

Soledad Village Environmental Impact Report

SCH NO. 2005041100

TECHNICAL APPENDICES

NOVEMBER 2005



RBF CONSULTING

DRAFT
ENVIRONMENTAL IMPACT REPORT

TECHNICAL APPENDICES

SOLEDAD VILLAGE

SCH NO. 2005041100

Lead Agency:

CITY OF SANTA CLARITA
23920 Valencia Boulevard
Santa Clarita, California 91355
Contact: Mr. Jason Mikaelian, AICP
661.255.4330

Prepared by:

RBF CONSULTING
14725 Alton Parkway
Irvine, California 92618-2069
Contacts: Ms. Collette Morse, AICP
949.472.3505

November 2005

JN 10-104142

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Appendix A
INITIAL STUDY/NOTICE OF PREPARATION

NOTICE OF PREPARATION

TO: Distribution List (Attached)

Lead Agency:		**Consulting Firm:**	
Agency Name:	City of Santa Clarita	***Name:***	RBF Consulting
Street Address:	23920 Valencia Boulevard, Suite 300	***Street Address:***	14725 Alton Parkway
City/State/Zip:	Santa Clarita, California 91355	***City/State/Zip:***	Irvine, California 92618
Contact:	Mr. Jason Mikaelian, AICP Associate Planner	***Contact:***	Ms. Collette L. Morse, AICP EIR Project Manager
Telephone:	(661) 255-4330	***Telephone:***	(949) 472-3505

SUBJECT: Notice of Preparation of Draft Environmental Impact Report and Public Scoping Meeting for the Soledad Townhomes Project

The City of Santa Clarita will be the lead agency and will prepare an Environmental Impact Report ("EIR") for the Soledad Townhomes project, located along the north side of Soledad Canyon road between Bouquet Canyon Road and Golden Valley Road, in the City of Santa Clarita. The Project Applicant for the Soledad Townhomes project is the Newhall Land and Farming Company.

We need to know the views of your agency as to the scope and content of the environmental information, which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR prepared by our agency when considering your permit or other approval for the project. The project description, location, and the probable environmental effects are contained in the attached materials. A copy of the Initial Study is attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but not later than 30 days after receipt of this notice. Please send your written response to Jason Mikaelian, Associate Planner at the address shown above. We would appreciate the name of a contact person in your agency.

Also, the City of Santa Clarita will conduct a public scoping meeting on Wednesday, May 11, 2005 beginning at 6:00 p.m. at City Hall located at 23920 Valencia Boulevard to accept comments on the scope of the EIR for Soledad Townhomes project. This meeting will serve as a public forum to discuss the environmental issues identified in the Initial Study for the Soledad Townhomes EIR, and any other issues identified by the public that should be included for further analysis within the Soledad Townhomes EIR.

Date: April 18, 2005

Title: Jason Mikaelian, AICP, Associate Planner
Telephone: (661) 255-4330

Reference: California Administrative Code, Title 14, Sections 15082(a), 15103, 15375.

L.A. County Sheriff's Dept.
23740 Magic Mountain Parkway
Santa Clarita, CA 91355
Attn: Captain Minutello

Los Angeles County Fire Depart.
Fire Prevention Division
Land Development Unit
5823 Rickenbacker Rd.
Commerce, CA. 90040-3027

L.A. County Sanitation Districts
Ms. Ruth Charles
1955 Workman Mill Rd.
Whittier, CA. 601-1400

L.A. County Flood Control
23757 W. Valencia Blvd.
Santa Clarita, CA. 91355
Attn: Nishon

Chief Administrative Office
Bob Muench
500 W. Temple St., Rm 713
Los Angeles, CA 90012

Caltrans-District 7
Steve Buswell
120 S. Spring St., 1-10C
Los Angeles, CA 90012

South Coast Air Quality
Mr. Henry Hogo
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

U.S. Army Corps of Engineers
Ms. Cheryl Conel
300 N. Los Angeles St., Rm 6062
Los Angeles, CA 90012

SCAG
818 West 7th St., 12th Floor
Los Angeles, CA 90017-3435

Office of Planning & Research
Mr. Scott Morgan
1400 Tenth St., Room 222
Sacramento, CA 95814

L.A. County Regional Planning
Ms. Angelique Carreon
320 W. Temple St., Rm 1101
Los Angeles, CA 90012

Craig David
L.A. County Dpt. Of Public Works
900 S. Fremont
Alhambra, CA 91803

L.A. County Industrial Waste
23757 Valencia Blvd.
Santa Clarita, CA 91355

Gabrieleno/Tongva Tribal Council
501 Santa Monica Blvd., Suite 500
Santa Monica, CA 90401

California Highway Patrol
Captain Greg Augusta
28648 The Old Road
Santa Clarita, CA 91355

California Dept. of Parks & Rec.
1925 Las Virgenes Rd.
Calabasas, CA 91302

California Dept. of Finance
Dan Sheya
915 L Street, 8th Floor
Sacramento, CA 95814

SCOPE
P.O. Box 1182
Santa Clarita, CA 91386

SCV Chamber of Commerce
23920 Valencia Blvd., Suite 100
Santa Clarita, CA 91355

Santa Clarita Disposal
17524 Sierra Hwy.
Santa Clarita, CA 91351

L.A. County Regional Planning
Mr. Jim Hartl
320 W. Temple St., Rm 1346
Los Angeles, CA 90012

L.A. County Health Dept.
25050 Peachland Ave., #210
Santa Clarita, CA 91321

MTA CEQA Review Coordination
Mail Stop 99-23-2
One Gateway Plaza
Los Angeles, CA 90012-2952

Glenn Adamick
Newhall Land
23823 Valencia Boulevard
Santa Clarita, CA 91355

L.A. County 5th District
500 W. Temple St., Rm 869
Los Angeles, CA 90012

Calif. Dept. of Fish & Game
4949 Viewridge Avenue
San Diego, CA 92123
Attn: Don/Cindy

Center for Biological Diversity
P.O. Box 710
Tuscon, AZ 85702
Attn: Peter Galvin

Santa Clarita Oak Conservancy
c/o Ken Buchen
P.O. Box 800520
Santa Clarita, CA 91380

Newhall School District
Dr. Marc Winger
25375 Orchard Village Ste. 200
Santa Clarita, CA 91355

Santa Monica Mtns. Conservancy
Mr. Paul Edelman
5750 Ramirez Canyon Rd.
Malibu, CA 90265

Hart Union High School District
Mr. Robert Lee, Superintendent
21515 Redview Drive
Santa Clarita, CA 91355

Valencia Library
23743 West Valencia Boulevard
Valencia, CA 91355

Newhall Library
22704 West 9th Street
Newhall, CA 91321

Santa Clarita Water Company
W.J. Manetta, Jr., President
P.O. Box 903
Santa Clarita, CA 91380

Castaic Lake Water Agency
Dan Masnada, GM
27234 Bouquet Canyon Road
Santa Clarita, CA 91350

B.F.I. Waste Systems
9200 Glen Oaks Blvd.
Sun Valley, CA 91352

Time Warner
9260 Topanga Canyon
Chatsworth, CA 91311

Southern California Edison
Mr. Steve Winegar
25625 W. Rye Canyon Road
Santa Clarita, CA 91355

Saugus Union School District
Dr. Judy Fish, Superintendent
24930 Avenue Stanford
Santa Clarita, CA 91355

College of the Canyons
Dr. Diane Van Hook, President
26455 N. Rockwell Canyon
Santa Clarita, CA 91355

Metropolitan Water District
700 N. Alameda Street
Los Angeles, CA 90012

Water Quality Control Board
Los Angeles Region #4
320 W. 4th St., #200
Los Angeles, CA 90013
Attn: Xavier Swamikannu

Department of Water & Power
Chief Real Estate Officer
111 N. Hope St., Room 1208
Los Angeles, CA 90012

Blue Barrel Disposal Co.
25772 Springbrook Ave.
Santa Clarita, CA 91350

Comcast
22620 Market St.
Santa Clarita, CA 91321

Southern California Gas Company
Technical Services
Mr. Jim Hammel
9400 Oakdale Ave.
Chatsworth, CA 91313-2300

Sierra Club
3435 Wilshire Blvd.
Los Angeles, CA 90010-1904

Friends of the Santa Clara River
660 Randy Drive
Newbury Park, CA 91320

Jo Anne Darcy Library
18601 Soledad Canyon Road
Canyon Country, CA 91351

US Fish & Wildlife Offices
Ventura Field Office
2493 Portola Road, Suite B
Ventura, CA 93003

Cal. Dept. of Water Resources
Mr. David N. Kennedy
1416 9th St., #1115-1
Sacramento, CA 95801

The Historical Society
The Signal Newspaper
24000 Creekside Drive
Santa Clarita, CA 91355
Attn: Leon Worden

SBC
41 South Chester Avenue
Room 202
Pasadena, CA 91106
Attn: Public Works Coordinator

INITIAL STUDY
CITY OF SANTA CLARITA

Project Title/Master Case Number:	**Master Case No. 04-444 for the Soledad Townhomes** ▪ General Plan Amendment No. 04-006 ▪ Zone Change No. 04-004 ▪ Tentative Tract Map No. 62-322
Lead Agency name and address:	City of Santa Clarita 23920 Valencia Blvd., Suite 300 Santa Clarita, CA 91355
Contact person and phone number:	Jason Mikaelian, AICP, Associate Planner (661) 255-4330
Project location:	Thirty (30) acres along the north side of Soledad Canyon Road, between Bouquet Canyon Road and Golden Valley Road, in the City of Santa Clarita in the County of Los Angeles (APN 2849-027-001, 002, 003, 004 & 2849-001-029).
Applicant's name and address:	Newhall Land and Farming Company 23823 Valencia Boulevard Santa Clarita, CA 91355
General Plan designation:	Commercial Office (CO)
Zoning:	Commercial Office (CO)
Description of project and setting:	The project site includes the development of 30 acres of land to construct a residential community with 437 for-sale multiple-family dwelling units (162 two-story triplex units and 275 two-story townhome units), a maximum of 10,000 square feet of commercial uses, associated recreation uses (common and private open space areas) and on-site private roads. The residential units would range in size from approximately 1,400 square feet to 2,200 square feet. Requested entitlements for the project include a General Plan Amendment and Zone Change from CO (Commercial Office) to RMH (Residential Medium-High Density) and CN (Commercial Neighborhood), and a Tentative Tract Map. The project site is currently graded pursuant to the recorded Parcel Map No. 20838. Traffic improvements, including a new traffic signal at the entrance to the project site and property frontage improvements, have been constructed pursuant to the recorded parcel map. In addition, the construction of bank stabilization along the southern bank of the Santa Clara River and a trail system (Santa Clara River Trail and Soledad Canyon Road Class 1 Trail) have been completed.
Surrounding land uses:	Land uses in the surrounding area consist of Santa Clara River to the north and west, a mobile home park and bowling alley to the east, Soledad Canyon Road and commercial and industrial business to the south.
Other public agencies whose approval may be required:	Los Angeles County Sanitation Districts, Los Angeles County Fire Department, Los Angeles Regional Water Quality Control Board, Castaic Lake Water Agency, California Department of Fish and Game and Army Corps of Engineers.

A. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "**Potentially Significant Impact**" as indicated by the checklist on the following pages.

[X]	Aesthetics	[ ]	Agriculture Resources	[X]	Air Quality
[ ]	Biological Resources	[ ]	Cultural Resources	[ ]	Geology /Soils
[ ]	Hazards & Hazardous Materials	[X]	Hydrology / Water Quality	[X]	Land Use / Planning
[ ]	Mineral Resources	[X]	Noise	[X]	Population / Housing
[X]	Public Services	[X]	Recreation	[X]	Transportation/Traffic
[X]	Utilities / Service Systems	[X]	Mandatory Findings of Significance		

B. DETERMINATION:

On the basis of this initial evaluation:

[ ] I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

[ ] I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

[ ] I find that the proposed project, as reflected in the application for the discretionary entitlements does not require the preparation of a subsequent EIR pursuant to CEQA Guidelines 15162.

[X] I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

[ ] I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

[ ] I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature/Title



Collette Morse, AICP, Senior Associate, RBF Consulting

Date 04/18/05

C. EVALUATION OF ENVIRONMENTAL IMPACTS:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS - Would the project:				
a. Have a substantial adverse effect on a scenic vista?	[ ]	[ ]	[X]	[ ]
b. Substantially damage scenic resources, including, but not limited to, primary/secondary ridgelines, trees, rock outcroppings, and historic buildings within a state scenic highway?	[ ]	[ ]	[X]	[ ]
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	[X]	[ ]	[ ]	[ ]
d. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	[X]	[ ]	[ ]	[ ]
e. Other _____	[ ]	[ ]	[ ]	[X]
II. AGRICULTURE RESOURCES – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	[ ]	[ ]	[ ]	[X]
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	[ ]	[ ]	[ ]	[X]
c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	[ ]	[ ]	[ ]	[X]
d. Other _____	[ ]	[ ]	[ ]	[X]
III. AIR QUALITY - Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	[X]	[ ]	[ ]	[ ]

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	[X]	[ ]	[ ]	[ ]
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	[X]	[ ]	[ ]	[ ]
d. Expose sensitive receptors to substantial pollutant concentrations?	[X]	[ ]	[ ]	[ ]
e. Create objectionable odors affecting a substantial number of people?	[ ]	[ ]	[X]	[ ]
f. Other _____	[ ]	[ ]	[ ]	[X]
IV. BIOLOGICAL RESOURCES – Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	[ ]	[ ]	[X]	[ ]
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	[ ]	[ ]	[X]	[ ]
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	[ ]	[ ]	[X]	[ ]
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	[ ]	[ ]	[X]	[ ]
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? Oak trees?	[ ]	[ ]	[X]	[ ]

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	[ ]	[ ]	[X]	[ ]
g. Affect a Significant Ecological Area (SEA) or Significant Natural Area (SNA) as identified on the City of Santa Clarita ESA Delineation Map?	[ ]	[ ]	[X]	[ ]
h. Other _____	[ ]	[ ]	[ ]	[X]
V. CULTURAL RESOURCES - Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?	[ ]	[ ]	[ ]	[X]
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?	[ ]	[ ]	[ ]	[X]
c. Directly or indirectly destroy or impact a unique paleontological resource or site or unique geologic feature?	[ ]	[ ]	[ ]	[X]
d. Disturb any human remains, including those interred outside of formal cemeteries?	[ ]	[ ]	[ ]	[X]
e. Other _____	[ ]	[ ]	[ ]	[X]
VI. GEOLOGY AND SOILS - Would the project:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	[ ]	[ ]	[ ]	[ ]
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	[ ]	[ ]	[ ]	[X]
ii. Strong seismic ground shaking?	[ ]	[ ]	[X]	[ ]
iii. Seismic-related ground failure, including liquefaction?	[ ]	[ ]	[X]	[ ]

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
iv. Landslides?	[ ]	[ ]	[ ]	[X]
b. Result in substantial wind or water soil erosion or the loss of topsoil, either on or off site?	[ ]	[ ]	[ ]	[X]
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	[ ]	[ ]	[X]	[ ]
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial risks to life or property?	[ ]	[ ]	[X]	[ ]
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	[ ]	[ ]	[ ]	[X]
f. Change in topography or ground surface relief features?	[ ]	[ ]	[ ]	[X]
g. Earth movement (cut and/or fill) of 10,000 cubic yards or more?	[ ]	[ ]	[X]	[ ]
h. Development and/or grading on a slope greater than 10% natural grade?	[ ]	[ ]	[ ]	[X]
i. The destruction, covering or modification of any unique geologic or physical feature?	[ ]	[ ]	[ ]	[X]
j. Other -- Fill existing wash with soil from project site.	[ ]	[ ]	[ ]	[X]
VII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	[ ]	[ ]	[ ]	[X]
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving explosion or the release of hazardous materials into the environment (including, but not limited to oil, pesticides, chemicals, fuels, or radiation)?	[ ]	[ ]	[ ]	[X]

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	[ ]	[ ]	[ ]	[X]
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	[ ]	[ ]	[ ]	[X]
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	[ ]	[ ]	[ ]	[X]
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	[ ]	[ ]	[ ]	[X]
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	[ ]	[ ]	[ ]	[X]
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	[ ]	[ ]	[X]	[ ]
i. Exposure of people to existing sources of potential health hazards (e.g. electrical transmission lines, gas lines, oil pipelines)?	[ ]	[ ]	[X]	[ ]
j. Other _____	[ ]	[ ]	[ ]	[X]
VIII. HYDROLOGY AND WATER QUALITY - Would the project:				
a. Violate any water quality standards or waste discharge requirements?	[X]	[ ]	[ ]	[ ]
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	[ ]	[ ]	[X]	[ ]

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	[ ]	[ ]	[X]	[ ]
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	[ ]	[ ]	[X]	[ ]
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	[X]	[ ]	[ ]	[ ]
f. Otherwise substantially degrade water quality?	[X]	[ ]	[ ]	[ ]
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	[ ]	[ ]	[ ]	[X]
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	[ ]	[ ]	[ ]	[X]
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	[ ]	[ ]	[ ]	[X]
j. Inundation by seiche, tsunami, or mudflow?	[ ]	[ ]	[ ]	[X]
k. Changes in the rate of flow, currents, or the course and direction of surface water and/or groundwater?	[ ]	[ ]	[X]	[ ]
l. Other modification of a wash, channel creek or river?	[ ]	[ ]	[ ]	[X]
m. Impact Stormwater Management in any of the following ways:	[X]	[ ]	[ ]	[ ]
i. Potential impact of project construction and project post-construction activity on storm water runoff?	[ ]	[ ]	[ ]	[ ]

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
ii. Potential discharges from areas for materials storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work areas?	[ ]	[ ]	[X]	[ ]
iii. Significant environmentally harmful increase in the flow velocity or volume of storm water runoff?	[ ]	[ ]	[X]	[ ]
iv. Significant and environmentally harmful increases in erosion of the project site or surrounding areas?	[X]	[ ]	[ ]	[ ]
v. Storm water discharges that would significantly impair or contribute to the impairment of the beneficial uses of receiving waters or areas that provide water quality benefits (e.g. riparian corridors, wetlands, etc.)	[X]	[ ]	[ ]	[ ]
vi. Cause harm to the biological integrity of drainage systems, watersheds, and/or water bodies?	[X]	[ ]	[ ]	[ ]
vii. Does the proposed project include provisions for the separation, recycling, and reuse of materials both during construction and after project occupancy?	[X]	[ ]	[ ]	[ ]
IX. LAND USE AND PLANNING - Would the project:				
a. Disrupt or physically divide an established community (including a low-income or minority community)?	[ ]	[ ]	[ ]	[X]
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	[X]	[ ]	[ ]	[ ]
c. Conflict with any applicable habitat conservation plan, natural community conservation plan, and/or policies by agencies with jurisdiction over the project?	[ ]	[ ]	[ ]	[X]

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
X. MINERAL AND ENERGY RESOURCES - Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	[ ]	[ ]	[ ]	[X]
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	[ ]	[ ]	[ ]	[X]
c. Use nonrenewable resources in a wasteful and inefficient manner?	[ ]	[ ]	[X]	[ ]
XI. NOISE - Would the project result in:				
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	[X]	[ ]	[ ]	[ ]
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	[X]	[ ]	[ ]	[ ]
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	[X]	[ ]	[ ]	[ ]
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	[X]	[ ]	[ ]	[ ]
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	[ ]	[ ]	[ ]	[X]
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	[ ]	[ ]	[ ]	[X]
XII. POPULATION AND HOUSING – Would the project:				
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	[X]	[ ]	[ ]	[ ]

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere (especially affordable housing)?	[ ]	[ ]	[ ]	[X]
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	[ ]	[ ]	[ ]	[X]
XIII. PUBLIC SERVICES - Would the project result in:				
a. Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	[ ]	[ ]	[ ]	[ ]
i. Fire protection?	[ ]	[ ]	[X]	[ ]
ii. Police protection?	[ ]	[ ]	[X]	[ ]
iii. Schools?	[X]	[ ]	[ ]	[ ]
iv. Parks?	[X]	[ ]	[ ]	[ ]
XIV. RECREATION - Would the project:				
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	[X]	[ ]	[ ]	[ ]
b. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	[ ]	[ ]	[X]	[ ]
XV. TRANSPORTATION/TRAFFIC – Would the project:				
a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	[X]	[ ]	[ ]	[ ]

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	[X]	[ ]	[ ]	[ ]
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	[ ]	[ ]	[ ]	[X]
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	[ ]	[ ]	[X]	[ ]
e. Result in inadequate emergency access?	[ ]	[ ]	[ ]	[X]
f. Result in inadequate parking capacity?	[ ]	[ ]	[ ]	[X]
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	[ ]	[ ]	[ ]	[X]
h. Hazards or barriers for pedestrians or bicyclists?	[ ]	[ ]	[ ]	[X]
XVI. UTILITIES AND SERVICE SYSTEMS - Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	[ ]	[ ]	[X]	[ ]
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	[ ]	[ ]	[X]	[ ]
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	[ ]	[ ]	[X]	[ ]
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	[X]	[ ]	[ ]	[ ]
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	[ ]	[ ]	[X]	[ ]

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	[X]	[ ]	[ ]	[ ]
g. Comply with federal, state, and local statutes and regulations related to solid waste?	[X]	[ ]	[ ]	[ ]
XVII. MANDATORY FINDINGS OF SIGNIFICANCE:				
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	[ ]	[ ]	[X]	[ ]
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	[X]	[ ]	[ ]	[ ]
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	[ ]	[ ]	[X]	[ ]

D. DISCUSSION OF ENVIRONMENTAL IMPACTS AND/OR EARLIER ANALYSIS:

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I. AESTHETICS	a. Less Than Significant Impact. – Approval of the proposed project would change the existing visual character of the site by converting a vacant site that allows views through and across the site to surrounding uses. However, there are no scenic vistas within or surrounding the project site. It should be noted that the proposed residential and commercial project and associated GPA and ZC would result in potentially less impacts then that created by the construction of a commercial project permitted in the current CO zone. Therefore, development of the proposed project would not have a substantial effect on a scenic vista and impacts would be less than significant. b. Less Than Significant Impact. – The only scenic resource in the project area is the Santa Clara River, located north and west of the project site. Under the proposed project, access to the Santa Clara River Trail would be maintained, preserving the viewshed of the Santa Clara River. It should be noted that development of a residential and commercial project would reduce the density of development compared to the CO zone, thereby reducing visual impacts of the Santa Clarita River. Therefore, impacts would be less than significant. c. Potentially Significant Impact. – Approval of the proposed project would change the existing visual character of the site by converting a vacant, flat graded site to a man-made urban environment. Therefore, further review and analysis in the EIR is required. d. Potentially Significant Impact. – Development of the proposed project would introduce new sources of light and glare that may impact surrounding uses. Further review and analysis in the EIR is required. e. No Impact. – No additional impacts are anticipated with regards to aesthetics. Potential impacts may result from the proposed project and will be evaluated within the EIR. Any mitigation measures to reduce impacts to less than significant will be listed in the EIR Mitigation Monitoring and Reporting Program.
II. AGRICULTURE RESOURCES	a. No Impact. – No agricultural-related impacts would result from the development of the proposed residential and commercial uses. No Prime Farmland, Unique Farmland, or Farmland of Statewide Importance would be converted to a non-agricultural use because no designated farmland soils exists on-site, nor in proximity to the proposed development. Therefore, no impacts would result from the construction and occupancy of the proposed project. b. No Impact. – No conflict with the Williamson Act contract would occur because no portion of the site is within an agricultural zone or in a Williamson Act contract. Therefore, no impacts would result from the construction and occupancy of the proposed project.

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	c. No Impact. – The proposed project would not cause any changes in the existing environment that would result in the conversion of farmland to non-agricultural use because the site is not located in or adjacent to any agricultural land. Therefore, no impacts would result from the construction and occupancy of the proposed project. d. No Impact. – No additional impacts are anticipated with regards to agricultural resources. Development of the proposed project would not result in any potentially significant impacts to agricultural resources. Thus, further review and analysis of agricultural resources within the EIR is not required.
III. AIR QUALITY	a. Potentially Significant Impact. – The project site is located within the South Coast Air Basin (SoCAB), an area monitored by the South Coast Air Quality Management District (SCAQMD). SoCAB is identified as non-attainment for Ozone (O_3), Carbon Monoxide (CO) and Particulate Matter (PM_{10}). Further review and analysis is required to confirm the proposed project's status in terms of compliance/conflict with current SCAQMD plans and guidelines. b. Potentially Significant Impact. – Construction and buildout of the proposed project would result in pollutant emissions from three different sources, including: (1) short-term construction emissions; (2) long-term mobile emissions from trucks and vehicles traveling to and from the site once the project is operational; and (3) long-term stationary emissions from power and gas consumption and machinery and equipment on-site. The greatest potential for air quality impacts from the proposed project would be attributed to mobile emissions. The proposed project's potential air quality impacts on a local and regional level require an evaluation pursuant to the SCAQMD and California Air Resources Board (CARB) requirements and methodology. Additional review and analysis in the EIR is required to quantify potential project-related air quality impacts (both short-term and long-term) and potential mitigation that would be effective in reducing pollutant emissions. c. Potentially Significant Impact. – The proposed project could potentially result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard. Therefore, further review and analysis in the EIR is required. d. Potentially Significant Impact. – The project site is located adjacent to a mobile home community to the east, as well as in proximity to other residential uses within the vicinity of the project site. These residential uses are considered sensitive receptors. Therefore, further review and analysis in the EIR is required. e. Less Than Significant Impact. – Occupancy of the residential units and operation of the commercial center is not anticipated to generate objectionable odors. The uses proposed within the commercial center are typical commercial uses found within many land uses, including residential, and operate in harmony with those

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	uses. Therefore, any potential impacts would be less than significant. f. No Impact. – No additional impacts are anticipated with regards to air quality. Potential impacts may result from the proposed project and will be evaluated within the EIR. Any mitigation measures to reduce impacts to less than significant will be listed in the EIR Mitigation Monitoring and Reporting Program.
IV. BIOLOGICAL RESOURCES	a. Less Than Significant Impact. – The project site has been graded pursuant to the approval issued for Parcel Map No. 20838. Flood protection and trail improvements along the Santa Clara River have already been installed. In addition, as illustrated on Exhibit OS-1, *Generalized Vegetation Map*, of the *City of Santa Clarita General Plan*, the project site does not contain any biological resources. As such, development of the project site would create no new impacts on any species listed as candidate, sensitive or special status species in any local or regional plans, policies or regulations; thus impacts would be less than significant. b. Less Than Significant Impact. – The area proposed for the residential and commercial development has been graded pursuant to the approval issued for Parcel Map No. 20838. Flood protection and trail improvements along the Santa Clara River have already been installed. In addition, as illustrated on Exhibit OS-1, *Generalized Vegetation Map*, of the *City of Santa Clarita General Plan*, the project site does not contain any biological resources. As such, development of this property as proposed would create no new impacts on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations; thus impacts would be less than significant. c. Less Than Significant Impact. – The area proposed for the residential and commercial development has been graded pursuant to the approval issued for Parcel Map No. 20838. Flood protection and trail improvements along the Santa Clara River have already been installed. In addition, as illustrated on Exhibit OS-1, *Generalized Vegetation Map*, of the *City of Santa Clarita General Plan*, the project site does not contain any biological resources. As such, development of this property as proposed would create no new impacts on any federally protected wetlands in any local or regional plans, policies or regulations; thus impacts would be less than significant. d. Less Than Significant Impact. – The area proposed for the residential and commercial development has been graded pursuant to the approval issued for Parcel Map No. 20838. Flood protection and trail improvements along the Santa Clara River have already been installed. In addition, as illustrated on Exhibit OS-1, *Generalized Vegetation Map*, of the *City of Santa Clarita General Plan*, the project site does not contain any biological resources. As such, development of this property as proposed would create no

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	new impacts on the movement on any migratory fish or wildlife species or migratory wildlife corridors or impede the use of native wildlife nursery sites; thus impacts would be less than significant. e. Less Than Significant Impact. – The area proposed for the residential and commercial development has been graded pursuant to the approval issued for Parcel Map No. 20838. Flood protection and trail improvements along the Santa Clara River have already been installed. In addition, as illustrated on Exhibit OS-1, *Generalized Vegetation Map*, of the *City of Santa Clarita General Plan*, the project site does not contain any biological resources. As such, development of this property as proposed would create no new impacts either directly or through habitat modifications, on any local policies or ordinances protecting biological resources such as tree preservation; thus impacts would be less than significant. f. Less Than Significant Impact. – The area proposed for the residential and commercial development has been graded pursuant to the approval issued for Parcel Map No. 20838. Flood protection and trail improvements along the Santa Clara River have already been installed. In addition, as illustrated on Exhibit OS-1, *Generalized Vegetation Map*, of the *City of Santa Clarita General Plan*, the project site does not contain any biological resources. As such, development of this property as proposed would create no new impacts on any adopted Habitat Conservation Plan, Natural Community Conservation Plan or other local or regional plans, policies or regulations; thus impacts would be less than significant. g. Less Than Significant Impact. – The area is adjacent to the Santa Clara River, which is designated a Significant Natural Area (SNA) and a Significant Ecological Area (SEA). However, the area has already been graded pursuant to the approval issued for Parcel Map No. 20838. Flood protection and trail improvements along the Santa Clara River have already been installed. In addition, as illustrated on Exhibit OS-1, *Generalized Vegetation Map*, of the *City of Santa Clarita General Plan*, the project site does not contain any biological resources. Finally, the project would incorporate the following: ▪ Pets and other animals shall be restricted with fencing and signage from entering the Santa Clara Rive SEA. Additionally, the project has incorporated fencing along the Santa Clara River corridor to deter humans and domestic animals from entering these areas; ▪ Interpretive signs would be constructed in conjunction with the project and placed in appropriate areas explaining the sensitivity of natural habitats of the Santa Clara River and the need to minimize impacts to these areas; and ▪ All street, residential and parking lot lighting would be downcast luminaries or direction lighting with light patterns directed away from the Santa Clara River. Additionally, Covenants, Codes and Restrictions (C,C, and Rs would require the exterior lighting within the residential areas to be

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	low voltage. As such, development of this property as proposed would create no new impact son the SEA or SNA, thus impacts would be less than significant. h. No Impact. – No additional biological resources impacts have been identified at this time. Development of the proposed project would not result in any new potentially significant impacts to biological resources that have not already been analyzed. Thus, further review and analysis of biological resources within the EIR is not required.
V. CULTURAL RESOURCES	a. No Impact. – The project site is not listed in any register of historical resources, nor does the site contain any structures with distinctive characteristics of a region or period. The site does not meet any criteria set forth in the California Environmental Quality Act (CEQA) to identify the site as an historical resource. Therefore, no impacts would result from the construction and occupancy of the proposed project. b. No Impact. – The project site does not have archaeological significance as defined by CEQA, and no impacts are anticipated. Site preparation, including grading and excavation has occurred pursuant to the recorded Parcel Map No. 20838. Therefore, no impacts would result from the construction and occupancy of the proposed project. c. No Impact. – The project site is not known to contain any unique paleontological features. Site preparation, including grading and excavation has occurred pursuant to the recorded Parcel Map No. 20838. Therefore, no impacts would result from the construction and occupancy of the proposed project. d. No Impact. – No disturbance of human remains, including those interred outside of formal cemeteries is anticipated. Site preparation, including grading and excavation has occurred pursuant to the recorded Parcel Map No. 20838. Therefore, no impacts would result from the construction and occupancy of the proposed project. e. No Impact. – No additional cultural resources impacts have been identified at this time. Development of the proposed project would not result in any potentially significant impacts to cultural resources. Thus, further review and analysis of cultural resources within the EIR is not required.
VI. GEOLOGY AND SOILS	a(i). No Impact. – Southern California has numerous active and potentially active faults that could affect the project site. However, the project area is not within a special study zone and no active faults are known to exist on or in proximity to the project site. Therefore, there would be no impacts in this regard.

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	a(ii). Less Than Significant Impact. – Southern California has numerous active and potentially active faults that could produce strong ground shaking that could impact the project site. However, the project area is not within a special study zone and no active faults are known to exist on or in proximity to the project site. The California Building Code requires construction methods that minimize the effects of strong ground shaking to less than significant level. The California Building Code requirements would be applied to the proposed project as standard conditions of project approval. a(iii). Less Than Significant Impact. – As stated in the *City of Santa Clarita General Plan*, the region is susceptible to geological hazards in the event of a major earthquake that could result in ground failure and liquefaction. However, the project area is not within a special study zone and no active faults are known to existing on or in proximity to the subject area. The California Building Code requires construction methods that minimize the effects of an earthquake and liquefaction on structures to less than significant level. The California Building Code requirements would be applied to the proposed project as standard conditions of project approval. a(iv). No Impact. – As stated in the *City of Santa Clarita General Plan*, the region is susceptible to geological hazards in the event of a major earthquake which could result in landslides. However, the project area is not within a special study zone and no active faults are known to existing on or in proximity to the subject area. In addition, the project site and surrounding area are generally flat and not susceptible to landslides. Therefore, there would be no impacts in this regard. b. No Impact. – All site preparation such as grading, excavation, utility installation, and roadway construction has occurred pursuant to the recorded Parcel Map No. 20838. No new impacts to geology and soils would result from construction of the proposed project. c. Less Than Significant Impact. – All site preparation such as grading, excavation, utility installation, and roadway construction has occurred pursuant to the recorded Parcel Map No. 20838. Furthermore, the proposed project would not cause geological or soil units to become unstable. Therefore, any impacts to geology and soils from project construction are considered to be less than significant. d. Less Than Significant Impact. – All site preparation such as grading, excavation, utility installation, and roadway construction has occurred pursuant to the recorded Parcel Map No. 20838. Furthermore, the engineered soils on-site do not pose substantial risks from expansion. Therefore, any impacts to geology and soils from project construction are considered to be less than significant. e. No Impact. – All site preparation such as grading, excavation, utility installation, and roadway construction has occurred pursuant to the recorded Parcel Map No. 20838. Furthermore, no septic tanks would be installed on-site. No project-level impacts to geology and

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	soils would result from construction of the proposed project. f. No Impact. – All site preparation such as grading, excavation, utility installation, and roadway construction has occurred pursuant to the recorded Parcel Map No. 20838. The site is relatively flat and therefore, no new project-level impacts to topography, geology and soils would result from construction of the proposed project. g. Less Than Significant Impact. – All site preparation such as grading, excavation, utility installation, and roadway construction has occurred pursuant to the recorded Parcel Map No. 20838. Therefore, little earth movement is expected as part of project construction. Therefore, any potential impacts would be less than significant. h. No Impact. – All site preparation such as grading, excavation, utility installation, and roadway construction has occurred pursuant to the recorded Parcel Map No. 20838. Therefore, the project site is relatively flat and does not include any slopes greater than 10 percent. Therefore, no impacts would result from the construction and occupancy of the proposed project. i. No Impact. – All site preparation such as grading, excavation, utility installation, and roadway construction has occurred pursuant to the recorded Parcel Map No. 20838. Therefore, there are no unique geological or physical features on the subject site. Therefore, no impacts would result from the construction and occupancy of the proposed project. j. No Impact. – No additional impacts are anticipated with regards to filling the existing wash with soil from the project site. Development of the proposed project would not result in any potentially significant impacts in regards to geology and soils. Thus, further review and analysis of geology and soils within the EIR is not required.
VII. HAZARDS AND HAZARDOUS MATERIALS	a. No Impact. – No impacts would result from the construction and occupancy of the proposed project with respect to the transport, use, or disposal of hazardous materials. The project site would consist of residential units and a small amount of commercial uses. These types of uses do not typically include the use of hazardous materials for storage or operation. Should any future uses require the storage or use of hazardous materials, they would be subject to all applicable agency requirements. Therefore, no impacts would result from the construction and occupancy of the proposed project. b. No Impact. – The proposed development would not create a significant hazard to the public or the environment by creating a reasonably foreseeable upset or accident because the proposed project does not include any hazardous materials. Therefore, no impacts would result from the construction and occupancy of the proposed project.

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	c. No Impact. – An elementary school is located ½ mile to the east and Golden Valley High School is located 1 ½ miles to the southeast. However, the proposed project would not involve the transport, use or disposal of hazardous materials. Therefore, no impacts to schools would result from the construction and occupancy of the proposed project. d. No Impact. – The project site is not considered a hazardous materials site as identified by Government Code 65692.5. Therefore, no impacts would result from the construction and occupancy of the proposed project. e. No Impact. – The project site is not located within two miles of any public airport or within an airport land use plan. Therefore, no impacts would result from the construction and occupancy of the proposed project. f. No Impact. – The project site is not located within the vicinity of a private airstrip. Therefore, no impacts would result from the construction and occupancy of the proposed project. g. No Impact. – Emergency vehicles would continue to have access to Soledad Canyon Road upon the completion of the proposed project. The proposed project would not impact access to emergency response. In addition, the proposed project would not place temporary or permanent barriers on existing roadways or reconfigure existing roadways. Therefore, no impacts would result from the construction and occupancy of the proposed project. h. Less Than Significant Impact. – The project area is located within 1,000 feet of a brush fire area. However, the proposed project would require approval from the Los Angeles County Fire Department's Fuel Modification Unit to ensure selected vegetation is fire resistant and adequately spaced. The site would be within a developed urbanized area bounded by commercial and residential development to the east, and Soledad Canyon Road to the south. Therefore, the risk involving wildland fires is considered less than significant. i. Less Than Significant Impact. – The project site is not in proximity to any transmission lines or gas, water and oil lines. Therefore, any potential impacts would be less than significant. j. No Impact. – No additional impacts are anticipated with regards to hazards. Development of the proposed project would not result in any potentially significant impacts in regards to hazards and hazardous materials. Thus, further review and analysis of hazards and hazardous materials within the EIR is not required.
VIII. HYDROLOGY AND WATER QUALITY	a. Potentially Significant Impact. – The proposed project has the potential to violate or exceed water quality standards or waste discharge requirements. The property is adjacent to the 303(d) segment of the Santa Clara River. Therefore, further review and

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	analysis in the EIR is needed. b. Less Than Significant Impact. – The proposed project is not large enough to impact groundwater recharge areas. The adjacent Santa Clara River is a groundwater recharge area; however, the proposed project would not encroach into the riverbed nor would water run off into the riverbed that would negatively impact water recharge. Therefore, any potential impacts would be less than significant. c. Less Than Significant Impact. – The proposed project would be designed to drain in accordance with engineering standards so that it would not substantially alter the existing drainage pattern of the site or area. The applicant would also be required to implement Best Management Practices (BMPs), Standard Urban Storm Water Mitigation Plan (SUSMP) requirements, and meet all National Pollution Discharge Elimination System (NPDES) requirements of the California Regional Water Quality Board (RWQCB) and the City of Santa Clarita. Therefore, any potential impacts would be less than significant. d. Less Than Significant Impact. – Appropriate drainage infrastructure has been or would be installed per City requirements prior to the construction of the proposed project. Therefore, no additional impacts related to stormwater runoff, drainage, downstream flooding, and stream channel erosion would result from construction. The applicant would also be required to implement BMPs and meet all NPDES requirements of the California RWQCB and the City of Santa Clarita. Therefore, any potential impacts would be less than significant. e. Potentially Significant Impact. – The proposed project has the potential to create substantial additional sources of polluted runoff. Therefore, further review and analysis in the EIR is required. f. Potentially Significant Impact. – As previously discussed, the proposed project has the potential to create substantial additional sources of polluted runoff. Therefore, further review and analysis in the EIR is required. g. No Impact. – The proposed project is located outside the 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map, and no new impacts would result related to flood hazards from the development of this project. Therefore, no impacts would result from the construction and occupancy of the proposed project. h. No Impact. – The project site is located outside the 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map, and therefore, the proposed project would not construct any structures to impede or redirect flood flows. Therefore, no impacts would result from the construction and occupancy of the proposed project.

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	i. No Impact. – New bank stabilization at the edge of the project site, along the Santa Clara River, has recently been completed and will serve to minimize the exposure of people or structures to a significant risk of loss, injury or death involving flooding. This device has been reviewed and approved by the Los Angeles County Flood Control District. Therefore, no impacts would result from the construction and occupancy of the proposed project. j. No Impact. – There are no large bodies of water within the vicinity of the project site that would cause inundation by seiche, tsunami, or mudflow. Therefore, no impacts would result from the construction and occupancy of the proposed project. k. Less Than Significant Impact. – Land alteration, including grading and excavation has recently been completed pursuant to recorded Parcel Map No. 20838. The construction of the proposed project is not expected to result in significant changes to the course or direction of surface water and/or groundwater. Therefore, any potential impacts would be less than significant. l. No Impact. – The proposed project would not result in the modification of a wash, channel, creek or river because the site has already experienced extensive site preparation, including grading and excavation, pursuant to recorded Parcel Map No. 20838. Therefore, no impacts would result from the construction and occupancy of the proposed project. m(i). Potentially Significant Impact. – Project implementation could result in project construction and post-construction impacts to surface water quality. Short-term surface water quality impacts may occur from water erosion of soils during construction, with long-term impacts on surface water quality occurring primarily from the addition of project-related automobile trips that generate urban type pollutants (i.e., oil, tire particles, etc.) and landscape area development (i.e., fertilizers). The proposed project requires further review and analysis of BMPs in order to comply with the NPDES stormwater quality requirements. Therefore, further analyses and review in the EIR is required. m(ii). Less Than Significant Impact. – The proposed project would be required to implement BMPs and meet all NPDES requirements of the California RWQCB and the City of Santa Clarita. Therefore, any potential impacts would be less than significant. m(iii). Less Than Significant Impact. – Implementation of the proposed project would increase the amount of impervious surfaces, thereby increasing the potential volume and/or velocity of stormwater runoff. However, all project plans would be reviewed by the City to ensure adequate drainage for stormwater runoff, reducing impacts to a less than significant level. m(iv). Potentially Significant Impact. – Project implementation would involve the construction of impervious surfaces, which would lead to a decrease in ground absorption on-site, an increase in the quantity

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	of surface water and possible changes to existing drainage patterns. The possible changes in drainage patterns, altered absorption rates, and the manner in which runoff from the site would result in erosion on- or off-site requires further review and analysis in the EIR. m(v). Potentially Significant Impact. – The proposed project may have a substantial increase in stormwater discharges from the site and may impair the beneficial uses of receiving waters or areas that provide water quality benefits. Further review and analysis in the EIR is required. m(vi). Potentially Significant Impact. – The proposed project may have a substantial increase in stormwater discharges from the site and may cause harm to the biological integrity of drainage systems and water bodies. Therefore, further review and analysis in the EIR is required. m(vii). Potentially Significant Impact. – Development of the proposed project would result in an increase in solid waste, which may impact solid waste disposal services and incrementally reduce the lifespan of the regional landfills. Therefore, further review and analysis in the EIR is required. Potential impacts may result from the proposed project and will be evaluated within the EIR. Any mitigation measures to reduce impacts to less than significant will be listed in the EIR Mitigation Monitoring and Reporting Program.
IX. LAND USE AND PLANNING	a. No Impact. – The proposed residential and commercial uses would not disrupt or physically divide an established community because the project site is located directly adjacent to a mix of residential and commercial uses, and would be compatible with these uses. Residential development on this project site is appropriate given the availability of services nearby, including the Metrolink station located approximately ¼ mile west of the project site. Therefore, no impacts would result from the construction and occupancy of the proposed project. b. Potentially Significant Impact. – The project as proposed is not consistent with the current CO *General Plan* and zoning designations. Therefore, further review and analysis in the EIR is required. c. No Impact. – The construction and occupancy of the proposed project would not conflict with any applicable habitat conservation plan, natural community conservation plan, and/or policies by agencies because site preparation work, including grading and excavation, has already occurred on the project site. Therefore, no impacts would result from the construction and occupancy of the proposed project.

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	Potential impacts may result from the proposed project and will be evaluated within the EIR. Any mitigation measures to reduce impacts to less than significant will be listed in the EIR Mitigation Monitoring and Reporting Program.
X. MINERAL AND ENERGY RESOURCES	a. No Impact. – No impacts would result from the construction and occupancy of the proposed project. The proposed project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State, because the development would not use any mineral resources as defined or identified in the *City of Santa Clarita General Plan.* Therefore, no impacts would result from the construction and occupancy of the proposed project. b. No Impact. – The *City of Santa Clarita General Plan* does not identify any locally important mineral resources within the City, including the project site. Therefore, no impacts would result from the construction and occupancy of the proposed project. c. Less Than Significant Impact – No impacts would result from the construction and occupancy of the proposed project. The proposed project would use materials for construction that may be considered non-renewable resources. However, these materials would not be used for construction in a wasteful and inefficient manner, because they would be used to construct much needed housing in the Santa Clarita Valley. Therefore, any potential impacts would be less than significant. Development of the proposed project would not result in any potentially significant impacts to mineral resources. Thus, further review and analysis of mineral resources within the EIR is not required.
XI. NOISE	a. Potentially Significant Impact. – The proposed project could potentially generate short-term construction related noise impacts in excess of the City's standards. Additionally, increases in traffic due to the proposed project could potentially increase noise levels above the City standards to off-site sensitive receptors. Therefore, further review and analysis in the EIR is required. b. Potentially Significant Impact. – Construction of the proposed project could potentially expose persons to groundbourne vibration or groundbourne noise levels as a result of pile driving activities. Therefore, further review and analysis in the EIR is required. c. Potentially Significant Impact – The proposed project could potentially result in a permanent increase in ambient noise levels within the project area. Therefore, further review and analysis in the EIR is required. d. Potentially Significant Impact. – Construction of the proposed project could potentially expose new residents of the project to temporary or periodic noise levels in excess of those in the *City of Santa Clarita General Plan* Noise Element. Therefore, further review and analysis in the EIR is required.

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	e. No Impact. – Construction of the proposed project would have no impact with regards to airports. The project area is not located within two miles of any public airport or within an airport land use plan. Therefore, no impacts would result from the construction and occupancy of the proposed project. f. No Impact. – The construction of the project would have no impact with regards to private airstrips. The project area is not located within the vicinity of a private airstrip. Therefore, no impacts would result from the construction and occupancy of the project. Potential impacts may result from the proposed project and will be evaluated within the EIR. Any mitigation measures to reduce impacts to less than significant will be listed in the EIR Mitigation Monitoring and Reporting Program.
XII. POPULATION AND HOUSING	a. Potentially Significant Impact. – The proposed project would directly induce population growth by adding 437 new residential units and 10,000 square feet of new commercial space. Therefore, further review and analysis in the EIR is required. b. No Impact. – The proposed project would no displace any existing housing necessitating the construction of replacement housing elsewhere because no housing exists on the project site. Therefore, no impacts would result from the construction and occupancy of the proposed project. c. No Impact. – The proposed project would not displace any people, necessitating the construction of replacement housing elsewhere because no housing exists on the project site. Therefore, no impacts would result from the construction and occupancy of the project. Potential impacts may result from the proposed project and will be evaluated within the EIR. Any mitigation measures to reduce impacts to less than significant will be listed in the EIR Mitigation Monitoring and Reporting Program.
XIII. PUBLIC SERVICES	a(i). Less Than Significant Impact. – No new or substantially increased impacts would occur with respect to fire service requirement protections, since the project site is located along a major arterial within a built environment. In addition, the proposed project is located within the service area of the Los Angeles County Fire District and would contribute to fees necessary to operate adequate fire protection. The development fees would off-set any increase in services, reducing impacts to less than significant. a(ii). Less Than Significant Impact. – No new or substantially increased impacts would occur with respect to police service requirement protections, since the project site is located along a major arterial within a built environment. In addition, the proposed project would contribute to fees necessary to operate adequate police protection in the vicinity of the proposed project. The development fees would off-set any increase in services, reducing impacts to less than significant.

Section and Subsections	Evaluation of Impacts
	a(iii). Potentially Significant Impact. - The project site is located within the Saugus School District (elementary schools) and the Hart High School District. The applicant has school mitigation agreements in place with both Districts. Compliance with these agreements would reduce project impacts to a less than significant level. a(iv). Potentially Significant Impact. – The proposed project would involve development of 437 residential units, which would result in an increase in the resident population utilizing parks. Therefore, further review and analysis in the EIR is required. Potential impacts may result from the proposed project and will be evaluated within the EIR. Any mitigation measures to reduce impacts to less than significant will be listed in the EIR Mitigation Monitoring and Reporting Program.
XIV. RECREATION	a. Potentially Significant Impact. – Based on the City's assumptions for the impact on park facilities from new residential development, the proposed project would increase the use of existing facilities. Therefore, further review and analysis in the EIR is required. b. Less Than Significant Impact. – The proposed project includes common recreational areas and private patios to serve the project residents. In addition, the project site is directly linked to the City's extensive trail network. Therefore, the need for new or expanded recreational facilities is less than significant. Potential impacts may result from the proposed project and will be evaluated within the EIR. Any mitigation measures to reduce impacts to less than significant will be listed in the EIR Mitigation Monitoring and Reporting Program.
XV. TRANSPORTATION / TRAFFIC	a. Potentially Significant Impact. – Certain traffic improvements for the project site have been completed as a result of Parcel Map No. 20838. These improvements include: ▪ New traffic signal at project entrance/Soledad Canyon Road; ▪ Extension of the City's river trail along the project frontage to the Santa Clara River; ▪ New street curb along the project's Soledad Canyon Road frontage; and ▪ Various modifications to Soledad Canyon Road. However, due to the proposed increased density of development on-site, the proposed project has the potential to increase traffic in the project vicinity. Therefore, further review and analysis in the EIR is required. b. Potentially Significant Impact. – The proposed project has the potential to exceed existing level of service standards for surrounding roadways and intersections. Therefore, further review

Section and Subsections	Evaluation of Impacts
	and analysis in the EIR is required. c. No Impact. – The proposed project would not result in a change in air traffic patterns, and no impact to air traffic would occur. d. Less Than Significant Impact. – The proposed project would not result in increased hazards due to design features or incompatible uses. Therefore, any potential impacts would be less than significant. e. No Impact. – The proposed project would not impact the adequacy of existing and future emergency services. Constructed roadways and driveways are required to meet access standards of the Los Angeles Fire Department. Therefore, no impacts would result from the construction and occupancy of the proposed project. f. No Impact. – The proposed project is required to comply with the City's parking requirements for residential and commercial uses, and would be subject to review and approval of the Planning Division and Building and Engineering Department. Therefore, no impacts would result from the construction and occupancy of the proposed project. g. No Impact. – The proposed project would not conflict with adopted policies, plans or programs supporting alternative transportation. The project site is located along Soledad Canyon Road, which is a major bus corridor. The project site is located in close proximity to a variety of transportation modes. The Santa Clarita Soledad Metrolink Station is located approximately ¼ mile west of the project site. Soledad Canyon Road also provides access to the City's extensive network of bus lines. In addition, the City's backbone river trail system runs directly adjacent to the site and provides the sites future residents access to a wide variety of retail, service and entertainment uses. None of these modes of transportation would be changed by the proposed project. Therefore, no impacts would result from the construction and occupancy of the proposed project. h. No Impact. – The proposed project would not create new hazards or barriers to pedestrians or bicyclists. In addition, the proposed project would be directly linked to the City's babkbone river trail system, which is regularly used by pedestrians and cyclists. Therefore, no impacts would result from the construction and occupancy of the project. Potential impacts may result from the proposed project and will be evaluated within the EIR. Any mitigation measures to reduce impacts to less than significant will be listed in the EIR Mitigation Monitoring and Reporting Program.
XVI. UTILITIES AND SERVICE SYSTEMS	a. Less Than Significant Impact. – The proposed project would not exceed wastewater treatment requirements because the applicant would be required to obtain all permits and operate in compliance with all Regional Water Quality Control Board approvals. The

Section and Subsections	Evaluation of Impacts
	project site would annex into the Los Angeles County Sanitation District No. 26, which has adequate capacity to serve the proposed project. Therefore, any potential impacts would be less than significant. b. Less Than Significant Impact. – Existing water and wastewater treatment facilities in the area have sufficient capacity to serve the proposed project. Therefore, any potential impacts would be less than significant. c. Less Than Significant Impact. – Existing stormwater drainage facilities have sufficient capacity to serve the proposed project. Therefore, any potential impacts would be less than significant. d. Potentially Significant Impact. – The proposed project has the potential to impact existing and future water supplies. Therefore, further review and analysis in the EIR is required. e. Less Than Significant Impact. – The existing wastewater treatment provider has determined that it has adequate capacity to serve the projected demand of the proposed project. Therefore, any potential impacts would be less than significant. f. Potentially Significant Impact. – The proposed project may have a significant impact on the City's solid waste contractor. Therefore, further review and analysis in the EIR is required. g. Potentially Significant Impact. – Development of the proposed project would result in an increase in solid waste, which may impact solid waste disposal services and incrementally reduce the lifespan of the regional landfills. Therefore, further review and analysis in the EIR is required. Potential impacts may result from the proposed project and will be evaluated within the EIR. Any mitigation measures to reduce impacts to less than significant will be listed in the EIR Mitigation Monitoring and Reporting Program.
XVII. MANDATORY FINDINGS OF SIGNIFICANCE	a. Less Than Significant Impact. – The proposed project does not have the potential to degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. The project site has already been graded pursuant to a previously recorded parcel map, and additional improvements to the site have been made. Therefore, further analysis is not required. b. Potentially Significant Impact. – The proposed project may have impacts that are individually limited, but cumulatively considerable. Therefore, further review and analysis in the EIR is required.

Section and Subsections	Evaluation of Impacts
	c. Less Than Significant Impact. – The proposed project does not have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly. Therefore, further analysis is not required.



Appendix B
NOP RESPONSES

California Regional Water Quality Control Board

Los Angeles Region

Over 51 Years Serving Coastal Los Angeles and Ventura Counties

Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Dr. Alan Lloyd
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.swrcb.ca.gov/rwqcb4

April 25, 2005

Jason Mikaelian
Associate Planner
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, CA 91355

RECEIVED
PLANNING DIVISION
JUN 06 2005
ECONOMIC DEVELOPMENT
SANTA CLARITA

Dear Jason Mikaelian,

Re: CEQA Documentation for Project in the Santa Clara Watershed

Master Case No. 04-444
Soledad Townhomes

We appreciate the opportunity to comment on the CEQA documentation for the above-mentioned project. For your information a list of permitting requirements and Regional Board Contacts is provided in Attachment A hereto.

The project site lies in the Santa Clara watershed that was listed as being impaired pursuant to Section 303 (d) of the Clean Water Act. Impairments listed in reaches downstream from the proposed project include nutrients and their effects, salts, coliform bacteria, and historic pesticides. The Los Angeles Regional Water Quality Control Board will be developing Total Maximum Daily Loads (TMDLs) for the watershed, but the proposed project is expected to proceed before applicable TMDLs are adopted. In the interim, the Regional Board must carefully evaluate the potential impacts of new projects that may discharge to impaired waterbodies.

Our review of your documentation shows that it does not include information on how this project will change the loading of these pollutants into the watershed. Please provide the following additional information for both the construction and operational phases of the project.

- For each constituent listed above, please provide an estimate of the concentration (ppb) and load (lbs/day) from non-point and point source discharges.
- Estimates of the amount of additional runoff generated by the project during wet and dry seasons.
- Estimate of the amount of increased or decreased percolation due to the project.

- Estimates of the net change in cubic feet per second of groundwater and surface water contributions under historic drought conditions (as compiled by local water purveyors, the Department of Water Resources, and others), and 10-year 50-year, and 100-year flood conditions.

The Upper Santa Clara River River has been subjected to significant urban development during the past 10 years. Unfortunately very little water quality data has been collected in this area, especially in comparison with data collected in the Lower Santa Clara River.

Additional water quality data are necessary to evaluate the cumulative impacts of past development and predict potential impacts of the subject project. Pollutants of concern include sediment, dissolved oxygen, pesticides, metals, and bioassessment.

If you have any questions please call me at (213) 576 6683.

Sincerely,

Elizabeth Erickson
Associate Geologist, TMDL Unit
Los Angeles Regional Water Quality Control Board

EE
Attachments (1)
cc:
State Clearinghouse
File

ATTACHMENT A

✓ If the proposed project will result in a **discharge of dredge or fill into a surface water** (including a dry streambed), and is subject to a **federal license or permit**, the project may require a *Section 401 Water Quality Certification*, or waiver of Waste Discharge Requirements. For further information, please contact:

Valerie Carillo, Nonpoint Source Unit at (213) 576-6759.

✓ If the project involves **inland disposal of nonhazardous contaminated soils and materials**, the proposed project may be subject to *Waste Discharge Requirements*. For further information, please contact:

Rodney Nelson, Landfills Unit, at (213) 620-6119

****

✓ If the overall project area is **larger than five acres**, the proposed project may be subject to the State *Board's General Construction Activity Storm Water Permit*. For further information, please contact:

Tracy Woods, Statewide General Construction Activity Storm Water Permits at (213) 620-2095.

✓ If the project involves a facility that is proposing to discharge storm water associated with **industrial activity** (e.g., manufacturing, recycling and transportation facilities, etc.), the facility may be subject to the State Board's *General Industrial Activities Storm Water Permit*. For further information, please contact:

Kristie Chung, Statewide General Industrial Storm Water Permits at (213) 620-2283.

✓ If the proposed project involves requirements for new development and construction pertaining to **municipal storm water programs**, please contact:

Dan Radulescu, Municipal Storm Water Permits, Los Angeles County at (213) 620-2038;
Jeff Mack, Municipal Storm Water Permits, Ventura County at (213) 620-2121.

✓ The proposed project also shall comply with the local regulations associated with the applicable **Regional Board stormwater permit**:

Los Angeles County and Co-permittees:
NPDES No. CAS614001
Waste Discharge Requirements Order No. 96-054.

Long Beach County and Co-permittees:
NPDES CAS004003
Waste Discharge Requirements Order No. 99-060.

Ventura County and Co-permittees:
NPDES No. CAS004002
Waste Discharge Requirements Order No. 00-108.

****

✓ If the proposed project involves any construction and/or groundwater **dewatering to be discharged to surface waters**, the project may be subject to *NPDES/Waste Discharge Requirements*. For further information, please contact:

Augustine Anijielo, General Permitting and Special Projects Unit at (213) 576-6657(All Region 4 Watersheds).

✓ If the proposed project involves any construction and/or groundwater **dewatering to be discharged to land or groundwater**, the project may be subject to *Waste Discharge Requirements*. For further information, please contact:

Kwang-il Lee, Non-Chapter 15 Unit, at (213) 620-2269 (All Region 4 Watersheds).

STATE OF CALIFORNIA–THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, *Governor*

SANTA MONICA MOUNTAINS CONSERVANCY
RAMIREZ CANYON PARK
5750 RAMIREZ CANYON ROAD
MALIBU, CALIFORNIA 90265
PHONE (310) 589-3200
FAX (310) 589-3207

June 20, 2005

Mr. Jason Mikaelian, AICP
Associate Planner
Planning and Building Services
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, California 91355

Comments on Notice of Preparation for Soledad Townhomes Project (Master Case No. 04-444), Santa Clara River Watershed

Dear Mr. Mikaelian:

The proposed project consists of the development of 30 acres of land to construct a residential community with 437 for-sale multiple-family dwelling units, a maximum of 10,000 square feet of commercial uses, associated recreation uses, and on-site private roads. (The Assessor's parcel numbers [APNs] and acres provided in the Notice of Preparation [NOP]/Initial Study [IS] do not correspond to the shape of the project site shown on the Preliminary Landscape Plan provided by you at our request. We assume that the correct project boundary is depicted by APNs 2849-027-001, 002, 003, 004, 005, and 2849-001-027.) The Preliminary Landscape Plan appears to show that the entire approximately 30 acres would be developed or modified. The NOP/IS (p. 1) states that the project site is currently graded pursuant to the recorded Parcel Map No. 20838. Traffic improvements, construction of bank stabilization along the southern bank of the Santa Clara River, and a trail system have been completed.

The Draft Environmental Impact Report (DEIR) should explicitly explain why a new DEIR is being prepared for a recorded tract map, whether significant changes are being proposed to the previously approved project, and the reason for those changes. The DEIR should also explain the status of that tract map (i.e., expirations), and expand upon the ability of the new DEIR to allow for additional changes or improvements to the project.

The Santa Clara River is an important wildlife corridor. The proposed project is adjacent to and within the Santa Clara River. Habitat nodes and buffers should be maintained along the river corridor to maintain the ecological function, particularly in narrower areas such as the location of the proposed project.

The Santa Monica Mountains Conservancy recommends that the project be limited to 250 feet from the edge of the channel. Grading and improvements should be excluded from this 250-foot-buffer, while trails and native habitat restoration should be permitted. A fee title dedication should be required to be granted to an appropriate agency capable of managing land for resource protection such as the City of Santa Clarita, Santa Clarita Watershed Recreation and Conservation Authority, or Mountains Recreation and Conservation Authority. Long-term management funding, in the form of a Community Facilities District, should also be required. This is necessary because this project site is located at a narrow point in the river. Also the land use of the large parcel just north of the river is undetermined, and absent legal assurances, it cannot be assumed that it will remain as open space.

An analysis of an aerial photo of the site and surroundings shows that the site is a chokepoint connecting to open space habitat to the south of the Santa Clara River. (Development along Soledad Canyon Road hinders open space connections to the south, just east and west of the project site.) The Conservancy recommends that the western tip of the project site be avoided. The project and DEIR alternatives should provide a minimum 200-foot-wide wildlife corridor on the site to take advantage of the open space associated with the Metrolink facility, just south of Soledad Canyon Road. A fee title dedication should also be required of this open space, under the same conditions as described above.

The DEIR should provide an estimate of the acreage of alluvial scrub, if any, to be impacted by the proposed project. All impacts to this vegetation type should be avoided.

Thank you for your consideration of these comments. Please direct any questions and all future correspondence to Judi Tamasi of our staff at the above address and by phone at (310) 589-3200, ext. 121.

Sincerely,

Elizabeth A Cheadle

ELIZABETH A. CHEADLE
Chairperson

california water impact network

Carolee K. Krieger
president

Dorothy Green
secretary

Joan H. Wells
treasurer

Melinda Chouinard
director

Yvon Chouinard
director

Hap Dunning
director

Michael Jackson
director

Huey Johnson
director

Imaging Spence
director

June 20, 2005

Jason Mikaelian
City of Santa Clarita
23920 Valencia Blvd.
Santa Clarita, CA 91355
FAX: (661) 259-8125

RE: Soledad Townhome Project Notice of Preparation

Dear Mr. Mikaelian:

The California Water Impact Network (C-WIN) objects to the proposed Soledad Townhome Project relying on a contested transfer of 41,000 acre feet (AF) of SWP allocation from the Kern County Water Agency to the Castaic Lake Water Agency (CLWA) as a reliable source of water supply as indicated in the SB610 Water Assessment Report. The analysis is inappropriately relying on the permanence of a non-final and highly contested transfer of 41,000 acre feet of SWP water from the Kern County Water Agency. This 41,000 acre foot transfer continues to be clouded by ongoing litigation and its very validity is one of the subjects of the forthcoming and very complex EIR known as "Monterey Plus", to be prepared by the state Department of Water Resources.

C-WIN is currently a plaintiff in several cases against CLWA opposing proposed transfers that depend on the 41,000 AF transfer mentioned above. Any transfer that is dependent on a water source that is not free and clear is not reliable. C-WIN hereby incorporates our January 1, 2004 objection letter to the CLWA on the Negative Declaration for a proposed 35,000 AF transfer for a Groundwater Banking Project that depends on this same 41,000 AF transfer and the C-WIN February 3, 2004 objection letter to the LA County Regional Planning Department on the proposed West Creek **Project** #98-008 **(2,545 units)** that depends on this same 41,000 AF transfer. We also incorporate our February 26, 2004 objection letter to the County of Los Angeles Regional Planning Department regarding the proposed **River Valley Project** No.00-196 **(1,444 units & 1.5 million square feet of mixed non-residential)** that also relies on this 41,000 acre foot transfer. Further, we incorporate our letter to the City of Santa Clarita on May 4, 2004 objecting to the **River Park Project**, Project No. 02-175 **(1,183 units)**, our letter of December 16, 2004 objecting to the **Northlake Project** No. 98-047 (specific plan of approximately **3,000 units)** and our letter of June 15, 2005 to the City of Santa Clarita opposing the **Synergy Project (946 units)**. Also, we incorporate our comments on the **Mission Village Project** No. 04-181 **(5,331 units, 1,299,000 million square feet commercial/mixed use, etc)** submitted June 15, 2005 to the County of LA Regional Planning Department. All of these projects, depending upon this same questionable 41,000 AF water transfer, must be looked at cumulatively, not as individual projects depending on the same source of water. Urban Water Management Plans require that cumulative impacts must be assessed; cumulative impacts must be addressed here as well.

P.O. Box 5462, Santa Barbara, CA 93150, e-mail: caroleekrieger@cox.net, Phone: 805.969.6824, Fax 805.565.3394

The Soledad Townhome Project, along with many other developments in California, is dependent on the analysis by DWR and its State Water Project Delivery Reliability Report, Final 2002. This Reliability Report has been seriously criticized for overstating actual available supply, questionable modeling and simulations, and lack of proper peer review. C-WIN hereby incorporates this Final Report, including all of the published comment letters in Appendix E. Please make a special note of those letters submitted by Senator Michael Machado, Robert Wilkinson, Arve Sjovold, Joan Wells, Dr. Peter Gleick and myself.

C-WIN also incorporates "A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operations in Central California" submitted by the California Bay Delta Authority Science Program Association of Bay Governments, December 4, 2003. This document raises significant questions as to the reliability of DWR's Delivery Reliability Report.

Please reject the proposed Soledad Townhome Project consisting of 437 townhouses on the grounds that the proposed water supply is inadequate and unsubstantiated at this time and cumulative impacts have not been assessed.

Please address all the above issues in the forthcoming Environmental Impact Report. If you are unable to obtain any of the above documents, please contact us and we will provide them.

Please send me any relevant documents that may come out in the future regarding this project.

C-WIN hereby incorporates all other comments by reference opposing the proposed Soledad Townhome Project.

Sincerely,

Carolee K. Krieger

Carolee K. Krieger
President, C-WIN
808 Romero Canyon Road
Santa Barbara, CA 93108
PH: (805) 969-0824

STATE OF CALIFORNIA ARNOLD SCHWARZENEGGER, *Governor*

PUBLIC UTILITIES COMMISSION
320 WEST 4TH STREET, SUITE 500
LOS ANGELES, CA 90013

June 1, 2005 File No. SCH 2005041100

Jason Mikaelian
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, CA 91355

RECEIVED
PLANNING DIVISION
JUN 06 2005
PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

Subject: Soledad Townhomes

Dear Mr. Mikaelian:

As the state agency responsible for rail safety within California, we recommend that the proposed Soledad Townhomes project be planned with the safety of the rail corridor in mind. The proposed project is near the Southern California Regional Rail Authority-Metrolink right-of-way. The full development of the project area will increase traffic volumes not only on streets and at intersections, but also at at-grade highway-rail crossings.

Safety considerations may include, but are not limited to, the following items:

- Grade separation of the crossings along major thoroughfares
- Fencing to limit the access of pedestrians onto the railroad right-of-way
- Improvements to warning devices at existing at-grade highway-rail crossings
- Improvements to traffic signaling at intersections adjacent to crossings
- Improvements to roadway geometry and lane striping near crossings
- Increased enforcement of traffic laws at crossings
- A safety awareness program on rail related hazards

The above-mentioned safety improvements should be considered when approval is sought for new developments. Working with Commission staff early in the conceptual design phase will help improve the safety to motorists and pedestrians in the community.

Please advise us on the status of the project. If you have any questions in this matter, please contact me at (213) 576-7078 or at rxm@cpuc.ca.gov.

Sincerely,

Rosa Muñoz, PE
Utilities Engineer
Rail Crossings Engineering Section
Consumer Protection & Safety Division

cc: Ron Mathieu, SCRRA

RECEIVED
JUN 1 2005
RBF CONSULTING

SANTA CLARITA WATER, A DIVISION OF CASTAIC LAKE WATER AGENCY

SCWD

22722 SOLEDAD CANYON ROAD • SANTA CLARITA, CALIFORNIA 91350 • (661) 259-2737
MAILING ADDRESS: P.O. BOX 903 • SANTA CLARITA, CALIFORNIA 91380-9003

May 20, 2005

RECEIVED
PLANNING DIVISION
MAY 23 2005
PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

Mr. Jason Mikaelian, Associate Planner
Planning Department
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, CA 91355

Re: Notice of Preparation of Draft Environmental Impact Report for the Soledad Townhomes Project (Master Case 04-444)

Dear Mr. Mikaelian:

By this letter the Castaic Lake Water Agency informs you that the above-mentioned project is not subject to the terms of various sections of the California Water Code and Government Code, also known as "SB 610." This law was chaptered in 2001 and took effect January 1, 2002. The project does not meet the threshold size requirements for an SB 610 Water Supply Assessment.

The water retailer for the project is the CLWA Santa Clarita Water Division (SCWD). CLWA and SCWD have instituted several water conservation programs that should be incorporated into the planning for the project.

In addition, the city may want to consider installing as part of this project recently developed low-water-use landscape technologies, such as ETo Controllers (which utilize local weather data to control irrigation systems) and low-water use irrigation devices wherever possible.

If you have any questions or comments, please call me at the above number or Mary Lou Cotton, Water Resources Manager, at (661) 297-1600.

Sincerely,

W. J. Manetta, Jr.
Retail Manager

MLC/naf

cc: Dan Masnada, CLWA

released to the Santa Clara River. This issue should be addressed and mitigated from a cumulative aspect as well as a project specific aspect.

We disagree with your finding that his project is not large enough to impact ground water re-charge areas (p.22). Cumulative loss of recharge areas along the Santa Clara River is substantial. Such loss of recharge will damage the ability of the water agencies to supply ground water in the future. We believe you must address this issue from a cumulative perspective and calculate loss of recharge from this project in addition to the many others that have been approved in recharge areas along the Santa Clara River in the last ten years (i.e. North Val I and North Val II, Riverpark, and other projects immediately adjacent to the Santa Clara River).

Loss of recharge will also affect water quality. We request that the EIR address increased nitrate levels and migration of VOC's and ammonium perchlorate pollution.

Since migration of ammonium perchlorate has now affected a new Valencia Water Supply Well (Q2) immediately downstream from this project and from the recently filled project area, we further request a full disclosure of the origin of the fill dirt used to fill this area. Did it come from the vicinity of the Whittiker Bermite project? How much dirt was moved and used to fill this project? We believe that Item J, pg. 6 must still be addressed even though the fill has already been completed.

Seismic Hazard Zone
We believe that the statement made on page 5 and 19 that this area is not in a seismic hazard zone is inaccurate and out-dated. The City of Santa Clarita's General Plan was approved in 1990 and has not been updated. In 1996, the Div. of Mines released new Seismic Hazard Maps. The map covering this quadrant (Newhall 7.5 Quadrangle, dated Feb. 1996) clearly indicates that this area may be hazardous because it potentially contains liquefaction materials. Liquefaction must therefore be addressed in the EIR. Failure to do so may affect the safety of future residents.

Utilities
We concur with your finding that water availability from current entitlements must be addressed. We request that the City further include an evaluation of how cumulative loss of recharge may affect water supply, surface flow and public trust water flows in the Santa Clara River. Also, how additional pumping will affect the migration of the ammonium perchlorate pollution plume should be addressed.

Thank-you for your time and attention to our concerns.

Sincerely,

Lynne Plambeck
President

RECEIVED
PLANNING DIVISION
MAY 19 2005
PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

SCOPE
Santa Clarita Organization for Planning and the Environment
TO PROMOTE, PROTECT AND PRESERVE THE ENVIRONMENT, ECOLOGY
AND QUALITY OF LIFE IN THE SANTA CLARITA VALLEY
POST OFFICE BOX 1182, SANTA CLARITA, CA 91386

5-18-05

Jason Mikaelian
City of Santa Clarita
23920 Valencia Blvd.
Santa Clarita, CA 91355

Re: Soledad Townhome Project Notice of Preparation

Dear Sirs:

We concur with your finding that an environmental impact report must be prepared. However, we would like to express our disagreement with the findings you have made in other areas and request that certain additional issues be addressed.

Significant Impact to Riparian Habitat
This project is in a significant ecological area overlay. We find it disturbing that the City of Santa Clarita issued a grade and fill permit for a very old previous project located at this site, full well knowing that this project would not be built. Now the NOP describes a project requiring a zone change, which is a totally discretionary approval, and requiring new environmental review. The new NOP states that a review of impacts to riparian habitat does not need to be conducted because grading has already been completed. This smacks of an effort on behalf of the City to avoid disclosure of impacts and evade the proper CEQA process requiring disclosure and mitigation of such impacts. The fact that the former head of the Dept. of Planning under which this grading permit was granted is now working for Newhall Land and Farming/Lennar Corp. as the consultant for this project furthers the appearance of impropriety in the CEQA process.

We believe that cumulative loss of upland habitat is severely impacting the survival of several threatened and endangered species. Such species will be further impacted by human activities in this area that will be increased if townhomes are located here instead of the previously proposed commercial project. Further, riparian habitat can easily be re-established. Thus we believe that impacts to the riparian habitat of this area PREVIOUS to the grading that the City, perhaps illegally, has allowed, must be addressed in this environmental impact report.

Impacts to Water Quality
As the City is aware, the Sanitation District is not meeting the Chloride TMDL for the upper reaches of the Santa Clara River. This project will increase reliance on State Water Project water and thus increase the chloride level in the treated effluent water

Friends of the Santa Clara River

660 Randy Drive, Newbury Park, California 91320-3035 • (805) 498-4323

May 18, 2005

RECEIVED
PLANNING DIVISION
MAY 20 2005
PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

Mr. Jason Mikaelian
City of Santa Clarita
23920 Valencia Blvd.
Santa Clarita, CA 91355

Board of Directors

Ron Bottorff
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L.A./Santa Monica Mountains Chapter

Santa Clarita Organization for Planning the Environment (SCOPE)

Sierra Club
Angeles Chapter
Los Padres Chapter

Surfrider Foundation

Audubon Society
Ventura Chapter

Ventura County Environmental Coalition

Wishtoyo Foundation

Re: Notice of Preparation of EIR for Soledad Townhomes Project

Dear Mr. Mikaelian:

We agree with your finding that an Environmental Impact Report must be prepared for the project. Some of the environmental factors in the Initial Study must be reevaluated, however.

This project most definitely could have significant impacts on biological resources, including cumulative impacts. The unprecedented growth in the Santa Clara River watershed over the last few decades has caused an array of cumulative impacts to flora and fauna. Continued encroachment by development into the River floodplain and terrace lands has resulted in habitat loss and fragmentation. Further, the continued filling and channelization of the River has altered and is altering the hydrology of the watershed, increasing storm runoff and decreasing water quality (the River is now impaired for ammonia, chloride, coliform, nitrate/nitrite and organic enrichment). These cumulative impacts must be addressed in all project EIRs.

Even though the project area is graded, the addition of homes and commercial development to the site will, most assuredly, have significant biological impacts. This is true because of urban edge effects, which include illegal ORV use and predation on riparian species by household pets, will degrade riparian biological values. Adequate buffer zones protecting these resources have not been provided, and the function of the river terrace area as wildlife habitat or wildlife corridor will be eliminated.

We cite two scientific studies in support of our statement that urban development degrades adjacent biological resources. The first (Kelly et al, 1993) is a paper by two University of California Riverside scientists entitled "Buffer Zones for Ecological Reserves in California: Replacing Guesswork with Science". This paper shows that even nature reserves over a mile in width suffer urban edge effects at their centers - and of course the Santa Clara River riparian corridor is much narrower than these reserves and even more susceptible to such effects. The second (Rottenborn, 1999) is a paper by a Stanford University scientist entitled "Predicting the impacts of urbanization on riparian bird communities".

This paper shows impacts to bird communities out to a distance of 500 meters, or over 1500 feet, from the urban edge.

As for water quality, you may be aware that the Sanitation District is not currently meeting the Chloride TMDL for the upper reaches of the Santa Clara River. This project will exacerbate this problem by increased use of state water, which is high in chloride. Mitigation is required.

Thank you for considering these comments.

Sincerely,

Ron Bottorff

Ron Bottorff, Chair

References:

Kelly, Patrick J. and John T. Rotenberry, *Buffer Zones for Ecological Reserves in California: Replacing Guesswork with Science*, in *Interface Between Ecology and Land Development in California*, Southern California Academy of Sciences, 1993.

Rottenborn, S.C. *Predicting the impacts of urbanization on riparian bird communities*, Biological Conservation 88 (1999).

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

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www.ladpw.org

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

May 12, 2005

IN REPLY PLEASE
REFER TO FILE: W-9

Mr. Jason Mikaelian, Associate Planner
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, CA 91355

Dear Mr. Mikaelian:

REVIEW OF ENVIRONMENTAL DOCUMENTS
NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT AND PUBLIC SCOPING MEETING FOR THE SOLEDAD TOWNHOMES PROJECT

As requested, we have reviewed the Initial Study for the above project and offer the following comments.

This project is located within the City of Santa Clarita (City). The City owns and the County of Los Angeles Department of Public Works Consolidated Sewer Maintenance District (CSMD) is responsible for the operation and maintenance of the local sewers within the City.

The proposed development will be required to be annexed to the CSMD. We will require that the proposed sewer construction complies with the CSMD's sewer design standards. This will be in addition to compliance with the County Sanitation Districts of Los Angeles County's requirements for connection to the trunk sewer system and disposal facilities.

If you have any questions, please contact Mr. Winston Cole at (626) 300-3380.

Very truly yours,

DONALD L. WOLFE
Acting Director of Public Works

Nicholas A. Arhontes

for MANUEL DEL REAL
Assistant Deputy Director
Waterworks and Sewer Maintenance Division

WC:sr
792.doc

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CITY OF SANTA CLARITA

NOTICE OF PREPARATION

#27

TO: Distribution List (Attached)

Lead Agency:		**Consulting Firm:**	
Agency Name:	City of Santa Clarita	***Name:***	RBF Consulting
Street Address:	23920 Valencia Boulevard, Suite 300	***Street Address:***	14725 Alton Parkway
City/State/Zip:	Santa Clarita, California 91355	***City/State/Zip:***	Irvine, California 92618
Contact:	Mr. Jason Mikaelian, AICP Associate Planner	***Contact:***	Ms. Collette L. Morse, AICP EIR Project Manager
Telephone:	(661) 255-4330	***Telephone:***	(949) 472-3505

SUBJECT: Notice of Preparation of Draft Environmental Impact Report and Public Scoping Meeting for the Soledad Townhomes Project

The City of Santa Clarita will be the lead agency and will prepare an Environmental Impact Report ("EIR") for the Soledad Townhomes project, located along the north side of Soledad Canyon road between Bouquet Canyon Road and Golden Valley Road, in the City of Santa Clarita. The Project Applicant for the Soledad Townhomes project is the Newhall Land and Farming Company.

We need to know the views of your agency as to the scope and content of the environmental information, which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR prepared by our agency when considering your permit or other approval for the project. The project description, location, and the probable environmental effects are contained in the attached materials. A copy of the Initial Study is attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but not later than 30 days after receipt of this notice. Please send your written response to Jason Mikaelian, Associate Planner at the address shown above. We would appreciate the name of a contact person in your agency.

Also, the City of Santa Clarita will conduct a public scoping meeting on Wednesday, May 11, 2005 beginning at 6:00 p.m. at City Hall located at 23920 Valencia Boulevard to accept comments on the scope of the EIR for Soledad Townhomes project. This meeting will serve as a public forum to discuss the environmental issues identified in the Initial Study for the Soledad Townhomes EIR, and any other issues identified by the public that should be included for further analysis within the Soledad Townhomes EIR.

Date: April 18, 2005

Title: Jason Mikaelian, AICP, Associate Planner
Telephone: (661) 255-4330

Reference: California Administrative Code, Title 14, Sections 15082(a), 15103, 15375.

7/30 - Sick
7/9/10 choice

SOUTHERN CALIFORNIA

ASSOCIATION of GOVERNMENTS

Main Office

818 West Seventh Street

12th Floor

Los Angeles, California

90017-3435

t (213) 236-1800

f (213) 236-1825

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Orange County: Chris Norby, Orange County • John Beauman, Brea • Lou Bone, Tustin • Art Brown, Buena Park • Richard Chavez, Anaheim • Debbie Cook, Huntington Beach • Cathryn DeYoung, Laguna Niguel • Richard Dixon, Lake Forest • Marilyn Poe, Los Alamitos • Tod Ridgeway, Newport Beach

Riverside County: Jeff Stone, Riverside County • Thomas Buckley, Lake Elsinore • Bonnie Flickinger, Moreno Valley • Ron Loveridge, Riverside • Greg Pettis, Cathedral City • Ron Roberts, Temecula

San Bernardino County: Gary Ovitt, San Bernardino County • Lawrence Dale, Barstow • Paul Eaton, Montclair • Lee Ann Garcia, Grand Terrace • Tim Jasper, Town of Apple Valley • Susan Longville, San Bernardino • Deborah Robertson, Rialto • Alan Wapner, Ontario

Ventura County: Judy Mikels, Ventura County • Glen Becerra, Simi Valley • Carl Morehouse, San Buenaventura • Toni Young, Port Hueneme

Orange County Transportation Authority: Lou Correa, County of Orange

Riverside County Transportation Commission: Robin Lowe, Hemet

Ventura County Transportation Commission: Keith Millhouse, Moorpark

May 9, 2005

Mr. Jason Mikaelian, AICP
Associate Planner
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, CA 91355

RE: SCAG Clearinghouse No. I 20050252 Master Case No. 04-444 for the Soledad Townhomes

Dear Mr. Mikaelian:

Thank you for submitting the **Master Case No. 04-444 for the Soledad Townhomes** for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

We have reviewed the **Master Case No. 04-444 for the Soledad Townhomes**, and have determined that the proposed Project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and California Environmental Quality Act (CEQA) Guidelines (Section 15206). The proposed project is not a residential development of more than 500 dwelling units. Therefore, the proposed Project does not warrant comments at this time. Should there be a change in the scope of the proposed Project, we would appreciate the opportunity to review and comment at that time.

A description of the proposed Project was published in SCAG's **April 16-30, 2005** Intergovernmental Review Clearinghouse Report for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this Project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1867. Thank you.

Sincerely,

MARK BUTALA
Senior Regional Planner
Intergovernmental Review

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DEPARTMENT OF CALIFORNIA HIGHWAY PATROL
28648 The Old Road
Valencia, CA 91355
(661)294-5540
(800) 735-2929 (TT/TDD)
(800) 735-2922 (Voice)

May 6, 2005

File No.: 540.10868.9367

Mr. Jason Mikaelian
Associate Planner
23920 Valencia Blvd., Suite 300
Santa Clarita, CA 91355

Dear Mr. Mikaelian

This is in response to the Notice of Preparation of a draft Environmental Impact Report, dated April 18, 2005, for the Soledad Townhomes Project.

The proposed project will be located within the City of Santa Clarita; which will be within the jurisdiction of the Los Angeles County Sheriff's Department. Therefore, traffic enforcement, emergency incident management, public service, assistance and accident investigation will be the responsibility of their agency.

In reviewing this project, our concern is what effect this projects will have on traffic. The project will increase traffic volume on Soledad Canyon, Bouquet Canyon Valencia Blvd and Newhall Ranch Road. The increased traffic will ultimately cause traffic delays on I-5 and SR-14, specifically the Valencia Blvd, McBean Pkwy, Magic Mountain. Pkwy and Sierra Highway on ramps and off ramps. The increased traffic in conjunction with the several other projects currently in progress and several others in the planning stages will create a hardship on our current resources. It is our opinion, The Soledad Townhomes project will delay response times and public service will be compromised.

Lieutenant M.T. Hoose will be our Department's contact person for the project. If you have any questions or concerns, he may be reached at the above address or telephone number.

Thank you for allowing us the opportunity to comment on this project.

Sincerely,

for E. CONLEY, Captain
Commander
Newhall Area

Cc: Southern Division, CHP
Special Projects Section, CHP

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OF LOS ANGELES COUNTY

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JAMES F. STAHL
Chief Engineer and General Manager

May 2, 2005

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File No: 26-00.04-00

Mr. Jason Mikaelian, AICP, Associate Planner
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, CA 91355

Dear Mr. Mikaelian:

Master Case No. 04-444 for the Soledad Townhomes
Tentative Tract Map No. 062322, General Plan Amendment No. 04-006, Zone Change No. 04-004

The County Sanitation Districts of Los Angeles County (Districts) received a Notice of Preparation of a Draft Environmental Impact Report for the subject project on April 18, 2005. The proposed development is located within the jurisdictional boundaries of District No. 26. We offer the following comments regarding sewerage service:

1. The wastewater flow originating from the proposed project will discharge directly to the Districts' Soledad Canyon Trunk Sewer or Soledad Canyon Relief Trunk Sewer, both located in Soledad Canyon Road between Bouquet Canyon Road and Golden Valley Road. The 15- to 18-inch diameter Soledad Canyon Trunk Sewer has a design capacity of 3.1 to 4.1 million gallons per day (mgd) and conveyed a peak flow of 1.2 mgd when last measured in 2003. The 24- to 27-inch diameter Soledad Canyon Relief Trunk Sewer has a design capacity of 5.1 to 22.8 mgd and conveyed a peak flow of 5 mgd when last measured in 2003. A direct connection to a Districts' trunk sewer requires a Trunk Sewer Connection Permit, issued by the Districts. For information regarding the permit, please contact the Public Counter at extension 1205.

2. The Districts operate two water reclamation plants (WRPs), the Saugus WRP and the Valencia WRP, which provide wastewater treatment in the Santa Clarita Valley. These facilities are interconnected to form a regional treatment system known as the Santa Clarita Valley Joint Sewerage System (SCVJSS). The SCVJSS has a design capacity of 28.1 mgd and currently processes an average flow of 18.8 mgd.

3. The expected average wastewater flow from the project site is 88,465 gallons per day.

4. The Districts are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting (directly or indirectly) to the Districts' Sewerage System or increasing the existing strength and/or quantity of wastewater attributable to a particular parcel or operation already connected. This connection fee is required to construct an incremental expansion of the Sewerage System to accommodate the proposed project, which will mitigate the impact of this project on the present Sewerage System. Payment of a connection fee will be required before a

permit to connect to the sewer is issued. A copy of the Connection Fee Information Sheet is enclosed for your convenience. For more specific information regarding the connection fee application procedure and fees, please contact the Connection Fee Counter at extension 2727.

5. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the design capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into the Air Quality Management Plan, which is prepared by the South Coast Air Quality Management District in order to improve air quality in the South Coast Air Basin as mandated by the CAA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise you that the Districts intend to provide this service up to the levels that are legally permitted and to inform you of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 699-7411, extension 2717.

Very truly yours,

James F. Stahl

Ruth I. Frazen
Engineering Technician
Planning & Property Management Section

RIF:rf

Enclosure

489160.1

INFORMATION SHEET FOR APPLICANTS
PROPOSING TO CONNECT OR INCREASE THEIR DISCHARGE TO
THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY SEWERAGE SYSTEM

THE PROGRAM

The County Sanitation Districts of Los Angeles County are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting to a Sanitation District's sewerage system. Your connection to a City or County sewer constitutes a connection to a Sanitation District's sewerage system as these sewers flow into a Sanitation District's system. The County Sanitation Districts of Los Angeles County provide for the conveyance, treatment, and disposal of your wastewater. **PAYMENT OF A CONNECTION FEE TO THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY WILL BE REQUIRED BEFORE A CITY OR THE COUNTY WILL ISSUE YOU A PERMIT TO CONNECT TO THE SEWER.**

I. WHO IS REQUIRED TO PAY A CONNECTION FEE?

1. Anyone connecting to the sewerage system for the first time for any structure located on a parcel(s) of land within a County Sanitation District of Los Angeles County.
2. Anyone increasing the quantity of wastewater discharged due to the construction of additional dwelling units on or a change in land usage of a parcel already connected to the sewerage system.
3. Anyone increasing the improvement square footage of a commercial or institutional parcel by more than 25 percent.
4. Anyone increasing the quantity and/or strength of wastewater from an industrial parcel.
5. If you qualify for an Ad Valorem Tax or Demolition Credit, connection fee will be adjusted accordingly.

II. HOW ARE THE CONNECTION FEES USED?

The connection fees are used to provide additional conveyance, treatment, and disposal facilities (capital facilities) which are made necessary by new users connecting to a Sanitation District's sewerage system or by existing users who significantly increase the quantity or strength of their wastewater discharge. The Connection Fee Program insures that all users pay their fair share for any necessary expansion of the system.

III. HOW MUCH IS MY CONNECTION FEE?

Your connection fee can be determined from the Connection Fee Schedule specific to the Sanitation District in which your parcel(s) to be connected is located. A Sanitation District boundary map is attached to each corresponding Sanitation District Connection Fee Schedule. Your City or County sewer permitting office has copies of the Connection Fee Schedule(s) and Sanitation District boundary map(s) for your parcel(s). If you require verification of the Sanitation District in which your parcel is located, please call the Sanitation Districts' information number listed under Item IX below.

IV. WHAT FORMS ARE REQUIRED*?

The Connection Fee application package consists of the following:

1. Information Sheet for Applicants (this form)
2. Application for Sewer Connection

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, REGIONAL PLANNING
IGR/CEQA BRANCH
100 SO. MAIN ST.
LOS ANGELES, CA 90012
PHONE (213) 897-6536
FAX (213) 897-1337
E-Mail:NersesYerjanian@dot.ca.gov

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Mr. Jason Mikaelian, AICP
City of Santa Clarita
23920 Valencia Blvd., Suite 300
Santa Clarita, CA. 91355

IGR/CEQA# 050448/NY
NOP/Soledad Townhomes Project
LA/14/52.17

April 26, 2005

Dear Mr. Mikaelian:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Soledad Townhomes Project which consists of 437 for-sale multiple family dwelling units (162 two-story triplex units and 275 two story townhome units) development.

Based on the information received, and to assist us in our efforts to completely evaluate and assess the impacts of this project on the State transportation system, a traffic study in advance of the DEIR should be prepared to analyze the following information:

Please reference the Department's **Traffic Impact Study Guideline** on the Internet at http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf

1. Presentations of assumptions and methods used to develop trip generation, trip distribution, choice of travel mode, and assignments of trips to State Route 14.

2. Consistency of project travel modeling with other regional and local modeling forecasts and with travel data. The IGR/CEQA office may use indices to check results. Differences or inconsistencies must be thoroughly explained.

3. Analysis of ADT, AM, and PM peak-hour volumes for both existing and future conditions in the affected area. This should include freeways, interchanges, and intersections, and all HOV facilities. Interchange Level of Service should be

specified (HCM2000 method requested). Utilization of transit lines and vehicles, and of all facilities, should be realistically estimated. Future conditions would include build-out of all projects (see next item) and any plan-horizon years.

4. Inclusion of all appropriate traffic volumes. Analysis should include traffic from the project, cumulative traffic generated from all specific approved developments in the area, and traffic growth other than from the project and developments. That is, include: existing + project + other projects + other growth.

5. Discussion of mitigation measures appropriate to alleviate anticipated traffic impacts. These mitigation discussions should include, but not be limited to, the following:

- description of transportation infrastructure improvements
- financial costs, funding sources and financing
- sequence and scheduling considerations
- implementation responsibilities, controls and monitoring

Any mitigation involving transit, HOV, or TDM must be rigorously justified and its effects conservatively estimated. Improvements involving dedication of land or physical construction may be favorably considered.

6. Specification of developer's percent share of the cost, as well as a plan of realistic mitigation measures under the control of the developer. The following ratio should be estimated: Additional traffic volume due to project implementation is divided by the total increase in the traffic volume (see Appendix "B" of the Guidelines). That ratio would be the project equitable share responsibility.

We note for purposes of determining project share of costs, the number of trips from the project on each traveling segment or element is estimated in the context of forecasted traffic volumes which include build-out of all approved and not yet approved projects, and other sources of growth. Analytical methods such as select-zone travel forecast modeling might be used.

The Department as a commenting agency under CEQA has jurisdiction superceding that of MTA in identifying the freeway analysis needed for this project. Caltrans is responsible for obtaining measures that will off-set project vehicle trip generation that worsens Caltrans facilities and hence, it does not adhere to the CMP guide of 150 or more vehicle trips added before freeway analysis is needed. MTA's Congestion Management Program in acknowledging the Department's role, stipulates that Caltrans must be consulted to identify specific locations to be analyzed on the State Highway System. Therefore State Route(s) mentioned in item #1 and it's facilities must be analyzed per the Department's **Traffic Impact Study Guidelines.**

We look forward to reviewing the DEIR. We expect to receive a copy from the State Clearinghouse. However, to expedite the review process, you may send two copies in advance to the undersigned at the following address:

Cheryl J. Powell
IGR/CEQA Branch Chief
Caltrans District 07
Regional Transportation Planning Office
100 S. Main St., Los Angeles, CA 90012

Sincerely,

Cheryl J. Powell
IGR/CEQA Branch Chief
Regional Transportation Planning

Metropolitan Transportation Authority
One Gateway Plaza
Los Angeles, CA 90012-2952
213.922.2000 Tel
metro.net

Metro

April 22, 2005

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CITY OF SANTA CLARITA

Mr. Jason Mikaelian, AICP
Associate Planner
City of Santa Clarita
23920 Valencia Boulevard
Santa Clarita, CA 91355

Dear Mr. Mikaelian:

Thank you for the opportunity to comment on the Notice of Preparation (NOP) for the Soledad Townhomes Project. This letter conveys recommendations from the Los Angeles County Metropolitan Transportation Authority (LACMTA) concerning issues that are germane to our agency's statutory responsibilities in relation to the proposed project.

A Traffic Impact Analysis (TIA), with both highway and freeway, and transit components, is required under the State of California Congestion Management Program (CMP) statute. The CMP TIA Guidelines are published in the "2002 Congestion Management Program for Los Angeles County", Appendix D. The geographic area examined in the TIA must include the following, at a minimum:

1. All CMP arterial monitoring intersections, including monitored freeway on/off-ramp intersections, where the proposed project will add 50 or more trips during either the a.m. or p.m. weekday peak hour (of adjacent street traffic); and
2. Mainline freeway-monitoring locations where the project will add 150 or more trips, in either direction, during either the a.m. or p.m. weekday peak hour.

Among the required steps for the analysis of development-related impacts to transit are:

1. Evidence that, in addition to Metro, all affected municipal transit operators received the NOP for the Draft EIR;
2. A summary of the existing transit services in the area;
3. Estimated project trip generation and mode assignment for both morning and evening peak periods;
4. Documentation on the assumptions/analyses used to determine the number of percentage of trips assigned to transit;

5. Information on facilities and/or programs that will be incorporated in to the development plan that will encourage public transit usage and transportation demand management (TDM) policies and programs; and
6. An analysis of the expected project impacts on current and future transit services along with proposed project mitigation.

The MTA looks forward to reviewing the Draft EIR. If you have any questions regarding this response, please call me at 213-922-6908 or email at chapmans@metro.net. Please send the Draft EIR to the following address:

LACMTA
One Gateway Plaza
Attn: Susan Chapman
Long Range Planning, 99-23-2
Los Angeles, CA 90012-2952

Sincerely,

Susan Chapman
Program Manager, Long Range Planning

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South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

April 22, 2005

Mr. Jason Mikaelian, Associate Planner
City of Santa Clarita
23920 Valencia Blvd., Suite 300
Santa Clarita, CA 91355

Dear Mr. Mikaelian:

Notice of Preparation of a Draft Environmental Impact Report for
Soledad Townhomes Project

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the Draft Environmental Impact Report (EIR). Please send the SCAQMD a copy of the Draft EIR upon its completion.

Air Quality Analysis

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2002 Model. This model is available on the CARB Website at: www.arb.ca.gov.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should

be included in the analysis. It is recommended that lead agencies for projects generating or attracting vehicular trips, especially heavy-duty diesel-fueled vehicles, perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on the SCAQMD's CEQA webpages at the following internet address: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/diesel_analysis.doc. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. Please call Charles Blankson, Ph.D., Air Quality Specialist, CEQA Section, at (909) 396-3304 if you have any questions regarding this letter.

Sincerely,

Steve Smith

Steve Smith, Ph.D.
Program Supervisor, CEQA Section
Planning, Rule Development and Area Sources

SS:CB:li

LAC050421-03LI
Control Number

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Sean Walsh
Director

Notice of Preparation

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PLANNING DIVISION

APR 21 2005

PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

April 18, 2005

To: Reviewing Agencies

Re: Soledad Townhomes
SCH# 2005041100

Attached for your review and comment is the Notice of Preparation (NOP) for the Soledad Townhomes draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Jason Mikaelian
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, CA 91355

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

C. Roberts for

Scott Morgan
Project Analyst, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH#	2005041100
Project Title	Soledad Townhomes
Lead Agency	Santa Clarita, City of

Type	NOP Notice of Preparation
Description	Development of a 30-acre site with 437 for-sale multiple-family dwelling units, a maximum of 10,000 sf of commercial uses, associated private recreation uses and on-site private circulation.

Lead Agency Contact

Name	Jason Mikaelian		
Agency	City of Santa Clarita		
Phone	(661) 255-4330	*Fax*	
email			
Address	23920 Valencia Boulevard, Suite 300		
City	Santa Clarita	*State* CA	*Zip* 91355

Project Location

County	Los Angeles
City	Santa Clarita
Region	
Cross Streets	Soledad Canyon Road / Bouquet Canyon Road / Golden Valley Road
Parcel No.	2849-0027-001, 002, 003, 004; 2849-001-029

Township	*Range*	*Section*	*Base*

Proximity to:

Highways	5
Airports	
Railways	Metrolink
Waterways	Santa Clara River
Schools	> 5 school sites
Land Use	Commercial Office (CO) Z: Commercial Office (CO)

Project Issues	Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Cumulative Effects; Drainage/Absorption; Economics/Jobs; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Growth Inducing; Landuse; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife
Reviewing Agencies	Resources Agency; Regional Water Quality Control Board, Region 4; Department of Parks and Recreation; Native American Heritage Commission; Department of Housing and Community Development; Department of Health Services; Office of Emergency Services; Department of Fish and Game, Region 5; Department of Water Resources; California Highway Patrol; Caltrans, District 7

Date Received	04/18/2005	*Start of Review*	04/18/2005	*End of Review*	05/17/2005

OP Distribution List

County: Los Angeles **SCH#** 2005041100

esources Agency

- [ ] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  David Johnson
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Gerald R. Zimmerman
- [ ] **Dept. of Conservation**
  Roseanne Taylor
- [ ] **California Energy Commission**
  Environmental Office
- [ ] **Dept. of Forestry & Fire Protection**
  Allen Robertson
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  Wayne Donaldson
- [ ] **Dept of Parks & Recreation**
  B. Noah Tilghman
  Environmental Stewardship Section
- [ ] **Reclamation Board**
  DeeDee Jones
- [ ] **Santa Monica Mountains Conservancy**
  Paul Edelman
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [ ] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou

sh and Game

- [ ] **Depart. of Fish & Game**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Game Region 1**
  Donald Koch
- [ ] **Fish & Game Region 2**
  Banky Curtis
- [ ] **Fish & Game Region 3**
  Robert Floerke
- [ ] **Fish & Game Region 4**
  William Laudermilk
- [x] **Fish & Game Region 5**
  Don Chadwick
  Habitat Conservation Program
- [ ] **Fish & Game Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] **Fish & Game Region 6 I/M**
  Tammy Allen
  Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M**
  George Isaac
  Marine Region

Other Departments

- [ ] **Food & Agriculture**
  Steve Shaffer
  Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
  Public School Construction
- [ ] **Dept. of General Services**
  Robert Sleppy
  Environmental Services Section
- [x] **Dept. of Health Services**
  Veronica Ramerlz
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Coachella Valley Mountains Conservancy**
- [ ] **Delta Protection Commission**
  Debby Eddy
- [x] **Office of Emergency Services**
  Dennis Castrillo
- [ ] **Governor's Office of Planning & Research**
  State Clearinghouse
- [ ] **Native American Heritage Comm.**
  Debbie Treadway
- [ ] **Public Utilities Commission**
  Ken Lewis
- [ ] **San Gabriel & Lower LA Rivers**
- [ ] **San Joaquin River Conservancy**
- [ ] **State Lands Commission**
  Jean Sarino
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
  Sandy Hesnard
- [ ] **Caltrans - Planning**
  Terri Pencovic
- [x] **California Highway Patrol**
  John Olejnik
  Office of Special Projects
- [x] **Housing & Community Development**
  Lisa Nichols
  Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Mike Eagan
- [ ] **Caltrans, District 2**
  Don Anderson
- [ ] **Caltrans, District 3**
  Jeff Pulverman
- [ ] **Caltrans, District 4**
  Tim Sable
- [ ] **Caltrans, District 5**
  David Murray
- [ ] **Caltrans, District 6**
  Marc Birnbaum
- [x] **Caltrans, District 7**
  Cheryl J. Powell
- [ ] **Caltrans, District 8**
  John Pagano
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [ ] **Caltrans, District 11**
  Mario Orso
- [ ] **Caltrans, District 12**
  Bob Joseph

Cal EPA

Air Resources Board

- [ ] Airport Projects
  Jim Lerner
  - [ ] Transportation Projects
    Kurt Karperos
  - [ ] Industrial Projects
    Mike Tollstrup
- [ ] **California Integrated Waste Management Board**
  Sue O'Leary
- [ ] **State Water Resources Control Board**
  Jim Hockenberry
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resouces Control Board**
  Steven Herrera
  Division of Water Rights
- [ ] **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [x] **RWQCB 4**
  Jonathan Bishop
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
  - [ ] **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
  - [ ] **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [ ] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [ ] **Other** _____

Last Updated on 3/11/05

State of California—Business, Transportation and Housing Agency ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF CALIFORNIA HIGHWAY PATROL
28648 The Old Road
Valencia, CA 91355
(661)294-5540
(800) 735-2929 (TT/TDD)
(800) 735-2922 (Voice)

May 6, 2005

File No.: 540.10868.9367

Mr. Jason Mikaelian
Associate Planner
23920 Valencia Blvd., Suite 300
Santa Clarita, CA 91355

Dear Mr. Mikaelian

This is in response to the Notice of Preparation of a draft Environmental Impact Report, dated April 18, 2005, for the Soledad Townhomes Project.

The proposed project will be located within the City of Santa Clarita; which will be within the jurisdiction of the Los Angeles County Sheriff's Department. Therefore, traffic enforcement, emergency incident management, public service, assistance and accident investigation will be the responsibility of their agency.

In reviewing this project, our concern is what effect this projects will have on traffic. The project will increase traffic volume on Soledad Canyon, Bouquet Canyon Valencia Blvd and Newhall Ranch Road. The increased traffic will ultimately cause traffic delays on I-5 and SR-14, specifically the Valencia Blvd, McBean Pkwy, Magic Mountain. Pkwy and Sierra Highway on ramps and off ramps. The increased traffic in conjunction with the several other projects currently in progress and several others in the planning stages will create a hardship on our current resources. It is our opinion, The Soledad Townhomes project will delay response times and public service will be compromised.

Lieutenant M.T. Hoose will be our Department's contact person for the project. If you have any questions or concerns, he may be reached at the above address or telephone number.

Thank you for allowing us the opportunity to comment on this project.

Sincerely,

for E. CONLEY, Captain
Commander
Newhall Area

Cc: Southern Division, CHP
Special Projects Section, CHP

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MAY 11 2005
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CITY OF SANTA CLARITA

WATER RECLAMATION
SOLID WASTE MANAGEMENT

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

JAMES F. STAHL
Chief Engineer and General Manager

May 2, 2005

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MAY 03 2005
PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

File No: 26-00.04-00

Mr. Jason Mikaelian, AICP, Associate Planner
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, CA 91355

Dear Mr. Mikaelian:

Master Case No. 04-444 for the Soledad Townhomes
Tentative Tract Map No. 062322, General Plan Amendment No. 04-006, Zone Change No. 04-004

The County Sanitation Districts of Los Angeles County (Districts) received a Notice of Preparation of a Draft Environmental Impact Report for the subject project on April 18, 2005. The proposed development is located within the jurisdictional boundaries of District No. 26. We offer the following comments regarding sewerage service:

1. The wastewater flow originating from the proposed project will discharge directly to the Districts' Soledad Canyon Trunk Sewer or Soledad Canyon Relief Trunk Sewer, both located in Soledad Canyon Road between Bouquet Canyon Road and Golden Valley Road. The 15- to 18-inch diameter Soledad Canyon Trunk Sewer has a design capacity of 3.1 to 4.1 million gallons per day (mgd) and conveyed a peak flow of 1.2 mgd when last measured in 2003. The 24- to 27-inch diameter Soledad Canyon Relief Trunk Sewer has a design capacity of 5.1 to 22.8 mgd and conveyed a peak flow of 5 mgd when last measured in 2003. A direct connection to a Districts' trunk sewer requires a Trunk Sewer Connection Permit, issued by the Districts. For information regarding the permit, please contact the Public Counter at extension 1205.

2. The Districts operate two water reclamation plants (WRPs), the Saugus WRP and the Valencia WRP, which provide wastewater treatment in the Santa Clarita Valley. These facilities are interconnected to form a regional treatment system known as the Santa Clarita Valley Joint Sewerage System (SCVJSS). The SCVJSS has a design capacity of 28.1 mgd and currently processes an average flow of 18.8 mgd.

3. The expected average wastewater flow from the project site is 88,465 gallons per day.

4. The Districts are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting (directly or indirectly) to the Districts' Sewerage System or increasing the existing strength and/or quantity of wastewater attributable to a particular parcel or operation already connected. This connection fee is required to construct an incremental expansion of the Sewerage System to accommodate the proposed project, which will mitigate the impact of this project on the present Sewerage System. Payment of a connection fee will be required before a

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permit to connect to the sewer is issued. A copy of the Connection Fee Information Sheet is enclosed for your convenience. For more specific information regarding the connection fee application procedure and fees, please contact the Connection Fee Counter at extension 2727.

5. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the design capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into the Air Quality Management Plan, which is prepared by the South Coast Air Quality Management District in order to improve air quality in the South Coast Air Basin as mandated by the CAA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise you that the Districts intend to provide this service up to the levels that are legally permitted and to inform you of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 699-7411, extension 2717.

Very truly yours,

James F. Stahl

Ruth I. Frazen
Engineering Technician
Planning & Property Management Section

RIF:rf

Enclosure

489160.1

INFORMATION SHEET FOR APPLICANTS
PROPOSING TO CONNECT OR INCREASE THEIR DISCHARGE TO
THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY SEWERAGE SYSTEM

THE PROGRAM

The County Sanitation Districts of Los Angeles County are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting to a Sanitation District's sewerage system. Your connection to a City or County sewer constitutes a connection to a Sanitation District's sewerage system as these sewers flow into a Sanitation District's system. The County Sanitation Districts of Los Angeles County provide for the conveyance, treatment, and disposal of your wastewater. **PAYMENT OF A CONNECTION FEE TO THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY WILL BE REQUIRED BEFORE A CITY OR THE COUNTY WILL ISSUE YOU A PERMIT TO CONNECT TO THE SEWER.**

I. WHO IS REQUIRED TO PAY A CONNECTION FEE?

1. Anyone connecting to the sewerage system for the first time for any structure located on a parcel(s) of land within a County Sanitation District of Los Angeles County.
2. Anyone increasing the quantity of wastewater discharged due to the construction of additional dwelling units on or a change in land usage of a parcel already connected to the sewerage system.
3. Anyone increasing the improvement square footage of a commercial or institutional parcel by more than 25 percent.
4. Anyone increasing the quantity and/or strength of wastewater from an industrial parcel.
5. If you qualify for an Ad Valorem Tax or Demolition Credit, connection fee will be adjusted accordingly.

II. HOW ARE THE CONNECTION FEES USED?

The connection fees are used to provide additional conveyance, treatment, and disposal facilities (capital facilities) which are made necessary by new users connecting to a Sanitation District's sewerage system or by existing users who significantly increase the quantity or strength of their wastewater discharge. The Connection Fee Program insures that all users pay their fair share for any necessary expansion of the system.

III. HOW MUCH IS MY CONNECTION FEE?

Your connection fee can be determined from the Connection Fee Schedule specific to the Sanitation District in which your parcel(s) to be connected is located. A Sanitation District boundary map is attached to each corresponding Sanitation District Connection Fee Schedule. Your City or County sewer permitting office has copies of the Connection Fee Schedule(s) and Sanitation District boundary map(s) for your parcel(s). If you require verification of the Sanitation District in which your parcel is located, please call the Sanitation Districts' information number listed under Item IX below.

IV. WHAT FORMS ARE REQUIRED*?

The Connection Fee application package consists of the following:

1. Information Sheet for Applicants (this form)
2. Application for Sewer Connection

3. Connection Fee Schedule with Sanitation District Map (one schedule for each Sanitation District)

*Additional forms are required for Industrial Dischargers.

V. WHAT DO I NEED TO FILE?

1. Completed Application Form
2. A complete set of architectural blueprints (not required for connecting one single family home)
3. Fee Payment (checks payable to: County Sanitation Districts of Los Angeles County)
4. Industrial applicants must file additional forms and follow the procedures as outlined in the application instructions

VI. WHERE DO I SUBMIT THE FORMS?

Residential, Commercial, and Institutional applicants should submit the above listed materials either by mail or in person to:

County Sanitation Districts of Los Angeles County
Connection Fee Program, Room 130
1955 Workman Mill Road
Whittier, CA 90601

Industrial applicants should submit the appropriate materials directly to the City or County office which will issue the sewer connection permit.

VII. HOW LONG DOES IT TAKE TO PROCESS MY APPLICATION?

Applications submitted by mail are generally processed and mailed within three working days of receipt. Applications brought in person are processed on the same day provided the application, supporting materials, and fee is satisfactory. Processing of large and/or complex projects may take longer.

VIII. HOW DO I OBTAIN MY SEWER PERMIT TO CONNECT?

An approved Application for Sewer Connection will be returned to the applicant after all necessary documents for processing have been submitted. Present this approved-stamped copy to the City or County Office issuing sewer connection permits for your area at the time you apply for actual sewer hookup.

IX. HOW CAN I GET ADDITIONAL INFORMATION?

If you require assistance or need additional information, please call the County Sanitation Districts of Los Angeles County at (562) 699-7411, extension 2727.

X. WHAT ARE THE DISTRICTS' WORKING HOURS?

The Districts' offices are open between the hours of 7:00 a.m. and 4:00 p.m., Monday through Thursday, and between the hours of 7:00 a.m. and 3:00 p.m. on Friday, except holidays. When applying in person, applicants must be at the Connection Fee counter at least 30 minutes before closing time.

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, REGIONAL PLANNING
IGR/CEQA BRANCH
100 SO. MAIN ST.
LOS ANGELES, CA 90012
PHONE (213) 897-6536
FAX (213) 897-1337
E-Mail:NersesYerjanian@dot.ca.gov

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APR 2 8 2005
PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

Flex your power!
Be energy efficient!

Mr. Jason Mikaelian, AICP
City of Santa Clarita
23920 Valencia Blvd., Suite 300
Santa Clarita, CA. 91355

IGR/CEQA# 050448/NY
NOP/Soledad Townhomes Project
LA/14/52.17

April 26, 2005

Dear Mr. Mikaelian:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Soledad Townhomes Project which consists of 437 for-sale multiple family dwelling units (162 two-story triplex units and 275 two story townhome units) development.

Based on the information received, and to assist us in our efforts to completely evaluate and assess the impacts of this project on the State transportation system, a traffic study in advance of the DEIR should be prepared to analyze the following information:

Please reference the Department's **Traffic Impact Study Guideline** on the Internet at http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf

1. Presentations of assumptions and methods used to develop trip generation, trip distribution, choice of travel mode, and assignments of trips to State Route 14.

2. Consistency of project travel modeling with other regional and local modeling forecasts and with travel data. The IGR/CEQA office may use indices to check results. Differences or inconsistencies must be thoroughly explained.

3. Analysis of ADT, AM, and PM peak-hour volumes for both existing and future conditions in the affected area. This should include freeways, interchanges, and intersections, and all HOV facilities. Interchange Level of Service should be

specified (HCM2000 method requested). Utilization of transit lines and vehicles, and of all facilities, should be realistically estimated. Future conditions would include build-out of all projects (see next item) and any plan-horizon years.

4. Inclusion of all appropriate traffic volumes. Analysis should include traffic from the project, cumulative traffic generated from all specific approved developments in the area, and traffic growth other than from the project and developments. That is, include: existing + project + other projects + other growth.

5. Discussion of mitigation measures appropriate to alleviate anticipated traffic impacts. These mitigation discussions should include, but not be limited to, the following:

- description of transportation infrastructure improvements
- financial costs, funding sources and financing
- sequence and scheduling considerations
- implementation responsibilities, controls and monitoring

Any mitigation involving transit, HOV, or TDM must be rigorously justified and its effects conservatively estimated. Improvements involving dedication of land or physical construction may be favorably considered.

6. Specification of developer's percent share of the cost, as well as a plan of realistic mitigation measures under the control of the developer. The following ratio should be estimated: Additional traffic volume due to project implementation is divided by the total increase in the traffic volume (see Appendix "B" of the Guidelines). That ratio would be the project equitable share responsibility.

We note for purposes of determining project share of costs, the number of trips from the project on each traveling segment or element is estimated in the context of forecasted traffic volumes which include build-out of all approved and not yet approved projects, and other sources of growth. Analytical methods such as select-zone travel forecast modeling might be used.

The Department as a commenting agency under CEQA has jurisdiction superceding that of MTA in identifying the freeway analysis needed for this project. Caltrans is responsible for obtaining measures that will off-set project vehicle trip generation that worsens Caltrans facilities and hence, it does not adhere to the CMP guide of 150 or more vehicle trips added before freeway analysis is needed. MTA's Congestion Management Program in acknowledging the Department's role, stipulates that Caltrans must be consulted to identify specific locations to be analyzed on the State Highway System. Therefore State Route(s) mentioned in item #1 and it's facilities must be analyzed per the Department's **Traffic Impact Study Guidelines.**

We look forward to reviewing the DEIR. We expect to receive a copy from the State Clearinghouse. However, to expedite the review process, you may send two copies in advance to the undersigned at the following address:

Cheryl J. Powell
IGR/CEQA Branch Chief
Caltrans District 07
Regional Transportation Planning Office
100 S. Main St., Los Angeles, CA 90012

Sincerely,

Cheryl J. Powell
IGR/CEQA Branch Chief
Regional Transportation Planning

Metropolitan Transportation Authority
One Gateway Plaza
Los Angeles, CA 90012-2952
213.922.2000 Tel
metro.net

Metro

April 22, 2005

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APR 28 2005
PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

Mr. Jason Mikaelian, AICP
Associate Planner
City of Santa Clarita
23920 Valencia Boulevard
Santa Clarita, CA 91355

Dear Mr. Mikaelian:

Thank you for the opportunity to comment on the Notice of Preparation (NOP) for the Soledad Townhomes Project. This letter conveys recommendations from the Los Angeles County Metropolitan Transportation Authority (LACMTA) concerning issues that are germane to our agency's statutory responsibilities in relation to the proposed project.

A Traffic Impact Analysis (TIA), with both highway and freeway, and transit components, is required under the State of California Congestion Management Program (CMP) statute. The CMP TIA Guidelines are published in the "2002 Congestion Management Program for Los Angeles County", Appendix D. The geographic area examined in the TIA must include the following, at a minimum:

1. All CMP arterial monitoring intersections, including monitored freeway on/off-ramp intersections, where the proposed project will add 50 or more trips during either the a.m. or p.m. weekday peak hour (of adjacent street traffic); and
2. Mainline freeway-monitoring locations where the project will add 150 or more trips, in either direction, during either the a.m. or p.m. weekday peak hour.

Among the required steps for the analysis of development-related impacts to transit are:

1. Evidence that, in addition to Metro, all affected municipal transit operators received the NOP for the Draft EIR;
2. A summary of the existing transit services in the area;
3. Estimated project trip generation and mode assignment for both morning and evening peak periods;
4. Documentation on the assumptions/analyses used to determine the number of percentage of trips assigned to transit;

5. Information on facilities and/or programs that will be incorporated in to the development plan that will encourage public transit usage and transportation demand management (TDM) policies and programs; and
6. An analysis of the expected project impacts on current and future transit services along with proposed project mitigation.

The MTA looks forward to reviewing the Draft EIR. If you have any questions regarding this response, please call me at 213-922-6908 or email at chapmans@metro.net. Please send the Draft EIR to the following address:

LACMTA
One Gateway Plaza
Attn: Susan Chapman
Long Range Planning, 99-23-2
Los Angeles, CA 90012-2952

Sincerely,

Susan Chapman
Program Manager, Long Range Planning

STATE OF CALIFORNIA

Governor's Office of Planning and Research

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PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

April 18, 2005

To: Reviewing Agencies

Re: Soledad Townhomes
SCH# 2005041100

Attached for your review and comment is the Notice of Preparation (NOP) for the Soledad Townhomes draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Jason Mikaelian
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, CA 91355

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

C. Roberts for

Scott Morgan
Project Analyst, State Clearinghouse

Attachments
cc: Lead Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2005041100
Project Title Soledad Townhomes
Lead Agency Santa Clarita, City of

Type NOP Notice of Preparation

Description Development of a 30-acre site with 437 for-sale multiple-family dwelling units, a maximum of 10,000 sf of commercial uses, associated private recreation uses and on-site private circulation.

Lead Agency Contact

Name Jason Mikaelian
Agency City of Santa Clarita
Phone (661) 255-4330 **Fax**
email
Address 23920 Valencia Boulevard, Suite 300
City Santa Clarita **State** CA **Zip** 91355

Project Location

County Los Angeles
City Santa Clarita
Region
Cross Streets Soledad Canyon Road / Bouquet Canyon Road / Golden Valley Road
Parcel No. 2849-0027-001, 002, 003, 004; 2849-001-029
Township **Range** **Section** **Base**

Proximity to:

Highways 5
Airports
Railways Metrolink
Waterways Santa Clara River
Schools > 5 school sites
Land Use Commercial Office (CO)
Z: Commercial Office (CO)

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Cumulative Effects; Drainage/Absorption; Economics/Jobs; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Growth Inducing; Landuse; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife

Reviewing Agencies Resources Agency; Regional Water Quality Control Board, Region 4; Department of Parks and Recreation; Native American Heritage Commission; Department of Housing and Community Development; Department of Health Services; Office of Emergency Services; Department of Fish and Game, Region 5; Department of Water Resources; California Highway Patrol; Caltrans, District 7

Date Received 04/18/2005 **Start of Review** 04/18/2005 **End of Review** 05/17/2005

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: Los Angeles

SCH# 2005041100

Resources Agency

- [ ] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  David Johnson
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Gerald R. Zimmerman
- [ ] **Dept. of Conservation**
  Roseanne Taylor
- [ ] **California Energy Commission**
  Environmental Office
- [ ] **Dept. of Forestry & Fire Protection**
  Allen Robertson
- [ ] **Office of Historic Preservation**
  Wayne Donaldson
- [ ] **Dept of Parks & Recreation**
  B. Noah Tilghman
  Environmental Stewardship Section
- [ ] **Reclamation Board**
  DeeDee Jones
- [ ] **Santa Monica Mountains Conservancy**
  Paul Edelman
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [ ] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou

Fish and Game

- [ ] **Depart. of Fish & Game**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Game Region 1**
  Donald Koch
- [ ] **Fish & Game Region 2**
  Banky Curtis
- [ ] **Fish & Game Region 3**
  Robert Floerke
- [ ] **Fish & Game Region 4**
  William Laudermilk
- [ ] **Fish & Game Region 5**
  Don Chadwick
  Habitat Conservation Program
- [ ] **Fish & Game Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] **Fish & Game Region 6 I/M**
  Tammy Allen
  Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M**
  George Isaac
  Marine Region

Other Departments

- [ ] **Food & Agriculture**
  Steve Shaffer
  Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
  Public School Construction
- [ ] **Dept. of General Services**
  Robert Sleppy
  Environmental Services Section
- [ ] **Dept. of Health Services**
  Veronica Rameriz
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Coachella Valley Mountains Conservancy**
- [ ] **Delta Protection Commission**
  Debby Eddy
- [ ] **Office of Emergency Services**
  Dennis Castrillo
- [ ] **Governor's Office of Planning & Research**
  State Clearinghouse
- [ ] **Native American Heritage Comm.**
  Debbie Treadway
- [ ] **Public Utilities Commission**
  Ken Lewis
- [ ] **San Gabriel & Lower LA Rivers**
- [ ] **San Joaquin River Conservancy**
- [ ] **State Lands Commission**
  Jean Sarino
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
  Sandy Hesnard
- [ ] **Caltrans - Planning**
  Terri Pencovic
- [ ] **California Highway Patrol**
  John Olejnik
  Office of Special Projects
- [ ] **Housing & Community Development**
  Lisa Nichols
  Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Mike Eagan
- [ ] **Caltrans, District 2**
  Don Anderson
- [ ] **Caltrans, District 3**
  Jeff Pulverman
- [ ] **Caltrans, District 4**
  Tim Sable
- [ ] **Caltrans, District 5**
  David Murray
- [ ] **Caltrans, District 6**
  Marc Birnbaum
- [ ] **Caltrans, District 7**
  Cheryl J. Powell
- [ ] **Caltrans, District 8**
  John Pagano
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [ ] **Caltrans, District 11**
  Mario Orso
- [ ] **Caltrans, District 12**
  Bob Joseph

Cal EPA

Air Resources Board

- [ ] Airport Projects
  Jim Lerner
- [ ] Transportation Projects
  Kurt Karperos
- [ ] Industrial Projects
  Mike Tollstrup

- [ ] **California Integrated Waste Management Board**
  Sue O'Leary
- [ ] **State Water Resources Control Board**
  Jim Hockenberry
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resouces Control Board**
  Steven Herrera
  Division of Water Rights
- [ ] **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Jonathan Bishop
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
  - [ ] **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
  - [ ] **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [ ] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [ ] **Other** _____

Last Updated on 3/11/05

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PLANNING DIVISION

APR 29 2005

PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

April 22, 2005

Mr. Jason Mikaelian, Associate Planner
City of Santa Clarita
23920 Valencia Blvd., Suite 300
Santa Clarita, CA 91355

Dear Mr. Mikaelian:

Notice of Preparation of a Draft Environmental Impact Report for
Soledad Townhomes Project

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the Draft Environmental Impact Report (EIR). Please send the SCAQMD a copy of the Draft EIR upon its completion.

Air Quality Analysis

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2002 Model. This model is available on the CARB Website at: www.arb.ca.gov.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should

be included in the analysis. It is recommended that lead agencies for projects generating or attracting vehicular trips, especially heavy-duty diesel-fueled vehicles, perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on the SCAQMD's CEQA webpages at the following internet address: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/diesel_analysis.doc. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. Please call Charles Blankson, Ph.D., Air Quality Specialist, CEQA Section, at (909) 396-3304 if you have any questions regarding this letter.

Sincerely,

Steve Smith

Steve Smith, Ph.D.
Program Supervisor, CEQA Section
Planning, Rule Development and Area Sources

SS:CB:li

LAC050421-03LI
Control Number

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294
(323) 890-4330

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PLANNING DIVISION

AUG 0 1 2005

PLANNING & ECONOMIC DEVELOPMENT
CITY OF SANTA CLARITA

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

July 21, 2005

Mr. Jason Mikaelian
AICP, Associate Planner
City of Santa Clarita
23920 Valencia Blvd #300
Santa Clarita, CA 91355

Dear Mr. Mikaelian:

DRAFT ENVIRONMENTAL IMPACT REPORT, MASTER CASE #04-444 SOLEDAD TOWNHOMES GPA #04-006, ZC #04-004, TTM #62-322 "SANTA CLARITA" – (FFER 200500055)

The Draft Environmental Impact Report has been reviewed by the Planning Division, Land Development Unit, and Forestry Division of the County of Los Angeles Fire Department. The following are their comments:

PLANNING DIVISION/PROJECT IMPACT SERVICES:

The Public Services section of the Initial Study states: "No new or substantially increased impacts would occur with respect to fire service requirement protections, since the project site is located along a major arterial within a built environment." This is faulty logic. Any new development on vacant land will increase the demand for fire protection and paramedic services. Although this development might be in proximity to existing fire stations, it would increase service demand on the existing fire protection resources in the general area. Additional manpower, equipment, and facilities are needed in the area now.

The applicant shall participate in an appropriate financing mechanism, such as a developer fee or an in-kind consideration in lieu of developer fees, to provide funds for fire protection facilities which are required by new commercial, industrial or residential development in an amount proportionate to the demand created by this project. Currently, the developer fee is a set amount per square foot of building space, adjusted annually, and is due and payable at the time a building permit is issued. In the event that the developer fee is no longer in effect at the time of building permit issuance, alternative mitigation measures shall be required.

SERVICE RESPONSIBILITY:

The package we received did not include any maps. We would need a general location map and a detailed map showing the location of proposed land uses as well as existing and proposed roads in order to calculate response distances/times.

Due to the fact that the materials available on this project are incomplete at the present time, we are not able to respond fully as to how this project will affect our Department. We would like to reserve the right to respond further at a future date when suitable maps are available.

LAND DEVELOPMENT UNIT:

1. The proposed development may necessitate multiple ingress/egress access for the circulation of traffic, and emergency response issues.

2. The development of this project must comply with all applicable code and ordinance requirements for construction, access, water mains, fire flows and fire hydrants.

3. This property is located within the area described by the Forester and Fire Warden as a Fire Zone 4, Very High Fire Hazard Severity Zone (VHFHSZ). All applicable fire code and ordinance requirements for construction, access, water mains, fire hydrants, fire flows, brush clearance and fuel modification plans, must be met.

4. Specific fire and life safety requirements for the construction phase will be addressed at the building fire plan check. There may be additional fire and life safety requirements during this time.

5. Every building constructed shall be accessible to Fire Department apparatus by way of access roadways, with an all-weather surface of not less than the prescribed width. The roadway shall be extended to within 150 feet of all portions of the exterior walls when measured by an unobstructed route around the exterior of the building.

6. Access roads shall be maintained with a minimum of ten (10) feet of brush clearance on each side. Fire access roads shall have an unobstructed vertical clearance clear-to-sky with the exception of protected tree species. Protected tree species overhanging fire access roads shall be maintained to provide a vertical clearance of thirteen (13) feet, six (6) inches.

7. When a bridge is required to be used as part of a fire access road, it shall be constructed and maintained in accordance with nationally recognized standards and designed for a live load sufficient to carry a minimum of 75,000 pounds. All water crossing designs are required to be approved by the Public Works Department prior to installation.

8. The maximum allowable grade shall not exceed 15% except where topography makes it impractical to keep within such grade; in such cases, an absolute maximum of 20% will be allowed for up to 150 feet in distance. The average maximum allowed grade, including topographical difficulties, shall be no more than 17%. Grade breaks shall not exceed 10% in ten (10) feet.

9. When involved with a subdivision in a city contracting fire protection with the County of Los Angeles Fire Department, requirements for access, fire flows and hydrants are addressed during the subdivision tentative map stage.

10. Fire sprinkler systems are required in some residential and most commercial occupancies. For those occupancies not requiring fire sprinkler systems, it is strongly suggested that fire sprinkler systems be installed. This will reduce potential fire and life losses. Systems are now technically and economically feasible for residential use

11. The development may require fire flows up to 5,000 gallons per minute at 20 pounds per square inch residual pressure for up to a five-hour duration. Final fire flows will be based on the size of buildings, their relationship to other structures, property lines, and types of construction used.

12. Fire hydrant spacing shall be 300 feet and shall meet the following requirements:

    - No portion of lot frontage shall be more than 200 feet via vehicular access from a public fire hydrant.
    - No portion of a building shall exceed 400 feet via vehicular access from a properly spaced public fire hydrant.
    - Additional hydrants will be required if hydrant spacing exceeds specified distances.
    - When cul-de-sac depth exceeds 200 feet on a commercial street, hydrants shall be required at the corner and mid-block.
    - A cul-de-sac shall not be more than 500 feet in length, when serving land zoned for commercial use.

13. Turning radii shall not be less than 32 feet. This measurement shall be determined at the centerline of the road. A Fire Department approved turning area shall be provided for all driveways exceeding 150 feet in length and at the end of all cul-de-sacs.

14. All on-site driveways/roadways shall provide a minimum unobstructed width of 28 feet, clear-to-sky. The on-site driveway is to be within 150 feet of all portions of the exterior walls of the first story of any building. The centerline of the access driveway shall be located parallel to, and within 30 feet of an exterior wall on one side of the proposed structure.

15. Driveway width for non-residential developments shall be increased when any of the following conditions will exist:

    - Provide 34 feet in width, when parallel parking is allowed on one side of the access roadway/driveway. Preference is that such parking is not adjacent to the structure.
    - Provide 42 feet in width, when parallel parking is allowed on each side of the access roadway/driveway.
    - Any access way less than 34 feet in width shall be labeled "Fire Lane" on the final recording map, and final building plans.
    - For streets or driveways with parking restrictions: The entrance to the street/driveway and intermittent spacing distances of 150 feet shall be posted with Fire Department approved signs stating "NO PARKING – FIRE LANE" in three-inch high letters. Driveway labeling is necessary to endure access for Fire Department use.

16. The development may require fire flows up to 5,000 gallons per minute at 20 pounds per square inch residual pressure for up to a five-hour duration. Final fire flows will be based on the size of the buildings, their relationship to other structures, property lines, and types of construction used.

17. Fire hydrant spacing shall be 300 feet and shall meet the following requirements:

- No portion of lot frontage shall be more than 200 feet via vehicular access from a public fire hydrant.
- No portion of a building shall exceed 400 feet via vehicular access from a properly spaced fire hydrant.
- When cul-de-sac depth exceeds 200 feet, hydrants will be required at the corner and mid-block.
- Additional hydrants will be required if the hydrant spacing exceeds specified distances.

18. Turning radii shall not be less than 32 feet. This measurement shall be determined at the centerline of the road. A Fire Department approved turning area shall be provided for all driveways exceeding 150 feet in length and at the end of all cul-de-sacs.

19. All on-site driveways shall provide a minimum unobstructed width of 28 feet, clear-to-sky. The 28 feet width does not allow for parking, and shall be designated as a "Fire Lane" and have appropriate signage. The centerline of the on-site driveway shall be located parallel to and within 30 feet of an exterior wall on one side of the proposed structure. The on-site driveway is to be within 150 feet of all portions of the exterior walls of the first story of any building.

20. The twenty-eight (28) feet in width shall be increased to:

- Thirty-four (34) feet in width when parallel parking is allowed on one side of the access way.
- Thirty-six (36) feet in width when parallel parking is allowed on both sides of the access way.
- Any access way less than 34 feet in width shall be labeled "Fire Lane" on the final recording map, and final building plans.
- For streets or driveways with parking restrictions: The entrance to the street/driveway and intermittent spacing distances of 150 feet shall be posted with Fire Department approved signs stating "NO PARKING – FIRE LANE" in three-inch high letters. Driveway labeling is necessary to ensure access for Fire Department use.

21. When serving land zoned for residential uses having a density of more than four (4) units per net acre:

- A cul-de-sac shall be a minimum of 34 feet in width and shall not be more than 700 feet in length.
- The length of the cul-de-sac may be increased to 1,000 feet if a minimum of 36 feet in width is provided.
- A Fire Department approved turning area shall be provided at the end of a cul-de-sac.

22. All access devices and gates shall meet the following requirements:

- Any single-gated opening used for ingress and egress shall be a minimum of 26 feet in width, clear-to-sky.

- Any divided gate opening (when each gate is used for a single-direction of travel – i.e., ingress or egress) shall be a minimum width of 20 feet clear-to-sky.

- Gates and/or control devices shall be positioned a minimum of 50 feet from a public right-of-way, and shall be provided with a turnaround having a minimum of 32 feet of turning radius. If an intercom system is used, the 50 feet shall be measured from the right-of-way to the intercom control device.

- All limited access devices shall be of a type approved by the Fire Department.

- Gate plans shall be submitted to the Fire Department, prior to installation. These plans shall show all locations, widths and details of the proposed gates.

23. All proposals for traffic calming measures (speed humps/bumps/cushions, traffic circles, roundabouts, etc.) shall be submitted to the Fire Department for review, prior to implementation.

24. Should any questions arise regarding subdivision, water systems, or access, please contact the County of Los Angeles Fire Department – Land Development Unit's EIR Specialist at (323) 890-4243.

FORESTRY DIVISION – OTHER ENVIRONMENTAL CONCERNS:

1. The statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources, and the County Oak Tree Ordinance. Potential impacts in these areas should be addressed.

If you have any additional questions, please contact this office at (323) 890-4330.

Very truly yours,

DAVID R. LEININGER, CHIEF, FORESTRY DIVISION
PREVENTION SERVICES BUREAU

DRL:sc

Appendix C
CUMULATIVE GROWTH CALCULATIONS

CUMULATIVE POPULATION CALCULATIONS

Land Use	SFR (s.f.)	MFR (s.f.)	Retail (s.f.)	Office (s.f.)	Industrial (s.f.)	Schools (s.f.)	Parks (acres)
Henry Mayo Newhall Memorial Hospital				600,000			
Facey Medical Building				79,000			
Valencia Town Center Expansion			600,000				
Pony League (Auto sales)			115,000				
Whittaker Bermmite	1,648	1,560	538,000	971,000	973,000	261,360	30
Riverpark	419	704	16,000				26
Sonrisa Residential		35					
Plum Canyon	498						
Keystone Project	96	883				274,428	4
Centerpoint Business Park			560,000	40,000	400,000		
Golden Triangle		180	10,000				
Soledad Circle Estates		150					
Golden Valley High School						156,816	
Centex Homes	166						
Valle do Oro Residential		111					
Friendly Valley Association 11	44						
Aspen Investment Co.					109,000		
Proposed Project		437	8,000				
TOTAL	**2,871**	**4,060**	**1,847,000**	**1,690,000**	**1,482,000**	**692,604**	**60**
Growth Factor	3.081	3.081	0.00182	0.00182	0.00208	0.00182	N/A
Population	**8,846**	**12,509**	**3,357**	**3,072**	**3,082**	**1,259**	**0**

TOTAL POPULATION GROWTH	**32,125**

Note: The population growth factor assumes 3.081 persons per household on average. Housing units are multiplied by 3.081 to yield population growth, while employment-generating uses are multiplied by an employment factor to yield employment growth, then it is assumed (conservatively) that 25% of new employees would relocate to the area. Assuming 1/4 of new employees (and their families) move to the area and require housing, the resultant population growth would be new employees multiplied by 3.081 for each respective housing unit required to house each new employee. Employment factors are 2.36 employees per 1,000 square feet for commercial and school uses, and 2.70 employees per 1,000 square feet for industrial uses. (Per SCAG 2003)

CUMULATIVE EMPLOYMENT CALCULATIONS

Land Use	SFR (d.u.)	MFR (d.u.)	Retail (s.f.)	Office (s.f.)	Industrial (s.f.)	Schools (s.f.)	Parks (acres)
Henry Mayo Newhall Memorial Hospital				600,000			
Facey Medical Building				79,000			
Valencia Town Center Expansion			600,000				
Pony League (Auto sales)			115,000				
Whittaker Bermmite	1,648	1,560	538,000	971,000	973,000	261,360	30
Riverpark	419	704	16,000				26
Sonrisa Residential		35					
Plum Canyon	498						
Keystone Project	96	883				274,428	4
Centerpoint Business Park			560,000	40,000	400,000		
Golden Triangle		180	10,000				
Soledad Circle Estates		150					
Golden Valley High School						156,816	
Centex Homes	166						
Valle do Oro Residential		111					
Friendly Valley Association 11	44						
Aspen Investment Co.					109,000		
Proposed Project		437	8,000				
TOTAL	**2,871**	**4,060**	**1,847,000**	**1,690,000**	**1,482,000**	**692,604**	**60**
Growth Factor	N/A	N/A	0.00236	0.00236	0.00270	0.00236	N/A
Employment	**0**	**0**	**4,359**	**3,988**	**4,001**	**1,635**	**0**

TOTAL EMPLOYMENT GROWTH	**13,983**

Note: Employment growth factors are 2.36 employees per 1,000 square feet for commercial and school uses and 2.70 employees per 1,000 square feet for industrial uses (per SCAG 2003).

CUMULATIVE HOUSING CALCULATIONS

Land Use	SFR (d.u.)	MFR (d.u.)	Retail (s.f.)	Office (s.f.)	Industrial (s.f.)	Schools (s.f.)	Parks (acres)
Henry Mayo Newhall Memorial Hospital				600,000			
Facey Medical Building				79,000			
Valencia Town Center Expansion			600,000				
Pony League (Auto sales)			115,000				
Whittaker Bermmite	1,648	1,560	538,000	971,000	973,000	261,360	30
Riverpark	419	704	16,000				26
Sonrisa Residential		35					
Plum Canyon	498						
Keystone Project	96	883				274,428	4
Centerpoint Business Park			560,000	40,000	400,000		
Golden Triangle		180	10,000				
Soledad Circle Estates		150					
Golden Valley High School						156,816	
Centex Homes	166						
Valle do Oro Residential		111					
Friendly Valley Association 11	44						
Aspen Investment Co.					109,000		
Proposed Project		437	8,000				
TOTAL	**2,871**	**4,060**	**1,847,000**	**1,690,000**	**1,482,000**	**692,604**	**60**
Growth Factor	N/A	N/A	0.00059	0.00059	0.00068	0.00059	N/A
Housing	**2,871**	**4,060**	**1,090**	**997**	**1,000**	**409**	**0**

TOTAL HOUSING GROWTH	**10,427**

Note: Housing growth factors are equal to the projected employment generated by uses multiplied by 0.25 (25%), which assumes that 1/4 of employees would relocate to the project vicinity and require housing. Commercial and school factor is 2.36 employees per 1,000 square feet, while the industrial factor is 2.70 employees per 1,000 square feet (per SCAG 2003).

CUMULATIVE PARKS CALCULATIONS

Land Use	SFR[a] (d.u.)	MFR[b] (d.u.)	Retail (s.f.)	Office (s.f.)	Industrial (s.f.)	Schools (s.f.)	Parks (acres)
Henry Mayo Newhall Memorial Hospital				600,000			
Facey Medical Building				79,000			
Valencia Town Center Expansion			600,000				
Pony League (Auto sales)			115,000				
Whittaker Bermmite	1,648	1,560	538,000	971,000	973,000	261,360	30
Riverpark	419	704	16,000				26
Sonrisa Residential		35					
Plum Canyon	498						
Keystone Project	96	883				274,428	4
Centerpoint Business Park			560,000	40,000	400,000		
Golden Triangle		180	10,000				
Soledad Circle Estates		150					
Golden Valley High School						156,816	
Centex Homes	166						
Valle do Oro Residential		111					
Friendly Valley Association 11	44						
Aspen Investment Co.					109,000		
Proposed Project		437	8,000				
TOTAL	**2,871**	**4,060**	**1,847,000**	**1,690,000**	**1,482,000**	**692,604**	**60**
Growth Factor	$743	$297	$0.3716	$0.3716	$0.3716	$0.3716	N/A
Park Fees	**$ 2,133,727.20**	**$ 1,206,956.80**	**$ 686,345.20**	**$ 628,004.00**	**$ 550,711.20**	**$ 257,371.65**	**$ -**

TOTAL PARK IMPACT FEES	**$ 5,463,116.05**

Notes:

a) Single-family homes are assumed to be 2,000 square feet on average.

b) Multi-family homes are assumed to be 800 square feet on average.

e) Fees for park service impacts are $0.3716 per square foot of new development for all land uses.

CUMULATIVE SOLID WASTE CALCULATIONS

Land Use	SFR (d.u.)	MFR (d.u.)	Retail (s.f.)	Office (s.f.)	Industrial (s.f.)	Schools (acres)	Parks (acres)
Henry Mayo Newhall Memorial Hospital				600,000			
Facey Medical Building				79,000			
Valencia Town Center Expansion			600,000				
Pony League (Auto sales)			115,000				
Whittaker Bermmite	1,648	1,560	538,000	971,000	973,000	20	30
Riverpark	419	704	16,000				26
Sonrisa Residential		35					
Plum Canyon	498						
Keystone Project	96	883				21	4
Centerpoint Business Park			560,000	40,000	400,000		
Golden Triangle		180	10,000				
Soledad Circle Estates		150					
Golden Valley High School						12	
Centex Homes	166						
Valle do Oro Residential		111					
Friendly Valley Association 11	44						
Aspen Investment Co.					109,000		
Proposed Project		437	8,000				
TOTAL	**2,871**	**4,060**	**1,847,000**	**1,690,000**	**1,482,000**	**53**	**60**
Growth Factor (tpd)	**0.005**	**0.0032**	**0.000023**	**0.00003**	**0.000031**	**0.0000036**	**N/A**
Solid Waste (tpd)	**14.36**	**12.99**	**42.48**	**50.70**	**45.94**	**0.00**	**0.00**

TOTAL DAILY SOLID WASTE GENERATION (tpd)	**166**

Notes:Generation factors are in tons per day per dwelling unit or square foot, as appropriate, and are derived from the California Integrated Waste Management Board website. (http://www.ciwmb.ca.gov/WasteChar/WasteGenRates/default.htm)

tpd = tons per day

CUMULATIVE SCHOOL CALCULATIONS

Land Use	SFR (d.u.)	MFR (d.u.)	Retail (s.f.)	Office (s.f.)	Industrial (s.f.)	Schools (acres)	Parks (acres)
Henry Mayo Newhall Memorial Hospital				600,000			
Facey Medical Building				79,000			
Valencia Town Center Expansion			600,000				
Pony League (Auto sales)			115,000				
Whittaker Bermmite	1,648	1,560	538,000	971,000	973,000	20	30
Riverpark	419	704	16,000				26
Sonrisa Residential		35					
Plum Canyon	498						
Keystone Project	96	883				21	4
Centerpoint Business Park			560,000	40,000	400,000		
Golden Triangle		180	10,000				
Soledad Circle Estates		150					
Golden Valley High School						12	
Centex Homes	166						
Valle do Oro Residential		111					
Friendly Valley Association 11	44						
Aspen Investment Co.					109,000		
Proposed Project		437	8,000				
TOTAL	**2,871**	**4,060**	**1,847,000**	**1,690,000**	**1,482,000**	**53**	**60**

Total Elementary School Students	**1,008**
Total Junior High School Students	**632**
Total Senior High School Students	**1,010**

Appendix D
TRAFFIC IMPACT ANALYSIS

TT 062322

Traffic Impact Analysis

June 2005

AUSTIN-FOUST ASSOCIATES, INC.

DRAFT

TT 062322

TRAFFIC IMPACT ANALYSIS

Prepared by:

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June 2, 2005

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1.0 INTRODUCTION

This report presents the results of a traffic study carried out to evaluate Tentative Tract (TT) 062322, the Soledad Townhomes project located in the City of Santa Clarita. It provides the traffic and circulation material for the environmental documentation prepared for this project.

1.1 PROJECT DESCRIPTION

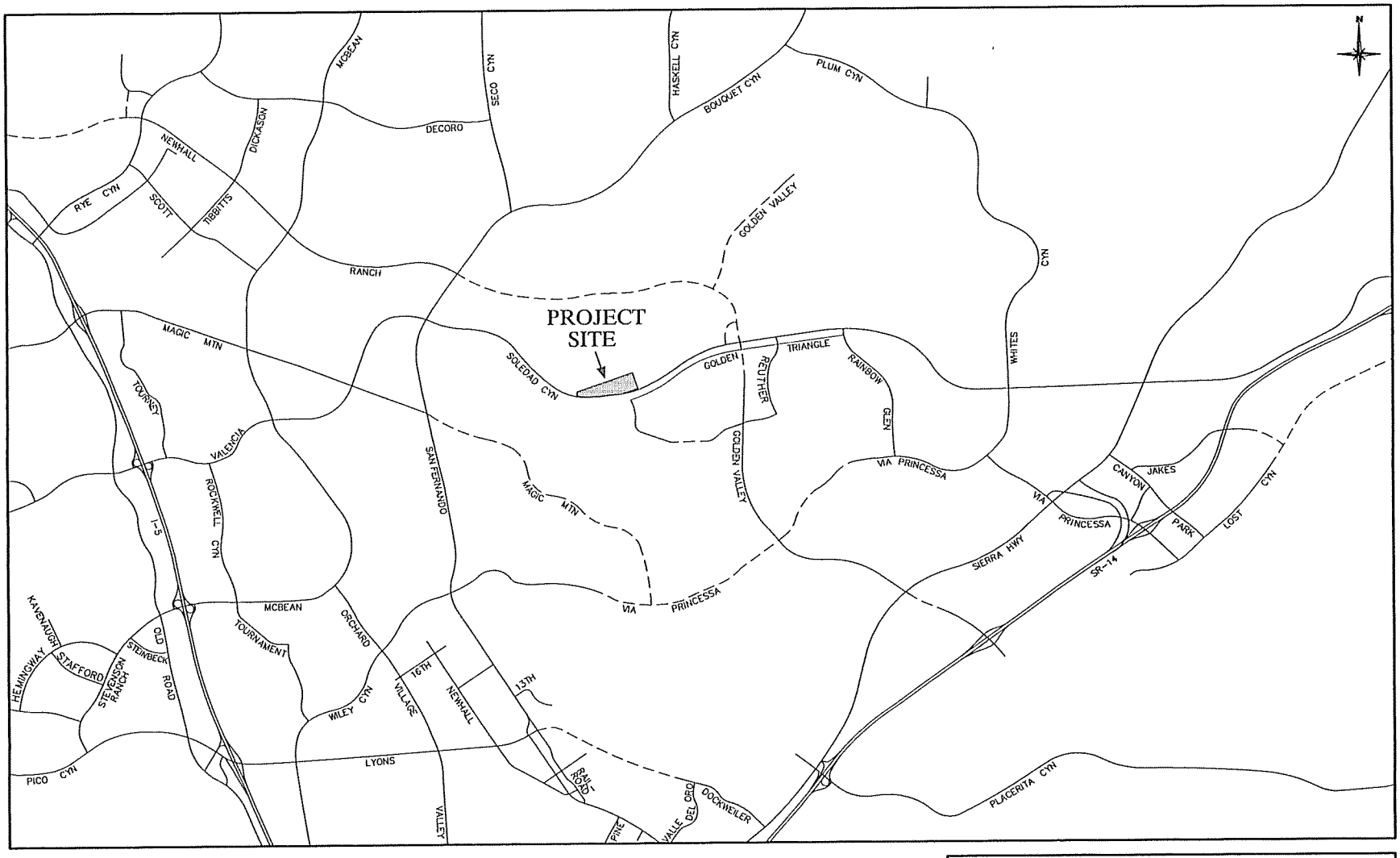
The proposed project is located on an approximately 30-acre site and consists of a maximum of 437 residential condominium units and 8,000 square feet of commercial retail use. Approximately 200 units, along with the 8,000 square foot commercial center, will be constructed in the first phase of development (prior to completion of the Cross Valley Connector), and the remaining 237 units will be completed in the second phase of construction (after completion of the Cross Valley Connector). The site is generally bounded by the Santa Clara River to the north, Bentgrass Way and residential uses to the east, and Soledad Canyon Road and a Metrolink rail line the to the south. Figure 1-1 illustrates the location of the site in relation to the surrounding roadway system and Figure 1-2 illustrates the site plan for the proposed project.

1.2 STUDY AREA

The study area includes the roadways and intersections near to the project site and those locations where project-generated traffic could cause a significant impact, which is based on a criteria of 50 or more new trips added to the peak travel direction. Figure 1-3 illustrates the intersections selected for study based on this criteria.

1.3 METHODOLOGY

The traffic analysis evaluates the proposed project for a short-range and an interim year time frame using the Santa Clarita Valley Consolidated Traffic Model (SCVCTM). The SCVCTM was developed jointly by the City of Santa Clarita and the County of Los Angeles and is the primary tool used for forecasting traffic volumes for the Santa Clarita Valley.



Legend

– – – – – Planned Roadway

Figure 1-1

PROJECT SITE LOCATION

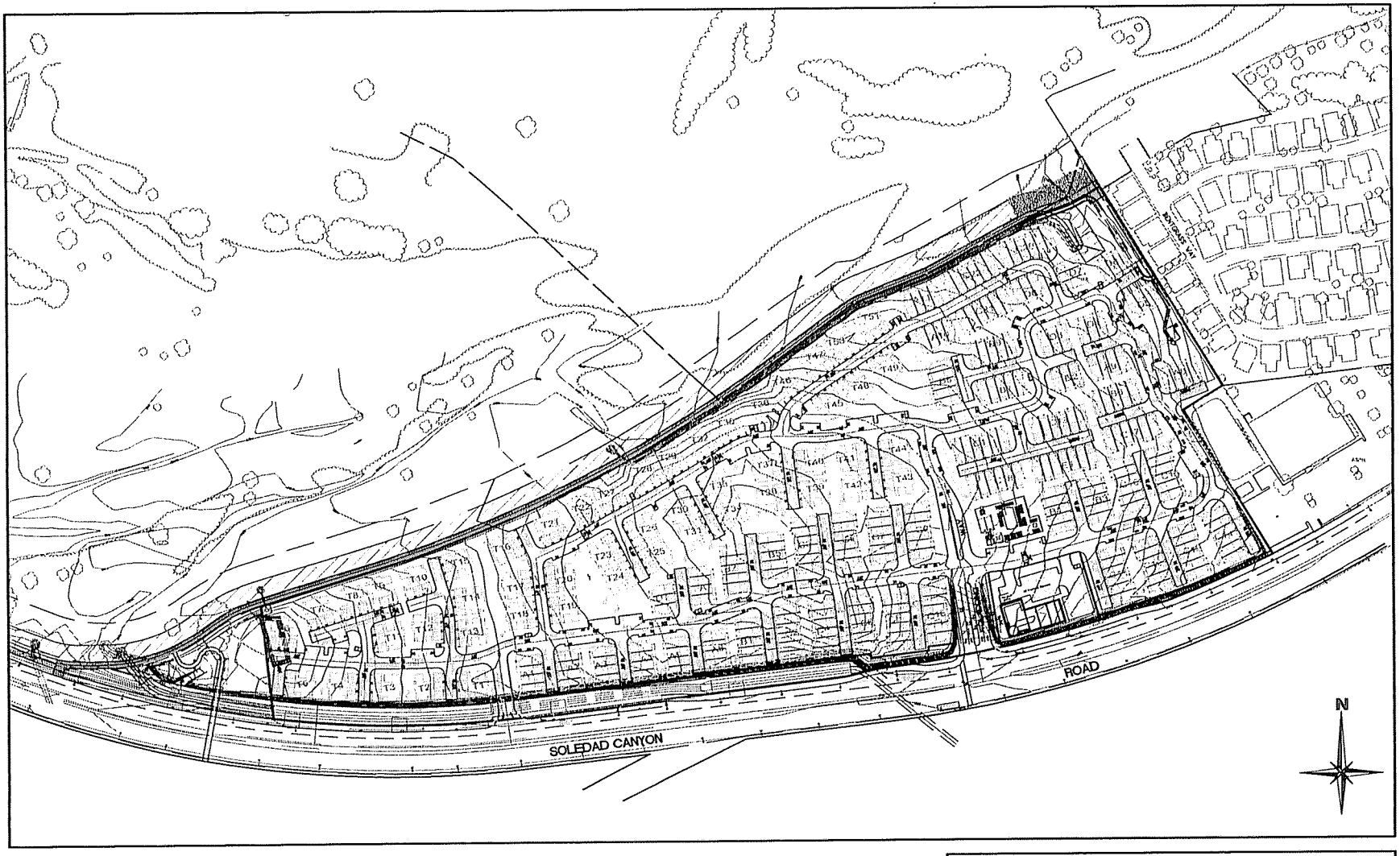
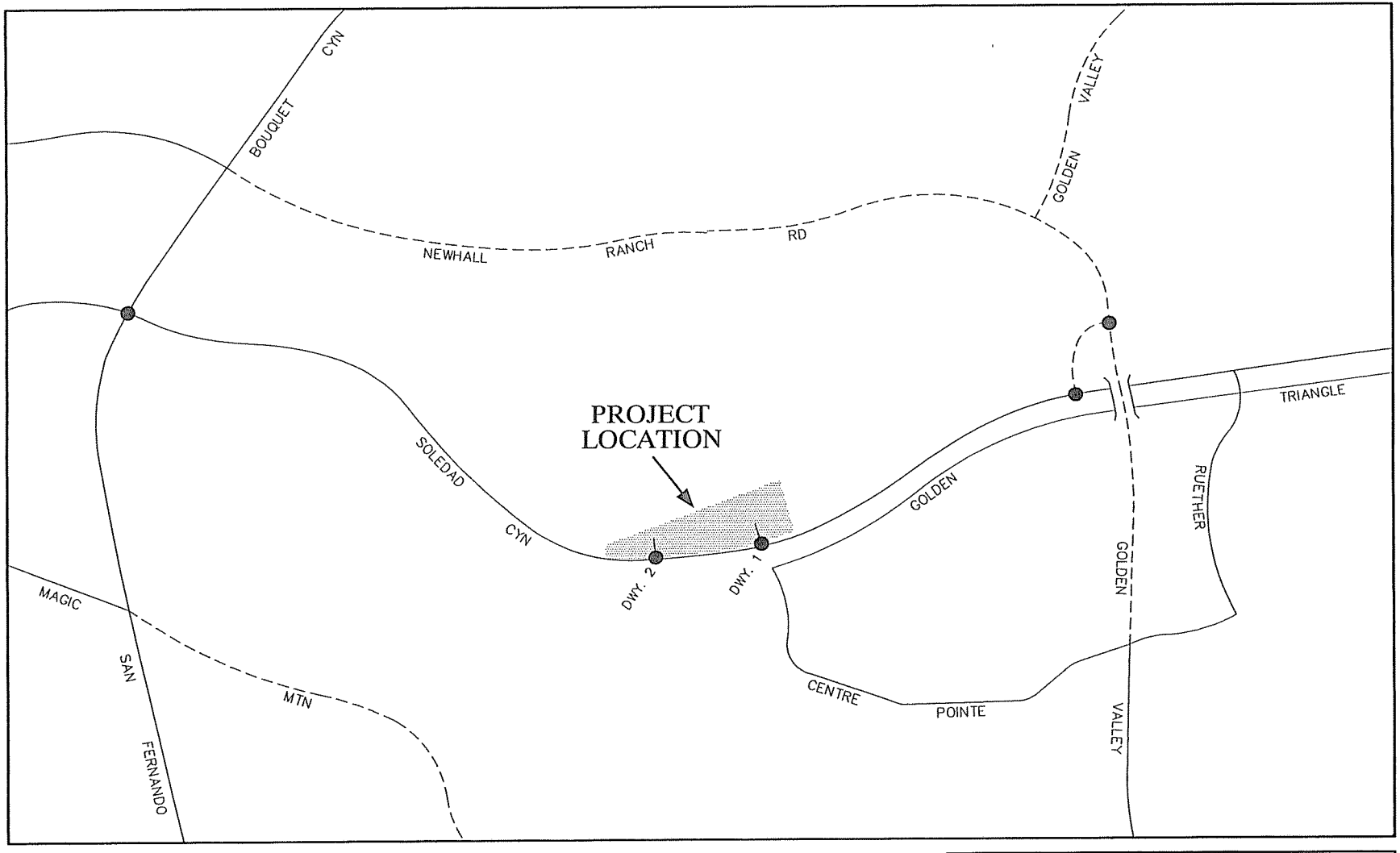


Figure 1-2

PROPOSED PROJECT SITE PLAN



Legend

Planned Roadway

Study Area Intersection

Figure 1-3

STUDY AREA INTERSECTIONS

The SCVCTM has the ability to provide traffic volume forecasts for three future scenarios; Interim Year, which generally corresponds to a horizon of year 2015, Long-Range General Plan, which represents buildout of the City and County's General Plans, and Long-Range Cumulative, which represents buildout conditions and also includes pending projects not yet adopted by the respective agency.

Consistent with the EIR traffic studies done for other recent projects in the City, this analysis uses the SCVCTM Interim Year horizon, which is roughly halfway between existing conditions and buildout of the General Plan, as the basis for background traffic conditions. An update to the SCVCTM was recently undertaken (see Reference 7 in Section 1.6) which included incorporating current land use information for planned and pending cumulative projects. As part of the development of this traffic impact analysis, the SCVCTM land use database was reviewed and verified for use in the cumulative analysis (see Section 2.3 for related project information obtained from the SCVCTM).

The impact analysis is based on specific performance criteria which are outlined in the following section. Where appropriate, mitigation measures are identified for those scenarios in which significant impacts are determined based on the established impact thresholds.

1.4 PERFORMANCE CRITERIA

For CEQA purposes, defined performance criteria are utilized to determine if a proposed project causes a significant impact. In most traffic studies, performance criteria are based on two primary measures. The first is "capacity", which establishes the vehicle carrying ability of a roadway and the second is "volume." The volume measure is either a traffic count (in the case of existing volumes) or a forecast for a future point in time. The ratio between the volume and the capacity gives a volume/capacity (V/C) ratio and based on that V/C ratio, a corresponding level of service (LOS) is defined. Traffic LOS is designated A through F with LOS A representing free flow conditions and LOS F representing severe traffic congestion. Traffic flow quality for each LOS is described in Table 1-1.

Both the V/C ratio and the LOS are used in determining impact significance. Certain LOS values are deemed unacceptable by the City and increases in the V/C ratio which cause or contribute to the LOS being unacceptable are defined as a significant impact (see following sections for details).

Table 1-1

LEVEL OF SERVICE DESCRIPTIONS

LOS	Arterial Roads	Freeway Segments
A	Describes primarily free-flow operations at average travel speeds, usually about 90 percent of the free-flow speed for the given street class. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal.	Describes free-flow operations. Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The effects of incidents or point breakdowns are easily absorbed at this level.
B	Describes reasonably unimpeded operations at average travel speeds, usually about 70 percent of the free-flow speed for the street class. The ability to maneuver within the traffic stream is only slightly restricted, and control delays at signalized intersections are not significant.	Represents reasonably free flow, and free-flow speeds are maintained. The ability to maneuver within the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers is still high. The effects of minor incidents and point breakdowns are still easily absorbed.
C	Describes stable operations; however, ability to maneuver and change lanes in midblock locations may be more restricted than at LOS B, and longer queues, adverse signal coordination, or both may contribute to lower average travel speeds of about 50 percent of the free-flow speed for the street class.	Provides for flow with speeds at or near the free-flow speed of the freeway. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver. Minor incidents may still be absorbed, but the local deterioration in service will be substantial. Queues may be expected to form behind any significant blockage.
D	Borders on a range in which small increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors. Average travel speeds are about 40 percent of free-flow speed.	The level at which speeds begin to decline slightly with increasing flows and density begins to increase somewhat more quickly. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort levels. Even minor incidents can be expected to create queuing, because the traffic stream has little space to absorb disruptions.

(cont.)

Table 1-1 (cont.)
LEVEL OF SERVICE DESCRIPTIONS

LOS	Arterial Roads	Freeway Segments
E	Characterized by significant delays and average travel speeds of 33 percent or less of the free-flow speed. Such operations are caused by a combination of adverse signal progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.	At its highest density value, LOS E describes operation at capacity. Operations at this level are volatile, because there are virtually no usable gaps in the traffic stream. Vehicles are closely spaced, leaving little room to maneuver within the traffic stream at speeds that still exceed 49 miles per hour. Any disruption of the traffic stream, such as vehicles entering from a ramp or a vehicle changing lanes, can establish a disruption wave that propagates throughout the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate even the most minor disruption, and any incident can be expected to produce a serious breakdown with extensive queuing. Maneuverability within the traffic stream is extremely limited, and the level of physical and psychological comfort afforded the driver is poor.
F	Characterized by urban street flow at extremely low speeds, typically one-third to one-fourth of the free-flow speed. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.	Describes breakdowns in vehicular flow. Such conditions generally exist within queues forming behind breakdown points. LOS F operations within a queue are the result of a breakdown or bottleneck at a downstream point. LOS F is also used to describe conditions at the point of the breakdown or bottleneck and the queue discharge flow that occurs at speeds lower than the lowest speed for LOS E, as well as the operations within the queue that forms upstream. Whenever LOS F conditions exist, they have the potential to extend upstream for significant distances.

Source: *Highway Capacity Manual 2000 (HCM 2000)*, Transportation Research Board, National Research Council.

In establishing V/C based performance criteria, there are certain items that need to be addressed to obtain suitable V/C estimates and relate them to LOS. For instance, while average daily traffic (ADT) is a useful measure to show general levels of traffic on a facility and to provide data for other related aspects such as noise and air quality, highway congestion is largely a peak hour or peak period occurrence and ADT does not reflect peak period conditions very effectively. Because of this, ADT is not used here as the basis for capacity evaluation but instead this evaluation focuses on those parts of the day when such congestion can occur, specifically the AM and PM peak hours.

1.4.1 Arterial Roads

For the arterial system, the peak hour is the accepted time period used for impact evaluation and a number of techniques are available to establish suitable V/C ratios and define the corresponding LOS. These definitions and procedures are established by individual local jurisdictions or by regional programs such as the Congestion Management Program (CMP).

The analysis of the arterial road system is based on intersection capacity since this is the defining capacity limitation on an arterial highway system. There may be exceptions where certain facilities have long distances between signalized intersections, but within the traffic analysis study area, peak hour intersection performance is the most representative measure for evaluating the arterial road system. Levels of service for arterial roadway intersections are determined based on operating conditions during the AM and PM peak hours. For intersections, the intersection capacity utilization (ICU) methodology is applied, providing a planning level basis for determining V/C and LOS. This methodology sums the V/C ratios for the critical movements of an intersection and is the preferred procedure for intersection analysis by the City of Santa Clarita and the County of Los Angeles. The ICU methodology is generally compatible with the intersection capacity analysis methodology outlined in the *HCM 2000*.

1.4.2 Impact Criteria for Arterial Roads

The ICU calculation methodology and associated impact criteria for the study area arterial system are summarized in Table 1-2.

Table 1-2

ARTERIAL INTERSECTION PERFORMANCE CRITERIA

V/C Calculation Methodology

Level of service to be based on peak hour intersection capacity utilization (ICU) values calculated using the following assumptions:

Saturation Flow Rate: 1,750 vehicles/hour/lane for all lanes

Clearance Interval: .10

Performance Standards

LOS D or existing LOS, whichever is greater, for existing intersections

Impact Thresholds

An intersection is considered to be adversely impacted if:

1. The intersection is forecast to operate deficiently (i.e., worse than the performance standard), and

2. Compared to the ICU in the no-project alternative, the ICU in the with-project alternative increases the ICU by the following:

With-Project ICU	Project Increment
.81 - 90 (LOS D)	greater than or equal to .02
.91 or more (LOS E & F)	greater than or equal to .01

Abbreviations:
V/C – Volume/Capacity Ratio
LOS – Level of Service
ICU – Intersection Capacity Utilization

1.5 DEFINITIONS

Certain terms used throughout this report are defined below to clarify their intended meaning:

ADT	Average Daily Traffic. Generally used to measure the total two-directional traffic volumes passing a given point on a roadway.
CMP	Congestion Management Program. A state mandated program administered by the Los Angeles County Metropolitan Transportation Authority (MTA) that provides a mechanism for coordinating land use and development decisions.
ICU	Intersection Capacity Utilization. A measure of the volume to capacity ratio for an intersection. Typically used to determine the peak hour level of service for a given set of intersection volumes.
LOS	Level of Service. A scale used to evaluate circulation system performance based on intersection ICU values or volume/capacity ratios of arterial segments.
Peak Hour	This refers to the hour during the AM peak period (typically 7 AM - 9 AM) or the PM peak period (typically 3 PM - 6 PM) in which the greatest number of vehicle trips are generated by a given land use or are traveling on a given roadway.
Tripend	A trip generation measure which represents the total trips entering and leaving a location.
V/C	Volume to Capacity Ratio. This is typically used to describe the percentage of capacity utilized by existing or projected traffic on a segment of an arterial or intersection.
VPH	Vehicles Per Hour. Used for roadway volumes (counts or forecasts) and trip generation estimates. Measures the number of vehicles in a one-hour period, typically the AM or PM peak hour.

1.6 REFERENCES

1. "Highway Capacity Manual 2000," Transportation Research Board, National Research Council, 2000.
2. "Trip Generation 7th Edition," Institute of Transportation Engineers, 2004.
3. "Caltrans Highway Design Manual," Caltrans, July 1995.
4. "Guide for the Preparation of Traffic Impact Studies," Caltrans, December 2002.
5. "Preliminary Traffic Impact Report Guidelines," City of Santa Clarita, August 1990.

6. "Santa Clarita Valley Consolidated Traffic Model Report," County of Los Angeles Department of Public Works, 1994.

7. "Draft Santa Clarita Valley Consolidated Traffic Model 2004 Update and Validation," City of Santa Clarita and County of Los Angeles Department of Public Works, June 2004.

8. "2004 Congestion Management Program for Los Angeles County," Los Angeles County Metropolitan Transportation Authority, July 2004.

9. "City of Santa Clarita General Plan Circulation Element," City of Santa Clarita, December 1997.

10. "Trip Generation, An Informational Report, February 1995 Update to the 5th Edition," Institute of Transportation Engineers, February 1995.

11. "North County Combined Highway Corridors Study Final Report," Los Angeles County Metropolitan Transportation Authority, June 2004.

12. "River Park–VTTM 53425, Traffic Impact Analysis," Austin-Foust Associates, Inc., February 2004

2.0 TRANSPORTATION SETTING

This chapter describes the transportation setting for the traffic analysis. Existing conditions are first discussed, followed by a description of the future circulation system as outlined in the City's Circulation Element.

2.1 EXISTING CONDITIONS

The following section describes existing traffic conditions in the study area. It includes a description of the study area roadway system, existing traffic volumes and corresponding levels of service as defined by the performance criteria outlined in the previous chapter.

2.1.1 Existing Roadway System

The existing roadway network in the study area is illustrated in Figure 2-1 in the form of mid-block lanes and intersection lane configurations for the intersections being studied. Future roadways are also shown for comparison. Major arterial streets near the project site consist of Soledad Canyon Road and Bouquet Canyon Road.

The I-5 Freeway and State Route 14 (SR-14) provide regional access for residents of the site. The I-5 Freeway is located west the project site and can be accessed from the project site via full interchanges at Magic Mountain Parkway and Valencia Boulevard. SR-14 is located south of the project site and in the future, when the Soledad Canyon Road/Golden Valley Road flyover is completed (this improvement is presently under construction), can be accessed from the Golden Valley Road interchange.

2.1.2 Existing Traffic Volumes and Levels of Service

The existing average daily traffic (ADT) volumes on the study area roadway system are illustrated in Figure 2-2. Illustrations of peak hour turning movement volumes for the existing study area intersection can be found in Figure 2-3 for the AM and PM peak hours, respectively. The peak hour count was collected in September 2003, and since the intersection is currently under construction, a new traffic count has not been collected. Instead, the 2003 count volumes have been factored up by four percent to approximate 2005 conditions.

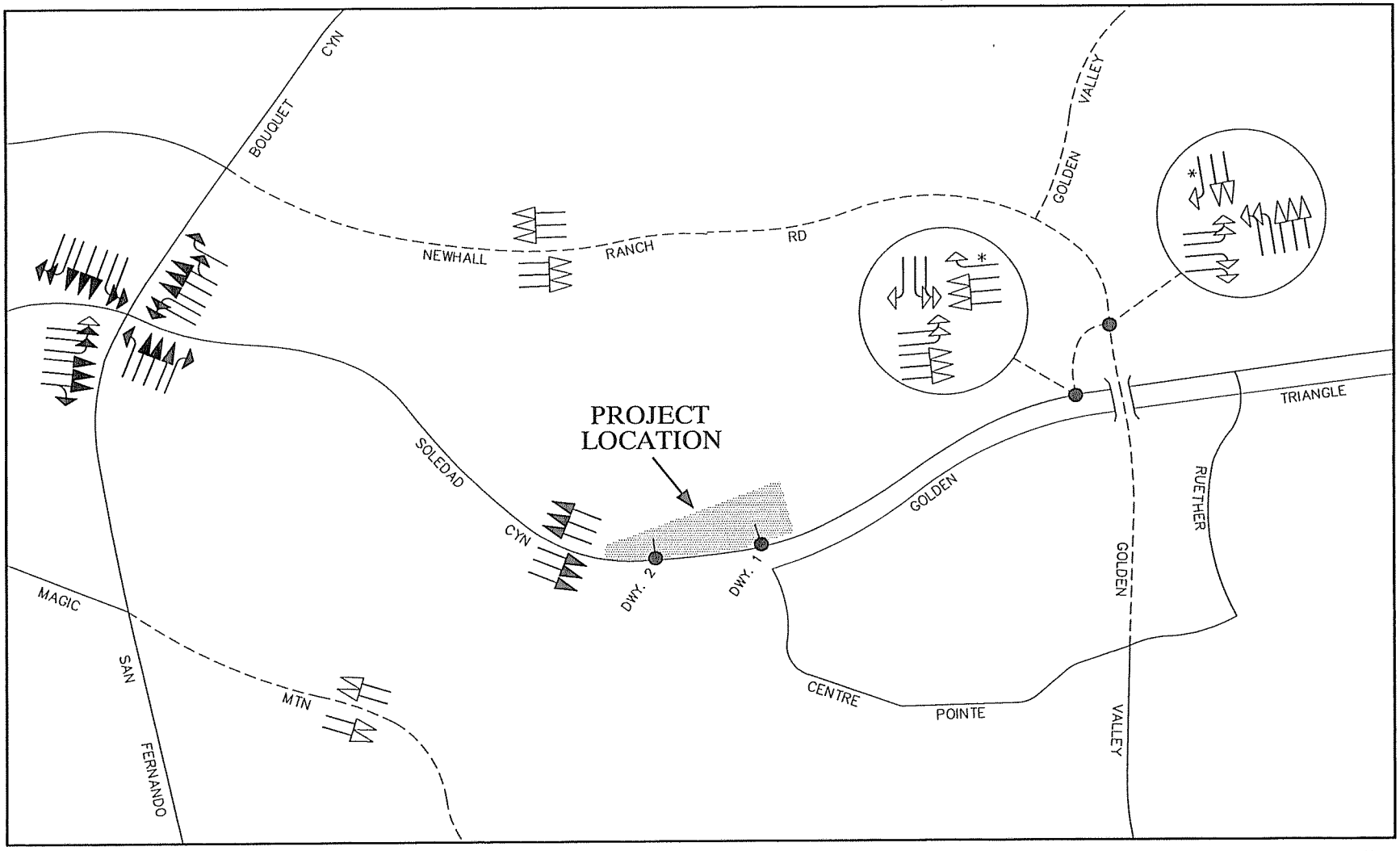
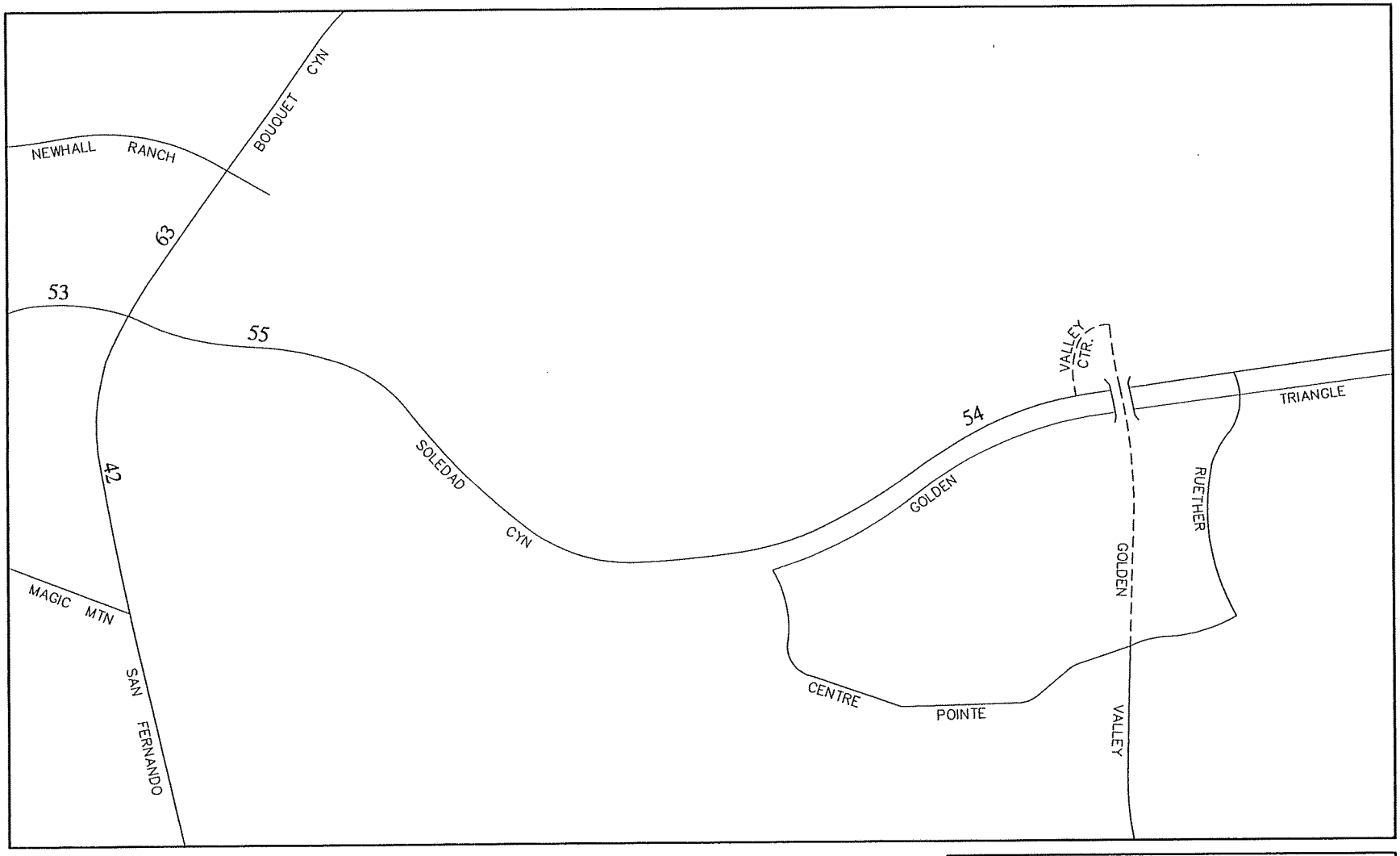


Figure 2-1

EXISTING AND FUTURE ROADWAY NETWORK



Legend

– – – – – Planned Roadway

Figure 2-2

EXISTING ADT VOLUMES
(In 000's)

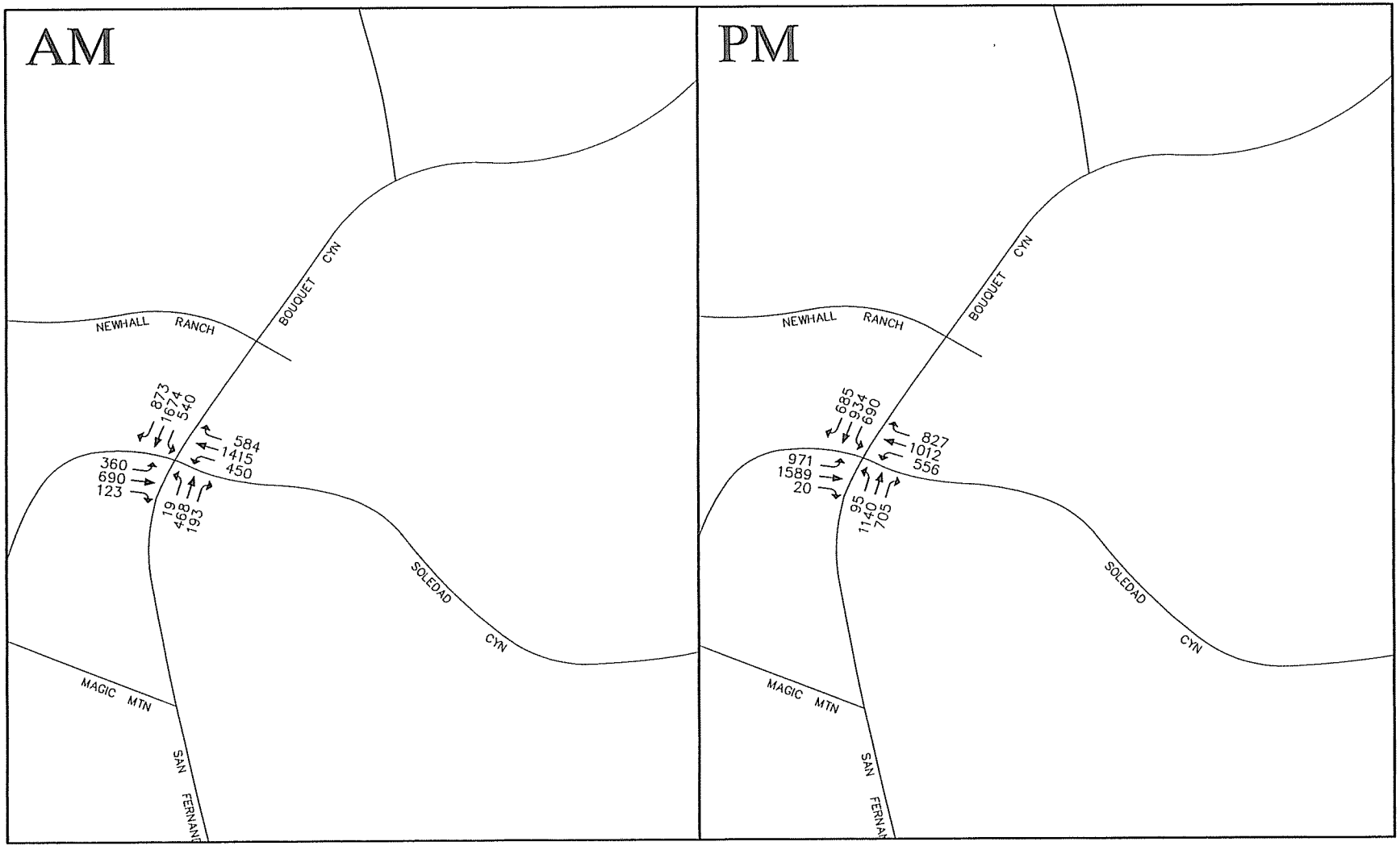


Figure 2-3

EXISTING AM & PM PEAK HOUR VOLUMES

As discussed in the section on performance criteria in Chapter 1.0, level of service (LOS) is a concept developed to quantify the degree of comfort afforded to drivers as they travel on a given roadway. The degree of comfort includes such elements as travel time, number of stops, total amount of stopped delay, etc. As defined in the HCM 2000, six grades are used to denote the various LOS. The six are denoted A through F and a discussion on these was also given in Chapter 1.0.

The result of the ICU LOS analysis for the one existing intersection in the study area is shown in Table 2-1 (ICU worksheets are provided in Appendix A).

Table 2-1

ICU SUMMARY – EXISTING CONDITIONS

	AM Peak Hour		PM Peak Hour		
Location	**ICU**	**LOS**	**ICU**	**LOS**	**Count Date**
65. Bouquet Cyn Rd & Soledad Cyn Rd	.80	C	1.06	F	(1)

(1) Intersection currently under construction. A 2003 count (pre-construction) has been increased by four percent to approximate 2005 conditions.

Level of service ranges:

00 - .60	A
.61 - .70	B
.71 - .80	C
.81 - .90	D
.91 – 1.00	E
Above 1.00	F

The table shows that the intersection of Bouquet Canyon Road and Soledad Canyon Road currently operates at LOS "C" and "F" in the AM and PM peak hours, respectively.

2.1.3 Public Transportation

Santa Clarita Transit provides fixed-route transit immediately adjacent to the project site via Routes 5 and 6. Routes 5 and 6 provide service to the Stevenson Ranch Area, Hart High School, the Valencia Town Center and Canyon Country.

The nearest transit center is the Santa Clarita Metrolink station which is located just west of the project site, south of Soledad Canyon Road.

2.2 SHORT-RANGE TRANSPORTATION SYSTEM

The short-range transportation improvements in this area consist primarily of two significant projects currently under construction.

At Bouquet Junction, the Bouquet Canyon Road bridge is being widened to provide a fourth lane in each direction. As part of that project, the Bouquet Canyon Road/Soledad Canyon Road intersection will be improved by adding a third eastbound left-turn lane. These improvements will be in place prior to the first occupancy of TT 062322, the Soledad Townhomes project.

A grade-separated interchange for Golden Valley Road at Soledad Canyon Road is also currently under construction. When completed, the interchange will provide a direct connection between Golden Valley Road and Soledad Canyon Road via Valley Center Drive.

Traffic volume forecasts for short-range conditions were obtained from the River Park EIR Traffic Impact Analysis (see Reference 12 in Chapter 1.0).

2.3 INTERIM YEAR TRANSPORTATION SYSTEM

The Interim Year transportation system consists of roadway improvements and future infrastructure consistent with the related projects included within the horizon year. Generally, this horizon year corresponds to the year 2015 based on anticipated Santa Clarita Valley growth rates from sources such as the Southern California Association of Governments (SCAG). While this horizon does not coincide specifically with the buildout of the project site, it represents the best timeframe for planning purposes since it includes a comprehensive set of cumulative development projects that have been incorporated into the SCVCTM. With this, a conservative scenario is established for analyzing the impacts of the proposed project combined with projected and approved growth on a reasonably expanded circulation system.

Interim Year land use is based on data provided by the City and County and includes approved, pending and planned development projects. For this analysis, the recently updated Interim Year land use database was utilized since it includes the most recent data from the City and County regarding these future projects. Table 2-2 summarizes the total land use and trip generation statistics for the entire Santa Clarita Valley area for existing (2004), Interim Year (2015) and Long-range General Plan (2030) conditions.

Table 2-2

LAND USE AND ADT SUMMARY – SANTA CLARITA VALLEY EXISTING AND FUTURE

Land Use Type	Units	Existing (2004)		Interim Year (2015)		Long-Range General Plan (2030)	
		Amount	ADT	Amount	ADT	Amount	ADT
Single Family Residential	DU	51,300	500,600	72,600	709,700	90,300	886,000
Multi-Family Residential	DU	25,600	202,700	39,200	305,200	49,400	385,800
Commercial Retail, Office & Industrial	MSF	31.8	695,600	67.1	1,208,300	82.6	1,581,400
Other	--	--	171,200	--	224,400	--	247,400
TOTAL	--	--	1,570,100	--	2,447,600	--	3,100,600

Notes:
DU = Dwelling Units
MSF = Million Square Feet

Cumulative projects included with the Interim Year scenario that are within the proximity (approximately two miles) of the project site include the Riverpark project, the Keystone project, buildout of the Centre Point Business Park, and approximately 50 percent of the planned Whitaker-Bermite site.

The City's Circulation Element includes significant future roadway projects throughout the valley that will effect traffic patterns of both existing and future trips. Many of these are anticipated to be in place by 2015. Near to the project site, the construction of Newhall Ranch Road from its current terminus at Bouquet Canyon Road eastward as a six-lane roadway will become the future extension of Golden Valley Road. Golden Valley Road, also a six-lane roadway, will continue southward to connect to its existing terminus in the vicinity of Centre Pointe. Golden Valley Road in the vicinity of Soledad Canyon

Road is currently being constructed as a fly-over and access to Soledad Canyon Road will be provided via a connector road, Valley Center Drive.

3.0 PROJECT DESCRIPTION

This chapter describes the project in terms of its transportation characteristics. Trip generation is summarized and the distribution of project trips on the study area roadway network is presented.

3.1 PROJECT OVERVIEW

The proposed project is located on an approximately 30-acre site generally bounded by the Santa Clara River to the north and west, commercial and residential uses to the east, and Soledad Canyon Road and a Metrolink rail line the to the south.

TT 062322, the Soledad Townhomes project, is currently being planned as a development consisting of up to 437 residential condominium units and 8,000 square feet of commercial retail use. Approximately 200 units, along with the commercial component, will be constructed prior to completion of the Cross Valley Connector, and the remaining 237 units will be constructed after completion of the Cross Valley Connector.

Access for the site is proposed from two project intersections with Soledad Canyon Road. The first intersection with Soledad Canyon Road (Project Driveway 1) will be located approximately 700' west of the eastern project boundary. Configured as a full access, signalized "tee" intersection, this location will serve both the residential and retail components of the site. A second intersection (Project Driveway 2) will be located approximately 1,100' west of the first intersection, will be configured as a limited access left-in and right-in, right-out intersection, and is intended for residential traffic use only.

3.2 PROJECT TRIP GENERATION

Trip generation estimates for the proposed project are shown in Table 3-1. The trip generation is calculated using published data from the Institute of Transportation Engineers (ITE) Seventh Edition Trip Generation Manual (see Reference 2 in Section 1.6).

The proposed project is estimated to generate approximately 3,930 total average daily trips (ADT) with approximately 240 occurring in the AM peak hour (200 outbound) and approximately 370

Table 3-1

TRIP GENERATION AND TRIP RATE SUMMARY

Land Use	Units	AM Peak Hour			PM Peak Hour			
		In	Out	Total	In	Out	Total	ADT
LAND USE – PHASE 1								
Condominium	200 DU	12	96	108	94	52	146	1,600
Commercial / Retail	8 TSF	21	13	34	57	61	118	1,315
Driveway Total		33	109	142	151	113	264	2,915
Pass-by Reduction	-50%	-10	-7	-17	-29	-30	-59	-658
Net Total (New Trips)		23	102	125	122	83	205	2,257
LAND USE – PHASE 2								
Condominium	237 DU	14	114	128	111	62	173	1,896
LAND USE – PROJECT BUILDOUT								
Condominium	437 DU	26	210	236	205	114	319	3,496
Commercial / Retail	8 TSF	21	13	34	57	61	118	1,315
Metrolink Riders	--	--	-14	-14	-13	--	-13	-227
Driveway Total		47	209	256	249	175	424	4,584
Pass-by Reduction for Retail	-50%	-10	-7	-17	-29	-30	-59	-658
Net Total (New Trips)		37	202	239	220	145	365	3,926
TRIP RATES								
Condominium[1]	DU	.06	.48	.54	.47	.26	.73	8.00
Commercial / Retail[2]	TSF	ITE Shopping Center Equation (see note below)						

Trip Rate Sources
[1] SCVCTM Category 4 (Condominium/Townhome)
[2] ITE Category 820 (Shopping Center Equation)
ADT Ln(T) = 0.65 Ln(X) + 5.83
AM Ln(T) = 0.60 Ln(X) + 2.29
PM Ln(T) = 0.66 Ln(X) + 3.40

Abbreviations
DU = Dwelling Unit
TSF = Thousand Square Feet

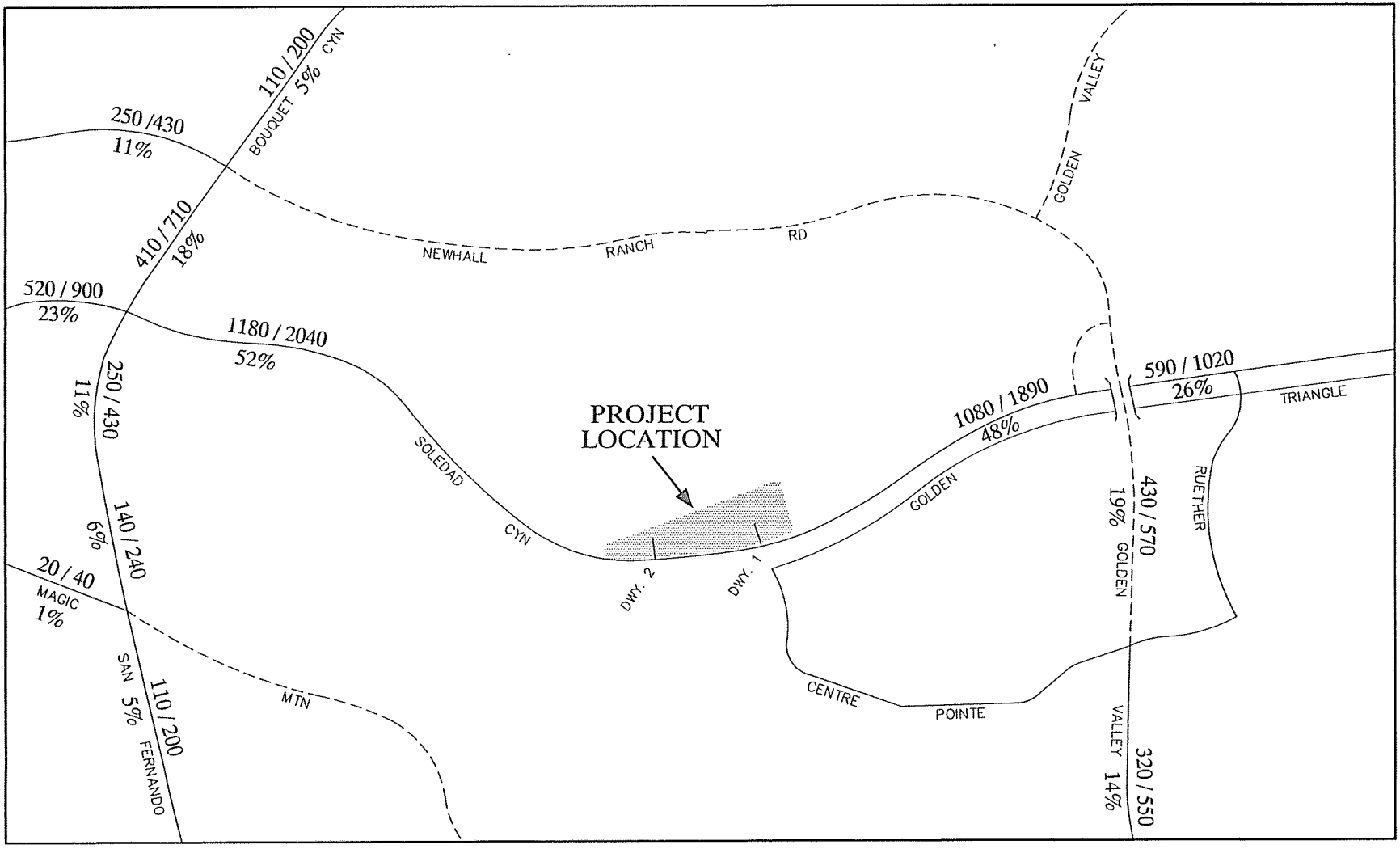
occurring in the PM peak hour (220 inbound). These values represent the net volume of new traffic added to the roadway system. The volume entering and exiting the project site (i.e., driveway volumes) is slightly higher due to the pass-by trips generated by the project's retail component. Pass-by trips are from existing vehicles on the roadway network that "pass by" the site with or without the project in place.

As noted previously, the project site is immediately across Soledad Canyon Road from the Metrolink Santa Clarita Station. To estimate the number of Metrolink riders from the site, factors listed in the Los Angeles County Congestion Management Plan (CMP) were applied (see Reference 8 in Section 1.6). The CMP uses these factors to determine the amount of transit ridership based on the proximity of a project site to a transit station such as the Metrolink Santa Clarita Station. Since the project site is within one quarter mile of the transit station, the CMP estimates that 10 percent of the total number of person trips will utilize transit. In contrast, the CMP estimates that for a typical project site (one that is more than one quarter mile from a transit station), just 3.5 percent of the total person trips will utilize transit. From this relationship it has been determined that the vehicle trips from the project site will be reduced by approximately 13 to 14 vehicles during the peak hour in the peak direction. The previously referenced trip generation table takes these transit trips into account to determine the net volume of vehicle traffic added to the arterial roadway system.

3.3 PROJECT TRIP DISTRIBUTION

The geographic distribution of project-generated trips was determined using the SCVCTM to prepare a project only select zone run. The Interim Year version of the SCVCTM provided the background conditions for this select zone run. The model takes into account the specific type of land use proposed for the site and how that land use would interact with the other land uses in the City.

Figure 3-1 illustrates the project only (Phase 1 and full project) average daily trips (ADT) and distribution percentages for the proposed project. Figures 3-2 and 3-3 illustrate the Phase 1 project-generated trips for the AM and PM peak hours, respectively, within the study area and Figures 3-4 and 3-5 illustrate the corresponding trips for project buildout. Since the SCVCTM performs separate assignments for the AM peak hour, the PM peak hour and the off-peak period, the specific volumes for any individual time period will not precisely match the percentages noted in the previous figure.

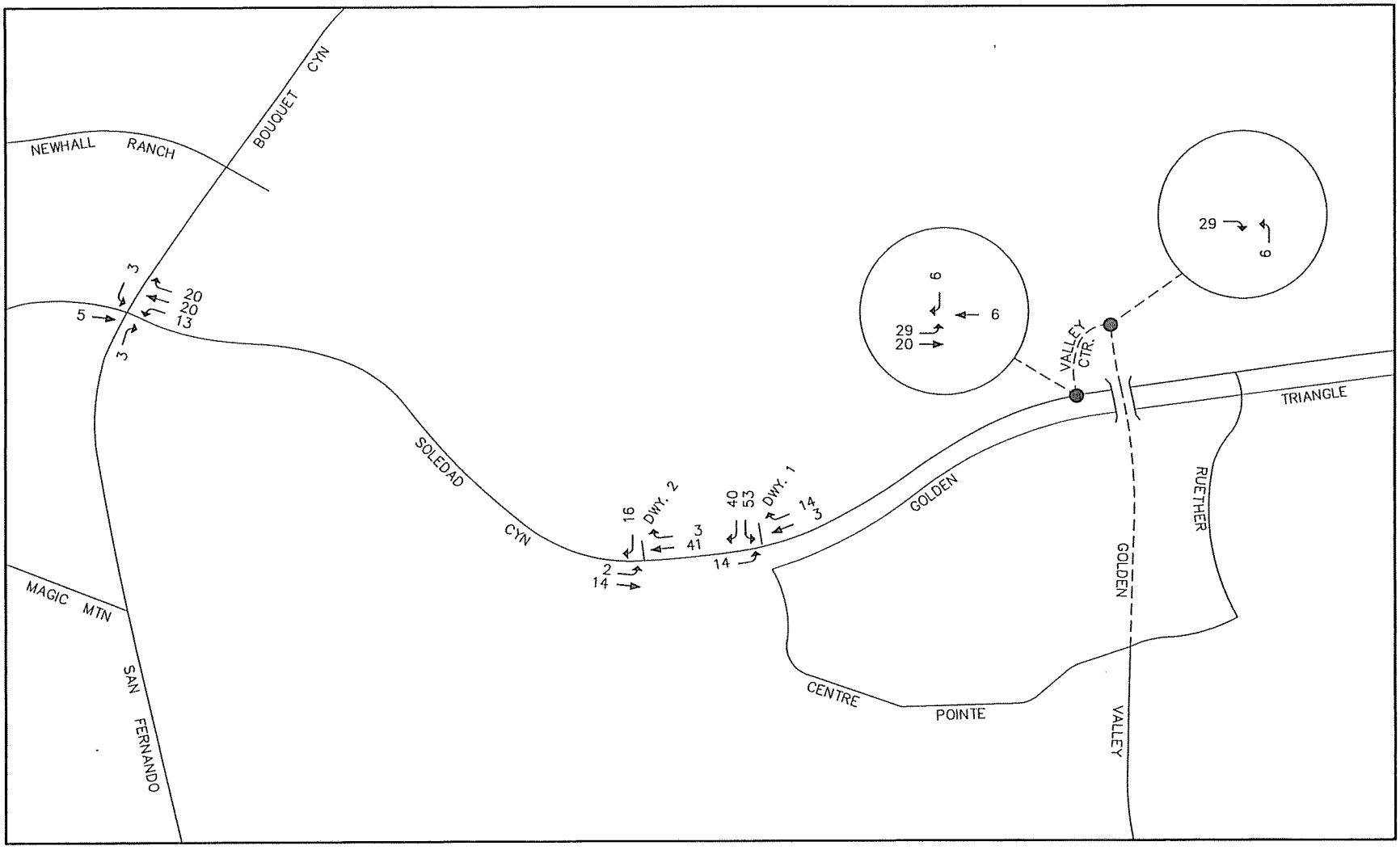


Legend

- – – – – Planned Roadway
- 180 / 520 Phase 1 Volume / Project Buildout Volume (ADT)
- 52% Project Trip Distribution Percentage

Figure 3-1

PROJECT TRIP DISTRIBUTION

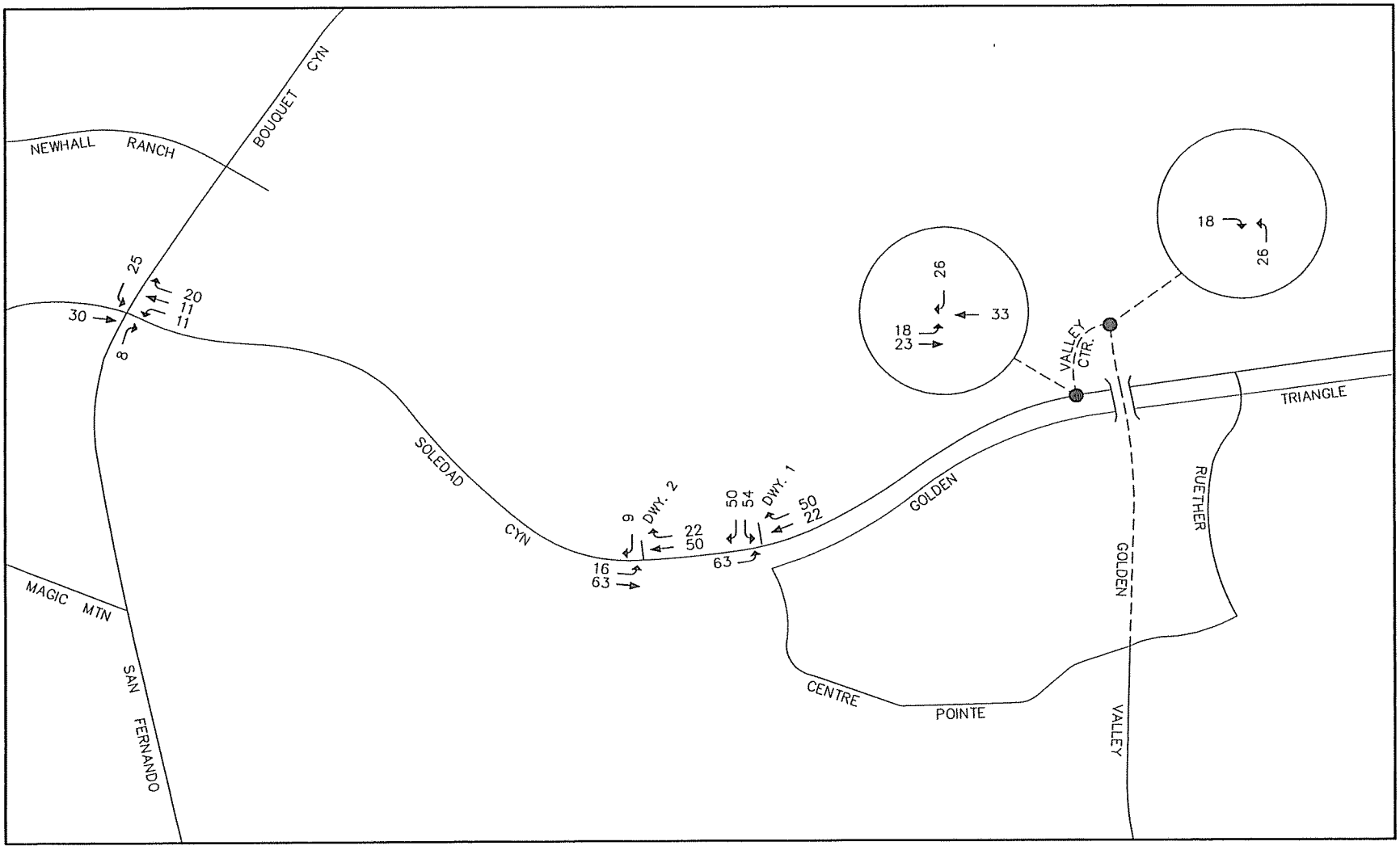


Legend

– – – – – Planned Roadway

Figure 3-2

PHASE 1 PROJECT ONLY
AM Peak Hour

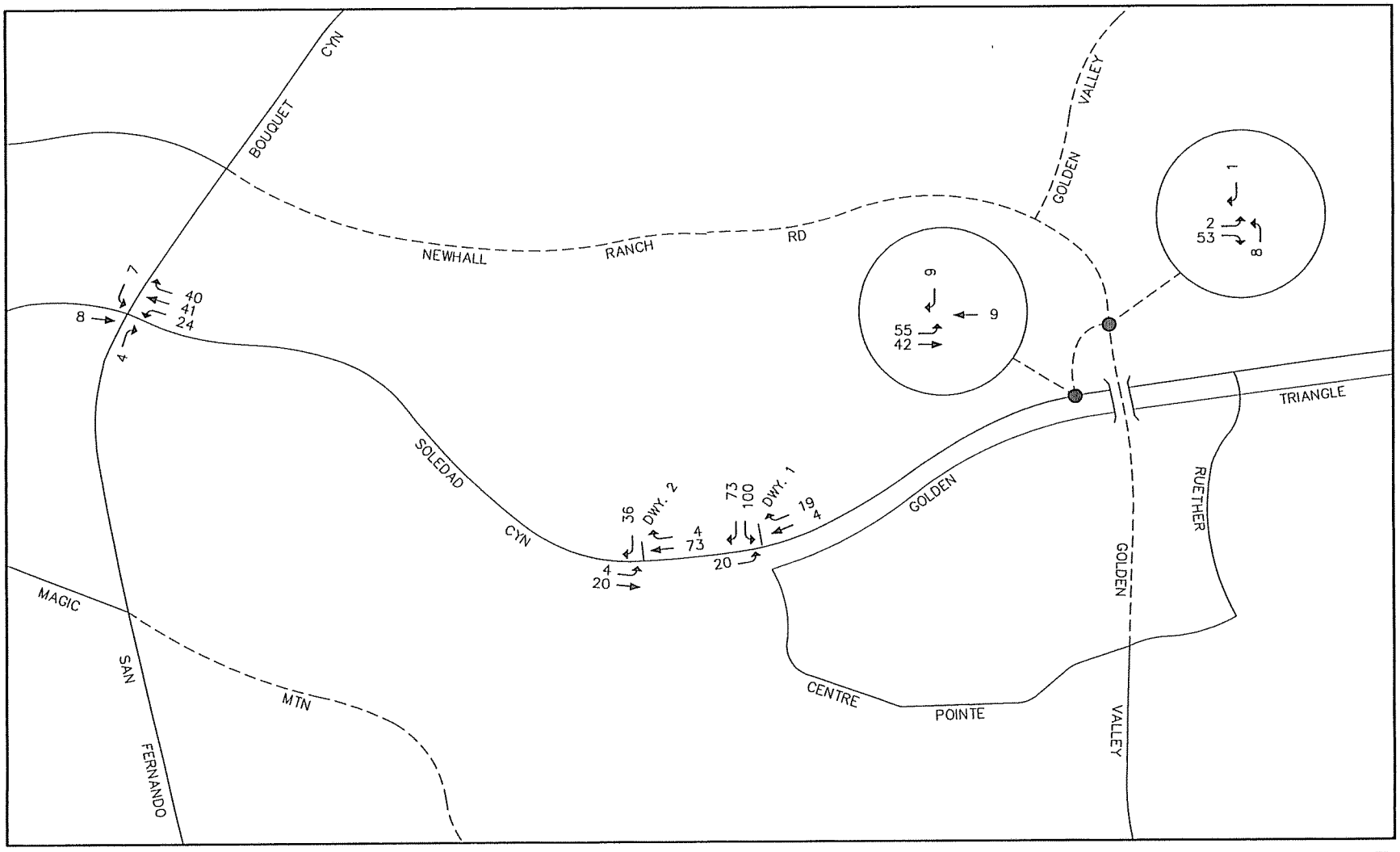


Legend

– – – – – Planned Roadway

Figure 3-3

PHASE 1 PROJECT ONLY
PM Peak Hour

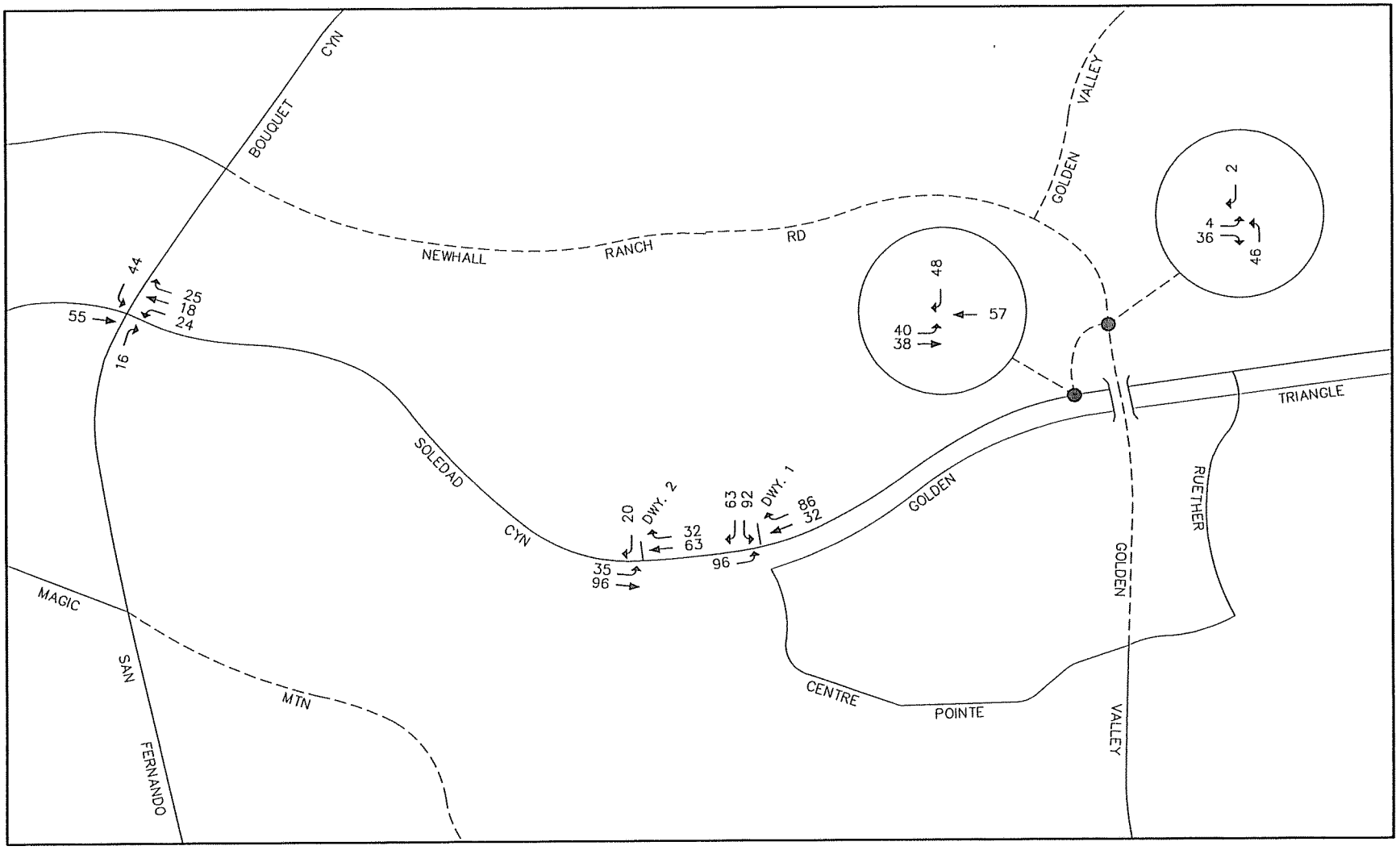


Legend

– – – – – Planned Roadway

Figure 3-4

BUILDOUT PROJECT ONLY
AM Peak Hour



Legend

– – – – – Planned Roadway

Figure 3-5

BUILDOUT PROJECT ONLY
PM Peak Hour

Approximately 52 percent of the trips generated by the project are assigned west of the project via Soledad Canyon Road. West of San Fernando Road/Bouquet Canyon Road, these trips are then assigned along Newhall Ranch Road (11 percent), Valencia Boulevard (23 percent), San Fernando Road (11 percent) and Bouquet Canyon Road (5 percent).

Approximately 48 percent of the trips generated by the project are assigned east of the project via Soledad Canyon Road. Beyond the intersection with Golden Valley Road, 26 percent of the project trips are assigned to Soledad Canyon Road, and 19 percent to Golden Valley Road.

4.0 IMPACT ANALYSIS

This chapter addresses the traffic impacts of the proposed project. Traffic conditions with and without the proposed project are described in the following sections. Project impacts are identified using the criteria outlined in Chapter 1.0.

4.1 SHORT-RANGE ANALYSIS

The short-range traffic conditions are based on the short-range setting described in Section 2.2. This setting forms the basis for identifying the potential short-range traffic impacts of Phase 1 of the proposed project. The following sections discuss short-range no-project and with-project conditions.

4.1.1 Short-Range No-Project Traffic Conditions

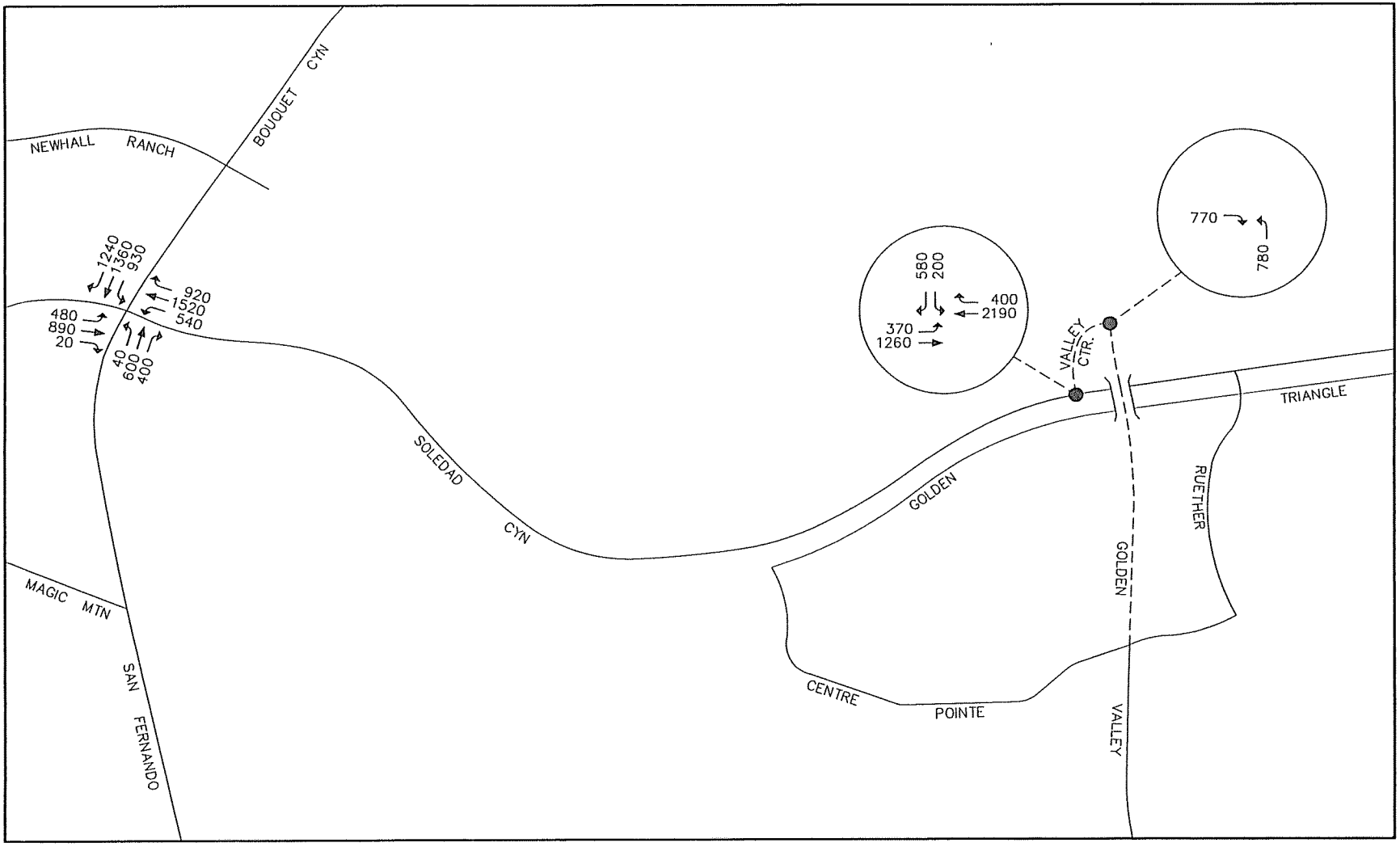
The short-range no-project peak hour turning movement volumes for the intersections in the study area are illustrated in Figures 4-1 and 4-2 for the AM and PM peak hours, respectively.

Table 4-1 provides the corresponding ICU values and also listed for comparison purposes are the ICUs for existing conditions. The ICU tabulations indicate that the intersection of Bouquet Canyon Road and Soledad Canyon Road (intersection 65) is deficient in the PM peak hour under existing conditions and the short-range conditions without Phase 1 of the project.

4.1.2 Short-Range With Project Traffic Conditions

Phase 1 of the proposed project will generate approximately 2,260 vehicle trips per day, with approximately 130 in the AM peak hour and 210 in the PM peak hour. These estimates are used to represent the project's impacts on the analysis area circulation system.

Short-range volumes that include Phase 1 project-generated traffic are provided in Figure 4-3 for the ADT volumes, and in Figures 4-4 and 4-5 for the AM and PM peak hours, respectively. Peak hour

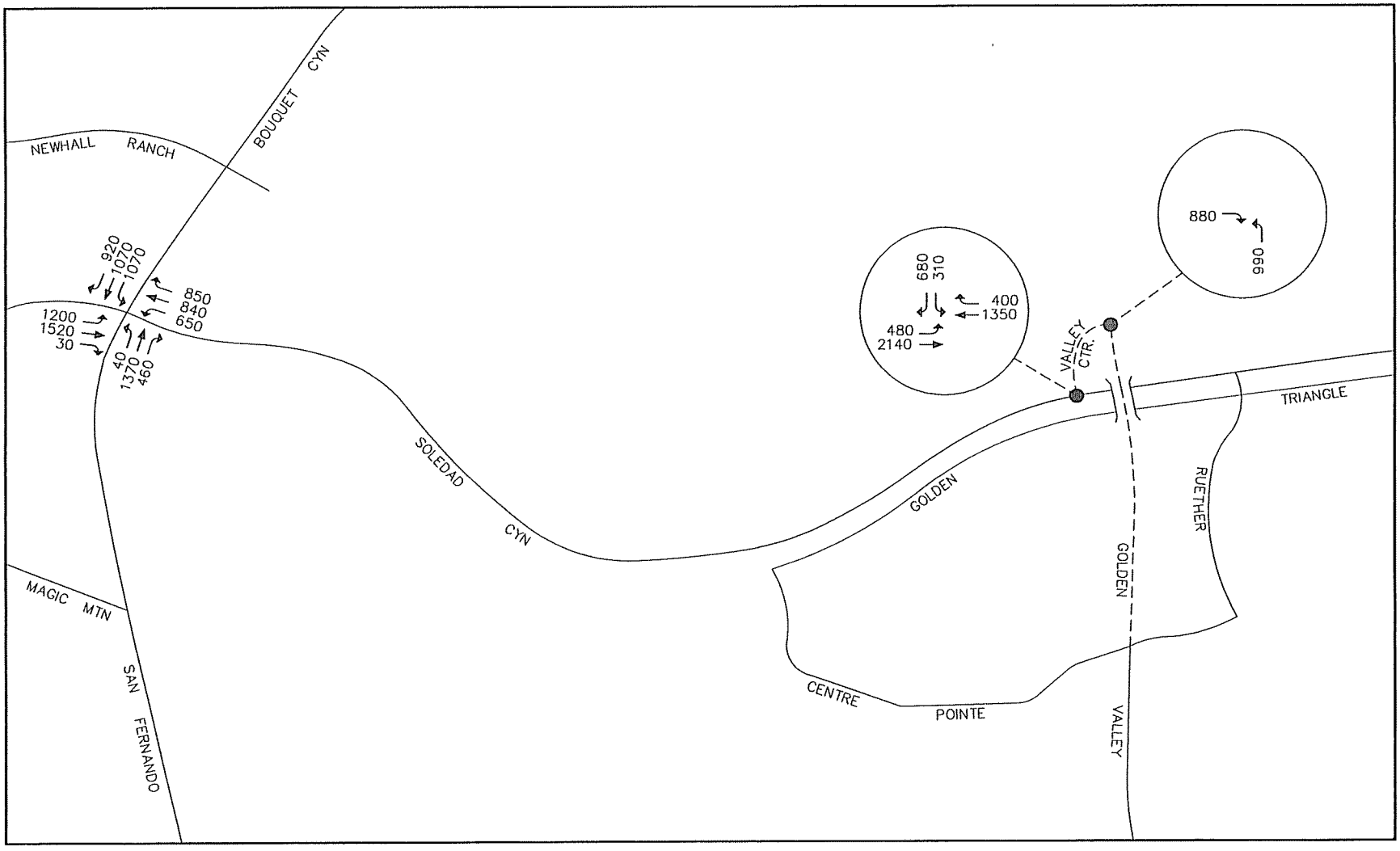


Legend

– – – – – Planned Roadway

Figure 4-1

SHORT-RANGE CUMULATIVE CONDITIONS
(WITHOUT PROJECT)
AM Peak Hour



Legend

– – – – – Planned Roadway

Figure 4-2

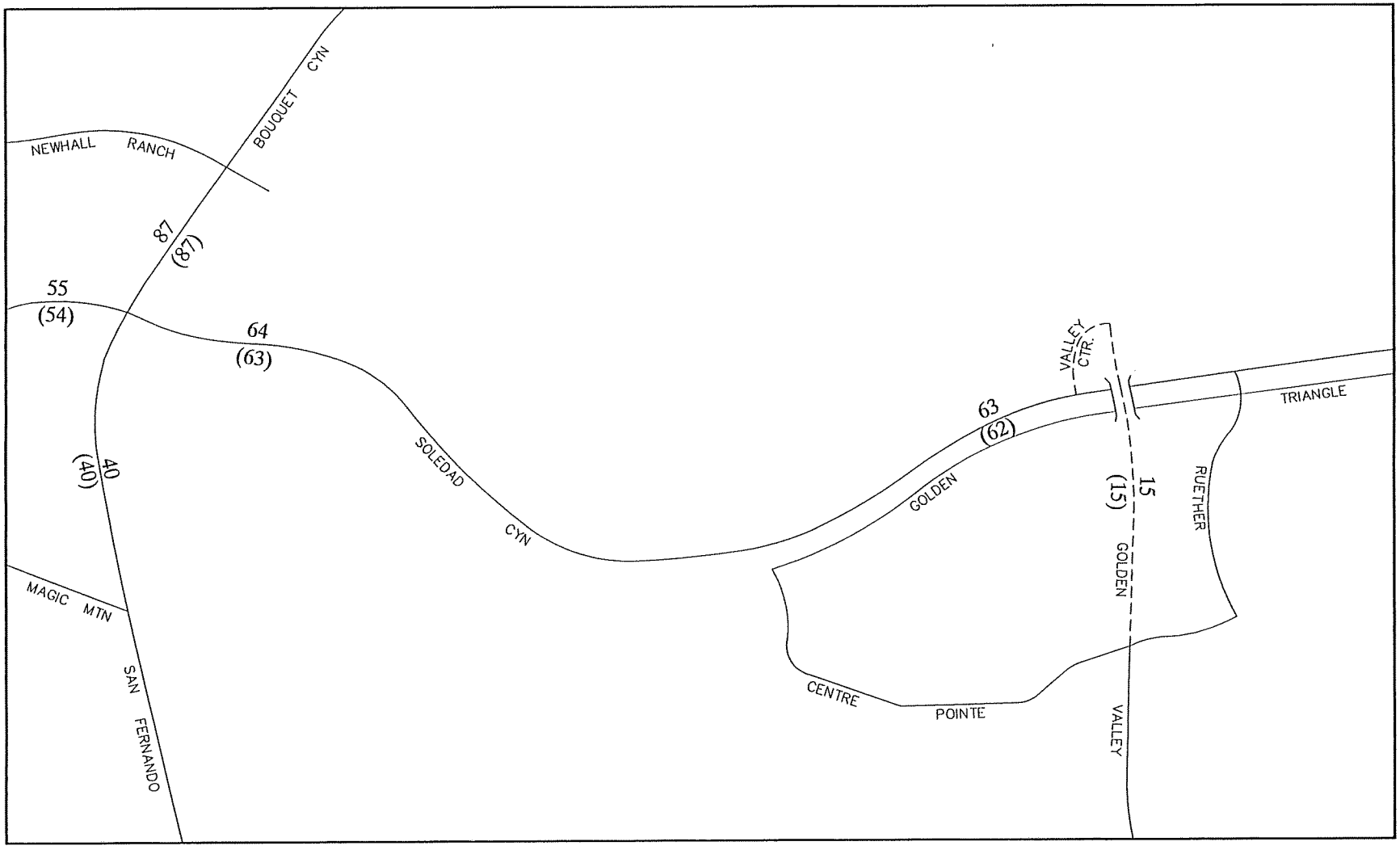
SHORT-RANGE CUMULATIVE CONDITIONS
(WITHOUT PROJECT)
PM Peak Hour

Table 4-1

ICU AND LOS SUMMARY – EXISTING AND SHORT-RANGE WITHOUT PROJECT

Intersection	Existing				Short-Range Without Project				Increase	
	AM		PM		AM		PM		AM	PM
Existing Intersections										
65. Bouquet Cyn Rd & Soledad Cyn Rd	.80	C	1.06	F	.87	D	1.16	F	.07	.10
Future Intersections										
165. Golden Valley Rd & Valley Center	--	--	--	--	.32	A	.38	A	--	--
198. Valley Center & Soledad Cyn Rd	--	--	--	--	.85	D	.75	C	--	--

Level of service ranges:
.00 - .60 A
.61 - .70 B
.71 - .80 C
.81 - .90 D
.91 - 1.00 E
Above 1.00 F

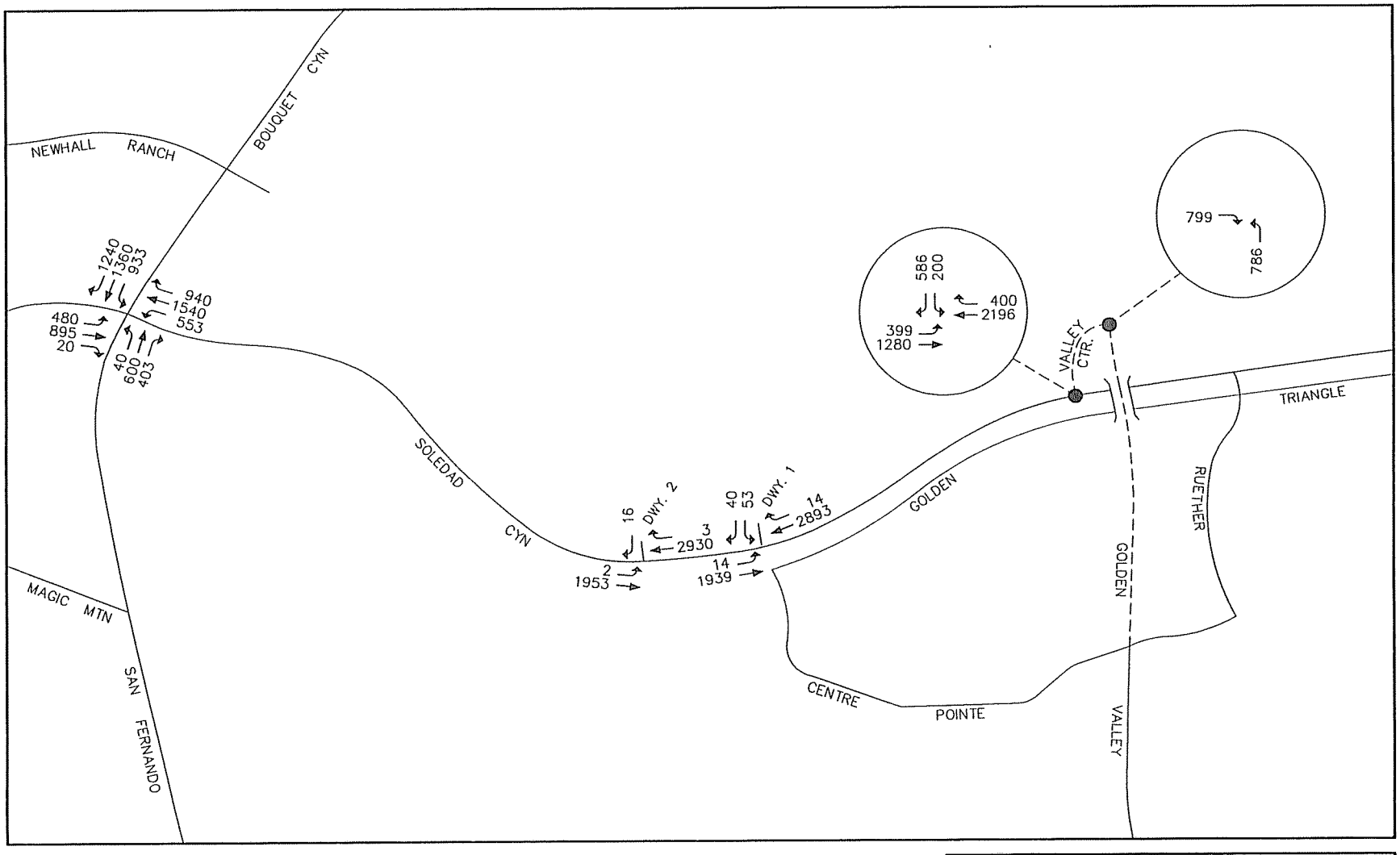


Legend

- – – – – Planned Roadway
- 15 With Phase 1 Project Volume (ADT)
- (14) Without Phase 1 Project Volume (ADT)

Figure 4-3

SHORT-RANGE CUMULATIVE CONDITIONS
(WITH AND WITHOUT PROJECT)
ADT Volumes (In 000's)

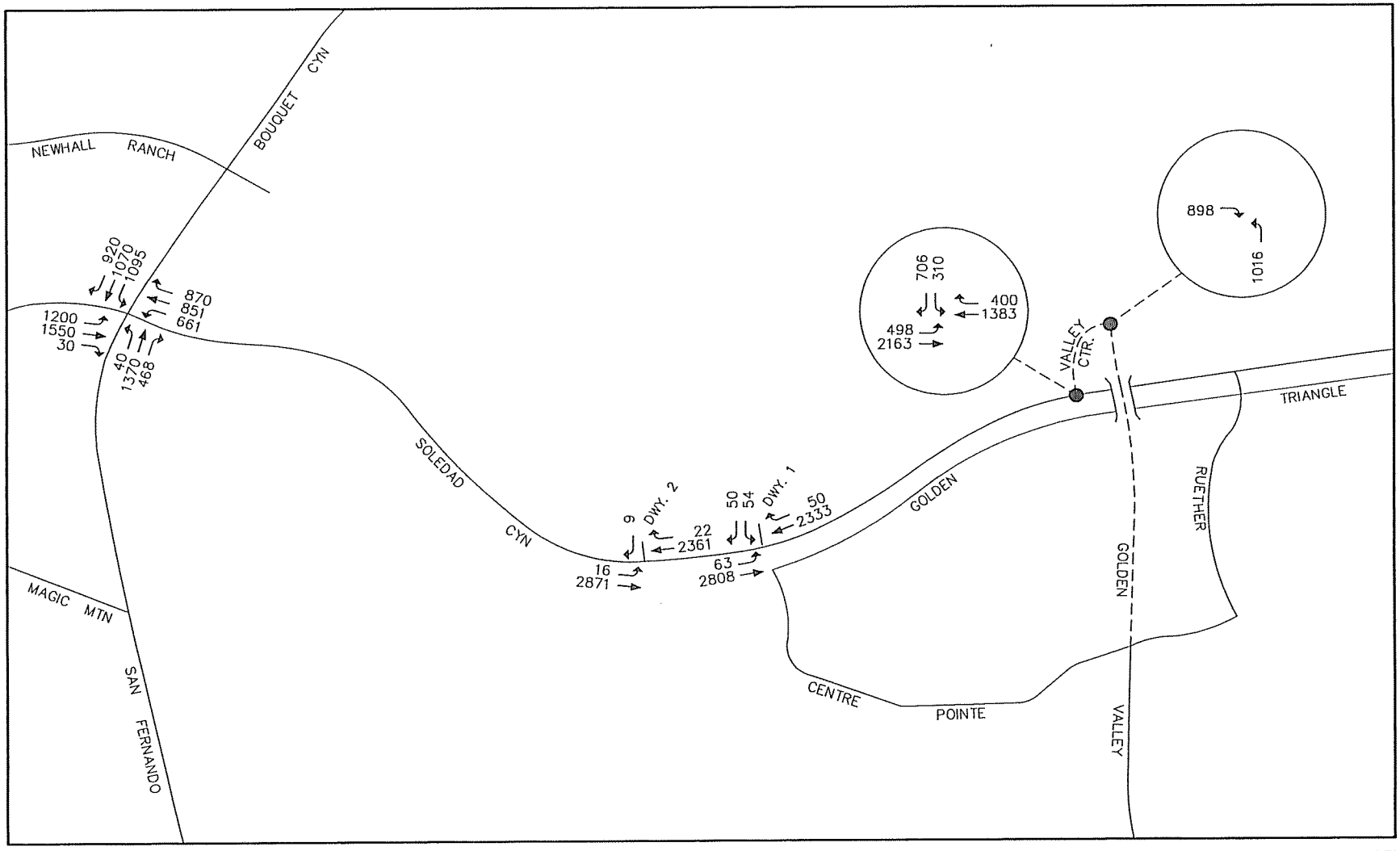


Legend

– – – – – Planned Roadway

Figure 4-4

SHORT-RANGE CUMULATIVE CONDITIONS
(WITH PROJECT PHASE 1)
AM Peak Hour



Legend

– – – – – Planned Roadway

Figure 4-5

SHORT-RANGE CUMULATIVE CONDITIONS
(WITH PROJECT PHASE 1)
PM Peak Hour

ICU values can be found in Table 4-2 which provides a comparison between short-range no-project and short-range with-project conditions. The table shows that there is no significant impact at any intersection due to Phase 1 project-generated traffic (see Table 1-2 for significant impact criteria).

Table 4-2

ICU AND LOS SUMMARY – SHORT-RANGE WITH AND WITHOUT PROJECT
(PROJECT PHASE 1)

	Short-Range Without Project				Short-Range With Project Phase 1				Increase	
Intersection	**AM**		**PM**		**AM**		**PM**		**AM**	**PM**
Existing Intersections										
65. Bouquet Cyn Rd & Soledad Cyn Rd	.87	D	1.16	F	.87	D	1.16	F	.00	.00
Future Intersections										
1. Project Dwy. 1 & Soledad Cyn Rd	--	--	--	--	.69	B	.66	B	--	--
2. Project Dwy. 2 & Soledad Cyn Rd	--	--	--	--	.67	B	.65	B	--	--
165. Golden Valley Rd & Valley Center	.32	A	.38	A	.33	A	.39	A	.01	.01
198. Valley Center & Soledad Cyn Rd	.85	D	.75	C	.85	D	.76	C	.00	.01

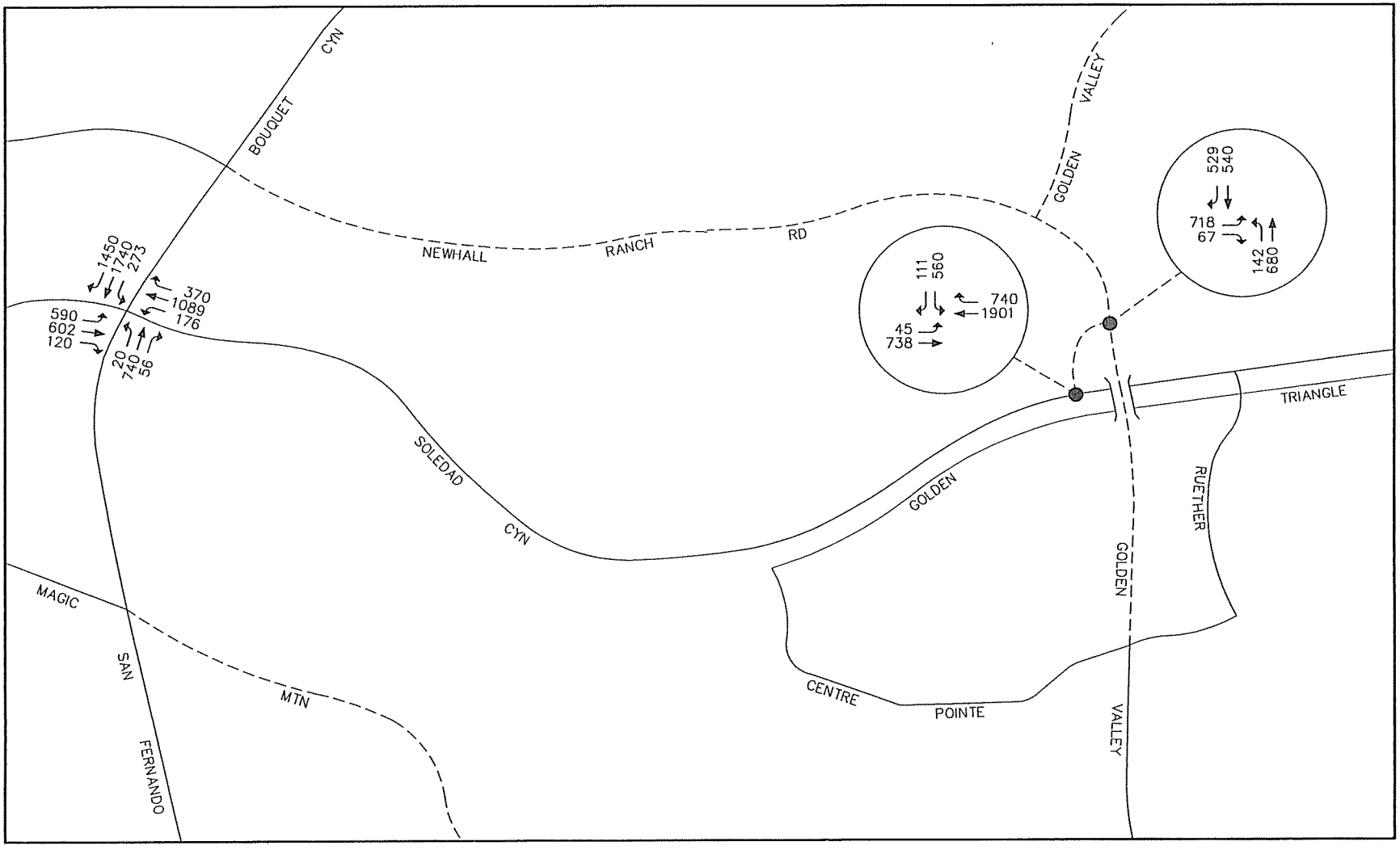
Level of service ranges: .00 - .60 A
.61 - .70 B
.71 - .80 C
.81 - .90 D
.91 - 1.00 E
Above 1.00 F

4.2 CUMULATIVE ANALYSIS

The cumulative traffic conditions are based on the Interim Year setting described in Section 2.3. This setting forms the basis for identifying the potential Interim Year traffic impacts of buildout of the proposed project. The following sections discuss Interim Year no-project and with-project conditions.

4.2.1 Interim Year No-Project Traffic Conditions

The Interim Year no-project peak hour turning movement volumes for the intersections in the study area are illustrated in Figures 4-6 and 4-7 for the AM and PM peak hours, respectively. Table 4-3 provides the corresponding ICU values and also listed for comparison purposes are the ICUs for existing conditions. The ICU tabulations indicate that the intersection of Bouquet Canyon Road & Soledad

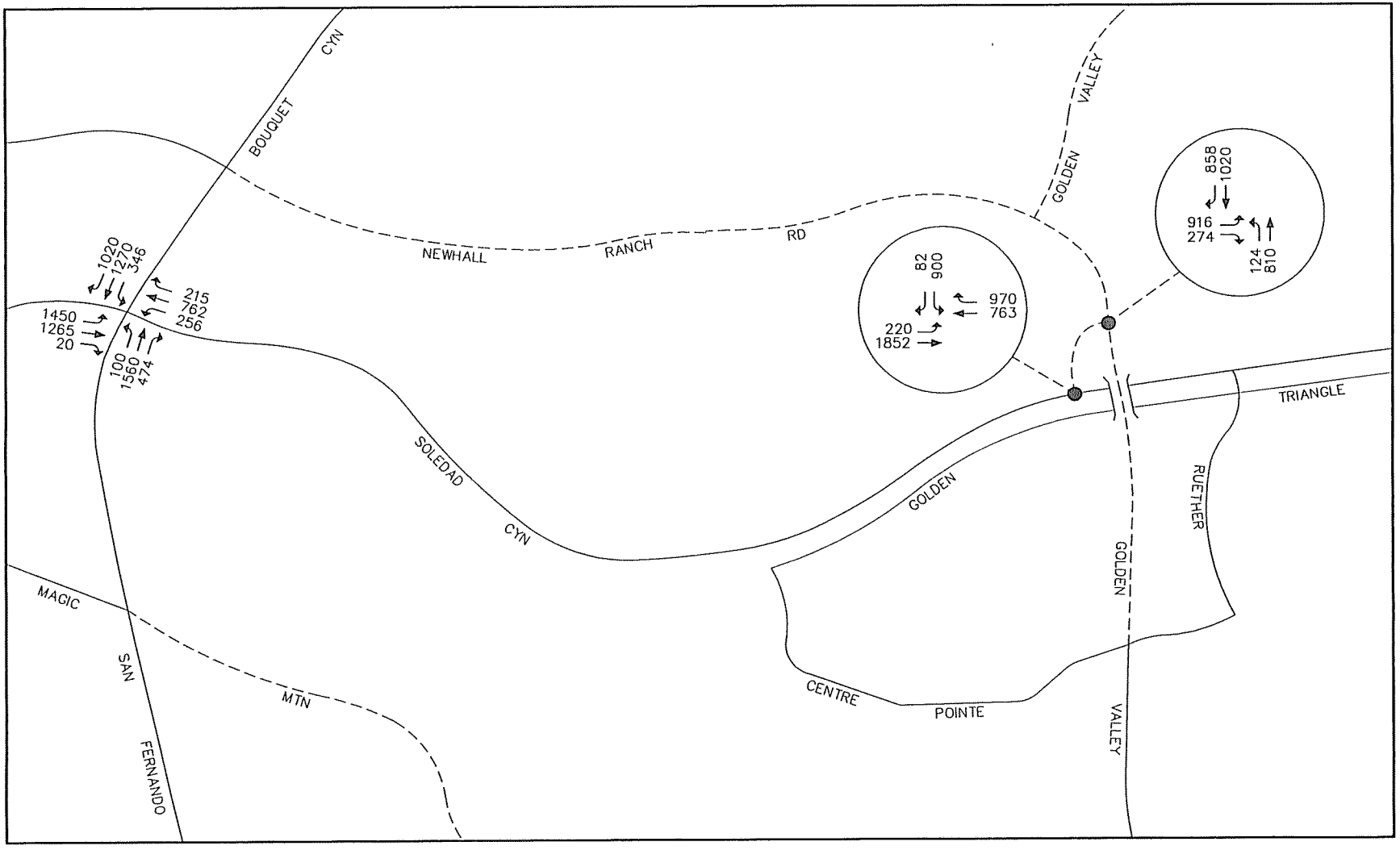


Legend

– – – – – Planned Roadway

Figure 4-6

INTERIM YEAR (WITHOUT PROJECT)
AM Peak Hour



Legend

Planned Roadway

Figure 4-7

INTERIM YEAR (WITHOUT PROJECT)
PM Peak Hour

Canyon Road (intersection 65) is deficient in the PM peak hour under existing conditions and the Interim Year conditions without the project.

Table 4-3

ICU AND LOS SUMMARY – EXISTING AND INTERIM YEAR WITHOUT PROJECT

	Existing				Interim Year without Project				Increase	
Intersection	**AM**		**PM**		**AM**		**PM**		**AM**	**PM**
Existing Intersections										
65. Bouquet Cyn Rd & Soledad Cyn Rd	.80	C	1.06	F	.76	C	.93	E	-.04[1]	-.13[1]
Future Intersections										
165. Golden Valley Rd & Valley Center	--	--	--	--	.50	A	.69	B	--	--
198. Valley Center & Soledad Cyn Rd	--	--	--	--	.63	B	.71	C	--	--

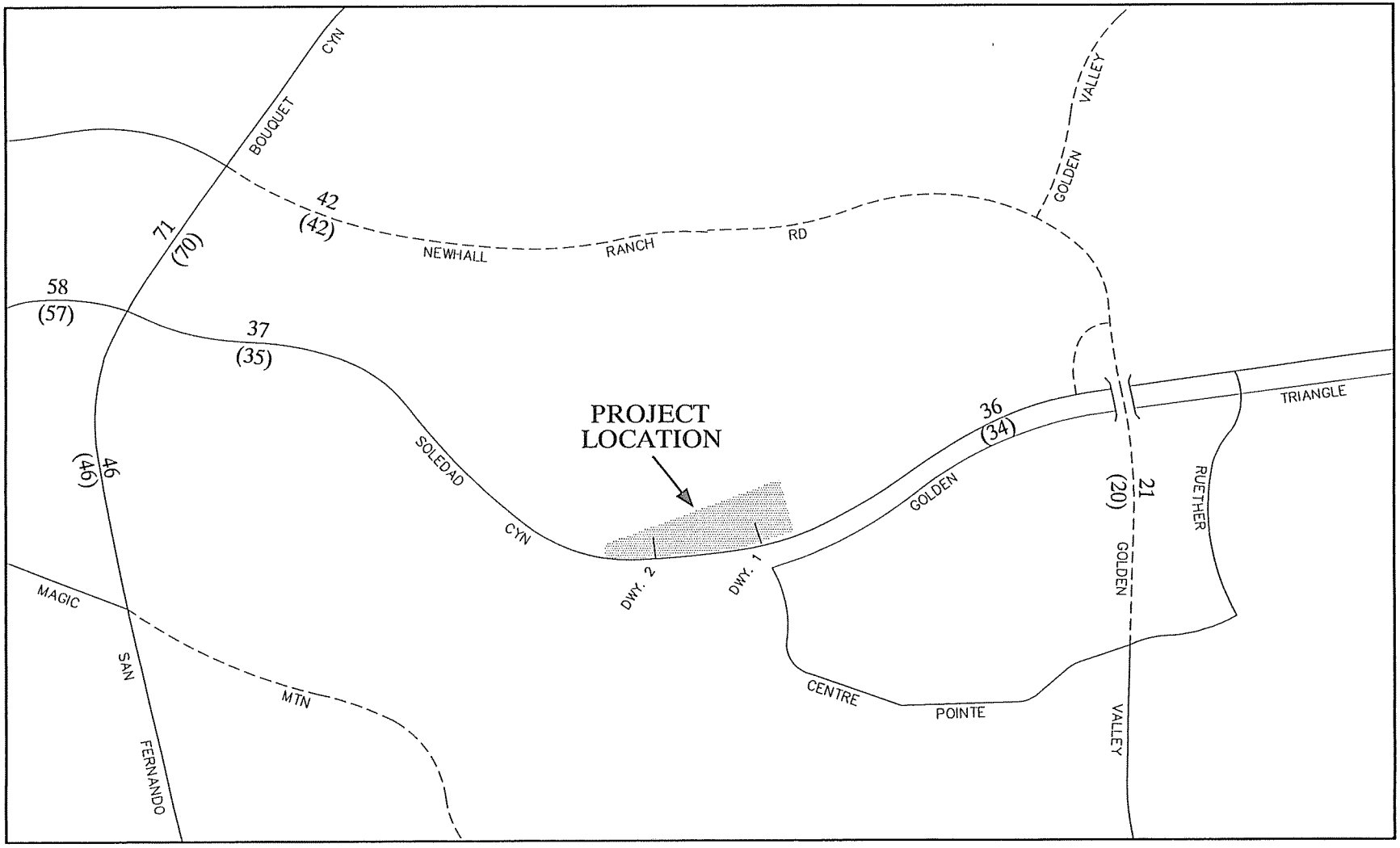
[1]The Interim Year ICUs at this location are less than the existing ICUs because of the diversion of traffic to future roadways such as the extensions of Newhall Ranch Road and Golden Valley Road.

Level of service ranges:
.00 - .60 A
.61 - .70 B
.71 - .80 C
.81 - .90 D
.91 - 1.00 E
Above 1.00 F

4.2.2 Interim Year With Project Traffic Conditions

As discussed in Chapter 3.0, the buildout of the proposed project would generate approximately 3,930 new vehicle trips per day, with approximately 240 in the AM peak hour and 370 in the PM peak hour. These are the off-site estimates that are used to represent the project's impacts on the analysis area circulation system.

Interim Year volumes that include project-generated traffic are provided in Figure 4-8 for the ADT volumes, and in Figures 4-9 and 4-10 for the AM and PM peak hours, respectively. Peak hour ICU values can be found in Table 4-4 which provides a comparison between Interim Year no-project and Interim Year with-project conditions. The table shows that in the PM peak hour, the intersection of Bouquet Canyon Road and Soledad Canyon Road experiences an ICU increase of .01, worsening an

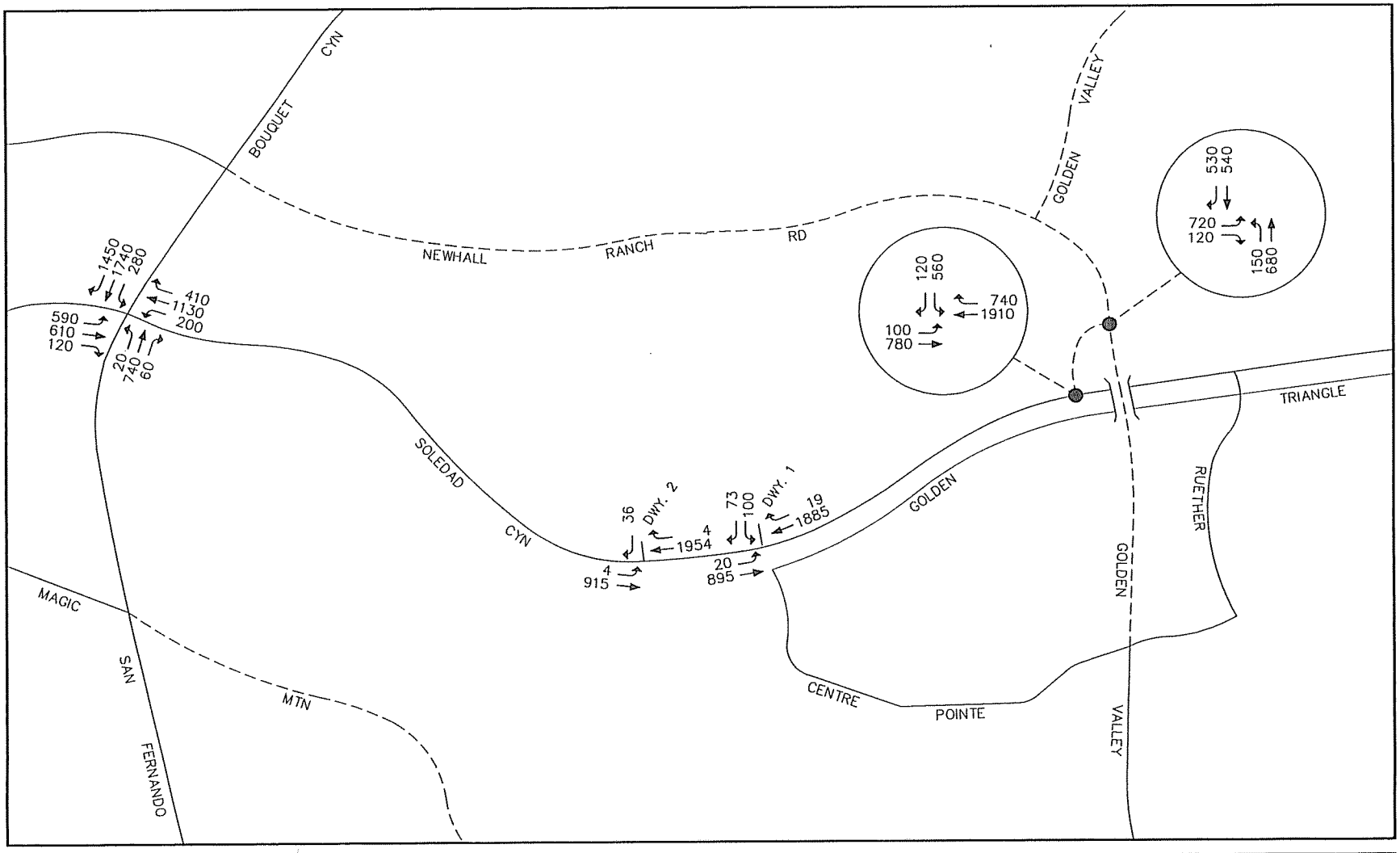


Legend

- – – – – Planned Roadway
- 15 With Buildout Project Volume
- (14) Without Buildout Project Volume

Figure 4-8

INTERIM YEAR
(WITH AND WITHOUT PROJECT)
ADT Volumes (In 000's)

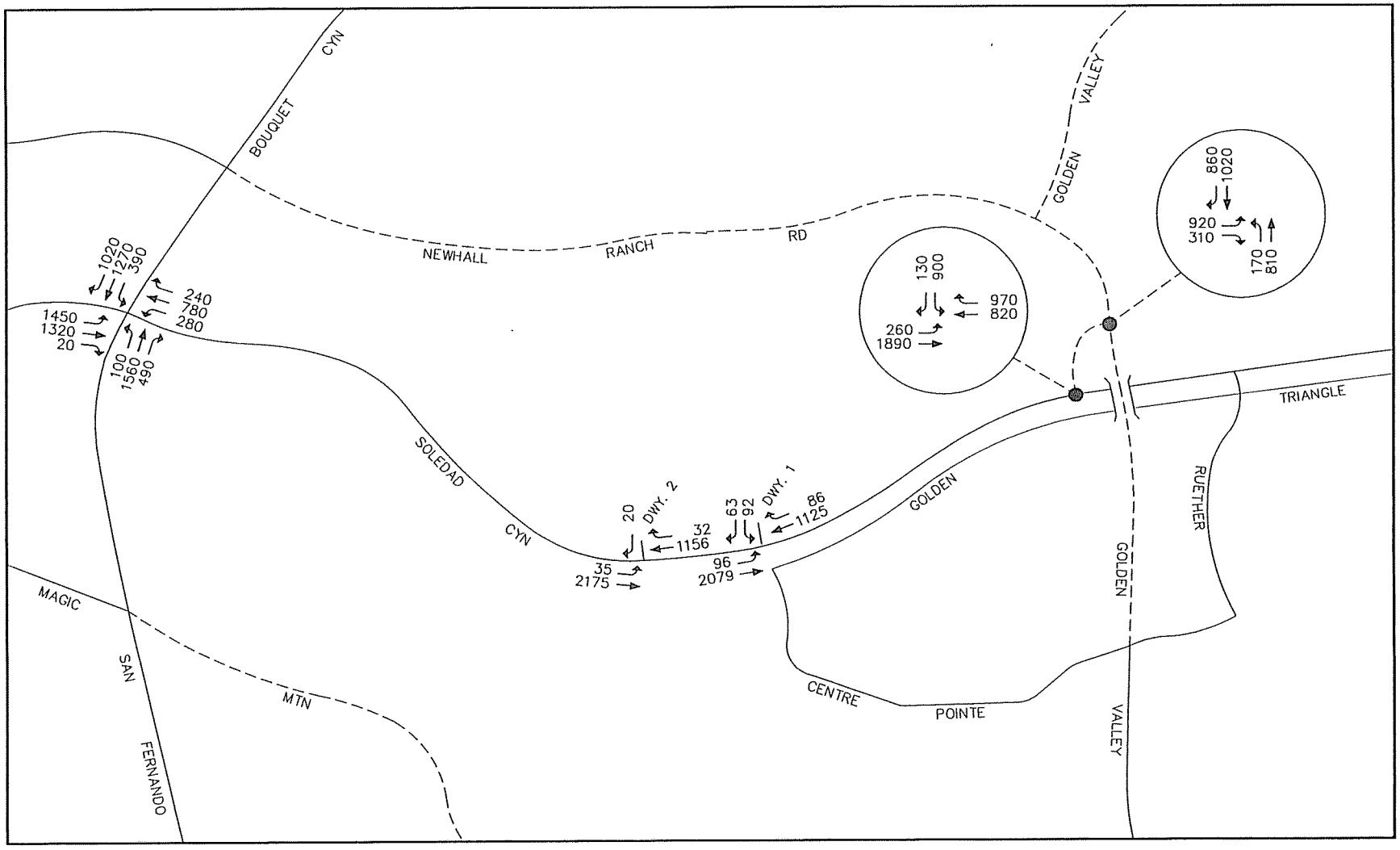


Legend

– – – – – Planned Roadway

Figure 4-9

INTERIM YEAR (WITH PROJECT)
AM Peak Hour



Legend

– – – – – Planned Roadway

Figure 4-10

INTERIM YEAR (WITH PROJECT)
PM Peak Hour

already deficient condition of LOS "E". This impact is considered significant as outlined in the City's "Impact Study Guidelines" (see Reference 5 in Section 1.6).

Table 4-4

ICU AND LOS SUMMARY – INTERIM YEAR WITH AND WITHOUT PROJECT (PROJECT BUILDOUT)

	Interim Year without Project				Interim Year with Project Buildout				Increase	
Intersection	**AM**		**PM**		**AM**		**PM**		**AM**	**PM**
Existing Intersections										
65. Bouquet Cyn Rd & Soledad Cyn Rd	.76	C	.93	E	.77	C	.94	E	.01	.01*
Future Intersections										
1. Project Dwy. 1 & Soledad Cyn Rd	--	--	--	--	.53	A	.55	A	--	--
2. Project Dwy. 2 & Soledad Cyn Rd	--	--	--	--	.49	A	.52	A	--	--
165. Golden Valley Rd & Valley Center	.50	A	.69	B	.50	A	.70	B	.00	.01
198. Valley Center & Soledad Cyn Rd	.63	B	.71	C	.65	B	.72	C	.02	.01

*Significant Impact (See Table 1-2)

Level of service ranges: .00 - .60 A
.61 - .70 B
.71 - .80 C
.81 - .90 D
.91 - 1.00 E
Above 1.00 F

4.2.3 Traffic Signal Warrants

The existing study area intersection is currently signalized and the two planned future intersections at Soledad Canyon Road and Golden Valley Road have been identified in previous studies as warranting a traffic signal when constructed. The installation of a traffic signal at the main project driveway was recently completed and there is no plan for a traffic signal at the second project driveway (configured as a limited access left-in and right-in, right-out only intersection).

4.2.4 Mitigation

Mitigation measures can generally be classified into two categories, measures related directly to project site access, and measures related to off-site locations. Project site mitigation is summarized in Table 4-5.

Table 4-5

PROJECT SITE MITIGATION

Location	Mitigation
2. Project Dwy. 2 and Soledad Cyn Rd	Construct project intersection (limited access left-in and right-in, right-out only).

The previous sections identified the off-site intersection that is significantly impacted by the proposed project. Mitigation measures that address this impact are listed in Table 4-6.

Table 4-6

OFF-SITE INTERSECTION MITIGATION

Intersection	Mitigation
65. Bouquet Cyn Rd & Soledad Cyn Rd	Add 4th northbound through lane (requires right-of-way on southeast corner of intersection along Bouquet Canyon Road, presently infeasible).

Table 4-7 summarizes the resulting ICUs and LOS with the above mitigation.

Table 4-7

ICU AND LOS SUMMARY – INTERIM YEAR WITH PROJECT AND MITIGATION

	Interim Year without Project				Interim Year With Project and Mitigation				Net Change	
Intersection	**AM**		**PM**		**AM**		**PM**		**AM**	**PM**
Existing Intersections										
65. Bouquet Cyn Rd & Soledad Cyn Rd	.76	C	.93	E	.77	C	.86	D	.01	-.07

Level of service ranges:
.00 - .60 A
.61 - .70 B
.71 - .80 C
.81 - .90 D
.91 - 1.00 E
Above 1.00 F

TT 062322, the Soledad Townhomes project is located within the Bouquet Bridge and Thoroughfare (B & T) District. The B & T District fee per factored unit is $14,730, and the total fee obligation for the project is approximately $5,215,893, as summarized in Table 4-8.

Table 4-8

BRIDGE AND THOROUGHFARE DISTRICT FEE SUMMARY

Land Use	Units	Base Fee	Factor	Fee
Condominium	437 DU	$14,730	0.8	$5,149,608
Commercial / Retail	0.9 Acres[1]	$14,730	5.0	$66,285
Total				$5,215,893

[1]Estimate

4.3 BUILDOUT ANALYSIS

When compared to the land use that has historically been used by the City and County for long-range planning in the SCVCTM, the proposed project represents a net reduction in traffic of approximately 16,000 ADT as shown in Table 4-9.

Table 4-9

TRIP GENERATION SUMMARY – GENERAL PLAN COMPARISON

Land Use	Units	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
PROPOSED PROJECT LAND USE								
Condominium	437 DU	26	210	236	205	114	319	3,496
Commercial / Retail	8 TSF	21	13	34	57	61	118	1,315
Metrolink Riders	--	--	-14	-14	-13	--	-13	-227
Driveway Total		47	209	256	249	175	424	4,584
Pass-by Reduction for Retail	-50%	-10	-7	-17	-29	-30	-59	-658
Net Total (New Trips)		37	202	239	220	145	365	3,926
GENERAL PLAN LAND USE (FROM SCVCTM)								
Commercial Center (>30ac)[3]	500 TSF	235	150	385	820	890	1,710	20,030
DIFFERENCE								
--	--	-198	52	-146	-600	-745	-1,345	-16,104

Trip Rate Sources
[1] SCVCTM Category 4 (Condominium/Townhome)
[2] ITE Category 820 (Shopping Center Equation)
ADT Ln(T) = 0.65 Ln(X) + 5.83
AM Ln(T) = 0.60 Ln(X) + 2.29
PM Ln(T) = 0.66 Ln(X) + 3.40
[3]SCVCTM Category 10 (Commercial Center (>30ac))

Abbreviations
DU = Dwelling Unit
TSF = Thousand Square Feet

Appendix A
INTERSECTION CAPACITY UTILIZATION WORKSHEETS

Peak hour intersection volume/capacity ratios are calculated by means of intersection capacity utilization (ICU) values. ICU calculations were performed for the intersections shown in Figure A-1.

The procedure is based on the critical movement methodology, and shows the amount of capacity utilized by each critical move. A "de-facto" right-turn lane is used in the ICU calculation for cases where a curb lane is wide enough to separately serve both through and right-turn traffic (typically with a width of 19 feet from curb to outside of through-lane with parking prohibited during peak periods). Such lanes are treated the same as striped right-turn lanes during the ICU calculations, but they are denoted on the ICU calculation worksheets using the letter "d" in place of a numerical entry for right-turn lanes.

The methodology also incorporates a check for right-turn capacity utilization. Both right-turn-on-green (RTOG) and right-turn-on-red (RTOR) capacity availability are calculated and checked against the total right-turn capacity need. If insufficient capacity is available, then an adjustment is made to the total capacity utilization value. The following example shows how this adjustment is made.

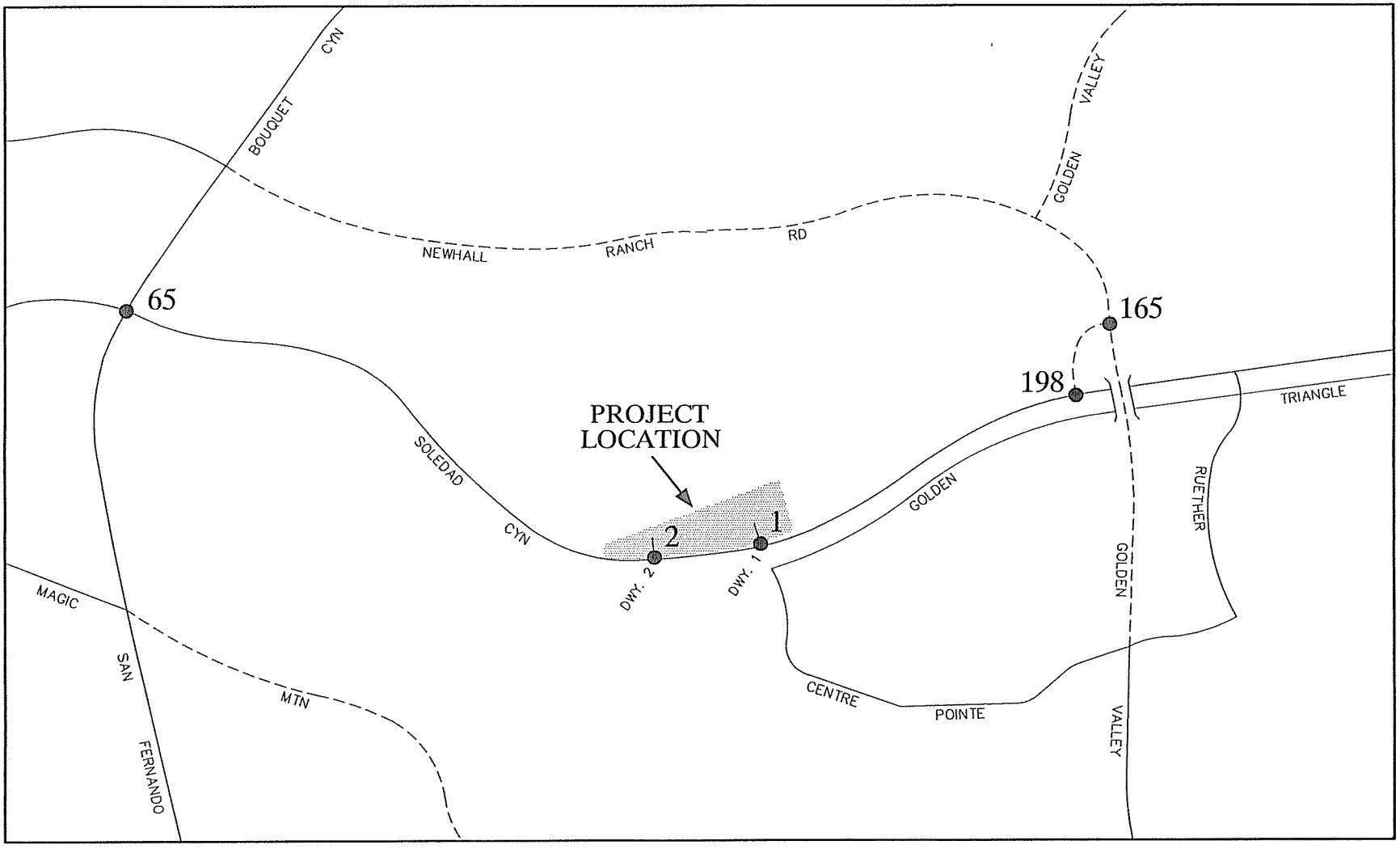
Example of Right-turn Capacity Utilization For Northbound Right

1. Right-Turn-On-Green (RTOG)

If NBT is critical move, then:
RTOG = V/C (NBT)
Otherwise,
RTOG = V/C (NBL) + V/C (SBT) - V/C (SBL)

2. Right-Turn-On-Red (RTOR)

If WBL is critical move, then:
RTOR = V/C (WBL)
Otherwise,
RTOR = V/C (EBL) + V/C (WBT) - V/C (EBT)



Legend

Planned Roadway

Study Area Intersection

Figure A-1

STUDY AREA INTERSECTIONS

3. Right-Turn Overlap Adjustment

If the northbound right is assumed to overlap with the adjacent westbound left, adjustments to the RTOG and RTOR values are made as follows:

RTOG = RTOG + V/C (WBL)
RTOR = RTOR - V/C (WBL)

4. Total Right-Turn Capacity (RTC) Availability For NBR

RTC = RTOG + factor x RTOR
Where factor = RTOR saturation flow factor (typically 75%)

5. Right-turn Adjustment for ICU Calculation

Right-turn adjustment is then as follows: Additional ICU = V/C (NBR) - RTC

A zero or negative value indicates that adequate capacity is available and no adjustment is necessary. A positive value indicates that the available RTOR and RTOG capacity does not adequately accommodate the right-turn V/C, therefore the right-turn is essentially considered to be a critical movement. In such cases, the right-turn adjustment is noted on the ICU worksheet and it is included in the total capacity utilization value. When it is determined that a right-turn adjustment is required for more than one right-turn movement, the word "multi" is printed on the worksheet instead of an actual right-turn movement reference, and the right-turn adjustments are cumulatively added to the total capacity utilization value. In such cases, further operational evaluation is typically carried out to determine if under actual operational conditions, the critical right-turns would operate simultaneously, and therefore a right-turn adjustment credit should be applied.

Shared Lane V/C Methodology

For intersection approaches where shared usage of a lane is permitted by more than one turn movement (e.g., left/through, through/right, left/through/right), the individual turn volumes are evaluated to determine whether dedication of the shared lane is warranted to any one given turn movement. The following example demonstrates how this evaluation is carried out:

Example of Shared Lane Utilization for Shared Left/Through Lane

1. Average Lane Volume (ALV)

$$ALV = \frac{\text{Left-Turn Volume + Through Volume}}{\text{Total Left + Through Approach Lanes (including shared lane)}}.$$

2. ALV for Each Approach

$$ALV\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Left Approach Lanes (including shared lane)}}.$$

$$ALV\ (Through) = \frac{\text{Through Volume}}{\text{Through Approach Lanes (including shared lane)}}.$$

3. Lane Dedication is Warranted

If ALV (Left) is greater than ALV then full dedication of the shared lane to the left-turn approach is warranted. Left-turn and through V/C ratios for this case are calculated as follows:

$$V/C\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Left Approach Capacity (including shared lane)}}.$$

$$V/C\ (Through) = \frac{\text{Through Volume}}{\text{Through Approach Capacity (excluding shared lane)}}.$$

Similarly, if ALV (Through) is greater than ALV then full dedication to the through approach is warranted, and left-turn and through V/C ratios are calculated as follows:

$$V/C\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Left Approach Capacity (excluding shared lane)}}.$$

$$V/C\ (Through) = \frac{\text{Through Volume}}{\text{Through Approach Capacity (including shared lane)}}.$$

4. Lane Dedication is not Warranted

If ALV (Left) and ALV (Through) are both less than ALV, the left/through lane is assumed to be truly shared and each left, left/through or through approach lane carries an evenly distributed volume of traffic equal to ALV. A combined left/through V/C ratio is calculated as follows:

$$V/C\ (Left/Through) = \frac{\text{Left-Turn Volume + Through Volume}}{\text{Total Left + Through Approach Capacity (including shared lane)}}.$$

This V/C (Left/Through) ratio is assigned as the V/C (Through) ratio for the critical movement analysis and ICU summary listing.

If split phasing has not been designated for this approach, the relative proportion of V/C (Through) that is attributed to the left-turn volume is estimated as follows:

If approach has more than one left-turn (including shared lane), then:

$$V/C\ (Left) = V/C\ (Through)$$

If approach has only one left-turn lane (shared lane), then:

$$V/C\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Single Approach Lane Capacity}}.$$

If this left-turn movement is determined to be a critical movement, the V/C (Left) value is posted in brackets on the ICU summary printout.

These same steps are carried out for shared through/right lanes. If full dedication of a shared through/right lane to the right-turn movement is warranted, the right-turn V/C value calculated in step three is checked against the RTOR and RTOG capacity availability if the option to include right-turns in the V/C ratio calculations is selected. If the V/C value that is determined using the shared lane methodology described here is reduced due to RTOR and RTOG capacity availability, the V/C value for the through/right lanes is posted in brackets.

When an approach contains more than one shared lane (e.g., left/through and through/right), steps one and two listed above are carried out for the three turn movements combined. Step four is carried out if dedication is not warranted for either of the shared lanes. If dedication of one of the shared lanes is warranted to one movement or another, step three is carried out for the two movements involved, and then steps one through four are repeated for the two movements involved in the other shared lane.

1. Project Dwy. 1 & Soledad

Short-Range Conditions (With Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	1	1750	53	.03*	54	.03*
SBT	0	0	0		0	
SBR	1	1750	40	.02	50	.03
EBL	1	1750	14	.01*	63	.04
EBT	3	5250	1939	.37	2808	.53*
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	3	5250	2893	.55*	2333	.45
WBR	0	0	14		50	
Clearance Interval				.10*		.10*
TOTAL CAPACITY UTILIZATION				**.69**		**.66**

Interim Year (With Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	1	1750	100	.06*	92	.05*
SBT	0	0	0		0	
SBR	1	1750	73	.04	63	.04
EBL	1	1750	20	.01*	96	.05
EBT	3	5250	895	.17	2079	.40*
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	3	5250	1885	.36*	1125	.23
WBR	0	0	19		86	
Clearance Interval				.10*		.10*
TOTAL CAPACITY UTILIZATION				**.53**		**.55**

2. Project Dwy. 2 & Soledad

Short-Range Conditions (With Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	1	1750	16	.01	9	.01
EBL	1	1750	2	.00	16	.01
EBT	3	5250	1953	.37	2871	.55*
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	3	5250	2930	.56*	2361	.45
WBR	0	0	3		22	
Right Turn Adjustment			SBR	.01*		
Clearance Interval				.10*		.10*
TOTAL CAPACITY UTILIZATION				**.67**		**.65**

Interim Year (With Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	1	1750	36	.02	20	.01
EBL	0	0	4		35	
EBT	3	5250	915	.18	2175	.42*
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	3	5250	1954	.37*	1156	.23
WBR	0	0	4		32	
Right Turn Adjustment			SBR	.02*		
Clearance Interval				.10*		.10*
TOTAL CAPACITY UTILIZATION				**.49**		**.52**

65. Bouquet & Soledad

Existing Count

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1750	19	.01*	95	.05
NBT	3	5250	468	.09	1140	.22*
NBR	1	1750	193	.11	705	.40
SBL	2	3500	540	.15	690	.20*
SBT	3	5250	1674	.32*	934	.18
SBR	2	3500	873	.25	685	.20
EBL	2	3500	360	.10*	971	.28*
EBT	3	5250	690	.15	1589	.31
EBR	0	0	123		20	
WBL	2	3500	450	.13	556	.16
WBT	2.5	7000	1415	(.27)*	1012	(.23)*
WBR	1.5		584	(.15)	827	
Right Turn Adjustment					NBR	.03*
Clearance Interval				.10*		.10*

Note: Assumes Right-Turn Overlap for SBR

TOTAL CAPACITY UTILIZATION .80 1.06

Short-Range Conditions (Without Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1750	40	.02	40	.02
NBT	3	5250	600	.11*	1370	.26*
NBR	1	1750	400	.23	460	.26
SBL	2	3500	930	.27*	1070	.31*
SBT	3	5250	1360	.26	1070	.20
SBR	2	3500	1240	.35	920	.26
EBL	3	5250	480	.09*	1200	.23
EBT	3	5250	890	.17	1520	.30*
EBR	0	0	20		30	
WBL	2	3500	540	.15	650	.19*
WBT	2.5	7000	1520	(.30)*	840	(.18)
WBR	1.5		920		850	
Clearance Interval				.10*		.10*

Note: Assumes Right-Turn Overlap for SBR

TOTAL CAPACITY UTILIZATION .87 1.16

Short-Range Conditions (With Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1750	40	.02	40	.02
NBT	3	5250	600	.11*	1370	.26*
NBR	1	1750	403	.23	468	.27
SBL	2	3500	933	.27*	1095	.31*
SBT	3	5250	1360	.26	1070	.20
SBR	2	3500	1240	.35	920	.26
EBL	3	5250	480	.09*	1200	.23
EBT	3	5250	895	.17	1550	.30*
EBR	0	0	20		30	
WBL	2	3500	553	.16	661	.19*
WBT	2.5	7000	1540	(.30)*	851	(.19)
WBR	1.5		940		870	
Clearance Interval				.10*		.10*

Note: Assumes Right-Turn Overlap for SBR

TOTAL CAPACITY UTILIZATION .87 1.16

Interim Year (Without Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1750	20	.01*	100	.06
NBT	3	5250	740	.14	1560	.30*
NBR	1	1750	56	.03	474	.27
SBL	2	3500	273	.08	346	.10*
SBT	3	5250	1740	.33*	1270	.24
SBR	2	3500	1450	.41	1020	.29
EBL	3	5250	590	.11*	1450	.28*
EBT	3	5250	602	.14	1265	.24
EBR	0	0	120		20	
WBL	2	3500	176	.05	256	.07
WBT	2.5	7000	1089	.21*	762	.15*
WBR	1.5		370	(.06)	215	.12
Clearance Interval				.10*		.10*

Note: Assumes Right-Turn Overlap for SBR

TOTAL CAPACITY UTILIZATION .76 .93

65. Bouquet & Soledad

Interim Year (With Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1750	20	.01*	100	.06
NBT	3	5250	740	.14	1560	.30*
NBR	1	1750	60	.03	490	.28
SBL	2	3500	280	.08	390	.11*
SBT	3	5250	1740	.33*	1270	.24
SBR	2	3500	1450	.41	1020	.29
EBL	3	5250	590	.11*	1450	.28*
EBT	3	5250	610	.14	1320	.26
EBR	0	0	120		20	
WBL	2	3500	200	.06	280	.08
WBT	2.5	7000	1130	.22*	780	.15*
WBR	1.5		410	{.08}	240	.14
Clearance Interval				.10*		.10*

Note: Assumes Right-Turn Overlap for SBR

TOTAL CAPACITY UTILIZATION .77 .94

Interim Year (With Project) - With Mitigation

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1750	20	.01*	100	.06
NBT	4	7000	740	.11	1560	.22*
NBR	1	1750	60	.03	490	.28
SBL	2	3500	280	.08	390	.11*
SBT	3	5250	1740	.33*	1270	.24
SBR	2	3500	1450	.41	1020	.29
EBL	3	5250	590	.11*	1450	.28*
EBT	3	5250	610	.14	1320	.26
EBR	0	0	120		20	
WBL	2	3500	200	.06	280	.08
WBT	2.5	7000	1130	.22*	780	.15*
WBR	1.5		410	{.06}	240	.14
Clearance Interval				.10*		.10*

Note: Assumes Right-Turn Overlap for SBR

TOTAL CAPACITY UTILIZATION .77 .86

165. Golden Valley & Valley Cntr

Short-Range Conditions (Without Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3500	780	.22*	990	.28*
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	2	3500	770	.22	880	.25
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Clearance Interval				.10*		.10*

Note: Assumes Right-Turn Overlap for EBR

TOTAL CAPACITY UTILIZATION .32 .38

Short-Range Conditions (With Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3500	786	.22*	1016	.29*
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	0	0	0		0	
EBR	2	3500	799	.23	898	.26
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment		EBR		.01*		
Clearance Interval				.10*		.10*

Note: Assumes Right-Turn Overlap for EBR

TOTAL CAPACITY UTILIZATION .33 .39

Interim Year (Without Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3500	142	.04*	124	.04*
NBT	3	5250	680	.13	810	.15
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	2	3500	540	.15*	1020	.29*
SBR	f		529		858	
EBL	2	3500	718	.21*	916	.26*
EBT	0	0	0		0	
EBR	2	3500	67	.02	274	.08
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Clearance Interval				.10*		.10*

TOTAL CAPACITY UTILIZATION .50 .69

Interim Year (With Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3500	150	.04*	170	.05*
NBT	3	5250	680	.13	810	.15
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	2	3500	540	.15*	1020	.29*
SBR	f		530		860	
EBL	2	3500	720	.21*	920	.26*
EBT	0	0	0		0	
EBR	2	3500	120	.03	310	.09
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Clearance Interval				.10*		.10*

TOTAL CAPACITY UTILIZATION .50 .70

198. Valley Center & Soledad

Short-Range Conditions (Without Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3500	200	.06*	310	.09*
SBT	0	0	0		0	
SBR	1	1750	580	.33	680	.39
EBL	2	3500	370	.11*	480	.14
EBT	3	5250	1260	.24	2140	.41*
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	3	5250	2190	.42*	1350	.26
WBR	f		400		400	
Right Turn Adjustment			SBR	.16*	SBR	.15*
Clearance Interval				.10*		.10*

Note: Assumes Right-Turn Overlap for SBR

TOTAL CAPACITY UTILIZATION .85 .75

Short-Range Conditions (With Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3500	200	.06*	310	.09*
SBT	0	0	0		0	
SBR	1	1750	586	.33	706	.40
EBL	2	3500	399	.11*	498	.14
EBT	3	5250	1280	.24	2163	.41*
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	3	5250	2196	.42*	1383	.26
WBR	f		400		400	
Right Turn Adjustment			SBR	.16*	SBR	.16*
Clearance Interval				.10*		.10*

Note: Assumes Right-Turn Overlap for SBR

TOTAL CAPACITY UTILIZATION .85 .76

Interim Year (Without Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3500	560	.16*	900	.26*
SBT	0	0	0		0	
SBR	1	1750	111	.06	82	.05
EBL	2	3500	45	.01*	220	.06
EBT	3	5250	738	.14	1852	.35*
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	3	5250	1901	.36*	763	.15
WBR	f		740		970	
Clearance Interval				.10*		.10*

TOTAL CAPACITY UTILIZATION .63 .71

Interim Year (With Project)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3500	560	.16*	900	.26*
SBT	0	0	0		0	
SBR	1	1750	120	.07	130	.07
EBL	2	3500	100	.03*	260	.07
EBT	3	5250	780	.15	1890	.36*
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	3	5250	1910	.36*	820	.16
WBR	f		740		970	
Clearance Interval				.10*		.10*

TOTAL CAPACITY UTILIZATION .65 .72

Appendix E
AIR QUALITY IMPACT ANALYSIS

AIR QUALITY IMPACT ANALYSIS

SOLEDAD TOWNHOMES

CITY OF SANTA CLARITA

LSA

June 2005

AIR QUALITY IMPACT ANALYSIS

SOLEDAD TOWNHOMES

CITY OF SANTA CLARITA, CALIFORNIA

Submitted to:

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LSA

June 2005

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SOLEDAD TOWNHOMES

EXECUTIVE SUMMARY

The proposed project would result in criteria pollutants exceeding the South Coast Air Quality Management District (SCAQMD) daily emissions thresholds for reactive organic compounds (ROC), nitrogen oxides (NO_X), and suspended particulate (PM_{10}) during construction.

The proposed project would result in exceedances of daily emissions thresholds established by the SCAQMD for ROC from project-related net increase in vehicular and stationary sources emissions. Long-term carbon monoxide (CO) concentrations would remain below both State and federal CO standards. In addition, significant cumulative air quality impacts would not occur as a result of the proposed project. At the present time, the project is not consistent with and would need amendments to the City of Santa Clarita (City) General Plan. Upon approval of the proposed project, it will be consistent with the City's General Plan and the SCAQMD's Air Quality Management Plan (AQMP).

INTRODUCTION

This air quality impact analysis has been prepared to evaluate the potential air quality impacts associated with the Soledad Townhomes project in the City of Santa Clarita, California. This report is intended to satisfy the requirements for a project-specific air quality impact analysis by examining the impacts of the proposed project and evaluating the measures recommended to be incorporated as part of the project design.

The air quality study provides a discussion of the proposed project, the physical setting of the project area, and the regulatory framework for air quality. The analysis also provides data on existing air quality, evaluates potential air quality impacts associated with the proposed project, and identifies measures recommended to limit potential impacts. Modeled air quality levels are based upon vehicle data and project trip generation included in a traffic study prepared for the proposed project (Austin-Foust Associates, Inc. [AFA] June 2005).

The evaluation was prepared in conformance with appropriate standards, utilizing procedures and methodologies in the SCAQMD California Environmental Quality Act (CEQA) *(CEQA) Air Quality Handbook* (SCAQMD, April 1993).

Project Description

The proposed project is located on an approximately 30-acre site and consists of a maximum of 437 residential condominium units and 8,000 square feet of commercial use. Approximately 200 units, along with the 8,000-square-foot commercial center, will be constructed in the first phase of development (prior to completion of the Cross Valley Connector), and the remaining 237 units will be completed in the second phase of construction (after completion of the Cross Valley Connector). The site is generally bounded by the Santa Clara River to the north and west; Bentgrass Way and

commercial and residential uses to the east; and Soledad Canyon Road and a Metrolink rail line to the south. Figure 1 shows the location of the project site. Figure 2 illustrates the site plan for the proposed project.

Access to the site is proposed from project intersections with Soledad Canyon Road. The first intersection with Soledad Canyon Road will be located approximately 700 feet west of the eastern project boundary. Configured as a full-access signalized "tee" intersection, this location will serve both the residential and retail components of the site. A second intersection, located approximately 1,100 feet west of the first intersection, will be configured as a limited access left-in and right-in right-out intersection and is intended for residential traffic use only.

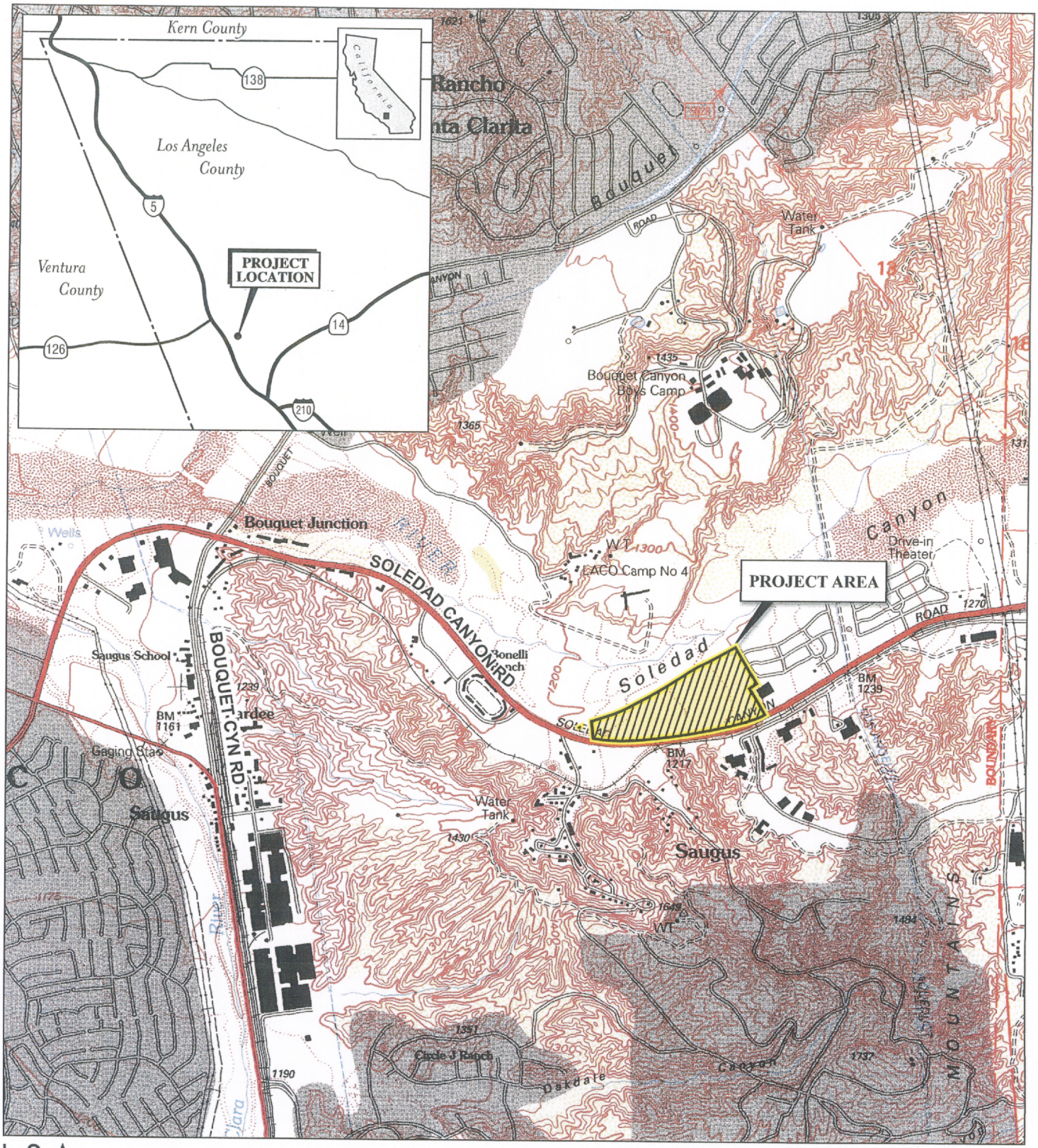
Existing Environmental Setting

Regional Air Quality. The project site is located in the City of Santa Clarita and is within the South Coast Air Basin (Basin), which includes Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino Counties. Air quality regulation in the Basin is administered by the SCAQMD, a regional agency created for the Basin.

The Basin climate is determined by its terrain and geographical location. The Basin is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern boundary, and high mountains surround the rest of the Basin. The region lies in the semipermanent high pressure zone of the eastern Pacific. The resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur.

The annual average temperature varies little throughout the Basin, ranging from the low to middle 60s, measured in degrees Fahrenheit. With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than that of inland areas. The climatological station closest to the site is the San Fernando Station.[1] Although this station was closed after 1974, the monitored temperatures are considered representative for the project area. The annual average maximum temperature recorded between 1927 and 1974 at this station is 78.2°F, and the annual average minimum is 49.3°F. January is typically the coldest month in this area of the Basin.

1 Western Regional Climatic Center, at Web site wrcc.dri.edu, 2005.



LSA

FIGURE 1

N

0 1000 2000

FEET

SOURCE: USGS 7.5' Quad - *Newhall, Ca.*

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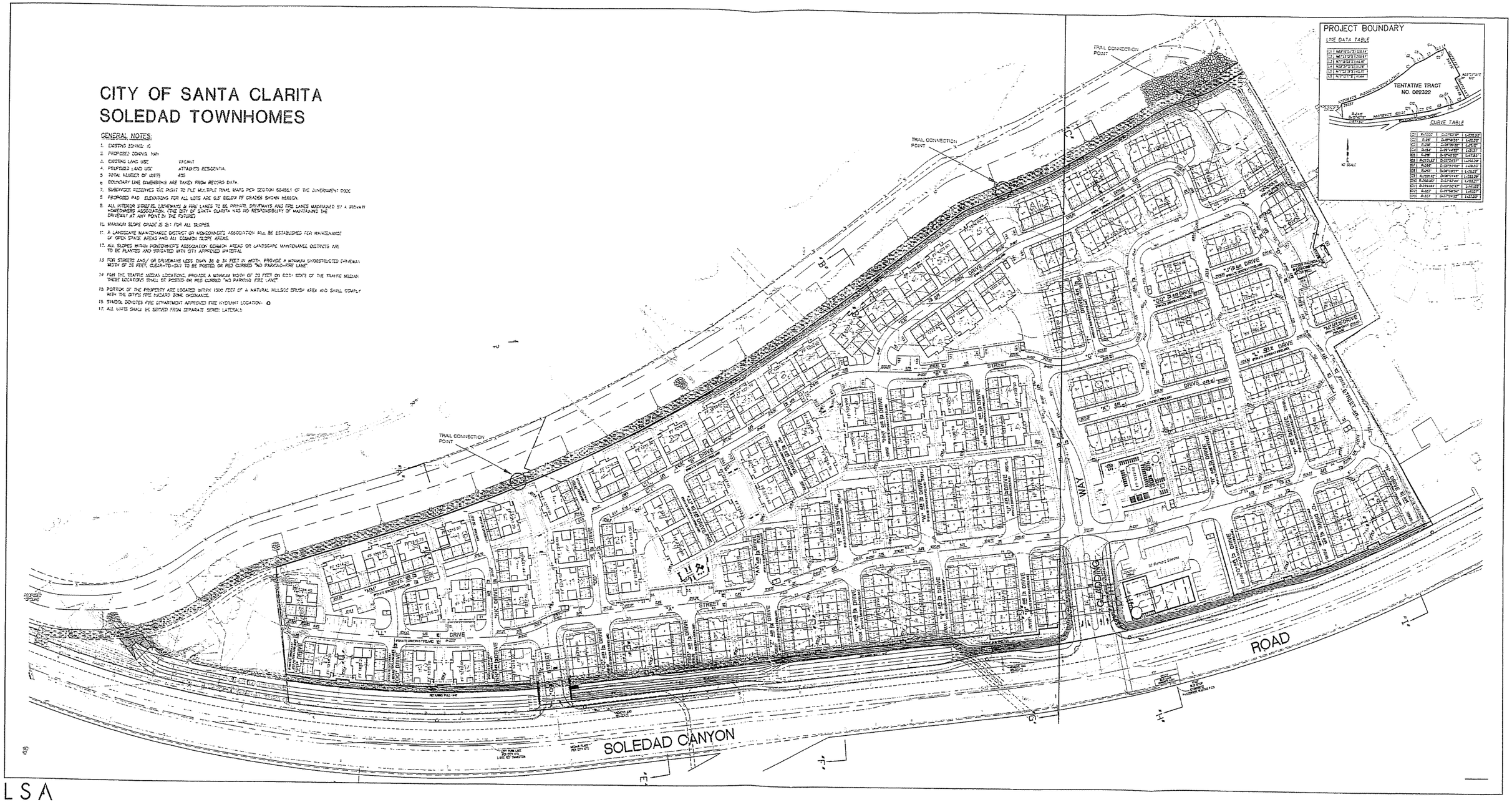
Soledad Townhomes

Project Location

CITY OF SANTA CLARITA
SOLEDAD TOWNHOMES

GENERAL NOTES:

1. EXISTING ZONING: IG
2. PROPOSED ZONING: RMH
3. EXISTING LAND USE: VACANT
4. PROPOSED LAND USE: ATTACHED RESIDENTIAL
5. TOTAL NUMBER OF UNITS: 438
6. BOUNDARY LINE DIMENSIONS ARE TAKEN FROM RECORD DATA.
7. SUBDIVIDER RESERVES THE RIGHT TO FILE MULTIPLE FINAL MAPS PER SECTION 66456.1 OF THE GOVERNMENT CODE.
8. PROPOSED PAD ELEVATIONS FOR ALL LOTS ARE 0.5' BELOW FF GRADES SHOWN HEREON.
9. ALL INTERIOR STREETS, DRIVEWAYS & FIRE LANES TO BE PRIVATE. DRIVEWAYS AND FIRE LANES MAINTAINED BY A PRIVATE HOMEOWNERS ASSOCIATION. THE CITY OF SANTA CLARITA HAS NO RESPONSIBILITY OF MAINTAINING THE DRIVEWAY AT ANY POINT IN THE FUTURE.
10. MAXIMUM SLOPE GRADE IS 2:1 FOR ALL SLOPES.
11. A LANDSCAPE MAINTENANCE DISTRICT OR HOMEOWNER'S ASSOCIATION WILL BE ESTABLISHED FOR MAINTENANCE OF OPEN SPACE AREAS AND ALL COMMON SLOPE AREAS.
12. ALL SLOPES WITHIN HOMEOWNER'S ASSOCIATION COMMON AREAS OR LANDSCAPE MAINTENANCE DISTRICTS ARE TO BE PLANTED AND IRRIGATED WITH CITY APPROVED MATERIAL.
13. FOR STREETS AND/ OR DRIVEWAYS LESS THAN 36 & 34 FEET IN WIDTH, PROVIDE A MINIMUM UNOBSTRUCTED DRIVEWAY WIDTH OF 28 FEET, CLEAR-TO-SKY TO BE POSTED OR RED CURBED "NO PARKING FIRE LANE".
14. FOR THE TRAFFIC MEDIAN LOCATIONS, PROVIDE A MINIMUM WIDTH OF 20 FEET ON EACH SIDE OF THE TRAFFIC MEDIAN. THESE LOCATIONS SHALL BE POSTED OR RED CURBED "NO PARKING FIRE LANE".
15. PORTION OF THE PROPERTY ARE LOCATED WITHIN 1000 FEET OF A NATURAL HILLSIDE BRUSH AREA AND SHALL COMPLY WITH THE CITY'S FIRE HAZARD ZONE ORDINANCE.
16. SYMBOL DENOTES FIRE DEPARTMENT APPROVED FIRE HYDRANT LOCATION: O
17. ALL UNITS SHALL BE SERVED FROM SEPARATE SEWER LATERALS



LSA

N

0 100 200
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SOURCE: PACIFIC COAST CIVIL, INC.

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FIGURE 2

Soledad Townhomes
Site Plan

The majority of annual rainfall in the Basin occurs between November and April. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the Basin along the coastal side of the mountains. Average rainfall measured at the San Fernando Station varied from 3.53 inches in January to 0.41 inch or less between May and October, with an average annual total of 16.16 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

The Basin experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of a semipermanent high pressure cell over the Pacific Ocean (the Pacific high). This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed in midafternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently break by midmorning.

Winds in the vicinity of the project area blow predominantly from the east-southeast, with relatively low velocities. Wind speeds in the project area average about four miles per hour (mph). Summer wind speeds average slightly higher than winter wind speeds. Low average wind speeds, together with a persistent temperature inversion, limit the vertical dispersion of air pollutants throughout the Basin. Strong, dry, north or northeasterly winds, known as Santa Ana winds, occur during the fall and winter months, dispersing air contaminants. The Santa Ana conditions tend to last for several days at a time.

The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore into Riverside and San Bernardino Counties. In the winter, the greatest pollution problems are carbon monoxide (CO) and oxides of nitrogen (NO_X) because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and NO_X to form photochemical smog.

Local Air Quality. The proposed site is located within the SCAQMD's jurisdiction. The SCAQMD maintains ambient air quality monitoring stations throughout the Basin. The air quality monitoring station closest to the site with more complete air quality data is the Santa Clarita Station. The criteria pollutants monitored at this station are shown in Tables A and B. CO and nitrogen dioxide (NO_2) levels monitored at this station have not exceeded State and federal standards in the past three years. Ozone (O_3) concentrations monitored at this station exceeded the State one-hour O_3 standard from 69 to 89 days per year in the past three years. The federal one-hour O_3 standard was exceeded at this station from 13 to 35 days per year over the three-year period. The federal eight-hour O_3 standard was exceeded from 52 to 69 days per year. Particulate matter less than 10 microns in diameter (PM_{10}) monitored at this station exceeded the State 24-hour standard from 2 to 10 days per year, but did not exceed the federal standard in the past three years. The Burbank-West Palm Avenue Station is the closest station that monitors particulate matter less

Table A: Ambient Air Quality at Santa Clarita Air Monitoring Station

	One-Hour Carbon Monoxide		One-Hour Ozone		Coarse Suspended Particulate (PM_{10})		Nitrogen Dioxide	
	Max. 1-Hour Conc. (ppm)[1]	Number of Days Exceeded	Max. 1-Hour Conc. (ppm)	Number of Days Exceeded	Max. 24-Hour Conc. ($\mu g/m^3$)	Number of Days Exceeded	Max. Conc. (ppm)	Number of Days Exceeded
State Stds.	> 20 ppm/1 hr		> .09 ppm/1 hr		> 50 $\mu g/m^3$, 24 hrs		> .25 ppm/1 hr	
2004	5.2	0	0.16	69	54	2	0.09	0
2003	3.3	0	0.19	89	72	10	0.12	0
2002	3.3	0	0.17	81	61	7	0.09	0
MAXIMUM	**5.2**		**0.19**		**72**		**0.12**	
Federal Stds.	> 35 ppm/1 hr		> .12 ppm/1 hr		> 150 $\mu g/m^3$, 24 hrs		0.053 ppm, annual average	
2004	5.2	0	0.16	13	54	0	0.021	0
2003	3.3	0	0.19	35	72	0	0.021	0
2002	3.3	0	0.17	32	61	0	0.019	0
MAXIMUM	**5.2**		**0.19**		**72**		**0.021**	

Source: ARB and EPA 2002–2004.

[1] Data taken from the EPA Web site; others taken from Air Resources Board (ARB) Web site.

Table B: Ambient Air Quality at Santa Clarita Air Monitoring Station

	Eight-Hour Carbon Monoxide		Eight-Hour Ozone		Fine Suspended Particulate ($PM_{2.5}$)[1]		Sulfur Dioxide[1]	
	Max. 8-Hour Conc. (ppm)	Number of Days Exceeded	Max. 8-Hour Conc. (ppm)	Number of Days Exceeded	Max. 24-Hour Conc. (μg/m)	Number of Days Exceeded	Max. 24-Hour Conc. (ppm)	Number of Days Exceeded
State Stds.	≥ 9.0 ppm/8 hrs		No State Standard		No State Standard		> .04 ppm/24 hrs	
2004	3.7	0	0.13	NA[2]	60	NA	0.007	0
2003	1.7	0	0.15	NA	121	NA	0.005	0
2002	1.7	0	0.14	NA	63	NA	0.007	0
MAXIMUM	**3.7**		**0.15**		**121**		**0.007**	
Federal Stds.	≥ 9.0 ppm/8 hrs		> .08 ppm/8 hrs		> 65 $\mu g/m^3$, 24 hrs		0.14 ppm/24 hrs	
2004	3.7	0	0.13	52	60	0	0.002	0
2003	1.7	0	0.15	69	121	1	0.001	0
2002	1.7	0	0.14	52	63	0	0.002	0
MAXIMUM	**3.7**		**0.15**		**121**		**0.002**	

Source: ARB 2002–2004.

1 Data taken from Burbank-W Palm Avenue Station, the closest station that monitors $PM_{2.5}$ and sulfur dioxide data.
2 No State standard.

than 2.5 microns in diameter ($PM_{2.5}$) and sulfur dioxide (SO_2). Data for $PM_{2.5}$ and SO_2 taken from the Burbank-West Palm Avenue Station are included in Tables A and B. The federal $PM_{2.5}$ standard was exceeded just once in the past three years, in 2003. There is no State $PM_{2.5}$ standard. The federal and State standards for SO_2 were not exceeded in the past ten years.

Regulatory Setting. The following discusses federal, State, and regional regulatory requirements.

Federal Regulations/Standards. Pursuant to the federal Clean Air Act (CAA) of 1970, the U.S. Environmental Protection Agency (EPA) established national ambient air quality standards (NAAQS). The NAAQS were established for six major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

The NAAQS are two tiered: primary, to protect public health, and secondary, to prevent degradation of the environment (e.g., impairment of visibility, damage to vegetation and property). The six criteria pollutants are O_3, CO, PM_{10}, NO_2, SO_2, and lead (Pb). The primary standards for these pollutants are shown in Table C, and the health effects from exposure to the criteria pollutants are described in Table D. The concentration standards were set at a level that protects public health with adequate margin of safety (EPA); therefore, these health effects would not occur unless the standards are exceeded by a large margin. In July 1997, the EPA adopted new standards for eight-hour O_3 and $PM_{2.5}$, as shown in Table C.

Data collected at permanent monitoring stations are used by the EPA to classify regions as "attainment" or "nonattainment," depending on whether the regions met the requirements stated in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the EPA.

The CAA Amendments designated the Basin as "extreme" for O_3, requiring attainment with the federal O_3 standard by 2010; "serious" for CO, requiring attainment of federal CO standards by 2000; and "serious" for PM_{10}, requiring attainment with federal standards by 2001. Table E lists the air quality attainment status for the Basin.

The EPA has designated the Southern California Association of Governments (SCAG) as the Metropolitan Planning Organization (MPO) responsible for ensuring compliance with the requirements of the CAA.

The EPA established new national air quality standards for ground-level O_3 and $PM_{2.5}$ in 1997. On May 14, 1999, the Court of Appeals for the District of Columbia Circuit issued a decision ruling that the CAA, as applied in setting the new public health standards for O_3 and particulate matter, was unconstitutional as an improper delegation of legislative authority to the EPA. On February 27, 2001, the U.S. Supreme Court upheld the way the government sets air quality standards under the CAA. The Court unanimously rejected industry arguments that the EPA must

Table C: Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[2,5]	Secondary[2,6]	Method[7]
Ozone (O_3)	1-Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	0.12 ppm (235 µg/m^3)[8]	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (140 µg/m^3)		0.08 ppm (157 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation*	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetic Analysis
	Annual Arithmetic Mean	20 µg/m^3*		50 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	No Separate State Standard		65 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetic Analysis
	Annual Arithmetic Mean	12 µg/m^3*	Gravimetric or Beta Attenuation*	15 µg/m^3		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Nondispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Nondispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	–	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.25 ppm (470 µg/m^3)		–		
Lead	30-day average	1.5 µg/m^3	Atomic Absorption	–	–	High Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m^3	Same as Primary Standard	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	–	Spectrophotometry (Pararosaniline Method)
	24-Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	–	
	3-Hour	–		–	0.5 ppm (1300 µg/m^3)	
	1-Hour	0.25 ppm (655 µg/m^3)		–	–	
Visibility Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24-Hour	25 µg/m^3	Ion Chromatography*			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Cloride[9]	24-Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: ARB (June 2005).

Footnotes:

1 California standards for ozone; carbon monoxide (except Lake Tahoe); sulfur dioxide (1 and 24 hour); nitrogen dioxide; suspended particulate matter, PM_{10}; and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2 National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

3 Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4 Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7 Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

8 New federal eight-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on July 18, 1997. Contact U.S. EPA for further clarification and current federal policies.

9 The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Table D: Health Effects Summary of the Major Criteria Air Pollutants

Pollutants	Sources	Primary Effects
Ozone (O_3)	Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	Aggravation of respiratory and cardiovascular diseases. Irritation of eyes. Impairment of cardiopulmonary function. Plant leaf injury.
NO_2	Motor vehicle exhaust. High-temperature stationary combustion. Atmospheric reactions.	Aggravation of respiratory illness. Reduced visibility. Reduced plant growth. Formation of acid rain.
CO	Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. Natural Events, such as decomposition of organic mater.	Reduced tolerance for exercise. Impairment of mental function. Impairment of fetal development. Death at high levels of exposure. Aggravation of some heart diseases (angina).
PM_{10}	Stationary combustion of solid fuels. Construction activities. Industrial processes. Atmospheric chemical reactions.	Reduced lung function. Aggravation of the effects of gaseous pollutants. Aggravation of respiratory and cardiorespiratory diseases. Increased cough and chest discomfort. Soiling. Reduced visibility.
SO_2	Combustion of sulfur-containing fossil fuels. Smelting of sulfur-bearing metal ores. Industrial processes.	Aggravation of respiratory diseases (asthma, emphysema). Reduced lung function. Irritation of eyes. Reduced visibility. Plant injury. Deterioration of metals, textiles, leather, finishes, coatings, etc.
Lead (Pb)	Contaminated soil.	Impairment of blood function and nerve construction. Behavioral and hearing problems in children.

Source: ARB 2000.

Table E: South Coast Air Basin Attainment Status

	State	Federal
One-Hour O_3	Nonattainment	Extreme Nonattainment (attainment date 2010)
Eight-Hour O_3	Not Established	Severe 17 Nonattainment (attainment date 2021)
$PM_{2.5}$	Not Established	Nonattainment
PM_{10}	Nonattainment	Serious Nonattainment
CO	Nonattainment (Los Angeles County only)	Attainment (data finding in 2003 AQMP)
NO_2	Attainment	Attainment/Maintenance
All Others	Attainment/Unclassified	Attainment/Unclassified

Source: ARB and SCAQMD, June 2005.

consider financial cost as well as health benefits in writing standards. The justices also rejected arguments that the EPA took too much lawmaking power from Congress when it set tougher standards for O_3 and soot in 1997. Nevertheless, the Court threw out the EPA's policy for implementing new O_3 rules, saying the agency ignored a section of the law that restricts its authority. It ordered the agency to come up with a more "reasonable" interpretation of the law.

The EPA issued the final eight-hour ozone nonattainment designations/boundaries on April 15, 2004. States will be provided three years, to April 2007, to develop eight-hour ozone State Implementation Plans (SIPs) following the final designations. States will need to demonstrate conformity by April 15, 2005, in eight-hour ozone nonattainment areas, given the one-year grace period following the final designations. Various areas in the State of California have different attainment dates based on their corresponding classifications. The eight-hour ozone implementation rule revokes the one-hour standard issued in April 2005. This will change the attainment status in some areas; however, it does not change any commitment each area made for attaining the one-hour ozone standard.

The EPA took final action to designate the final $PM_{2.5}$ attainment and nonattainment areas on December 17, 2004. States with nonattainment areas must submit plans by early 2008 that outline how they will meet the $PM_{2.5}$ standards. They are expected to attain clean air as soon as possible and not later than 2010. EPA can grant one five-year extension for areas with more severe problems. The attainment date for those areas would be 2015.

State Regulations/Standards. The State of California began to set California ambient air quality standards (CAAQS) in 1969 under the mandate of the Mulford-Carrell Act. The CAAQS are generally more stringent than the NAAQS. In addition to the six criteria pollutants covered by the NAAQS, there are CAAQS for sulfates (SO_4), hydrogen sulfide (H_2S), vinyl chloride (VC), and visibility-reducing particles. These standards are also listed in Table C.

Originally, there were no attainment deadlines for the CAAQS. However, the California Clean Air Act (CCAA) of 1988 provided a time frame and planning structure to promote their attainment.

The CCAA required nonattainment areas in the State to prepare attainment plans and proposed to classify each such area on the basis of the submitted plan, as follows: moderate, if CAAQS attainment could not occur before December 31, 1994; serious, if CAAQS attainment could not occur before December 31, 1997; and severe, if CAAQS attainment could not be conclusively demonstrated at all.

Regional Air Quality Planning Framework. The 1976 Lewis Air Quality Management Act established the SCAQMD and other air districts throughout the State. The CAA Amendments of 1977 required that each state adopt an implementation plan outlining pollution control measures to attain the federal standards in nonattainment areas of the state.

The ARB coordinates and oversees both State and federal air pollution control programs in California. The ARB oversees activities of local air quality management agencies and is responsible for incorporating air quality management plans for local air basins into a SIP for EPA approval. The ARB maintains air quality monitoring stations throughout the State in conjunction with local air districts. Data collected at these stations are used by the ARB to classify air basins as "attainment" or "nonattainment" with respect to each pollutant and to monitor progress in attaining air quality standards. The ARB has divided the State into 15 air basins. Significant authority for air quality control within the basins has been given to local air districts that regulate stationary source emissions and develop local nonattainment plans. The CCAA provides the SCAQMD with the authority to manage transportation activities at indirect sources and regulate stationary source emissions. Indirect sources of pollution are generated when minor sources collectively emit a substantial amount of pollution. An example of this would be the motor vehicles at an intersection, at a mall, and on highways. As a State agency, the ARB regulates motor vehicles and fuels for their emissions.

Regional Air Quality Management Plan. The SCAQMD and SCAG are responsible for formulating and implementing the Air Quality Management Plan (AQMP) for the Basin. Every three years, the SCAQMD prepares a new AQMP, updating the previous plan and having a twenty-year horizon. The SCAQMD adopted the 2003 AQMP in August 2003 and forwarded it to the ARB for review and approval. The ARB approved a modified version of the 2003 AQMP and forwarded it to the EPA in October 2003 for review and approval.

The 2003 AQMP updates the attainment demonstration for the federal standards for O_3 and PM_{10}; replaces the 1997 attainment demonstration for the federal CO standard and provides a basis for a maintenance plan for CO for the future; and updates the maintenance plan for the federal NO_2 standard that the Basin has met since 1992.

This revision to the AQMP also addresses several State and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2003 AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the Ozone SIP for the Basin for the attainment of the federal ozone air quality standard. However, this revision points to the urgent need for additional

emission reductions (beyond those incorporated in the 1997/1999 Plan) from all sources, specifically those under the jurisdiction of the ARB and the U.S. EPA, which account for approximately 80 percent of the ozone precursor emissions in the Basin.

METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

Methodology

A number of modeling tools are available to assess air quality impacts of projects. In addition, certain air districts, such as the SCAQMD, have created guidelines and requirements to conduct air quality analysis. The SCAQMD's current guidelines, *CEQA Air Quality Handbook* (April 1993), were adhered to in the assessment of air quality impacts for the proposed project.

The air quality assessment includes estimating emissions associated with short-term construction and long-term operation of the proposed project. Criteria pollutants with regional impacts would be emitted by project-related vehicular trips. In addition, localized air quality impacts, i.e., slight increase in CO concentrations (CO hot spots) near intersections or roadway segments in the project vicinity, would come from project-related vehicle trips.

CO concentrations were predicted for the short range and interim year without and with the project conditions based on traffic data provided in the traffic study (AFA, June 2005) for this project. CALINE4, the fourth generation California Line Source Dispersion Model developed by the California Department of Transportation (Caltrans), was used to calculate the CO concentrations. Input data for this model include meteorology, street network geometrics, traffic information, and emission generation rates. Meteorological data required include temperature, sigma theta (standard deviation of wind direction change), wind direction, and wind speed. Street network geometrics require use of an "x, y" coordinate system onto which the modeled roadway can be overlaid in order to identify the relative locations of the traffic lane(s) and nearby receptor(s). Required traffic information included peak-hour traffic volumes, speed limit, level of service, and signal cycle times. Emission factors were calculated using the ARB EMFAC 2002 emission factors.

Output from the model includes one-hour CO concentrations in parts per million (ppm) at selected receptor locations. To reflect total concentrations, the ambient CO concentration of the vicinity must be added to the CO concentration predicted by CALINE4. Based on the methodology suggested by the EPA and included in Caltrans CO Protocol, the existing ambient concentration was determined as the higher of the second highest annual one-hour and annual eight-hour observation at the nearest representative monitoring station over the past two years. Ambient concentrations for the interim year scenarios are assumed to be the same as the existing levels, which were determined to be the higher of the second highest CO concentrations monitored in the past two years at the nearest monitoring station, for the worst-case scenario. The predicted CALINE4 concentration is calculated for the one-hour averaging time. The one-hour CO concentrations predicted by CALINE4 were multiplied by a persistence factor of 0.7 to determine the predicted eight-hour CO concentrations.

Regional emissions were calculated from motor vehicles. Predictions for air pollutant emissions generated by the project traffic were calculated with the URBEMIS 2002 model, based on the trip generations projected for the project from the traffic study (AFA, June 2005). Emissions from stationary sources such as natural gas usage were also calculated with URBEMIS 2002.

Thresholds of Significance

Specific criteria for determining whether the potential air quality impacts of a project are significant are set forth in the SCAQMD's *CEQA Air Quality Handbook*. The criteria include emissions thresholds, compliance with State and national air quality standards, and consistency with the current AQMP.

Thresholds for Construction Emissions. The following significance thresholds for construction emissions have been established by the SCAQMD:

- 75 pounds per day of reactive organic compounds (ROC)
- 100 pounds per day of NO_X
- 550 pounds per day of CO
- 150 pounds per day of PM_{10}
- 150 pounds per day of SO_X

Projects in the Basin with construction-related emissions that exceed any of the emission thresholds above are considered significant per CEQA.

Thresholds for Pollutants with Regional Effects from Project Operations. The daily operational emissions "significance" thresholds are as follows:

- 55 pounds per day of ROC
- 55 pounds per day of NO_X
- 550 pounds per day of CO
- 150 pounds per day of PM_{10}
- 150 pounds per day of SO_X

Projects in the Basin with operation-related emissions that exceed any of the emission thresholds are considered significant per CEQA.

Standards for Pollutants with Localized "Hot Spot" Effects. Air pollutant standards for CO are as follows:

- California State one-hour CO standard of 20.0 ppm
- California State eight-hour CO standard of 9.0 ppm

The significance of localized project impacts depends on whether ambient CO levels in the vicinity of the project are above or below State and federal CO standards. When ambient levels are below the standards without the project emissions, a project is considered to have significant impacts if project-related emissions result in an exceedance of one or more of these standards. According to Section 9.4 of the SCAQMD *CEQA Air Quality Handbook*, if ambient levels already exceed a State or federal standard, project emissions are considered significant if they increase one-hour CO concentrations by 1.0 ppm or more or eight-hour CO concentrations by 0.45 ppm or more.

IMPACTS AND RECOMMENDED MEASURES

Project Impacts

Air pollutant emissions associated with the project would occur over the short term from grading and construction activities, such as fugitive dust from site preparation and grading and emissions from equipment exhaust. There would be long-term regional emissions associated with project-related vehicular trips and stationary source emissions due to energy consumption such as natural gas usage by the proposed project. Long-term local CO emissions at intersections in the project vicinity are not expected to be significantly affected by project-related traffic.

Construction Impacts. Construction activities produce combustion emissions from various sources such as utility engines, on-site heavy-duty construction vehicles, equipment hauling materials to and from the site, asphalt paving, and motor vehicles transporting the construction crew. Exhaust emissions from construction activities envisioned on site would vary daily as construction activity levels change. The use of construction equipment on site would result in localized exhaust emissions.

Construction activities associated with new development occurring on the project site would temporarily increase localized PM_{10}, ROC, NO_X, and CO concentrations in the project vicinity. The primary sources of construction-related ROC and NO_X emissions are gasoline- and diesel-powered, heavy-duty mobile construction equipment such as scrapers and motor graders. Primary sources of PM_{10} emissions would be clearing activities, excavation and grading operations, construction vehicle traffic on unpaved ground, and wind blowing over exposed earth surfaces.

Emissions generated from construction activities are anticipated to cause temporary increases in pollutant concentrations that could contribute to the continuing violations of the federal and State maximum concentration standards. The frequency and concentrations of such violations would depend on several factors, including the soil composition on the site, the amount of soil disturbed, wind speed, the number and type of machinery used, the construction schedule, and the proximity of other construction and demolition projects.

Grading Activities. Phase 1 of the proposed project includes the construction of: (1) 200 residential units, and (2) 8,000 square feet of commercial use. Phase 2 of the project includes the construction of the remaining 237 residential units.

Equipment exhaust, material transport, and construction crew commutes will generate gaseous emissions during grading. It is assumed that on a peak day during the grading phase, the following equipment could be used: 2 rubber-tired dozers (8 hours/day), 3 scrapers (8 hours/day), 1 rubber-tired loader (8 hours/day), 2 motor graders (8 hours/day), 1 water truck (15 miles/day), 25 haul truck trips (30 miles/day each), and 40 workers (40 miles/day each). Based on emission factors in the EPA AP-42 documents and the SCAQMD *CEQA Air Quality Handbook*, Table F lists the construction equipment exhaust emissions during a peak grading day. Table F also lists the vehicle exhaust emissions associated with the workers' commute on a peak grading day, assuming a crew of 40 and an average round-trip commute of 40 miles. Table F shows that on a peak grading day, emissions from the construction activities would exceed the SCAQMD-established daily NO_X emissions thresholds for construction. On a typical grading day, it is

estimated that only 60 percent of the workload or, proportionally, the air pollutant emissions would be emitted.

Table F: Peak-Day Construction Equipment Exhaust Emissions

Number and Equipment Type[1]	No. of Hours in Operation	Pollutants[2] (pounds/day)				
		CO	ROC	NO_X	SO_X	PM_{10}
2 Rubber-Tired Dozers	8	17.7	3.5	46.7	7.2	1.9
3 Scrapers	8	21.8	5.5	73.2	11.9	1.9
1 Rubber-Tired Loader	8	3.5	0.9	9.5	1.8	0.5
2 Motor Graders	8	8.8	2.2	24.6	4.4	1.3
1 Water Truck	40 miles	0.6	0.0	0.2	0.0	0.0
25 Haul Truck Trips	30 miles each	10.7	1.1	17.5	0.2	0.5
Workers' Commute[3]	40 miles each	14.1	0.5	1.9	0.0	0.1
TOTAL		**77.2**	**13.7**	**173.6**	**25.5**	**7.2**
SCAQMD Threshold		**550**	**75**	**100**	**150**	**150**
Exceeds Threshold?		**No**	**No**	**Yes**	**No**	**No**

Source: LSA 2005; SCAQMD *CEQA Air Quality Handbook*, 1993; and EPA, *AP-42, Fifth Edition*, 1995.

Fugitive dust emissions are generally associated with grading, land clearing, exposure, vehicle and equipment travel on unpaved roads, and dirt/debris pushing. Dust generated during construction activities would vary substantially depending on the level of activity, the specific operations, and weather conditions. Sensitive receptors in the project vicinity and on-site construction workers may be exposed to blowing dust, depending upon prevailing wind conditions.

Regional rules exist that would help reduce fugitive dust emissions during construction periods, which would reduce short-term air quality impacts. Fugitive dust from a construction site must be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. Dust suppression techniques would be implemented to prevent fugitive dust from creating a nuisance off site. Implementation of these dust suppression techniques can reduce the fugitive dust generation (and thus the PM_{10} component) by 50 percent or more. Compliance with these rules would reduce impacts on nearby sensitive receptors.

PM_{10} emissions from site clearance and grading operations during a peak construction day for the project site are based on assumptions and past experience on similarly sized projects. The SCAQMD estimates that each acre of graded surface creates about 26.4 pounds of PM_{10} per

1 Number of equipment, equipment type, and number of workers are based on estimates provided to LSA on grading.

2 Emissions factors are from the SCAQMD *CEQA Air Quality Handbook*, Table A9-8-A, Table A9-8-B, and Table A9-8-C.

3 Assumption based on 40 workers traveling 40 miles (round trip) per worker.

workday during the construction phase of the project and 21.8 pounds of PM_{10} per hour from dirt/debris pushing per dozer. Based on the construction estimates, fugitive dust emissions from excavation, hauling/transport, dumping/reclamation, wind erosion, and miscellaneous activities during grading days, the uncontrolled PM_{10} emissions would be 465.5 pounds per day (lbs/day). However, with the implementation of the Standard Air Pollution Control Measures, fugitive dust emissions from construction activities are expected to be reduced by 50 percent. The PM_{10} emissions under the controlled condition would be reduced to 232.7 lbs/day. Table G lists fugitive dust emissions and construction equipment exhausts.

Table G shows that, during peak grading days, daily total construction emissions with compliance with the Standard Air Pollution Control Measures would exceed the SCAQMD thresholds for NO_X and PM_{10}. This is considered a significant impact.

Table G: Peak Grading Day Total Emissions (lbs/day)

Category	CO	ROC	NO_X	SO_X	PM_{10}
Vehicle/Equipment Exhaust (Table G)	77.2	13.7	173.6	25.5	7.2
Fugitive Dust from Soil Disturbance, No Controls	—	—	—	—	465.5
Fugitive Dust from Soil Disturbance, with 50 Percent Control Efficiency	—	—	—	—	232.7
Total Grading, No Controls	77.2	13.7	173.6	25.5	472.7
Total Grading, with Controls	77.2	13.7	173.6	25.5	239.9
SCAQMD Threshold	**550**	**75**	**100**	**150**	**150**
Significant? (With Controls)	**No**	**No**	**Yes**	**No**	**Yes[1]**

Source: LSA 2005; EPA, *AP-42, Fifth Edition,* 1995.

Building Activities. Building construction will be conducted in phases. Phase 1 of the project is anticipated to be completed by 2007. After completion of Phase 1, the project's Phase 2 development will be completed by 2030. Building construction uses different types of equipment on the project site than during the grading period. It is anticipated that 1 crane (8 hours/day), 1 forklift (8 hours/day), 1 backhoe (8 hours/day), 1 excavator (8 hours/day), and 2 generators (8 hours/day) would be used. In addition, 20 haul truck trips (30 miles/day each) and 50 workers (40 miles/day each) will be needed on a peak day. Similarities do exist in terms of equipment exhaust emissions and fugitive dust emissions. However, it is anticipated that emissions during building construction would be below peak grading day emissions. Therefore, air pollution control measures implemented for the peak grading day emissions would be adequate to reduce emissions during other construction periods.

Architectural Coatings. Architectural coatings contain volatile organic compounds (VOC) that are similar to ROC and are part of the O_3 precursors. At this time, there is no project-specific information available for the types and volumes of architectural coatings needed for the proposed on-site buildings. Based on the number of proposed on-site buildings and the square footage of these buildings, the proposed project is expected to result in architectural coatings-related ROC emissions exceeding the SCAQMD daily threshold of 75 lbs/day. The proposed project will

[1] With control measures for fugitive dust implemented.

comply with the SCAQMD Rule 1113 on the use of architectural coatings. After implementation of the SCAQMD Rule 1113, emissions associated with architectural coatings could be further reduced by using precoated/natural colored building materials, water-based or low-VOC coating, and coating transfer or spray equipment with high transfer efficiency. For example, a high-volume, low-pressure (HVLP) spray method is a coating application system operated at air pressure between 0.1 and 10 pounds per square inch gauge (psig), with 65 percent transfer efficiency. Manual coating applications such as a paintbrush, hand roller, trowel, spatula, dauber, rag, or sponge have 100 percent transfer efficiency.

Summary of Construction Emissions. Based on the above, with implementation of feasible measures during construction of the proposed project, emissions from construction equipment exhaust and soil disturbance would be minimized. However, construction emissions from the project would exceed the daily emissions thresholds for ROC, NO_X, and PM_{10} established by the SCAQMD. Construction of the proposed project would result in potentially significant air quality impacts.

Long-Term Project-Related Emissions Impacts. The following discusses project-related long-term air quality impacts.

Area Sources Emissions. The proposed project would result in stationary source emissions from natural gas usage and consumer products. The emissions associated with area sources would be small when compared to mobile source emissions. Emissions associated with area sources were calculated with URBEMIS 2002 and are included in the corresponding tables below for land uses under the Phase 1 and completion of the Phase 2 project development.

Mobile Sources Emissions. The proposed Phase 1 project development is estimated to generate 2,257 net total new vehicular trips per day (AFA, June 2005). After completion of both Phase 1 and Phase 2 development, the proposed project is estimated to generate 3,926 vehicular trips per day (AFA, June 2005). Using the default emissions factors included in URBEMIS 2002, emissions associated with vehicular trips for Phase 1 (2006 emissions factors) and Phase 2 project completion (2008 emissions factors) conditions are shown in Tables H and I, respectively.

Table H shows that total on-site emissions for CO, ROC, NO_X, SO_2, and PM_{10} would be below the SCAQMD daily emissions thresholds after implementation of Phase 1 development, and Table I shows that total on-site emissions for ROC would be higher than the SCAQMD daily emissions thresholds after implementation of both Phase 1 and Phase 2 of the proposed project. Therefore, potential significant regional air quality impacts would occur with the implementation of the proposed project.

Table H: Proposed Phase 1 Development (2006) Land Use Emissions

Source	Pollutants, lbs/day				
	CO	ROC	NO_X	SO_2	PM_{10}
Stationary Sources: Summer	2.27	13.48	1.59	0.00	0.01
Vehicular Traffic: Summer	255.33	21.45	23.38	0.23	21.23
Subtotal Summer	257.60	34.94	24.97	0.23	21.24
Stationary Sources: Winter	0.85	13.25	1.92	0.00	0.03
Vehicular Traffic: Winter	244.48	20.35	34.00	0.21	21.23
Subtotal Winter	245.33	33.60	35.92	0.21	21.26
SCAQMD Threshold	**550**	**55**	**55**	**150**	**150**
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**

Source: LSA, June 2005.

Table I: Proposed Total Project (2008) Land Use Emissions

Source	Pollutants, lbs/day				
	CO	ROC	NO_X	SO_2	PM_{10}
Stationary Sources: Summer	3.03	29.03	3.38	0.00	0.01
Vehicular Traffic: Summer	345.11	32.70	31.67	0.21	32.28
Subtotal Summer	348.14	61.73	35.05	0.21	32.29
Stationary Sources: Winter	1.78	28.82	4.10	0.00	0.07
Vehicular Traffic: Winter	334.00	29.48	45.62	0.18	32.28
Subtotal Winter	335.77	58.30	49.72	0.18	32.35
SCAQMD Threshold	**550**	**55**	**55**	**150**	**150**
Exceeds Threshold?	**No**	**Yes**	**No**	**No**	**No**

Source: LSA, June 2005.

Despite great progress in air quality improvement, approximately 146 million people nationwide lived in counties with pollution levels above the NAAQS in 2002. Out of the 230 nonattainment areas identified during the 1990 Clean Air Act Amendment designation process, 124 areas remain as nonattainment today. In these nonattainment areas, however, the severity of air pollution episodes has decreased. Air quality in the South Coast Air Basin in the past 20 years has improved steadily and dramatically, even with the tremendous increase in population, vehicles, and other sources. Long-term exposure to elevated levels of criteria pollutants could result in potential health effects. However, as stated in the Thresholds of Significance, emissions thresholds established by the air district are used to manage total regional emissions within an air basin based on the air basin attainment status for criteria pollutants. These emissions thresholds were established for individual projects that would contribute to regional emissions and pollutant concentrations that may affect or delay the projected attainment target year for certain criteria pollutants.

Due to the conservative nature of the thresholds and the basinwide context of an individual project's emissions, there is no direct correlation of a single project to localized health effects. One individual project having emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like NO_X and ROC.

Based on the above discussion, the potential for an individual project to significantly deteriorate regional air quality or contribute to significant health risk is small, even if the emissions thresholds are exceeded by the project. Due to the overall improvement trend on air quality in the air basin, it is unlikely that the regional air quality or health risk would worsen from the current condition due to emissions from an individual project.

Long-Term Microscale (CO Hot Spot) Analysis. The intersection vehicle turn volumes included in the traffic study report (AFA, June 2005) were used in the Caltrans CALINE4 model to evaluate the local CO concentrations at intersections most affected by project traffic. The intersections that either have the highest turn volumes or worst level of service (LOS) in the project vicinity most affected by the project traffic were selected for the CO hot spot analysis. Table J lists the CO concentrations for one intersection (Bouquet Canyon Road and Soledad Canyon Road, the only intersection provided with existing traffic turn volumes) in the project vicinity under the existing (2005) conditions. Table K lists the CO level in the project completion (2008) year under the with and without project scenarios. Table L lists the CO level in the Interim Year (2015) under the with and without project scenarios. It should be pointed out that, due to technological improvements, emissions factors (for vehicle exhaust) for future years would decrease. In addition, background concentrations in future years are anticipated to continue to decrease as the concerted effort to improve regional air quality progresses. Therefore, CO concentrations in the future years would generally be lower than existing conditions or more recent years in the future. The following analysis evaluates CO concentrations in 2008 (after the entire project is completed) and in 2015 (Interim Year). It is anticipated that in the future years beyond the Interim Year (2015), CO concentrations at similar locations would be lower, even with higher projected traffic volumes.

Table J shows that under the existing condition, the 8-hour CO concentrations at the intersection of Bouquet Canyon Road and Soledad Canyon Road would exceed the federal and State standards of 9 ppm due to heavy traffic volumes and a level of service (LOS) F condition. In the future years, vehicle exhaust and therefore CO emission factors would decrease. The proposed project would contribute to increased CO concentrations at intersections in the project vicinity. As shown in Tables K and L, none of the 5 intersections analyzed would have a one-hour CO concentration exceeding State standards of 20 ppm under 2008 and 2015 with and without project conditions. The eight-hour CO concentration at these intersections would also be below the State standard of 9.0 ppm.

Table J: Existing CO Concentrations[1]

Intersection	Receptor Distance to Road Centerline (Meters)	Existing One-Hour CO Concentration (ppm)	Existing Eight-Hour CO Concentration (ppm)	Exceeds State Standards	
				1-Hr	8-Hr
Bouquet Cyn & Soledad Cyn.	21	15.1	10.6	No	Yes
	21	13.1	9.2	No	Yes
	17	13.0	9.2	No	Yes
	7	12.0	8.5	No	No

Source: LSA Associates, Inc. June 2005

Table K: 2008 CO Concentrations[1] without and with the Project

Intersection	Receptor Distance to Road Centerline (Meters)	Project-Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards	
					1-Hr	8-Hr
Bouquet Cyn & Soledad Cyn.	21 / 21	0.1 / 0.1	13.5 / 13.6	8.1 / 8.2	No	No
	21 / 17	0.1 / 0.1	12.0 / 12.1	7.0 / 7.1	No	No
	17 / 15	0.0 / 0.0	11.9 / 11.9	7.0 / 7.0	No	No
	7 / 7	0.1 / 0.1	11.1 / 11.2	6.4 / 6.5	No	No
Project Drwy 1 & Soledad Cyn.	21 / 21	-0.2 / -0.1	10.5 / 10.3	6.0 / 5.9	No	No
	17 / 17	-0.3 / -0.2	10.2 / 9.9	5.8 / 5.6	No	No
	17 / 17	-0.1 / -0.1	9.6 / 9.5	5.4 / 5.3	No	No
	7 / 7	-0.1 / -0.1	9.5 / 9.4	5.3 / 5.2	No	No
Project Drwy 2 & Soledad Cyn.	7 / 7	-0.2 / -0.1	11.7 / 11.5	6.8 / 6.7	No	No
	7 / 7	-0.3 / -0.2	11.7 / 11.4	6.8 / 6.6	No	No
	7 / 7	-0.1 / -0.1	11.5 / 11.4	6.7 / 6.6	No	No
	7 / 7	-0.1 / -0.1	11.5 / 11.4	6.7 / 6.6	No	No
Valley Center & Soledad Cyn.	7 / 7	0.1 / 0.1	11.4 / 11.5	6.6 / 6.7	No	No
	7 / 7	0.1 / 0.0	10.9 / 11.0	6.3 / 6.3	No	No
	7 / 7	0.0 / 0.0	10.6 / 10.6	6.1 / 6.1	No	No
	7 / 7	0.1 / 0.0	10.3 / 10.4	5.9 / 5.9	No	No
Golden Valley Rd. & Valley Center	7 / 7	0.2 / 0.1	8.2 / 8.4	4.4 / 4.5	No	No
	7 / 7	0.1 / 0.1	8.0 / 8.1	4.2 / 4.3	No	No
	7 / 7	0.2 / 0.1	7.5 / 7.7	3.9 / 4.0	No	No
	7 / 7	0.2 / 0.2	7.4 / 7.6	3.8 / 4.0	No	No

Source: LSA Associates, Inc. June 2005

[1] Includes ambient one-hour concentration of 4.8 ppm and ambient eight-hour concentration of 2.0 ppm. Measured at the 22224 Placerita Canyon Rd, Santa Clarita, CA, AQ Station (Los Angeles County).

Table L: 2015 CO Concentrations[1] without and with the Project

Intersection	Receptor Distance to Road Centerline (Meters)	Project-Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards	
					1-Hr	8-Hr
Bouquet Cyn & Soledad Cyn.	21 / 21	0.1 / 0.1	8.4 / 8.5	4.5 / 4.6	No	No
	21 / 21	0.0 / 0.0	8.3 / 8.3	4.5 / 4.5	No	No
	17 / 17	0.0 / 0.0	8.1 / 8.1	4.3 / 4.3	No	No
	7 / 7	0.0 / 0.0	7.9 / 7.9	4.2 / 4.2	No	No
Project Drwy 1 & Soledad Cyn.	21 / 21	0.2 / 0.1	6.5 / 6.7	3.2 / 3.3	No	No
	17 / 17	0.2 / 0.2	6.4 / 6.6	3.1 / 3.3	No	No
	17 / 17	0.1 / 0.0	6.3 / 6.4	3.1 / 3.1	No	No
	17 / 17	0.1 / 0.1	6.1 / 6.2	2.9 / 3.0	No	No
Project Drwy 2 & Soledad Cyn.	7 / 7	0.0 / 0.0	6.9 / 6.9	3.5 / 3.5	No	No
	7 / 7	0.0 / 0.0	6.9 / 6.9	3.5 / 3.5	No	No
	7 / 7	0.1 / 0.1	6.8 / 6.9	3.4 / 3.5	No	No
	7 / 7	0.0 / 0.0	6.8 / 6.8	3.4 / 3.4	No	No
Valley Center & Soledad Cyn.	7 / 7	0.0 / 0.0	8.1 / 8.1	4.3 / 4.3	No	No
	7 / 7	0.1 / 0.0	7.6 / 7.7	4.0 / 4.0	No	No
	7 / 7	0.2 / 0.1	7.5 / 7.7	3.9 / 4.0	No	No
	7 / 7	0.1 / 0.1	7.5 / 7.6	3.9 / 4.0	No	No
Golden Valley Rd. & Valley Center	7 / 7	0.0 / 0.0	7.6 / 7.6	4.0 / 4.0	No	No
	7 / 7	0.1 / 0.1	7.2 / 7.3	3.7 / 3.8	No	No
	7 / 7	0.1 / 0.1	7.2 / 7.3	3.7 / 3.8	No	No
	7 / 7	0.0 / 0.0	7.2 / 7.2	3.7 / 3.7	No	No

Source: LSA Associates, Inc. June 2005

[1] Includes ambient one-hour concentration of 4.8 ppm and ambient eight-hour concentration of 2.0 ppm. Measured at the 22224 Placerita Canyon Rd, Santa Clarita, CA, AQ Station (Los Angeles County).

The project-related increase in CO concentrations at all eight intersections would be 0.2 ppm or less for both the one-hour period and the eight-hour period. Since no federal or State standards would be exceeded, no CO hot spot would occur. Therefore, no air pollution control measures are necessary or recommended for CO emissions.

Air Quality Management Plan Consistency. In order to accurately assess the environmental impacts as a result of new or renovated developments, environmental pollution and population growth are projected for future scenarios in the general plans of local jurisdictions and incorporated into the regional AQMPs. The project pollutant emissions would not contribute to new exceedances of the SCAQMD's established daily emission thresholds. However, the project will need amendments to the projections of the City's General Plan and the SCAQMD's 1997 AQMP. The project is therefore considered not consistent with the most recently adopted AQMP. However, upon project approval and submittal of the City's General Plan to SCAG and SCAQMD for inclusion in the next version of the AQMP, the proposed project will be consistent with the regional air quality plan.

Cumulative Impacts. The traffic study included vehicular trips from all present and future projects in the project vicinity. Therefore, CO hot spot concentrations calculated at these intersections include the cumulative traffic effect. Based on Tables K and L, no significant cumulative CO impacts would occur.

Construction of the project would contribute cumulatively to the local and regional air pollutants together with other projects in the City that are under construction. Emissions associated with operation of the proposed project would contribute to long-term regional air pollutants. However, a net increase in criteria pollutant emissions would not exceed the SCAQMD emission thresholds. Therefore, implementation of the proposed project would not contribute to significant cumulative air quality impacts.

Recommended Standard Project Measures. Because project-related construction emissions would exceed the SCAQMD thresholds for criteria pollutants, the following measures are recommended to minimize air pollutant emissions. Compliance with the fugitive dust palliative SCAQMD Rules 402 and 403 have been utilized in the impact analyses to reduce potential PM_{10} emissions to within SCAQMD thresholds.

- During construction, the contractor shall be responsible for ensuring that all measures listed in Table M are implemented. To achieve the particulate control efficiencies shown, it is assumed that finished surfaces will be stabilized with water and/or dust palliatives and isolated from traffic flows to prevent emissions of fugitive dust from these areas. In addition, the following water application rates are assumed:
    - Roads traveled by autos, rock trucks, water trucks, fuel trucks, and maintenance trucks: up to twice per hour
    - Roads traveled by scrapers and loaders; active excavation area: up to three times per hour
    - Finish grading area: up to once every two hours

- All construction equipment shall be maintained in good operating condition so as to reduce operational emissions. The contractor will ensure that all construction equipment is being properly serviced and maintained.
- The construction contractor shall utilize, as much as possible, precoated/natural colored building materials, water-based or low-VOC coating, and coating transfer or spray equipment with high transfer efficiency, such as HVLP spray method, or manual coatings application such as a paintbrush, hand roller, trowel, spatula, dauber, rag, or sponge.
- Project design will incorporate energy-saving features throughout the project, including low-emission water heaters, central water heating systems, and built-in energy efficient appliances.
- Parking areas will be planted with trees to insure shading and prevent heat buildup.

Conclusion

The proposed project would result in criteria pollutants exceeding the SCAQMD daily emissions thresholds during construction.

The proposed project would result in exceedances of daily emissions thresholds established by the SCAQMD for ROC from project-related net change in vehicular and stationary sources emissions. CO concentrations would remain below both State and federal CO standards. In addition, significant cumulative air quality impacts would not occur as a result of the proposed project.

Table M: Standard Measures for Construction-Related Emissions

Construction Vehicle/Equipment Operation
• Configure construction parking to minimize traffic interference.
• Provide temporary traffic control during all phases of construction activities to improve traffic flow (e.g., flag person).
• Provide on-site food service for construction workers.
• Prohibit truck idling in excess of 10 minutes.
• Apply four to six degree injection timing retard to diesel IC engines, whenever feasible.
• Use reformulated low-sulfur diesel fuel in all equipment, whenever feasible.
• Use catalytic converters on all gasoline-powered equipment.
• Minimize concurrent use of equipment through equipment phasing.
• Use low NO_X engines, alternative fuels, and electrification, whenever feasible.
• Substitute electric and gasoline-powered equipment for diesel-powered equipment, whenever feasible.
• Turn off engines when not in use.
• Wash truck wheels before the trucks leave the construction site.
• When operating on site, do not leave trucks idling for periods in excess of 10 minutes.
• Operate clean fuel van(s), preferably vans that run on compressed natural gas or propane, to transport construction workers to and from the construction site.
• Provide documentation to the City prior to beginning construction, demonstrating that the project proponents will comply with all SCAQMD regulations including 402, 403, 1113, and 1403.
• Suspend use of all construction equipment operations during second stage smog alerts.
Grading
• Apply nontoxic soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
• Enclose, cover, water twice daily, or apply nontoxic soil binders, according to manufacturers' specifications, to exposed piles (i.e., gravel, sand, dirt) with 5 percent or greater silt content.
• Water active sites at least twice daily.
• Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph.
• Cover all trucks hauling dirt, sand, soil, or other loose materials on site or maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer) in accordance with the requirements of CDC Section 23114.
• Cover all trucks hauling these materials off site.
Paved Roads
• Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved road (water sweepers with reclaimed water are recommended).
• Sweep public streets at the conclusion of construction work.
• Install adequate storm water control systems to prevent mud deposition onto paved areas.
Unpaved Roads
• Apply water three times daily, or nontoxic soil stabilizers according to manufacturers' specifications, to all unpaved parking or staging areas or unpaved road surfaces.

Source: SCAQMD Rules 402 and 403; LSA, 2005.

APPENDIX A

URBEMIS 2002 MODEL OUTPUTS

SOLEDAD TOWNHOUSES

AIR QUALITY REGIONAL EMISSIONS

URBEMIS 2002 MODEL PRINTOUTS

URBEMIS 2002 For Windows 8.7.0

File Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Phase I.urb
Project Name: Soledad Townhomes
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	13.48	1.59	2.27	0.00	0.01
TOTALS (lbs/day, mitigated)	13.41	1.28	1.81	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	21.45	23.38	255.33	0.23	21.23
TOTALS (lbs/day, mitigated)	20.98	22.76	248.56	0.23	20.67

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	34.94	24.97	257.60	0.23	21.24
TOTALS (lbs/day, mitigated)	34.39	24.04	250.38	0.23	20.68

URBEMIS 2002 For Windows 8.7.0

File Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Phase I.urb
Project Name: Soledad Townhomes
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	13.25	1.92	0.85	0.00	0.03
TOTALS (lbs/day, mitigated)	13.23	1.60	0.71	0.00	0.03

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	20.35	34.00	244.48	0.21	21.23
TOTALS (lbs/day, mitigated)	19.81	33.10	238.01	0.20	20.67

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	33.60	35.92	245.33	0.21	21.26
TOTALS (lbs/day, mitigated)	33.04	34.70	238.72	0.20	20.70

URBEMIS 2002 For Windows 8.7.0

File Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Phase I.urb
Project Name: Soledad Townhomes
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.12	1.59	0.71	0	0.00
Hearth	0.02	0.33	0.14	0.00	0.03
Landscaping - No winter emissions					
Consumer Prdcts	9.78	-	-	-	-
Architectural Coatings	3.33	-	-	-	-
TOTALS(lbs/day,unmitigated)	13.25	1.92	0.85	0.00	0.03

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Condo/townhouse general	12.23	20.06	145.54	0.12	12.62
Regnl shop. center	8.12	13.94	98.94	0.08	8.62
TOTAL EMISSIONS (lbs/day)	20.35	34.00	244.48	0.21	21.23

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2006 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Condo/townhouse general	0.00	6.21 trips/dwelling unit	200.00	1,242.00
Regnl shop. center		126.88 trips/1000 sq. ft.	8.00	1,015.04
		Sum of Total Trips		2,257.04
		Total Vehicle Miles Traveled		13,989.76

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.60	2.20	97.30	0.50
Light Truck < 3,750 lbs	15.10	4.00	93.40	2.60
Light Truck 3,751- 5,750	15.90	1.90	96.90	1.20
Med Truck 5,751- 8,500	7.00	1.40	95.70	2.90
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	10.00	20.00	70.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.10	0.00	0.00	100.00
Motorcycle	1.70	82.40	17.60	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	0.00	91.70	8.30

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Condominium/townhouse general
have changed from the defaults 6.9/12.5 to 6.21/

Changes made to the default values for Area

The area souce mitigation measure option switch changed from off to on.
The wood stove percentage changed from 35 to 0.
The wood fireplace percentage changed from 10 to 0.
The natural gas fireplace percentage changed from 55 to 30.
The no hearth options percentage changed from 0 to 70.
Mitigation measure Residential Increase Efficiency Beyond Title 24
has been changed from off to on.
Mitigation measure Commercial Increase Efficiency Beyond Title 24
has been changed from off to on.
Mitigation measure Residential Electric Landscape Maintenance Equipment
has been changed from off to on.
Mitigation measure Commercial/Industrial Electric Landscape Maintenance Equipment
has been changed from off to on.

Changes made to the default values for Operations

The mitigation option switch changed from off to on.
The operational emission year changed from 2005 to 2006.
The Res and Non-Res Local-Serving Retail Mitigation changed from off to on.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Phase I.urb
Project Name: Soledad Townhomes
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.12	1.59	0.71	0	0.00
Hearth - No summer emissions					
Landscaping	0.25	0.01	1.56	0.00	0.01
Consumer Prdcts	9.78	-	-	-	-
Architectural Coatings	3.33	-	-	-	-
TOTALS(lbs/day,unmitigated)	13.48	1.59	2.27	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Condo/townhouse general	14.24	13.78	153.79	0.14	12.62
Regnl shop. center	7.21	9.60	101.54	0.09	8.62
TOTAL EMISSIONS (lbs/day)	21.45	23.38	255.33	0.23	21.23

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2006 Temperature (F): 90 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Condo/townhouse general	0.00	6.21 trips/dwelling unit	200.00	1,242.00
Regnl shop. center		126.88 trips/1000 sq. ft.	8.00	1,015.04
		Sum of Total Trips		2,257.04
		Total Vehicle Miles Traveled		13,989.76

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.60	2.20	97.30	0.50
Light Truck < 3,750 lbs	15.10	4.00	93.40	2.60
Light Truck 3,751- 5,750	15.90	1.90	96.90	1.20
Med Truck 5,751- 8,500	7.00	1.40	95.70	2.90
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	10.00	20.00	70.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.10	0.00	0.00	100.00
Motorcycle	1.70	82.40	17.60	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	0.00	91.70	8.30

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Condominium/townhouse general
have changed from the defaults 6.9/12.5 to 6.21/

Changes made to the default values for Area

The area souce mitigation measure option switch changed from off to on.
The wood stove percentage changed from 35 to 0.
The wood fireplace percentage changed from 10 to 0.
The natural gas fireplace percentage changed from 55 to 30.
The no hearth options percentage changed from 0 to 70.
Mitigation measure Residential Increase Efficiency Beyond Title 24
has been changed from off to on.
Mitigation measure Commercial Increase Efficiency Beyond Title 24
has been changed from off to on.
Mitigation measure Residential Electric Landscape Maintenance Equipment
has been changed from off to on.
Mitigation measure Commercial/Industrial Electric Landscape Maintenance Equipment
has been changed from off to on.

Changes made to the default values for Operations

The mitigation option switch changed from off to on.
The operational emission year changed from 2005 to 2006.
The Res and Non-Res Local-Serving Retail Mitigation changed from off to on.

URBEMIS 2002 For Windows 8.7.0

'ile Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Buildout-2008.urb
'roject Name: Soledad Townhomes
'roject Location: South Coast Air Basin (Los Angeles area)
)n-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

\REA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	29.03	3.38	3.03	0.00	0.01
TOTALS (lbs/day, mitigated)	28.93	2.71	2.42	0.00	0.01

)PERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	32.70	31.67	345.11	0.21	32.28
TOTALS (lbs/day, mitigated)	32.19	31.04	338.21	0.21	31.63

3UM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	61.73	35.05	348.14	0.21	32.29
TOTALS (lbs/day, mitigated)	61.12	33.74	340.64	0.21	31.64

URBEMIS 2002 For Windows 8.7.0

'ile Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Buildout-2008.urb
'roject Name: Soledad Townhomes
'roject Location: South Coast Air Basin (Los Angeles area)
)n-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

.REA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	28.82	4.10	1.78	0.00	0.07
TOTALS (lbs/day, mitigated)	28.77	3.42	1.48	0.00	0.06

)PERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	29.48	45.62	334.00	0.18	32.28
TOTALS (lbs/day, mitigated)	28.89	44.71	327.32	0.17	31.63

)UM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	58.30	49.72	335.77	0.18	32.35
TOTALS (lbs/day, mitigated)	57.66	48.13	328.80	0.18	31.70

URBEMIS 2002 For Windows 8.7.0

'ile Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Buildout-2008.urb
'roject Name: Soledad Townhomes
'roject Location: South Coast Air Basin (Los Angeles area)
)n-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.26	3.37	1.47	0	0.01
Hearth	0.04	0.72	0.31	0.00	0.06
Landscaping - No winter emissions					
Consumer Prdcts	21.38	-	-	-	-
Architectural Coatings	7.14	-	-	-	-
TOTALS(lbs/day,unmitigated)	28.82	4.10	1.78	0.00	0.07

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Condo/townhouse general	25.08	39.42	287.48	0.15	28.16
Regnl shop. center	4.39	6.20	46.52	0.02	4.12
TOTAL EMISSIONS (lbs/day)	29.48	45.62	334.00	0.18	32.28

Includes correction for passby trips.
Includes the following double counting adjustment for internal trips:
Residential trips: 9.41 % reduction. Nonresidential trips: 30.24 % reduction.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2008 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Condo/townhouse general	30.00	7.25 trips/dwelling unit	437.00	3,167.00
Regnl shop. center		94.87 trips/1000 sq. ft.	8.00	759.00
		Sum of Total Trips		3,926.00
		Total Vehicle Miles Traveled		21,262.75

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.00	1.60	98.00	0.40
Light Truck < 3,750 lbs	15.00	2.70	95.30	2.00
Light Truck 3,751- 5,750	16.20	1.20	97.50	1.30
Med Truck 5,751- 8,500	7.20	1.40	95.80	2.80
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.70	76.50	23.50	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	8.30	83.30	8.40

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Condominium/townhouse general have changed from the defaults 6.9/27.31 to 8/30

Changes made to the default values for Area

The area souce mitigation measure option switch changed from off to on.
The wood stove percentage changed from 35 to 0.
The wood fireplace percentage changed from 10 to 0.
The natural gas fireplace percentage changed from 55 to 30.
The no hearth options percentage changed from 0 to 70.
Mitigation measure Residential Increase Efficiency Beyond Title 24 has been changed from off to on.
Mitigation measure Commercial Increase Efficiency Beyond Title 24 has been changed from off to on.
Mitigation measure Residential Electric Landscape Maintenance Equipment has been changed from off to on.
Mitigation measure Commercial/Industrial Electric Landscape Maintenance Equipment has been changed from off to on.

Changes made to the default values for Operations

The pass by trips option switch changed from off to on.
The double counting option switch changed from off to on.
The mitigation option switch changed from off to on.
The operational emission year changed from 2005 to 2008.
The Res and Non-Res Local-Serving Retail Mitigation changed from off to on.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Buildout-2008.urb
Project Name: Soledad Townhomes
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.26	3.37	1.47	0	0.01
Hearth - No summer emissions					
Landscaping	0.25	0.01	1.56	0.00	0.01
Consumer Prdcts	21.38	-	-	-	-
Architectural Coatings	7.14	-	-	-	-
TOTALS(lbs/day,unmitigated)	29.03	3.38	3.03	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Condo/townhouse general	28.82	27.32	300.10	0.19	28.16
Regnl shop. center	3.88	4.35	45.02	0.03	4.12
TOTAL EMISSIONS (lbs/day)	32.70	31.67	345.11	0.21	32.28

Includes correction for passby trips.
Includes the following double counting adjustment for internal trips:
Residential trips: 9.41 % reduction. Nonresidential trips: 30.24 % reduction.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2008 Temperature (F): 90 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Condo/townhouse general	30.00	7.25 trips/dwelling unit	437.00	3,167.00
Regnl shop. center		94.87 trips/1000 sq. ft.	8.00	759.00
		Sum of Total Trips		3,926.00
		Total Vehicle Miles Traveled		21,262.75

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.00	1.60	98.00	0.40
Light Truck < 3,750 lbs	15.00	2.70	95.30	2.00
Light Truck 3,751- 5,750	16.20	1.20	97.50	1.30
Med Truck 5,751- 8,500	7.20	1.40	95.80	2.80
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.70	76.50	23.50	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	8.30	83.30	8.40

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Condominium/townhouse general have changed from the defaults 6.9/27.31 to 8/30

Changes made to the default values for Area

The area souce mitigation measure option switch changed from off to on.
The wood stove percentage changed from 35 to 0.
The wood fireplace percentage changed from 10 to 0.
The natural gas fireplace percentage changed from 55 to 30.
The no hearth options percentage changed from 0 to 70.
Mitigation measure Residential Increase Efficiency Beyond Title 24 has been changed from off to on.
Mitigation measure Commercial Increase Efficiency Beyond Title 24 has been changed from off to on.
Mitigation measure Residential Electric Landscape Maintenance Equipment has been changed from off to on.
Mitigation measure Commercial/Industrial Electric Landscape Maintenance Equipment has been changed from off to on.

Changes made to the default values for Operations

The pass by trips option switch changed from off to on.
The double counting option switch changed from off to on.
The mitigation option switch changed from off to on.
The operational emission year changed from 2005 to 2008.
The Res and Non-Res Local-Serving Retail Mitigation changed from off to on.

URBEMIS 2002 For Windows 8.7.0

ile Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Buildout.urb
roject Name: Soledad Townhomes
roject Location: South Coast Air Basin (Los Angeles area)
n-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

REA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	29.03	3.38	3.03	0.00	0.01
TOTALS (lbs/day, mitigated)	28.93	2.71	2.42	0.00	0.01

PERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	35.27	34.12	374.72	0.21	32.29
TOTALS (lbs/day, mitigated)	34.71	33.44	367.23	0.21	31.64

UM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	64.30	37.51	377.75	0.21	32.30
TOTALS (lbs/day, mitigated)	63.64	36.15	369.65	0.21	31.65

URBEMIS 2002 For Windows 8.7.0

File Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Buildout.urb
Project Name: Soledad Townhomes
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	28.82	4.10	1.78	0.00	0.07
TOTALS (lbs/day, mitigated)	28.77	3.42	1.48	0.00	0.06

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	32.00	49.25	362.66	0.18	32.29
TOTALS (lbs/day, mitigated)	31.37	48.27	355.41	0.17	31.64

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	60.83	53.35	364.44	0.18	32.36
TOTALS (lbs/day, mitigated)	60.14	51.69	356.89	0.18	31.71

URBEMIS 2002 For Windows 8.7.0

File Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Buildout.urb
Project Name: Soledad Townhomes
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.26	3.37	1.47	0	0.01
Hearth	0.04	0.72	0.31	0.00	0.06
Landscaping - No winter emissions					
Consumer Prdcts	21.38	-	-	-	-
Architectural Coatings	7.14	-	-	-	-
TOTALS(lbs/day,unmitigated)	28.82	4.10	1.78	0.00	0.07

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
:ondo/townhouse general	27.24	42.57	312.21	0.15	28.17
:egnl shop. center	4.77	6.68	50.45	0.02	4.12
:OTAL EMISSIONS (lbs/day)	32.00	49.25	362.66	0.18	32.29

:ncludes correction for passby trips.
:ncludes the following double counting adjustment for internal trips:
:esidential trips: 9.41 % reduction. Nonresidential trips: 30.24 % reduction.

)PERATIONAL (Vehicle) EMISSION ESTIMATES

inalysis Year: 2007 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Jnit Type	Acreage	Trip Rate	No. Units	Total Trips
:ondo/townhouse general	30.00	7.25 trips/dwelling unit	437.00	3,167.00
:egnl shop. center		94.87 trips/1000 sq. ft.	8.00	759.00
		Sum of Total Trips		3,926.00
		Total Vehicle Miles Traveled		21,262.75

/ehicle Assumptions:

:leet Mix:

/ehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.20	1.80	97.80	0.40
Light Truck < 3,750 lbs	15.10	3.30	94.00	2.70
Light Truck 3,751- 5,750	16.10	1.90	96.90	1.20
Med Truck 5,751- 8,500	7.10	1.40	95.80	2.80
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.10	0.00	0.00	100.00
Motorcycle	1.70	82.40	17.60	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	8.30	83.30	8.40

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
Regnl shop. center				2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Condominium/townhouse general have changed from the defaults 6.9/27.31 to 8/30

Changes made to the default values for Area

The area souce mitigation measure option switch changed from off to on.
The wood stove percentage changed from 35 to 0.
The wood fireplace percentage changed from 10 to 0.
The natural gas fireplace percentage changed from 55 to 30.
The no hearth options percentage changed from 0 to 70.
Mitigation measure Residential Increase Efficiency Beyond Title 24 has been changed from off to on.
Mitigation measure Commercial Increase Efficiency Beyond Title 24 has been changed from off to on.
Mitigation measure Residential Electric Landscape Maintenance Equipment has been changed from off to on.
Mitigation measure Commercial/Industrial Electric Landscape Maintenance Equipment has been changed from off to on.

Changes made to the default values for Operations

The pass by trips option switch changed from off to on.
The double counting option switch changed from off to on.
The mitigation option switch changed from off to on.
The operational emission year changed from 2005 to 2007.
The Res and Non-Res Local-Serving Retail Mitigation changed from off to on.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\RonaldB\Files\Projects\RBF530 Soledad Townhomes\Project Buildout.urb
Project Name: Soledad Townhomes
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.26	3.37	1.47	0	0.01
Hearth - No summer emissions					
Landscaping	0.25	0.01	1.56	0.00	0.01
Consumer Prdcts	21.38	-	-	-	-
Architectural Coatings	7.14	-	-	-	-
TOTALS(lbs/day,unmitigated)	29.03	3.38	3.03	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
ondo/townhouse general	31.07	29.45	325.84	0.19	28.17
egnl shop. center	4.20	4.68	48.88	0.03	4.12
OTAL EMISSIONS (lbs/day)	35.27	34.12	374.72	0.21	32.29

ncludes correction for passby trips.
ncludes the following double counting adjustment for internal trips:
esidential trips: 9.41 % reduction. Nonresidential trips: 30.24 % reduction.

PERATIONAL (Vehicle) EMISSION ESTIMATES

nalysis Year: 2007 Temperature (F): 90 Season: Summer

MFAC Version: EMFAC2002 (9/2002)

ummary of Land Uses:

nit Type	Acreage	Trip Rate	No. Units	Total Trips
ondo/townhouse general	30.00	7.25 trips/dwelling unit	437.00	3,167.00
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		Total Vehicle Miles Traveled		21,262.75

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ehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
ight Auto	55.20	1.80	97.80	0.40
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ight Truck 3,751- 5,750	16.10	1.90	96.90	1.20
ed Truck 5,751- 8,500	7.10	1.40	95.80	2.80
ite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
ite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
ed-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
eavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
ine Haul > 60,000 lbs	0.00	0.00	0.00	100.00
rban Bus	0.10	0.00	0.00	100.00
otorcycle	1.70	82.40	17.60	0.00
chool Bus	0.10	0.00	0.00	100.00
otor Home	1.20	8.30	83.30	8.40

ravel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
rban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
ural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
rip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
of Trips - Residential	20.0	37.0	43.0			

of Trips - Commercial (by land use)

egnl shop. center				2.0	1.0	97.0

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he Trip Rate and/or Acreage values for Condominium/townhouse general
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he pass by trips option switch changed from off to on.
he double counting option switch changed from off to on.
he mitigation option switch changed from off to on.
he operational emission year changed from 2005 to 2007.
he Res and Non-Res Local-Serving Retail Mitigation changed from off to on.

APPENDIX B

CALINE4 MODEL OUTPUTS

SOLEDAD TOWNHOUSES

AIR QUALITY REGIONAL EMISSIONS

EMFAC 2002 MODEL PRINTOUTS

Title : South Coast Air Basin Avg 2005 Annual
Version : Emfac2002 V2.2 Sept 23 2002
Run Date : 03/08/05 17:10:46
Scen Year: 2005 -- Model Years: 1965 to 2005
Season : Annual
Area : South Coast AB

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Year:2005 -- Model Years 1965 to 2005 Inclusive -- Annual
Emfac2002 Emission Factors: V2.2 Sept 23 2002

South Coast A Basin Average Basin Average

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Total Organic Gases Temperature: 50F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	1.167	1.408	1.593	3.184	7.597	6.682	1.409
5	0.947	1.152	1.343	3.184	7.597	6.682	1.189
10	0.648	0.799	0.926	2.286	5.112	5.270	0.824
15	0.466	0.581	0.669	1.706	3.586	4.351	0.599
20	0.351	0.442	0.506	1.320	2.622	3.760	0.456
25	0.278	0.353	0.400	1.056	1.997	3.400	0.363
30	0.230	0.294	0.331	0.873	1.585	3.218	0.302
35	0.199	0.257	0.286	0.744	1.310	3.187	0.262
40	0.181	0.234	0.258	0.653	1.127	3.303	0.238
45	0.172	0.224	0.243	0.590	1.008	3.583	0.226
50	0.171	0.223	0.239	0.549	0.939	4.066	0.224
55	0.178	0.234	0.247	0.524	0.910	4.830	0.233
60	0.195	0.256	0.266	0.515	0.917	6.004	0.253
65	0.223	0.293	0.300	0.520	0.960	7.811	0.289

Pollutant Name: Carbon Monoxide Temperature: 50F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	9.894	14.420	14.388	31.364	61.073	49.429	12.909
5	8.961	12.877	13.032	31.364	61.073	49.429	11.820
10	7.519	10.545	10.274	21.069	40.284	40.583	9.489
15	6.476	8.911	8.437	14.917	28.105	35.075	7.907
20	5.697	7.733	7.173	11.131	20.738	31.908	6.796
25	5.105	6.870	6.284	8.752	16.182	30.553	5.997
30	4.652	6.236	5.656	7.251	13.352	30.794	5.419
35	4.307	5.779	5.223	6.330	11.649	32.674	5.009
40	4.053	5.472	4.949	5.823	10.746	36.503	4.735
45	3.885	5.305	4.820	5.646	10.480	42.944	4.589
50	3.803	5.282	4.842	5.771	10.806	53.209	4.574
55	3.820	5.431	5.041	6.219	11.779	69.442	4.715
60	3.964	5.803	5.476	7.067	13.574	95.463	5.063
65	4.286	6.498	6.252	8.472	16.537	138.238	5.714

Pollutant Name: Oxides of Nitrogen Temperature: 50F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.969	1.541	2.434	18.971	26.978	1.204	2.236
5	0.894	1.416	2.282	18.971	26.978	1.204	2.144
10	0.774	1.217	1.958	15.919	21.160	1.254	1.820
15	0.686	1.073	1.729	13.846	17.486	1.306	1.594
20	0.622	0.970	1.569	12.472	15.187	1.360	1.438
25	0.576	0.897	1.460	11.624	13.825	1.415	1.335
30	0.544	0.848	1.392	11.200	13.154	1.472	1.274
35	0.524	0.819	1.359	11.148	13.053	1.531	1.249
40	0.514	0.806	1.356	11.457	13.493	1.590	1.256
45	0.514	0.810	1.383	12.158	14.526	1.650	1.298
50	0.523	0.829	1.442	13.324	16.305	1.711	1.378
55	0.542	0.866	1.539	15.088	19.120	1.772	1.505
60	0.573	0.924	1.684	17.669	23.484	1.834	1.695
65	0.618	1.007	1.894	21.416	30.297	1.897	1.971

Title : South Coast AQMD Avg 2008 Winter
Version : Emfac2002 V2.2 Sept 23 2002
Run Date : 03/03/05 14:42:00
Scen Year: 2008 -- Model Years: 1965 to 2008
Season : Winter
Area : South Coast AQMD Dis

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Year:2008 -- Model Years 1965 to 2008 Inclusive -- Winter
Emfac2002 Emission Factors: V2.2 Sept 23 2002

District Average District Average South Coast AQMD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Total Organic Gases Temperature: 50F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.848	1.097	1.274	2.411	7.145	6.422	1.080
5	0.687	0.895	1.068	2.411	7.145	6.422	0.913
10	0.468	0.619	0.736	1.748	4.804	5.042	0.632
15	0.335	0.448	0.532	1.315	3.367	4.146	0.459
20	0.252	0.341	0.402	1.024	2.460	3.571	0.350
25	0.198	0.271	0.318	0.825	1.873	3.221	0.278
30	0.164	0.226	0.263	0.685	1.485	3.042	0.232
35	0.142	0.197	0.227	0.586	1.226	3.007	0.201
40	0.129	0.179	0.205	0.516	1.054	3.113	0.183
45	0.122	0.171	0.193	0.467	0.943	3.373	0.174
50	0.122	0.171	0.190	0.434	0.878	3.826	0.173
55	0.127	0.178	0.196	0.415	0.850	4.543	0.179
60	0.139	0.195	0.211	0.407	0.856	5.648	0.195
65	0.159	0.224	0.239	0.411	0.896	7.351	0.223

Pollutant Name: Carbon Monoxide Temperature: 50F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	7.504	11.441	11.386	22.565	56.586	44.918	10.065
5	6.838	10.264	10.327	22.565	56.586	44.918	9.259
10	5.800	8.472	8.257	15.184	37.329	36.979	7.490
15	5.036	7.206	6.858	10.764	26.047	32.013	6.282
20	4.457	6.283	5.880	8.039	19.221	29.134	5.426
25	4.009	5.599	5.181	6.323	15.000	27.871	4.805
30	3.659	5.089	4.677	5.238	12.378	28.031	4.350
35	3.387	4.716	4.321	4.570	10.800	29.651	4.021
40	3.181	4.457	4.086	4.200	9.963	33.006	3.798
45	3.035	4.304	3.961	4.066	9.717	38.684	3.670
50	2.951	4.262	3.951	4.148	10.020	47.761	3.643
55	2.936	4.349	4.075	4.459	10.922	62.140	3.735
60	3.008	4.604	4.375	5.054	12.587	85.210	3.985
65	3.203	5.101	4.929	6.040	15.334	123.155	4.466

Pollutant Name: Oxides of Nitrogen Temperature: 50F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.729	1.222	2.022	15.147	24.515	1.237	1.832
5	0.673	1.124	1.898	15.147	24.515	1.237	1.762
10	0.584	0.967	1.628	12.694	19.268	1.271	1.495
15	0.519	0.854	1.437	11.027	15.958	1.310	1.308
20	0.471	0.772	1.303	9.921	13.890	1.353	1.180
25	0.436	0.714	1.211	9.237	12.667	1.399	1.095
30	0.411	0.675	1.154	8.892	12.069	1.449	1.044
35	0.396	0.650	1.125	8.846	11.986	1.501	1.024
40	0.388	0.640	1.121	9.091	12.391	1.556	1.030
45	0.386	0.641	1.143	9.649	13.332	1.612	1.065
50	0.392	0.655	1.192	10.581	14.946	1.672	1.132
55	0.405	0.683	1.273	11.993	17.496	1.733	1.239
60	0.427	0.727	1.395	14.060	21.444	1.797	1.398
65	0.458	0.790	1.570	17.063	27.604	1.863	1.631

Title : South Coast Air Basin Avg 2015 Winter
Version : Emfac2002 V2.2 Sept 23 2002
Run Date : 06/29/04 18:00:18
Scen Year: 2015 -- Model Years: 1970 to 2015
Season : Winter
Area : South Coast AB

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Year:2015 -- Model Years 1970 to 2015 Inclusive -- Winter
Emfac2002 Emission Factors: V2.2 Sept 23 2002

South Coast A Basin Average Basin Average

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Total Organic Gases Temperature: 50F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.287	0.458	0.632	1.124	6.090	5.598	0.450
10	0.193	0.313	0.434	0.834	4.093	4.294	0.311
15	0.137	0.225	0.313	0.640	2.869	3.462	0.226
20	0.102	0.169	0.236	0.507	2.095	2.932	0.171
25	0.079	0.134	0.186	0.414	1.595	2.607	0.136
30	0.065	0.110	0.154	0.348	1.264	2.434	0.113
35	0.056	0.096	0.133	0.300	1.044	2.383	0.098
40	0.050	0.087	0.120	0.266	0.897	2.449	0.089
45	0.048	0.082	0.113	0.241	0.802	2.640	0.085
50	0.047	0.082	0.111	0.225	0.747	2.984	0.084
55	0.049	0.085	0.115	0.215	0.723	3.539	0.088
60	0.054	0.093	0.124	0.211	0.728	4.401	0.096
65	0.061	0.106	0.140	0.212	0.762	5.742	0.110

Pollutant Name: Carbon Monoxide Temperature: 50F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	3.202	5.587	6.245	9.738	41.802	30.665	4.735
10	2.790	4.726	5.126	6.590	27.538	25.700	3.915
15	2.470	4.094	4.345	4.692	19.192	22.489	3.339
20	2.215	3.617	3.782	3.513	14.147	20.517	2.920
25	2.009	3.248	3.365	2.767	11.030	19.509	2.606
30	1.839	2.962	3.053	2.291	9.095	19.349	2.367
35	1.700	2.741	2.821	1.995	7.930	20.056	2.187
40	1.587	2.574	2.656	1.827	7.312	21.784	2.055
45	1.498	2.457	2.552	1.760	7.128	24.870	1.968
50	1.430	2.391	2.509	1.784	7.348	29.930	1.926
55	1.387	2.382	2.538	1.903	8.008	38.057	1.936
60	1.373	2.445	2.659	2.137	9.227	51.199	2.015
65	1.395	2.607	2.910	2.527	11.241	72.914	2.194

Pollutant Name: Oxides of Nitrogen Temperature: 50F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.317	0.633	1.118	6.615	20.559	1.338	0.909
10	0.274	0.545	0.960	5.537	16.202	1.303	0.769
15	0.243	0.480	0.848	4.804	13.455	1.284	0.671
20	0.219	0.433	0.769	4.316	11.742	1.279	0.604
25	0.202	0.399	0.714	4.014	10.732	1.284	0.559
30	0.190	0.376	0.680	3.861	10.243	1.300	0.532
35	0.182	0.361	0.661	3.840	10.182	1.324	0.521
40	0.177	0.354	0.658	3.945	10.526	1.356	0.523
45	0.176	0.353	0.669	4.189	11.318	1.397	0.540
50	0.178	0.360	0.696	4.596	12.669	1.446	0.574
55	0.183	0.374	0.741	5.214	14.799	1.505	0.628
60	0.192	0.397	0.809	6.120	18.093	1.574	0.709
65	0.206	0.430	0.907	7.436	23.227	1.656	0.829

Pollutant Name: Carbon Dioxide Temperature: 50F Relative Humidity: 50%

SOLEDAD TOWNHOUSES

AIR QUALITY CO HOT SPOT ANALYSIS

CALINE4 MODEL PRINTOUTS

EXISTING BASELINE CONDITIONS

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: Existing-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Bouquet NBA	*	0	-150	0	0	* AG	1845	11.6	.0	17.0
B. Bouquet NBD	*	0	0	0	150	* AG	2938	11.1	.0	13.5
C. Bouquet NBL	*	2	-150	0	0	* AG	95	11.7	.0	10.0
D. Bouquet SBA	*	-9	150	-9	0	* AG	1619	10.5	.0	20.5
E. Bouquet SBD	*	-9	0	-9	-150	* AG	1510	6.1	.0	13.5
F. Bouquet SBL	*	-9	150	0	0	* AG	690	12.9	.0	10.0
G. Soledad EBA	*	-150	-12	0	-12	* AG	1609	10.5	.0	17.0
H. Soledad EBD	*	0	-12	150	-12	* AG	2984	11.1	.0	13.5
I. Soledad EBL	*	-150	-9	0	0	* AG	971	12.9	.0	10.0
J. Soledad WBA	*	150	7	0	7	* AG	1839	11.6	.0	17.0
K. Soledad WBD	*	0	7	-150	7	* AG	1792	6.1	.0	11.8
L. Soledad WBL	*	150	2	0	0	* AG	556	12.7	.0	10.0
M. Bouquet NBAX	*	0	-750	0	-150	* AG	1940	5.3	.0	17.0
N. Bouquet NBDX	*	0	150	0	750	* AG	2938	5.3	.0	13.5
O. Bouquet SBAX	*	-9	750	-9	150	* AG	2309	5.3	.0	20.5
P. Bouquet SBDX	*	-9	-150	-9	-750	* AG	1510	5.3	.0	13.5
Q. Soledad EBAX	*	-750	-12	-150	-12	* AG	2580	5.3	.0	17.0
R. Soledad EBDX	*	150	-12	750	-12	* AG	2984	5.3	.0	13.5
S. Soledad WBAX	*	750	7	150	7	* AG	2395	5.3	.0	17.0
T. Soledad WBDX	*	-150	7	-750	7	* AG	1792	5.3	.0	11.8

JOB: Soledad Townhomes
RUN: Existing-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-21	1.8
2. NW	*	-15	15	1.8
3. SW	*	-15	-21	1.8
4. NE	*	7	17	1.8
5. ES mdblk	*	150	-21	1.8
6. WN mdblk	*	-150	15	1.8
7. WS mdblk	*	-150	-21	1.8
8. EN mdblk	*	150	17	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-15	150	1.8
11. SW mdblk	*	-15	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-21	1.8
14. WN blk	*	-600	15	1.8
15. WS blk	*	-600	-21	1.8
16. EN blk	*	600	17	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-15	600	1.8
19. SW blk	*	-15	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: Existing-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	354.	9.9	1.3	2.8	.0	1.0	.0	.9	.0	2.1
2. NW	101.	6.7	.0	1.4	.0	.8	.0	.4	.0	.9
3. SW	81.	6.8	1.0	.0	.0	.0	.6	.0	.7	3.0
4. NE	186.	7.8	2.1	1.9	.2	.0	.5	.2	.1	.7
5. ES mdblk	280.	6.2	.0	.3	.0	.2	.0	.0	.2	3.9
6. WN mdblk	98.	4.0	.2	.1	.0	.0	.0	.0	.3	.6
7. WS mdblk	82.	5.2	.1	.2	.0	.1	.0	.0	2.4	.3
8. EN mdblk	261.	5.0	.2	.1	.0	.0	.0	.0	.4	.5
9. SE mdblk	355.	6.1	3.2	.5	.3	.4	.4	.2	.2	.1
10. NW mdblk	171.	6.5	.3	1.7	.0	2.2	.0	1.2	.0	.3
11. SW mdblk	6.	4.8	1.1	.6	.0	.3	1.5	.2	.1	.2
12. NE mdblk	187.	7.9	.3	4.8	.0	1.1	.2	.6	.2	.0
13. ES blk	277.	3.4	.0	.2	.0	.1	.0	.0	.0	.0
14. WN blk	96.	2.5	.1	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	3.4	.0	.2	.0	.1	.0	.0	.0	.0
16. EN blk	263.	2.9	.1	.0	.0	.0	.0	.0	.0	.1
17. SE blk	355.	3.2	.0	.0	.0	.0	.0	.0	.1	.0
18. NW blk	175.	3.8	.0	.1	.0	.0	.0	.0	.0	.2
19. SW blk	6.	3.1	.0	.0	.0	.0	.0	.0	.0	.2
20. NE blk	186.	4.4	.0	.0	.0	.0	.0	.0	.1	.0

JOB: Soledad Townhomes
RUN: Existing-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	.0	.6	.0	.2	.0	.3	.4	.0	.0	.0	.0	.0
2. NW	.0	2.0	.2	.5	.0	.0	.0	.0	.0	.3	.1	.0
3. SW	.0	.6	.0	.3	.0	.0	.0	.0	.0	.2	.4	.0
4. NE	.0	1.3	.0	.3	.3	.0	.0	.3	.0	.0	.0	.0
5. ES mdblk	.2	.6	.2	.3	.0	.0	.0	.0	.0	.0	.0	.1
6. WN mdblk	.5	.3	1.2	.2	.0	.0	.0	.0	.0	.2	.1	.0
7. WS mdblk	.7	.5	.2	.2	.0	.0	.0	.0	.0	.1	.2	.0
8. EN mdblk	.3	2.4	.1	.4	.0	.0	.0	.0	.2	.0	.0	.0
9. SE mdblk	.1	.0	.0	.0	.0	.2	.2	.0	.0	.0	.0	.0
10. NW mdblk	.0	.2	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	.0	.2	.0	.0	.0	.2	.2	.0	.0	.0	.0	.0
12. NE mdblk	.1	.0	.1	.0	.1	.0	.0	.1	.0	.0	.0	.0
13. ES blk	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.0	.6	.0
14. WN blk	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.0	1.2
15. WS blk	.0	.0	.0	.0	.0	.0	.0	.0	2.1	.0	.0	.4
16. EN blk	.0	.0	.0	.0	.0	.0	.0	.0	.0	.6	1.6	.0
17. SE blk	.0	.0	.0	.0	1.8	.0	.0	.6	.0	.0	.0	.0
18. NW blk	.0	.1	.0	.0	.0	.9	2.0	.0	.0	.0	.0	.0
19. SW blk	.0	.1	.0	.0	.8	.0	.0	1.5	.0	.0	.0	.0
20. NE blk	.0	.0	.0	.0	.0	2.6	1.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: Existing-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Project NBA	*	12	-150	12	0	* AG	0	5.7	.0	10.0
B. Project NBD	*	12	0	12	150	* AG	0	5.7	.0	10.0
C. Project NBL	*	9	-150	0	0	* AG	0	5.7	.0	10.0
D. Project SBA	*	-5	150	-5	0	* AG	0	5.7	.0	10.0
E. Project SBD	*	-5	0	-5	-150	* AG	0	5.7	.0	10.0
F. Project SBL	*	-2	150	0	0	* AG	0	5.7	.0	10.0
G. Soledad EBA	*	-150	-11	0	-11	* AG	2984	12.4	.0	13.5
H. Soledad EBD	*	0	-11	150	-11	* AG	2984	8.2	.0	13.5
I. Soledad EBL	*	-150	-9	0	0	* AG	0	5.3	.0	10.0
J. Soledad WBA	*	150	0	0	0	* AG	2395	10.7	.0	13.5
K. Soledad WBD	*	0	0	-150	0	* AG	2395	6.2	.0	13.5
L. Soledad WBL	*	150	2	0	0	* AG	0	5.3	.0	10.0
M. Project NBAX	*	12	-750	12	-150	* AG	0	5.7	.0	10.0
N. Project NBDX	*	12	150	12	750	* AG	0	5.7	.0	10.0
O. Project SBAX	*	-5	750	-5	150	* AG	0	5.7	.0	10.0
P. Project SBDX	*	-5	-150	-5	-750	* AG	0	5.7	.0	10.0
Q. Soledad EBAX	*	-750	-11	-150	-11	* AG	2984	5.3	.0	13.5
R. Soledad EBDX	*	150	-11	750	-11	* AG	2984	5.3	.0	13.5
S. Soledad WBAX	*	750	0	150	0	* AG	2395	5.3	.0	13.5
T. Soledad WBDX	*	-150	0	-750	0	* AG	2395	5.3	.0	13.5

JOB: Soledad Townhomes
RUN: Existing-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	21	-17	1.8
2. NW	*	-14	7	1.8
3. SW	*	-12	-17	1.8
4. NE	*	21	7	1.8
5. ES mdblk	*	150	-17	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-17	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	21	-150	1.8
10. NW mdblk	*	-14	150	1.8
11. SW mdblk	*	-12	-150	1.8
12. NE mdblk	*	21	150	1.8
13. ES blk	*	600	-17	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-17	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	21	-600	1.8
18. NW blk	*	-14	600	1.8
19. SW blk	*	-12	-600	1.8
20. NE blk	*	21	600	1.8

JOB: Soledad Townhomes
RUN: Existing-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	277.	6.0	.0	.0	.0	.0	.0	.0	3.2	1.6
2. NW	97.	5.1	.0	.0	.0	.0	.0	.0	.0	1.0
3. SW	277.	6.7	.0	.0	.0	.0	.0	.0	5.4	.0
4. NE	261.	5.3	.0	.0	.0	.0	.0	.0	1.8	.0
5. ES mdblk	277.	5.7	.0	.0	.0	.0	.0	.0	.4	3.6
6. WN mdblk	97.	4.7	.0	.0	.0	.0	.0	.0	1.4	.4
7. WS mdblk	83.	7.2	.0	.0	.0	.0	.0	.0	5.5	.3
8. EN mdblk	263.	6.0	.0	.0	.0	.0	.0	.0	.6	.9
9. SE mdblk	320.	.7	.0	.0	.0	.0	.0	.0	.5	.0
10. NW mdblk	143.	.7	.0	.0	.0	.0	.0	.0	.0	.3
11. SW mdblk	38.	.7	.0	.0	.0	.0	.0	.0	.0	.3
12. NE mdblk	217.	.7	.0	.0	.0	.0	.0	.0	.5	.0
13. ES blk	276.	3.8	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	96.	3.5	.0	.0	.0	.0	.0	.0	.1	.0
15. WS blk	84.	3.8	.0	.0	.0	.0	.0	.0	.1	.0
16. EN blk	264.	3.5	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	357.	.4	.0	.0	.0	.0	.0	.0	.1	.0
18. NW blk	179.	.4	.0	.0	.0	.0	.0	.0	.1	.0
19. SW blk	360.	.4	.0	.0	.0	.0	.0	.0	.1	.0
20. NE blk	183.	.4	.0	.0	.0	.0	.0	.0	.1	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: Existing-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.0	.6	.0	.0	.0	.0	.0	.3	.0	.0	.3
2. NW	*	.0	2.7	.7	.0	.0	.0	.0	.0	.0	.4	.2	.0
3. SW	*	.0	.0	.5	.0	.0	.0	.0	.0	.3	.0	.0	.4
4. NE	*	.0	1.8	1.3	.0	.0	.0	.0	.0	.3	.0	.0	.2
5. ES mdblk	*	.0	1.0	.3	.0	.0	.0	.0	.0	.1	.0	.0	.2
6. WN mdblk	*	.0	.3	2.3	.0	.0	.0	.0	.0	.0	.2	.1	.0
7. WS mdblk	*	.0	.5	.6	.0	.0	.0	.0	.0	.0	.1	.2	.0
8. EN mdblk	*	.0	3.9	.2	.0	.0	.0	.0	.0	.2	.0	.0	.1
9. SE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.6	.8	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0	.0	2.2
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.6	.0	.0	.8
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.9	2.2	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: Existing-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Project NBA	0	-150	0	0	AG	0	5.7	.0	10.0
B. Project NBD	0	0	0	150	AG	0	5.7	.0	10.0
C. Project NBL	2	-150	0	0	AG	0	5.7	.0	10.0
D. Project SBA	0	150	0	0	AG	0	5.7	.0	10.0
E. Project SBD	0	0	0	-150	AG	0	5.7	.0	10.0
F. Project SBL	-2	150	0	0	AG	0	5.7	.0	10.0
G. Soledad EBA	-150	0	0	0	AG	2984	12.4	.0	13.5
H. Soledad EBD	0	0	150	0	AG	2984	8.2	.0	13.5
I. Soledad EBL	-150	-2	0	0	AG	0	5.3	.0	10.0
J. Soledad WBA	150	0	0	0	AG	2395	10.7	.0	13.5
K. Soledad WBD	0	0	-150	0	AG	2395	6.2	.0	13.5
L. Soledad WBL	150	2	0	0	AG	0	5.3	.0	10.0
M. Project NBAX	0	-750	0	-150	AG	0	5.7	.0	10.0
N. Project NBDX	0	150	0	750	AG	0	5.7	.0	10.0
O. Project SBAX	0	750	0	150	AG	0	5.7	.0	10.0
P. Project SBDX	0	-150	0	-750	AG	0	5.7	.0	10.0
Q. Soledad EBAX	-750	0	-150	0	AG	2984	5.3	.0	13.5
R. Soledad EBDX	150	0	750	0	AG	2984	5.3	.0	13.5
S. Soledad WBAX	750	0	150	0	AG	2395	5.3	.0	13.5
T. Soledad WBDX	-150	0	-750	0	AG	2395	5.3	.0	13.5

JOB: Soledad Townhomes
RUN: Existing-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

JOB: Soledad Townhomes
RUN: Existing-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	276.	8.3	.0	.0	.0	.0	.0	.0	4.6	.6
2. NW	264.	8.3	.0	.0	.0	.0	.0	.0	5.4	.0
3. SW	276.	8.3	.0	.0	.0	.0	.0	.0	5.4	.0
4. NE	264.	8.3	.0	.0	.0	.0	.0	.0	4.6	.6
5. ES mdblk	276.	8.5	.0	.0	.0	.0	.0	.0	.5	3.6
6. WN mdblk	96.	8.7	.0	.0	.0	.0	.0	.0	5.4	.3
7. WS mdblk	84.	8.7	.0	.0	.0	.0	.0	.0	5.4	.3
8. EN mdblk	264.	8.5	.0	.0	.0	.0	.0	.0	.5	3.6
9. SE mdblk	324.	.7	.0	.0	.0	.0	.0	.0	.5	.0
10. NW mdblk	144.	.7	.0	.0	.0	.0	.0	.0	.0	.3
11. SW mdblk	36.	.7	.0	.0	.0	.0	.0	.0	.0	.3
12. NE mdblk	216.	.7	.0	.0	.0	.0	.0	.0	.5	.0
13. ES blk	275.	5.2	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	95.	5.2	.0	.0	.0	.0	.0	.0	.1	.0
15. WS blk	85.	5.2	.0	.0	.0	.0	.0	.0	.1	.0
16. EN blk	265.	5.2	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	358.	.4	.0	.0	.0	.0	.0	.0	.1	.0
18. NW blk	181.	.4	.0	.0	.0	.0	.0	.0	.2	.0
19. SW blk	359.	.4	.0	.0	.0	.0	.0	.0	.2	.0
20. NE blk	182.	.4	.0	.0	.0	.0	.0	.0	.1	.0

JOB: Soledad Townhomes
RUN: Existing-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.6	1.9	.0	.0	.0	.0	.0	.4	.0	.0	.3
2. NW	*	.0	.0	2.2	.0	.0	.0	.0	.0	.4	.0	.0	.3
3. SW	*	.0	.0	2.2	.0	.0	.0	.0	.0	.4	.0	.0	.3
4. NE	*	.0	.6	1.9	.0	.0	.0	.0	.0	.4	.0	.0	.3
5. ES mdblk	*	.0	3.9	.2	.0	.0	.0	.0	.0	.2	.0	.0	.2
6. WN mdblk	*	.0	.4	2.2	.0	.0	.0	.0	.0	.0	.2	.2	.0
7. WS mdblk	*	.0	.4	2.2	.0	.0	.0	.0	.0	.0	.2	.2	.0
8. EN mdblk	*	.0	3.9	.2	.0	.0	.0	.0	.0	.2	.0	.0	.2
9. SE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.6	2.2	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.6	.0	.0	2.2
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.6	.0	.0	2.2
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.6	2.2	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: Existing-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Valley C NBA	*	0	-150	0	0	* AG	0	5.7	.0	10.0
B. Valley C NBD	*	0	0	0	150	* AG	0	5.7	.0	10.0
C. Valley C NBL	*	2	-150	0	0	* AG	0	5.7	.0	10.0
D. Valley C SBA	*	0	150	0	0	* AG	0	5.7	.0	10.0
E. Valley C SBD	*	0	0	0	-150	* AG	0	5.7	.0	10.0
F. Valley C SBL	*	-2	150	0	0	* AG	0	5.7	.0	10.0
G. Soledad EBA	*	-150	0	0	0	* AG	2984	12.4	.0	13.5
H. Soledad EBD	*	0	0	150	0	* AG	2984	8.2	.0	13.5
I. Soledad EBL	*	-150	-2	0	0	* AG	0	5.3	.0	10.0
J. Soledad WBA	*	150	0	0	0	* AG	2395	10.7	.0	17.0
K. Soledad WBD	*	0	0	-150	0	* AG	2395	6.2	.0	13.5
L. Soledad WBL	*	150	2	0	0	* AG	0	5.3	.0	10.0
M. Valley NBAX	*	0	-750	0	-150	* AG	0	5.7	.0	10.0
N. Valley NBDX	*	0	150	0	750	* AG	0	5.7	.0	10.0
O. Valley SBAX	*	0	750	0	150	* AG	0	5.7	.0	10.0
P. Valley SBDX	*	0	-150	0	-750	* AG	0	5.7	.0	10.0
Q. Soledad EBAX	*	-750	0	-150	0	* AG	2984	5.3	.0	13.5
R. Soledad EBDX	*	150	0	750	0	* AG	2984	5.3	.0	13.5
S. Soledad WBAX	*	750	0	150	0	* AG	2395	5.3	.0	17.0
T. Soledad WBDX	*	-150	0	-750	0	* AG	2395	5.3	.0	13.5

JOB: Soledad Townhomes
RUN: Existing-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: Existing-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	276.	8.3	.0	.0	.0	.0	.0	.0	4.6	.6
2. NW	264.	8.3	.0	.0	.0	.0	.0	.0	5.4	.0
3. SW	276.	8.3	.0	.0	.0	.0	.0	.0	5.4	.0
4. NE	264.	8.3	.0	.0	.0	.0	.0	.0	4.6	.6
5. ES mdblk	275.	8.5	.0	.0	.0	.0	.0	.0	.6	3.5
6. WN mdblk	96.	8.8	.0	.0	.0	.0	.0	.0	5.4	.3
7. WS mdblk	84.	8.8	.0	.0	.0	.0	.0	.0	5.4	.3
8. EN mdblk	265.	8.5	.0	.0	.0	.0	.0	.0	.6	3.5
9. SE mdblk	324.	.7	.0	.0	.0	.0	.0	.0	.5	.0
10. NW mdblk	144.	.7	.0	.0	.0	.0	.0	.0	.0	.3
11. SW mdblk	36.	.7	.0	.0	.0	.0	.0	.0	.0	.3
12. NE mdblk	216.	.7	.0	.0	.0	.0	.0	.0	.5	.0
13. ES blk	275.	5.2	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	95.	5.2	.0	.0	.0	.0	.0	.0	.1	.0
15. WS blk	85.	5.2	.0	.0	.0	.0	.0	.0	.1	.0
16. EN blk	265.	5.2	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	1.	.4	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	178.	.4	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	2.	.4	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	179.	.4	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: Existing-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.6	1.9	.0	.0	.0	.0	.0	.4	.0	.0	.3
2. NW	*	.0	.0	2.2	.0	.0	.0	.0	.0	.4	.0	.0	.3
3. SW	*	.0	.0	2.2	.0	.0	.0	.0	.0	.4	.0	.0	.3
4. NE	*	.0	.6	1.9	.0	.0	.0	.0	.0	.4	.0	.0	.3
5. ES mdblk	*	.0	3.8	.3	.0	.0	.0	.0	.0	.2	.0	.0	.2
6. WN mdblk	*	.0	.4	2.2	.0	.0	.0	.0	.0	.0	.2	.2	.0
7. WS mdblk	*	.0	.4	2.2	.0	.0	.0	.0	.0	.0	.2	.2	.0
8. EN mdblk	*	.0	3.8	.3	.0	.0	.0	.0	.0	.2	.0	.0	.2
9. SE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.6	2.2	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.6	.0	.0	2.2
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.6	.0	.0	2.2
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.6	2.2	.0
17. SE blk	*	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: Existing-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Newhall NBA	0	-150	0	0	AG	0	5.3	.0	13.5
B. Newhall NBD	0	0	0	150	AG	0	5.3	.0	13.5
C. Newhall NBL	2	-150	0	0	AG	0	5.3	.0	10.0
D. Newhall SBA	0	150	0	0	AG	0	5.3	.0	13.5
E. Newhall SBD	0	0	0	-150	AG	0	5.3	.0	10.0
F. Newhall SBL	-2	150	0	0	AG	0	5.3	.0	10.0
G. Valley C EBA	-150	0	0	0	AG	0	5.7	.0	10.0
H. Valley C EBD	0	0	150	0	AG	0	5.7	.0	10.0
I. Valley C EBL	-150	-2	0	0	AG	0	5.7	.0	10.0
J. Valley C WBA	150	0	0	0	AG	0	5.7	.0	10.0
K. Valley C WBD	0	0	-150	0	AG	0	5.7	.0	10.0
L. Valley C WBL	150	2	0	0	AG	0	5.7	.0	10.0
M. Newhall NBAX	0	-750	0	-150	AG	0	5.3	.0	13.5
N. Newhall NBDX	0	150	0	750	AG	0	5.3	.0	13.5
O. Newhall SBAX	0	750	0	150	AG	0	5.3	.0	13.5
P. Newhall SBDX	0	-150	0	-750	AG	0	5.3	.0	10.0
Q. Valley EBAX	-750	0	-150	0	AG	0	5.7	.0	10.0
R. Valley EBDX	150	0	750	0	AG	0	5.7	.0	10.0
S. Valley WBAX	750	0	150	0	AG	0	5.7	.0	10.0
T. Valley WBDX	-150	0	-750	0	AG	0	5.7	.0	10.0

JOB: Soledad Townhomes
RUN: Existing-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

JOB: Soledad Townhomes
RUN: Existing-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. NW	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. SW	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
4. NE	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
5. ES mdblk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	0.	.0	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: Existing-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. NW	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. SW	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4. NE	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5. ES mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

SOLEDAD TOWNHOUSES

AIR QUALITY CO HOT SPOT ANALYSIS

CALINE4 MODEL PRINTOUTS

2008 WITHOUT PROJECT SCENARIO

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008nP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Bouquet NBA	*	0	-150	0	0	* AG	1830	9.1	.0	17.0
B. Bouquet NBD	*	0	0	0	150	* AG	3420	8.7	.0	13.5
C. Bouquet NBL	*	2	-150	0	0	* AG	40	9.2	.0	10.0
D. Bouquet SBA	*	-9	150	-9	0	* AG	1990	9.1	.0	20.5
E. Bouquet SBD	*	-9	0	-9	-150	* AG	1750	4.9	.0	13.5
F. Bouquet SBL	*	-9	150	0	0	* AG	1070	10.1	.0	10.0
G. Soledad EBA	*	-150	-12	0	-12	* AG	1550	8.2	.0	17.0
H. Soledad EBD	*	0	-12	150	-12	* AG	3050	8.7	.0	13.5
I. Soledad EBL	*	-150	-9	0	0	* AG	1200	10.1	.0	10.0
J. Soledad WBA	*	150	7	0	7	* AG	1690	8.2	.0	17.0
K. Soledad WBD	*	0	7	-150	7	* AG	1800	4.9	.0	11.8
L. Soledad WBL	*	150	2	0	0	* AG	650	10.1	.0	10.0
M. Bouquet NBAX	*	0	-750	0	-150	* AG	1870	4.3	.0	17.0
N. Bouquet NBDX	*	0	150	0	750	* AG	3420	4.3	.0	13.5
O. Bouquet SBAX	*	-9	750	-9	150	* AG	3060	4.3	.0	20.5
P. Bouquet SBDX	*	-9	-150	-9	-750	* AG	1750	4.3	.0	13.5
Q. Soledad EBAX	*	-750	-12	-150	-12	* AG	2750	4.3	.0	17.0
R. Soledad EBDX	*	150	-12	750	-12	* AG	3050	4.3	.0	13.5
S. Soledad WBAX	*	750	7	150	7	* AG	2340	4.3	.0	17.0
T. Soledad WBDX	*	-150	7	-750	7	* AG	1800	4.3	.0	11.8

JOB: Soledad Townhomes
RUN: 2008nP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-21	1.8
2. NW	*	-15	15	1.8
3. SW	*	-15	-21	1.8
4. NE	*	7	17	1.8
5. ES mdblk	*	150	-21	1.8
6. WN mdblk	*	-150	15	1.8
7. WS mdblk	*	-150	-21	1.8
8. EN mdblk	*	150	17	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-15	150	1.8
11. SW mdblk	*	-15	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-21	1.8
14. WN blk	*	-600	15	1.8
15. WS blk	*	-600	-21	1.8
16. EN blk	*	600	17	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-15	600	1.8
19. SW blk	*	-15	-600	1.8
20. NE blk	*	7	600	1.8

JOB: Soledad Townhomes
RUN: 2008nP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	353.	8.7	1.0	2.5	.0	1.1	.0	1.1	.0	1.7
2. NW	101.	5.6	.0	1.3	.0	.9	.0	.5	.0	.7
3. SW	8.	6.3	.0	1.5	.0	1.5	.6	.7	.8	.0
4. NE	351.	7.1	.0	4.2	.0	1.2	.0	1.1	.0	.0
5. ES mdblk	280.	5.0	.0	.2	.0	.2	.0	.1	.1	3.1
6. WN mdblk	98.	3.3	.2	.1	.0	.0	.0	.0	.3	.5
7. WS mdblk	81.	4.2	.0	.2	.0	.1	.0	.0	1.8	.2
8. EN mdblk	261.	3.7	.2	.1	.0	.0	.0	.0	.3	.4
9. SE mdblk	355.	4.9	2.5	.4	.0	.4	.3	.2	.1	.1
10. NW mdblk	170.	6.3	.2	1.5	.0	2.3	.0	1.5	.0	.2
11. SW mdblk	6.	4.2	.8	.5	.0	.3	1.4	.3	.0	.1
12. NE mdblk	187.	7.2	.2	4.3	.0	1.1	.2	.7	.1	.0
13. ES blk	277.	2.9	.0	.1	.0	.1	.0	.0	.0	.0
14. WN blk	96.	2.1	.1	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	2.9	.0	.1	.0	.1	.0	.0	.0	.0
16. EN blk	263.	2.4	.1	.0	.0	.0	.0	.0	.0	.0
17. SE blk	355.	2.7	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	175.	3.6	.0	.0	.0	.0	.0	.0	.0	.1
19. SW blk	6.	2.7	.0	.0	.0	.0	.0	.0	.0	.1
20. NE blk	186.	4.1	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2008nP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.4	.0	.2	.0	.2	.3	.0	.0	.0	.0	.0
2. NW	*	.0	1.3	.2	.5	.0	.0	.0	.0	.0	.3	.0	.0
3. SW	*	.4	.0	.3	.0	.0	.3	.2	.0	.0	.0	.0	.0
4. NE	*	.0	.0	.0	.0	.0	.2	.3	.0	.0	.0	.0	.0
5. ES mdblk	*	.2	.4	.2	.3	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.4	.2	1.0	.1	.0	.0	.0	.0	.0	.2	.0	.0
7. WS mdblk	*	.8	.3	.2	.2	.0	.0	.0	.0	.0	.0	.1	.0
8. EN mdblk	*	.2	1.6	.0	.4	.0	.0	.0	.0	.2	.0	.0	.0
9. SE mdblk	*	.1	.0	.0	.0	.0	.2	.2	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.1	.0	.0	.0	.2	.2	.0	.0	.0	.0	.0
12. NE mdblk	*	.1	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.7	.5	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.5	.0	.0	1.0
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	1.8	.0	.0	.3
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.5	1.3	.0
17. SE blk	*	.0	.0	.0	.0	1.4	.0	.0	.5	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.8	2.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.6	.0	.0	1.4	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	2.4	1.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008nP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Project NBA	12	-150	12	0	AG	0	4.5	.0	10.0
B. Project NBD	12	0	12	150	AG	0	4.5	.0	10.0
C. Project NBL	9	-150	0	0	AG	0	4.5	.0	10.0
D. Project SBA	-5	150	-5	0	AG	0	4.5	.0	10.0
E. Project SBD	-5	0	-5	-150	AG	0	4.5	.0	10.0
F. Project SBL	-2	150	0	0	AG	0	4.5	.0	10.0
G. Soledad EBA	-150	-11	0	-11	AG	3050	9.7	.0	13.5
H. Soledad EBD	0	-11	150	-11	AG	3050	6.5	.0	13.5
I. Soledad EBL	-150	-9	0	0	AG	0	4.3	.0	10.0
J. Soledad WBA	150	0	0	0	AG	2340	8.4	.0	13.5
K. Soledad WBD	0	0	-150	0	AG	2340	5.0	.0	13.5
L. Soledad WBL	150	2	0	0	AG	0	4.3	.0	10.0
M. Project NBAX	12	-750	12	-150	AG	0	4.5	.0	10.0
N. Project NBDX	12	150	12	750	AG	0	4.5	.0	10.0
O. Project SBAX	-5	750	-5	150	AG	0	4.5	.0	10.0
P. Project SBDX	-5	-150	-5	-750	AG	0	4.5	.0	10.0
Q. Soledad EBAX	-750	-11	-150	-11	AG	3050	4.3	.0	13.5
R. Soledad EBDX	150	-11	750	-11	AG	3050	4.3	.0	13.5
S. Soledad WBAX	750	0	150	0	AG	2340	4.3	.0	13.5
T. Soledad WBDX	-150	0	-750	0	AG	2340	4.3	.0	13.5

JOB: Soledad Townhomes
RUN: 2008nP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	21	-17	1.8
2. NW	*	-14	7	1.8
3. SW	*	-12	-17	1.8
4. NE	*	21	7	1.8
5. ES mdblk	*	150	-17	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-17	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	21	-150	1.8
10. NW mdblk	*	-14	150	1.8
11. SW mdblk	*	-12	-150	1.8
12. NE mdblk	*	21	150	1.8
13. ES blk	*	600	-17	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-17	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	21	-600	1.8
18. NW blk	*	-14	600	1.8
19. SW blk	*	-12	-600	1.8
20. NE blk	*	21	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008nP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	277.	4.8	.0	.0	.0	.0	.0	.0	2.5	1.3
2. NW	97.	4.0	.0	.0	.0	.0	.0	.0	.0	.8
3. SW	277.	5.4	.0	.0	.0	.0	.0	.0	4.3	.0
4. NE	261.	4.1	.0	.0	.0	.0	.0	.0	1.4	.0
5. ES mdblk	277.	4.5	.0	.0	.0	.0	.0	.0	.3	2.9
6. WN mdblk	97.	3.7	.0	.0	.0	.0	.0	.0	1.1	.3
7. WS mdblk	83.	5.7	.0	.0	.0	.0	.0	.0	4.4	.2
8. EN mdblk	263.	4.7	.0	.0	.0	.0	.0	.0	.5	.7
9. SE mdblk	320.	.6	.0	.0	.0	.0	.0	.0	.4	.0
10. NW mdblk	142.	.5	.0	.0	.0	.0	.0	.0	.0	.2
11. SW mdblk	39.	.5	.0	.0	.0	.0	.0	.0	.0	.3
12. NE mdblk	217.	.5	.0	.0	.0	.0	.0	.0	.4	.0
13. ES blk	276.	3.1	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	96.	2.8	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	3.1	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	264.	2.8	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	356.	.3	.0	.0	.0	.0	.0	.0	.1	.0
18. NW blk	179.	.3	.0	.0	.0	.0	.0	.0	.1	.0
19. SW blk	359.	.3	.0	.0	.0	.0	.0	.0	.1	.0
20. NE blk	183.	.3	.0	.0	.0	.0	.0	.0	.1	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008nP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.0	.5	.0	.0	.0	.0	.0	.2	.0	.0	.3
2. NW	*	.0	2.1	.6	.0	.0	.0	.0	.0	.0	.3	.2	.0
3. SW	*	.0	.0	.4	.0	.0	.0	.0	.0	.3	.0	.0	.3
4. NE	*	.0	1.4	1.0	.0	.0	.0	.0	.0	.2	.0	.0	.1
5. ES mdblk	*	.0	.8	.2	.0	.0	.0	.0	.0	.1	.0	.0	.1
6. WN mdblk	*	.0	.2	1.8	.0	.0	.0	.0	.0	.0	.2	.1	.0
7. WS mdblk	*	.0	.4	.5	.0	.0	.0	.0	.0	.0	.1	.1	.0
8. EN mdblk	*	.0	3.0	.1	.0	.0	.0	.0	.0	.2	.0	.0	.1
9. SE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.2	.6	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.7	.0	.0	1.7
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.2	.0	.0	.6
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.7	1.7	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008nP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Project NBA	*	0	-150	0	0	* AG	0	4.5	.0	10.0
B. Project NBD	*	0	0	0	150	* AG	0	4.5	.0	10.0
C. Project NBL	*	2	-150	0	0	* AG	0	4.5	.0	10.0
D. Project SBA	*	0	150	0	0	* AG	0	4.5	.0	10.0
E. Project SBD	*	0	0	0	-150	* AG	0	4.5	.0	10.0
F. Project SBL	*	-2	150	0	0	* AG	0	4.5	.0	10.0
G. Soledad EBA	*	-150	0	0	0	* AG	3050	9.7	.0	13.5
H. Soledad EBD	*	0	0	150	0	* AG	3050	6.5	.0	13.5
I. Soledad EBL	*	-150	-2	0	0	* AG	0	4.3	.0	10.0
J. Soledad WBA	*	150	0	0	0	* AG	2340	8.4	.0	13.5
K. Soledad WBD	*	0	0	-150	0	* AG	2340	5.0	.0	13.5
L. Soledad WBL	*	150	2	0	0	* AG	0	4.3	.0	10.0
M. Project NBAX	*	0	-750	0	-150	* AG	0	4.5	.0	10.0
N. Project NBDX	*	0	150	0	750	* AG	0	4.5	.0	10.0
O. Project SBAX	*	0	750	0	150	* AG	0	4.5	.0	10.0
P. Project SBDX	*	0	-150	0	-750	* AG	0	4.5	.0	10.0
Q. Soledad EBAX	*	-750	0	-150	0	* AG	3050	4.3	.0	13.5
R. Soledad EBDX	*	150	0	750	0	* AG	3050	4.3	.0	13.5
S. Soledad WBAX	*	750	0	150	0	* AG	2340	4.3	.0	13.5
T. Soledad WBDX	*	-150	0	-750	0	* AG	2340	4.3	.0	13.5

JOB: Soledad Townhomes
RUN: 2008nP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

JOB: Soledad Townhomes
RUN: 2008nP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	276.	6.6	.0	.0	.0	.0	.0	.0	3.6	.5
2. NW	264.	6.6	.0	.0	.0	.0	.0	.0	4.3	.0
3. SW	276.	6.6	.0	.0	.0	.0	.0	.0	4.3	.0
4. NE	264.	6.6	.0	.0	.0	.0	.0	.0	3.6	.5
5. ES mdblk	276.	6.7	.0	.0	.0	.0	.0	.0	.4	2.9
6. WN mdblk	96.	6.9	.0	.0	.0	.0	.0	.0	4.3	.3
7. WS mdblk	84.	6.9	.0	.0	.0	.0	.0	.0	4.3	.3
8. EN mdblk	264.	6.7	.0	.0	.0	.0	.0	.0	.4	2.9
9. SE mdblk	324.	.5	.0	.0	.0	.0	.0	.0	.4	.0
10. NW mdblk	144.	.5	.0	.0	.0	.0	.0	.0	.0	.3
11. SW mdblk	36.	.5	.0	.0	.0	.0	.0	.0	.0	.3
12. NE mdblk	216.	.5	.0	.0	.0	.0	.0	.0	.4	.0
13. ES blk	275.	4.2	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	95.	4.2	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	85.	4.2	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	265.	4.2	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	358.	.3	.0	.0	.0	.0	.0	.0	.1	.0
18. NW blk	181.	.3	.0	.0	.0	.0	.0	.0	.1	.0
19. SW blk	359.	.3	.0	.0	.0	.0	.0	.0	.1	.0
20. NE blk	182.	.3	.0	.0	.0	.0	.0	.0	.1	.0

JOB: Soledad Townhomes
RUN: 2008nP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.5	1.5	.0	.0	.0	.0	.0	.3	.0	.0	.2
2. NW	*	.0	.0	1.8	.0	.0	.0	.0	.0	.3	.0	.0	.3
3. SW	*	.0	.0	1.8	.0	.0	.0	.0	.0	.3	.0	.0	.3
4. NE	*	.0	.5	1.5	.0	.0	.0	.0	.0	.3	.0	.0	.2
5. ES mdblk	*	.0	3.0	.2	.0	.0	.0	.0	.0	.1	.0	.0	.1
6. WN mdblk	*	.0	.3	1.8	.0	.0	.0	.0	.0	.0	.1	.1	.0
7. WS mdblk	*	.0	.3	1.8	.0	.0	.0	.0	.0	.0	.1	.1	.0
8. EN mdblk	*	.0	3.0	.2	.0	.0	.0	.0	.0	.1	.0	.0	.1
9. SE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.1	1.7	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.1	.0	.0	1.7
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.1	.0	.0	1.7
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.1	1.7	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008nP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	*	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Valley C NBA	*	0	-150	0	0	*	AG	0	4.5	.0	10.0
B. Valley C NBD	*	0	0	0	150	*	AG	880	10.0	.0	10.0
C. Valley C NBL	*	2	-150	0	0	*	AG	0	4.5	.0	10.0
D. Valley C SBA	*	0	150	0	0	*	AG	680	9.9	.0	10.0
E. Valley C SBD	*	0	0	0	-150	*	AG	0	4.5	.0	10.0
F. Valley C SBL	*	-2	150	0	0	*	AG	310	9.2	.0	10.0
G. Soledad EBA	*	-150	0	0	0	*	AG	2140	8.4	.0	13.5
H. Soledad EBD	*	0	0	150	0	*	AG	2450	5.5	.0	13.5
I. Soledad EBL	*	-150	-2	0	0	*	AG	480	9.9	.0	10.0
J. Soledad WBA	*	150	0	0	0	*	AG	1750	7.2	.0	17.0
K. Soledad WBD	*	0	0	-150	0	*	AG	2030	4.7	.0	13.5
L. Soledad WBL	*	150	2	0	0	*	AG	0	4.3	.0	10.0
M. Valley NBAX	*	0	-750	0	-150	*	AG	0	4.5	.0	10.0
N. Valley NBDX	*	0	150	0	750	*	AG	880	4.5	.0	10.0
O. Valley SBAX	*	0	750	0	150	*	AG	990	4.5	.0	10.0
P. Valley SBDX	*	0	-150	0	-750	*	AG	0	4.5	.0	10.0
Q. Soledad EBAX	*	-750	0	-150	0	*	AG	2620	4.3	.0	13.5
R. Soledad EBDX	*	150	0	750	0	*	AG	2450	4.3	.0	13.5
S. Soledad WBAX	*	750	0	150	0	*	AG	1750	4.3	.0	17.0
T. Soledad WBDX	*	-150	0	-750	0	*	AG	2030	4.3	.0	13.5

JOB: Soledad Townhomes
RUN: 2008nP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008nP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	276.	5.4	.0	.0	.0	.0	.0	.0	2.3	.3
2. NW	95.	5.8	.0	.6	.0	.4	.0	.2	.4	1.7
3. SW	276.	5.5	.0	.0	.0	.0	.0	.0	2.7	.0
4. NE	264.	6.6	.0	.6	.0	.4	.0	.2	2.3	.3
5. ES mdblk	275.	5.0	.0	.0	.0	.0	.0	.0	.3	2.0
6. WN mdblk	96.	5.5	.0	.0	.0	.0	.0	.0	2.8	.2
7. WS mdblk	84.	6.1	.0	.0	.0	.0	.0	.0	2.8	.2
8. EN mdblk	266.	4.9	.0	.0	.0	.0	.0	.0	.3	1.9
9. SE mdblk	358.	1.1	.0	.2	.0	.2	.0	.0	.1	.0
10. NW mdblk	171.	3.3	.0	1.3	.0	1.0	.0	.6	.0	.1
11. SW mdblk	1.	1.1	.0	.2	.0	.2	.0	.0	.1	.0
12. NE mdblk	190.	3.1	.0	1.3	.0	1.0	.0	.4	.2	.0
13. ES blk	275.	3.6	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	95.	3.8	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	85.	3.9	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	266.	3.5	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	359.	.4	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	174.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	359.	.4	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	186.	1.7	.0	.0	.0	.0	.0	.0	.1	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008nP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.7	.3	1.3	.0	.0	.0	.0	.0	.3	.0	.0	.2
2. NW	*	.0	1.7	.2	.0	.0	.0	.0	.0	.0	.3	.2	.0
3. SW	*	.7	.0	1.5	.0	.0	.0	.0	.0	.3	.0	.0	.3
4. NE	*	.7	.3	1.3	.0	.0	.0	.0	.0	.3	.0	.0	.2
5. ES mdblk	*	.1	1.9	.2	.0	.0	.0	.0	.0	.2	.0	.0	.1
6. WN mdblk	*	.5	.2	1.5	.0	.0	.0	.0	.0	.0	.1	.1	.0
7. WS mdblk	*	1.0	.2	1.5	.0	.0	.0	.0	.0	.0	.1	.1	.0
8. EN mdblk	*	.1	1.9	.2	.0	.0	.0	.0	.0	.2	.0	.0	.1
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.8	1.4	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	1.9	.0	.0	1.5
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	1.9	.0	.0	1.5
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.8	1.4	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.6	.7	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.6	.7	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008nP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Golden V NBA	*	0	-150	0	0	* AG	0	4.3	.0	13.5
B. Golden V NBD	*	0	0	0	150	* AG	0	4.3	.0	13.5
C. Golden V NBL	*	2	-150	0	0	* AG	990	10.1	.0	10.0
D. Golden V SBA	*	0	150	0	0	* AG	0	4.3	.0	13.5
E. Golden V SBD	*	0	0	0	-150	* AG	880	4.5	.0	10.0
F. Golden V SBL	*	-2	150	0	0	* AG	0	4.3	.0	10.0
G. Valley C EBA	*	-150	0	0	0	* AG	880	9.9	.0	10.0
H. Valley C EBD	*	0	0	150	0	* AG	0	4.5	.0	10.0
I. Valley C EBL	*	-150	-2	0	0	* AG	0	4.5	.0	10.0
J. Valley C WBA	*	150	0	0	0	* AG	0	4.5	.0	10.0
K. Valley C WBD	*	0	0	-150	0	* AG	990	7.8	.0	10.0
L. Valley C WBL	*	150	2	0	0	* AG	0	4.5	.0	10.0
M. Golden NBAX	*	0	-750	0	-150	* AG	990	4.3	.0	13.5
N. Golden NBDX	*	0	150	0	750	* AG	0	4.3	.0	13.5
O. Golden SBAX	*	0	750	0	150	* AG	0	4.3	.0	13.5
P. Golden SBDX	*	0	-150	0	-750	* AG	880	4.3	.0	10.0
Q. Valley EBAX	*	-750	0	-150	0	* AG	880	4.5	.0	10.0
R. Valley EBDX	*	150	0	750	0	* AG	0	4.5	.0	10.0
S. Valley WBAX	*	750	0	150	0	* AG	0	4.5	.0	10.0
T. Valley WBDX	*	-150	0	-750	0	* AG	990	4.5	.0	10.0

JOB: Soledad Townhomes
RUN: 2008nP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008nP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	277.	3.4	.0	.0	.7	.0	.3	.0	1.2	.0
2. NW	173.	3.2	.0	.0	1.3	.0	.5	.0	.6	.0
3. SW	278.	2.6	.0	.0	.0	.0	.0	.0	1.3	.0
4. NE	263.	2.4	.0	.0	.0	.0	.0	.0	1.2	.0
5. ES mdblk	271.	.7	.0	.0	.0	.0	.0	.0	.2	.0
6. WN mdblk	100.	2.6	.0	.0	.1	.0	.0	.0	1.3	.0
7. WS mdblk	81.	2.4	.0	.0	.0	.0	.0	.0	1.3	.0
8. EN mdblk	268.	.7	.0	.0	.0	.0	.0	.0	.2	.0
9. SE mdblk	352.	2.7	.0	.0	2.0	.0	.6	.0	.1	.0
10. NW mdblk	179.	.7	.0	.0	.2	.0	.0	.0	.0	.0
11. SW mdblk	9.	1.7	.0	.0	1.1	.0	.6	.0	.0	.0
12. NE mdblk	182.	.6	.0	.0	.2	.0	.1	.0	.0	.0
13. ES blk	268.	.2	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	97.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	1.4	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	267.	.2	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	354.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	182.	.2	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	5.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	185.	.2	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2008nP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.0	1.0	.0	.0	.0	.0	.0	.1	.0	.0	.1
2. NW	*	.0	.0	.5	.0	.1	.0	.0	.0	.0	.0	.0	.0
3. SW	*	.0	.0	1.1	.0	.0	.0	.0	.0	.0	.0	.0	.1
4. NE	*	.0	.0	1.0	.0	.0	.0	.0	.0	.1	.0	.0	.1
5. ES mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.1
6. WN mdblk	*	.0	.0	1.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.0	.0	1.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.1
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.0	.7
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.0	.7
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	*	.0	.0	.0	.0	.8	.0	.0	.6	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.8	.0	.0	.6	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

SOLEDAD TOWNHOUSES

AIR QUALITY CO HOT SPOT ANALYSIS

CALINE4 MODEL PRINTOUTS

2008 WITH PROJECT SCENARIO

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Bouquet NBA	*	0	-150	0	0	* AG	1838	9.1	.0	17.0
B. Bouquet NBD	*	0	0	0	150	* AG	3440	8.7	.0	13.5
C. Bouquet NBL	*	2	-150	0	0	* AG	40	9.2	.0	10.0
D. Bouquet SBA	*	-9	150	-9	0	* AG	1990	9.1	.0	20.5
E. Bouquet SBD	*	-9	0	-9	-150	* AG	1761	4.9	.0	13.5
F. Bouquet SBL	*	-9	150	0	0	* AG	1095	10.1	.0	10.0
G. Soledad EBA	*	-150	-12	0	-12	* AG	1580	8.2	.0	17.0
H. Soledad EBD	*	0	-12	150	-12	* AG	3113	8.7	.0	13.5
I. Soledad EBL	*	-150	-9	0	0	* AG	1200	10.1	.0	10.0
J. Soledad WBA	*	150	7	0	7	* AG	1721	8.2	.0	17.0
K. Soledad WBD	*	0	7	-150	7	* AG	1811	5.4	.0	11.8
L. Soledad WBL	*	150	2	0	0	* AG	661	10.1	.0	10.0
M. Bouquet NBAX	*	0	-750	0	-150	* AG	1878	4.3	.0	17.0
N. Bouquet NBDX	*	0	150	0	750	* AG	3440	4.3	.0	13.5
O. Bouquet SBAX	*	-9	750	-9	150	* AG	3085	4.3	.0	20.5
P. Bouquet SBDX	*	-9	-150	-9	-750	* AG	1761	4.3	.0	13.5
Q. Soledad EBAX	*	-750	-12	-150	-12	* AG	2780	4.3	.0	17.0
R. Soledad EBDX	*	150	-12	750	-12	* AG	3113	4.3	.0	13.5
S. Soledad WBAX	*	750	7	150	7	* AG	2382	4.3	.0	17.0
T. Soledad WBDX	*	-150	7	-750	7	* AG	1811	4.3	.0	11.8

JOB: Soledad Townhomes
RUN: 2008wP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-21	1.8
2. NW	*	-15	15	1.8
3. SW	*	-15	-21	1.8
4. NE	*	7	17	1.8
5. ES mdblk	*	150	-21	1.8
6. WN mdblk	*	-150	15	1.8
7. WS mdblk	*	-150	-21	1.8
8. EN mdblk	*	150	17	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-15	150	1.8
11. SW mdblk	*	-15	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-21	1.8
14. WN blk	*	-600	15	1.8
15. WS blk	*	-600	-21	1.8
16. EN blk	*	600	17	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-15	600	1.8
19. SW blk	*	-15	-600	1.8
20. NE blk	*	7	600	1.8

JOB: Soledad Townhomes
RUN: 2008wP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	353.	8.8	1.0	2.5	.0	1.1	.0	1.1	.0	1.7
2. NW	101.	5.7	.0	1.3	.0	.9	.0	.5	.0	.7
3. SW	9.	6.3	.0	1.6	.0	1.5	.6	.7	.8	.0
4. NE	351.	7.1	.0	4.3	.0	1.2	.0	1.2	.0	.0
5. ES mdblk	280.	5.1	.0	.2	.0	.2	.0	.1	.1	3.2
6. WN mdblk	98.	3.4	.2	.1	.0	.0	.0	.0	.3	.5
7. WS mdblk	81.	4.3	.0	.2	.0	.1	.0	.0	1.8	.2
8. EN mdblk	261.	3.8	.2	.1	.0	.0	.0	.0	.3	.4
9. SE mdblk	355.	5.0	2.5	.4	.0	.4	.3	.2	.1	.1
10. NW mdblk	170.	6.4	.2	1.6	.0	2.3	.0	1.5	.0	.2
11. SW mdblk	6.	4.2	.8	.5	.0	.3	1.4	.3	.0	.2
12. NE mdblk	188.	7.3	.2	4.4	.0	1.2	.2	.7	.2	.0
13. ES blk	277.	2.9	.0	.1	.0	.1	.0	.0	.0	.0
14. WN blk	96.	2.1	.1	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	2.9	.0	.1	.0	.1	.0	.0	.0	.0
16. EN blk	263.	2.4	.1	.0	.0	.0	.0	.0	.0	.0
17. SE blk	355.	2.7	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	175.	3.6	.0	.0	.0	.0	.0	.0	.0	.1
19. SW blk	6.	2.7	.0	.0	.0	.0	.0	.0	.0	.1
20. NE blk	186.	4.1	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.4	.0	.2	.0	.2	.3	.0	.0	.0	.0	.0
2. NW	*	.0	1.3	.2	.5	.0	.0	.0	.0	.0	.3	.0	.0
3. SW	*	.4	.0	.3	.0	.0	.2	.2	.0	.0	.0	.0	.0
4. NE	*	.0	.0	.0	.0	.0	.2	.3	.0	.0	.0	.0	.0
5. ES mdblk	*	.2	.4	.2	.3	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.4	.2	1.1	.1	.0	.0	.0	.0	.0	.2	.0	.0
7. WS mdblk	*	.8	.3	.2	.2	.0	.0	.0	.0	.0	.0	.1	.0
8. EN mdblk	*	.2	1.6	.1	.4	.0	.0	.0	.0	.2	.0	.0	.0
9. SE mdblk	*	.1	.0	.0	.0	.0	.2	.2	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.1	.0	.0	.0	.2	.2	.0	.0	.0	.0	.0
12. NE mdblk	*	.1	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.7	.5	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.5	.0	.0	1.0
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	1.8	.0	.0	.3
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.5	1.3	.0
17. SE blk	*	.0	.0	.0	.0	1.4	.0	.0	.5	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.8	2.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.7	.0	.0	1.4	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	2.4	1.1	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Project NBA	*	12	-150	12	0	* AG	0	4.5	.0	10.0
B. Project NBD	*	12	0	12	150	* AG	38	5.2	.0	10.0
C. Project NBL	*	9	-150	0	0	* AG	0	4.5	.0	10.0
D. Project SBA	*	-5	150	-5	0	* AG	9	8.4	.0	10.0
E. Project SBD	*	-5	0	-5	-150	* AG	0	4.5	.0	10.0
F. Project SBL	*	-2	150	0	0	* AG	0	4.5	.0	10.0
G. Soledad EBA	*	-150	-11	0	-11	* AG	2871	9.7	.0	13.5
H. Soledad EBD	*	0	-11	150	-11	* AG	2871	6.5	.0	13.5
I. Soledad EBL	*	-150	-9	0	0	* AG	16	9.2	.0	10.0
J. Soledad WBA	*	150	0	0	0	* AG	2383	8.4	.0	13.5
K. Soledad WBD	*	0	0	-150	0	* AG	2370	5.0	.0	11.8
L. Soledad WBL	*	150	2	0	0	* AG	0	4.3	.0	10.0
M. Project NBAX	*	12	-750	12	-150	* AG	0	4.5	.0	10.0
N. Project NBDX	*	12	150	12	750	* AG	38	4.5	.0	10.0
O. Project SBAX	*	-5	750	-5	150	* AG	9	4.5	.0	10.0
P. Project SBDX	*	-5	-150	-5	-750	* AG	0	4.5	.0	10.0
Q. Soledad EBAX	*	-750	-11	-150	-11	* AG	2887	4.3	.0	13.5
R. Soledad EBDX	*	150	-11	750	-11	* AG	2871	4.3	.0	13.5
S. Soledad WBAX	*	750	0	150	0	* AG	2383	4.3	.0	13.5
T. Soledad WBDX	*	-150	0	-750	0	* AG	2370	4.3	.0	11.8

JOB: Soledad Townhomes
RUN: 2008wP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	21	-17	1.8
2. NW	*	-14	7	1.8
3. SW	*	-12	-17	1.8
4. NE	*	21	7	1.8
5. ES mdblk	*	150	-17	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-17	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	21	-150	1.8
10. NW mdblk	*	-14	150	1.8
11. SW mdblk	*	-12	-150	1.8
12. NE mdblk	*	21	150	1.8
13. ES blk	*	600	-17	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-17	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	21	-600	1.8
18. NW blk	*	-14	600	1.8
19. SW blk	*	-12	-600	1.8
20. NE blk	*	21	600	1.8

JOB: Soledad Townhomes
RUN: 2008wP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	277.	4.6	.0	.0	.0	.0	.0	.0	2.4	1.2
2. NW	97.	3.9	.0	.0	.0	.0	.0	.0	.0	.7
3. SW	277.	5.1	.0	.0	.0	.0	.0	.0	4.1	.0
4. NE	261.	4.1	.0	.0	.0	.0	.0	.0	1.4	.0
5. ES mdblk	277.	4.4	.0	.0	.0	.0	.0	.0	.3	2.8
6. WN mdblk	98.	3.6	.0	.0	.0	.0	.0	.0	1.1	.3
7. WS mdblk	83.	5.5	.0	.0	.0	.0	.0	.0	4.2	.2
8. EN mdblk	263.	4.7	.0	.0	.0	.0	.0	.0	.5	.7
9. SE mdblk	320.	.6	.0	.0	.0	.0	.0	.0	.4	.0
10. NW mdblk	143.	.5	.0	.0	.0	.0	.0	.0	.0	.2
11. SW mdblk	39.	.5	.0	.0	.0	.0	.0	.0	.0	.3
12. NE mdblk	217.	.5	.0	.0	.0	.0	.0	.0	.4	.0
13. ES blk	276.	3.0	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	97.	2.6	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	3.0	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	264.	2.8	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	358.	.3	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	175.	.3	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	1.	.3	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	184.	.3	.0	.0	.0	.0	.0	.0	.1	.0

JOB: Soledad Townhomes
RUN: 2008wP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.0	.5	.0	.0	.0	.0	.0	.2	.0	.0	.3
2. NW	*	.0	2.1	.5	.0	.0	.0	.0	.0	.0	.3	.2	.0
3. SW	*	.0	.0	.4	.0	.0	.0	.0	.0	.3	.0	.0	.3
4. NE	*	.0	1.4	1.0	.0	.0	.0	.0	.0	.2	.0	.0	.1
5. ES mdblk	*	.0	.8	.2	.0	.0	.0	.0	.0	.1	.0	.0	.1
6. WN mdblk	*	.0	.2	1.7	.0	.0	.0	.0	.0	.0	.1	.0	.0
7. WS mdblk	*	.0	.4	.4	.0	.0	.0	.0	.0	.0	.1	.1	.0
8. EN mdblk	*	.0	3.1	.1	.0	.0	.0	.0	.0	.2	.0	.0	.0
9. SE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.1	.6	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.8	.0	.0	1.6
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.1	.0	.0	.6
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.7	1.8	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Project NBA	*	0	-150	0	0	* AG	0	4.5	.0	10.0
B. Project NBD	*	0	0	0	150	* AG	113	5.2	.0	10.0
C. Project NBL	*	2	-150	0	0	* AG	0	4.5	.0	10.0
D. Project SBA	*	0	150	0	0	* AG	50	8.4	.0	10.0
E. Project SBD	*	0	0	0	-150	* AG	0	4.5	.0	10.0
F. Project SBL	*	-2	150	0	0	* AG	54	9.2	.0	10.0
G. Soledad EBA	*	-150	0	0	0	* AG	2808	9.7	.0	13.5
H. Soledad EBD	*	0	0	150	0	* AG	2862	6.5	.0	13.5
I. Soledad EBL	*	-150	-2	0	0	* AG	63	9.2	.0	10.0
J. Soledad WBA	*	150	0	0	0	* AG	2383	8.4	.0	13.5
K. Soledad WBD	*	0	0	-150	0	* AG	2383	5.0	.0	11.8
L. Soledad WBL	*	150	2	0	0	* AG	0	4.3	.0	10.0
M. Project NBAX	*	0	-750	0	-150	* AG	0	4.5	.0	10.0
N. Project NBDX	*	0	150	0	750	* AG	113	4.5	.0	10.0
O. Project SBAX	*	0	750	0	150	* AG	104	4.5	.0	10.0
P. Project SBDX	*	0	-150	0	-750	* AG	0	4.5	.0	10.0
Q. Soledad EBAX	*	-750	0	-150	0	* AG	2871	4.3	.0	13.5
R. Soledad EBDX	*	150	0	750	0	* AG	2862	4.3	.0	13.5
S. Soledad WBAX	*	750	0	150	0	* AG	2383	4.3	.0	13.5
T. Soledad WBDX	*	-150	0	-750	0	* AG	2383	4.3	.0	11.8

JOB: Soledad Townhomes
RUN: 2008wP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	276.	6.4	.0	.0	.0	.0	.0	.0	3.4	.4
2. NW	263.	6.3	.0	.0	.0	.0	.0	.0	4.0	.0
3. SW	277.	6.3	.0	.0	.0	.0	.0	.0	4.0	.0
4. NE	264.	6.5	.0	.0	.0	.0	.0	.0	3.4	.4
5. ES mdblk	276.	6.6	.0	.0	.0	.0	.0	.0	.4	2.7
6. WN mdblk	96.	6.6	.0	.0	.0	.0	.0	.0	4.0	.3
7. WS mdblk	84.	6.7	.0	.0	.0	.0	.0	.0	4.0	.3
8. EN mdblk	264.	6.6	.0	.0	.0	.0	.0	.0	.4	2.7
9. SE mdblk	358.	.6	.0	.0	.0	.0	.0	.0	.1	.1
10. NW mdblk	172.	.8	.0	.1	.0	.0	.0	.1	.0	.2
11. SW mdblk	1.	.6	.0	.0	.0	.0	.0	.0	.2	.0
12. NE mdblk	189.	.8	.0	.1	.0	.0	.0	.0	.3	.0
13. ES blk	275.	4.1	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	96.	4.0	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	4.0	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	265.	4.1	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	359.	.3	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	176.	.5	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	360.	.3	.0	.0	.0	.0	.0	.0	.1	.0
20. NE blk	185.	.5	.0	.0	.0	.0	.0	.0	.1	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.1	.5	1.5	.0	.0	.0	.0	.0	.3	.0	.0	.2
2. NW	*	.1	.0	1.7	.0	.0	.0	.0	.0	.3	.0	.0	.2
3. SW	*	.1	.0	1.7	.0	.0	.0	.0	.0	.3	.0	.0	.2
4. NE	*	.1	.5	1.5	.0	.0	.0	.0	.0	.3	.0	.0	.2
5. ES mdblk	*	.0	3.0	.2	.0	.0	.0	.0	.0	.1	.0	.0	.1
6. WN mdblk	*	.0	.3	1.6	.0	.0	.0	.0	.0	.0	.1	.1	.0
7. WS mdblk	*	.1	.3	1.6	.0	.0	.0	.0	.0	.0	.1	.1	.0
8. EN mdblk	*	.0	3.0	.2	.0	.0	.0	.0	.0	.1	.0	.0	.1
9. SE mdblk	*	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.0	1.7	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.1	.0	.0	1.6
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	2.1	.0	.0	1.6
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.0	1.7	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.1	.0	.0	.0	.1	.1	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.1	.1	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Valley C NBA	0	-150	0	0	AG	0	4.5	.0	10.0
B. Valley C NBD	0	0	0	150	AG	898	10.0	.0	10.0
C. Valley C NBL	2	-150	0	0	AG	0	4.5	.0	10.0
D. Valley C SBA	0	150	0	0	AG	706	9.9	.0	10.0
E. Valley C SBD	0	0	0	-150	AG	0	4.5	.0	10.0
F. Valley C SBL	-2	150	0	0	AG	310	9.2	.0	10.0
G. Soledad EBA	-150	0	0	0	AG	2163	8.4	.0	13.5
H. Soledad EBD	0	0	150	0	AG	2473	5.5	.0	13.5
I. Soledad EBL	-150	-2	0	0	AG	498	9.9	.0	10.0
J. Soledad WBA	150	0	0	0	AG	1783	7.2	.0	17.0
K. Soledad WBD	0	0	-150	0	AG	2089	4.7	.0	13.5
L. Soledad WBL	150	2	0	0	AG	0	4.3	.0	10.0
M. Valley NBAX	0	-750	0	-150	AG	0	4.5	.0	10.0
N. Valley NBDX	0	150	0	750	AG	898	4.5	.0	10.0
O. Valley SBAX	0	750	0	150	AG	1016	4.5	.0	10.0
P. Valley SBDX	0	-150	0	-750	AG	0	4.5	.0	10.0
Q. Soledad EBAX	-750	0	-150	0	AG	2661	4.3	.0	13.5
R. Soledad EBDX	150	0	750	0	AG	2473	4.3	.0	13.5
S. Soledad WBAX	750	0	150	0	AG	1783	4.3	.0	17.0
T. Soledad WBDX	-150	0	-750	0	AG	2089	4.3	.0	13.5

JOB: Soledad Townhomes
RUN: 2008wP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	276.	5.5	.0	.0	.0	.0	.0	.0	2.4	.3
2. NW	95.	5.8	.0	.6	.0	.5	.0	.2	.4	1.7
3. SW	276.	5.5	.0	.0	.0	.0	.0	.0	2.8	.0
4. NE	264.	6.7	.0	.6	.0	.5	.0	.2	2.4	.3
5. ES mdblk	275.	5.0	.0	.0	.0	.0	.0	.0	.3	2.0
6. WN mdblk	96.	5.6	.0	.0	.0	.0	.0	.0	2.8	.2
7. WS mdblk	84.	6.2	.0	.0	.0	.0	.0	.0	2.8	.2
8. EN mdblk	266.	4.9	.0	.0	.0	.0	.0	.0	.3	1.9
9. SE mdblk	358.	1.1	.0	.2	.0	.2	.0	.0	.1	.0
10. NW mdblk	171.	3.3	.0	1.3	.0	1.0	.0	.6	.0	.1
11. SW mdblk	1.	1.1	.0	.2	.0	.2	.0	.0	.1	.0
12. NE mdblk	190.	3.2	.0	1.3	.0	1.0	.0	.4	.2	.0
13. ES blk	275.	3.6	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	95.	3.8	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	85.	3.9	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	266.	3.5	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	359.	.4	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	174.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	359.	.4	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	186.	1.7	.0	.0	.0	.0	.0	.0	.1	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.7	.3	1.3	.0	.0	.0	.0	.0	.3	.0	.0	.2
2. NW	*	.0	1.7	.2	.0	.0	.0	.0	.0	.0	.3	.3	.0
3. SW	*	.7	.0	1.5	.0	.0	.0	.0	.0	.3	.0	.0	.3
4. NE	*	.7	.3	1.3	.0	.0	.0	.0	.0	.3	.0	.0	.2
5. ES mdblk	*	.1	1.9	.2	.0	.0	.0	.0	.0	.2	.0	.0	.1
6. WN mdblk	*	.6	.2	1.5	.0	.0	.0	.0	.0	.0	.1	.1	.0
7. WS mdblk	*	1.0	.2	1.5	.0	.0	.0	.0	.0	.0	.1	.1	.0
8. EN mdblk	*	.1	1.9	.2	.0	.0	.0	.0	.0	.2	.0	.0	.1
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.8	1.4	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	1.9	.0	.0	1.6
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	1.9	.0	.0	1.6
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.8	1.4	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.7	.7	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.7	.7	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Golden V NBA	*	0	-150	0	0	* AG	0	4.3	.0	13.5
B. Golden V NBD	*	0	0	0	150	* AG	0	4.3	.0	13.5
C. Golden V NBL	*	2	-150	0	0	* AG	1016	10.1	.0	10.0
D. Golden V SBA	*	0	150	0	0	* AG	0	4.3	.0	13.5
E. Golden V SBD	*	0	0	0	-150	* AG	898	4.5	.0	10.0
F. Golden V SBL	*	-2	150	0	0	* AG	0	4.3	.0	10.0
G. Valley C EBA	*	-150	0	0	0	* AG	898	9.9	.0	10.0
H. Valley C EBD	*	0	0	150	0	* AG	0	4.5	.0	10.0
I. Valley C EBL	*	-150	-2	0	0	* AG	0	4.5	.0	10.0
J. Valley C WBA	*	150	0	0	0	* AG	0	4.5	.0	10.0
K. Valley C WBD	*	0	0	-150	0	* AG	1016	9.2	.0	10.0
L. Valley C WBL	*	150	2	0	0	* AG	0	4.5	.0	10.0
M. Golden NBAX	*	0	-750	0	-150	* AG	1016	4.3	.0	13.5
N. Golden NBDX	*	0	150	0	750	* AG	0	4.3	.0	13.5
O. Golden SBAX	*	0	750	0	150	* AG	0	4.3	.0	13.5
P. Golden SBDX	*	0	-150	0	-750	* AG	898	4.3	.0	10.0
Q. Valley EBAX	*	-750	0	-150	0	* AG	898	4.5	.0	10.0
R. Valley EBDX	*	150	0	750	0	* AG	0	4.5	.0	10.0
S. Valley WBAX	*	750	0	150	0	* AG	0	4.5	.0	10.0
T. Valley WBDX	*	-150	0	-750	0	* AG	1016	4.5	.0	10.0

JOB: Soledad Townhomes
RUN: 2008wP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2008wP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	277.	3.6	.0	.0	.7	.0	.3	.0	1.2	.0
2. NW	172.	3.3	.0	.0	1.4	.0	.6	.0	.6	.0
3. SW	278.	2.8	.0	.0	.0	.0	.0	.0	1.3	.0
4. NE	263.	2.7	.0	.0	.0	.0	.0	.0	1.2	.0
5. ES mdblk	271.	.8	.0	.0	.0	.0	.0	.0	.2	.0
6. WN mdblk	100.	2.9	.0	.0	.1	.0	.0	.0	1.3	.0
7. WS mdblk	81.	2.7	.0	.0	.0	.0	.0	.0	1.3	.0
8. EN mdblk	268.	.8	.0	.0	.0	.0	.0	.0	.2	.0
9. SE mdblk	352.	2.8	.0	.0	2.0	.0	.6	.0	.1	.0
10. NW mdblk	179.	.7	.0	.0	.2	.0	.1	.0	.0	.0
11. SW mdblk	9.	1.8	.0	.0	1.2	.0	.6	.0	.0	.0
12. NE mdblk	182.	.7	.0	.0	.2	.0	.1	.0	.0	.0
13. ES blk	268.	.2	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	97.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	267.	.2	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	354.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	183.	.2	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	5.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	185.	.2	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2008wP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.0	1.3	.0	.0	.0	.0	.0	.1	.0	.0	.1
2. NW	*	.0	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. SW	*	.0	.0	1.3	.0	.0	.0	.0	.0	.0	.0	.0	.1
4. NE	*	.0	.0	1.3	.0	.0	.0	.0	.0	.1	.0	.0	.1
5. ES mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.1
6. WN mdblk	*	.0	.0	1.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.0	.0	1.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.1
9. SE mdblk	*	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.7	.0	.0	.7
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.7	.0	.0	.7
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	*	.0	.0	.0	.0	.8	.0	.0	.6	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.8	.0	.0	.6	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

SOLEDAD TOWNHOUSES

AIR QUALITY CO HOT SPOT ANALYSIS

CALINE4 MODEL PRINTOUTS

2015 WITHOUT PROJECT SCENARIO

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015nP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Bouquet NBA	*	0	-150	0	0	* AG	2034	4.7	.0	17.0
B. Bouquet NBD	*	0	0	0	150	* AG	3225	4.5	.0	13.5
C. Bouquet NBL	*	2	-150	0	0	* AG	100	4.7	.0	10.0
D. Bouquet SBA	*	-9	150	-9	0	* AG	2290	4.9	.0	20.5
E. Bouquet SBD	*	-9	0	-9	-150	* AG	1546	2.7	.0	13.5
F. Bouquet SBL	*	-9	150	0	0	* AG	346	4.7	.0	10.0
G. Soledad EBA	*	-150	-12	0	-12	* AG	1285	4.0	.0	17.0
H. Soledad EBD	*	0	-12	150	-12	* AG	2085	2.9	.0	13.5
I. Soledad EBL	*	-150	-9	0	0	* AG	1450	5.1	.0	10.0
J. Soledad WBA	*	150	7	0	7	* AG	977	3.9	.0	17.0
K. Soledad WBD	*	0	7	-150	7	* AG	1882	2.9	.0	11.8
L. Soledad WBL	*	150	2	0	0	* AG	256	4.7	.0	10.0
M. Bouquet NBAX	*	0	-750	0	-150	* AG	2134	2.3	.0	17.0
N. Bouquet NBDX	*	0	150	0	750	* AG	3225	2.3	.0	13.5
O. Bouquet SBAX	*	-9	750	-9	150	* AG	2636	2.3	.0	20.5
P. Bouquet SBDX	*	-9	-150	-9	-750	* AG	1546	2.3	.0	13.5
Q. Soledad EBAX	*	-750	-12	-150	-12	* AG	2735	2.3	.0	17.0
R. Soledad EBDX	*	150	-12	750	-12	* AG	2085	2.3	.0	13.5
S. Soledad WBAX	*	750	7	150	7	* AG	1233	2.3	.0	17.0
T. Soledad WBDX	*	-150	7	-750	7	* AG	1882	2.3	.0	11.8

JOB: Soledad Townhomes
RUN: 2015nP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-21	1.8
2. NW	*	-15	15	1.8
3. SW	*	-15	-21	1.8
4. NE	*	7	17	1.8
5. ES mdblk	*	150	-21	1.8
6. WN mdblk	*	-150	15	1.8
7. WS mdblk	*	-150	-21	1.8
8. EN mdblk	*	150	17	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-15	150	1.8
11. SW mdblk	*	-15	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-21	1.8
14. WN blk	*	-600	15	1.8
15. WS blk	*	-600	-21	1.8
16. EN blk	*	600	17	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-15	600	1.8
19. SW blk	*	-15	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015nP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	353.	3.6	.6	1.2	.0	.7	.0	.2	.0	.4
2. NW	172.	2.5	.6	.0	.0	.4	.5	.0	.2	.0
3. SW	7.	3.1	.0	.7	.0	.9	.3	.1	.3	.0
4. NE	352.	3.3	.0	2.1	.0	.7	.0	.2	.0	.0
5. ES mdblk	278.	1.6	.0	.0	.0	.0	.0	.0	.0	.7
6. WN mdblk	100.	1.6	.1	.0	.0	.0	.0	.0	.1	.1
7. WS mdblk	77.	1.9	.0	.1	.0	.1	.0	.0	.7	.0
8. EN mdblk	263.	1.4	.0	.0	.0	.0	.0	.0	.1	.0
9. SE mdblk	355.	2.6	1.4	.2	.1	.2	.2	.0	.0	.0
10. NW mdblk	173.	2.9	.2	.6	.0	1.5	.0	.2	.0	.0
11. SW mdblk	6.	2.0	.5	.2	.0	.2	.7	.0	.0	.0
12. NE mdblk	188.	3.5	.1	2.1	.0	.7	.0	.1	.0	.0
13. ES blk	277.	1.1	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	97.	1.1	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	264.	.9	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	355.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	175.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	6.	1.3	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	186.	2.0	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2015nP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.1	.0	.0	.0	.1	.2	.0	.0	.0	.0	.0
2. NW	*	.3	.0	.3	.0	.1	.0	.0	.0	.0	.0	.0	.0
3. SW	*	.3	.0	.2	.0	.0	.2	.1	.0	.0	.0	.0	.0
4. NE	*	.0	.0	.0	.0	.0	.1	.2	.0	.0	.0	.0	.0
5. ES mdblk	*	.2	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.3	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.6	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.2	.4	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.7	.2	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.3	.0	.0	.5
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	1.0	.0	.0	.2
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.4	.0
17. SE blk	*	.0	.0	.0	.0	.9	.0	.0	.3	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.4	1.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.4	.0	.0	.7	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	1.2	.5	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015nP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	*	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Project NBA	*	12	-150	12	0	*	AG	0	2.5	.0	10.0
B. Project NBD	*	12	0	12	150	*	AG	0	2.5	.0	10.0
C. Project NBL	*	9	-150	0	0	*	AG	0	2.5	.0	10.0
D. Project SBA	*	-5	150	-5	0	*	AG	0	2.5	.0	10.0
E. Project SBD	*	-5	0	-5	-150	*	AG	0	2.5	.0	10.0
F. Project SBL	*	-2	150	0	0	*	AG	0	2.5	.0	10.0
G. Soledad EBA	*	-150	-11	0	-11	*	AG	2085	4.0	.0	13.5
H. Soledad EBD	*	0	-11	150	-11	*	AG	2085	2.6	.0	13.5
I. Soledad EBL	*	-150	-9	0	0	*	AG	0	2.3	.0	10.0
J. Soledad WBA	*	150	0	0	0	*	AG	1233	3.7	.0	13.5
K. Soledad WBD	*	0	0	-150	0	*	AG	1233	2.5	.0	13.5
L. Soledad WBL	*	150	2	0	0	*	AG	0	2.3	.0	10.0
M. Project NBAX	*	12	-750	12	-150	*	AG	0	2.5	.0	10.0
N. Project NBDX	*	12	150	12	750	*	AG	0	2.5	.0	10.0
O. Project SBAX	*	-5	750	-5	150	*	AG	0	2.5	.0	10.0
P. Project SBDX	*	-5	-150	-5	-750	*	AG	0	2.5	.0	10.0
Q. Soledad EBAX	*	-750	-11	-150	-11	*	AG	2085	2.3	.0	13.5
R. Soledad EBDX	*	150	-11	750	-11	*	AG	2085	2.3	.0	13.5
S. Soledad WBAX	*	750	0	150	0	*	AG	1233	2.3	.0	13.5
T. Soledad WBDX	*	-150	0	-750	0	*	AG	1233	2.3	.0	13.5

JOB: Soledad Townhomes
RUN: 2015nP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	21	-17	1.8
2. NW	*	-14	7	1.8
3. SW	*	-12	-17	1.8
4. NE	*	21	7	1.8
5. ES mdblk	*	150	-17	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-17	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	21	-150	1.8
10. NW mdblk	*	-14	150	1.8
11. SW mdblk	*	-12	-150	1.8
12. NE mdblk	*	21	150	1.8
13. ES blk	*	600	-17	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-17	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	21	-600	1.8
18. NW blk	*	-14	600	1.8
19. SW blk	*	-12	-600	1.8
20. NE blk	*	21	600	1.8

JOB: Soledad Townhomes
RUN: 2015nP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	276.	1.5	.0	.0	.0	.0	.0	.0	.8	.4
2. NW	97.	1.1	.0	.0	.0	.0	.0	.0	.0	.2
3. SW	277.	1.6	.0	.0	.0	.0	.0	.0	1.3	.0
4. NE	262.	1.2	.0	.0	.0	.0	.0	.0	.4	.0
5. ES mdblk	276.	1.3	.0	.0	.0	.0	.0	.0	.1	.8
6. WN mdblk	97.	1.1	.0	.0	.0	.0	.0	.0	.3	.1
7. WS mdblk	84.	1.7	.0	.0	.0	.0	.0	.0	1.3	.0
8. EN mdblk	263.	1.3	.0	.0	.0	.0	.0	.0	.2	.2
9. SE mdblk	319.	.2	.0	.0	.0	.0	.0	.0	.1	.0
10. NW mdblk	212.	.2	.0	.0	.0	.0	.0	.0	.1	.0
11. SW mdblk	323.	.2	.0	.0	.0	.0	.0	.0	.1	.0
12. NE mdblk	218.	.2	.0	.0	.0	.0	.0	.0	.1	.0
13. ES blk	276.	1.2	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	96.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	1.2	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	264.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	352.	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	183.	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	357.	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	186.	.0	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2015nP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.0	.1	.0	.0	.0	.0	.0	.1	.0	.0	.1
2. NW	*	.0	.5	.2	.0	.0	.0	.0	.0	.0	.1	.0	.0
3. SW	*	.0	.0	.1	.0	.0	.0	.0	.0	.1	.0	.0	.1
4. NE	*	.0	.3	.3	.0	.0	.0	.0	.0	.1	.0	.0	.0
5. ES mdblk	*	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.0	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.0	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.0	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.8	.2	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.3	.0	.0	.5
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.8	.0	.0	.2
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.3	.5	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015nP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Project NBA	*	0	-150	0	0	* AG	0	2.5	.0	10.0
B. Project NBD	*	0	0	0	150	* AG	0	2.5	.0	10.0
C. Project NBL	*	2	-150	0	0	* AG	0	2.5	.0	10.0
D. Project SBA	*	0	150	0	0	* AG	0	2.5	.0	10.0
E. Project SBD	*	0	0	0	-150	* AG	0	2.5	.0	10.0
F. Project SBL	*	-2	150	0	0	* AG	0	2.5	.0	10.0
G. Soledad EBA	*	-150	0	0	0	* AG	2085	4.0	.0	13.5
H. Soledad EBD	*	0	0	150	0	* AG	2085	2.6	.0	13.5
I. Soledad EBL	*	-150	-2	0	0	* AG	0	2.3	.0	10.0
J. Soledad WBA	*	150	0	0	0	* AG	1233	3.7	.0	13.5
K. Soledad WBD	*	0	0	-150	0	* AG	1233	2.5	.0	13.5
L. Soledad WBL	*	150	2	0	0	* AG	0	2.3	.0	10.0
M. Project NBAX	*	0	-750	0	-150	* AG	0	2.5	.0	10.0
N. Project NBDX	*	0	150	0	750	* AG	0	2.5	.0	10.0
O. Project SBAX	*	0	750	0	150	* AG	0	2.5	.0	10.0
P. Project SBDX	*	0	-150	0	-750	* AG	0	2.5	.0	10.0
Q. Soledad EBAX	*	-750	0	-150	0	* AG	2085	2.3	.0	13.5
R. Soledad EBDX	*	150	0	750	0	* AG	2085	2.3	.0	13.5
S. Soledad WBAX	*	750	0	150	0	* AG	1233	2.3	.0	13.5
T. Soledad WBDX	*	-150	0	-750	0	* AG	1233	2.3	.0	13.5

JOB: Soledad Townhomes
RUN: 2015nP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015nP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	276.	2.0	.0	.0	.0	.0	.0	.0	1.1	.1
2. NW	264.	2.0	.0	.0	.0	.0	.0	.0	1.3	.0
3. SW	276.	2.0	.0	.0	.0	.0	.0	.0	1.3	.0
4. NE	264.	2.0	.0	.0	.0	.0	.0	.0	1.1	.1
5. ES mdblk	275.	1.9	.0	.0	.0	.0	.0	.0	.1	.8
6. WN mdblk	96.	2.1	.0	.0	.0	.0	.0	.0	1.3	.0
7. WS mdblk	84.	2.1	.0	.0	.0	.0	.0	.0	1.3	.0
8. EN mdblk	265.	1.9	.0	.0	.0	.0	.0	.0	.1	.8
9. SE mdblk	323.	.2	.0	.0	.0	.0	.0	.0	.1	.0
10. NW mdblk	218.	.2	.0	.0	.0	.0	.0	.0	.1	.0
11. SW mdblk	322.	.2	.0	.0	.0	.0	.0	.0	.1	.0
12. NE mdblk	217.	.2	.0	.0	.0	.0	.0	.0	.1	.0
13. ES blk	275.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	95.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	85.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	265.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	355.	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	185.	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	355.	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	185.	.0	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2015nP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.1	.4	.0	.0	.0	.0	.0	.1	.0	.0	.0
2. NW	*	.0	.0	.5	.0	.0	.0	.0	.0	.1	.0	.0	.0
3. SW	*	.0	.0	.5	.0	.0	.0	.0	.0	.1	.0	.0	.0
4. NE	*	.0	.1	.4	.0	.0	.0	.0	.0	.1	.0	.0	.0
5. ES mdblk	*	.0	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.0	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.0	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.0	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.8	.5	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.8	.0	.0	.5
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.8	.0	.0	.5
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.8	.5	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015nP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Valley C NBA	*	0	-150	0	0	* AG	0	2.5	.0	10.0
B. Valley C NBD	*	0	0	0	150	* AG	1190	5.1	.0	10.0
C. Valley C NBL	*	2	-150	0	0	* AG	0	2.5	.0	10.0
D. Valley C SBA	*	0	150	0	0	* AG	82	4.3	.0	10.0
E. Valley C SBD	*	0	0	0	-150	* AG	0	2.5	.0	10.0
F. Valley C SBL	*	-2	150	0	0	* AG	900	5.1	.0	10.0
G. Soledad EBA	*	-150	0	0	0	* AG	1852	4.0	.0	13.5
H. Soledad EBD	*	0	0	150	0	* AG	2752	3.4	.0	13.5
I. Soledad EBL	*	-150	-2	0	0	* AG	220	4.7	.0	10.0
J. Soledad WBA	*	150	0	0	0	* AG	1733	3.8	.0	17.0
K. Soledad WBD	*	0	0	-150	0	* AG	845	2.4	.0	13.5
L. Soledad WBL	*	150	2	0	0	* AG	0	2.3	.0	10.0
M. Valley NBAX	*	0	-750	0	-150	* AG	0	2.5	.0	10.0
N. Valley NBDX	*	0	150	0	750	* AG	1190	2.5	.0	10.0
O. Valley SBAX	*	0	750	0	150	* AG	982	2.5	.0	10.0
P. Valley SBDX	*	0	-150	0	-750	* AG	0	2.5	.0	10.0
Q. Soledad EBAX	*	-750	0	-150	0	* AG	2072	2.3	.0	13.5
R. Soledad EBDX	*	150	0	750	0	* AG	2752	2.3	.0	13.5
S. Soledad WBAX	*	750	0	150	0	* AG	1733	2.3	.0	17.0
T. Soledad WBDX	*	-150	0	-750	0	* AG	845	2.3	.0	13.5

JOB: Soledad Townhomes
RUN: 2015nP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

JOB: Soledad Townhomes
RUN: 2015nP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	352.	2.6	.0	.8	.0	.0	.0	.6	.0	.6
2. NW	95.	3.3	.0	.4	.0	.0	.0	.3	.2	1.1
3. SW	85.	2.5	.0	.0	.0	.0	.0	.0	.2	1.1
4. NE	264.	2.7	.0	.4	.0	.0	.0	.3	1.0	.2
5. ES mdblk	276.	2.8	.0	.0	.0	.0	.0	.0	.1	1.4
6. WN mdblk	95.	2.1	.0	.0	.0	.0	.0	.0	1.1	.1
7. WS mdblk	85.	2.2	.0	.0	.0	.0	.0	.0	1.1	.1
8. EN mdblk	265.	2.7	.0	.0	.0	.0	.0	.0	.1	1.3
9. SE mdblk	359.	.6	.0	.1	.0	.0	.0	.1	.0	.0
10. NW mdblk	172.	2.0	.0	.9	.0	.0	.0	.9	.0	.0
11. SW mdblk	2.	.6	.0	.1	.0	.0	.0	.1	.0	.0
12. NE mdblk	190.	1.6	.0	.9	.0	.0	.0	.5	.0	.0
13. ES blk	275.	2.0	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	95.	1.4	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	85.	1.4	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	265.	1.9	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	360.	.2	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	174.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	1.	.2	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	186.	1.0	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2015nP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. NW	*	.0	.9	.0	.0	.0	.0	.0	.0	.0	.2	.1	.0
3. SW	*	.0	.9	.0	.0	.0	.0	.0	.0	.0	.2	.1	.0
4. NE	*	.2	.1	.3	.0	.0	.0	.0	.0	.1	.0	.0	.0
5. ES mdblk	*	.0	1.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.1	.1	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.2	.1	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.0	1.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.1	.7	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.8	.0	.0	.4
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.8	.0	.0	.4
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.1	.7	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.5	.4	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.5	.4	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015nP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Golden V NBA	*	0	-150	0	0	* AG	810	3.5	.0	13.5
B. Golden V NBD	*	0	0	0	150	* AG	1726	2.5	.0	13.5
C. Golden V NBL	*	2	-150	0	0	* AG	124	4.7	.0	10.0
D. Golden V SBA	*	0	150	0	0	* AG	1878	4.9	.0	13.5
E. Golden V SBD	*	0	0	0	-150	* AG	1294	2.6	.0	10.0
F. Golden V SBL	*	-2	150	0	0	* AG	0	2.3	.0	10.0
G. Valley C EBA	*	-150	0	0	0	* AG	274	4.3	.0	10.0
H. Valley C EBD	*	0	0	150	0	* AG	0	2.5	.0	10.0
I. Valley C EBL	*	-150	-2	0	0	* AG	916	5.1	.0	10.0
J. Valley C WBA	*	150	0	0	0	* AG	0	2.5	.0	10.0
K. Valley C WBD	*	0	0	-150	0	* AG	982	4.1	.0	10.0
L. Valley C WBL	*	150	2	0	0	* AG	0	2.5	.0	10.0
M. Golden NBAX	*	0	-750	0	-150	* AG	934	2.3	.0	13.5
N. Golden NBDX	*	0	150	0	750	* AG	1726	2.3	.0	13.5
O. Golden SBAX	*	0	750	0	150	* AG	1878	2.3	.0	13.5
P. Golden SBDX	*	0	-150	0	-750	* AG	1294	2.3	.0	10.0
Q. Valley EBAX	*	-750	0	-150	0	* AG	1190	2.5	.0	10.0
R. Valley EBDX	*	150	0	750	0	* AG	0	2.5	.0	10.0
S. Valley WBAX	*	750	0	150	0	* AG	0	2.5	.0	10.0
T. Valley WBDX	*	-150	0	-750	0	* AG	982	2.5	.0	10.0

JOB: Soledad Townhomes
RUN: 2015nP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015nP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	354.	2.1	.0	.6	.0	1.2	.0	.0	.0	.0
2. NW	6.	2.4	.0	.7	.0	1.4	.0	.0	.0	.0
3. SW	6.	2.8	.0	.6	.0	1.2	.0	.0	.0	.0
4. NE	263.	2.4	.0	.3	.0	.6	.0	.0	.2	.0
5. ES mdblk	272.	.5	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	99.	1.4	.0	.0	.0	.0	.0	.0	.2	.0
7. WS mdblk	82.	1.9	.0	.0	.0	.1	.0	.0	.2	.0
8. EN mdblk	269.	.5	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	355.	1.5	.5	.0	.1	.2	.4	.0	.0	.0
10. NW mdblk	174.	2.4	.0	.7	.0	1.4	.0	.0	.0	.0
11. SW mdblk	5.	1.4	.5	.0	.0	.2	.4	.0	.0	.0
12. NE mdblk	186.	2.4	.0	.7	.0	1.4	.0	.0	.0	.0
13. ES blk	272.	.2	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	96.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	83.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	271.	.2	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	354.	1.1	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	175.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	5.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	185.	1.7	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015nP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.0	.0	.0	.0	.1	.1	.0	.0	.0	.0	.0
2. NW	*	.0	.0	.0	.0	.0	.1	.1	.0	.0	.0	.0	.0
3. SW	*	.3	.0	.3	.0	.0	.1	.1	.0	.0	.0	.0	.0
4. NE	*	.6	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
5. ES mdblk	*	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.5	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.9	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.5	.0	.0	.4
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.5	.0	.0	.4
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	*	.0	.0	.0	.0	.4	.0	.0	.5	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.7	.8	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.4	.0	.0	.5	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.7	.8	.0	.0	.0	.0	.0

SOLEDAD TOWNHOUSES

AIR QUALITY CO HOT SPOT ANALYSIS

CALINE4 MODEL PRINTOUTS

2015 WITH PROJECT SCENARIO

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Bouquet NBA	*	0	-150	0	0	* AG	2050	4.7	.0	17.0
B. Bouquet NBD	*	0	0	0	150	* AG	3250	4.5	.0	13.5
C. Bouquet NBL	*	2	-150	0	0	* AG	100	4.7	.0	10.0
D. Bouquet SBA	*	-9	150	-9	0	* AG	2290	4.9	.0	20.5
E. Bouquet SBD	*	-9	0	-9	-150	* AG	1570	2.7	.0	13.5
F. Bouquet SBL	*	-9	150	0	0	* AG	390	4.7	.0	10.0
G. Soledad EBA	*	-150	-12	0	-12	* AG	1340	4.0	.0	17.0
H. Soledad EBD	*	0	-12	150	-12	* AG	2200	3.4	.0	13.5
I. Soledad EBL	*	-150	-9	0	0	* AG	1450	5.1	.0	10.0
J. Soledad WBA	*	150	7	0	7	* AG	1020	3.9	.0	17.0
K. Soledad WBD	*	0	7	-150	7	* AG	1900	2.9	.0	11.8
L. Soledad WBL	*	150	2	0	0	* AG	280	4.7	.0	10.0
M. Bouquet NBAX	*	0	-750	0	-150	* AG	2150	2.3	.0	17.0
N. Bouquet NBDX	*	0	150	0	750	* AG	3250	2.3	.0	13.5
O. Bouquet SBAX	*	-9	750	-9	150	* AG	2680	2.3	.0	20.5
P. Bouquet SBDX	*	-9	-150	-9	-750	* AG	1570	2.3	.0	13.5
Q. Soledad EBAX	*	-750	-12	-150	-12	* AG	2790	2.3	.0	17.0
R. Soledad EBDX	*	150	-12	750	-12	* AG	2200	2.3	.0	13.5
S. Soledad WBAX	*	750	7	150	7	* AG	1300	2.3	.0	17.0
T. Soledad WBDX	*	-150	7	-750	7	* AG	1900	2.3	.0	11.8

JOB: Soledad Townhomes
RUN: 2015wP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-21	1.8
2. NW	*	-15	15	1.8
3. SW	*	-15	-21	1.8
4. NE	*	7	17	1.8
5. ES mdblk	*	150	-21	1.8
6. WN mdblk	*	-150	15	1.8
7. WS mdblk	*	-150	-21	1.8
8. EN mdblk	*	150	17	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-15	150	1.8
11. SW mdblk	*	-15	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-21	1.8
14. WN blk	*	-600	15	1.8
15. WS blk	*	-600	-21	1.8
16. EN blk	*	600	17	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-15	600	1.8
19. SW blk	*	-15	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	353.	3.7	.6	1.2	.0	.7	.0	.2	.0	.5
2. NW	172.	2.5	.6	.0	.0	.4	.5	.0	.2	.0
3. SW	7.	3.1	.0	.7	.0	.9	.3	.1	.3	.0
4. NE	352.	3.3	.0	2.1	.0	.7	.0	.2	.0	.0
5. ES mdblk	278.	1.8	.0	.0	.0	.0	.0	.0	.0	.9
6. WN mdblk	99.	1.6	.0	.0	.0	.0	.0	.0	.1	.2
7. WS mdblk	79.	1.9	.0	.1	.0	.1	.0	.0	.7	.0
8. EN mdblk	263.	1.4	.0	.0	.0	.0	.0	.0	.1	.0
9. SE mdblk	355.	2.7	1.4	.2	.1	.2	.2	.0	.0	.0
10. NW mdblk	173.	2.9	.2	.6	.0	1.5	.0	.2	.0	.0
11. SW mdblk	6.	2.1	.5	.2	.0	.2	.7	.0	.0	.0
12. NE mdblk	187.	3.5	.1	2.1	.0	.7	.0	.1	.0	.0
13. ES blk	277.	1.2	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	97.	1.1	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	264.	.9	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	355.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	175.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	6.	1.4	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	186.	2.0	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2015wP-01 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.1	.0	.0	.0	.1	.2	.0	.0	.0	.0	.0
2. NW	*	.3	.0	.3	.0	.1	.0	.0	.0	.0	.0	.0	.0
3. SW	*	.3	.0	.2	.0	.0	.2	.1	.0	.0	.0	.0	.0
4. NE	*	.0	.0	.0	.0	.0	.1	.2	.0	.0	.0	.0	.0
5. ES mdblk	*	.2	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.3	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.5	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.2	.5	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.7	.2	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.3	.0	.0	.5
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	1.0	.0	.0	.2
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.4	.0
17. SE blk	*	.0	.0	.0	.0	.9	.0	.0	.3	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.4	1.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.4	.0	.0	.7	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	1.2	.5	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Project NBA	12	-150	12	0	AG	0	2.5	.0	10.0
B. Project NBD	12	0	12	150	AG	67	2.8	.0	10.0
C. Project NBL	9	-150	0	0	AG	0	2.5	.0	10.0
D. Project SBA	-5	150	-5	0	AG	20	4.3	.0	10.0
E. Project SBD	-5	0	-5	-150	AG	0	2.5	.0	10.0
F. Project SBL	-2	150	0	0	AG	0	2.5	.0	10.0
G. Soledad EBA	-150	-11	0	-11	AG	2175	4.3	.0	13.5
H. Soledad EBD	0	-11	150	-11	AG	2175	2.7	.0	13.5
I. Soledad EBL	-150	-9	0	0	AG	35	4.7	.0	10.0
J. Soledad WBA	150	0	0	0	AG	1188	3.6	.0	13.5
K. Soledad WBD	0	0	-150	0	AG	1176	2.4	.0	11.8
L. Soledad WBL	150	2	0	0	AG	0	2.3	.0	10.0
M. Project NBAX	12	-750	12	-150	AG	0	2.5	.0	10.0
N. Project NBDX	12	150	12	750	AG	67	2.5	.0	10.0
O. Project SBAX	-5	750	-5	150	AG	20	2.5	.0	10.0
P. Project SBDX	-5	-150	-5	-750	AG	0	2.5	.0	10.0
Q. Soledad EBAX	-750	-11	-150	-11	AG	2210	2.3	.0	13.5
R. Soledad EBDX	150	-11	750	-11	AG	2175	2.3	.0	13.5
S. Soledad WBAX	750	0	150	0	AG	1188	2.3	.0	13.5
T. Soledad WBDX	-150	0	-750	0	AG	1176	2.3	.0	11.8

JOB: Soledad Townhomes
RUN: 2015wP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	21	-17	1.8
2. NW	*	-14	7	1.8
3. SW	*	-12	-17	1.8
4. NE	*	21	7	1.8
5. ES mdblk	*	150	-17	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-17	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	21	-150	1.8
10. NW mdblk	*	-14	150	1.8
11. SW mdblk	*	-12	-150	1.8
12. NE mdblk	*	21	150	1.8
13. ES blk	*	600	-17	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-17	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	21	-600	1.8
18. NW blk	*	-14	600	1.8
19. SW blk	*	-12	-600	1.8
20. NE blk	*	21	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	276.	1.6	.0	.0	.0	.0	.0	.0	.9	.4
2. NW	261.	1.1	.0	.0	.0	.0	.0	.0	.4	.0
3. SW	277.	1.8	.0	.0	.0	.0	.0	.0	1.4	.0
4. NE	262.	1.3	.0	.0	.0	.0	.0	.0	.5	.0
5. ES mdblk	276.	1.4	.0	.0	.0	.0	.0	.0	.1	.9
6. WN mdblk	98.	1.1	.0	.0	.0	.0	.0	.0	.4	.1
7. WS mdblk	84.	1.9	.0	.0	.0	.0	.0	.0	1.4	.0
8. EN mdblk	263.	1.3	.0	.0	.0	.0	.0	.0	.2	.2
9. SE mdblk	319.	.2	.0	.0	.0	.0	.0	.0	.1	.0
10. NW mdblk	211.	.2	.0	.0	.0	.0	.0	.0	.1	.0
11. SW mdblk	325.	.2	.0	.0	.0	.0	.0	.0	.1	.0
12. NE mdblk	217.	.2	.0	.0	.0	.0	.0	.0	.1	.0
13. ES blk	276.	1.2	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	96.	.9	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	84.	1.2	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	264.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	355.	.1	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	175.	.1	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	358.	.1	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	186.	.1	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2015wP-02 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.0	.1	.0	.0	.0	.0	.0	.1	.0	.0	.0
2. NW	*	.0	.0	.4	.0	.0	.0	.0	.0	.1	.0	.0	.0
3. SW	*	.0	.0	.1	.0	.0	.0	.0	.0	.1	.0	.0	.1
4. NE	*	.0	.3	.3	.0	.0	.0	.0	.0	.1	.0	.0	.0
5. ES mdblk	*	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.0	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.0	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.9	.2	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.3	.0	.0	.5
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0	.0	.2
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.3	.5	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

	LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	Project NBA	*	0	-150	0	0	* AG	0	2.5	.0	10.0
B.	Project NBD	*	0	0	0	150	* AG	182	2.8	.0	10.0
C.	Project NBL	*	2	-150	0	0	* AG	0	2.5	.0	10.0
D.	Project SBA	*	0	150	0	0	* AG	63	4.3	.0	10.0
E.	Project SBD	*	0	0	0	-150	* AG	0	2.5	.0	10.0
F.	Project SBL	*	-2	150	0	0	* AG	92	4.7	.0	10.0
G.	Soledad EBA	*	-150	0	0	0	* AG	2079	4.0	.0	13.5
H.	Soledad EBD	*	0	0	150	0	* AG	2171	2.7	.0	13.5
I.	Soledad EBL	*	-150	-2	0	0	* AG	96	4.7	.0	10.0
J.	Soledad WBA	*	150	0	0	0	* AG	1211	3.7	.0	13.5
K.	Soledad WBD	*	0	0	-150	0	* AG	1188	2.4	.0	11.8
L.	Soledad WBL	*	150	2	0	0	* AG	0	2.3	.0	10.0
M.	Project NBAX	*	0	-750	0	-150	* AG	0	2.5	.0	10.0
N.	Project NBDX	*	0	150	0	750	* AG	182	2.5	.0	10.0
O.	Project SBAX	*	0	750	0	150	* AG	155	2.5	.0	10.0
P.	Project SBDX	*	0	-150	0	-750	* AG	0	2.5	.0	10.0
Q.	Soledad EBAX	*	-750	0	-150	0	* AG	2175	2.3	.0	13.5
R.	Soledad EBDX	*	150	0	750	0	* AG	2171	2.3	.0	13.5
S.	Soledad WBAX	*	750	0	150	0	* AG	1211	2.3	.0	13.5
T.	Soledad WBDX	*	-150	0	-750	0	* AG	1188	2.3	.0	11.8

JOB: Soledad Townhomes
RUN: 2015wP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	276.	2.0	.0	.0	.0	.0	.0	.0	1.1	.1
2. NW	264.	2.0	.0	.0	.0	.0	.0	.0	1.3	.0
3. SW	276.	2.0	.0	.0	.0	.0	.0	.0	1.3	.0
4. NE	264.	2.1	.0	.0	.0	.0	.0	.0	1.1	.1
5. ES mdblk	276.	1.9	.0	.0	.0	.0	.0	.0	.1	.9
6. WN mdblk	96.	2.1	.0	.0	.0	.0	.0	.0	1.3	.0
7. WS mdblk	84.	2.1	.0	.0	.0	.0	.0	.0	1.3	.0
8. EN mdblk	265.	1.9	.0	.0	.0	.0	.0	.0	.1	.9
9. SE mdblk	358.	.2	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	172.	.4	.0	.0	.0	.0	.0	.1	.0	.0
11. SW mdblk	1.	.2	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	189.	.4	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	275.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	95.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	85.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	265.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	358.	.1	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	175.	.3	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	359.	.1	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	185.	.3	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2015wP-03 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.1	.4	.0	.0	.0	.0	.0	.1	.0	.0	.0
2. NW	*	.0	.0	.4	.0	.0	.0	.0	.0	.1	.0	.0	.0
3. SW	*	.0	.0	.4	.0	.0	.0	.0	.0	.1	.0	.0	.0
4. NE	*	.0	.1	.4	.0	.0	.0	.0	.0	.1	.0	.0	.0
5. ES mdblk	*	.0	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.1	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.0	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.9	.5	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0	.0	.5
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0	.0	.5
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.9	.5	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Valley C NBA	*	0	-150	0	0	* AG	0	2.5	.0	10.0
B. Valley C NBD	*	0	0	0	150	* AG	1230	5.1	.0	10.0
C. Valley C NBL	*	2	-150	0	0	* AG	0	2.5	.0	10.0
D. Valley C SBA	*	0	150	0	0	* AG	130	4.3	.0	10.0
E. Valley C SBD	*	0	0	0	-150	* AG	0	2.5	.0	10.0
F. Valley C SBL	*	-2	150	0	0	* AG	900	5.1	.0	10.0
G. Soledad EBA	*	-150	0	0	0	* AG	1890	4.0	.0	13.5
H. Soledad EBD	*	0	0	150	0	* AG	2790	3.4	.0	13.5
I. Soledad EBL	*	-150	-2	0	0	* AG	260	4.7	.0	10.0
J. Soledad WBA	*	150	0	0	0	* AG	1790	3.8	.0	17.0
K. Soledad WBD	*	0	0	-150	0	* AG	950	2.4	.0	13.5
L. Soledad WBL	*	150	2	0	0	* AG	0	2.3	.0	10.0
M. Valley NBAX	*	0	-750	0	-150	* AG	0	2.5	.0	10.0
N. Valley NBDX	*	0	150	0	750	* AG	1230	2.5	.0	10.0
O. Valley SBAX	*	0	750	0	150	* AG	1030	2.5	.0	10.0
P. Valley SBDX	*	0	-150	0	-750	* AG	0	2.5	.0	10.0
Q. Soledad EBAX	*	-750	0	-150	0	* AG	2150	2.3	.0	13.5
R. Soledad EBDX	*	150	0	750	0	* AG	2790	2.3	.0	13.5
S. Soledad WBAX	*	750	0	150	0	* AG	1790	2.3	.0	17.0
T. Soledad WBDX	*	-150	0	-750	0	* AG	950	2.3	.0	13.5

JOB: Soledad Townhomes
RUN: 2015wP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	352.	2.7	.0	.8	.0	.0	.0	.6	.0	.6
2. NW	95.	3.3	.0	.4	.0	.0	.0	.3	.2	1.2
3. SW	85.	2.6	.0	.0	.0	.0	.0	.0	.2	1.2
4. NE	264.	2.9	.0	.4	.0	.0	.0	.3	1.0	.2
5. ES mdblk	276.	2.9	.0	.0	.0	.0	.0	.0	.1	1.4
6. WN mdblk	95.	2.2	.0	.0	.0	.0	.0	.0	1.2	.2
7. WS mdblk	84.	2.3	.0	.0	.0	.0	.0	.0	1.2	.1
8. EN mdblk	265.	2.8	.0	.0	.0	.0	.0	.0	.1	1.4
9. SE mdblk	359.	.6	.0	.1	.0	.0	.0	.1	.0	.0
10. NW mdblk	171.	2.1	.0	.9	.0	.1	.0	.9	.0	.0
11. SW mdblk	2.	.6	.0	.1	.0	.0	.0	.1	.0	.0
12. NE mdblk	190.	1.7	.0	.9	.0	.0	.0	.5	.0	.0
13. ES blk	275.	2.0	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	95.	1.4	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	85.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	265.	2.0	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	360.	.2	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	174.	1.1	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	1.	.2	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	186.	1.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-04 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	*	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. NW	*	.0	.9	.0	.0	.0	.0	.0	.0	.0	.2	.1	.0
3. SW	*	.0	.9	.0	.0	.0	.0	.0	.0	.0	.2	.1	.0
4. NE	*	.2	.2	.3	.0	.0	.0	.0	.0	.1	.0	.0	.0
5. ES mdblk	*	.0	1.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	*	.1	.1	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	*	.3	.1	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	*	.0	1.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.1	.7	.0
14. WN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0	.0	.4
15. WS blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0	.0	.4
16. EN blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.1	.7	.0
17. SE blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	*	.0	.0	.0	.0	.0	.5	.4	.0	.0	.0	.0	.0
19. SW blk	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	*	.0	.0	.0	.0	.0	.5	.4	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	366. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	10.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Golden V NBA	*	0	-150	0	0	* AG	810	3.5	.0	13.5
B. Golden V NBD	*	0	0	0	150	* AG	1730	2.5	.0	13.5
C. Golden V NBL	*	2	-150	0	0	* AG	170	4.7	.0	10.0
D. Golden V SBA	*	0	150	0	0	* AG	1880	4.9	.0	13.5
E. Golden V SBD	*	0	0	0	-150	* AG	1330	2.6	.0	10.0
F. Golden V SBL	*	-2	150	0	0	* AG	0	2.3	.0	10.0
G. Valley C EBA	*	-150	0	0	0	* AG	310	4.3	.0	10.0
H. Valley C EBD	*	0	0	150	0	* AG	0	2.5	.0	10.0
I. Valley C EBL	*	-150	-2	0	0	* AG	920	5.1	.0	10.0
J. Valley C WBA	*	150	0	0	0	* AG	0	2.5	.0	10.0
K. Valley C WBD	*	0	0	-150	0	* AG	1030	4.7	.0	10.0
L. Valley C WBL	*	150	2	0	0	* AG	0	2.5	.0	10.0
M. Golden NBAX	*	0	-750	0	-150	* AG	980	2.3	.0	13.5
N. Golden NBDX	*	0	150	0	750	* AG	1730	2.3	.0	13.5
O. Golden SBAX	*	0	750	0	150	* AG	1880	2.3	.0	13.5
P. Golden SBDX	*	0	-150	0	-750	* AG	1330	2.3	.0	10.0
Q. Valley EBAX	*	-750	0	-150	0	* AG	1230	2.5	.0	10.0
R. Valley EBDX	*	150	0	750	0	* AG	0	2.5	.0	10.0
S. Valley WBAX	*	750	0	150	0	* AG	0	2.5	.0	10.0
T. Valley WBDX	*	-150	0	-750	0	* AG	1030	2.5	.0	10.0

JOB: Soledad Townhomes
RUN: 2015wP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. SE	*	7	-7	1.8
2. NW	*	-7	7	1.8
3. SW	*	-7	-7	1.8
4. NE	*	7	7	1.8
5. ES mdblk	*	150	-7	1.8
6. WN mdblk	*	-150	7	1.8
7. WS mdblk	*	-150	-7	1.8
8. EN mdblk	*	150	7	1.8
9. SE mdblk	*	7	-150	1.8
10. NW mdblk	*	-7	150	1.8
11. SW mdblk	*	-7	-150	1.8
12. NE mdblk	*	7	150	1.8
13. ES blk	*	600	-7	1.8
14. WN blk	*	-600	7	1.8
15. WS blk	*	-600	-7	1.8
16. EN blk	*	600	7	1.8
17. SE blk	*	7	-600	1.8
18. NW blk	*	-7	600	1.8
19. SW blk	*	-7	-600	1.8
20. NE blk	*	7	600	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Soledad Townhomes
RUN: 2015wP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. SE	277.	2.1	.2	.0	.0	.0	.2	.0	.2	.0
2. NW	6.	2.4	.0	.7	.0	1.4	.0	.0	.0	.0
3. SW	6.	2.8	.0	.6	.0	1.2	.0	.0	.0	.0
4. NE	263.	2.5	.0	.3	.0	.6	.0	.0	.2	.0
5. ES mdblk	272.	.5	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	99.	1.6	.0	.0	.0	.0	.0	.0	.2	.0
7. WS mdblk	82.	2.0	.0	.0	.0	.1	.0	.0	.2	.0
8. EN mdblk	269.	.6	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	355.	1.6	.5	.0	.2	.2	.4	.0	.0	.0
10. NW mdblk	174.	2.4	.0	.7	.0	1.4	.0	.0	.0	.0
11. SW mdblk	5.	1.4	.5	.0	.0	.2	.4	.0	.0	.0
12. NE mdblk	186.	2.5	.0	.7	.0	1.4	.0	.0	.0	.0
13. ES blk	272.	.2	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	96.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
15. WS blk	83.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
16. EN blk	271.	.2	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	354.	1.1	.0	.0	.0	.0	.0	.0	.0	.0
18. NW blk	175.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
19. SW blk	5.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
20. NE blk	185.	1.7	.0	.0	.0	.0	.0	.0	.0	.0

JOB: Soledad Townhomes
RUN: 2015wP-05 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. SE	.6	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. NW	.0	.0	.0	.0	.0	.1	.1	.0	.0	.0	.0	.0
3. SW	.3	.0	.3	.0	.0	.1	.1	.0	.0	.0	.0	.0
4. NE	.6	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
5. ES mdblk	.1	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. WN mdblk	.5	.0	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. WS mdblk	.9	.0	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. EN mdblk	.1	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. SE mdblk	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. NW mdblk	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. SW mdblk	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12. NE mdblk	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13. ES blk	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14. WN blk	.0	.0	.0	.0	.0	.0	.0	.0	.5	.0	.0	.4
15. WS blk	.0	.0	.0	.0	.0	.0	.0	.0	.5	.0	.0	.4
16. EN blk	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
17. SE blk	.0	.0	.0	.0	.4	.0	.0	.5	.0	.0	.0	.0
18. NW blk	.0	.0	.0	.0	.0	.7	.8	.0	.0	.0	.0	.0
19. SW blk	.0	.0	.0	.0	.4	.0	.0	.5	.0	.0	.0	.0
20. NE blk	.0	.0	.0	.0	.0	.7	.8	.0	.0	.0	.0	.0

APPENDIX C

CONSTRUCTION EMISSIONS SPREADSHEET

FUGITIVE PM10 EMISSION FACTORS

(I) POTENTIAL SOURCES:

Fugitive PM10 emissions result from the following sources:

(1) Scraper loading
(2) Ripping operations by dozer prior to scraper loading material
(3) Scrapers traveling on Haul Roads
(4) Dumping of material
(5) Redistribution of material with a grader
(6) Wind erosion of disturbed areas.

(II) EMISSION FACTORS AND ASSUMPTIONS:

(1) Scraper Loading

Emission Factor (Table 13.2.3-1, AP-42, 1995):

E = 20.2 lb/VMT

Width of Cut = 9.5 feet
Max Depth of Cut = 1.32 feet
Load per trip = 20 c.y.

Using a 1 foot depth of cut, distance required to load 15 c.y.
Distance = 0.0108 miles

Emissions per Trip EF(1) = 0.2175 lb/trip

(2) Ripping operations by dozer prior to scraper loading material

Emission Factor (Table 11.9-1, AP-42, 1995):

EF(2) = [(1.0)(s^1.5)/(M^1.4)](K) lb/hour

where:

s = Silt Loading (percent): see table below
M = Moisture content surface material (percent): see table below
K =Particle size multiplier (dimensionless) 0.75

EF(2) =

DOZER			
Soil Type	Silt Content(%)	Moisture content(%)	PM10 Emission Rate (lb/hour)
Topsoil	7.5	15	0.35
Overburden	5	15	0.19
Aggregate	5	15	0.19

(3) Scrapers traveling on Haul Roads

Emission Factor (Section 13.2.2, AP-42, 1995):

EF(3) = K(5.9)(s/12)(S/30)[(W/3)^0.7][(w/4)^0.5][(365-p)/365] lb/vehicle mile traveled (VMT)

where:

s = Silt Loading (percent): see table below
S = Mean Vehicle Speed (mph): 5
W = Mean Vehicle Weight (tons) see table below (Caterpillar 1995)
w= Number of Wheels 4 (Caterpillar 1995)
p = Number of Days > 0.01 in. Precipitation: 0 (recommended when considering effects of dust control measures)
K=Particle size multiplier (dimensionless) 0.36

EF(3) =

SCRAPER					
Soil type	Silt content(%)	Loaded Vehicle(tons)	Empty Vehicle(tons)	Mean Vehicle Weight (tons)	Mean PM10 Emission Rate (lb/VMT)
Topsoil	7.5	115.39	73.4	94.39	2.47
Overburden	5	94.81	73.39	84.1	1.52
Aggregate	5	94.81	73.39	84.10	1.52

(4) Dumping of topsoil using scraper

Emission Factor (Section 13.2.4.3, AP-42, 1995)

EF(4)=(K)(0.0032)[(U/5)^1.3]/[M/2)^1.4]lb/ton

where:

K =Particle size multiplier (dimensionless)	0.35	
U = Mean Wind Speed (mph)	7.3	(McClellan AFB, 1939 to1972, DWR 1978)
M = Material Moisture content (percent)	see table below	

EF(4)=

SCRAPER		
Soil type	Moisture content(%)	PM10 Emission Rate (lb/ton)
Topsoil	15	0.0001
Overburden	15	0.0001
Aggregate	15	0.0001

(5) Redistribution of material with a grader

Emission Factor (Table 11.9-1, AP-42, 1995):

EF(5) =(0.051)(S^2)(K) lb/VMT

where:

S = Mean vehicle speed (mph)	5
K = Particle size multiplier (dimensionless)	0.6

EF(5) = 0.77 lb/VMT

(6) Wind erosion of disturbed areas

Emission Factor (SCAQMD Table A9-9-E):

EF(4) = (1.7)(s/1.5)[(365-p)/235](I/15)(W) lb/acre-day

where:

s = Silt Loading (percent):	see table below
p = Number of days >= 0.01 in. precip/yr:	0
I = Percent time WS > 12 mph (5.4 m/sec):	14
W = PM10 fraction:	0.5

EF(4) = see table below

WIND EROSION		
DISTURBED AREA	Silt content(%)	PM10 Emission Rate (lb/acre-day)
QUARRY	3.9	3.2
OVERBURDEN DISPOSAL	5	4.1
RECLAMATION	5	4.1

(7) Loader Travelling

Emission Factor (Section 13.2.2.2, AP-42, 2001)

EF(3)=k[(s/12)^0.9][(W/3)^0.45]

K =Particle size multiplier (dimensionless)	0.75
s = Silt Loading (percent):	3.9
W=Mean vehicle weight (tons)	16.55
PM10 Emission Rate (lb/vmt)=	0.59

(8) Vehicle travel on unpaved roads
Emission Factor (SCAQMD Table A9-9-D):

EF(5) = 2.1 (G/12) (H/30) [(J/3)^0.7] [(I/4)^0.5] [(365-K)/365] lb/vehicle mile traveled (vmt)
where:

G = Silt Loading (%): 5
H = Mean Vehicle Speed (mph): 15
J = Mean Vehicle Weight (tons) - see tables below
I = Number of Wheels - see tables below
K = Number of Days > 0.01 in. Precipitation: 0

EF(1) =

Light Heavy Duty Trucks		
Parameter	Loaded	Unloaded
J	16.5	9.75
I	10	10
lb/VMT	2.28	1.58

Heavy Duty Trucks		
Parameter	Loaded	Unloaded
J	40	19
I	18	18
lb/VMT	5.69	3.38

On-Site Fugitive Dust Emissions

Source Category [1]	Source Description	Amount	No. units	Trip Distance	Parameter 1	Parameter 2	Uncontrolled PM10 Emissions		Emissions Control		Controlled PM10 Emissions	
							Rate	(lb/day)	Technique	Efficiency (%)	Rate	(lb/day)
(1) EXCAVATION (GRADING)	Scraper	7,500 c.y. per day	3	--	20 cubic yards/trip	0.714 cubic yards/ton	0.22 lb/Trip	81.5	Watering	50%	0.11 lb/VMT	40.8
	Dozer/Compactor	8 hours per day	2	--	--	--	0.35 lb/hour	5.6	Watering	50%	0.18 lb/hour	2.8
(2) HAULING/ TRANSPORT (GRADING)	Scraper	7,500 c.y. per day	3	1000 feet	15 cubic yards/trip	0.71 cubic yards/ton	2.47 lb/VMT	233.9	Watering	50%	1.24 lb/VMT	117.0
(3) DUMPING/ RECLAMATION (GRADING)	Scraper	7,500 c.y. per day	--	--	--	1.4 ton/cubic yard	0.0001 lb/ton	1.2	Watering	50%	0.0001 lb/ton	0.6
(4) MISCELLANEOUS ACTIVITIES (GRADING)	Grader	8 hours per day	2	--	--	5 miles per hour	0.77 lb/VMT	61.6	Watering	50%	0.39 lb/VMT	30.8
(5) WIND EROSION	Excavation Area	10 acres	--	--	--	--	4.11 lb/acre-day	41.1	Water	50%	2.05 lb/acre-day	20.5
(6) LOADER TRAVEL	Loader	240 c.y./day	1	100 feet	3 c.y./trip	5 miles per hour	0.59 lb/VMT	0.9	Watering	50%	0.29 lb/VMT	0.4
(7) VEHICLE TRAVEL	Light Heavy Duty	8 hours	1	--	10 mph	15 miles/day	1.93 lb/VMT	28.9	Watering	50%	0.96 lb/vmt	14.5
	Heavy Duty Trucks	25 trips/day	--	500 feet			4.53 lb/VMT	10.7	Watering	50%	2.27 lb/VMT	5.4
TOTAL FUGITIVE PM10 EMISSIONS								465.5				232.7

ENGINE EXHAUST EMISSIONS

Source [1]	Parameter 1	Parameter 2	Parameter 3	CO		ROC		NOx		SOx		PM10	
				Emission Factor	Emission (lbs/day)	Emission Factor	Emission (lbs/day)	Emission Factor	Emission (lbs/day)	Emission Factor	Emission (lbs/day)	Emission Factor	Emission (lbs/day)
MOBILE EQUIPMENT:													
(1) Grading													
Scraper	--	8 hours/day	3 unit	0.909 lb/hr	21.8	0.230 lb/hr	5.5	3.051 lb/hr	73.2	0.496 lb/hr	11.9	0.124 lb/hr	3.0
Dozer	--	8 hours/day	2 unit	1.106 lb/hr	17.7	0.219 lb/hr	3.5	2.919 lb/hr	46.7	0.452 lb/hr	7.2	0.117 lb/hr	1.9
Loader	--	8 hours/day	1 unit	0.432 lb/hr	3.5	0.109 lb/hr	0.9	1.187 lb/hr	9.5	0.221 lb/hr	1.8	0.068 lb/hr	0.5
Motor Grader	--	8 hours/day	2 unit	0.553 lb/hr	8.8	0.135 lb/hr	2.2	1.537 lb/hr	24.6	0.276 lb/hr	4.4	0.079 lb/hr	1.3
Water Truck (Light Heavy Duty)	15 mph	15 miles	1 unit	18.660 gr/VMT	0.6	1.340 gr/VMT	0.0	7.140 gr/VMT	0.2	0.000 gr/VMT	0.0	0.330 gr/VMT	0.0
Haul Trucks (Heavy Duty Trucks)	30 mph	30 miles	25 trips per day	6.459 gr/VMT	10.7	0.684 gr/VMT	1.1	10.577 gr/VMT	17.5	0.131 gr/VMT	0.2	0.291 gr/VMT	0.5
Worker Commute (Light Duty Auto)	35 mph	40 miles	40 trips per day	3.990 gr/VMT	14.1	0.130 gr/VMT	0.5	0.542 gr/VMT	1.9	0.004 gr/VMT	0.0	0.031 gr/VMT	0.1
<TOTAL>					77.2		13.7		173.6		25.5		7.2

FUGITIVE PM10 EMISSION FACTORS

(I) POTENTIAL SOURCES:

Fugitive PM10 emissions result from the following sources:

(1) Scraper loading
(2) Ripping operations by dozer prior to scraper loading material
(3) Scrapers traveling on Haul Roads
(4) Dumping of material
(5) Redistribution of material with a grader
(6) Wind erosion of disturbed areas.

(II) EMISSION FACTORS AND ASSUMPTIONS:

(1) Scraper Loading

Emission Factor (Table 13.2.3-1, AP-42, 1995):

E = 20.2 lb/VMT

Width of Cut = 9.5 feet
Max Depth of Cut = 1.32 feet
Load per trip = 20 c.y.

Using a 1 foot depth of cut, distance required to load 15 c.y.
Distance = 0.0108 miles

Emissions per Trip EF(1) = 0.2175 lb/trip

(2) Ripping operations by dozer prior to scraper loading material

Emission Factor (Table 11.9-1, AP-42, 1995):

EF(2) = [(1.0)(s^1.5)/(M^1.4)](K) lb/hour

where:

s = Silt Loading (percent): see table below
M = Moisture content surface material (percent): see table below
K =Particle size multiplier (dimensionless) 0.75

EF(2) =

DOZER			
Soil Type	Silt Content(%)	Moisture content(%)	PM10 Emission Rate (lb/hour)
Topsoil	7.5	15	0.35
Overburden	5	15	0.19
Aggregate	5	15	0.19

(3) Scrapers traveling on Haul Roads

Emission Factor (Section 13.2.2, AP-42, 1995):

EF(3) = K(5.9)(s/12)(S/30)[(W/3)^0.7][(w/4)^0.5][(365-p)/365] lb/vehicle mile traveled (VMT)

where:

s = Silt Loading (percent): see table below
S = Mean Vehicle Speed (mph): 5
W = Mean Vehicle Weight (tons) see table below (Caterpillar 1995)
w= Number of Wheels 4 (Caterpillar 1995)
p = Number of Days > 0.01 in. Precipitation: 0 (recommended when considering effects of dust control measures)
K=Particle size multiplier (dimensionless) 0.36

EF(3) =

SCRAPER					
Soil type	Silt content(%)	Loaded Vehicle(tons)	Empty Vehicle(tons)	Mean Vehicle Weight (tons)	Mean PM10 Emission Rate (lb/VMT)
Topsoil	7.5	115.39	73.4	94.39	2.47
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(8) Vehicle travel on unpaved roads
Emission Factor (SCAQMD Table A9-9-D):

EF(5) = 2.1 (G/12) (H/30) [(J/3)^0.7] [(I/4)^0.5] [(365-K)/365] lb/vehicle mile traveled (vmt)
where:

G = Silt Loading (%): 5
H = Mean Vehicle Speed (mph): 15
J = Mean Vehicle Weight (tons) - see tables below
I = Number of Wheels - see tables below
K = Number of Days > 0.01 in. Precipitation: 0

EF(1) =

Light Heavy Duty Trucks		
Parameter	Loaded	Unloaded
J	16.5	9.75
I	10	10
lb/VMT	2.28	1.58

Heavy Duty Trucks		
Parameter	Loaded	Unloaded
J	40	19
I	18	18
lb/VMT	5.69	3.38

ENGINE EXHAUST EMISSIONS

Source [1]	Parameter 1	Parameter 2	Parameter 3	CO		ROC		NOx		SOx		PM10	
				Emission Factor	Emission (lbs/day)	Emission Factor	Emission (lbs/day)	Emission Factor	Emission (lbs/day)	Emission Factor	Emission (lbs/day)	Emission Factor	Emission (lbs/day)
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(1) Grading													
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Water Truck (Light Heavy Duty)	15 mph	15 miles	1 unit	18.660 gr/VMT	0.6	1.340 gr/VMT	0.0	7.140 gr/VMT	0.2	0.000 gr/VMT	0.0	0.330 gr/VMT	0.0
Haul Trucks (Heavy Duty Trucks)	30 mph	30 miles	25 trips per day	6.459 gr/VMT	10.7	0.684 gr/VMT	1.1	10.577 gr/VMT	17.5	0.131 gr/VMT	0.2	0.291 gr/VMT	0.5
Worker Commute (Light Duty Auto)	35 mph	40 miles	40 trips per day	3.990 gr/VMT	14.1	0.130 gr/VMT	0.5	0.542 gr/VMT	1.9	0.004 gr/VMT	0.0	0.031 gr/VMT	0.1
<TOTAL>					77.2		13.7		173.6		25.5		7.2

Appendix F
NOISE IMPACT ANALYSIS

NOISE IMPACT ANALYSIS

SOLEDAD TOWNHOMES

Tung-Chen Chung, Ph.D., INCE

LSA

August 2005

NOISE IMPACT ANALYSIS

SOLEDAD TOWNHOMES

Submitted to:

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LSA Project No. RBF530

LSA

August 2005

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INTRODUCTION

This noise impact analysis has been prepared to evaluate the potential noise impacts and mitigation measures associated with the development of Soledad Townhomes project in the City of Santa Clarita (City), California. This report is intended to satisfy the City's requirement for a project-specific noise impact analysis by examining the short-term and long-term impacts on the project site and by evaluating the effectiveness of mitigation measures incorporated as part of the project designs.

PROJECT DESCRIPTION

The proposed project is located on an approximately 30-acre site and consists of a maximum of 437 residential condominium units and 8,000 square feet of commercial use. Approximately 200 units, along with the 8,000-square-foot commercial center, will be constructed in the first phase of development (prior to completion of the Cross Valley Connector), and the remaining 237 units will be completed in the second phase of construction (after completion of the Cross Valley Connector). The site is generally bounded by the Santa Clara River to the north and west; Bentgrass Way and commercial and residential uses to the east; and Soledad Canyon Road and a Metrolink rail line to the south. Figure 1 shows the location of the project site. Figure 2 illustrates the site plan for the proposed project.

Access to the site is proposed from project intersections with Soledad Canyon Road. The first intersection with Soledad Canyon Road will be located approximately 700 feet west of the eastern project boundary. Configured as a full-access, signalized "tee" intersection, this location will serve both the residential and retail components of the site. A second intersection, located approximately 1,100 feet west of the first intersection, will be configured as a limited access left-in and right-in, right-out intersection, and is intended for residential traffic use only.

METHODOLOGY RELATED TO NOISE IMPACT ASSESSMENT

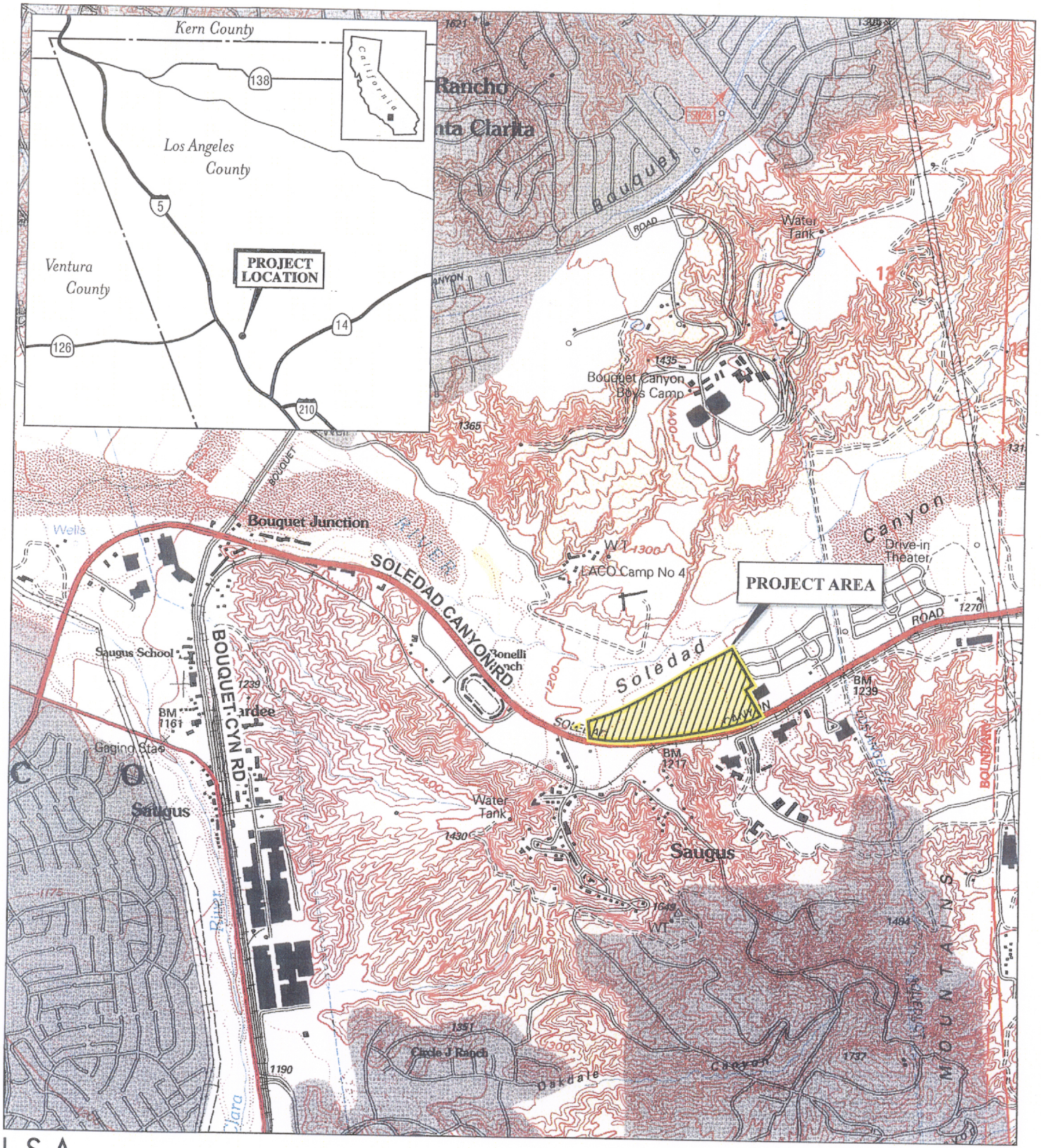
Evaluation of noise impacts associated with the proposed project includes the following:

- Determine the noise impacts associated with short-term construction of the proposed project on adjacent noise-sensitive uses
- Determine the long-term traffic and commercial use noise impacts on noise-sensitive uses on site; and
- Determine the required mitigation measures to reduce short-term and long-term noise impacts

This noise impact analysis utilizes the City's noise standards, including the City's Noise Element and Noise Control Ordinance, as thresholds against which potential noise impacts are evaluated.

CHARACTERISTICS OF SOUND

Sound is increasing in the environment and can affect quality of life. Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.



LSA

FIGURE 1

0 1000 2000
FEET

SOURCE: USGS 7.5' Quad - *Newhall, Ca.*

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Soledad Townhomes
Project Location

CITY OF SANTA CLARITA
SOLEDAD TOWNHOMES

GENERAL NOTES:

1. EXISTING ZONING: IC
2. PROPOSED ZONING: PRRH
3. EXISTING LAND USE: VACANT
4. PROPOSED LAND USE: ATTACHED RESIDENTIAL
5. TOTAL NUMBER OF LOTS: 408
6. BOUNDARY LINE DIMENSIONS ARE TAKEN FROM RECORD DATA.
7. SUBDIVIDER RESERVES THE RIGHT TO FILE MULTIPLE FINAL MAPS PER SECTION 66456.1 OF THE GOVERNMENT CODE.
8. PROPOSED PAD ELEVATIONS FOR ALL LOTS ARE 0.5' BELOW FF GRADE SHOWN HEREON.
9. ALL INTERIOR STREETS, DRIVEWAYS & FIRE LANES TO BE PRIVATE, SIDEWALKS AND FIRE LANES MAINTAINED BY A PRIVATE HOMEOWNERS ASSOCIATION. THE CITY OF SANTA CLARITA HAS NO RESPONSIBILITY OF MAINTAINING THE DRIVEWAY AT ANY POINT IN THE FUTURE.
10. MAXIMUM SLOPE GRADE IS 2:1 FOR ALL SLOPES
11. A LANDSCAPE MAINTENANCE DISTRICT OR HOMEOWNERS' ASSOCIATION WILL BE ESTABLISHED FOR MAINTENANCE OF OPEN SPACE AREAS AND ALL COMMON SLOPE AREAS.
12. ALL SLOPES WITHIN HOMEOWNER'S ASSOCIATION COMMON AREAS OR LANDSCAPE MAINTENANCE DISTRICTS ARE TO BE PLANTED AND IRRIGATED WITH CITY APPROVED MATERIAL
13. FOR STREETS AND/ OR DRIVEWAYS LESS THAN 36 & 34 FEET IN WIDTH, PROVIDE A MINIMUM UNOBSTRUCTED DRIVEWAY WIDTH OF 28 FEET, CLEAR-TO-SKY TO BE POSTED OR RED CURBED "NO PARKING-FIRE LANE"
14. FOR THE TRAFFIC MEDIAN LOCATIONS, PROVIDE A MINIMUM WIDTH OF 20 FEET ON EITHER SIDES OF THE TRAFFIC MEDIAN. THESE LOCATIONS SHALL BE POSTED OR RED CURBED "NO PARKING-FIRE LANE"
15. PORTION OF THE PROPERTY ARE LOCATED WITHIN 1000 FEET OF A NATURAL HILLSIDE BRUSH AREA AND SHALL COMPLY WITH THE CITY'S FIRE HAZARD ZONE ORDINANCE.
16. SYMBOL DENOTES FIRE DEPARTMENT APPROVED FIRE HYDRANT LOCATION. ●
17. ALL UNITS SHALL BE SERVED FROM SEPARATE SEWER LATERALS

PROJECT BOUNDARY

LINE DATA TABLE

L1	N89°57'09"E	1633.74'
L2	N47°23'38"E	1334.81'
L3	N17°49'59"E	44.19'
L4	N30°39'39"E	161.70'
L5	N17°49'59"E	42.70'
L6	N17°49'59"E	91.66'

TENTATIVE TRACT NO. 062332

CURVE TABLE

C1	R=700'	Δ=07°58'18"	L=97.40'
C2	R=50'	Δ=07°58'24"	L=6.96'
C3	R=25'	Δ=20°37'05"	L=9.00'
C4	R=15'	Δ=35°47'10"	L=9.37'
C5	R=25'	Δ=21°42'05"	L=9.47'
C6	R=1170.00'	Δ=10°13'47"	L=208.92'
C7	R=25'	Δ=27°22'05"	L=11.94'
C8	R=25'	Δ=90°00'00"	L=39.27'
C9	R=1040.00'	Δ=08°57'19"	L=162.58'
C10	R=1040.00'	Δ=10°05'47"	L=183.27'
C11	R=1170.00'	Δ=10°13'47"	L=208.92'
C12	R=25'	Δ=90°00'00"	L=39.27'
C13	R=25'	Δ=90°00'00"	L=39.27'

TRAIL CONNECTION POINT

TRAIL CONNECTION POINT

TRAIL CONNECTION POINT

SOLEDAD CANYON ROAD

LSA

N

0 100 200
FEET

SOURCE: PACIFIC COAST CIVIL, INC.

I:\RBF530\G\Site_Plan.cdr (6/17/04)

FIGURE 2

Soledad Townhomes
Site Plan

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave, resulting in the tone's range from high to low. Loudness is the strength of a sound and describes a noisy or quiet environment; it is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves, combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

MEASUREMENT OF SOUND

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units, such as inches or pounds, decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) are 10 times more intense than 1 decibel, 20 decibels are 100 times more intense, and 30 decibels are 1,000 times more intense. Thirty decibels represent 1,000 times more acoustic energy than one decibel. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 decibels. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10-decibel increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately six decibels for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source, such as highway traffic or railroad operations, the sound decreases three decibels for each doubling of distance in a hard site environment. Line source noise, when produced within a relatively flat environment with absorptive vegetation, decreases four and one-half decibels for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoyance effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and community noise equivalent level (CNEL) or the day-night average level (L_{dn}) based on A-weighted decibels (dBA). CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of maximum levels denoted by L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoyance aspects of intermittent noise.

Another noise scale often used together with the L_{max} in noise ordinances for enforcement purposes is noise standards in terms of percentile noise levels. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first is audible impacts, which refers to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3.0 dB or greater, since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1.0 and 3.0 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise level of less than 1.0 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

PSYCHOLOGICAL AND PHYSIOLOGICAL EFFECTS OF NOISE

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions and thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160 to 165 dBA will result in dizziness or loss of equilibrium.

The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less developed areas.

Table A lists "Definitions of Acoustical Terms;" Table B shows "Common Sound Levels and Their Noise Sources;" and Table C shows "Land Use Compatibility for Exterior Community Noise" recommended by the California Department of Health, Office of Noise Control.

Table A: Definitions of Acoustical Terms

Term	Definition
Decibel, dB	A unit of level that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{02}, L_{08}, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period, respectively.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 decibels to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurement and Noise Control 1991.

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	
Near Freeway Auto Traffic	70	Moderately Loud	Reference Level
Average Office	60	Quiet	½ as loud
Suburban Street	55	Quiet	
Light Traffic; Soft Radio Music in Apartment	50	Quiet	¼ as loud
Large Transformer	45	Quiet	
Average Residence without Stereo Playing	40	Faint	⅛ as loud
Soft Whisper	30	Faint	
Rustling Leaves	20	Very Faint	
Human Breathing	10	Very Faint	Threshold of Hearing
	0	Very Faint	

Source: LSA Associates, Inc. 2004.

Table C: Land Use Compatibility for Exterior Community Noise

Land Use Category	Noise Range (Ldn or CNEL), dB			
	I	II	III	IV
Passively used open spaces	50	50–55	55–70	70+
Auditoriums, concert halls, amphitheaters	45–50	50–65	65–70	70+
Residential—low-density single family, duplex, mobile homes	50–55	55–70	70–75	75+
Residential—multifamily	50–60	60–70	70–75	75+
Transient lodging—motels, hotels	50–60	60–70	70–80	80+
Schools, libraries, churches, hospitals, nursing homes	50–60	60–70	70–80	80+
Actively used open spaces—playgrounds, neighborhood parks	50–67	—	67–73	73+
Golf courses, riding stables, water recreation, cemeteries	50–70	—	70–80	80+
Office buildings, business commercial and professional	50–67	67–75	75+	—
Industrial, manufacturing, utilities, agriculture	50–70	70–75	75+	—

Source: Office of Noise Control, California Department of Health 1976.

Noise Range I—Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Noise Range II—Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made, and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Noise Range III—Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Noise Range IV—Clearly Unacceptable: New construction or development should generally not be undertaken.

SETTING

Existing Sensitive Land Uses in the Project Area

Sensitive receptors include residences, schools, hospitals, and similar uses that are sensitive to noise. There are existing residences to the east of the project site. These sensitive land uses may be potentially affected by the noise generated during construction on the project site.

Overview of the Existing Noise Environment

The primary existing noise sources in the project area are transportation facilities. Traffic on Soledad Canyon Road and other streets in the project vicinity is the source of ambient noise in the project vicinity. Metrolink commuter trains also contribute to the ambient noise in the project vicinity. Saugus Speedway is approximately 0.25 mile (1,320 feet) west of the project site and does not affect the project site significantly.

The existing average daily traffic volumes (ADT) for roadway segments in the project vicinity (Bouquet Canyon Road) are provided by Austin-Foust Associates, Inc. (June and August 2005). The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used to evaluate highway traffic-related noise conditions in the vicinity of the project site. This model requires various parameters including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the CNEL values. Table D provides the existing traffic noise levels adjacent to roadway segments in the project vicinity. These noise levels represent worst-case scenarios, which assume that no shielding is provided between the traffic and the location where the noise contours are drawn. The specific assumptions used in developing these noise levels and the model printouts are provided in Appendix A. Traffic noise is generally moderate to high along Bouquet Canyon Road under existing conditions in the project vicinity. The 70, 65, and 60 dBA CNEL extend up to 143, 303, and 651 feet, respectively, from the roadway centerline.

Table D: Existing Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane
Bouquet Canyon north of Soledad Canyon	63,000	143	303	651	74.1
Bouquet Canyon south of Soledad Canyon	42,000	111	232	497	72.4
Soledad Canyon west of Bouquet Canyon	53,000	128	271	580	73.4
Soledad Canyon east of Bouquet Canyon	55,000	131	277	594	73.6
Soledad Canyon west of Proposed Project	54,000	130	274	587	73.5

Source: LSA Associates, Inc., June 2005.

Based on the most recent Metrolink schedule, there are 12 commuter trains a day from Lancaster to Los Angeles and 12 commuter trains a day from Los Angeles to Lancaster on weekdays that pass through the Santa Clarita area along the Metrolink track to the south of the project site. Using the Metrolink schedule and methodologies outlined in Transit Noise and Vibration Impact Assessment (Federal Transit Administration, April 1995), it was estimated that the commuter trains would result in a noise level of 63.4 dBA CNEL at 50 feet from the railroad track. The proposed project site is approximately 200 feet from the nearest Metrolink railroad track and is projected to be exposed to 54.4 dBA CNEL noise level from Metrolink trains.

Thresholds of Significance

A project will normally have a significant noise-related effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of the community in which it is located. The applicable noise standards governing the project site are the criteria in the City's Noise Element and Noise Control Ordinance.

City of Santa Clarita Noise Standards

The City has set land use standards for noise in its General Plan Noise Element (June 25, 1991; First Amendment, May 23, 2000). One of the City's goals in the Noise Element is to prevent and mitigate significant noise levels in residential neighborhoods. It requires that developers of new single-family and multifamily residential neighborhoods in areas where the ambient noise level exceeds 55 dBA (night) and 65 dBA (day) (or the equivalent of 65 dBA CNEL) provide mitigation measures for the new residences to reduce interior noise levels.

In addition, the City will develop, adopt, and enforce a standard for all commercial uses of 70 dBA (night) and 80 dBA (day) (or the equivalent of 80 dBA CNEL) that cause adverse levels of significant discernible noise on adjacent residential neighborhoods.

The City's Municipal Code, Chapter 11.44, Noise Limits, establishes noise standards in various land use zones during daytime (7:00 a.m.–10:00 p.m.) and nighttime (10:00 p.m.–7:00 a.m.) periods. For residential zones, the base noise levels are 65 dBA during the daytime period and 55 dBA during the nighttime period. For commercial and manufacturing zones, the base noise levels are 80 dBA during the daytime period and 70 dBA during the nighttime period. For repetitive impulsive noise or steady, whine, screech, or hum noise, the base noise levels noted above are reduced by 5 dBA. If the noise occurs more than 5 but less than 15 minutes per hour during the daytime period, the above base noise levels are raised by 5 dBA. If the noise occurs more than 1 but less than 5 minutes per hour during the daytime period, the above base noise levels are raised by 10 dBA. If the noise occurs less than 1 minute per hour during daytime period, the above base noise levels are raised by 20 dBA.

No person shall engage in any construction work that requires a building permit from the City on sites within 300 feet of a residentially zoned property except between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and 8:00 a.m. and 6:00 p.m. on Saturday. Further, no work shall be performed on the following public holidays: New Year's Day, Independence Day, Thanksgiving, Christmas Day, Memorial Day, and Labor Day. The City of Santa Clarita Planning and Building

Services Department may issue a permit for work to be done "after hours" provided that containment of construction noises is provided.

PROJECT IMPACTS

Construction Noise

Short-term noise impacts would be associated with excavation, grading, and erecting of buildings on site during construction of the proposed project. Construction-related short-term noise levels would be higher than existing ambient noise levels in the project area today but would no longer occur once construction of the project is completed.

Two types of short-term noise impacts could occur during the construction of the proposed project. First, construction crew commutes and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on access roads leading to the site. There will be a relatively high single-event noise exposure potential at a maximum level of 87 dBA L_{max} with trucks passing at 50 feet. However, the projected construction traffic will be small when compared to the existing traffic volumes on Soledad Canyon Road and its associated long-term noise level change will not be perceptible. Therefore, short-term construction-related worker commutes and equipment transport noise impacts would not be substantial.

The second type of short-term noise impact is related to noise generated during excavation, grading, and construction on the project site. Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table E lists maximum noise levels recommended for noise impact assessments for typical construction equipment based on a distance of 50 feet between the equipment and a noise receptor. Typical maximum noise levels range up to 91 dBA at 50 feet during the noisiest construction phases. The site preparation phase, which includes excavation and grading of the site, tends to generate the highest noise levels, because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three or four minutes at lower power settings.

Construction of the proposed project is expected to require the use of earthmovers, bulldozers, and water and pickup trucks. This equipment would be used on the project site. Based on Table E, the maximum noise level generated by each earthmover on the proposed project site is assumed to be 88 dBA L_{max} at 50 feet from the earthmover. Each bulldozer would also generate 88 dBA L_{max} at 50 feet. The maximum noise level generated by water and pickup trucks is approximately 86 dBA L_{max} at 50 feet from these vehicles. Each doubling of a sound source with equal strength increases the noise level by 3 dBA. Assuming that each piece of construction equipment operates at some distance from the other equipment, the worst-case combined noise level at each individual residence during this phase of construction would be 91 dBA L_{max} at a distance of 50 feet from the active construction area.

Table E: Typical Maximum Construction Equipment Noise Levels (L_{max})

Type of Equipment	Range of Maximum Sound Level Measured at 50 feet (dBA)	Suggested Maximum Sound Level for Analysis at 50 feet (dBA)
Pile Drivers, 12,000 to 18,000 ft-lb/blow	81–96	93
Rock Drills	83–99	96
Jackhammers	75–85	82
Pneumatic Tools	78–88	85
Pumps	74–84	80
Scrapers	83–91	87
Haul Trucks	83–94	88
Cranes	79–86	82
Portable Generators	71–87	80
Rollers	75–82	80
Dozers	77–90	85
Tractors	77–82	80
Front-End Loaders	77–90	86
Hydraulic Backhoes	81–90	86
Hydraulic Excavators	81–90	86
Graders	79–89	86
Air Compressors	76–89	86
Trucks	81–87	86

Source: Noise Control for Buildings and Manufacturing Plants, Bolt, Beranek, & Newman 1987.

The closest existing residences in the vicinity of the project area are located more than 200 feet from the project construction areas. There are no intervening structures between these homes and the project site. These closest residences may be subject to short-term noise reaching 79 dBA L_{max}, generated by construction activities near the project boundary. Compliance with the construction hours specified in the City's Noise Control Ordinance would be required.

Traffic Noise Impacts

Exterior land uses on the project site that would be potentially exposed to high noise levels are the home lots fronting Soledad Canyon Road. The projected future traffic volumes (Austin-Foust Associates, Inc., June 2005) for roadway segments in the project vicinity are used in the traffic noise impact analysis.

The FHWA Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used to evaluate future highway traffic-related noise conditions in the vicinity of the project site. Table F provides the Short-Range Baseline traffic noise levels. Table G lists the Short-Range Plus Project traffic noise levels. Table H lists the future Interim Year (2015) No Project traffic noise levels adjacent to roadway segments in the project vicinity. Table I provides the future Interim Year (2015) Plus Project traffic noise levels adjacent to roadway segments in the project vicinity. Table J lists the future cumulative year (2030) no project traffic noise levels. Table K lists the future cumulative year (2030) plus project traffic noise levels. These noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. The specific assumptions used in developing these noise levels and the model printouts are provided in Appendix A.

Table F: Short-Range No Project Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane
Bouquet Canyon north of Soledad Canyon	87,000	176	375	807	75.5
Bouquet Canyon south of Soledad Canyon	40,000	108	225	481	72.2
Valley Center between Soledad Canyon and Golden Valley Rd.	18,700	< 50[1]	75	161	66.9
Golden Valley Rd. south of Valley Center	15,000	< 50	99	210	67.6
Soledad Canyon west of Bouquet Canyon	54,000	130	274	587	73.5
Soledad Canyon east of Bouquet Canyon	63,000	143	303	651	74.1
Soledad Canyon west of Proposed Project	62,000	142	300	644	74.1

Source: LSA Associates. Inc., June 2005.

[1] Traffic noise within 50 feet of roadway centerline requires site-specific analysis.

Table G: Short-Range Traffic Noise Levels with Project

Roadway Segment	ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions
Bouquet Canyon north of Soledad Canyon	87,000	176	375	807	75.5	0
Bouquet Canyon south of Soledad Canyon	40,000	108	225	481	72.2	0
Project Driveway #1 north of Soledad Canyon	500	< 50[1]	< 50	< 50	51.2	NA
Project Driveway #2 north of Soledad Canyon	2,200	< 50	< 50	< 50	57.6	NA
Valley Center between Soledad Canyon and Golden Valley Rd.	19,200	< 50	76	164	67	0.1
Golden Valley Rd. south of Valley Center	15,000	< 50	99	210	67.6	0
Soledad Canyon west of Bouquet Canyon	55,000	131	277	594	73.6	0.1
Soledad Canyon between Bouquet Canyon and Proj. Drwy #1	64,000	145	306	657	74.2	0.1
Soledad Canyon between Proj. Drwy #1 and Proj. Drwy #2	64,000	145	306	657	74.2	0.1
Soledad Canyon between Proj. Drwy #2 and Valley Center	63,000	143	303	651	74.1	0
Soledad Canyon east of Valley Center	63,000	143	303	651	74.1	0

Source: LSA Associates. Inc., June 2005.

[1] Traffic noise within 50 feet of roadway centerline requires site-specific analysis.

Table H: Long-Range Year Traffic Noise Levels without Project

Roadway Segment	ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane
Bouquet Canyon north of Soledad Canyon	70,000	153	325	698	74.6
Bouquet Canyon south of Soledad Canyon	46,000	117	246	528	72.8
Valley Center between Soledad Canyon and Golden Valley Rd.	21,800	< 50[1]	83	178	67.6
Golden Valley Rd. north of Valley Center	42,000	91	194	417	72
Golden Valley Rd. south of Valley Center	20,000	58	119	254	68.8
Soledad Canyon west of Bouquet Canyon	57,000	134	284	609	73.7
Soledad Canyon east of Bouquet Canyon	35,000	99	206	440	71.6
Soledad Canyon west of Proposed Project	34,000	98	202	432	71.5

Source: LSA Associates. Inc., June 2005.

[1] Traffic noise within 50 feet of roadway centerline requires site-specific analysis.

Table I: Long-Range Year Traffic Noise Levels with Project

Roadway Segment	ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions
Bouquet Canyon north of Soledad Canyon	71,000	155	328	704	74.7	0.1
Bouquet Canyon south of Soledad Canyon	46,000	117	246	528	72.8	0
Project Driveway #1 north of Soledad Canyon	900	< 50[1]	< 50	< 50	53.7	NA
Project Driveway #2 north of Soledad Canyon	3,400	< 50	< 50	52	59.5	NA
Valley Center between Soledad Canyon and Golden Valley Rd.	22,600	< 50	85	183	67.7	0.1
Golden Valley Rd. north of Valley Center	42,000	91	194	417	72	0
Golden Valley Rd. south of Soledad Canyon	21,000	59	123	263	69	0.2
Soledad Canyon west of Bouquet Canyon	58,000	136	287	616	73.8	0.1
Soledad Canyon between Bouquet Canyon and Proj. Drwy #1	37,000	103	214	457	71.8	0.2
Soledad Canyon between Proj. Drwy #1 and Proj. Drwy #2	37,000	103	214	457	71.8	0.2
Soledad Canyon between Proj. Drwy #2 and Valley Center	36,000	101	210	449	71.7	0.2
Soledad Canyon east of Valley Center	36,000	101	210	449	71.7	0.2

Source: LSA Associates. Inc., June 2005.

[1] Traffic noise within 50 feet of roadway centerline requires site-specific analysis.

Table J: Cumulative (2030) Traffic Noise Levels without Project

Roadway Segment	ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 Feet from Centerline of Outermost Lane
Bouquet Canyon north of Soledad Canyon	80,000	167	355	763	75.2
Bouquet Canyon south of Soledad Canyon	43,000	113	236	505	72.5
Newhall Ranch Rd. east of Bouquet Canyon Rd.	42,000	91	194	417	72
Golden Valley Rd. south of Soledad Canyon	24,000	64	134	287	69.6
Soledad Canyon west of Bouquet Canyon	48,000	121	253	543	73
Soledad Canyon east of Bouquet Canyon	34,000	98	202	432	71.5
Soledad Canyon west of Golden Valley Rd.	36,000	101	210	449	71.7
Santa Clarita Parkway north of Soledad Canyon	29,000	89	182	389	70.8
Santa Clarita Parkway south of Soledad Canyon	38,000	104	217	465	71.9

Source: LSA Associates. Inc., August 2005.

Table K: Cumulative (2030) Traffic Noise Levels with Project

Roadway Segment	ADT	Center-line to 70 CNEL (feet)	Center-line to 65 CNEL (feet)	Center-line to 60 CNEL (feet)	CNEL (dBA) 50 Feet from Centerline of Outermost Lane	Increase from Baseline Conditions
Bouquet Canyon north of Soledad Canyon	81,000	168	358	769	75.2	0
Bouquet Canyon south of Soledad Canyon	43,000	113	236	505	72.5	0
Newhall Ranch Rd. east of Bouquet Canyon Rd.	42,000	91	194	417	72	0
Golden Valley Rd. south of Soledad Canyon	25,000	66	138	295	69.8	0.2
Soledad Canyon west of Bouquet Canyon	49,000	122	257	550	73.1	0.1
Soledad Canyon east of Bouquet Canyon	36,000	101	210	449	71.7	0.2
Soledad Canyon west of Golden Valley Rd.	38,000	104	217	465	71.9	0.2
Santa Clarita Parkway north of Soledad Canyon	29,000	89	182	389	70.8	0
Santa Clarita Parkway south of Soledad Canyon	38,000	104	217	465	71.9	0

Source: LSA Associates. Inc., August 2005.

Tables G, I and K show that project-related traffic noise increases along roadway segments in the project vicinity would be mostly minimal and negligible (0.2 dBA or less), and these increases are less than the 3 dBA threshold normally perceptible by the human ear. No significant project-related traffic noise impacts on off-site land uses would occur. No mitigation measures would be required.

Based on the project's traffic study report (Austin-Foust Associates, Inc., June 2005), all internal roadways on site, including the two driveways, would carry maximum daily trips of 3,400. Vehicle speeds on these internal roads are usually 35 miles per hour (mph) or slower. However, even with the assumption of a vehicle speed at 45 mph, the 65 dBA CNEL would be within 24 feet of the roadway centerline. This range of distance is within the roadway right-of-way. No significant traffic noise impacts would occur from traffic on on-site roadways.

For a worst-case scenario, traffic noise under the cumulative year (2030) plus project condition is used to determine whether the project site would be exposed to any significant traffic noise impacts. Table K shows that the 65 dBA CNEL would extend up to 217 feet from the centerline of Soledad Canyon Road in the project area.

Based on Vesting Tentative Tract Map 062322 for Soledad Townhomes (Pacific Coast Civil, Inc., May 17, 2005), portions of the project site designated for residential development (T1 through T5, A1 through A6, B1, C2, C4, C6, C8, and C10 through C14) and neighborhood commercial would be potentially exposed to high traffic noise from Soledad Canyon Road.

It is estimated that the property line of these frontline dwelling units/buildings would be 60 to 70 feet from the centerline of Soledad Canyon Road and would potentially be exposed to noise reaching 74 dBA CNEL. However, based on the project's site plan, no outdoor recreational use areas such as barbeques or swimming pools would be located between these buildings and the road. Therefore, noise mitigation for the open space between these buildings and Soledad Canyon Road is not required. However, if patios or balconies are proposed for the dwelling units fronting Soledad Canyon Road and are directly exposed to traffic on Soledad Canyon Road, they would be exposed to noise exceeding the City's 65 dBA CNEL noise standard for residential uses.

Outdoor Active Use Areas. Based on the above discussion, if outdoor active use areas such as patios or balconies are proposed for dwelling units along the southern project boundary, they would be exposed to traffic noise from 69 to 72 dBA CNEL. These outdoor active use areas, if proposed, would be potentially exposed to exterior noise levels exceeding the City's exterior noise standard of 65 dBA CNEL. Therefore, noise barriers will be required along the along the perimeter of the patios or balconies of these dwelling units along and directly exposed to traffic on Soledad Canyon Road.

For the ground-floor frontline outdoor active use areas (patios), a sound barrier with a minimum wall height of six feet would be required to reduce the traffic noise level to 65 dBA CNEL or lower in the outdoor areas. In addition, if balconies or decks are proposed for these frontline dwelling units that are directly exposed to traffic noise from Soledad Canyon Road, a noise barrier with a minimum height of five feet is required along the perimeter of balconies or decks. Balconies or decks on the side of the building facing away from the street or outside of the 65 dBA CNEL impact zone do not require sound wall protection.

All other home lots that have (on-site) intervening structures blocking their direct line-of-sight to Soledad Canyon Road traffic would be outside the 65 dBA CNEL impact zone. No mitigation measures would be required for their outdoor active use areas.

Interior Noise Levels. As stated above, homes proposed along the southern project boundary would be potentially exposed to traffic noise levels exceeding 65 dBA CNEL. Based on the data provided in the Environmental Protection Agency's (EPA) Protective Noise Levels (EPA 550/9-79-100, November 1979), standard homes in Southern California provide at least 12 dBA of exterior to interior noise attenuation with windows open and 24 dBA with windows closed. Therefore, homes exposed to exterior traffic noise levels lower than 69 dBA CNEL (45 + 24 = 69 dBA) would not have their interior noise level exceed the 45 dBA CNEL standard with the windows closed. With the windows open, homes exposed to exterior traffic noise levels exceeding 57 dBA CNEL (45 + 12 = 57 dBA) would exceed the 45 dBA CNEL interior noise standard.

Based on the above discussion and the projected traffic noise levels on the southern project boundary, all frontline residential structures are anticipated to be exposed to traffic noise below 69 dBA CNEL from roads adjacent to the project site, except for dwelling units on A1 through A5 (70 dBA CNEL), C8 (70 dBA CNEL), C10 (70 dBA CNEL, C11 (71 dBA CNEL), and C12 through C14 (72 dBA CNEL). Building facade upgrades, such as windows with sound transmission class (STC) ratings higher than standard building construction provides, would be required for homes proposed on these buildings. In addition, mechanical ventilation, such as an air-conditioning system, would be required for dwelling units along the project southern boundary to ensure that windows can remain closed for prolonged periods of time.

Standard windows provide up to STC-28 in noise attenuation. Depending on the distance to the centerline of Soledad Canyon Road, the required window STC ratings vary among these dwelling units. The following lists the minimum STC rating recommended for the frontline dwelling units that would be exposed to traffic noise exceeding 69 dBA CNEL:

- STC-30: A1 through A5, C8, C10
- STC-32: C11 through C14

Commercial uses are not as noise-sensitive as residential uses. Therefore, the proposed retail use along Soledad Canyon Road would not be significantly affected by traffic noise and would not require any mitigation except for an air-conditioning system.

Stationary Noise Impacts

Potential long-term stationary noise impacts would primarily be associated with operations at the future commercial uses on site. The proposed commercial uses would generate noise from truck deliveries, loading/unloading activities, and other activities at the parking lot. These activities are potential point sources of noise that could affect noise-sensitive receptors adjacent to the loading areas, such as proposed residential uses on site.

As noise spreads from a source it loses energy, so the farther away the noise receiver is from the noise source, the lower the perceived noise level would be. Geometric spreading causes the sound level to attenuate or be reduced, resulting in a 6 dBA reduction in the noise level for each doubling of distance from a single-point source of noise, such as an idling truck, to the noise-sensitive receptor of concern. Although individual activity may generate relatively high and intermittent noise, when added to the typically lower ambient noise and averaged over a longer period of time, the cumulative noise level would be much lower and would be considered a less than significant impact.

The proposed commercial uses do not have major loading/unloading areas on the east side adjacent to homes. The closest loading/unloading area is located more than 200 feet from the nearest dwelling units. The 200-foot distance would result in a 12 dBA noise attenuation (compared to the levels at 50 feet).

Truck Delivery and Loading/Unloading. Delivery trucks for the proposed on-site uses would result in a maximum noise similar to noise readings from loading and unloading activities for other commercial uses, which generate a noise level of 75 dBA L_{max} at 50 feet and are used in this analysis. Based on the above discussion, loading/unloading noise from the commercial uses would be reduced to below 63 dBA L_{max} at ground level of the nearest residences on site. This range of maximum noise levels is lower than the typical exterior noise standards of 75 dBA L_{max} during the day (7:00 a.m. to 10:00 p.m.) and the 65 dBA L_{max} standard during the night (10:00 p.m. to 7:00 a.m.). Although a typical truck unloading process takes an average of 15 to 20 minutes, this maximum noise level occurs in a much shorter period of time, in a few minutes. Therefore, noise associated with loading and unloading activities at the loading areas would not result in maximum noise levels exceeding the typical standards at the nearest residences.

Parking Lot Activity. The shortest distance from on-site residences to the parking areas associated with commercial uses is approximately 50 feet. Representative parking activities, such as customers conversing and doors slamming, would generate approximately 60 dBA L_{max} at 50 feet. This level of noise is much lower than that of the truck delivery and loading/unloading activities and is not anticipated to be a significant noise issue with respect to residences adjacent to the commercial use area.

Metrolink Train Noise Impact

As discussed in the existing condition, the current Metrolink operations of 12 commuter trains a day from Lancaster to Los Angeles and 12 commuter trains a day from Los Angeles to Lancaster on weekdays that pass through the Santa Clarita area would result in a noise level of 63.4 dBA CNEL at 50 feet from the railroad track. The proposed project site is approximately 200 feet from the nearest Metrolink railroad track and is projected to be exposed to 54.4 dBA CNEL noise level from Metrolink trains. This noise level is 15 to 18 dBA lower than traffic noise on Soledad Canyon Road. Train noise would not add measurable noise (less than 0.2 dBA) to the project site. No mitigation measures are required for train noise on the proposed residential uses on the project site.

MITIGATION MEASURES

Construction Impacts

Construction will be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 8:00 a.m. to 6:00 p.m. on Saturday, in accordance with the City's Noise Control Ordinance. No construction activities are permitted outside of these hours or on Sundays and federal holidays.

The following measures can be implemented to reduce potential construction noise impacts on nearby sensitive receptors:

1. During all site excavation and grading, the project contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
2. The project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
3. The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

Traffic Noise Impacts

Outdoor Active Use Area. The following mitigation measures are required for outdoor active use areas associated with residential uses:

1. A sound barrier with a minimum wall height of six feet would be required for ground-floor frontline outdoor active use areas associated with the following dwelling units: T1 through T5, A1 through A6, B1, C2, C4, C6, C8, and C10 through C14.

2. Balconies or decks, if proposed for the following frontline dwelling units, which are directly exposed to traffic noise from Soledad Canyon Road, require a noise barrier with a minimum height of five feet along the perimeter of balconies or decks: T1 through T5, A1 through A6, B1, C2, C4, C6, C8, and C10 through C14. Balconies or decks on the side of the building facing away from the street or outside of the 65 dBA CNEL impact zone do not require sound wall protection.

Interior Noise Sound Wall. To meet the City's 45 dBA CNEL interior noise standard, the following mitigation measures will be required:

1. Mechanical ventilation, such as an air-conditioning system, shall be required for the following dwelling units along the project's southern boundary to ensure that windows can remain closed for prolonged periods of time: T1 through T5, A1 through A6, B1, C2, C4, C6, C8, and C10 through C14.
2. Windows with STC-30 or higher are required for bedrooms associated with the following dwelling units along Soledad Canyon Road: A1 through A5, C8, C10.
3. Windows with STC-32 or higher are required for bedrooms associated with the following dwelling units along Soledad Canyon Road: C11 through C14.

4. Mechanical ventilation, such as an air-conditioning system, shall be required for the commercial uses proposed on the project site.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

With implementation of the identified mitigation measures, potential short-term and long-term noise impacts would be reduced to below the level of significance.

REFERENCES

Austin, Foust Associates, Inc., Traffic Impact Analysis, June and August 2005.

Bolt, Beranek & Newman, Noise Control for Buildings and Manufacturing Plants, 1987.

City of Santa Clarita, Municipal Code Noise Ordinance.

City of Santa Clarita, Noise Element of the General Plan.

Federal Highway Administration, Highway Traffic Noise Prediction Model, FHWA RD-77-108, 1977.

APPENDIX A

FHWA TRAFFIC NOISE MODEL PRINTOUTS

SOLEDAD TOWNHOUSES

FHWA ROADWAY NOISE LEVEL ANALYSIS

CONTOUR6 MODEL PRINTOUTS

EXISTING BASELINE CONDITIONS

TABLE Existing-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Bouquet Canyon north of Soledad Canyon
NOTES: Soledad Townhomes - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 63000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
143.3	303.2	650.6	1400.2

TABLE Existing-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Bouquet Canyon south of Soledad Canyon
NOTES: Soledad Townhomes - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 42000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.38

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
111.0	232.2	496.9	1068.8

TABLE Existing-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Project Driveway #1 north of Soledad Canyon
NOTES: Soledad Townhomes - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 24.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Project Driveway #2 north of Soledad Canyon
NOTES: Soledad Townhomes - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 24.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Valley Center between Soledad Canyon and Newhall Ranch Rd.
NOTES: Soledad Townhomes - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 24.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. north of Valley Center
NOTES: Soledad Townhomes - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 25.81

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. between Valley Center and Soledad Canyon
NOTES: Soledad Townhomes - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 25.81

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. south of Soledad Canyon
NOTES: Soledad Townhomes - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 25.81

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon west of Bouquet Canyon
NOTES: Soledad Townhomes - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 53000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.39

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
128.4	270.6	580.0	1247.9

TABLE Existing-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Bouquet Canyon and Proj. Drwy #1
NOTES: Soledad Townhomes - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 55000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.55

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
131.4	277.2	594.4	1279.1

TABLE Existing-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Proj. Drwy #1 and Proj. Drwy #2
NOTES: Soledad Townhomes - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 55000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.55

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
131.4	277.2	594.4	1279.1

TABLE Existing-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Proj. Drwy #2 and Valley Center
NOTES: Soledad Townhomes - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 54000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
129.9	273.9	587.2	1263.6

TABLE Existing-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Valley Center and Newhall Ranch Rd.
NOTES: Soledad Townhomes - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 54000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
129.9	273.9	587.2	1263.6

TABLE Existing-14
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon east of Newhall Ranch Rd.
NOTES: Soledad Townhomes - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 54000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
129.9	273.9	587.2	1263.6

SOLEDAD TOWNHOUSES

FHWA ROADWAY NOISE LEVEL ANALYSIS

CONTOUR6 MODEL PRINTOUTS

BUILD-OUT YEAR WITHOUT PROJECT SCENARIO

TABLE Build-Out Year w/o Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Bouquet Canyon north of Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 87000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 75.55

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
176.3	375.4	806.5	1736.3

TABLE Build-Out Year w/o Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Bouquet Canyon south of Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 40000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.17

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
107.7	224.9	481.0	1034.6

TABLE Build-Out Year w/o Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Project Driveway #1 north of Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year w/o Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 24.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Build-Out Year w/o Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Project Driveway #2 north of Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 24.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Build-Out Year w/o Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Valley Center between Soledad Canyon and Newhall Ranch Rd.
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18700 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.91

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	74.9	160.9	346.4

TABLE Build-Out Year w/o Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. north of Valley Center
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 25.81

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Build-Out Year w/o Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. between Valley Center and Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18700 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.53

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
55.3	114.1	243.3	523.0

TABLE Build-Out Year w/o Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. south of Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.57

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	98.9	210.3	451.7

TABLE Build-Out Year w/o Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon west of Bouquet Canyon
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 54000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
129.9	273.9	587.2	1263.6

TABLE Build-Out Year w/o Project-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Bouquet Canyon and Proj. Drwy #1
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 63000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
143.3	303.2	650.6	1400.2

TABLE Build-Out Year w/o Project-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Proj. Drwy #1 and Proj. Drwy #2
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 63000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
143.3	303.2	650.6	1400.2

TABLE Build-Out Year w/o Project-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Proj. Drwy #2 and Valley Center
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 62000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
141.8	300.0	643.7	1385.4

TABLE Build-Out Year w/o Project-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Valley Center and Newhall Ranch Rd.
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 62000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
141.8	300.0	643.7	1385.4

TABLE Build-Out Year w/o Project-14
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon east of Newhall Ranch Rd.
NOTES: Soledad Townhomes - Build-Out Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 62000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
141.8	300.0	643.7	1385.4

SOLEDAD TOWNHOUSES

FHWA ROADWAY NOISE LEVEL ANALYSIS

CONTOUR6 MODEL PRINTOUTS

BUILD-OUT YEAR WITH PROJECT SCENARIO

TABLE Build-Out Year with Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Bouquet Canyon north of Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 87000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 75.55

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
176.3	375.4	806.5	1736.3

TABLE Build-Out Year with Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Bouquet Canyon south of Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 40000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.17

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
107.7	224.9	481.0	1034.6

TABLE Build-Out Year with Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Project Driveway #1 north of Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 500 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 51.18

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Build-Out Year with Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Project Driveway #2 north of Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2200 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.62

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	83.4

TABLE Build-Out Year with Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Valley Center between Soledad Canyon and Newhall Ranch Rd.
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 19200 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.03

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	76.2	163.7	352.5

TABLE Build-Out Year with Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. north of Valley Center
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 25.81

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Build-Out Year with Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. between Valley Center and Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 19200 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.64

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
56.2	116.1	247.6	532.3

TABLE Build-Out Year with Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. south of Soledad Canyon
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.57

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	98.9	210.3	451.7

TABLE Build-Out Year with Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon west of Bouquet Canyon
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 55000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.55

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
131.4	277.2	594.4	1279.1

TABLE Build-Out Year with Project-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Bouquet Canyon and Proj. Drwy #1
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 64000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.21

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
144.7	306.4	657.5	1415.0

TABLE Build-Out Year with Project-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Proj. Drwy #1 and Proj. Drwy #2
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 64000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.21

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
144.7	306.4	657.5	1415.0

TABLE Build-Out Year with Project-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Proj. Drwy #2 and Valley Center
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 63000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
143.3	303.2	650.6	1400.2

TABLE Build-Out Year with Project-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Valley Center and Newhall Ranch Rd.
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 63000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
143.3	303.2	650.6	1400.2

TABLE Build-Out Year with Project-14
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon east of Newhall Ranch Rd.
NOTES: Soledad Townhomes - Build-Out Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 63000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
143.3	303.2	650.6	1400.2

SOLEDAD TOWNHOUSES

FHWA ROADWAY NOISE LEVEL ANALYSIS

CONTOUR6 MODEL PRINTOUTS

INTERIM YEAR WITHOUT PROJECT SCENARIO

TABLE Interim Year w/o Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Bouquet Canyon north of Soledad Canyon
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 70000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.60

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
153.2	325.1	697.8	1502.1

TABLE Interim Year w/o Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Bouquet Canyon south of Soledad Canyon
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 46000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.78

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
117.5	246.5	527.8	1135.5

TABLE Interim Year w/o Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Project Driveway #1 north of Soledad Canyon
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 24.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Interim Year w/o Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Project Driveway #2 north of Soledad Canyon
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 0 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 24.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Interim Year w/o Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Valley Center between Soledad Canyon and Newhall Ranch Rd.
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 21800 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.58

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	82.9	178.2	383.7

TABLE Interim Year w/o Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. north of Valley Center
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 42000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
91.5	194.0	416.5	896.6

TABLE Interim Year w/o Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. between Valley Center and Soledad Canyon
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 42000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
91.5	194.0	416.5	896.6

TABLE Interim Year w/o Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. south of Soledad Canyon
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 20000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.82

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
57.6	119.2	254.4	546.9

TABLE Interim Year w/o Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon west of Bouquet Canyon
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 57000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.71

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
134.4	283.8	608.7	1309.9

TABLE Interim Year w/o Project-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Bouquet Canyon and Proj. Drwy #1
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 35000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.59

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
99.3	206.1	440.2	946.5

TABLE Interim Year w/o Project-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Proj. Drwy #1 and Proj. Drwy #2
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 35000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.59

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
99.3	206.1	440.2	946.5

TABLE Interim Year w/o Project-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Proj. Drwy #2 and Valley Center
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 34000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
97.6	202.2	431.9	928.5

TABLE Interim Year w/o Project-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Valley Center and Newhall Ranch Rd.
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 34000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
97.6	202.2	431.9	928.5

TABLE Interim Year w/o Project-14
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon east of Newhall Ranch Rd.
NOTES: Soledad Townhomes - Interim Year w/o Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 34000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
97.6	202.2	431.9	928.5

SOLEDAD TOWNHOUSES

FHWA ROADWAY NOISE LEVEL ANALYSIS

CONTOUR6 MODEL PRINTOUTS

INTERIM YEAR WITH PROJECT SCENARIO

TABLE Interim Year with Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Bouquet Canyon north of Soledad Canyon
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 71000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.66

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
154.6	328.1	704.5	1516.3

TABLE Interim Year with Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Bouquet Canyon south of Soledad Canyon
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 46000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.78

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
117.5	246.5	527.8	1135.5

TABLE Interim Year with Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Project Driveway #1 north of Soledad Canyon
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 900 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 53.74

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Interim Year with Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Project Driveway #2 north of Soledad Canyon
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3400 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 59.51

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	52.0	111.3

TABLE Interim Year with Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Valley Center between Soledad Canyon and Newhall Ranch Rd.
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 22600 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.73

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	84.9	182.5	393.0

TABLE Interim Year with Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. north of Valley Center
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 42000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
91.5	194.0	416.5	896.6

TABLE Interim Year with Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. between Valley Center and Soledad Canyon
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 42000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
91.5	194.0	416.5	896.6

TABLE Interim Year with Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Newhall Ranch Rd. south of Soledad Canyon
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 21000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.03

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
59.3	123.0	262.8	565.0

TABLE Interim Year with Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon west of Bouquet Canyon
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 58000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.79

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
135.9	287.1	615.8	1325.2

TABLE Interim Year with Project-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Bouquet Canyon and Proj. Drwy #1
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 37000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.83

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
102.7	213.7	456.8	982.2

TABLE Interim Year with Project-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Proj. Drwy #1 and Proj. Drwy #2
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 37000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.83

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
102.7	213.7	456.8	982.2

TABLE Interim Year with Project-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Proj. Drwy #2 and Valley Center
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 36000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.71

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
101.0	209.9	448.5	964.5

TABLE Interim Year with Project-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon between Valley Center and Newhall Ranch Rd.
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 36000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.71

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
101.0	209.9	448.5	964.5

TABLE Interim Year with Project-14
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/13/2005
ROADWAY SEGMENT: Soledad Canyon east of Newhall Ranch Rd.
NOTES: Soledad Townhomes - Interim Year with Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 36000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.71

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
101.0	209.9	448.5	964.5

SOLEDAD TOWNHOUSES

FHWA ROADWAY NOISE LEVEL ANALYSIS

CONTOUR6 MODEL PRINTOUTS

YEAR 2030 WITHOUT PROJECT SCENARIO

TABLE Cumulative Year (2030) without Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Bouquet Canyon north of Soledad Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) without Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 80000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 75.18

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
167.0	355.1	762.7	1641.9

TABLE Cumulative Year (2030) without Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Bouquet Canyon south of Soledad Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) without Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 43000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.49

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
112.7	235.8	504.7	1085.6

TABLE Cumulative Year (2030) without Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Newhall Ranch Rd. east of Bouquet Canyon Rd.
NOTES: Soledad Townhomes - Cumulative Year (2030) without Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 42000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
91.5	194.0	416.5	896.6

TABLE Cumulative Year (2030) without Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Golden Valley Rd. south of Soledad Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.61

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
64.3	134.3	287.1	617.5

TABLE Cumulative Year (2030) without Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Soledad Canyon west of Bouquet Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 48000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.96

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
120.6	253.5	543.0	1168.2

TABLE Cumulative Year (2030) without Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Soledad Canyon east of Bouquet Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 34000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
97.6	202.2	431.9	928.5

TABLE Cumulative Year (2030) without Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Soledad Canyon west of Golden Valley Rd.
NOTES: Soledad Townhomes - Cumulative Year (2030) without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 36000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.71

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
101.0	209.9	448.5	964.5

TABLE Cumulative Year (2030) without Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Santa Clarita Parkway north of Soledad Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 29000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.78

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
88.7	182.4	388.6	835.1

TABLE Cumulative Year (2030) without Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Santa Clarita Parkway south of Soledad Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 38000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.95

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
104.4	217.5	464.9	999.8

SOLEDAD TOWNHOUSES

FHWA ROADWAY NOISE LEVEL ANALYSIS

CONTOUR6 MODEL PRINTOUTS

YEAR 2030 WITH PROJECT SCENARIO

TABLE Cumulative Year (2030) with Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Bouquet Canyon north of Soledad Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) with Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 81000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 75.24

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
168.3	358.0	769.0	1655.5

TABLE Cumulative Year (2030) with Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Bouquet Canyon south of Soledad Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) with Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 43000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.49

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
112.7	235.8	504.7	1085.6

TABLE Cumulative Year (2030) with Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Newhall Ranch Rd. east of Bouquet Canyon Rd.
NOTES: Soledad Townhomes - Cumulative Year (2030) with Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 42000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
91.5	194.0	416.5	896.6

TABLE Cumulative Year (2030) with Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Golden Valley Rd. south of Soledad Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) with Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 25000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.79

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
66.0	137.9	295.0	634.6

TABLE Cumulative Year (2030) with Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Soledad Canyon west of Bouquet Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) with Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 49000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.05

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
122.2	256.9	550.5	1184.3

TABLE Cumulative Year (2030) with Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Soledad Canyon east of Bouquet Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) with Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 36000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.71

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
101.0	209.9	448.5	964.5

TABLE Cumulative Year (2030) with Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Soledad Canyon west of Golden Valley Rd.
NOTES: Soledad Townhomes - Cumulative Year (2030) with Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 38000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.95

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
104.4	217.5	464.9	999.8

TABLE Cumulative Year (2030) with Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Santa Clarita Parkway north of Soledad Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) with Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 29000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.78

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
88.7	182.4	388.6	835.1

TABLE Cumulative Year (2030) with Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 08/11/2005
ROADWAY SEGMENT: Santa Clarita Parkway south of Soledad Canyon
NOTES: Soledad Townhomes - Cumulative Year (2030) with Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 38000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.95

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
104.4	217.5	464.9	999.8

Appendix G
WATER QUALITY TECHNICAL REPORT

Soledad Townhomes
Water Quality Technical Report

Prepared for

Newhall Land
Valencia, California

Prepared by

GeoSyntec Consultants
Portland, Oregon

June 2005

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Acronyms

ASCE: American Society of Civil Engineers
BAT: Best Available Technology
BCT: Best Conventional Technology
BMP: Best Management Practice
BOD: Biochemical Oxygen Demand
CASQA: California Stormwater Quality Association
CEQA: California Environmental Quality Act
CTR: California Toxics Rule
CWA: Clean Water Act
CWP: Center For Watershed Protection
DCIA: Directly Connected Impervious Area
DDT: Dichlorodiphenyltrichloroethane

DLWC:	Department of Land and Water Conservation
EIR:	Environmental Impact Report
EMC:	Event Mean Concentration
EPA:	Environmental Protection Agency
HOA:	Home Owners Association
HEC:	Herrera Environmental Consultants
IRWD:	Irvine Ranch Water District
LACDPW:	Los Angeles County Department of Public Works
LARWQCB:	Los Angeles Regional Water Control Board
MBAS:	Methylene Blue Activated Substances
MEP:	Maximum Extent Practicable
MPN:	Most Probable Number
MS4:	Municipal Separate Storm Sewer System
NCDC:	National Climatic Data Center
NHC:	Northwest Hydraulic Consultants
NPDES:	National Pollutant Discharge Elimination System
NSWQ:	National Storm Water Quality Database
PAH:	Polycyclic Aromatic Hydrocarbons
PCB:	Polychlorinated Biphenyl
PCC:	Pacific Coast Civil Inc.
PDF:	Project Design Feature
PIPP:	Public Information and Participation Program
RTFA:	R.T. Frankian & Associates
RWQCB:	Regional Water Quality Control Board
SAR:	Sodium Adsorption Ratio
SCR:	Santa Clara River
SDRWQCB:	San Diego Regional Water Quality Control Board
SQMP:	Stormwater Quality Management Plan
SUSMP:	Standard Urban Stormwater Mitigation Plan
SWPPP:	Storm Water Pollution Prevention Plan
SWRCB:	State Water Resources Control Board
TDS:	Total Dissolved Solids
TKN:	Total Kjeldahl Nitrogen
TMDL:	Total Maximum Daily Load
TN:	Total Nitrogen
TP:	Total Phosphorus
TPH:	Total Petroleum Hydrocarbons
TSS:	Total Suspended Solids
USEPA:	United States Environmental Protection Agency
USGS:	United States Geological Survey
WEF:	Water Environment Federation
WDR:	Waste Discharge Requirements

WHO:	World Health Organization
WMA:	Watershed Management Area
WMC:	Watershed Management Committee
WRP:	Water Reclamation Plant

1 INTRODUCTION

This report addresses the potential impacts of the proposed Soledad Townhomes Project (the Project) on water quality in the Project's receiving waters. To evaluate impacts of the Project on water quality, pollutants of concern are identified based on regulatory and other considerations. Potential changes in water quality are addressed for pollutants of concern based on runoff water quality modeling, literature information, and professional judgment. Impacts take into account Project Design Features (PDFs) selected consistent with the Los Angeles County Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit, including the Standard Urban Stormwater Mitigation Plan (SUSMP) requirements. The level of significance of impacts is evaluated using a weight of evidence approach considering significance criteria that include predicted runoff quality for proposed versus existing conditions, MS4 Permit and General Construction Permit requirements, and reference to receiving water quality benchmarks, including Total Maximum Daily Load (TMDL) waste load allocations and water quality standards from the Basin Plan and California Toxics Rule.

The report also assesses the potential for post-development peak stormwater runoff discharge rates, velocities, and durations to cause accelerated stream erosion and to impact stream habitat, and includes PDFs to address these impacts and to comply with the Interim Peak Flow Runoff Criteria for New Development, adopted by the County of Los Angeles in January, 2005 pursuant to the MS4 Permit.

The purpose of this Water Quality Technical Report is to assess the Project's potential impacts on water quality and hydrology in the Project's receiving waters, to identify Project Design Features for inclusion in the Project, and to serve as the Conceptual Project SUSMP.

2 ENVIRONMENTAL SETTING

2.1 Physical Setting

The Project lies in the center of the City of Santa Clarita (Figure 2-1), adjacent to the Santa Clara River. The Project site is located north of Soledad Canyon Road, south of the Santa Clara River, east of Bouquet Canyon Road, and west of the Greenbrier Mobile Home Park.

The Project lies upstream from two water reclamation plants. The Saugus Water Reclamation Plant is located downstream from the Project, across Bouquet Canyon Road at Soledad Canyon Road, and the Valencia Water Reclamation Plant is located further downstream. Both treatment plants discharge treated wastewater into reaches of the river lying downstream from the Project.

2.2 Project Area Land Uses

The Project area encompasses approximately 33.2 gross acres of mostly graded property. The City of Santa Clarita approved a parcel map (Tentative Parcel Map 20838) on the Project site in the early 1990's, which permitted the subdividing of the property, site grading, and the construction of flood protection improvements. The site has since been graded and all flood protection improvements have been installed. Prior to commencing land development, the site was used for dry land farming.

Newhall Land has submitted an application to the City of Santa Clarita to develop the site with a mixed use project consisting of a maximum of 437 multi-family units (condominiums / townhomes) and 8,000 square feet of commercial floor space. Access to the Project site will be provided from Soledad Canyon Road (Figure 2-1). The site is directly adjacent to a multipurpose trail located along Soledad Canyon Road and the yet-to-be-constructed Santa Clara River multipurpose trail that will be located along the Santa Clara River. The City's primary Metrolink Station is located directly south and west of the Project site.

2.3 Proposed Drainage Improvements – Project and Santa Clara River

The proposed improvements on the Project site that would occur or have occurred in and adjacent to the River, include bank stabilization, storm drain outfalls and associated energy dissipators.

2.3.1 Proposed Project Drainage Improvements

Runoff from the developed portions of the Project would be discharged to the Santa Clara River through two new outfalls after passing through the water quality treatment BMPs (see Section 5.3 for further detail).

2.3.2 Energy Dissipaters

To reduce storm flow velocities and prevent erosion at stormwater discharge points into the River, energy dissipaters consisting of either rip-rap or other larger reinforced concrete standard impact-type energy dissipaters would be constructed at the two storm drain outlets into the River. These energy dissipaters would slow the rate of flow of runoff into the River to prevent erosion of the stream channel.

2.3.3 Bank Stabilization

Buried soil cement along the Santa Clara River adjacent to and upstream of the Project site has already been installed per the requirements of the Natural River Management Plan. The Project does not require any new bank stabilization.

The existing bank protection consists of buried soil cement to provide scour and freeboard flood control protection. Soil cement bank protection provides a stable riverbank protection material, in terms of both surface erosion and structural stability. The exposed top portion of the soil cement is aesthetically compatible with the native earth re-vegetated resource area.

2.4 Surface Receiving Water Bodies and Beneficial Uses

2.4.1 Santa Clara River

The Project will discharge surface runoff from its storm drain and water quality control facilities directly to Santa Clara River Reach 9_E[1]. The Project site consists of a 33.2 gross acre drainage area within the 1,618 square-mile Santa Clara River Basin Watershed. The site drains to that portion of the Santa Clara River designated as Reach 7 by the Los Angeles Regional Water Quality Control Board (LARWQCB) and as Reach 9 by the U.S. Environmental Protection Agency (EPA) (for convenience, this reach of the river will generally be referred to as Reach 9_E); this reach extends from the Lang Gauging Station (to the east and upstream of the Project, downstream of Agua Dulce Canyon Creek) to Bouquet Canyon Road Bridge (located approximately one mile west and downstream of the Project). Reach 9_E has intermittent low surface flows created by larger storm events. Its intermittent flows occur generally only during the "rainy" season during and immediately after storm events of sufficient size to cause flows. Completely natural flows in the river only occur in the winter due to storm runoff. Reach 9_E contains relatively little water when compared to other reaches of the river during non-flood conditions. Non-storm flows within Reach 9_E are localized, and primarily result from anthropogenic sources. Therefore, under dry-weather (i.e., non-storm flow, excluding storm events) conditions, Reach 9_E flows do not impact downstream reaches of the river. When water is present in this reach, it is almost always during the rainy winter months and typically lasts only for a few days after a storm event large enough to create flow.

The Water Quality Control Plan for the Los Angeles Region (Basin Plan) (LARWQCB, 1994, as amended) lists beneficial uses of major water bodies within this region (Table 2-1). Santa Clara River Reach 9_E is listed and has specific beneficial uses assigned to it.

[1] The SCR is divided into reaches for purposes of establishing beneficial uses and water quality objectives. However, there are two reach classifications, one established by the Los Angeles Regional Water Quality Control Board (LARWQCB), and one established by the United States Environmental Protection Agency (EPA). Both of these reach classifications are used by the LARWQCB and the EPA in various documents, which at times is a source of confusion. This report will use the EPA reach numbers.

Table 2-1: Beneficial Uses of Surface Receiving Waters

Water Body	Beneficial Uses[1]														
	MUN	IND	PROC	AGR	GWR	FRSH	REC1	REC2	WARM	COLD	WILD	RARE	MIGR	SPWN	WET[1]
Santa Clara River (Hydrologic Unit 403.51)	P*	E	E	E	E	E	E	E	E		E	E			E

[1]Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.
E – Existing beneficial use; P – Potential beneficial use; *Asterixed MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date.
Source: Water Quality Control Plan for the Los Angeles Region (Basin Plan) (LARWQCB, 1994 as amended)

As identified in Table 2-1 above, the existing and potential beneficial uses of Santa Clara River Reach 9_E include the following:

- MUN: Community, military, or individual water supply systems including, but not limited to, drinking water supply (a potential beneficial use)
- IND: Industrial activities that do not depend primarily on water quality
- PROC: Industrial activities that depend primarily on water quality
- AGR: Agricultural supply waters used for farming, horticulture, or ranching
- GWR: Groundwater recharge for natural or artificial recharge of groundwater
- REC1: Water contact recreation involving body contact with water and ingestion is reasonably possible
- REC2: Non-contact water recreation for activities in proximity to water, but not involving body contact
- WARM: Warm freshwater habitat to support warm water ecosystems
- WILD: Wildlife habitat waters that support wildlife habitats
- RARE: Waters that support rare, threatened, or endangered species and associated habitats
- WET: Wetland ecosystems

2.5 Existing Surface Receiving Water Quality

The existing wet weather surface water quality in the Project region was characterized from available water quality monitoring data obtained from the following three sources:

1. USGS Monitoring-Bouquet Junction. The United States Geologic Survey (USGS) collected water quality data in Santa Clara River (SCR) at Bouquet Junction from 1974 to 1976, which is about one mile downstream of the western edge of the project. While these data are limited and may not be fully representative of current conditions, they are the most relevant in terms of characterizing the existing stormwater runoff within the Project vicinity.

2. LA County Monitoring. The County of Los Angeles recently initiated in-stream monitoring on the mainstem of the SCR at a mass emission station downstream of the project. Both dry-weather and wet-weather monitoring data are available. The LA County monitoring data are the most current and are the only source of wet-weather monitoring in the SCR immediately downstream of the Project vicinity.

3. USGS Monitoring-County Line. The USGS collected a large number of water quality data in the SCR near the county line, from 1951 through 1995. These data provide a historical perspective of wet weather water quality in the SCR downstream from the Project vicinity.

2.5.1 USGS Monitoring Data - Bouquet Junction

The United States Geologic Survey (USGS) collected water quality data in Santa Clara River (SCR) at Bouquet Junction from 1974 to 1976, which is about one mile downstream of the western edge of the Project. Although these data are dated and may not be fully representative of current conditions within the Santa Clara River at Bouquet Junction, they are the only data available within Santa Clara River Reach 9_E, and therefore are summarized below for later comparison to stormwater modeling results.

The USGS collected water quality data during both dry- and wet-weather conditions. To facilitate comparison with stormwater modeling results, the water quality data were grouped into two categories depending on the depth of two-day antecedent rainfall measured at the Newhall rain gage[2].

1. 0–0.1 inches. No rainfall, or trace amounts of rainfall that would not be expected to produce significant storm runoff.

2. >0.1 inches. Rainfall depths that would likely produce storm runoff.

The USGS data for selected general constituents in category #2 is summarized in Table 2-2.

[2] The Newhall rain gage is located approximately 2.2 miles southwest of the Project location (Figure 2-1).

Hardness. Average hardness concentrations for storm flow conditions ranged from 280 to 340 mg/L as $CaCO_3$, which represents a relatively hard water typical of wet weather stream flows in Southern California.

TSS. TSS concentrations were not measured at this USGS monitoring station. High TSS loads in storm flows can be expected and are observed in other stations (Table 2-3 and Table 2-4) due to highly erodible, sandy alluvial soils found in the Santa Clara River watershed.

Chloride. Average chloride concentrations at the Bouquet Junction Station were between 100 to 120 mg/L in storm flows. For all storm events, chloride concentration averaged 110 mg/L, which is greater than the Basin Plan water quality objective of 100 mg/L.

Table 2-2: Summary of USGS Water Quality Data from the SCR at Bouquet Junction, Two Day Antecedent Rainfall >0.1 inches

Constituent	No. of Samples	No of non-detects	Range (mg/L)	Average (mg/L)	Median (mg/L)
Hardness (as $CaCO_3$)	3	0	280 - 340	310	310
Chloride	3	0	100 - 120	110	110
Total Phosphorus	3	0	9.9 - 12	11.3	12.0
Nitrate- + Nitrite-Nitrogen	3	2	5.8	5.8	5.8
Ammonia-Nitrogen	3	0	0.4 - 6.4	4.3	6

2.5.2 LA County Department of Public Works Monitoring Data

The Los Angeles County Department of Public Works (LACDPW) initiated dry- and wet-weather monitoring in the Santa Clara River in the 2002/2003 season (LACDPW, 2003). The monitoring station (S29) is located in Santa Clara River Reach 8_E at The Old Road (Figure 2-1). It is more than two miles downstream from the western boundary of the Project site. The monitoring station is downstream of the Saugus Water Reclamation Plant and upstream of the Valencia Water Reclamation Plant. The monitoring station is intended to provide long-term information about water quality trends in areas with heterogeneous land uses and has a tributary area of 411 square miles. Land use in the tributary area is 87 percent open space, 4.3 percent urban development, and 8.7 percent other land uses (LACDPW, 2003).

Monitoring at the mass emission station in 2002-2003 included four storm events. Table 2-3 lists the rainfall depth and duration of the four monitored storm events based on hourly rainfall measurements at the Newhall rain gage. The depth of each of the storms was greater than the median storm depth for the Newhall rain gage (0.70 inches). In particular, the storm event beginning on 2/11/03 was a very large event, with a total storm depth of almost 8 inches. Due to these large storm sizes, pollutant concentrations of samples may be highly diluted and not representative of concentrations in more frequent storm events. During large storm events, samples taken after the initial wash off of pollutants will generally have much lower pollutant

concentrations. Also, groundwater effects, which increase hardness, are highly diluted. For these reasons, the SCR Mass Emission station was used as the most stringent benchmark for comparison of post-development pollutant concentrations.

Table 2-3: Depth and Duration of Storms Monitored by LACDPW at S29

Date	Rainfall Depth (inches)[1]	Storm Duration (hours)[1]
11/8/2002	1.6	21
12/16/2002	1.9	5
2/11/03	7.9	29
3/15/03	1.0	14

[1] Based on rainfall measured at the Newhall rain gage

Table 2-4 lists summary statistics of the monitoring data collected at the LACDPW monitoring station for the four events listed in Table 2-3.

Table 2-4: Summary Results of LACDPW Stormwater Monitoring at the SCR Mass Emission Station (S29) during 2002-2003

Parameter	No. of Samples	No. of Detects	Minimum	Maximum	Average
General & Conventional Parameters					
TSS (mg/L)	4	4	53	712	353
Hardness (mg/L)	4	4	15.2	131	92
TDS (mg/L)	4	4	28	278	197
Chloride (mg/L)	4	4	2.58	39.8	22
Oil & Grease (mg/L)	4	2	1.7	3.1	2.4
Nutrients					
Dissolved phosphorus (mg/L)	4	4	0.16	0.38	0.28
Total phosphorus (mg/L)	4	4	0.29	0.44	0.36
Nitrate-N (mg/L)	4	4	0.52	1.11	0.82
Nitrite-N (mg/L)	4	2	0.26	0.87	0.56
Ammonia-N (mg/L)	4	2	0.34	1.09	0.71
TKN (mg/L)	4		0.66	2.62	1.72
Metals					
Dissolved copper (ug/L)	4	4	3.8	8.4	7
Total copper (ug/L)	4	4	9.4	32.9	16
Dissolved lead (ug/L)	4	2	1.0	2.3	1.6
Total lead (ug/L)	4	4	1.1	14.5	5.6
Dissolved zinc (ug/L)	4	4	27	37	32

Parameter	No. of Samples	No. of Detects	Minimum	Maximum	Average
Total zinc (ug/L)	4	4	42	103	63
Dissolved cadmium (ug/L)	4	0	--	--	--
Total cadmium (ug/L)	4	2	0.25	0.6	0.43
Indicator Bacteria					
Total coliform (MPN/100mL)	4	4	50000	500000	272500
Fecal coliform (MPN/100mL)	4	4	9000	170000	92750
Fecal Enterococcus (MPN/100mL)	4	4	17000	240000	96750
Pesticides					
Chlorpyrifos (ug/L)	4	0	--	--	--
Diazinon (ug/L)	4	3	0.05	0.43	0.25

Comparison of these instream wet-weather monitoring data with the USGS monitoring data at the Los Angeles / Ventura County line (Table 2-5) indicates the following:

TSS. The average instream TSS concentration at Station S29 was considerably lower than the average TSS concentrations measured downstream at the USGS station.

Hardness and Chloride. The average instream concentrations of hardness and chloride at Station 29 were much less than the average concentrations measured at the USGS station.

Nutrients. Instream nutrient concentrations were generally low. Ammonia data was not collected at the USGS monitoring station. The average instream nitrate concentration at Station 29 was lower, but generally comparable with the average concentration at the USGS monitoring station.

Indicator Bacteria. The average instream bacteria concentrations at Station S29 were very high.

2.5.3 USGS Monitoring Data – County Line

The US Geological Survey (USGS) has collected stream flow and water quality data at a number of locations in the SCR watershed (http://waterdata.usgs.gov/nwis). Among the largest data sets are flow and water quality data collected at USGS station 11108500 located on the Santa Clara River just downstream of the Los Angeles / Ventura County Line. This station is located approximately 12 miles downstream of the Project area (Figure 2-1).

The USGS collected water quality data at the Los Angeles / Ventura County Line station between April 1951 and October 1995. These data thus provide an historical perspective of water quality in the SCR within the NRSP subregion. To facilitate interpretation, the water

quality data were grouped into two categories depending on the depth of 2-day antecedent rainfall measured at the Newhall rain gauge:

1. ***0.1 – 1 inches.*** Rainfall depths that would likely produce runoff volumes characteristic of more frequent, smaller storm events

2. ***> 1 inch.*** Rainfall depths that would likely produce runoff volumes characteristic of larger, less frequent storm events

Table 2-5 summarizes the USGS data for selected general constituents. Comparison of the historical water quality data at the USGS County Line station (Table 2-5) with the wet weather monitoring data summarized in Table 2-2 and Table 2-4 above indicates the following

Hardness. Average hardness concentrations for storm flow conditions ranged from 250 to 1,500 mg/L as $CaCO_3$, with lower concentrations corresponding with larger antecedent rainfall depths. Lower values occur in larger rain events due to the extended dilution of the harder groundwater. Hardness values from the SCR Mass emission station are much lower than the USGS County Line station. This may be caused by the increased tributary flow that enters the SCR downstream of the mass emission station, and it also may be caused by dilution effects caused by Water Reclamation Plants upstream from the mass emission station. Hardness values from Bouquet Junction, upstream to the SCR mass emission station and closest to the Project area show much higher values than the mass emission station and low-end values of the USGS County Line station, and are more representative of site conditions.

TSS. TSS concentrations at the USGS monitoring station increased substantially in storm flows and were generally in the range of 2,000 to 10,000 mg/L (Table 2-5). This concentration is much higher than the concentration at the SCR mass emission station, for similar reasons as above.

TDS. Table 2-5 summarizes results for specific conductance, which can be related to TDS concentration. As a rough rule-of-thumb, TDS concentration can be estimated as 0.64 times the specific conductance (USDI, 1998). Using this rule-of-thumb, the average TDS concentrations at the USGS station ranged from about 800 mg/L to 1,400 mg/L for storm flows. Again, this number is higher than the mass emission station and is most likely related to inflow of groundwater from the tributaries to the SCR.

Chloride. Average chloride concentrations at the USGS station were about 60 mg/L to 122 mg/L for storm flows. Chloride levels were higher, on average, for smaller storm events, again due to dilution effects. For all storm events, chloride concentration averaged 89 mg/L.

Table 2-5: USGS Water Quality Data for Selected General Constituents in the Santa Clara River at the County Line

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	Minimum	Maximum	Average	Median
Hardness (mg/L)						
0.1 – < 1.0 inches	5/51 – 12/85	27	270	1500	773	660
≥1.0 inches		37	250	1200	546	470
TSS (mg/L)						
0.1 – < 1.0 inches	11/70 – 9/88	10	248	4730	2291	2345
≥1.0 inches		41	107	51200	10711	5270
Specific Conductance (uS/cm)						
0.1 – < 1.0 inches	4/51 – 10/95	33	831	4220	2246	1720
≥1.0 inches		42	637	3240	1309	1100
Chloride (mg/L)						
0.1 – < 1.0 inches	4/51 – 4/92	34	21	290	122	111
≥1.0 inches		39	14	192	61	47

Table 2-6 summarizes the USGS County Line data for selected nutrients. Comparison of the historical nutrient data at the USGS station (Table 2-6) with the other nutrient monitoring data (Table 2-2 and Table 2-4) indicates the following:

Phosphorus. Average total phosphorus concentrations at the USGS station were about 1.0 to 1.3 mg/L and appear to be somewhat independent of storm event size, and represent slightly higher values than at the SCR mass emission station.

Nitrogen. The average nitrate-N + nitrite-N concentration at the USGS station varied from 2.1 mg/L for lower storm flows to 1.7 mg/L for higher storm flows, and was similar to monitoring data at the SCR mass emission station.

Table 2-6: USGS Water Quality Data for Selected Nutrients in the Santa Clara River at the County Line

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	Minimum	Maximum	Average	Median
Dissolved phosphorus (mg/L)						
0.1 – < 1.0 inches	3/79 – 4/92	3	0.35	0.66	0.46	0.36
≥1.0 inches		1			0.01	
Total phosphorus (mg/L)						
0.1 – < 1.0 inches	8/74 –	5	0.81	1.8	1.28	1.10

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	Minimum	Maximum	Average	Median
≥1.0 inches	9/88	2	0.63	1.4	1.02	1.02
Ammonia as N (mg/L)						
0.1 – < 1.0 inches	10/79 – 4/92	3	0.03	0.39	0.16	0.07
≥1.0 inches		0				
Nitrate + Nitrite as N (mg/L)						
0.1 – < 1.0 inches	8/71 – 4/92	7	0.87	4	2.1	2.2
≥1.0 inches		4	1.2	2	1.7	1.8
TKN as N (mg/L)						
0.1 – < 1.0 inches	3/79 – 4/92	1			0.64	
≥1.0 inches		1			0.69	
Total Nitrogen (mg/L)						
0.1 – < 1.0 inches	8/74 – 9/81	2	0.6	2.2	1.4	
≥1.0 inches		2	3.5	4.4	4.0	

Table 2-7 summarizes the USGS data for selected metals, pesticides, and FIB constituents.

Metals. Available data for trace metals at the USGS station are limited. For copper and lead, there were a considerable number of non-detects with very high detection limits.

FIB. There were only four measurements of fecal coliform concentration corresponding to storm flows at the USGS station, and the single measurement corresponding to large storm flows showed an elevation in fecal coliform levels.

Pesticides. Diazinon was detected in one wet weather sample in the historical data.

Table 2-7: USGS Water Quality Data for Selected Metals, Pesticides and Indicator Bacteria in the Santa Clara River at the County Line

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	No. > Detect Limit	Minimum	Maximum	Average	Median
Dissolved Copper (ug/L)							
0.1 – < 1.0 inches	6/73 – 9/88	4	0	-	-	-	-
Total Copper (ug/L)							
0.1 – < 1.0 inches	4/79 – 9/82	1	1	-	-	30	-

Constituent & 2-day Preceding Rainfall (in)	Sample Dates	No. of Samples	No. > Detect Limit	Minimum	Maximum	Average	Median
Dissolved Lead (ug/L)							
0 – < 0.1 inches	6/73 – 9/88	39	4	1	23	7.8	3.5
0.1 – < 1.0 inches		4	0				
Total Lead (ug/L)							
0.1 – < 1.0 inches	8/74 – 9/82	3	0	-	-	-	-
≥1.0 inches		1	0	-	-	-	-
Dissolved Zinc (ug/L)							
0.1 – < 1.0 inches	5/75 – 9/88	4	1	-	-	10	-
Total Zinc (ug/L)							
0.1 – < 1.0 inches	4/79 – 9/82	1	1	-	-	150	-
Fecal Coliform (CFU/100mL)							
0.1 – < 1.0 inches	3/79 – 9/88	3	3	80	720	427	480
≥1.0 inches		1	1	-	-	2700	-
Diazinon (ug/L)							
0.1 – < 1.0 inches	8/74 – 6/76	1	1	-	-	0.02	-

2.6 Groundwater

The geology within and adjacent to the Project area consists of relatively thin alluvial deposits (Alluvium) overlying a deeper, relatively thick Saugus Formation. Both the Alluvium and Saugus Formation contain water-bearing sediments capable of becoming saturated so as to provide water to wells. These water-bearing sediments constitute the local "groundwater reservoir" for the Santa Clarita Valley. The upper basin, called the Alluvium or Alluvial Aquifer, generally underlies the Santa Clarita Valley and side canyons. The main river valley consists of medium-grained sand on the west to cobbly sand in the east. Due to the unconsolidated to poorly consolidated condition of the Alluvium, and its lack of cementation, the Alluvium has relatively high permeability and porosity.

The Project area is within the Santa Clarita Valley Groundwater Basin, East Subbasin and is located in the Bouquet and San Francisquito Canyon division of that subbasin. Beneficial uses for groundwaters for this subbasin are shown in Table 2-8.

Table 2-8: Beneficial Uses of Groundwaters

Groundwater Basin	MUN	IND	PROC	AGR	AQUA*
DWR 4.07 - Eastern Santa Clara Sub-basin: Santa Clara-Bouquet and San Francisquito Canyons	E	E	E	E	

E-Existing Beneficial Use
*Beneficial Use Definitions are provided above in Section 2.4.1 with the exception of AQUA- Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.
Source: Water Quality Control Plan for the Los Angeles Region (Basin Plan) (LARWQCB, 1994 as amended)

3 REGULATORY SETTING

3.1 Clean Water Act

In 1972, the Federal Water Pollution Control Act [later referred to as the Clean Water Act (CWA)] was amended to require National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants to waters of the United States from any point source. In 1987, the CWA was amended to require that the United States Environmental Protection Agency (EPA) establish regulations for permitting of municipal and industrial stormwater discharges under the NPDES permit program. The EPA published final regulations regarding stormwater discharges on November 16, 1990. The regulations require that municipal separate storm sewer system (MS4) discharges to surface waters be regulated by a NPDES permit.

In addition, the CWA requires the States to adopt water quality standards for receiving water bodies and to have those standards approved by the EPA. Water quality standards consist of designated beneficial uses for a particular receiving water body (e.g. wildlife habitat, agricultural supply, fishing etc.), along with water quality criteria necessary to support those uses. Water quality criteria are prescribed concentrations or levels of constituents – such as lead, suspended sediment, and fecal coliform bacteria – or narrative statements which represent the quality of water that support a particular use. Because California had not established a complete list of acceptable water quality criteria, EPA established numeric water quality criteria for certain toxic constituents in receiving waters with human health or aquatic life designated uses in the form of the California Toxics Rule ("CTR") (40 CFR 131.38).

3.2 CWA Section 303(d) - TMDLs

When designated beneficial uses of a particular receiving water body are being compromised by water quality, Section 303(d) of the CWA requires identifying and listing that water body as "impaired". Once a water body has been deemed impaired, a Total Maximum Daily Load (TMDL) must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, non-point, and natural sources that a water body may receive without exceeding applicable water quality standards (with a "factor of safety" included). Once

established, the TMDL allocates the loads among current and future pollutant sources to the water body.

The Soledad Townhomes Project will discharge stormwater and runoff to Santa Clara River Reach 9_E. Table 3-1 lists the water quality impairments for the Santa Clara River mainstem as reported on the 2002 CWA Section 303(d) List of Water Quality Limited Segments. Reach 9_E of the Santa Clara River is listed for coliform. The Regional Board has not yet adopted a TMDL for coliform in Reach 9_E. Downstream segments of the river are listed for historical pesticides, chloride, coliform, Total Dissolved Solids (TDS), and for nitrogen compounds, including nitrate-nitrogen, nitrite-nitrogen and ammonia.

3.3 California Toxics Rule

The California Toxics Rule (CTR) is a federal regulation issued by the USEPA providing water quality criteria for potentially toxic constituents in receiving waters with human health or aquatic life designated uses in the State of California. CTR criteria are applicable to the receiving water body and therefore must be calculated based upon the probable hardness values of the receiving waters for evaluation of acute (and chronic) toxicity criteria. At higher hardness values for the receiving water, copper, lead, and zinc are more likely to be complexed (bound with) components in the water column. This in turn reduces the bioavailability and resulting potential toxicity of these metals.

Due to the intermittent nature of stormwater runoff (especially in Southern California), the acute criteria are considered to be more applicable to stormwater conditions than chronic criteria and therefore are used in assessing Project impacts. For example, the average storm duration in the 34-year Newhall gage rainfall record is 12 hours. Acute criteria represent the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time without deleterious effects; chronic criteria equal the highest concentration to which aquatic life can be exposed for an extended period of time (four days) without deleterious effects.

Monitoring data in the Santa Clara River at Bouquet Junction (see Section 1.4 above) were evaluated for hardness, as this is the closest and most representative monitoring station to the Project. The minimum hardness value of 280 mg/L as $CaCO_3$ was used to approximate CTR criteria for metals.

In this document, the CTR criteria are used as one type of benchmark to evaluate the potential ecological impacts of Project runoff on the receiving waters.

Table 3-1: 2002 CWA Section 303(d) Listings for the Santa Clara River Mainstem

SCR Reach or Tributary	Geographic Description & Distance from Project to Upstream End of Reach	Pollutants	TMDL Priority	303(d) List Proposed TMDL Completion	Potential Sources	TMDL Status and Notes
9_E	Bouquet Cyn Road to Lang Gaging Station (Project location)	High coliform count	Medium	None listed	Nonpoint and point sources	None.
8_E	West Pier Hwy 99 to Bouquet Cyn Rd (1 mile)	1) Chloride 2) High coliform count	1) High 2) Medium	1) 2002 2) None listed	Nonpoint and point sources	The Regional Board has adopted a Chloride TMDL into the Basin Plan. Note: Reach 8_E is on the 2002 State Monitoring List for impairment from organic enrichment/low dissolved oxygen. Inclusion on the Monitoring List suggests that standards are not being met, but available data are inconclusive.
7_E	Blue cut Gaging Station to West Pier Hwy 99 (6.2 miles)	1) Chloride 2) Ammonia 3) Nitrate and nitrite	1) High 2) High 3) Low	1) 2002 2) 2003 3) None listed	Nonpoint and point sources	The Regional Board has adopted a Nitrogen compound TMDL (including Ammonia) into the Basin Plan. The Regional Board has adopted a Chloride TMDL into the Basin Plan.

SCR Reach or Tributary	Geographic Description & Distance from Project to Upstream End of Reach	Pollutants	TMDL Priority	303(d) List Proposed TMDL Completion	Potential Sources	TMDL Status and Notes
3_R	Freeman diversion dam to "A" street (34 miles)	1) Ammonia 2) Chloride 3) Total Dissolved Solids	1) High 2) High 3) Low	1) 2003 2) 2002 3) None listed	Nonpoint and point sources	The Regional Board has adopted a Nitrogen compound TMDL (including Ammonia) into the Basin Plan The EPA promulgated Chloride TMDLs for Reach 3_R. The EPA recommended that the State defer implementation of the TMDL until after adoption of a proposed Basin Plan amendment of the chloride objective for Reach 3_R. The Regional Board has developed a tentative Basin Plan amendment to revise the Reach 3_R chloride objective from 80 to 100 mg/L. The EPA supports this increase in the water quality objective. The status of TMDL development for TDS is unknown.
--	Estuary (49 miles)	1) ChemA[1] 2) Coliform 3) Toxaphene	1) Medium 2) Medium 3) Medium	None listed	1) Unknown Source 2) Nonpoint source 3) Nonpoint source	Draft documents are available for the Total Maximum Daily Loads for Santa Clara River Estuary Beach/Surfers' Knoll, McGrath State Beach, and Mandalay Beach Coliform and Beach Closures (07/18/2003).

[1]ChemA suite of chlorinated legacy pesticides include: aldrin, chlordane, dieldrin, endosulfan I/II, endrin, gamma-BHC, heptachlor, heptachlor epoxide, and toxaphene.

3.4 California Porter-Cologne Act

The federal CWA places the primary responsibly for the control of surface water pollution and for planning the development and use of water resources with the states, although it does establish certain guidelines for the states to follow in developing their programs and allows EPA to withdraw control from states with inadequate implementation mechanisms.

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act). The Porter-Cologne Act grants the State Water Resource Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) power to protect water quality and is the primary vehicle for implementation of California's responsibilities under the federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a water quality control plan (Basin Plan) for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its state water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

3.5 Basin Plan

The Basin Plan (LARWQCB, 1994, as amended) provides quantitative and narrative criteria for a range of water quality constituents applicable to certain receiving water bodies and groundwater basins within the Los Angeles Region. Specific criteria are provided for the larger, designated water bodies within the region, as well as general criteria or guidelines for ocean waters, bays and estuaries, inland surface waters, and ground waters. In general, the narrative criteria require that degradation of water quality does not occur due to increases in pollutant loads that will adversely impact the designated beneficial uses of a water body. For example, the Los Angeles Basin Plan requires that "Inland surface waters shall not contain suspended or settleable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors." Water quality criteria apply within receiving waters as opposed to applying directly to runoff; therefore, water quality criteria from the Basin Plan are utilized as benchmarks as one method to evaluate the potential ecological impacts of Project runoff on the receiving waters of the proposed Project. Table 2-1 above lists the beneficial uses of applicable receiving waters.

The Basin Plan also contains water quality criteria for groundwater basins. For example, the Basin Plan requires that "Ground waters shall not contain taste or odor producing substances in concentrations that cause nuisance or adversely affect beneficial uses."

3.6 MS4 Permit

In 2001, the Los Angeles Regional Water Quality Control Board (LARWQCB, 2001) issued an NPDES Permit and Waste Discharge Requirements (Order No. 01-182) under the CWA and the Porter-Cologne Act for discharges of urban runoff from public storm drains in Los Angeles County. The Permittees are the Los Angeles County cities and the County (collectively "the Co-permittees"). This permit regulates stormwater discharges from MS4s in the Project area. The NPDES permit details requirements for new development and significant redevelopment, including specific sizing criteria for treatment BMPs and flow control requirements.

To implement the requirements of the NPDES permit, the Co-permittees have developed development planning guidance and control measures that control and mitigate stormwater quality and quantity impacts to receiving waters as a result of new development and redevelopment. They are also required to implement other municipal source detection and elimination programs, as well as maintenance measures.

3.6.1 Stormwater Quality Management Program

The MS4 Permit contains the following provisions for implementation of the Stormwater Quality Management Program (SQMP) by the Co-permittees:

- General Requirements – Each permittee is required to implement the SQMP to comply with applicable storm water program requirements and implement additional controls where necessary to reduce the discharge of pollutants in stormwater to the maximum extent practicable (MEP).
- BMP Implementation – Permittees are required to implement the most effective combination of BMPs for stormwater/urban runoff pollution control.
- SQMP Revision – Permittees are required to revise the SQMP to comply with regional, watershed specific requirements, and/or waste load allocations for implementation of TMDLs for impaired waterbodies.
- Responsibilities of the Principal Permittee – The responsibilities of the Los Angeles County Department of Public Works (as the Principal Permittee) include, but are not limited to, coordinating activities necessary to comply with the NPDES permit, providing personnel and fiscal resources for SQMP updates and annual reports and summaries of reports required under the SQMP, and implementing a County-wide Monitoring Program and evaluating results of the monitoring program.

- Responsibilities of Permittees – Each permittee is required to comply with the requirements of the SQMP applicable to the discharges within its boundaries.
- Watershed Management Committees (WMCs) – WMCs are comprised of a voting representative from each Permittee within the Watershed Management Areas (WMAs). WMCs are required to facilitate efforts and exchange of information between Permittees, establish additional goals for WMAs, prioritize pollution control efforts, monitor implementation of tasks designated for the WMA, and assess the effectiveness of and recommend revisions to the SQMP.
- Legal Authority – Permittees are granted the necessary legal authority to prohibit non-storm water discharges to the storm drain system.

The objective of the SQMP is to reduce pollutants in urban stormwater discharges to the "maximum extent practicable" in order to attain water quality objectives and to protect the beneficial uses of receiving waters in Los Angeles County. Special provisions are provided in the MS4 permit to facilitate implementation of the SQMP. These provisions include:

- BMP substitution – Substitution of site-specific BMPs is allowed provided the alternative BMP will meet or exceed pollutant reduction of the original BMP, the fiscal burden of the original BMP is substantially greater than the proposed alternative, and the alternative BMP will be implemented within a similar time period.
- Public Information and Participation Program (PIPP) – This requires the permittee to identify how public education needs were determined, who is responsible for developing and implementing the program, and the method used to determine its effectiveness.
- Industrial/Commercial Facilities Control Program – This requires the permittee to develop a plan for managing stormwater runoff from industrial and commercial facilities. This program will track, inspect, and ensure compliance at industrial and commercial facilities that are sources of pollutants in storm water.
- Development Planning Program – This requires the permittee to implement a development-planning program that requires new development and redevelopment Projects to minimize impacts from stormwater and urban runoff.
- Development Construction Program – This requires the permittee to implement a program to control runoff from construction activity to minimize erosion and transportation of sediment and prevent non-stormwater discharges from equipment and vehicle washing.
- Public Agency Activities Program – This requires municipalities to evaluate existing public agency activities that have an impact on stormwater quality (such as vehicle maintenance, landscape maintenance and weed control, and construction and maintenance of streets, roads, and flood control systems) and to develop a program to reduce stormwater impacts with a schedule for implementation.

- Illicit Connections and Illicit Discharges Elimination Program – This requires each permittee to have a plan for finding and preventing illegal connections and discharges and a mechanism for enforcing against illegal connections and discharges.

3.6.2 Standard Urban Stormwater Mitigation Plan

On March 8, 2000, the development planning program requirements, including the Standard Urban Stormwater Mitigation Plan requirements (collectively, development planning program requirements, including Standard Urban Stormwater Mitigation Pan requirements, are referred to in this report as SUSMP requirements) were approved by the RWQCB as part of the MS4 program to address stormwater pollution from new construction and redevelopment. The SUSMP contains a list of minimum BMPs that must be employed to infiltrate or treat stormwater runoff, control peak flow discharge, and reduce the post-Project discharge of pollutants from stormwater conveyance systems. The SUSMP defines, based upon land use type, the types of practices that must be included and issues that must be addressed as appropriate to the development type and size. Compliance with SUSMP requirements is used as one method to evaluate significance of Project development impacts on surface water runoff.

Finalized in May 2000, the County of Los Angeles' "Manual for the Standard Urban Stormwater Mitigation Plan" details the requirements for new development and significant redevelopment BMPs (Los Angeles County, 2000) (the "Manual"). The Manual is a model guidance document for use by Permittees and individual Project owners to select post-construction BMPs and otherwise comply with the SUSMP requirements. It addresses water quality and drainage issues by specifying design standards for structural or treatment control BMPs that infiltrate or treat stormwater runoff and control peak flow discharge. BMPs are defined in the Manual and SUSMP requirements as any program, technology, process, sizing criteria, operational methods or measures, or engineered systems, which, when implemented, prevent, control, remove, or reduce pollution. Treatment BMP design criteria and guidance are also contained in the MS4 Permit, the Manual, and in the Technical Manual for Stormwater Best Management Practices in the County of Los Angeles, issued by the Department of Public Works in February 2004 (LACDPW, 2004).

One of the most important requirements within the SUSMP is the specific sizing criteria for stormwater treatment BMPs for new development and significant redevelopment Projects. The SUSMP includes sizing criteria for both volume-based and flow-based BMPs. The sizing criteria options for volume-based BMPs, such as extended detention basins, are as follows:

1. The 85th percentile 24-hour runoff event storm event determined as the maximized capture stormwater volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (WEF, 1998); or,

2. The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial (1993); or,

3. The volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a stormwater conveyance system; or,

4. The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County Area) that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile, 24-hour runoff event.

Volume-based treatment control BMPs for the Project will be sized to capture and treat 80 percent of the annual runoff volume, with a drawdown time of 48 hours. This methodology utilizes historical rainfall data with continuous simulation modeling and is consistent with criteria 2 above. The size of the facilities will be finalized during the design stage by the Project engineer with the final hydrology study, which will be prepared and approved to ensure consistency with this analysis prior to issuance of a grading permit.

Flow-based BMPs, such as vegetated swales, must be designed to infiltrate or treat the maximum flow rate generated from one of the following scenarios:

1. The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity, or

2. The flow of runoff produced from a rain event equal to at least two times the 85th percentile hourly rainfall intensity for Los Angeles County, or

3. The flow of runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

Flow-based BMPs for the Project will be sized using a rainfall intensity of 0.3 inches per hour, which will provide for 80 percent capture of the annual runoff volume, utilizing the historic rainfall record and in compliance with criteria 3 above. BMP sizing for Soledad Townhomes will be finalized during the design stage by the Project engineer with the final hydrology study, which will be prepared and approved to ensure consistency with this analysis prior to issuance of a grading permit.

Also, the SUSMP includes general design specifications for individual priority Project categories. These include:

- Single-Family Hillside Home
- 100,000 square foot commercial developments

- Restaurants
- Retail gasoline outlets
- Automotive repair shops
- Parking lots

For example, commercial developments must have properly designed loading and unloading dock areas, repair and maintenance bays, and vehicle equipment wash areas. Restaurants need to have properly designed equipment and accessory wash areas. Parking lots have to be properly designed to limit oil contamination and have regular maintenance of parking lot stormwater treatment systems (e.g., storm drain filters and biofilters).

The proposed Project is required to incorporate appropriate SUSMP requirements into Project plans as part of the development plan approval process for building and grading permits. This analysis will identify the general design specifications related to parking lots and other Project features associated with Soledad Townhomes. Design of these BMPs will be finalized by the Project engineer with the hydrology study to ensure constituency with this analysis prior to grading permit.

3.6.3 Hydromodification and Peak Flow Control

Part 4. Section D.1. of the MS4 Permit notes that increased volume, velocity, and discharge duration of stormwater runoff from developed areas may potentially accelerate downstream erosion and impair habitat-related beneficial uses in Natural Drainage Systems. As a result, Section D.1. of the Permit stipulates that Permittees shall control post-development peak storm water runoff discharge rates, velocities and durations in Natural Drainage Systems to prevent accelerated stream erosion and to protect stream habitat. Natural Drainage Systems are defined by the Permit to include the Santa Clara River.

Further, under Part 4, § D.1 of the MS4 Permit, the County and its co-permittees, including the City of Santa Clarita, were required to develop and implement by February 1, 2005, numeric criteria for peak flow control in accordance with the findings of the Peak Discharge Impact Study analyzing the potential impacts on natural streams due to impervious development. The County of Los Angeles Department of Public Works and the Southern California Storm Water Monitoring Coalition have been conducting the study, but the study was not completed in time to meet the February 1st deadline. Therefore, on January 31, 2005, the County adopted and submitted to the LARWQCB an Interim Peak Flow Standard to be in effect until such time as a final standard can be adopted based on a completed study.

The adopted Los Angeles County Interim Peak Flow Standard was derived from a similar Interim Peak Flow Standard for Ventura County approved by the LARWQCB under the SUSMP requirements provisions of the MS4 Permit. The intent of the Interim Standard, as described by

the County in the cover letter dated January 31, 2005, signed by Donald L. Wolfe transmitting the Interim Standard to Jonathan Bishop of the LARWQB, is to provide protection for natural streams to the extent supported by findings from the ongoing study, and consistent with practical construction practices.

The Interim Peak Flow Standard adopted by the County is:

> *The Peak Flow Standard shall require that all postdevelopment runoff from a 2-year, 24-hour storm shall not exceed the predevelopment peak flow rate, burned, from a 2-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cubic feet per second. Discharge flow rates shall be calculated using the County of Los Angeles Modified Rational Method. The Peak Flow Standard shall also require that postdevelopment runoff from the 50-year capital storm shall not exceed the predevelopment peak flow rate, burned and bulked, from the 50-year capital storm.*

In its cover letter dated January 31, 2005, signed by Donald L. Wolfe, transmitting the Peak Flow Interim Standard to Jonathan Bishop of the LARWQB, the County notes that upon completion of the Peak Discharge Impact Study, new peak flow standards may be determined to be appropriate.

The proposed Project is required to meet the peak flow control criteria as a part of the development plan approval process for building and grading permits. This analysis will identify the general facilities and design specifications necessary to comply with the current peak flow control criteria. Analysis of the peak flow control requirements in effect at the time that the hydrology study is prepared will be required, and peak flow requirements must be updated at that time. As a part of the hydrology study and prior to issuance of grading permit, the Project engineer must analyze and design the drainage facilities required to meet the peak flow control requirements then in effect under the MS4 Permit, and required to comply with this analysis.

3.7 Construction Permits

Pursuant to the CWA Section 402(p), requiring regulations for permitting of certain stormwater discharges, the State Water Resources Control Board (SWRCB) has issued a statewide general NPDES Permit and Waste Discharge Requirements for stormwater discharges from construction sites ((NPDES No. CAS000002) California Water Resources Control Board Resolution No. 2001-046; Modification of Water Quality Order 99-08-DWQ State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity (adopted by the SWRCB on April 26, 2001)).

Under this Construction General Permit, discharges of stormwater from construction sites with a disturbed area of one or more acres (effective March 2003) are required to either obtain individual NPDES permits for stormwater discharges or be covered by the Construction General

Permit. Coverage under the Construction General Permit is accomplished by completing and filing a Notice of Intent with the SWRCB. Each applicant under the Construction General Permit must ensure that a Stormwater Pollution Prevention Plan (SWPPP) is prepared prior to grading and implemented during construction. The primary objective of the SWPPP is to identify, construct, implement, and maintain BMPs to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the construction site during construction. Compliance with the requirements of the Construction General Permit is used as one method to evaluate Project construction-related impacts on surface water quality.

3.8 General Waste Discharge Requirements for Dischargers of Groundwater From Construction and Project Dewatering

The Los Angeles Regional Water Quality Control Board has issued a General NPDES Permit and General Waste Discharge Requirements (WDRs) (Order No. R4-2003-0111, NPDES No. CAG994004) governing construction-related dewatering discharges within the Project development areas (the "General Dewatering Permit.") This permit addresses discharges from temporary dewatering operations associated with construction and permanent dewatering operations associated with development. The discharge requirements include provisions mandating notification, sampling and analysis, and reporting of dewatering and testing-related discharges. The General Dewatering Permit authorizes such construction-related activities so long as all conditions of the permit are fulfilled. Compliance with the requirements of the General Dewatering Permit is used as one method to evaluate Project construction-related impacts on surface water quality.

3.9 Discharge of Fill or Dredge Materials

Hydrologic conditions of concern addressed in this report include instream changes in sediment transport, erosion, and sedimentation, and ultimately channel stability. There is a nexus between the these concerns and the stream, habitat, and species protection programs administered by the United States Army Corps of Engineers (ACOE), California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service.

Section 404 of the Clean Water Act is a program that regulates the discharge of dredged and fill material into waters of the United States, including wetlands. Activities in waters of the United States that are regulated under this program include fills for development, water resource Projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. EPA and the ACOE have issued Section 404(b)(1) Guidelines (40 CFR 230) that regulate dredge and fill activities, including water quality aspects of such activities. Subpart C at Sections 230.20 thru 230.25 contains water quality regulations applicable to dredge and fill activities. Among other topics, these guidelines address discharges which alter substrate elevation or contours, suspended particulates, water clarity, nutrients and chemical content, current patterns and water circulation, water fluctuations (including those that alter erosion or sediment rates), and salinity gradients.

Average annual stormwater concentrations of ammonia are predicted to be 0.3 mg/L, which is considerably less than the waste load allocation of 1.75 mg/L for Santa Clara River Reach 7_E (which is 6.2 miles downstream of the Project location) and well below the Basin Plan objective. Likewise, the average annual stormwater concentration of nitrate-N plus nitrite-N is predicted to be 0.8 mg/L, which is considerably less than the TMDL waste load allocation for Santa Clara River Reach 7_E of 6.8 mg/L or the Basin Plan water quality objective of 5.0 mg/L for this reach of the Santa Clara River.

Based on the comprehensive site design, source control, and treatment control strategy, and the comparison with available in-stream monitoring data and benchmark Basin Plan objectives and waste load allocations, potential impacts associated with nitrogen compounds are predicted to be less than significant.

7.1.5 Metals

Comparison of Pre- and Post-Project Conditions: Projected loads and concentrations for the trace metals copper, lead, and zinc are presented in through Tables 7-10 through 7-12. Where possible, the projections are for the dissolved form of the metal, as it is the dissolved form to which the CTR criteria apply. However, due to consistently low concentrations of dissolved lead in the available stormwater runoff data, it was not possible to develop reliable EMC parameters for most land uses for modeling the dissolved fraction of lead. This constituent was therefore modeled as the total recoverable metal. Copper, lead, and zinc are the most prevalent metals typically found in urban runoff. Other trace metals, such as cadmium, chromium, and mercury, are typically not detected in urban runoff or are detected at very low levels (LA County, 2000).

Post-development trace metal loads and concentrations are projected to increase compared to pre-development conditions. This result can be explained by the difference in EMC values observed in representative monitoring data from the pre-developed open space condition and the post-developed urban condition (see Appendix B, Table B-6). Runoff volumes will increase with development and the change in land use will increase the runoff concentrations for all three trace metals. PDF reductions in metal concentrations are limited due to the dissolved nature of the metals. Proposed bioretention areas will remove a greater percentage of trace metal loads through soil adsorption, plant uptake, and volume reduction through infiltration.

Project PDFs include site design, source control, and treatment control BMPs in compliance with the SUSMP requirements. Specific site design PDFs that will be implemented to minimize increases in trace metals include directing drainage from impervious areas to bioretention areas and the selection of building material for roof gutters and downspouts that do not include copper or zinc. Source control PDFs that target metals include education for property owners, BMP maintenance, and street sweeping private streets and parking lots. The treatment control bioretention area and vegetated swales will also reduce trace metals in the runoff from the proposed development. Only the effects of bioretention areas and vegetated swales are reflected in the model results. Thus, increases in metals loads and concentrations are overstated.

Section 401 of the Clean Water Act requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. Subject to certain limitations, license or permit may be issued by a federal agency until certification required by Section 401 has been granted. Further, no license or permit may be issued if certification has been denied. CWA Section 404 permits and authorizations are subject to section 401 certification by the Regional Water Quality Control Boards (RWQCBs).

The banks of the Santa Clara River adjacent to the Project site were previously stabilized in accordance with the Natural River Management Plan (NRMP).

3.10 Lake or Streambed Alteration Agreement (LSAA)

The CDFG is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the law requires the proponent of a Project that may impact a river, stream, or lake to notify the CDFG before beginning the Project. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation.

Section 1602 of the Fish and Game Code requires any person who proposes a Project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake or use materials from a streambed to notify the CDFG before beginning the Project. Similarly, under section 1602 of the Fish and Game Code, before any State or local governmental agency or public utility begins a construction Project that will: 1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; 2) use materials from a streambed; or 3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake, it must first notify the CDFG of the proposed Project. If the CDFG determines that the Project may adversely affect existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required.

The banks of the Santa Clara River adjacent to the Project site were previously stabilized in accordance with the Natural River Management Plan (NRMP).

3.11 Natural River Management Plan (NRMP)

On November 30, 1998, the ACOE, CDFG and the RWQCB approved the Natural River Management Plan (NRMP) for the Santa Clara River. The NRMP is a long-term, master plan that provides for the construction of various infrastructure improvements on lands adjacent to the Santa Clara River and portions of two of its tributaries. More specifically, the NRMP governs a

portion of the main-stem of the Santa Clara River from Castaic Creek to one-half mile east of the Los Angeles Department of Water and Power Aqueduct and portions of San Francisquito Creek and the Santa Clara River South Fork, Los Angeles County, California. The Project site is located within the portion of the river now governed by the NRMP.

In connection with this approval, the following permits were issued by the following agencies:

- ACOE – Permit No. 94-00504-BAH under Section 404 of the Federal Clean Water Act. Section 404 of the Federal Clean Water Act allows for certain activities that result in the discharge of fill or dredged materials into "Waters of the U.S." or in this case the Santa Clara River. Prior to issuing this permit, the ACOE had completed an Endangered species consultation (pursuant to Section 7 of the Federal Endangered Species Act) with the United States Fish and Wildlife Service.

- CDFG – 1603 Streambed Alteration Agreement No. 5-502-97 and Incidental Take Permit No. 2081-1998-49-5. In summary, the Streambed Alteration Agreement allows for activities that alter the "...natural flow or change the bed, channel or bank of the river...." The Incidental Take Permit applies to all state listed species pursuant to Fish and Game Code Section 2081(b).

- California Regional Water Quality Control Board (Los Angeles Region) (RWQCB) – Order No. 99-104 related to waste discharge associated with the improvements included in the NRMP.

The permits issued by the affected agencies (ACOE, CDFG, RWQCB) allow Newhall Land or its designee to engage in construction and maintenance activities for the various infrastructure improvements included within the NRMP. Those improvements may include the bank stabilization, toe or erosion protection, various outlet structures, and bridge structures. The NRMP, through its permits and EIR/EIS, includes certain requirements/conditions and mitigation measures associated with the implementation of the improvements.

Prior to initiating an individual Project under the NRMP, Newhall Land (or its designee) must submit to the ACOE and CDFG a Verification Request Letter (VRL), VRL Variance or Request for Amendment and accessory documentation (maps, exhibits, photographs, etc.) showing that the particular planned improvement is consistent with the NRMP and the accessory agency permits. Upon submittal of the VRL, the ACOE and CDFG have 45 days in which to make their determination on the individual Project's consistency with the NRMP and accessory agency permits. The ACOE and CDFG approvals of the request constitute the final approvals from ACOE, CDFG and RWQCB to initiate construction of the Project.

The banks of the Santa Clara River adjacent to the Project site was previously stabilized in accordance with the Natural River Management Plan. No discharge of dredge or fill materials to

waters of the United States and no alteration of a surface water body or streambed is proposed or will result from the Soledad Townhomes Project.

4 POLLUTANTS OF CONCERN AND SIGNIFICANCE CRITERIA

4.1 Surface Water Pollutants of Concern

4.1.1 Pollutants of Concern

Pollutants of concern consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at concentrations or loads considered potentially toxic to humans and/or flora and fauna. The pollutants of concern for the water quality analysis are those that are anticipated or potentially could be generated by the Project at concentrations, based on water quality data collected in Los Angeles County from land uses that are the same as those proposed by the Project, that exhibit these characteristics. Identification of the pollutants of concern for the Project considered proposed land uses, current 303(d) listings and TMDLs in the Santa Clara River, as well as pollutants that have the potential to cause toxicity or bioaccumulate in the Project's receiving waters. Appendix A lists the pollutants of concern, the basis for their selection, and the significance criteria that will be applied for each.

The following pollutants were chosen as pollutants of concern for purposes of evaluating water quality impacts based upon the above considerations:

Sediments (TSS and Turbidity): Excessive erosion, transport, and deposition of sediment in surface waters are a significant form of pollution resulting in major water quality problems. Sediment imbalances impair waters' designated uses. Excessive sediment can impair aquatic life by filling interstitial spaces of spawning gravels, impairing fish food sources, filling rearing pools, and reducing beneficial habitat structure in stream channels. In addition, excessive sediment can cause taste and odor problems in drinking water supplies and block water intake structures.

Nutrients (Phosphorus and Nitrogen (Nitrate+Nitrite-N and Ammonia-N)): Nutrients are inorganic forms of nitrogen (nitrate, nitrite and ammonia) and phosphorus. Organic forms of nitrogen are associated with vegetative matter such as particulates from sticks and leaves. Inorganic forms of nitrogen include nitrate, nitrite and ammonia. Total Nitrogen (TN) is a measure of all nitrogen present, including inorganic and particulate forms. There are several sources of nutrients in urban areas, mainly fertilizers in runoff from lawns, pet wastes, failing septic systems, and atmospheric deposition from industry and automobile emissions. Nutrient over-enrichment is especially prevalent in agricultural areas where manure and fertilizer inputs to

crops significantly contribute to nitrogen and phosphorus levels in streams and other receiving waters. Eutrophication due to excessive nutrient input can lead to changes in algae, benthic, and fish communities; extreme eutrophication can cause hypoxia or anoxia, resulting in fish kills. Surface algal scum, water discoloration, and the release of toxins from sediment can also occur.

Various downstream reaches of the Santa Clara River are identified as impaired by ammonia and nitrate- plus nitrite-nitrogen. Evidence of impairment includes low diversity of benthic macroinvertebrates and observations of excessive algae growth. A source analysis found that the majority of ammonia and nitrate/nitrite loads are from point sources; primarily water reclamation plants (WRPs) (LARWQCB, June 2003). Sources from municipal storm sewers are considered a minor source, but have a potential to cause significant local effects on water quality (LARWQCB, June 2003). TMDLs have been developed and adopted into the Basin Plan for ammonia and nitrate/nitrite compounds.

Trace Metals (Copper, Lead, and Zinc): The primary sources of trace metals in stormwater are typically commercially available metals used in transportation (e.g. automobiles), buildings, and infrastructure. Metals are also found in fuels, adhesives, paints, and other coatings. Copper, lead, and zinc are the most prevalent metals typically found in urban runoff. Other trace metals, such as cadmium, chromium, and mercury, are typically not detected in urban runoff or are detected at very low levels (LADPW, 2000). Metals are of concern because of the potential for toxic effects on aquatic life and the potential for ground water contamination. High metal concentrations can lead to bioaccumulation in fish and shellfish and affect beneficial uses of receiving waters.

Pathogens (Bacteria, Viruses, and Protozoa) – Elevated pathogens are typically caused by the transport of domestic animal, wildlife, or human fecal wastes from the watershed. Runoff that flows over land such as urban runoff can mobilize pathogens, including bacteria and viruses. Even runoff from natural areas can contain pathogens (e.g., from wildlife). Other sources of pathogens in urban areas include pets and leaky sanitary sewer pipes. The presence of pathogens in runoff can impair receiving waters and contaminate drinking water sources. Elevated pathogens are typically caused by the transport of animal or human fecal wastes from the watershed. Historically an indicator organism such as fecal coliform has been used for pathogens due to the difficulty of monitoring for pathogens directly. More recently, the scientific community has questioned the use of indicator organisms, as scientific studies have shown no correlation between indictor and pathogen levels and therefore total and fecal coliform may not indicate a significant potential for causing human illness (Paulsen and List, 2005). Santa Clara River Reach 9_E is identified as impaired by high fecal coliform counts from point and nonpoint sources. Coliform TMDLs have not yet been developed for this river reach.

Petroleum Hydrocarbons (Oil and Grease and PAHs): The sources of oil, grease, and other petroleum hydrocarbons in urban areas include spillage fuels and lubricants, discharge of domestic and industrial wastes, atmospheric deposition, and runoff. Runoff can be contaminated

by leachate from asphalt roads, wearing of tires, and deposition from automobile exhaust. Also, do-it-yourself auto mechanics may dump used oil and other automobile-related fluids directly into storm drains. Petroleum hydrocarbons, such as polycyclic aromatic hydrocarbons (PAHs), can bioaccumulate in aquatic organisms from contaminated water, sediments, and food and are toxic to aquatic life at low concentrations. Hydrocarbons can persist in sediments for long periods of time and result in adverse impacts on the diversity and abundance of benthic communities. Hydrocarbons can be measured as total petroleum hydrocarbons (TPH), oil and grease, or as individual groups of hydrocarbons, such as PAHs.

Pesticides: Pesticides (including herbicides, insecticides and fungicides) are chemical compounds commonly used to control insects, rodents, plant diseases, and weeds. Excessive application of a pesticide may result in runoff containing toxic levels of its active component. Pesticides may be classified as organochlorine pesticides or organophosphorus pesticides, the former being associated with persistent bioaccumulative pesticides (e.g., DDT and other legacy pesticides) which have been banned. The Santa Clara River estuary is listed as impaired for legacy pesticides. Organophosphorus pesticides include diazinon and chlorpyrifos whose uses also are being restricted by EPA.

Trash & Debris: Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic debris (such as leaves, grass cuttings, and food waste) are general waste products on the landscape that can be entrained in urban runoff. The presence of trash & debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a water body and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

Bioaccumulation: Certain pollutants, such as pesticides, selenium and mercury, have a tendency to bioaccumulate. The Basin Plan and the CTR criteria set forth toxicity objectives for receiving water levels of substances that bioaccumulate in aquatic resources to prohibit concentrations of toxic substances that are harmful to human health and adversely affect beneficial uses.

Chloride: High levels of chloride in Santa Clara River Reaches 3_E, 7_E, and 8_E downstream of the Project are causing impairment of listed beneficial uses for agricultural irrigation. Irrigation of salt sensitive crops such as avocados and strawberries with water containing elevated levels of chloride potentially results in reduced crop yields. Chloride levels in some areas exceed water quality standards associated with groundwater recharge. Chloride TMDLs for downstream reaches have been developed and adopted into the Basin Plan. The major sources of elevated chloride are dry-weather discharges from WRPs, contributing about 70% of the chloride load. Minor point sources are dewatering operations, and swimming pool and water ride discharges.

Methylene Blue Activated Substances (MBAS). MBAS are related to the presence of detergents in water. Positive results may indicate the presence of wastewater or be associated with urban runoff due to commercial and/or residential vehicle washing or other outdoor washing activities. Surfactants disturb the surface tension which affects insects and can affect gills in aquatic life.

4.1.2 Other Constituents

This section discusses other constituents that are listed in the Basin Plan, but for reasons explained below, are not pollutants of concern for the Project.

BOD (Biochemical Oxygen Demand) and Dissolved Oxygen. Adequate levels of dissolved oxygen are necessary to support aquatic life. High levels of oxygen demanding substances discharged to receiving waters can depress oxygen levels to levels of concern. Oxygen demanding substances are compounds that can be biologically degraded through aerobic processes. The presence of oxygen demanding substances can deplete oxygen supplies in waters and can contribute to algae growth. Nutrients in fertilizers and food wastes in trash are examples of likely oxygen demanding compounds to be present on the Project site. Other biodegradable organic materials include human and animal waste and vegetative matter. Biodegradable pollutants are largely subsumed by the nutrients and trash and debris categories above, and therefore will not be discussed as a separate category.

Chemical Constituents. Chemical constituents in excessive amounts in drinking water are harmful to human health. The Basin Plan objectives for chemical constituents states: "Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use." The chemical constituents referenced under this water quality objective, such as trace metals and nitrate are either subsumed by the categories above, or are not found in urban runoff (e.g., fluoride).

Temperature. Increase in temperature can result in lower dissolved oxygen levels, impairing habitat and other beneficial uses of receiving waters. Discharges of wastewater can also cause unnatural and/or rapid changes in temperature of receiving waters, which can adversely affect aquatic life. Elevated temperatures are typically associated with discharges of process wastewaters or non-contact cooling waters. As the beneficial uses in the receiving waters for the Project include warm freshwater habitat to support warm water ecosystems, temperatures of stormwater runoff from the Project are not of concern.

Total Residual Chlorine. Total residual chlorine can be present in wastewater treatment plant discharges, or may be present in dry weather urban runoff from the emptying of swimming pools that have not been de-chlorinated. Chlorine is a strong oxidant and is therefore very toxic to aquatic life. Municipal pools and private pools in areas served by a municipal sanitary system are required to be discharged into the sanitary system, and therefore, total residual chlorine will not be present in runoff from the Project.

Color, Taste, and Odor. The Basin Plan contains narrative objectives for color, taste, or odor that causes a nuisance or adversely affects beneficial uses. Undesirable tastes and odors in water may be a nuisance and may indicate the presence of a pollutant(s). Odor associated with water can result from decomposition of organic matter or the reduction of inorganic compounds, such as sulfate. Other potential sources of odor causing substances, such as industrial processes, will not occur as part of the Project. Color in water may arise naturally, such as from minerals, plant matter, or algae, or may be caused by industrial pollutants. The Project will contain no industrial uses. Therefore, color-, taste-, or odor-producing substances are not pollutants of concern for the Project.

Exotic Vegetation. Non-native (exotic) vegetation typically provides little habitat value and can out compete native vegetation that is more suitable habitat for aquatic and terrestrial organisms. The Basin Plan objective for exotic vegetation states: "Exotic vegetation shall not be introduced around stream courses to the extent that such growth causes nuisance or adversely affects designated beneficial uses." Landscape plant pallets will not use exotic vegetation, and undesirable invasive vegetation will be eradicated to the extent possible. Therefore, exotic vegetation is not a pollutant of concern for the Project.

Mineral Quality: TDS, Sulfate, Boron, and SAR. Mineral quality in natural waters is largely determined by the mineral assemblage of soils and rocks near the land surface. Elevated mineral concentrations could impact beneficial uses; however, the minerals listed in the Basin Plan, except chloride and nitrogen, are not believed to be constituents of concern due to the absence of river impairments and/or anticipated runoff concentrations well below the Basin Plan objectives (Table 4-1). Therefore, these constituents are not considered pollutants of concern for the Project.

Table 4-1: Comparison of Basin Plan Surface Water Mineral Objectives with Mean Measured Values in LA County

Mineral	Los Angeles Basin Plan Water Quality Objective for SCR Reach 9_E (mg/L)	Mean Concentration in Single-Family Residential Runoff[1] (mg/L)
Total Dissolved Solids	800	58
Sulfate	150	7
Boron	1.0	0.2
Sodium Absorption Ratio[2]	5	0.57

[1]Source: Los Angeles County, 2000

[2]Sodium adsorption ratio (SAR) predicts the degree to which irrigation water tends to enter into cation-exchange reactions in soil.

pH. The hydrogen ion activity of water (pH) is measured on a logarithmic scale, ranging from 0 to 14. While the pH of "pure" water at 25 °C is 7.0, the pH of natural waters is usually slightly

basic due to the solubility of carbon dioxide from the atmosphere. Aquatic organisms can be highly sensitive to pH. The Basin Plan objective for pH is:

> "the pH of inland waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0.5 units from natural conditions as a result of waste discharge."

Mean runoff concentrations in the Los Angeles County stormwater monitoring data ranged from 6.5 for mixed- and single-family residential land uses to 7.0 for commercial land use. Therefore, pH in the Santa Clara River is not expected to be affected by runoff discharges from the Project.

PCBs. PCBs are highly toxic persistent chemicals that have been historically released into the environment from industrial uses, such as transformers. Due to their persistence, PCBs can still be detected in urban runoff due to historic industrial sources of these chemicals. The Project area did not historically include PCB-producing land uses and industrial land uses using transformers are not included in the proposed Project. Therefore, PCBs are not a pollutant of concern for the Project.

Radioactive substances. Radioactive substances typically occur at very low concentrations in natural waters. Some activities such as mining or certain industrial activities (e.g., energy production, fuel reprocessing) can increase the amount of radioactive substances impairing beneficial uses. The Project will not have industrial or other activities that would be a source of any radioactive substances, and development will stabilize any naturally radioactive soils, though unlikely to be present in the Project area. Therefore, radioactive substances are not a pollutant of concern for the Project.

Toxicity. Certain pollutants in stormwater runoff have the potential to be highly toxic to aquatic organisms resulting in effects such as impaired reproduction or mortality. The Basin Plan water quality objective for toxicity is:

> "All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life."

Toxicity in urban runoff could be caused by ammonia, trace metals, PAHs, or pesticides. These constituents are subsumed by the pollutant of concern categories above.

4.2 Groundwater Pollutants of Concern

The Project will allow for incidental infiltration of urban runoff to groundwater after receiving treatment in the Project PDFs, as well as infiltration of irrigation water. Research conducted on the effects on groundwater from stormwater infiltration by Pitt et al. (1994) indicate that the

potential for contamination is dependent on a number of factors including the local hydrogeology and the chemical characteristics of the pollutants of concern.

Chemical characteristics that influence the potential for groundwater impacts include high mobility (low absorption potential), high solubility fractions, and abundance in stormwater. As a class of constituents, trace metals tend to adsorb onto soil particles and are filtered out by the soils. This has been confirmed by extensive data collected beneath stormwater detention/retention ponds in Fresno (conducted as part of the Nationwide Urban Runoff Program) that showed that trace metals tended to be adsorbed in the upper few feet in the bottom sediments. Bacteria are also filtered out by soils. More mobile constituents such as chloride and nitrate would have a greater potential for infiltration.

4.2.1 Pollutants of Concern

The pollutants of concern for the groundwater quality analysis are those that are anticipated or potentially could be generated by the Project at concentrations, based on water quality data collected in Los Angeles County from land uses that are the same as those proposed by the Project, that exhibit these characteristics. Identification of the pollutants of concern for the Project considered proposed land uses as well as pollutants that have the potential to impair beneficial uses of the groundwaters below the Project. The Los Angeles Basin Plan contains numerical objectives for bacteria, mineral quality, nitrogen, and various toxic chemical compounds, and contains qualitative objectives for taste and odor.

Nitrate+Nitrite-N was chosen as the pollutant of concern for purposes of evaluating groundwater quality impacts based upon the above considerations. High nitrate levels in drinking water can cause health problems in humans. Infants can develop methemoglobinemia (blue-baby syndrome). Human activities and land use practices can influence nitrogen concentrations in groundwaters. For example, irrigation water containing fertilizers can increase levels of nitrogen in groundwater.

4.2.2 Other Constituents

Bacteria: The Basin Plan contains numeric criteria for bacteria in drinking water sources. As bacteria are removed through straining in soils (for example, as with septic tank discharges), incidental infiltration of runoff in the Project treatment PDFs is not expected to affect bacteria levels in groundwater.

Chemical Constituents and Radioactivity: Drinking water limits for inorganic and organic chemicals that can be toxic to human health in excessive amounts and radionuclides are contained in Title 22 of the California Code of Regulations. These chemicals and radionuclides are not expected to occur in the Project's runoff.

Taste and Odor. The Basin Plan contains a narrative objective for taste and odor that cause a nuisance or adversely affect beneficial uses. Undesirable tastes and odors in groundwater may be a nuisance and may indicate the presence of a pollutant(s). Odor associated with water can result from natural processes, such as the decomposition of organic matter or the reduction of inorganic compounds, such as sulfate. Other potential sources of odor causing substances, such as industrial processes, will not occur as part of the Project. Therefore, taste and odor-producing substances are not pollutants of concern for the Project.

Mineral Quality: TDS, Sulfate, Chloride, and Boron. Mineral quality in groundwaters is largely influenced by the mineral assemblage of soils and rocks that it comes into contact with. Elevated mineral concentrations could impact beneficial uses; however, the minerals listed in the Basin Plan are not believed to be pollutants of concern due to the anticipated runoff concentrations and the typical mineral concentrations in irrigation water (Castaic Lake Water Agency), which are well below the Basin Plan objectives (Table 4-2). Therefore, these constituents are not considered pollutants of concern for the Project.

Table 4-2: Comparison of Basin Plan Mineral Groundwater Objectives with Mean Measured Values in LA County and SWP Water Quality at Castaic Lake

Mineral	Los Angeles Basin Plan Groundwater Quality Objective[1] (mg/L)	Mean Concentration in Single-Family Residential Runoff[2] (mg/L)	Typical Concentration in Castaic Lake Water Agency Water[3](mg/L)
Total Dissolved Solids	700	58	314
Sulfate	250	7	52
Chloride	100	0.2	81
Boron	1.0	0.57	0.2

[1]Santa Clara-Bouquet and San Francisquito Canyons subbasin
[2]Source: Los Angeles County, 2000
[3]Source: The Santa Clarita Valley 2003 Annual Water Quality Report (available at www.clwa.org/h20quality/pdfs)

4.3 Hydrologic Conditions of Concern (Hydromodification)

Urbanization modifies natural watershed and stream hydrologic and geomorphic processes by introducing impervious surfaces and drainage infrastructure into a watershed (SCCWRP, 2005; GeoSyntec, 2002; Bledsoe & Watson, 2001; Booth, 1990; Hollis, 1975; Hammer, 1972). Potential changes to the hydrologic regime may include increased runoff volumes, frequency of runoff events, long-term cumulative duration, as well as increased peak flows. Urbanization may also introduce dry weather flows where only wet weather flows existed prior to development. These changes are referred to as "hydromodification."

Hydromodification intensifies sediment transport and often leads to stream channel enlargement and loss of habitat and associated riparian species (SCCWRP, 2005; GeoSyntec, 2002; Bledsoe & Watson, 2001; MacRae, 1992; Booth, 1990). Under certain circumstances, development can

also cause a reduction in the amount of sediment supplied to the stream system, which can lead to stream channel incision and widening. These changes also have the potential to impact downstream channels and habitat integrity. A Project that increases runoff due to impervious surfaces and traps sediment from upland watershed sources creates compounding effects.

A change to the Project site's hydrologic regime would be considered a condition of concern if the change could have a significant impact on downstream natural channels and habitat integrity, alone or in conjunction with impacts of other Projects.

4.4 Significance Criteria and Thresholds for Significance

4.4.1 Water Quality Significance Thresholds

Appendix A provides the criteria for evaluating the significance of a potential impact for each pollutant of concern. These criteria and the threshold for significance can be summarized as follows. The application of the criteria to a decision regarding significance requires an integrated or "weight of evidence" approach, rather than a decision based on any one of the individual criterion.

Thresholds of significance for water quality impacts have been developed based on a review of the MS4 Permit and the CEQA Guidelines, Appendix G. Significant adverse water quality impacts are presumed to occur if the proposed Project would:

- Create sizeable additional sources of polluted runoff to receiving waters that would result in exceedances of receiving water quality or substantially degrade water quality in receiving waters.
- Create sizeable additional sources of polluted runoff that would violate any water quality standards or waste discharge requirements for surface water runoff.
- Create sizeable additional sources of polluted construction site runoff (including polluted discharges associated with construction activities such as materials delivery, staging or storage, vehicle or equipment fueling, vehicle or equipment maintenance, waste handling, or hazardous materials handling or storage) that would violate any water quality standards or waste discharge requirements for surface water runoff or groundwater discharge.

This report analyzes whether sizeable additional sources of polluted runoff may result from the Project based on the results of water quality modeling and qualitative assessments that take into account water quality controls or BMPs that are considered Project Design Features (PDFs). Any increases in pollutant concentrations or loads resulting from the development of the Project site are considered an indication of a potentially significant adverse water quality impact. If loads and concentrations resulting from development are predicted to stay the same or to be reduced

when compared with existing conditions, it is concluded that the Project will not cause a significant adverse impact to the ambient water quality of the receiving waters for that pollutant.

If pollutant loads or concentrations are expected to increase, then for both the post-development and construction phases, potential impacts are assessed by evaluating compliance of the Project, including PDFs, with requirements of the MS4 Permit, including SQMP and SUSMP requirements, the General Construction Permit, and the General Dewatering Permit. Further, post-development increases in pollutant loads and concentrations are evaluated by comparing the magnitude of the increase to relevant benchmarks, including receiving water TMDLs and receiving water quality objectives and criteria from the Basin Plan and CTR, as described below.

Receiving Water Benchmarks. Comparison of post-development water quality concentrations in the runoff discharge with benchmark TMDL waste load or load allocations for MS4 discharges establishes the likelihood that runoff would result in TMDL exceedances in receiving waters or would otherwise degrade receiving water quality.

Comparison of post-development water quality concentrations in the runoff discharge with benchmark numeric and narrative receiving water quality criteria as provided in the Basin Plan and the CTR facilitates analysis of the potential for runoff to result in exceedances of receiving water quality standards, adversely affect beneficial uses, or otherwise degrade receiving waters.

Water quality criteria are considered benchmarks for comparison purposes only, as such criteria apply within receiving waters as opposed to applying directly to runoff discharges. Narrative and numeric water quality objectives contained in the Basin Plan apply to the Project's receiving waters. Water quality criteria contained in the CTR provide concentrations that are not to be exceeded in receiving waters more than once in a three year period for those waters designated with aquatic life or human health related uses. Projections of runoff water quality are compared to the acute form of the CTR criteria (as discussed above), as stormwater runoff is associated with episodic events of limited duration, whereas chronic criteria apply to 4-day exposures which do not describe typical storm events in the Project area, which last seven hours on average. If pollutant levels in stormwater runoff do not exceed receiving water benchmarks, it is one indication that no significant impacts will result from Project development.

MS4 Permit Requirements for New Development (SUSMP). Satisfaction of MS4 Permit requirements for new development, including SUSMP requirements and SQMP requirements, and satisfaction of construction-related requirements of the General Construction Permit and General Dewatering Permit establish compliance with water quality regulatory requirements applicable to stormwater runoff.

The MS4 Permit requires that the SQMP specify BMPs that will be implemented to reduce the discharge of pollutants in stormwater to the Maximum Extent Practicable. MS4 requirements are met when new development complies with the SUSMP requirements set forth in the MS4

Permit. Under the SUSMP requirements, the effectiveness of stormwater treatment controls are primarily based on two factors - the amount of runoff that is captured by the controls and the selection of BMPs to address identified pollutants of concern. Selection and numerical sizing criteria for new development treatment controls are included in the MS4 Permit and the County SUSMP Manuals. If the Project PDFs meet these criteria, and other source control and site design BMPs consistent with the SUSMP requirements are implemented, it indicates that no significant impacts will occur as the result of insufficient capacity for stormwater treatment.

Construction General Permit and General Dewatering Permit. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that describes erosion and sediment control BMPs as well as material management/ non-stormwater BMPs that will be used during the construction phase of development. The General Dewatering Permit addresses discharges from permanent or temporary dewatering operations associated with construction and development and includes provisions mandating notification, sampling and analysis, and reporting of dewatering and testing-related discharges. To evaluate significance of construction phase Project water quality impacts, we evaluate whether water quality control is achieved by implementation of BMPs consistent with Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology (BAT/BCT), as required by the Construction General Permit and the General Dewatering Permit.

4.4.2 Significance Thresholds for Hydrologic Conditions of Concern (Hydromodification Impacts)

Thresholds of significance for evaluating hydrologic impacts and conditions of concern have been developed based on a review of the MS4 Permit and the CEQA Guidelines, Appendix G. Significant adverse impacts to natural drainage systems created by altered hydrologic conditions of concern are presumed to occur if the proposed Project would:

- Substantially alter the existing drainage pattern of a natural drainage, stream, or river in a manner that would cause substantial erosion, siltation, or channel instability; or
- Substantially increase the rates, velocities, frequencies, duration and/or seasonality of flows in a manner that causes channel instability or in a manner that harms sensitive habitats or species in natural drainages.

4.4.3 Cumulative Impacts

CEQA requires the analysis of cumulative impacts of a Project when the Project's incremental effects may be significant when assessed along with the effects of past Projects and the effects of other current Projects, and the reasonably foreseeable effects of probable future Projects. The discussion of cumulative impacts must reflect the potential severity of the impacts and their likelihood of occurrence, but the discussion and analysis need not provide as great a detail as is

provided for the direct effects attributable to the Project alone. This report therefore analyzes the potential for cumulative water quality impacts, cumulative groundwater quality impacts and cumulative hydrologic impacts generally in accordance with the thresholds for direct impacts discussed in Sections 4.4.1 and 4.4.2 above, and section 4.4.4 below. See Sections 7.7, 7.8, and 7.9 below for this analysis.

The cumulative analysis of all surface water quality and hydrologic impacts in this report is based primarily on "adopted projections" found in the Los Angeles County Department of Public Works adopted and approved Hydrology Manual, which have been verified by reference to approved plans, including the City of Santa Clarita and County of Los Angeles adopted General Plans, as well as available empirical data for the Santa Clara River. As required by CEQA, the focus of the cumulative impacts analysis for this Project will be on the Project's incremental contribution to significant adverse water quality and hydrologic impacts to the SCR, taking into account the reasonably foreseeable water quality and hydrologic impacts of other Projects that may develop impervious surfaces and urban land uses within the watershed in accordance with adopted general plans and related projections. The cumulative impacts analysis will consider the Project's incremental contribution to significant cumulative water quality and hydrologic impacts to the SCR in light of the water quality and hydrology impact mitigation achieved by the PDFs. The analysis will also consider whether the Project, including PDFs, and future Projects will comply with specific requirements in a previously approved ordinance, plan, or mitigation program (such as the Basin Plan, the CTR, the MS4 Permit, the General Construction Permit and the General Dewatering Permit) that have been adopted for the purpose of avoiding or substantially lessening the cumulative water quality and hydrologic impact problems within the geographic area in which the Project is located.

4.4.4 Groundwater Quality Impacts

Thresholds of significance for evaluating the hydrologic and water quality impacts of the Project on groundwater have been developed based on CEQA Appendix G thresholds. Significant adverse impacts to groundwater are presumed to occur if the proposed Project would:

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that would cause a net deficit in aquifer volume or a lowering of the local groundwater table.

- Through changes in surface water runoff quality and quantity (including Project treatment PDFs), and changes in groundwater recharge, result in a violation of any groundwater quality standards or waste discharge requirements or otherwise substantially degrade water quality.

Groundwater quality is addressed in Section 7.8.1. Groundwater quality benchmarks were compared with post-development runoff water quality to establish the likelihood that runoff would result in a degradation of groundwater quality. Groundwater recharge is addressed in

Section 7.8.2. The hydrologic effects of the Project on groundwater were examined by comparison of historical and present levels of the underlying aquifer to determine the impact of development on aquifer volume.

5 PROJECT DESIGN FEATURES

Project Design Features (PDFs) for water quality and hydrologic impacts include site design, source control, treatment control, and hydromodification control BMPs that will be incorporated into the Project and are considered a part of the Project for impact analysis. Effective management of wet and dry weather runoff water quality begins with limiting increases in runoff pollutants and flows at the source. Site design and source control BMPs are practices designed to minimize runoff and the introduction of pollutants in stormwater runoff. Treatment control BMPs are designed to remove pollutants once they have been mobilized by rainfall and runoff. Hydromodification control BMPs are designed to control increases in post-development runoff flows. This section describes the site design, source control, treatment control, and hydromodification control PDFs for the Project.

5.1 SUSMP Requirements and Project Design Features

Table 5-1 summarizes the SUSMP requirements and the corresponding proposed PDFs.

Table 5-1: SUSMP Requirements and Corresponding Project Design Features

SUSMP Requirement	Criteria/ Description	Corresponding Soledad Townhomes PDFs
1. Peak Flow Controls	◦ Control post-development peak discharge rates, velocities and duration in Natural Drainage Systems to prevent accelerated downstream erosion and to protect habitat related beneficial uses.[3] ◦ All postdevelopment runoff from a 2-year, 24-hour storm shall not exceed the predevelopment peak flow rate, burned, from a 2-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cfs. Discharge flow rates shall be calculated using the County of Los Angeles Modified Rational Method. ◦ Postdevelopment runoff from the 50-year capital storm shall not exceed the predevelopment peak flow rate, burned and bulked, from the 50-year capital storm. ◦ Control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.	◦ Hydromodification source control BMPs will include bioretention and vegetated swales. ◦ Underground detention pipes will be provided to match the peak flow from the 2-year, 24-hour storm event. ◦ 50-year capital storm peak flow rate analysis is contained in the "Soledad Townhomes Drainage Concept Report," prepared by Pacific Coast Civil, Inc. (PCC, 2005)

[3]This requirement is from Part 4, § D.1 of the MS4 Permit.

SUSMP Requirement	Criteria/ Description	Corresponding Soledad Townhomes PDFs
2. Conserve Natural Areas	• Concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition • Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection • Maximize trees and other vegetation at each site, planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants • Promote natural vegetation by using parking lot islands and other landscaped areas • Preserve riparian areas and wetlands	• The site was previously graded under an earlier approval of a Parcel Map. This parcel map approval clustered the development on portions of the site outside of riparian areas. • The final Project stormwater system will include the use of the vegetated treatment BMPs, including bioretention (placed in median strips and parking lot islands where applicable) and vegetated swales. • Native and/or climate-appropriate vegetation will be utilized within the development. • The Project will incorporate nearly 12 acres of landscaped/open space area into the project.
3. Minimize Stormwater Pollutants of Concern	• Minimize to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at concentrations or loads considered potentially toxic to humans and/or flora and fauna.	• Treatment control BMPs will be selected to address the pollutants of concern for the Project (see Section 5.2 below). These BMPs are designed to minimize introduction of pollutants to the Maximum Extent Practicable (MEP). • The Project will include numerous source controls, including education programs, animal waste bag stations, street sweeping and catch basin cleaning, an Integrated Pest Management (IPM) Program per the LAUSD standards for common area landscaping in commercial and multi-family residential areas, use of native and/or non-invasive vegetation, installation of a car wash pad in multi-family residential areas, and directing runoff to vegetated areas. • An education program will be implemented that includes both the education of residents and commercial businesses regarding water quality issues. Topics will include services that could affect water quality, such as carpet cleaners and others that may not properly dispose of cleaning wastes; community car washes; and residential car washing. The education program will emphasize animal waste management, such as the importance of cleaning up after pets and not feeding

SUSMP Requirement	Criteria/ Description	Corresponding Soledad Townhomes PDFs
		pigeons, seagulls, ducks, and geese. • Vegetated treatment control BMPs will allow for stormwater infiltration as well as pollutant removal.
4. Protect Slopes and Channels	Project plans must include BMPs consistent with local codes and ordinances and the SUSMP requirements to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff: • Convey runoff safely from the tops of slopes and stabilize disturbed slopes • Utilize natural drainage systems to the maximum extent practicable • Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable • Stabilize permanent channel crossings • Vegetate slopes with native or drought tolerant vegetation • Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game.	• There are no significant slopes or natural drainage channels on the Project site. • Natural slopes and native vegetation on slopes to the River are preserved and/or restored and enhanced. • Project PDFs, including swales and bioretention areas (hydrologic source controls), will reduce flows to natural channels through infiltration and evapotranspiration. • The banks of the Santa Clara River at this site have previously been stabilized in accordance with the Natural River Management Plan. They will be capable of handling the expected flow regime with little or no erosion. • Native vegetation will be used in all plant palettes placed on restored slopes. • All outlet points to the Santa Clara River will include energy dissipaters consisting of ungrouted rip-rap per the Natural River Management Plan at erosion prone areas.
5. Provide Storm Drain System Stenciling and Signage	• All storm drain inlets and catch basins within the Project area must be stenciled with prohibitive language and/or graphical icons to discourage illegal dumping. • Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the Project area. • Legibility of stencils and signs must be maintained.	• All storm drain inlets and water quality inlets will be stenciled or labeled. • Signs will be posted in areas where dumping could occur. • The HOA will maintain stencils and signs.
6. Properly Design Outdoor Material Storage Areas	• Where proposed Project plans include outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system measures to mitigate impacts must be included.	• Pesticides, fertilizers, paints, and other hazardous materials used for maintenance of common areas, parks, commercial areas, and multifamily residential common areas will be kept in enclosed storage areas.

SUSMP Requirement	Criteria/ Description	Corresponding Soledad Townhomes PDFs
7. Properly Design Trash Storage Areas	All trash containers must meet the following structural or treatment control BMP requirements: • Trash container areas must have drainage from adjoining roofs and pavement diverter around the areas. • Trash container areas must be screened or walled to prevent offsite transport of trash.	• All trash facilities will be covered and isolated from stormwater runoff.
8. Provide Proof of Ongoing BMP Maintenance	• Applicant required to provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, and/or Conditional Use Permits.	• The Home Owners Association or a Landscape Maintenance District will be responsible for operations and maintenance of swale and bioretention BMPs.
9. Design Standards for Structural or Treatment Control BMPs	Post-construction Structural or Treatment Control BMPs shall be designed to mitigate (infiltrate or treat) stormwater runoff using either volumetric treatment control BMPs or flow-based treatment control BMPs sized per listed criteria (see section 3.6.2 above).	• Stormwater treatment facilities will be designed to meet or exceed the sizing standards outlined in the LA County SUSMP manual. • Volume-based treatment control BMPs for the Project will be designed to capture 80 percent or more of the annual runoff volume per criteria 2 of the MS4 Permit. See Appendix C for further detail. • Flow-based BMPs will be sized using criteria 3, which will provide 80 percent capture of annual runoff volume per criteria of the MS4 Permit. See Appendix C for further detail. • The size of the facilities will be finalized during the design stage by the Project engineer with the final hydrology study, which will be prepared and approved to ensure consistency with this analysis prior to issuance of a final grading permit. • The structural BMPs in the stormwater treatment system will be configured to achieve treatment in multiple BMP facilities for the majority of the developed areas. This "treatment train" approach affects greater pollutant removal. • Types of treatment control BMPs that will be employed include vegetated swales and bioretention and a combination thereof.

SUSMP Requirement	Criteria/ Description	Corresponding Soledad Townhomes PDFs
10.F.1. Properly Design Parking Area (Parking Lots)	• Reduce impervious land coverage of parking areas • Infiltrate runoff before it reaches the storm drain system • Treat runoff before it reaches storm drain system	• Commercial and multi-family parking lots will incorporate bioretention facilities located in islands to promote filtration and infiltration of runoff. • Stormwater runoff from parking lots will be directed to treatment control BMPs, including swales, water quality basins and/or bioretention areas in compliance with SUSMP requirements.
10.F.2 Properly Design to Limit Oil Contamination and Perform Maintenance (Parking Lots)	• Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used. • Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal	• See above. • Treatment of runoff in bioretention (or vegetated swales) and catch basin inserts will be used to address oil and petroleum hydrocarbons from high-use parking lots. • Maintenance will be performed by either the HOA or as set forth in the BMP maintenance responsibilities program.
13. Limitation of Use of Infiltration BMPs	• Infiltration is limited based on design of BMP, pollutant characteristics, land use, soil conditions, and traffic. • Appropriate conditions (groundwater >10 ft from grade) must exist to utilize infiltration to treat and reduce stormwater runoff for the Project.	• Bioretention and vegetated swales are not considered infiltration BMPs; they allow for infiltration of fully-treated runoff only.

5.2 Treatment BMPs

The SUSMP requirements mandate that treatment controls address the pollutants of concern, which are defined in the SUSMP Manual as consisting of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at concentrations or loads considered potentially toxic to humans and/or flora and fauna. These parameters were considered in defining pollutants of concern for analysis. See Section 4.1 of this report. Pollutants of concern for the Project include:

- Sediments (TSS and Turbidity)
- Nutrients (Phosphorus, Nitrate-N + Nitrite-N, and Ammonia-N)
- Trace Metals (Copper, Lead, and Zinc)
- Pathogens (Bacteria, Viruses, and Protozoa)
- Petroleum Hydrocarbons (Oil and Grease and PAHs)

- Pesticides
- Trash & Debris
- Chloride
- Methylene Blue Activated Substances (MBAS)

Treatment BMPs to be used for the Project are listed in Table 5-2, along with the pollutants of concern addressed by each.

Table 5-2: Treatment Control BMP Selection Matrix

Pollutant of Concern[1]	Treatment Control BMP Categories	
	Vegetated Swale	Bioretention
Sediment	M	H
Nutrients	L	M
Trash	L	H
Trace Metals	M	H
Bacteria	L	H
Organics[2]	M	H

Source: California Stormwater Best Management Practices Handbook for New Development and Redevelopment (CASQA, 2003)
Note: H, M, L, indicates high, medium, and low removal efficiency.
[1]Chloride and MBAS are addressed with source control BMPs, as they are not treatable in typical stormwater treatment BMPs, aside through incidental infiltration.
[2]Includes pesticides and petroleum hydrocarbons.

As currently planned, stormwater runoff from all urban areas within the Project will be routed to bioretention areas and/or vegetated swale treatment control BMPs (Figure 5-1). Catch basin inserts will also be used in high use parking lots. Collectively, the water quality treatment control PDFs will treat the pollutants of concern in runoff from the approximately 33 acre Project area. These treatment BMPs, when combined with the site design and source control BMPs described above, will address all of the pollutants of concern. The effectiveness of the selected treatment BMPs is described in detail in Appendix B, Section B.2.5. The effectiveness of treatment BMPs is evaluated without taking site design and source control BMPs into account. Therefore, the analysis is conservative in that it understates water quality controls.

Design criteria for the treatment control BMPs, including sizing, are presented in Appendix C.

Bioretention: Bioretention areas are vegetated (i.e., landscaped) shallow depressions that provide storage, infiltration, and evapotranspiration, and also provide for pollutant removal (e.g. filtration, adsorption, nutrient uptake) by filtering stormwater through the vegetation and soils. In bioretention areas, as well as in vegetated swales, pore spaces and organic material in the soils help to retain water in the form of soil moisture and to promote the adsorption of pollutants into

the soil matrix. Plants utilize soil moisture and promote the drying of the soil through transpiration. Due to the highly infiltrative soils on the Project site, no underdrain will be required for the biofiltration areas. Treated flows will be fully infiltrated. A conceptual illustration of a biofiltration area is shown in Figure 5-2, and photographs of existing bioretention areas are provided in Figure 5-3.

Vegetated Swales: Vegetated swales are engineered, vegetation-lined channels that provide water quality treatment in addition to conveying stormwater runoff. Swales provide pollutant removal through settling and filtration in the vegetation (often grasses) lining the channels and also provide the opportunity for volume reduction through infiltration and evapotranspiration. Swales are most effective where longitudinal slopes are small (2 percent to 6 percent), thereby increasing the residence time for treatment, and where water depths are less than the vegetation height. A conceptual illustration of a vegetated swale is shown in Figure 5-4 and photographs of existing swales are provided in Figure 5-5.

Catch basin inserts will be also be used to address trash and petroleum hydrocarbons in runoff from the commercial area parking lot.

5.3 Hydromodification Control BMPs

Several hydrologic source controls are included as hydromodification control PDFs:

- *Treatment Controls*. The Project's treatment control BMPs will also serve as hydromodification control BMPs. Vegetated swales can provide volume reduction on the order of 20 to 30 percent through infiltration and evaporation. The Project also includes use of bioretention areas sized to capture and treat 80 percent of the average annual stormwater runoff from its tributary catchment and will not utilize underdrains. Thus, all water captured in these facilities will be effectively removed from the Project's stormwater discharges. Collectively these vegetated treatment facilities are expected to provide significant reduction in wet weather runoff. In addition these facilities will also receive and eliminate dry weather flows.
- *Site Design Practices.* Site design PDFs that help to reduce the increase in runoff volume include routing of roof runoff to vegetated areas, use of native and drought tolerate plants in landscaped areas, and the use of efficient irrigation systems in common area landscaped areas.
- *Peak Flow Control.* The current Los Angeles County Interim Peak Flow Standard requires that all post development runoff from a 2-year, 24-hour storm not exceed the predevelopment peak flow rate, burned, from a 2-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cfs. Peak flow control of 2-year, 24-hour storm event will be achieved through appropriate sizing of the extended detention basin and through runoff volume reduction occurring in the vegetated swales and bioretention areas. Additional storage will be provided via detention in oversized

pipes if required. The design and size of the detention pond and pipes and bioretention areas will be finalized during the design stage by the Project engineer as part of the final hydrology study, which will be reviewed and approved by the City of Santa Clarita to ensure consistency with the EIR analysis prior to issuance of a final grading permit.

- *Energy Dissipation.* Erosion protection in areas where discharges have the potential to cause stream erosion. Erosion protection will be provided at all storm drain outlets to the Santa Clara River.
- *Bank Stabilization.* The banks of the Santa Clara River adjacent to the Project area have pre-existing bank stabilization via buried soil cement. Soil cement is a modern flood control technique used to protect against erosion while maintaining natural vegetation and soft banks. Soil cement will be buried below the existing banks of the Santa Clara River. Disturbed areas will then re-vegetated with native plant species, maintaining the natural habitat presently found along the River.
- *Project Conditions.* To assure that it complies with any new peak or other design flow standards that may be adopted in the future, the Project will be conditioned to require, as a design feature, sizing and design of the hydraulic features (i.e., oversized pipes) as necessary to control the post-development runoff rates as necessary to meet numeric flow criteria that may be adopted from time to time by the Los Angeles County Department of Public Works and co-permittees (including the City of Santa Clarita) under Part 4, § D.1 of the MS4 Permit.

6 WATER QUALITY MODELING APPROACH

6.1 Model Description

A water quality model was used to estimate pollutant loads and concentrations for certain pollutants of concern for pre-development conditions, post-development conditions, and post-development conditions with PDFs for the Tentative Map portion of the Project. The model is one of the few models that takes into account the observed variability in stormwater hydrology and water quality. This is accomplished by characterizing the probability distribution of observed rainfall event depths, the probability distribution of event mean concentrations, and the probability distribution of the number of storm events per year. These distributions are then sampled randomly using a Monte Carlo Approach to develop estimates of mean annual loads and concentrations.

A detailed description of the water quality model is presented in Appendix B. The following summarizes major features of the water quality model:

- *Rainfall Data*: The water quality model estimates the volume of runoff from storm events. The storm events were determined from 32 years (1969 - 2002) of hourly rainfall

data measured at the National Climatic Data Center (NCDC) Newhall rain gage that incorporates a wide range of storm events. The rainfall analysis that is incorporated in the water quality model requires rainfall measurements at 1 hour intervals and a long period of record that is at least 20 to 30 years in length.

- *Land Use Runoff Water Quality*: The water quality model estimates the concentration of pollutants in runoff from storm events based on existing and proposed land uses. The pollutant concentrations for various land uses, in the form of Event Mean Concentrations (EMCs), were estimated from data collected in Los Angeles County. The Los Angeles County database was chosen for use in the model because: (1) it is an extensive database that is quite comprehensive, (2) it contains monitoring data from land use specific drainage areas, and (3) the data is representative of the semi-arid conditions in southern California.

- *Pollutant Load*: The pollutant load associated with each storm is estimated as the product of the storm event runoff times the event mean concentration. For each year in the simulation, the individual storm event loads are summed to estimate the annual load. The mean annual load is then the average of all the annual loads.

- *PDFs Modeled*: The modeling only considers certain structural treatment PDFs and does not take into account the source control PDFs (e.g., street sweeping) or certain treatment BMPs (e.g., CDS units or catch basin inserts), which also would improve water quality. In this respect, the modeling results are conservative, i.e., tend to overestimate pollutant loads and concentrations.

- *Treatment Effectiveness*: The water quality model estimates mean pollutant concentrations and loads in stormwater following treatment. The amount of stormwater runoff that is captured by the treatment BMPs was calculated for each storm event, taking into consideration the intensity of rainfall, duration of the storm, and duration between storm events. The mean effluent water quality for treatment BMPs was based on the International Stormwater BMP Database (ASCE/EPA, 2004). The International Stormwater BMP Database was used because it is a robust, peer reviewed database that contains a wide range of BMP effectiveness studies that are reflective of diverse land uses. An analysis of the monitored inflow and outflow data contained in the International Stormwater BMP Database showed a volume reduction on the order of 38 percent for biofilters. Based on this analysis, a conservative estimate of 25 percent of the Project's inflow to the vegetated swales was assumed to infiltrate and/or evapotranspire. The bioretention areas will be designed to infiltrate 100% of inflow captured, but were conservatively modeled as infiltrating 90 percent of inflows. Peak flow controls do not account for volume reductions by Project PDFs.

- *Bypass Flows*: The water quality model takes into account conditions when the treatment facility is full and flows are bypassed.

- *Representativeness to Local Conditions*: The water quality model utilizes runoff water quality data obtained from tributary areas that have a predominant land use, and as measured prior to discharge into a receiving water body. Currently such data are available from stormwater programs in LA County, San Diego County, and Ventura County, although the amount of data available from San Diego County and Ventura County is small in comparison with the LA County database. Such data is often referred to as "end-of-pipe" data to distinguish it from data obtained in urban streams, for example.

6.2 Pollutants Modeled

The appropriate form of data used to address water quality are flow composite storm event samples, which are measures of the average water quality during the event. To obtain such data usually requires automatic samplers that collect data at a frequency that is proportionate to flow rate. The pollutants for which there are sufficient flow composite sampling data in the Los Angeles County database are:

- Total Suspended Solids (sediment)
- Total Phosphorus
- Nitrate-Nitrogen, Nitrite-Nitrogen, Ammonia, and Total Nitrogen (TN)
- Dissolved Copper
- Total Lead
- Dissolved Zinc
- Chloride

The other pollutants of concern, such as pathogens, hydrocarbons, pesticides, and trash and debris, are not amenable to this type of sampling either because of short holding times (e.g., pathogens), difficulties in obtaining a representative sample (e.g., hydrocarbons), or low detection levels (e.g., pesticides). These pollutants were addressed qualitatively using literature information and best professional judgment due to the lack of statistically reliable monitoring data for these pollutants (see Section 6.3 below).

6.3 Pollutants Addressed Without Modeling

The following pollutants of concern were addressed based on literature information and professional judgment because available data were not deemed sufficient for modeling:

- Turbidity
- Pathogens (Bacteria, Viruses, and Protozoa)

- Hydrocarbons (Oil and Grease, Polycyclic Aromatic Hydrocarbons)
- Pesticides
- Trash and Debris
- Methylene Blue Activated Substances (MBAS)

Human pathogens are usually not directly measured in stormwater monitoring programs because of the difficulty and expense involved; rather, indicator bacteria such as fecal coliform or certain strains of *E. Coli* are measured. Unfortunately, these indicators are not very reliable measures of the presence of pathogens in stormwater, in part because stormwater tends to mobilize pollutants from many sources, some of which contain non-pathogenic bacteria. For this reason, and because holding times for bacterial samples are necessarily short, most stormwater programs do not collect flow-weighted composite samples that potentially could produce more reliable statistical estimates of concentrations. Fecal coliform or *E. Coli* are typically measured with grab samples, making it difficult to develop reliable EMCs. Total coliform and fecal bacteria (fecal coliforms, fecal streptococcus, and fecal enterococcus) were detected in stormwater samples tested in Los Angeles County at highly variable densities (or most probable number, MPN) ranging between several hundred to several million cells per 100 ml (LADPW, 2000).

Hydrocarbons are difficult to measure because of laboratory interference effects and sample collection issues (hydrocarbons tend to coat sample bottles). Hydrocarbons are typically measured with single grab samples, making it difficult to develop reliable EMCs.

Pesticides in urban runoff are often at concentrations that are below detection limits for most commercial laboratories and therefore there are limited statistically reliable data available on pesticides in urban runoff. Pesticides were not detected in Los Angeles County monitoring data for land use-based samples, except for diazinon and glyphosate which were detected in less than 15 percent and 7 percent of samples, respectively (LADPW, 2000).

Trash and debris and MBAS sampling is not typically included in routine stormwater monitoring programs. Several studies conducted in the Los Angeles River basin have attempted to quantify trash generated from discrete areas, but the data represent relatively small areas or relatively short periods, or both. MBAS was included in the land use-based monitoring data, but not enough data is available for modeling purposes.

7 IMPACT ASSESSMENT

In this section, model results for each pollutant are evaluated in relation to the following significance criteria: (1) comparison of post-development versus pre-development stormwater quality concentrations and loads; (2) comparison with MS4 Permit, General Construction Permit, and General Dewatering Permit requirements for new development; and (3) evaluation in light of receiving water benchmarks. Pursuant to the third criterion, predicted runoff pollutant

concentrations in the post-development with PDFs condition are compared with benchmark receiving water quality criteria as provided in the Basin Plan and the CTR and TMDL waste load allocations. The water quality criteria and waste load allocations are considered benchmarks for comparison purposes only, since they do not apply directly to runoff from the Project, but the comparison provides useful information to evaluate potential impacts. A weight of evidence approach is employed in this analysis considering the various significance criteria.

The modeled pollutant impact assessment is presented in Section 7.1 and the quantitative analyses of the remaining pollutants of concern follow in Section 7.2. Analyses of dry weather impacts and compliance with NPDES Permit requirements and construction-related requirements of the Construction General Permit and Dewatering General Permit follow the pollutant-by-pollutant impact assessment. Also included is a discussion of other considerations, including operation and maintenance, vector control, bioaccumulation, and hydrologic impacts. The analysis of cumulative impacts to surface water, groundwater, and hydromodification is also provided.

7.1 Impact Assessment for Modeled Pollutants of Concern

Results from the water quality model for significance criteria 1 are reported in a series of tables, organized by constituent, showing predicted mean annual pollutant loads (lbs/yr) and mean annual concentrations. Projections are made for two conditions: (1) existing condition, and (2) developed condition with Project design features (PDFs).

Treatment PDFs that are considered in the model include bioretention areas and vegetated swales. Bioretention results in a low predicted average annual pollutant load due to the runoff volume reduction through infiltration of 90 percent of treated flows. The predicted post-developed runoff concentrations from these areas are greater than runoff treated in vegetated swales because the concentrations represent mostly the untreated bypass flows, while the treated flows are mostly infiltrated. Vegetated swale treatment allows for less runoff volume reduction, but will provide a lower predicted average annual pollutant concentration due to the higher percentage of treated runoff in combination with untreated bypassed flows. The combination of these Project PDFs will provide effective reduction of both pollutant load and concentration.

Note that the modeling results account for pollutant reductions in the bioretention areas and vegetated swales only and do not account for the pollutant reductions that will occur due to source control PDFs and parking lot catch basin inserts. Because not all BMPs are modeled, the model results predict greater water quality impacts than are likely to occur from the Project.

Following the tables comparing post-development and pre-development water quality loads and concentrations for each constituent (except runoff volume) is a table comparing the post-development with PDFs runoff quality to the benchmark water quality objectives and criteria and TMDL waste load allocations for downstream reaches of the Santa Clara River. Water quality

observed in the Santa Clara River is also included on these tables to provide comparison to the modeled developed condition with PDFs runoff quality.

7.1.1 Stormwater Runoff Volume

Table 7-1 shows the predicted changes in stormwater runoff mean annual volumes. Mean annual runoff volumes are expected to increase substantially with development. The increase can be explained by the change in percent imperviousness associated with urbanization and the highly infiltrative nature of the Project site's soils. As shown in Appendix B, Table B-2, the percent imperviousness used for open space is five percent (a conservative figure that minimally accounts for certain impervious features in open space, such as roads, rock outcrops, and compacted soils), in contrast to a value of 80 percent for multi-family residential land uses. Runoff volume is directly proportional to percent imperviousness.

Project PDFs include site design, source control, and treatment control BMPs in compliance with the SUSMP requirements. The treatment control BMPs will allow for runoff volume reduction. Based on BMP monitoring data in the International Stormwater BMP Database, a 25 percent reduction in stormwater runoff volume was assumed to occur in the vegetated swales PDFs. Bioretention areas will be designed for 100 percent reduction of the water quality volume, but were modeled with a 90 percent volume reduction to produce conservative estimates.

Table 7-1: Predicted Average Annual Stormwater Runoff Volumes

Site Conditions	Average Annual Stormwater Runoff Volume (acre-ft)
Existing	2.4
Developed with PDFs	16.7
Change	14.3

7.1.2 TSS

Comparison of Pre- and Post-Project Conditions: Table 7-2 shows the predicted average annual TSS concentration and loads. Conversion from pre-development open space to urban land-uses (with treatment) would reduce the average TSS concentration in stormwater runoff from the Project site. The average annual TSS load is predicted to increase minimally in the post-development condition due to the seven-fold increase in runoff volume.

Table 7-2: Predicted Average Annual TSS Concentration and Load

Site Conditions	Average Annual TSS Concentration (mg/L)	Average Annual TSS Load (tons/yr)
Existing	162	0.5
Developed with PDFs	26	0.6
Change	-136	0.1

Comparison with Water Quality Criteria: The predicted average annual TSS concentration in stormwater runoff from the total modeled area with PDFs is compared to water quality criteria and the range of observed concentrations in the Santa Clara River in Table 7-3. Although TSS load increases slightly, the predicted concentration declines with development and is below the range of observed concentrations in Santa Clara River Reach 9_E. Based on the comprehensive site design, source control, and treatment control strategy, and the comparison with available in-stream data and basin plan benchmark objectives, the TSS in stormwater runoff from the Project will not cause a nuisance or adversely affect beneficial uses in the receiving waters.

Table 7-3: Comparison of Predicted TSS Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 9_E

Predicted Average Annual TSS Concentration (mg/L)	LA Basin Plan Water Quality Objectives	California Toxics Rule Criteria	Range of Observed[1] Concentrations in Santa Clara River Reach 9_E (mg/L)
26	Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses	NA	53 – 712

[1]Range of concentrations observed in the Santa Clara River during wet weather at LACDPW Mass Emission Station S29 (located 5 miles downstream of the Project).
NA – not applicable

7.1.3 Total Phosphorus

Comparison of Pre- and Post-Project Conditions: Table 7-4 shows the predicted average total phosphorus (TP) concentration and annual loads. TP concentration and load are predicted to increase post-development. The increase in TP load can be attributed to the increase in runoff volume and higher total phosphorous EMCs observed in monitoring data from urbanized land uses.

Table 7-4: Predicted Average Annual Total Phosphorus Concentration and Annual Load

Site Conditions	Average Annual TP Concentration (mg/L)	Average Annual TP Load (lbs/yr)
Existing	0.08	0.5
Developed with PDFs	0.19	5.6
Change	0.11	5.1

Comparison with Water Quality Criteria: There are no numeric objectives for TP in the LA Basin Plan. A narrative objective for biostimulatory substances in the LA Basin Plan states: "waters shall not contain biostimulatory substances in concentrations that promote algal growth to the extent that such growth causes nuisance or adversely affects beneficial uses." Despite the predicted load increase, the low predicted TP concentrations in Project stormwater discharges will not promote (i.e., increase) algae growth and therefore comply with the narrative objective for biostimulatory substances in the LA County Basin Plan. As shown in Table 7-5, the predicted total phosphorus concentration is below the low end of the range of observed concentrations in Santa Clara River Reach 9_E.

Table 7-5: Comparison of Predicted Total Phosphorus Concentration with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 9_E

Predicted Average Annual Total Phosphorus Concentration (mg/L)	LA Basin Plan Water Quality Objectives	California Toxics Rule Criteria	Range of Observed[1] Concentrations in Santa Clara River Reaches 9_E (mg/L)
0.19	Waters shall not contain biostimulatory substances in concentrations that promote algal growth to the extent that such growth causes nuisance or adversely affects beneficial uses	NA	0.3 – 12

[1]Range of concentrations observed in the Santa Clara River during wet weather at USGS Bouquet Junction station (located one mile downstream of the Project) and at LACPDW Mass Emission Station S29 (located 5 miles downstream of the Project).
NA – not applicable

Based on the comprehensive site design, source control, and treatment control strategy and the comparison with available in-stream monitoring data and Basin Plan benchmark objectives, potential impacts associated with total phosphorus are predicted to be less than significant.

7.1.4 Nitrogen Compounds

Comparison of Pre- and Post-Project Conditions: The predicted average nitrate-nitrogen plus nitrite-nitrogen and ammonia concentrations and annual loads are summarized in Table 7-6 and Table 7-7, respectively. Average concentrations of nitrate-nitrogen plus nitrite nitrogen are predicted to decrease. Annual loads of nitrate-nitrogen plus nitrite nitrogen and average

concentration and annual loads for ammonia are predicted to increase due to the increase in runoff volume and higher runoff EMCs for these pollutants observed in monitoring data from urbanized land uses versus open space.

Table 7-6: Predicted Average Annual Nitrate-N + Nitrite-N Concentration and Load

Site Conditions	Average Annual NO3-N+NO2-N Concentration (mg/L)	Average Annual NO3-N+NO2-N Load (lbs/yr)
Existing	1.2	7.5
Developed with PDFs	0.8	35
Change	-0.4	27.5

Table 7-7: Predicted Average Annual Ammonia-N Concentration and Load

Site Conditions	Average Annual NH3 Concentration (mg/L)	Average Annual NH3 Load (lbs/yr)
Existing	0.06	0.4
Developed with PDFs	0.2	9.7
Change	0.14	9.3

Comparison with Water Quality Criteria: Predicted nitrogen compound concentrations are compared to Basin Plan objectives and observed concentrations in Table 7-9. The ammonia Basin Plan objective is temperature and pH dependent. At a pH of 7.25 (the geometric mean observed wet weather value at LADPW Station S29) and a temperature of 20 °C (conservatively assumed the maximum value in the Basin Plan), the one-hour average total ammonia-N objective is 15.8 mg/L as N for waters designated with a WARM beneficial use.

Table 7-8: Comparison of Predicted Nitrogen Compound Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 9_E

Nutrient	Predicted Average Annual Concentration (mg/L)	LA Basin Plan Water Quality Objectives (mg/L)	Range of Observed[1] Concentrations in Santa Clara River Reach 9_E (mg/L)
Nitrate-N + Nitrite-N	0.8	5.0	0.78 – 5.8
Ammonia-N	0.2	15.8[2]	0.1 – 6.4

[1]Range of concentrations observed in the Santa Clara River during wet weather at USGS Bouquet Junction station (located one mile downstream of the Project) and at LACPDW Mass Emission Station S29 (located 5 miles downstream of the Project).

[2] Water Quality Objective is for 1-hour average total Ammonia-N concentration for waters designated as WARM.

Table 7-9: Predicted Average Annual Dissolved Copper Concentration and Load

Site Conditions	Average Annual Dis. Cu Concentration (µg/L)	Average Annual Dis. Cu Load (lbs/yr)
Existing	0.3	0.002
Developed with PDFs	6	0.17
Change	5.7	0.168

Table 7-10: Predicted Average Total Lead Concentration and Annual Load

Site Conditions	Average Annual Tot. Pb Concentration (µg/L)	Average Annual Tot. Pb Load (lbs/yr)
Existing	1	0.08
Developed with PDFs	3	0.1
Change	2	0.02

Table 7-11: Predicted Average Annual Dissolved Zinc Concentration and Load

Site Conditions	Average Annual Dis. Zn Concentration (µg/L)	Average Annual Dis. Zn Load (lbs/yr)
Existing	8	0.06
Developed with PDFs	47	1.6
Change	39	1.54

Comparison with Water Quality Criteria: A narrative objective for toxic substances in the LA Basin Plan states: "all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life."

The CTR criteria are the applicable water quality objectives for protection of aquatic life. The CTR criteria are expressed for acute and chronic (4-day average) conditions; however, only acute conditions were considered to be applicable for stormwater discharges because the duration of stormwater discharge is consistently less than 4 days. The CTR criteria are calculated on the basis of the hardness of the receiving waters. Lower hardness concentrations result in lower, more stringent CTR criteria. The minimum hardness value (280 mg/L as $CaCO_3$) observed in the Santa Clara River at the USGS monitoring site at Bouquet Junction during wet weather was used as a conservative estimate; the mean observed hardness value was 310 mg/L as $CaCO_3$.

Comparison of the estimated runoff concentrations and the acute CTR criteria are shown in Table 7-12. Although the trace metal loadings and concentrations are predicted to increase, the

comparison of the post-developed with PDFs condition to the benchmark CTR values shows that all of the trace metal concentrations are well below the water quality criteria (Table 7-13). Predicted trace metal concentrations are generally within the range of observed concentrations in this reach of the Santa Clara River.

Table 7-12: Comparison of Predicted Trace Metal Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 9_E

Metal	Predicted Average Annual Concentration (µg/L)	California Toxics Rule Criteria[1] (µg/L)	Range of Observed[2] Concentrations in Santa Clara River Reach 9_E (µg/L)
Dissolved Copper (µg/L)	6	35	3.8 – 8.4
Total Lead (µg/L)	3	300	1.1 – 14.5
Dissolved Zinc (µg/L)	47	280	27 – 37

[1] Hardness = 280 mg/L, based on minimum observed value at USGS data in SCR at Bouquet Junction. Lead criteria is for total recoverable lead.
[2]Range of concentrations observed in the Santa Clara River during wet weather at LACPDW Mass Emission Station S29 (located 5 miles downstream of the Project).

Based on the comprehensive site design, source control, and treatment strategy and the comparison with the instream water quality monitoring data and benchmark CTR values, the Project will not have significant impacts resulting from trace metals.

7.1.6 Chloride

Comparison of Pre- and Post-Project Conditions: Table 7-13 shows the predicted average annual chloride concentration and load. Due to the conversion from open space to urban land-uses, annual chloride concentration and load is predicted to increase when compared to the existing conditions. This is in part due to the increases volume of runoff, the highly soluble nature of chlorides, and the difficulty in removing them from stormwater runoff.

Table 7-13: Predicted Average Annual Chloride Concentration and Load

Site Conditions	Average Annual Cl Concentration (mg/L)	Average Annual Cl Load (lbs/yr)
Existing	7	22
Developed with PDFs	8	399
Change	1	377

Comparison with Water Quality Criteria: The predicted chloride concentration in post-development Project runoff is compared to the LA Basin Plan water quality objective and the range of observed concentrations in Santa Clara River Reach 9_E in Table 7-15. The predicted average annual chloride concentration in stormwater runoff from the Project area (8 mg/L) is at the low end of the range of observed concentrations for this pollutant and is well below the Santa

Clara River Reach 9_E Basin Plan water quality objective and the TMDL waste load allocation for Santa Clara River Reach 7_E (100 mg/L for both). Based on the comprehensive site design, source control, and treatment control strategy, and comparison with benchmark receiving water criteria and instream monitoring data, the Project is not expected to have significant water quality impacts resulting from chloride.

Table 7-14: Comparison of Predicted Chloride Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 9_E

Pollutant	Predicted Average Annual Concentration (mg/L)	SCR Reach 7_E TMDL Waste Load Allocation & Basin Plan Water Quality Objective[1] (mg/L)	Range of Observed[2] Concentrations in Santa Clara River Reach 9_E (mg/L)
Chloride	8	100	2.6 – 120[3]

[1] There are no CTR criteria for chloride. This is the Basin Plan objective for SCR Reach 9_E.
[2]Range of concentrations observed in the Santa Clara River during wet weather at USGS Bouquet Junction station (located one mile downstream of the Project) and at LACPDW Mass Emission Station S29 (located 5 miles downstream of the Project).
[3]This value was observed in 1976.

7.2 Impact Assessment for Pollutants and Basin Plan Criteria Addressed Without Modeling

7.2.1 Turbidity

Turbidity is a measure of suspended matter that interferes with the passage of light through the water or in which visual depth is restricted (Sawyer et al, 1994). Turbidity may be caused by a wide variety of suspended materials, which range in size from colloidal to coarse dispersions, depending upon the degree of turbulence. In lakes or other waters existing under relatively quiescent conditions, most of the turbidity will be due to colloidal and extremely fine dispersions. In rivers under flood conditions, most of the turbidity will be due to relatively coarse dispersions. Erosion of clay and silt soils may contribute to in-stream turbidity (see discussion of hydromodification impacts in Section 7.8 below). Organic materials reaching rivers serve as food for bacteria, and the resulting bacterial growth and other microorganisms that feed upon the bacteria produce additional turbidity. Nutrients in runoff may stimulate the growth of algae, which also contribute to turbidity.

Discharges of turbid runoff are primarily of concern during the construction phase of development. Construction-related impacts are addressed in Section 7.6 below. The Construction Stormwater Pollution Prevention Plan must contain sediment and erosion control BMPs pursuant to the General Construction Permit, and those BMPs must effectively control erosion and discharge of sediment, along with other pollutants, per the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology

(BAT/BCT) standards[4]. Additionally, fertilizer control and non-visible pollutant monitoring and trash control BMPs in the SWPPP will combine to help control turbidity during the construction phase.

In the post-development condition, placement of impervious surfaces will serve to stabilize soils and to reduce the amount of erosion that may occur from the Project area during storm events, and will therefore decrease turbidity in the runoff from the Project area (see also hydromodification impacts discussed in section 7.8 below). Project PDFs, including source controls (such as common area landscape management and common area litter control) and treatment control BMPs in compliance with the SUSMP requirements, will prevent or reduce the release of organic materials and nutrients (which might contribute to algal blooms) to receiving waters. As shown in Section 7.1 above, post-development nutrients in runoff are not expected to cause significant water quality impacts. Based on implementation of the Project PDFs and the construction-related controls outlined in Section 7.6, runoff discharges from the Project will not cause increases in turbidity which would result in adverse affects to beneficial uses in the receiving waters. Based on these considerations, the water quality impacts of the Project on turbidity are considered less than significant.

7.2.2 Pesticides

Pesticides can be of concern where past farming practices involved the application of persistent organochlorine pesticides. Legacy pesticides Chlordane, Dieldrin, DDT, and Toxaphene are of particular concern, as TMDLs have been established for these pesticides in the Santa Clara River estuary, approximately 49 miles downstream of the Project and this intermittent reach of the river. Historical pesticides should no longer be discharged in the watershed except in association with erosion of sediments to which these pollutants may have adhered in the past. Site development will stabilize soils and prevent their transport from the Project site, actually reducing the potential for discharge of sediments to which legacy pesticides may have adsorbed in pre-development conditions.

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[4] BAT/BCT are Clean Water Act technology-based standards that are applicable to construction site stormwater discharges. Federal law specifies factors relating to the assessment of BAT including: age of the equipment and facilities involved; the process employed; the engineering aspects of the application of various types of control techniques; process changes; the cost of achieving effluent reduction; non-water quality environmental impacts (including energy requirements); and other factors as the Administrator deems appropriate. Clean Water Act §304(b)(2)(B). Factors relating to the assessment of BCT include: reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived; comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources; the age of the equipment and facilities involved; the process employed; the engineering aspects of the application of various types of control techniques; process changes; non-water quality environmental impact (including energy requirements); and other factors as the Administrator deems appropriate. Clean Water Act §304(b)(4)(B). The Administrator of U.S. EPA has not issued regulations specifying BAT or BCT for construction site discharges.

In the post-developed condition, pesticides will be applied to common landscaped areas and residential lawns and gardens. Pesticides that have been commonly found in urban streams include the organophosphate pesticides chlorpyrifos and diazinon (Katznelson and Mumley, 1997). However, only 0 to 13% of the samples in the LA County database had detectable levels of diazinon (depending on the land use) while level of chlorpyrifos were below detection limits for all land uses in all samples taken between 1994 and 2000 (LA County, 2000). Other pesticides presented in the database were seldom measured above detection limits. Furthermore, these data represent flows from areas without treatment controls, unlike the proposed Project, which does incorporate treatment control Project design features.

Diazinon and chlorpyrifos (commonly used urban pesticides) will not be used for landscape maintenance in the post-development conditions due to the USEPA ban of diazinon and chlorpyrifos (commonly used urban pesticides) for most urban applications (USEPA, June, 2002a[5]).

Source control measures such as education programs for owners, occupants, and employees in the proper application, storage, and disposal of pesticides are the most promising strategies for controlling the pesticides that will be used post-development. Structural treatment controls are less practical because of the variety of pesticides and wide range of chemical properties that affect their ability to treat these compounds. However, most pesticides, including legacy pesticides that may be present at the site, are relatively insoluble in water and therefore tend to adsorb to the surfaces of sediment, which will be stabilized with development, or if eroded, will be settled or filtered out of the water column in the water quality treatment PDFs. Thus, filtration in the bioretention and vegetated swales should achieve some removal of pesticides from stormwater as TSS is reduced.

For common area landscaping in commercial areas, multi-family residential areas, and parks, an Integrated Pest Management (IPM) Program will be incorporated. The goal of an IPM is to keep pest levels at or below threshold levels, reducing risk and damage from pest presence, while eliminating the risk from the pest control methods used. IPM programs achieve these goals through the use of low risk management options by emphasizing use of natural biological

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[5] Changes to the use of chlorpyrifos include reductions in the residue tolerances for agricultural use, phasing out nearly all indoor and outdoor residential uses, and also stopping non-residential uses where children may be exposed. Residential use accounts for around 90% of total chlorpyrifos (USEPA, June 2002a). Retail sales of chlorpyrifos were stopped by December 31, 2001, and structural (e.g. construction) uses will be phased out by December 31, 2005. Some continued uses will be allowed, for example public health use for fire ant eradication and mosquito control will be permitted by professionals.

Permissible uses of diazinon will also be restricted. All indoor uses are prohibited (as of 12/2002) and retailers were required to end sales for indoor use on December, 2002. All outdoor non-agricultural uses were phased out by December 31, 2004. The use of diazinon for many agricultural crops has been eliminated (USEPA 2001), while some use of this chemical will continue to be permitted for some agricultural activities.

methods and the appropriate use of selective pesticides. IPM programs also incorporate environmental consideration by implementing procedures that minimize intrusion and alteration of biodiversity in ecosystems.

While pesticides are subject to degradation, they vary in how long they maintain their ability to eradicate pests. Some break down almost immediately into nontoxic byproducts, while others can remain active for longer periods of time. While pesticides that degrade rapidly are less likely to adversely affect non-targeted organisms, in some instances it may be more advantageous to apply longer-lasting pesticides if it results in fewer applications or smaller amounts of pesticide use. As part of the Integrated Pest Management program, careful consideration will be made as to the appropriate type of pesticides for use on the Project site. While pesticide use is likely to occur due to maintenance of landscaped areas, particularly in the residential portions of the development, careful selection, storage and application of these chemicals for use in common areas per the IPM Program following LAUSD standards (set forth in Appendix E), will help prevent adverse water quality impacts from occurring. Additionally, as discussed above, removal of sediments in the PDFs will also remove sediment-adsorbed pesticides.

Based on the incorporation of site design, source control, and treatment control BMPs pursuant to SUSMP requirements, potential post-development impacts associated with pesticides are expected to be less than significant.

Transport of legacy pesticides adsorbed to existing site sediments may be a concern during the construction phase of development. Construction-related impacts are addressed in Section 7.6 below. The Construction Stormwater Pollution Prevention Plan must contain sediment and erosion control BMPs pursuant to the General Construction Permit, and those BMPs must effectively control erosion and the discharge of sediment along with other pollutants per the BAT/BCT standards. Based on these sediment controls construction-related impacts associated with pesticides are expected to be less than significant.

7.2.3 Pathogens

Pathogens are viruses, bacteria, and protozoa that can cause illness in humans. Identifying pathogens in water is difficult as the number of pathogens is exceedingly small requiring sampling and filtering large volumes of water. Traditionally, water managers have relied on measuring "pathogen indicators", such as total and fecal coliform, as an indirect measure of the presence of pathogens. Although such indicators were considered reliable for sewage samples, indicator organisms are not necessarily reliable indicators of viable pathogenic viruses, bacteria, or protozoa in stormwater because coliform bacteria, in addition to being found in the digestive systems of warm-blooded animals, are also found in plants and soil. Moreover, certain pathogen indicators can multiply in the field if the substrate, temperature, moisture, and nutrient conditions are suitable. In a review of the Los Angeles Basin Plan Administrative Record, Paulsen and List summarized the debate over the use of pathogenic indicators and pointed out that scientific studies show no correlation between pathogens and therefore may not indicate a significant

potential for causing human illness (Paulsen and List, 2005, provided in Appendix D). In a recent field study conducted by Schroeder et. al., pathogens (in the form of viruses, bacteria, or protozoa) were found to occur in 12 of 97 samples taken, but the samples that contained pathogens did not correlate with the concentrations of indicator organisms (Schroeder et. al. 2002).

There are numerous sources of pathogen indicators, including birds and other wildlife, domesticated animals and pets, and plant matter and soils. Human-related sources may include poorly functioning septic systems, cross-connections between sewer and storm drains, and the utilization of outdoor areas for human waste disposal by people without access to indoor sanitary facilities.

There are extensive studies in which samples have been collected and analyzed for bacteria. Almost all of these data do not distinguish bacteria that may result from new development versus bacteria from other sources. Runoff from new development is just one of many potential sources of bacteria in urban runoff. Urban runoff reflects both anthropogenic and natural sources, and consists of runoff from existing development, new development, and open space or vacant land. The large majority of existing development areas that contribute runoff into the monitored channels of Los Angeles County and other areas do not have the myriad of Project design features that have been incorporated into the proposed Project, see further discussions below. Consequently, it is likely that runoff from the proposed Project will not contain the same elevated levels of bacteria found in other urban runoff studies.

Available studies do not uniformly suggest that development increases indicator bacteria in runoff. For example, the City of San Diego currently monitors 20 shoreline stations within Mission Bay. Analysis of the 7,300 samples collected between 1987 and 1994 indicated that the highest geometric mean densities of total coliform, fecal coliform, and enterococcus occurred from December through March, which are historically the wettest months of the year in San Diego (Schiff and Kinney, 2000). Differences in mean densities between winter and summer months ranged over two orders of magnitude. The data also indicated that geometric densities for total coliform, fecal coliform, and enterococcus were always higher in wet weather samples than in dry weather samples. In a related study, 22 out of the 89 storm drain outfalls that discharge into Mission Bay were sampled during wet and dry weather. Only half of the storm drains contained measurable densities of indicator bacteria during dry weather while all 22 storm drains exceed water quality objectives during wet weather. The data also showed that indicator bacteria densities were as high from open space at the head of the watershed as at the mouth of the bay, indicating similar indicator bacteria contributions from urban and non-urban sources (Schiff and Kinney, 2000).

In addition to the Mission Bay data, the USEPA has compiled an extensive stormwater database with data from 65 programs in 17 states throughout the United States (Pitt et al, 2003). The data indicate that median fecal coliform concentrations range from about 4,500 to 7,700 MPN/100mL

for a range of commercial and residential land uses (land areas generally not having the type of source and treatment controls incorporated into the proposed Project and thus not indicative of runoff from the proposed Project), compared to a median value of around 3,000 MPN/100 mL for open space and vacant land. These data indicate that wildlife, plants and/or soils can be a very important source of pathogens and/or pathogen indicators such as fecal coliform. The Project, by converting some open land use to urban land use, would potentially reduce the pathogen contribution associated with such open space, including some terrestrial wildlife, plant matter, and soils. Additionally, another study, conducted by PBS&J in coastal watersheds near Laguna Beach in Orange County (PBS&J, 1999) found that indicator bacteria concentrations in receiving waters downstream from developed/urban watersheds were essentially the same concentrations as in receiving waters downstream from undeveloped watersheds. These studies support the conclusion that the development of the proposed Project is not expected to result in appreciably higher indicator bacteria levels in receiving waters relative to undeveloped conditions.

Additionally, Paulsen and List (Flow Science, 2005) found that indicator bacteria concentrations in receiving waters downstream from developed/urban watersheds were essentially the same concentrations as in receiving waters downstream from undeveloped watersheds. This study support the conclusion that the development of the proposed Project is not expected to result in appreciably higher indicator bacteria levels in receiving waters relative to undeveloped conditions.

This conclusion that urban development is no different than undeveloped areas in producing elevated bacteria levels is also supported by studies on runoff from areas in Northern Coastal Orange County, Southern Orange County, Los Angeles and San Diego. Studies by Schiff et al. and Grant et al. indicate that runoff from urban areas may not be the sole or even primary source of elevated bacteria in receiving waters, but that such elevated levels may be caused by non-human sources, such as terrestrial wildlife and birds or even local sediments (Schiff & Kinney, 2001 (evaluating Mission Bay in San Diego) and Grant et al., 2001 (evaluating Huntington Beach in Orange County)). Furthermore, data collected from undeveloped watersheds or watersheds with little development indicate that bacterial standards are often exceeded when runoff comes from open space areas (Moore, 2001 and LADPW, 2001). For example, data obtained by the Serrano Water District during 2003 in a largely undeveloped watershed, Santiago Creek Reach 3, which is located upstream of Irvine Lake in Orange County, showed a total coliform concentration of 80,000 MPN/100 mL (compared to MUN water quality criteria of 100 MPN/100 mL) and a corresponding concentration of fecal coliform of 700 MPN/100 mL (compared to REC 1 water quality criteria of 400 MPN/100 mL). For a review of the history of water quality bacterial standard development, as well as a review of the LA Basin Plan in relation to these standards, a report by Paulsen and List (2003) is attached to this document as Attachment D. Paulsen and List compare bacterial standards with undeveloped land use data relevant to the Los Angeles Area, and suggest that bacterial

standards for river reaches whose beneficial uses do not include primary human contact recreation may be unnecessary.

With particular regard to dry weather flows from urban areas, information from the MEC studies in Mission Bay (MEC, Mission Bay Clean Beaches Initiative Final Report (2004)) and Grant studies supports the idea that the Project will not significantly impact bacteria levels in receiving waters. The MEC study indicates that even with diversion of dry weather urban flows during the summer dry season, indicator bacteria samples in receiving waters still were not at acceptable regulatory levels. Moreover, the Grant study found that significant bacterial die off occurred before dry weather flows reached receiving waters, leading the authors to conclude that other sources (including avian sources) were the predominant source of bacteria to Huntington Beach State Park beaches and that dry weather flows were less significant than other sources of bacteria to the receiving waters.

For the proposed Project, significant efforts have been made to reduce dry weather flows through Project design features such as efficient irrigation systems, use of natural landscaping palettes, and infiltration/evaporation in treatment control facilities, making it unlikely that dry weather flows will persist as far as receiving waters. Even in the unlikely event that dry weather flows from the proposed Project were to reach receiving waters, based upon the Grant and Schiff studies, it is not likely that such dry weather flows would noticeably increase bacteria concentrations in the receiving waters.

Based on findings of these studies, it is possible that predominant sources of bacteria in the Project's receiving waters (in either existing conditions or proposed Project conditions) may be soils, birds, or other wildlife found either within or on the waterbodies themselves or in the watersheds tributary to the receiving waters. These studies also suggest that the elevated levels of bacteria already present in receiving waters in the existing condition (see Existing Water Quality, Section 2-5) will not be altered substantially by the development of the proposed Project. Also, as discussed in greater detail below, non-human sources of bacterial indicators may not reflect human health concerns pertinent to contact recreation use designations of local receiving waters. For all of these reasons, the LARWQCB determined in their consideration of bacteria TMDLs for Santa Monica Bay that numeric standards were inappropriate for controlling stormwater and non-point source runoff water quality.

Regarding the use of fecal coliform as a bacterial indicator, the fecal coliform standards contained in the Los Angeles Basin Plan were recommended in 1968 and were based upon epidemiological studies conducted in 1948, 1949, and 1950. Several studies conducted since 1968 have questioned these criteria, recognizing that high levels of pathogen indicators due to natural sources of pollution do occur, and recommended use of alternatives (EPA, 1986; EPA, 1972). Subsequent studies initiated by the USEPA were conducted at sites contaminated either with pollution from multiple or single point sources and found that fecal coliform densities showed "little or no correlation" to gastrointestinal illness rates in swimmers (Dufour, 1984).

Thus, EPA in 1986 proposed criteria for contact recreation based upon *E. coli* and/or enterococci rather than fecal coliform (EPA, 1986)

Bacterial indicators in receiving water samples are not an adequate proxy for determining significant water quality impacts of proposed development. Because measurements of indicator bacteria are not direct measurements of pathogens (and associated human health risk), many epidemiological studies have found conflicting results, and often fail to indicate a consistent relationship between a given bacteria indicator and a human-related illness (e.g., gastrointestinal illness). (Fleisher, et al., 1996). Furthermore, a comprehensive survey of the epidemiological literature found that viral indicators were significantly stronger predictors of gastrointestinal illness than bacteria indicators (Wade, et al., 2003). Several additional studies also indicate that public health risk (relevant to human-contact recreational uses) does not correlate with elevated levels of bacterial indicators in receiving waters, even in waters impacted by urban runoff (Schroeder, 2002). The Schroeder study analyzed highway runoff and found no correlation between the measured indicator organisms and the presence of pathogens. Similarly, a study of both pathogens and indicator bacteria in Southern California coastal waters impacted by urban runoff indicated that exceedances of bacteria indicators did not correlate with the presence of human adenoviruses and thus may not have indicated a human health risk (S. Jiang, et al., 2001). The USEPA also has indicated that non-human sources of fecal contamination need not be considered in determinations of water quality standard attainment (EPA, 2004); meaning that if non-human bacteria sources are shown to be minimal and exposure to such sources based on epidemiological studies do not appear to result in human health risks, bacteria standards may be interpreted to relate only to human-derived bacteria. The World Health Organization (WHO) has adopted a similar approach, recognizing that "due to the 'species barrier,' the density of pathogens of public health importance is generally assumed to be less in aggregate in animal excreta than in human excreta which may therefore represent a significantly lower risk to human health" (WHO, 2003). Based on the information discussed above, the reliance on bacterial indicators to gage potential impacts human health-related beneficial uses in the Project's receiving waters would not be prudent.

It is recognized that natural levels of bacteria are present in the Project area receiving waters and that control of such natural sources of bacteria is neither required nor desired by regulatory authorities. Both the San Diego and Los Angeles Regional Water Quality Control Boards have made provisions for background sources of bacteria from undeveloped portions of watersheds in their Bacteria Total Maximum Daily Loads (LARWQCB, 2002; San Diego RWQCB, 2004). To illustrate, the Los Angeles RWQCB stated that it was not their intent to "require treatment of natural sources of bacteria from undeveloped areas" as removal of such natural sources of bacteria from receiving waters "could adversely affect valuable aquatic life and wildlife beneficial uses supported by natural water bodies in the Region." Thus, the Project design features for the proposed Project have appropriately focused on the control of potential anthropogenic bacteria sources.

The primary sources of fecal coliforms from the Project would likely be pet wastes, and wildlife or vectors living in the storm drain itself. Other sources of pathogens and pathogen indicators, such as cross connections between sanitary and storm sewers, and other human-derived bacteria, are unlikely given the new systems to be installed with the Project, modern sanitary sewer installation methods, and inspection and maintenance practices.

The levels of bacteria in runoff from the proposed Project will be reduced by virtue of:

- Source Controls, and
- Treatment Controls.

The most effective means of controlling pet wastes as a source of pathogens is through source control, specifically education of pet owners, and providing products and disposal containers that encourage and facilitate cleaning up after pets. Storm drain cleaning practices help to remove pathogens that may have accumulated in the storm drain system. The bioretention areas and vegetated swales will have the effect of reducing the volume of stormwater and dry weather runoff from the proposed Project area, thereby reducing any associated bacteria.

In summary, the proposed Project, consistent with the SUSMP requirements, includes a comprehensive set of source and treatment control PDFs selected to manage pathogen indicators which, in combination, will reduce pathogen indicator levels in runoff from the proposed Project. With this series of PDFs, the Project will not result in appreciable changes in pathogen indicator levels in the receiving waters compared to existing conditions, and potential bacteria-related water quality impacts, including those associated with total coliform, are considered less than significant.

7.2.4 Hydrocarbons

Various forms of hydrocarbons (oil and grease) are common constituents associated with urban runoff; however, these constituents are difficult to measure and are typically measured with grab samples, making it difficult to develop reliable EMCs for modeling. Based on this consideration, hydrocarbons were not modeled but are addressed qualitatively.

Hydrocarbons are a broad class of compounds, most of which are non-toxic. Hydrocarbons are hydrophobic (low solubility in water), have the potential to volatilize, and most forms are biodegradable. A subset of hydrocarbons, Polynuclear Aromatic Hydrocarbons (PAHs) can be toxic depending on the concentration levels, exposure history, and sensitivity of the receptor organisms. Of particular concern are those PAH compounds associated with transportation-related sources.

Although the concentration of hydrocarbons in runoff is expected to increase slightly under post-development Project conditions due to the increase in roadways, driveways, parking areas, and vehicle use, the Project PDFs are expected to prevent appreciable increases in hydrocarbon

concentrations from leaving the Project site. Source control PDFs that address petroleum hydrocarbons include educational materials on used oil programs, carpooling, and public transportation alternatives to driving; BMP maintenance; and street sweeping private streets. Although vehicle emissions and leaks are the primary source of hydrocarbons in urban areas, it is anticipated that vehicles in the proposed development will in general be well maintained and newer models which will help to limit emissions and leaks. Lastly, the parking lot site design, source controls, treatment BMPs and vegetation and soils within the treatment control PDFs will adsorb the low levels of emulsified oils in stormwater runoff, preventing discharge of hydrocarbons and visible film in the discharge or the coating of objects in the receiving water.

The majority of PAHs in stormwater adsorb to the organic carbon fraction of particulates in the runoff, including soot carbon generated from vehicle exhaust (Ribes et al, 2003). For example, a stormwater runoff study by Marslek et. al. (1997) found that the dissolved-phase PAHs represented less than 11 percent of the total concentration of PAHs. Consequently, the bioretention areas and vegetated swales proposed as PDFs, which are designed to treat pollutants through settling, filtration, and infiltration, will be effective at treating PAHs.

Los Angeles County conducted PAH analyses on 27 stormwater samples from a variety of land uses in the period 1994-2000 (Los Angeles County, 2000). For those land uses where sufficient samples were taken and were above detection levels to estimate statistics, the mean concentrations of individual PAH compounds ranged from 0.04 to 0.83 µg/L. The reported means were less than acute toxicity criteria available from the literature (Suter and Tsao, 1996). Moreover, the Los Angeles County data do not account for any treatment, whereas the treatment in the Project's PDFs should result in a reduction in hydrocarbon concentrations inclusive of PAHs. This makes it very unlikely that impacts will occur to the receiving water due to hydrocarbon loads or concentrations. On this basis, the effect of the Project on petroleum hydrocarbon levels in the receiving waters post-development is considered less than significant.

During the construction phase of the Project, hydrocarbons in site runoff could result from construction equipment/vehicle fueling or spills. Construction related impacts are addressed in Section 7.6 below. However, pursuant to the General Construction Permit, the Construction Stormwater Pollution Prevention Plan will include BMPs that address proper handling of petroleum products on the construction site, such as proper petroleum product storage and spill response practices, and those BMPs must effectively prevent the release of hydrocarbons to runoff per the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology standards. PAH that are adsorbed to sediment during the construction phase would be effectively controlled via the erosion and sediment control BMPs. For these reasons, construction-related impacts related to hydrocarbons on water quality are considered less than significant.

7.2.5 Trash and Debris

Urban development tends to generate significant amounts of trash and debris. Trash refers to any human-derived materials including paper, plastics, metals, glass and cloth. Debris is defined as any organic material transported by stormwater, including leaves, twigs, and grass clippings (DLWC, 1996). Debris can be associated with the natural condition. Trash and debris is often characterized as material retained on a 5-mm mesh screen. It contributes to the degradation of receiving waters by imposing an oxygen demand, attracting pests, disturbing physical habitats, clogging storm drains and conveyance culverts and mobilizing nutrients, pathogens, metals, and other pollutants that may be attached to the surface. Sources of trash in developed areas can be both accidental and intentional. During wet weather events, gross debris deposited on paved surfaces can be transported to storm drains, where it can be eventually discharged to receiving waters. Trash and debris can also be mobilized by wind and transported directly into waterways. Trash and debris can impose an oxygen demand on the water body as organic matter decomposes.

Urbanization could significantly increase trash and debris loads if left unchecked. However, the Project PDFs, including source control and treatment BMPs, will minimize the adverse impacts of trash and debris. Source controls such as street sweeping, public education, fines for littering, and storm drain stenciling can be effective in reducing the amount of trash and debris that is available for mobilization during wet and dry weather events. Common area litter control will include a litter patrol, covered trash receptacles, emptying of trash receptacles in a timely fashion, and noting trash violations by tenants/homeowners or businesses and reporting the violations to the owner/HOA for investigation. Catch basin inserts will be provided for parking lots. The Project's PDFs will remove or prevent the release of floating materials, including solids, liquids, foam, or scum, from runoff discharges and will prevent impacts on dissolved oxygen in the receiving water due to decomposing debris. Based on these considerations, post-development trash and debris is not expected to significantly impact the receiving waters of the Project.

During the construction phase of the Project, trash and debris have the potential for buildup due to lack of proper Contractor maintenance. Per the General Construction Permit, the SWPPP for the site must contain BMPs for trash control (trash racks on outlets, catch basin inserts, good housekeeping practices, etc.). Compliance with the Permit Requirements and inclusion of these BMPs, meeting BAT/BCT, included in the SWPPP will mitigate impacts from trash and debris to a level less than significant. See Section 7.6 below for a full discussion of Construction Related Impacts.

7.2.6 Methylene Blue Activated Substances (MBAS)

MBAS, which is related to the presence of detergents in runoff, may be incidentally associated with urban development due to commercial and/or residential vehicle washing or other outdoor

washing activities. Surfactants disturb the surface tension which affects insects and can affect gills in aquatic life.

The presence of soap in runoff from the Project will be controlled through the source control PDFs, including a public education program on residential and charity car washing. Other sources of MBAS, such as cross connections between sanitary and storm sewers, are unlikely given modern sanitary sewer installation methods and inspection and maintenance practices. Therefore, MBAS are not expected to significantly impact the receiving waters of the proposed Project.

7.3 MS4 Permit Requirements for New Development as Defined in the SUSMP

Project Design Features (PDFs) include site design, source control, and treatment control BMPs in compliance with the SUSMP requirements, as described in Section 5.1 and summarized in Table 5-1. Treatment control PDFs will treat runoff from the entire Project area. Sizing criteria contained in the MS4 Permit and the SUSMP requirements will be met for all treatment control BMPs.

In summary, the proposed site design, source control, and treatment control PDFs have been selected for the Project based on:

- effectiveness for addressing pollutants of concern in runoff from the Project, resulting in insignificant water quality impacts;
- sizing and outlet design consistent with the MS4 Permit and SUSMP requirements;
- additional design guidance consistent with the California BMP Handbook: New Development and Redevelopment, other literature, and best professional judgment;
- hydrologic and water quality modeling to verify performance;
- meeting mean annual percent capture criteria contained in the California BMP New Development Manual; and
- providing specific O&M requirements to inspect and maintain the facilities.

On this basis, the proposed PDFs meet the MS4 Permit requirements for new development.

7.4 Construction-related Impacts

The potential impacts of construction activities, construction materials, and non-stormwater runoff on water quality focus primarily on sediment (TSS and turbidity). Construction-related activities that are primarily responsible for sediment releases are related to exposing soils to potential mobilization by rainfall/runoff and wind. Such activities include removal of vegetation

from the site, grading of the site, and trenching for infrastructure improvements. Environmental factors that affect erosion include topographic, soil, and rainfall characteristics. Non sediment-related pollutants that are also of concern during construction relate to construction materials and non-stormwater flows and include waste construction materials; chemicals, liquid products, petroleum hydrocarbon products used in building construction or the maintenance of heavy equipment; and concrete-related waste streams.

Construction impacts due to the Project development, including the in-stream construction elements of the Project, will be minimized through compliance with the General Construction Permit. This permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which must include erosion and sediment control BMPs that will meet or exceed measures required by the General Construction Permit, as well as BMPs that control the other potential construction-related pollutants. A SWPPP will be developed as required by, and in compliance with, the General Construction Permit and the County of Los Angeles Standard Conditions. Erosion control BMPs are designed to prevent erosion, whereas sediment controls are designed to trap sediment once it has been mobilized. The General Permit requires the SWPPP to include a menu of BMPs to be selected and implemented based on the phase of construction and the weather conditions to effectively control erosion and sediment to the BAT/BCT. BMPs to be included in this menu include, among others: slope stabilization using rock or vegetation, re-vegetation, hydro-seeding or using tackifiers on exposed areas and stockpiles, installation of energy dissipators, drop structures, catch basin inlet protection, construction materials management, and cover and containment of construction materials and wastes. This permit requires BMP selection, implementation, and maintenance during the construction phase of development.

The significance criteria for the construction phase of the Project is implementation of BMPs consistent with Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology (BAT/BCT), as required by the Construction General Permit and the general waste discharge requirements in the Dewatering General Permit. The Project will reduce or prevent erosion and sediment transport and transport of other potential pollutants from the Project site during the construction phase through implementation of BMPs meeting BAT/BCT in order to prevent or minimize environmental impacts and to ensure that discharges during the construction phase of the Project will not cause or contribute to any exceedance of water quality standards in the receiving waters. These BMPs will assure effective control of not only sediment discharge, but also of pollutants associated with sediments, such as and not limited to nutrients, heavy metals, and certain legacy pesticides, including legacy pesticides.

Construction on the Project site may require dewatering and non-stormwater related discharges. For example, dewatering may be necessary for construction of bank stabilization and outfall protection, if groundwater is encountered during grading, or to allow discharges associated with testing of water lines, sprinkler systems and other facilities.

In general, the General Construction Permit authorizes construction dewatering activities and other construction related non-stormwater discharges as long as they (a) comply with Section A.9 of the General Permit; (b) do not cause or contribute to violation of any water quality standards, (c) do not violate any other provisions of the General Permit, (d) do not require a non-stormwater permit as issued by some RWQCBs, and (e) are not prohibited by a Basin Plan provision. Full compliance with applicable local, state and federal water quality standards by the applicant would assure that potential impacts from dewatering discharges are not significant.

An additional Project design feature will be implemented to protect receiving waters from dewatering and construction related non-stormwater discharges. Such discharges will be implemented in compliance with the Los Angeles RWQCB's General Waste Discharge Requirements (WDRs) under Order No. R4-2003-0111, NPDES No. CAG994004 governing construction-related dewatering discharges within the Project development areas. Typical BMPs for construction dewatering include infiltration of clean groundwater; on-site treatment using suitable treatment technologies; on-site or transport offsite for sanitary sewer discharge with local sewer district approval; or use of a sedimentation bag for small volumes of localized dewatering. Compliance with these WDRs constitutes a PDF for the Project, further assuring that the impacts of these discharges are not significant.

On this basis, the impact of construction-related runoff from the Project is considered less than significant.

7.5 Pollutant Bioaccumulation

Certain pollutants have the potential to accumulate in treatment BMP vegetation and soils, potentially increasing the risk of exposure to wildlife and the food chain. Factors that could affect the extent of potential bioaccumulation, include:

- The bioavailability of the pollutant
- Conditions in the soils (e.g., pH, acid-volatile sulfide concentration, organic content) that affect the form and bioavailability of the pollutant;
- The efficiency by which pollutants in the soils enter the plant community, the storage of these pollutants in plant tissues that are edible, and the utilization of the plants as a food source by animals;
- The type of habitats, organisms attracted to these habitats, and their feeding habits; and
- System design and maintenance

The potential for bioaccumulation impacts from the proposed bioretention and vegetated swale facilities will be minimal. Since the site is largely impervious, very little coarse solids and associated pollutants are expected to be generated. The vegetation in the facilities will trap

sediments and pollutants in the soils, which contain bacteria that metabolize and transform trace metals, therefore reducing the potential for these pollutants to enter the food chain. The facilities do not provide open water areas and are not likely to attract waterfowl.

In the literature, the primary pollutants that are of concern with regard to bioaccumulation are mercury and selenium. However, selenium and mercury are not naturally present at levels of concern in this watershed and will not be introduced by the Project. Therefore, bioaccumulation of selenium and mercury is not expected.

Bioaccumulation of pollutants in the Santa Clara River is not of concern due to the low concentrations of pollutants, below the benchmark Basin Plan objectives and CTR criteria, predicted in the treated runoff. Also, sediments in the Santa Clara River are transported downstream in the wet season by storm flows, and therefore do not accumulate.

On this basis, the potential for bioaccumulation and adverse effects on waterfowl and other species is considered less than significant.

7.6 Dry Weather Runoff

While there are no specific requirements in the MS4 Permit and the SUSMP requirements to treat dry-weather discharges from the Project area, pollutants in dry weather flows could also be of concern because dry weather flow conditions occur throughout a large majority of the year, and because some of the TMDLs in downstream reaches of the Santa Clara River are applicable for dry weather conditions (e.g., nutrients and chloride).

Dry weather flows are typically low in sediment because the flows are relatively low and coarse suspended sediment tends to settle out or is filtered out by vegetation. As a consequence, pollutants that tend to be associated with suspended solids (e.g., phosphorus, some bacteria, some trace metals, and some pesticides) are typically found in very low concentrations in dry weather flows. The focus of the following discussion is therefore on constituents that tend to be dissolved, e.g., nitrate and trace metals, or constituents that are so small as to be effectively transported, e.g., pathogens and oil and grease.

In order to minimize the potential generation and transport of dissolved constituents, landscaping in public and common areas will utilize drought tolerant vegetation that requires little watering and chemical application. Landscape watering in common areas, commercial areas, multiple family residential areas, and in parks will use efficient irrigation technology utilizing evapotranspiration sensors to minimize excess watering.

In addition, educational programs and distribution of materials (source controls) will emphasize appropriate car washing locations (at commercial car washing facilities or the car wash pad in the multi-family residential areas) and techniques (minimizing usage of soap and water), encourage low impact landscaping and appropriate watering techniques, and discourage

driveway and sidewalk washing. Illegal dumping will be discouraged by stenciling storm drain inlets and posting signs that illustrate the connection between the storm drain system and the receiving waters and natural systems downstream.

The bioretention areas and vegetated swales will provide treatment for and infiltrate dry weather flows and small storm events. Water cleansing is a natural function of vegetation, offering a range of treatment mechanisms. Sedimentation of particulates is the major removal mechanism. However the performance is enhanced as plant materials allow pollutants to come in contact with vegetation and soils containing bacteria that metabolize and transform pollutants, especially nutrients and trace metals. Plants also take up nutrients in their root system. Some pathogens would be removed through ultraviolet light degradation. Any oil and grease will be effectively adsorbed by the vegetation and soil within the low flow wetland vegetation. Dry weather flows and small storm flows will infiltrate into the bottom of the basin after receiving treatment in the low flow wetland vegetation. The swales and bioretention basins will not be designed to have open pools of standing water.

The Orange County Public Health Laboratory conducted a monitoring study in 1998 in the San Juan Creek watershed to help determine the sources of pathogen indicators during dry weather conditions (Moore et al, 2002). Monitoring stations were located in the ocean, in creeks in the San Juan Creek watershed, and in storm drains. One finding of the study was that "the highest concentrations of fecal coliforms and *Enterococcus* were found in the storm drains as compared to the creeks and ocean sampling sites. Samples taken from creek sites distant to human habitat also had low to moderate levels of bacteria, suggestive of fecal contamination by non-human sources." The principal anthropogenic sources of pathogens into dry weather flows is leaking septic systems, cross-connections between sanitary sewers and storm drains, or leakage from the sanitary sewer system into groundwater, which feeds the dry and non-storm flows. However, the Project will be new development with new storm drains and sanitary sewer systems, which are expected to have minimal, if any, leakage.

The treatment control PDFs will infiltrate or evapotranspire all expected dry weather runoff from the Project (see Section 7.9.2 below). It is expected that no dry weather discharge will occur to the Santa Clara River from the Project. Based on source control PDFs reducing the amount of dry weather runoff and treatment control PDFs capturing and treating the dry weather runoff that does occur, the impact from dry weather flows is considered less than significant.

7.7 Summary of Surface Water Quality Impacts

7.7.1 Direct Impacts

With the exception of TSS concentrations and nitrate+nitrite-N concentrations, concentrations and loads of modeled constituents are predicted to increase under proposed conditions when compared to existing conditions. The modeled concentrations in runoff from developed areas with PDFs are below all benchmark water quality objectives and criteria and TMDL waste load

allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy and compliance with SUSMP, General Construction Permit and General De-Watering Permit requirements.

Concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may or may not increase under proposed conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of a comprehensive site design and a source control and treatment control strategy in compliance with the MS4 Permit Requirements, General Construction Permit and General De-Watering Permit requirements. Therefore potential impacts from the Project on receiving water quality are not expected to be significant.

7.7.2 Cumulative Impacts

As discussed above, the anticipated quality of effluent expected from the Project's PDFs will not contribute loads or concentrations of pollutants of concern that would be expected to cause or contribute to a violation of the water quality standards in the Project's receiving waters. Therefore, the Project's incremental effects on surface water quality are not expected to be significant.

The Project's surface runoff water quality, after PDFs, both during construction and post-development, is predicted to comply with adopted regulatory requirements that are designed by the LARWQCB to assure that regional development does not adversely affect water quality, including MS4 Permit and SUSMP requirements; General Construction Permit requirements; General Dewatering Permit requirements; and benchmark Basin Plan water quality objectives, CTR criteria, and TMDLs. Any future urban development occurring in the Santa Clara River watershed must also comply with these requirements. Therefore, cumulative impacts on surface water quality of receiving waters from the proposed Project and future urban development in the Santa Clara Watershed are addressed through compliance with the MS4 Permit and SUSMP requirements; General Construction Permit requirements; General Dewatering Permit requirements; and benchmark Basin Plan water quality objectives, CTR criteria, and TMDLs, which are intended to be protective of beneficial uses of the receiving waters. Based on compliance with these requirements designed to protect beneficial uses, cumulative water quality impacts are mitigated to a level that is less than significant.

7.8 Groundwater Impacts

7.8.1 Direct Groundwater Quality Impacts

Discharge from the Project's developed areas to groundwater will occur at three locations: (1) through general infiltration of irrigation water, (2) through incidental infiltration of urban runoff in the proposed treatment control PDFs after treatment, and (3) infiltration of urban runoff, after

treatment in the Project PDFs, in the Santa Clara River, which is the primary recharge zone for groundwater in the Santa Clara Valley. Groundwater quality will be fully protected through implement of the Project's site design, source control, and treatment control PDFs prior to discharge of Project runoff to groundwater.

The pollutant of concern with respect to groundwater is nitrate-N plus nitrite-N. The Basin Plan groundwater quality objective for nitrate-nitrogen plus nitrite-nitrogen is 10 mg/L (which is more stringent than the objective for nitrate-nitrogen alone (10 mg/L) and for nitrite-nitrogen alone (1 mg/L)). The predicted nitrate-nitrogen plus nitrite-nitrogen concentration in runoff after treatment in the Project PDFs is 0.8 mg/L, which is well below the groundwater quality objective. The typical irrigation water supply nitrate-nitrogen concentration is 0.63 mg/L, which is also well below the groundwater quality objective (CLWD, 2003).

On this basis, the potential for adversely affecting groundwater quality is considered less than significant.

7.8.2 Cumulative Groundwater Quality Impacts

As discussed above, the anticipated quality of stormwater runoff discharges from the Project's developed areas and irrigation to groundwater will not contribute loads or concentrations of pollutants of concern that would be expected to cause or contribute to a violation of the groundwater quality standards. Therefore, the Project's incremental effects on groundwater quality are not expected to be significant.

The Project's discharges to groundwater, after PDFs, both during construction and post-development, is predicted to comply with adopted regulatory requirements that are designed by the LARWQCB to assure that regional development does not adversely affect water quality, including MS4 Permit and SUSMP requirements; General Construction Permit requirements; General Dewatering Permit requirements; and benchmark Basin Plan groundwater quality objectives. Any future urban development occurring in the Santa Clara River watershed must also comply with these requirements. Therefore, cumulative impacts on groundwater quality from the proposed Project and future urban development in the Santa Clara Watershed are addressed through compliance with the MS4 Permit and SUSMP requirements, General Construction Permit requirements, General Dewatering Permit requirements, and benchmark Basin Plan groundwater quality objectives, which are intended to be protective of beneficial uses of the groundwater. Based on compliance with these requirements designed to protect beneficial uses, cumulative groundwater quality impacts are mitigated to a level that is less than significant.

7.8.3 Groundwater Recharge Impacts

Direct Project Impacts

In a groundwater basin, the effect of urbanization on recharge to underlying groundwater is dependent on land uses, water uses, vegetative cover, and geologic conditions. Groundwater

recharge from undeveloped lands occurs from precipitation alone, whereas areas that are developed for agricultural or urban land uses receive both precipitation and irrigation of vegetative cover. In an urban area, groundwater recharge occurs directly beneath irrigated lands and in drainages whose bottoms are not paved or cemented. A memorandum prepared by CH2M Hill entitled "Effect of Urbanization on Aquifer Recharge in the Santa Clarita Valley" (Appendix F) discusses the general effects of urbanization on groundwater recharge and the specific effects in the Santa Clarita Valley.

Currently the site is graded open space, and historically it has been used for dry land farming. As a result, in the existing condition recharge occurs within the project site from precipitation alone. On one hand, development of the site will introduce impervious surface over approximately 70 percent of the project site, which will tend to reduce recharge.

On the other hand, development of the site will increase runoff volume discharged after treatment to the Santa Clara River, whose channel is predominantly natural and consists of vegetation and coarse-grained sediments (rather than concrete). The porous nature of the sands and gravels forming the streambed will allow for significant infiltration to occur to the underlying groundwater. Also, the project will introduce landscaping, irrigation, and PDFs designed to infiltrate runoff. These project effects will increase groundwater recharge from the Project. On balance, it is likely that the project will result in a slight net increase in groundwater recharge in the project vicinity. See Appendix F, page 2.

All of the post-development urban runoff infiltrated into groundwater will have been treated in PDFs prior to infiltration. The slight increase in groundwater recharge is unlikely to noticeably affect water quality within the groundwater basin. Based on the above discussion, the Project's impact on groundwater recharge is considered less than significant.

Cumulative Impacts

Increased urbanization in the Valley has resulted in the irrigation of previously undeveloped lands. The effect of irrigation is to maintain higher soil moisture levels during the summer than would exist if no irrigation were occurring. Consequently, a greater percentage of the fall/winter precipitation recharges groundwater beneath irrigated land parcels than beneath undeveloped land parcels. In addition, urbanization in the Santa Clarita Valley has occurred in part because of the importation of State Water Project (SWP) water, which began in 1980. SWP water use has increased steadily, reaching nearly 44,500 acre-feet (AF) in 2003. Two-thirds of this water is used outdoors, and a portion of this water eventually infiltrates to groundwater. The other one-third is used indoors and is subsequently routed to local water reclamation plants (WRPs) and then to the Santa Clara River (after treatment). A portion of this water flows downstream out of the basin, and a portion infiltrates to groundwater.

Records show that groundwater levels and the amount of groundwater in storage were similar in both the late 1990s and the early 1980s, despite a significant increase in the urbanized area

during these two decades. This long-term stability of groundwater levels is attributed in part to the significant volume of natural recharge that occurs in the streambeds, which do not contain paved, urban land areas. On a long term historical basis, groundwater pumping volumes have not increased due to urbanization, compared with pumping volumes during the 1950s and 1960s when water was used primarily for agriculture. Also, the importation of SWP water is another process that contributes to recharge in the Valley. In summary, urbanization has been accompanied by long-term stability in pumping and groundwater levels, plus the addition of imported SWP water to the Valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater that is in storage within the Valley.

Based on the above discussion, the cumulative impact on groundwater recharge is considered less than significant.

7.9 Hydromodification Impacts

Development typically increases impervious surfaces on formerly undeveloped (or less developed) landscapes, reducing the capture and infiltration of rainfall. The result is that, as a watershed develops, a larger percentage of rainfall becomes runoff during any given storm. In addition, runoff reaches the stream channel more efficiently due to the development of storm drain systems, so that the peak discharge rates for rainfall events and floods are higher for an equivalent event than they were prior to development. These changes, in turn, affect the stability of natural drainages, including the physical and biological character of these drainages. This process, termed "hydromodification" (SCCWRP, 2005) is addressed in this section. Significant adverse hydromodification impacts are presumed to occur if the proposed Project would:

- Substantially alter the existing drainage pattern of a natural drainage, stream, or river in a manner that would cause substantial erosion, siltation, or channel instability; or
- Substantially increase the rates, velocities, frequencies, duration and/or seasonality of surface flows in a manner that causes channel instability or in a manner that harms sensitive habitats or species in natural drainages.

The only natural drainage channel that will receive flows from the project site is the Santa Clara River. Therefore this analysis addresses the potential for hydromodification impacts to the Santa Clara River as a result of the proposed project.

7.9.1 Wet Weather Flows

Direct Impacts

The project proposes development that would create impervious surface over approximately 70% or 23 acres of the 33.2 acre total site area.. It is estimated, based on the land use data

provided by LADPW, that the proposed Project will comprise 0.05 percent of the total impervious area in the watershed above the Project location at ultimate planned build-out for the watershed. See Section 4.4.3 above for information regarding adopted plans and projection used to derive build-out assumptions for the watershed.

The proposed Project includes several hydrologic source controls as hydromodification control PDFs that will substantially lessen any potential hydromodification impacts, as described below. The increase in impervious surface within the project area is expected to increase average annual stormwater runoff volume from the project area by approximately 14.3 acre-feet per year, taking into account volume reductions expected in the proposed treatment control swales and bioretention areas. Based on these volume increases, increases in stormwater runoff flow rates and duration of flows is expected as a result of the project.

Treatment Controls. The Project's treatment control BMPs will also serve as hydromodification control BMPs. Vegetated swales can provide volume reduction on the order of 20 to 30 percent through infiltration and evaporation. The Project also includes use of bioretention areas sized to capture and treat 80 percent of the average annual stormwater runoff from their tributary catchment and will not utilize underdrains. Thus, all water captured in these facilities will be effectively removed from the Project's stormwater discharges. Using conservative values for volume reduction, the treatment PDFs included in the Project are estimated to reduce the increase in average annual stormwater runoff volume by approximately 15 acre-feet per year, which is a 53 percent reduction of the predicted average post-development stormwater runoff volume. In addition these facilities will also receive and eliminate dry weather flows.

Site Design Practices. Site design PDFs that help to reduce the increase in runoff volume include routing of roof runoff to vegetated areas, use of native and drought tolerate plants in landscaped areas, and the use of efficient irrigation systems in common area landscaped areas. The volume reductions and hydromodification control achieved by these site design practices have not been considered in calculating the predicted increase in average annual stormwater runoff from the Project area due to development.

Peak Flow Control. The current Los Angeles County Interim Peak Flow Standard requires that all post development runoff from a 2-year, 24-hour storm not exceed the predevelopment peak flow rate, burned, from a 2-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cfs. Peak flow control of 2-year, 24-hour storm event will be achieved through runoff volume reduction occurring in the vegetated swales and bioretention areas. Additional storage will be provided via detention in oversized pipes if required. The design and size of the pipes and bioretention areas will be finalized during the design stage by the Project engineer as part of the final hydrology study, which will be review and approved by the County of Los Angeles to ensure consistency with the EIR analysis prior to issuance of a final grading permit. Compliance with the interim flow standards has not been quantitatively factored into the calculation of increased surface water runoff anticipated to result from project development, but

compliance with these flow standards is qualitatively taken into account in assessing project hydromodification impacts.

Project Conditions. To assure that it complies with any new peak or other design flow standards that may be adopted in the future, the Project will be conditioned to require, as a design feature, sizing and design of the hydraulic features (i.e., oversized pipes) as necessary to control the post-development runoff rates as necessary to meet numeric flow criteria that may be adopted from time to time by the Los Angeles County Department of Public Works under Part 4, § D.1 of the MS4 Permit.

Energy Dissipation. Erosion protection will be provided in the vicinity of proposed outlets for outlet areas where discharges have the potential to cause stream erosion. Erosion protection will be provided at all storm drain outlets to the Santa Clara River in accordance with the provisions of the NRMP.

In summary, although Project runoff volumes, flow rates, and durations will increase, potential impacts of hydromodification (i.e., the potential to cause erosion, siltation, or channel instability) will be avoided, minimized, and mitigated by the Project PDFs in the following ways:

- Project site design and treatment controls PDFs, especially bioretention areas, will avoid and minimize increases in runoff volume from the development area, the preferred method for controlling hydromodification impacts from new development (SCCWRP, 2005).
- Concentrated flows will be mitigated with energy dissipators at the discharge points to the Santa Clara River and the river banks have already been protected through vegetated buried bank stabilization in non-jurisdictional upland areas adjacent to the river. This type of biostabilization technique is the preferred approach for bank stabilization (SCCWRP, 2005).
- The Project will comply with adopted interim standard for control of peak flows from the 50-year capital storm event and the 2-year, 24-hour storm event, or other flow criteria that may be adopted by the Los Angeles County Department of Public Works to meet the Permit requirements for hydromodification control.

For these reasons, the hydromodification impacts of the Project on the Santa Clara River are considered less than significant.

Cumulative Impacts

As discussed above, the Project includes a number of hydrologic source control PDFs that will substantially lessen any potential contribution to cumulative hydromodification impacts to the Santa Clara River. In addition, all future development within the watershed will implement hydromodification controls to meet flow criteria that will be adopted by the LADPW under Part 4, § D.1 of the MS4 Permit. To assure that the Project complies with any new flow standards

that may be adopted in the future, the Project will be conditioned to require, as a design feature, design of the hydrologic features to control post-development runoff as necessary to meet flow criteria that may be adopted from time to time under Part 4, § D.1 of the MS4 Permit.

Based on the area of impervious surface proposed, the avoidance and minimization provided by the various hydromodification source controls as Project design features, the fact that the Project will be conditioned to include Project design features to meet future flow control standards established under the MS4 Permit to protect the river from hydromodification impacts, and that future development Projects within the watershed will control flow in compliance with the requirements of the MS4 Permit, the Project's contribution to cumulative hydromodification impacts to the Santa Clara River will be less than significant and consistent with the requirements of the MS4 permit.

7.9.2 Dry Weather Runoff

Direct Impacts

In order to quantitatively address dry weather impacts, a dry weather water balance was performed. The quantity of dry weather flows from urban sources such as car washing and irrigation is variable and not easily quantified. Information available from the Irvine Ranch Water District suggests an average dry-weather flow from urban areas of 2.9×10^{-4} cfs per urbanized acre (IRWD, 2003). Dry weather flow estimates in Santa Monica, used to design a dry-weather flow recycling facility, indicate a range of dry-weather flows between 8.3×10^{-5} to 1.8×10^{-4} cfs per urbanized acre (Antich et al., 2003). For purposes of conservatively estimating the impacts of dry-weather flow, a dry-weather discharge of 3.0×10^{-4} cfs per urbanized acre was used in this report. Table 7-16 presents a monthly dry weather flow balance for the proposed Project. Swales were assumed to infiltrate at 0.1 in/hr, while bioretention areas were assumed to infiltrate at 0.2 in/hr. Evapotranspiration rates were conservatively assumed to be 60% of reference rates from CIMIS Zone 14, in which the Project is located. It was assumed that open space in the Project area would result in no dry weather runoff discharged to the Santa Clara River.

Table 7-15: Predicted Dry Weather Water Balance

Month	Dry Weather Flow (af)	ETo (af)	Infiltration (af)	Outflow (af)
January	0.61	0.10	0.51	0.00
February	0.55	0.15	0.40	0.00
March	0.61	0.25	0.36	0.00
April	0.59	0.34	0.25	0.00
May	0.61	0.46	0.15	0.00
June	0.59	0.53	0.06	0.00
July	0.61	0.59	0.02	0.00
August	0.61	0.52	0.09	0.00
September	0.59	0.38	0.21	0.00

Month	Dry Weather Flow (af)	ETo (af)	Infiltration (af)	Outflow (af)
October	0.61	0.27	0.34	0.00
November	0.59	0.14	0.45	0.00
December	0.61	0.10	0.51	0.00

[1] Based on dry weather flow of 0.0003 cfs/acre from a range of researched values.
[2] 60% of Reference ETo from CIMIS Zone 14.
[3] Equal to dry weather runoff up to maximum of .2 in/hr for bioretention and .1 in/hr for swales.

It is predicted that all dry weather flows will be infiltrated or removed by evapotranspiration in the Project area.

Based on comprehensive site planning, source control, and treatment control strategy and the above water balance analysis, the potential for dry weather flows to result in hydromodification or associated habitat or water quality impacts is considered less than significant.

8 CONCLUSIONS

This section summarizes the potential effects, if any, of the proposed Soledad Townhomes Project on water quality and hydromodification in Santa Clara River Reach 9_E.

8.1 Surface Water Quality Impacts

The following are the conclusions regarding the significance of impacts for the pollutants of concern under wet- and dry-weather conditions:

- ***Sediments***: MS4 Permit, General Construction Permit, Dewatering General Permit, and SUSMP-compliant BMPs will be incorporated into the Project to address sediment in both the construction phase and post-development. Mean total suspended solids concentration is predicted to be less in the post-development condition than in the existing conditions. Turbidity in stormwater runoff will be controlled through implementation of a Construction SWPPP and will be permanently reduced through the stabilization of erodible soils with development. On this basis, the impact of the Project on sediments is considered less than significant.

- ***Nutrients (Phosphorus and Nitrogen (Nitrate+Nitrite-N and Ammonia-N))***: MS4 Permit, General Construction Permit, Dewatering General Permit, and SUSMP-compliant BMPs will be incorporated into the Project to address nutrients in both the construction phase and post-development. Nitrate-nitrogen plus nitrite-nitrogen concentrations are predicted to decrease in the post-developed condition. Total phosphorus concentration is predicted to increase with development; however, the resultant concentration is below the minimum observed value in the Santa Clara River. Ammonia-N concentration is predicted to increase, but this predicted concentration will be well below LA Basin Plan objectives and in the low range of observed values in the Santa Clara River Reach 9_E. Despite the predicted increases in

nutrient loads, the post-developed concentrations are below or within the range of observed values in the Santa Clara River Reach 9_E and are therefore not expected to cause increased algae growth. On this basis, the impact of the Project on nutrients is considered less than significant.

- ***Trace Metals***: MS4 Permit, General Construction Permit, General Dewatering Permit, and SUSMP-compliant BMPs will be incorporated into the Project to address trace metals in both the construction phase and post-development. The mean concentrations and loads of dissolved copper, total lead, and dissolved zinc are predicted to increase with Project development. Mean concentrations of dissolved copper, total lead, and dissolved zinc are below benchmark Basin Plan objectives and CTR criteria. Dissolved copper and total lead are within the range of values observed in the Santa Clara River Reach 9_E. Dissolved zinc is slightly higher than observed values in the Santa Clara River Reach 9_E, but is well below the CTR criteria. Cadmium is not expected to be present in runoff discharges from the Project. On this basis, the impact of the Project on trace metals is considered less than significant.

- ***Pesticides***: Pesticides in runoff may or may not increase with development as a result of landscape applications. Proposed pesticide management practices including source control, removal with sediments in infiltration basins, and advanced irrigation controls in compliance with the requirements of the MS4 Permit and the SUSMP will minimize the presence of pesticides in runoff. During the Construction phase of the Project, PDFs implemented per General Permit and General De-Watering Permit requirements will remove potential legacy pesticides through sedimentation of sediments to which they have adsorbed. Final site stabilization will limit mobility of legacy pesticides that may be present in pre-development conditions. On this basis, the impact of the Project on pesticides is considered less than significant.

- ***Pathogens***: Post-development pathogen sources include both natural and anthropogenic sources. The natural sources include bird and mammal excrement. Anthropogenic sources include leaking septic and sewer systems and pet wastes. A reduction in open space within the Project area will reduce the bacteria produced by wildlife. The Project will not include septic systems and the sewer system will be designed to current standards which minimizes the potential for leaks. Thus pet wastes are the primary source of concern. The PDFs will include source controls and treatment controls which in combination should help to reduce pathogen indicator levels in stormwater runoff. On this basis, the Projects impact on pathogen and pathogen indicators is considered less than significant.

- ***Hydrocarbons***: Hydrocarbon concentrations will likely increase with development because of vehicular emissions and leaks. In stormwater runoff hydrocarbons are often associated with soot particles that can combine with other solids in the runoff. Such materials are subject to treatment in the proposed infiltration basins and vegetated swales. Source control BMPs incorporated in compliance with the MS4 Permit, the General Construction Permit,

and the SUSMP will also minimize the presence of hydrocarbons in runoff. During the Construction phase of the Project, pursuant to the General Construction Permit, the Construction Stormwater Pollution Prevention Plan must include BMPs that address proper handling of petroleum products on the construction site, such as proper petroleum product storage and spill response practices, and those BMPs must effectively prevent the release of hydrocarbons to runoff per the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology standards. On this basis, the impact of the Project on hydrocarbons is considered less than significant.

- ***Trash and debris***: Trash and debris in runoff are likely to increase with development if left unchecked. However, the Project PDFs, including source control and treatment BMPs incorporated in compliance with the MS4 Permit and the SUSMP requirements, will minimize the adverse impacts of trash and debris. Source controls such as street sweeping, public education, fines for littering, covered trash receptacles, and storm drain stenciling are effective in reducing the amount of trash and debris that is available for mobilization during wet weather. Trash and debris will be captured in catch basin inserts in the commercial area parking lot and in the treatment control PDFs. During the Construction phase of the Project, PDFs implemented per General Permit and General De-Watering Permit requirements will remove trash and debris through trash screens and racks, catch basin inserts and by general good housekeeping practices. Trash and debris are not expected to significantly impact receiving waters due to the implementation of the Project PDFs.

- ***Chloride***: MS4 Permit, General Construction Permit, Dewatering General Permit, and SUSMP-compliant BMPs will be incorporated into the Project to address chloride in both the construction phase and post-development. Due to the high solubility of chloride, the majority of chloride removal will be accomplished through infiltration in the treatment control PDFs. The mean concentration and load of chloride is predicted to increase with development. Although chloride concentration is predicted to increase, the predicted concentration is well below the LA Basin Plan objective and is near the low range of observed values in the Santa Clara River Reach 9_E. On this basis, the impact of the Project on chloride is considered less than significant.

- ***Methylene Blue Activated Substances (MBAS):*** In the post-development phase, the presence of soap in runoff from the Project will be controlled through the source control PDFs, including a public education program on residential and charity car washing. Other sources of MBAS, such as cross connections between sanitary and storm sewers, are unlikely given modern sanitary sewer installation methods and inspection and maintenance practices. During the construction phase of the Project, equipment and vehicle washing will not use soaps or any other MBAS sources. Therefore, MBAS are not expected to significantly impact the receiving waters of the proposed Project.

- ***Bioaccumulation*:** In the literature, the primary pollutants that are of concern with regard to bioaccumulation are mercury and selenium. However, selenium and mercury are not of concern in this watershed, so bioaccumulation of selenium and mercury is also not expected to result either during the construction or post-development Project phases. On this basis, the potential for bioaccumulation in the Project PDFs or in the Santa Clara River and adverse effects on waterfowl and other species is considered less than significant.

- ***Construction Impacts:*** Construction impacts on water quality are generally caused by soil disturbance and subsequent suspended solids discharge. These impacts will be minimized through implementation of construction BMPs that will meet or exceed measures required by the General Construction Permit, as well as BMPs that control the other potential construction-related pollutants (PAHs, metals). A SWPPP will be developed as required by, and in compliance with, the General Construction Permit and City of Santa Clarita Standard Conditions. Erosion control BMPs, including but not limited to hydro-mulch, erosion control blankets, and energy dissipators will be implemented to prevent erosion, whereas sediment controls, including but not limited to silt fence, sedimentation ponds, and secondary containment on stockpiles will be implemented to trap sediment once it has been mobilized. On this basis, the construction-related impact of the Project on water quality is considered less than significant.

- ***Regulatory Requirements:*** The proposed Project satisfies MS4 Permit requirements for new development, including SUSMP requirements and SQMP requirements, and satisfies construction-related requirements of the General Construction Permit and General Dewatering Permit, and therefore complies with water quality regulatory requirements applicable to stormwater runoff.

8.2 Groundwater Impacts

- *Groundwater Quality Impacts (Nitrate+Nitrite-N)*: MS4 Permit, General Construction Permit, Dewatering General Permit, and SUSMP-compliant BMPs will be incorporated into the Project to address nutrients in both the construction phase and post-development. Nitrate-nitrogen plus nitrite-nitrogen concentrations are predicted to decrease in the post-developed condition. The predicted nitrate-nitrogen plus nitrite-nitrogen concentration in stormwater runoff after treatment in the Project PDFs and in irrigation water is well below the groundwater quality objective. On this basis, the potential for adversely affecting groundwater quality is considered less than significant.

- *Groundwater Recharge Impacts*: Stormwater runoff from the Project will be discharged to the Santa Clara River after treatment, whose channel is predominantly natural and consists of vegetation and coarse-grained sediments (rather than concrete). The porous nature of the sands and gravels forming the streambed will allow for significant infiltration to occur to the underlying groundwater. Also, irrigation water is predicted to be fully infiltrated during dry

weather, which will increase groundwater recharge from the Project. On this basis, the Project's impact on groundwater recharge is considered less than significant

8.3 Hydromodification Impacts

The following are the conclusions regarding the significance of impacts for hydromodification impacts under wet- and dry-weather conditions:

- ***Wet Weather Project Impacts:*** Potential impacts of hydromodification (i.e., the potential to cause erosion, siltation, or channel instability) will be controlled by the Project PDFs in the following ways:

  - Project site design and treatment controls PDFs, especially bioretention areas, will reduce the runoff volume from the development area.
  - Localized effects of concentrated flows will be mitigated with energy dissipators at the discharge points to the Santa Clara River and the river banks have been protected with buried bank stabilization in non-jurisdictional upland areas adjacent to the river.
  - The Project will comply with adopted interim standard for control of peak flows from the 50-year capital storm event and the 2-year, 24-hour storm event, or other flow criteria that may be adopted by the Los Angeles County Department of Public Works to meet the Permit requirements for hydromodification control.

  For these reasons, direct hydromodification impacts of the Project on the Santa Clara River are considered less than significant.

- ***Cumulative Hydromodification Impacts:*** The Project contributes only 0.05% of total potential impervious surface at build out within the watershed, the Project includes hydromodification source controls as Project design features, the Project will be conditioned to include Project design features to meet future flow control standards established under the MS4 Permit to protect the river from hydromodification impacts, and future development Projects within the watershed will control flow in compliance with the regional program. Therefore, the Project's contribution to cumulative hydromodification impacts to the Santa Clara River will be less than significant and consistent with the requirements of the MS4 permit.

- ***Dry Weather Hydromodification Impacts:*** Due to the proposed comprehensive site planning, source control, and treatment control strategy, it is predicted that all dry weather flows will be infiltrated or removed by evapotranspiration in the Project's treatment control BMPs. Low flows are unlikely to be discharged, preventing hydromodification from habitat conversion and other effects of dry weather runoff.

The proposed Project will not substantially alter the existing drainage pattern of the Santa Clara River in a manner that would cause substantial erosion, siltation, or channel instability; or substantially increase the rates, velocities, frequencies, duration and/or seasonality of flows in a manner that causes channel instability or in a manner that harms sensitive habitats or species in the river. Therefore, the impact of the Project on hydromodification is considered less than significant.

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Appendices

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(B) Modeling Parameters & Methodology

(C) BMP Sizing Criteria

(D) Los Angeles Unified School District Integrated Pest Management Plan

(E) Review of Bacteria Data from Southern California Watersheds

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A. POLLUTANTS OF CONCERN

A.1. Surface Water Pollutants of Concern

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Sediment: Total Suspended Solids (TSS) & Turbidity	1. "Sediment is a common component of stormwater, and can be a pollutant. Sediment can be detrimental to aquatic life (primary producers, benthic invertebrates, and fish) by interfering with photosynthesis, respiration, growth, reproduction, and oxygen exchange in water bodies. Sediment can transport other pollutants that are attached to it including nutrients, trace metals, and hydrocarbons. Sediment is the primary component of total suspended solids (TSS), a common water quality analytical parameter." (CSQA, 2003)	1. Narrative objective in the LA Basin Plan: "Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses." 2. LA Basin Plan objective for turbidity: "Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: Natural Turbidity — Max Increase 0-50 NTU — 20% > 50 NTU — 10% Allowable zones of dilution within which higher concentrations may be tolerated may be defined for each discharge in specific Water Discharge Requirements."
Nutrients: Ammonia, Nitrite, Nitrate, Total Nitrogen, and Total Phosphorus	1. "Nutrients including nitrogen and phosphorous are the major plant nutrients used for fertilizing landscapes, and are often found in stormwater. These nutrients can result in excessive or accelerated growth of vegetation, such as algae, resulting in impaired use of water in lakes and other sources of water supply. For example, nutrients have led to a loss of water clarity in Lake Tahoe. In addition, un-ionized ammonia (one of the nitrogen forms) can be toxic to fish." (CSQA, 2003). 2. Nutrients are a biostimulatory substance.	1. LA Basin Plan standards for ammonia: "In order to protect aquatic life, ammonia concentrations in receiving waters shall not exceed the values listed for the corresponding in-stream conditions in Tables 3-1 to 3-4." The criterion for ammonia varies with pH and temperature; the criterion is lower for lower pH and temperature. The basin plan amendment for updated ammonia standards (dated 04/02, effective July 15, 2003) will be used. 2. LA Basin Plan standards for nitrogen: "Waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen (NO_3-N + NO_2-N), 45

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
		mg/L as nitrate (NO_3), 10 mg/L as nitrate-nitrogen (NO_3-N), or 1 mg/L as nitrite-nitrogen (NO_2-N) or as otherwise designated in Table 3-8." Table 3-8 lists Santa Clara River Reach 9 with a water quality objective of 5 mg/L nitrate-N + nitrite-N. 3. Reach 9 of the Santa Clara River are listed as having ground water recharge as a beneficial use in the LA Basin Plan. LA Basin Plan standards for nitrogen: "Ground waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen (NO_3-N + NO_2-N), 45 mg/L as nitrate (NO_3), 10 mg/L as nitrate-nitrogen (NO_3-N), or 1 mg/L as nitrite-nitrogen (NO_2-N)." 4. Narrative objective for biostimulatory substances in the LA Basin Plan: "Waters shall not contain biostimulatory substances in concentrations that promote algal growth to the extent that such growth causes nuisance or adversely affects beneficial uses."
Trace metals: Copper, Lead, Zinc, Arsenic, Cadmium, Chromium, Mercury, and Nickel	1. "Metals including lead, zinc, cadmium, copper, chromium, and nickel are commonly found in stormwater. Many of the artificial surfaces of the urban environment (e.g., galvanized metal, paint, automobiles, or preserved wood) contain metals, which enter stormwater as the surfaces corrode, flake, dissolve, decay, or leach. Over half the trace metal load carried in stormwater is associated with sediments. Metals are of concern because they are toxic to aquatic organisms, can bioaccumulate (accumulate to toxic levels in aquatic animals such as fish), and have the potential to contaminate drinking water supplies." (CSQA, 2003)	1. Narrative objective in the LA Basin Plan: "All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. ..." 2. The CTR criteria are the applicable water quality objectives for protection of aquatic life (40 CFR 131.38). The CTR criteria are expressed for acute and chronic (4-day average) conditions; however, only acute conditions are applicable for stormwater discharges because the duration of stormwater discharge is typically less than 4 days. 3. CTR criteria are expressed for

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
	2. LA Basin Plan requires that discharges into receiving waters shall not cause or contribute to toxicity. 3. Urban development can increase potential sources of these metals due to sources from vehicles and building materials.	dissolved metal concentrations and are determined on the basis of hardness in the receiving water. In application of criteria to the Project, local hardness data will be used to determine most appropriate criteria.
Chloride	1. Resolution R03-008 Amendment to the Water Quality Control Plan (Basin Plan) for the Los Angeles Region to Incorporate a Total Maximum Daily Load for Chloride in the Upper Santa Clara River (07/03) states "Elevated chloride concentrations are causing impairments of the water quality objective in Reach 5 (EPA 303(d) list Reach 7) and Reach 6 (EPA 303(d) list Reach 8) of the Santa Clara River. This objective was set to protect all beneficial uses; agricultural beneficial uses have been determined to be most sensitive, and not currently attained at the downstream end of Reach 5 (EPA 303(d) list Reach 7) and Reach 6 (EPA 303(d) list Reach 8) in the Upper Santa Clara River. Irrigation of salt sensitive crops such as avocados and strawberries with water containing elevated levels of chloride results in reduced crop yields. Chloride levels in groundwater are also rising."	1. LA Basin Plan contains mineral objectives for individual inland surface waters. Reach 9 of the Santa Clara River has a chloride objective of 100 mg/L.

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Pathogens (Fecal Coliform, Viruses, and Protozoa)	1. "Bacteria and viruses are common contaminants of stormwater. For separate storm drain systems, sources of these contaminants include animal excrement and sanitary sewer overflow. High levels of indicator bacteria in stormwater have led to the closure of beaches, lakes, and rivers to contact recreation such as swimming." (CSQA, 2003) 2. Fecal coliform is a frequently monitored indicator organism of human pathogens. 3. Human related activities can increase fecal coliform concentrations. 4. Concentrations of fecal coliform in stormwater can be elevated, often due in part to the presence of coliform bacteria from natural sources.	1. LA Basin Plan objectives are based on the designated uses of the water body. The Santa Clara River Reach 9 is listed with a REC1 beneficial use. Resolution # 01-018 (LARWQCB, 2001) amended the LA Basin Plan standards for bacteria in waters with a contact recreation beneficial use. These standards for freshwaters are Geometric Mean / Single Sample E. coli ≤ 126/100 ml / ≤ 235/100 ml fecal coliform ≤ 200/100 ml / ≤ 400/100 ml
Pesticides	1. "Pesticides (including herbicides, fungicides, rodenticides, and insecticides) have been repeatedly detected in stormwater at toxic levels, even when pesticides have been applied in accordance with label instructions. As pesticide use has increased, so too have concerns about adverse effects of pesticides on the environment and human health. Accumulation of these compounds in simple aquatic organisms, such as plankton, provides an avenue for biomagnification through the food web, potentially resulting in elevated levels of toxins in organisms that feed on them, such as fish and birds." (CSQA, 2003) 2. Pesticides loads may be present in runoff from developed areas due to pesticide use for urban landscaping.	1. Narrative objective in the LA Basin Plan: "Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the limiting concentrations specified in ... Title 22 of the California Code of Regulations ...." The LA Basin Plan contains maximum contaminant levels for a range of pesticides. 2. CTR lists numeric objectives for some, but not all pesticides. There are no CTR criteria for diazinon and chlorpyrifos, but these substances are now banned from most urban uses.

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Petroleum Hydrocarbons: Oil & Grease and Polycyclic Aromatic Hydrocarbons (PAHs)	1. "Oil and grease includes a wide array of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. Sources of oil and grease include leakage, spills, cleaning and sloughing associated with vehicle and equipment engines and suspensions, leaking and breaks in hydraulic systems, restaurants, and waste oil disposal." (CSQA, 2003) 2. Petroleum hydrocarbons are ubiquitous, and used in a wide variety of applications. Potential sources are generally expected to increase with urban development. 3. A source of PAHs is automobile exhaust. Therefore, development would generally be expected to increase levels of PAHs.	1. Narrative objective in the LA Basin Plan for oil & grease: "Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance or that otherwise adversely affect beneficial uses." 2. PAHs are a class of compounds. CTR values for individual PAHs are available for protection of human health only. There are no regulatory standards for the protection of aquatic health.
Bioaccumulation & Toxicity	1. Some pollutant of concern in stormwater runoff such as metals or pesticides have the potential to bioaccumulate in aquatic organisms potentially affecting the health of those organism or other species higher up the food chain. 2. Certain pollutants in stormwater runoff have the potential to be highly toxic to aquatic organisms resulting in effects such as impaired reproduction or mortality.	1. Toxic pollutants shall not be present at levels that will bioaccumulate in aquatic life to levels which are harmful to aquatic life or human health. 2. LA Basin Plan objectives for toxicity: "All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life."

Pollutant of Concern [1]	Rationale for Selection/Exclusion as Pollutant of Concern	Significance Criteria
Trash and Debris	1. "Gross Pollutants (trash, debris, and floatables) may include heavy metals, pesticides, and bacteria in stormwater. Typically resulting from an urban environment, industrial sites and construction sites, trash and floatables may create an aesthetic "eye sore" in waterways. Gross pollutants also include plant debris (such as leaves and lawn-clippings from landscape maintenance), animal excrement, street litter, and other organic matter. Such substances may harbor bacteria, viruses, vectors, and depress the dissolved oxygen levels in streams, lakes, and estuaries sometimes causing fish kills." (CSQA, 2003)	1. LA Basin Plan narrative floating material objective: "Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause a nuisance or adversely affect beneficial uses."

(1) Pollutants of concern are those pollutants that are anticipated or potentially could be generated by development that have been identified by regulatory agencies as potentially impairing beneficial uses in the receiving water bodies or that could adversely affect receiving water quality.

A.2. References

California Stormwater Quality Association (CSQA), 2003. *Stormwater Best Management Practices Handbook New Development & Redevelopment.*

Los Angeles Regional Water Quality Control Board, 1995. Water Quality Control Plan Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

Los Angeles Regional Water Quality Control Board, October, 25th, 2001. Resolution 01-018: Amendment to the Water Quality Control Plan for the Los Angeles Region to Update the Bacteria Objectives for Water Bodies Designated for Water Contact Recreation

Los Angeles Regional Water Quality Control Board, July, 10th, 2003. Resolution R03-008 Revision of interim waste load allocations for chloride in the Amendment to the Water Quality Control Plan for the Los Angeles Region to include a TMDL for Chloride in the Upper Santa Clara River.

Los Angeles Regional Water Quality Control Board, August, 7th, 2003. Resolution R03-011 Amendment to the Water Quality Control Plan for the Los Angeles Region to include a TMDL for Nitrogen Compounds in the Santa Clara River.

US Environmental Protection Agency California Toxics Rule (CTR), 40 C.F.R. §131.38.

B. WATER QUALITY MODEL METHODOLOGY

B.1. Model Description

B.1.1. Model Overview

The model used to assess stormwater quality impacts associated with the proposed Soledad Townhomes Project is an empirical, volume-based, pollutant loads model. This type of loadings model is generally applicable in the planning and evaluation stages of a project. The model was developed to assess the potential impact of development on water quality and to evaluate the effectiveness of the structural Best Management Practices (BMPs) that will treat storm water runoff as part of the project storm water treatment system. Two project conditions were evaluated with the water quality model:

1. Pre-development
2. Post-development with treatment water quality basins

Measured runoff volumes and water quality characteristics of storm water are highly variable. To account for this variability, a statistical modeling approach was used to estimate the volume of storm water, the concentration of pollutants in storm water, and the overall pollutant load (total mass of pollutants) in storm water runoff. A statistical description of storm water provides an indication of the average characteristics and variability of the water quality parameters of storm water, and the probability of compliance with regulatory criteria. It does not forecast runoff characteristics or regulatory compliance for specific storms or monitoring periods.

The statistical model is based on relatively simple expressions describing rainfall/runoff relationships and estimated concentrations in storm water runoff. The volume of storm water runoff is estimated using a modification to the Rational Formula, an empirical expression that relates runoff volume to the rainfall depth and the broad basin characteristics. The pollutant concentration in storm water runoff is represented by an expected average pollutant concentration, called the event mean concentrations (EMC). The EMCs are estimated from available monitoring data from, and are strongly dependent on, the land-use type.

The model does not incorporate the hydraulics or hydrology of the site, which would be more appropriate for design stages and requires additional data and more sophisticated modeling. The model includes water quality benefits achieved by structural BMPs, but not source control BMPs because data is generally not available or inconclusive for the latter. Model results are presented for average annual runoff volumes, pollutant loads, and pollutants concentrations.

As with all environmental modeling, the precision of results is heavily dependent on how well the hydrologic, water quality and BMP effectiveness data describe the actual site characteristics. Local and regional data used to the fullest extent possible helps to minimize errors in predictions. It is important to remember that the predictions of relative differences are also of importance rather than just precision. The ability of errors to propagate and magnify is inherent with this type of model and must be considered when viewing results. An extensive sensitivity analysis is

beyond the scope of this document and therefore errors will only be discussed qualitatively. However, it is important to point out that one of the most variable parameters is the runoff coefficient, which is a function of the percent imperviousness. Novotny and Olem (1994), when discussing the Rational Formula, state "...the runoff coefficient is the most important task of the entire calculation." It is difficult to accurately estimate the percent impervious, especially for projects in the planning phase.

B.1.2. Model Assumptions

The water quality modeling methodology requires that some assumptions are made for both the model input parameters and the way the modeling calculations are carried out. Section B.2.6 discusses the assumptions that were made in the development of the model parameters and Section B.3.4 discussion the assumptions of the modeling methodology. Section B.4 discusses the affects on model accuracy of the modeling assumptions.

B.2. Model Input Parameters

Many parameters that can affect pollutant loads and concentrations vary between locations where stormwater monitoring has been conducted. Examples include source concentrations, topography, soil type, and rainfall characteristics all of which can influence the buildup and mobilization of pollutants. The following model parameters represent the best data currently available for representation of existing and developed site conditions in the water quality model.

B.2.1. Storm Events

Rainfall analysis was conducted with data from the National Climatic Data Center (NCDC) Newhall rain gauge (station number 046162), located in the town of Newhall California. This gauge is located approximately 2.5 miles from the project. The gauge elevation of 1,243 ft AMSL is comparable to the Soledad Townhomes Project area elevations of around 1,200 ft AMSL.

While the period of record rainfall data collected at the Newhall rain gauge is quite good, there are still some gaps in the 35 year period of record. In order to improve the characterization of rainfall at the project site, estimates of the missing rainfall data were made through correlation of the Newhall rain gauge with the San Fernando rain gauge (NCDC station number 047762) which is located approximately 5 miles away (south and slightly east).

First a comparison of daily rainfall totals was made from the available data to assess the similarity in rainfall amounts between the two stations. Daily data from 1969 to 2003 was screened to keep the 24-hour totals with measured rainfall at both stations, which eliminated missing data at either station. Correlation of the 24-hour rainfall totals is shown in Figure B-1.

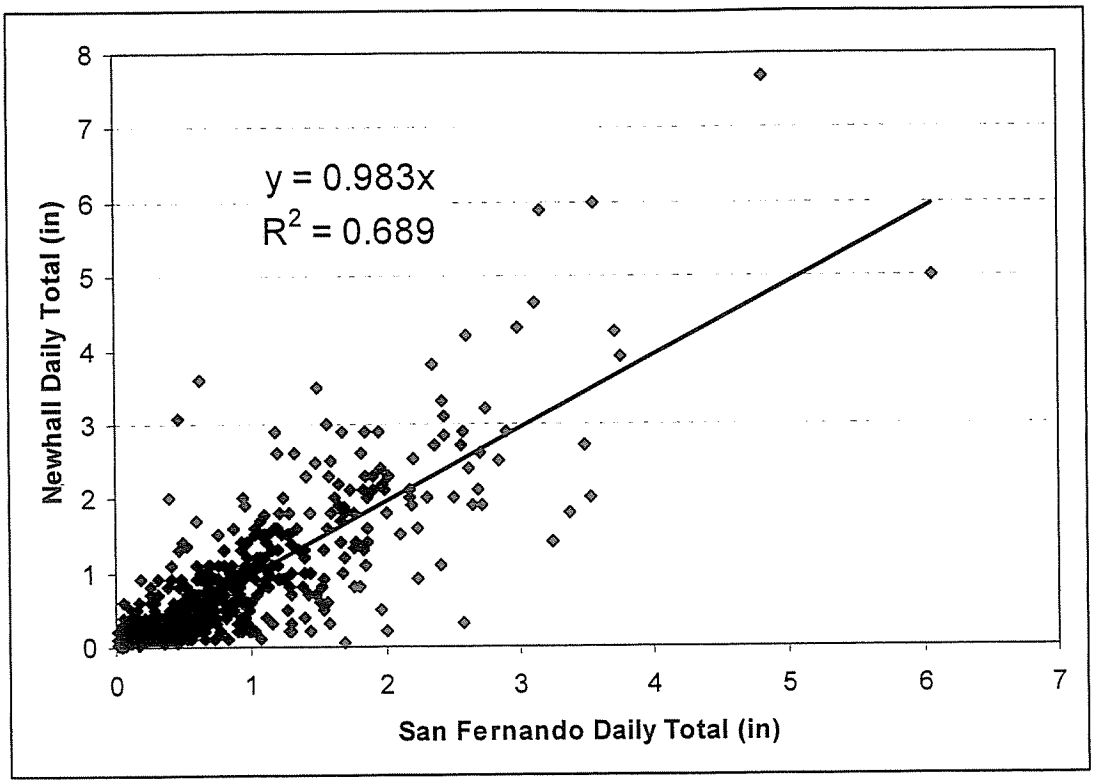


Figure B-1: Correlation of 24-hour Totals Newhall & San Fernando 3 Gauges

The correlation is reasonably strong considering that the comparison is between the daily accumulations, i.e. a storm could result in appreciable rainfall at one gauge and little rainfall at the other. This comparison indicates that precipitation depths are similar between the two gauges. Another comparison was made using only months with a complete rainfall record and measured rainfall at both stations. This correlation was much stronger due to the longer time period.

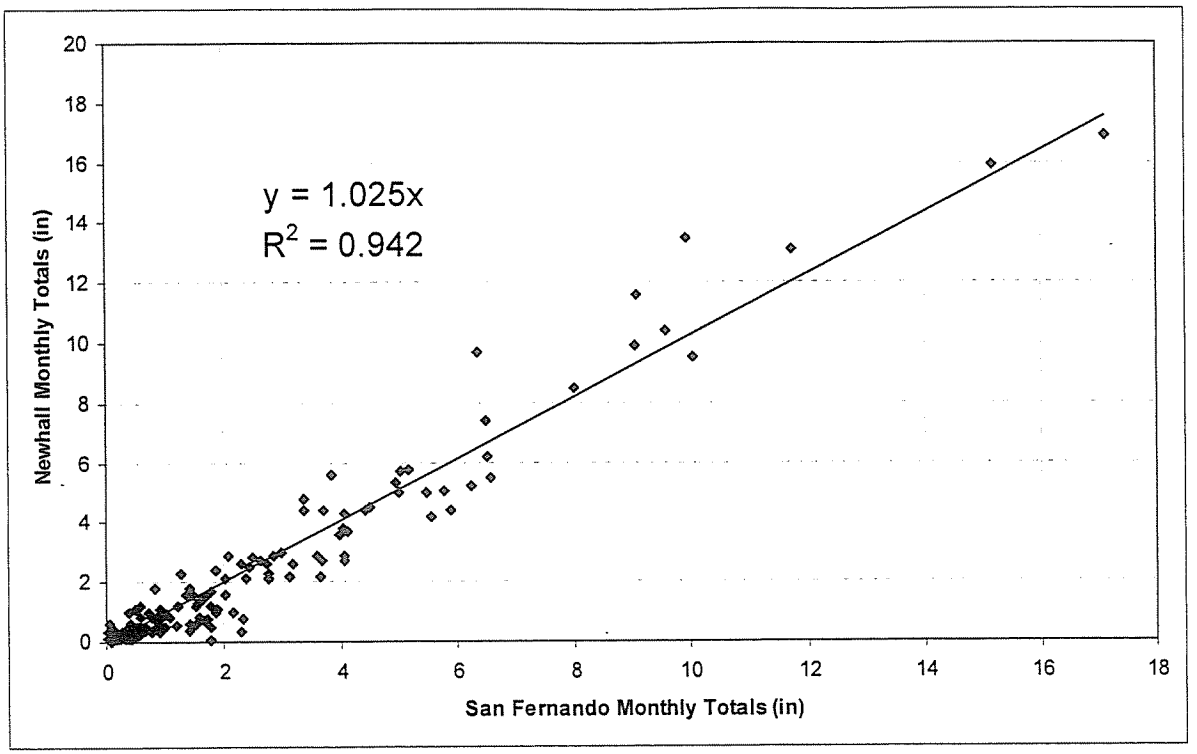


Figure B-2: Correlation of Monthly Totals Newhall & San Fernando 3 Gauges

The linear regression of daily rainfall totals (Figure B-1) has greater variability due to the shorter time period than regression of the monthly totals which indicates slightly higher rainfall amounts (Figure B-2) at the Newhall gauge compared to the San Fernando gauge. Hourly rainfall data from the San Fernando gauge were used to fill in the missing periods of rainfall data at the Newhall gauge using a multiplier of 1.025 and rounding to the nearest 1/100 inch after the adjustment.

Rainfall analysis was conducted for all storm events and for the storms that are expected to contribute to stormwater runoff (storms >0.1 inches). The rainfall data were analyzed using code similar in performance to EPA's Synoptic Rainfall Analysis Program (SYNOP). The customized code (GeoSYNOP) was used as it provide information on missing periods of data and is more robust when handling the date and time of storms. GeoSYNOP subdivides the rainfall record into discrete events separated by a dry inter-event period, which in this case was set to a minimum of 6 hours. Small rainfall events whose depth was less than or equal to 0.10 inches were deleted from the record as such events tend to produce little if any runoff (for the second analysis in Table B-1). For the Newhall gauge, a total of 538 storm events (>0.1 inches) were segregated from the continuous data.

Rainfall analysis was conducted with the original rainfall data and the augmented data in order to asses if the additional of data affected the storm statistics. Filling in the rainfall record should result in a small increase in the number of storms per year and the average annual rainfall, but should not substantially change the storm statistics.

Table B-1: Analysis Results for the Actual and Filled Newhall Rainfall Data

Storms	Newhall Gauge 1969 – 2003	Original Record	Augmented Record
	Total Missing Records (days):	427	52
All Storms	Average annual rainfall (in):	17.4	18.8
	Total number of storms:	840	890
	Average number of storms per year:	24.0	25.4
	Average storm volume (in):	0.72	0.74
	Average storm duration (hrs):	6.87	7.35
	Average storm intensity (in/hr):	0.103	0.101
Storms >0.1 inch	Average annual rainfall (in):	16.2	17.9
	Total number of storms:	493	538
	Average number of storms per year:	14.1	15.4
	Average storm volume (in):	1.15	1.16
	Average storm duration (hrs):	11.0	11.5
	Average storm intensity (in/hr):	0.107	0.105

Comparison of the results for the original and constructed records shows that the storm statistics do not change substantially, particularly for the second analysis using only storms greater than 0.1 inches depth which are used in the water quality model to predict stormwater runoff. Storms less than or equal to 0.1 inches depth were screened as these small storms typically do not contribute to runoff (USEPA, 1989; Schuler, 1987). The augmented record for the Newhall gauge was used for both hydrologic (e.g. estimating BMP percent capture) and water quality modeling.

B.2.2. Runoff Coefficients

B.2.2.1. SWMM Runoff Coefficient Modeling Parameters

The Monte-Carlo Water Quality model uses a linear equation to estimate a runoff coefficient for sub-basins as a function of the percent impervious. The runoff coefficient equation parameters (coefficient and intercept) were estimated with the SWMM model in an effort to more accurately reflect the Soledad Townhomes Project site conditions. The majority of the SWMM modeling parameters are shown in Table B-2.

Table B-2: SWMM Runoff Module Parameters

SWMM Runoff Parameters	Units	Values
Wet time step	Seconds	600
Wet/dry time step	Seconds	600
Dry time step	Seconds	14,400
Impervious Manning's n		0.012
Pervious Manning's n		0.25
Drainage area modeled for Rv determination	acres	10
Shape		Rectangular, 500 ft flow path length for pervious areas, 250 ft flow path length for impervious area
Impervious Fractions Modeled		0%, 33.3%, and 100%. See Table B-3 for specific runoff block dimensions.
Slopes	Ft/ft	0.02, project area is relatively flat.
Evaporation	In / month	80% of reference ET values contained in Table B-5 were used for the existing site conditions to reflect agricultural uses and the post-development project condition.
Soil properties / Infiltration		Green-Ampt soil parameters as contained in Table B-4.
Depression storage, Impervious	Inches	0.02, based on Table 5-14 in SWMM manual
Depression storage, Pervious	Inches	0.06, based on Table 5-14 in SWMM manual
Initial Soil moisture deficit	Vol air / vol voids	Variable, based on Table 5-10 in SWMM manual

Runoff path lengths will affect the ET that occurs and subsequent runoff volumes; the longer the runoff path length the greater the reduction in runoff volumes (evaporation losses impervious surfaces, ET and infiltration pervious surfaces). For consistency in model runs (e.g. flow path lengths) three scenarios were modeled as shown in the Table B-3. The modeled impervious fractions were chosen to result in consistent runoff path lengths and depths of runoff from pervious and impervious surfaces relative to the 659 inches of rainfall for the period of record that was simulated.

Table B-3: SWMM Runoff Block Modeled Percent Impervious Values

Area (ac)	% Impervious	SWMM Width (ft)	Pervious Flow Length (ft)	Pervious Flow Length (ft)
10	0	871	500	0
10	33.3	581	500	250
10	100	1742	0	250

Soils in the Soledad Townhomes Project area were best represented as sandy-loam soils deposited by the Santa Clara River. This was determined from a geotechnical soils investigation (R.T. Frankian & Associates, 2001). Soils properties in the post-development project conditions were changed to silt loam. This method was used to reduce infiltration due to compaction of soils and to give a more conservative estimate of post-development runoff. The Green-Ampt soils properties used for the SWMM modeling are shown in Table B-4.

Table B-4: Green-Ampt Soil Parameters

Soil Texture Class	Suction Head (cm)	Ks (cm/hr)	Suction Head (in)	Ks (in/hr)
Sandy Loam – Existing Condition	11.0	2.18	4.33	0.86
Silt Loam – Developed Condition	16.68	0.51	6.57	0.20

Soil properties estimated from information contained in Table 5.5.5 of the Handbook of Hydrology (Maidment, ed. 2003)

Reference ET values for estimating actual ET rates was taken from Figure B-3 produced by the California Department of Water Resources. The Soledad Townhomes Project site is located in zone 14. Reference ET values for zone 14 are reproduce in Table B-5.

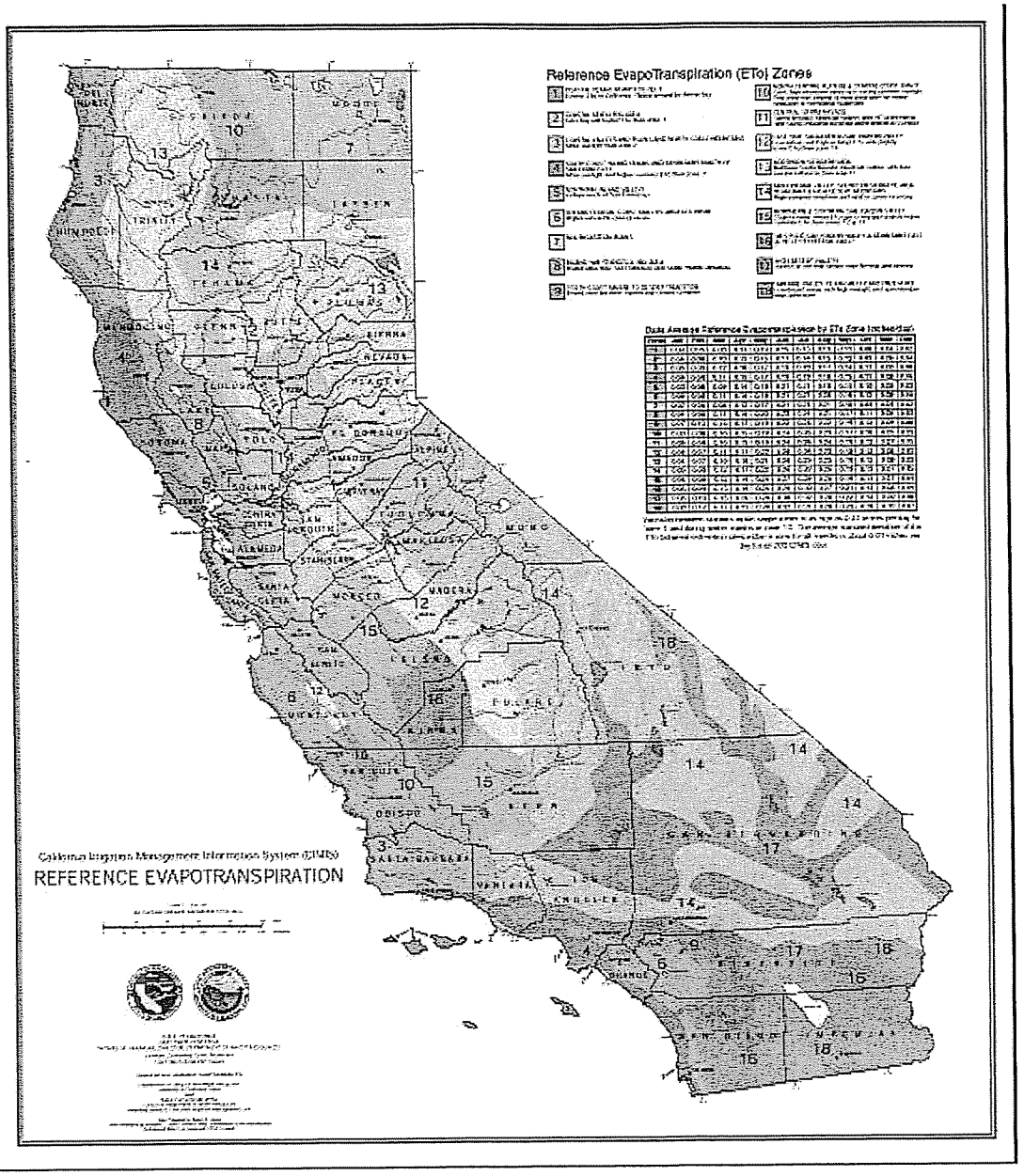


Figure B-3: Reference ET for CA Zones

Historical site conditions consisted of agricultural practices. During the initial site soil survey, the site conditions were open space. To represent average existing and historical site conditions 60 percent of the reference ET values were used to reflect dry farming crops with lower water requirements and irrigated farming with slightly higher evapotranspiration rates. Sixty percent of the reference ET values were also used to simulate the landscaped areas in the post-development condition.

Table B-5: Evaporation Parameters for Hydrology Model (from CA ETo map)

Month	Evapotranspiration Rates			60%
	In / day	In / Month	In / Month	In / Month
January	0.05	0.93	1.55	1.24
February	0.08	1.34	2.24	1.79
March	0.12	2.23	3.72	2.98
April	0.17	3.06	5.1	4.08
May	0.22	4.09	6.82	5.46
June	0.26	4.68	7.8	6.24
July	0.28	5.21	8.68	6.94
August	0.25	4.65	7.75	6.2
September	0.19	3.42	5.7	4.56
October	0.13	2.42	4.03	3.22
November	0.07	1.26	2.1	1.68
December	0.05	0.93	1.55	1.24
	Total	34.22	57.04	45.63

B.2.2.2. SWMM Runoff Coefficient Results

Figure B-4 displays the SWMM results for the existing conditions of the Project site and Figure B-5 displays the SWMM results for the developed project conditions.

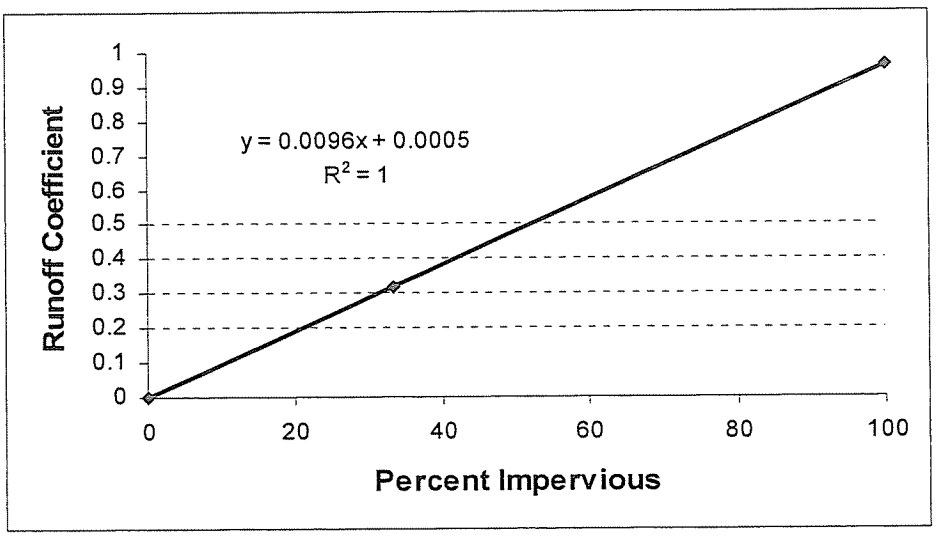


Figure B-4: Existing Conditions Runoff Coefficient Equation

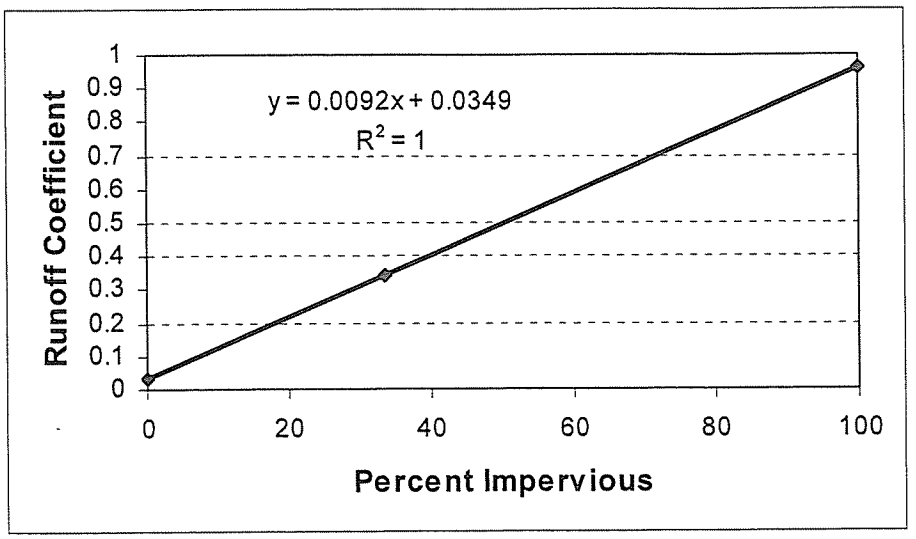


Figure B-5: Developed Conditions Runoff Coefficient Equation

The intercept was rounded to three decimal places resulting in the following equations used to estimate runoff coefficients in the water quality model as a function of imperviousness

- Existing Conditions: Runoff Coefficient = 0.0096 × % Impervious + 0.001
- Developed Conditions: Runoff Coefficient = 0.0092 × % Impervious + 0.035

B.2.3. Land Use

Detailed land use data and stormwater treatment system information has been developed for the Soledad Townhomes site. The delineation and area of the modeled sub-basins within Soledad Townhomes were determined from information provided by SIKAND engineering. Sub-basin areas, proposed land-uses, imperviousness values, and treatment BMPs are summarized in Table B-6 below.

Table B-6: Modeled Sub-basin Land-Uses & Areas

Sub-basin	Multi-family	Commercial
	70% Imp	90% Imp
1	18.8	
2		1.7
3	12.6	
TOTAL	31.4	1.7

Sub-basin total area, percent imperviousness and treatment BMPs for the Soledad Townhomes Project are listed in Table B-7.

Table B-7: Modeled Area, Percent Imperviousness, & BMPs

Sub-basin	Total Area (acres)	% Impervious	Treatment BMPs
1	18.8	65%	Bioretention
2	1.7	90%	Bioretention
3	12.6	75%	Swales
Project Total	33.1	74%	

B.2.4. Stormwater Runoff Pollutant Concentrations

Stormwater monitoring data collected by the Los Angeles Department of Public Works was used to derive estimates of pollutant concentrations for urban land uses. The existing conditions of the Soledad Townhomes Project site were modeled as open space. Stormwater monitoring data collected by Los Angeles County was used to estimate stormwater pollutant concentrations for open space land use.

B.2.4.1. Los Angeles County Monitoring Data

More recent and more regional land-use based stormwater quality monitoring data was collected through the LA County Stormwater Monitoring Program. This program was initiated with the goal of providing technical data and information to support effective watershed stormwater quality management programs in Los Angeles County. Specific objectives of this project included monitoring and assessing pollutant concentrations from specific land uses and watershed areas. In order to achieve this objective, the County undertook an extensive stormwater sampling project that included 8 land use stations and 5 mass emission stations, which were tested for 82 water quality parameters. These data are presented in *Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report, 2000* and *Los Angeles County 2000-2001 Stormwater Monitoring Report, 2001*.

Stormwater quality was estimated with the recent EMC data collected by LA County (LA County, 2000) in the water quality model for Soledad Townhomes. These data were used because of the relatively close location to the project site and because the monitored land uses were representative of the proposed land uses for the Soledad Townhomes Project. The land uses stations available through monitoring conducted by LA County used to develop stormwater quality parameters for the modeling are listed in Table B-8 with a brief description of the site and the years monitoring data have been collected.

Table B-8: LA County Land Use Monitoring Stations Available for Water Quality Modeling

Station Name	Station	Modeled Land Use	Site Description[1]	Years Monitoring Conducted
Santa Monica Pier	S08	Commercial	The monitoring site is located near intersection of Appian Way and Moss Avenue in Santa Monica. The storm drain discharges below the Santa Monica Pier. Drainage area is approximately 81 acres. The Santa Monica Mall and Third St. Promenade dominate the watershed with remaining land uses consisting of office buildings, small shops, restaurants, hotels and high-density apartments.	1995-1999
Sawpit Creek	S11	Open Space (& Parks)	Located in Los Angeles River watershed in City of Monrovia. The monitoring station is Sawpit Creek, downstream of Monrovia Creek. Sawpit Creek is a natural watercourse at this location. Drainage area is approximately 3300 acres.	1995-2001
Dominguez Channel	S23	Freeway (Roadways)	Located within the Dominguez Channel/Los Angeles Harbor watershed in Lennox, near LAX. The monitoring station is near the intersection of 116th Street and Isis Avenue. Land use is predominantly transportation and includes areas of LAX and Interstate 105.	1995-2001
Project 404	S26	Multi-Family Residential	Located in Los Angeles River watershed in City of Arcadia. The monitoring station is located along Duarte Road, between Holly Ave and La Cadena Ave. Drainage area is approximately 214 acres.	1997-2001

1) Los Angeles County 2000 Draft Stormwater Monitoring Report (Los Angeles County, 2000)

B.2.4.2. Data Analysis for Derivation of Land Use EMCs

The County of Los Angeles Department of Public Works (LADPW) has monitored stormwater runoff quality from various land uses throughout the County on an annual basis beginning in 1995 through 2001. For each year of monitoring several storm event mean concentrations (EMCs) are reported and included in the County's annual water quality report to the Los Angeles Regional Water Quality Control Board. The convention for dealing with the censored data (e.g., data only known to be below the analytical detection limit) is to substitute ½ of the detection limit for all non-detects. L.A. County has followed this convention when providing summary arithmetic statistics of the stormwater monitoring data. This method tends to introduce bias into the estimate of the mean and standard deviation and the summary statistics are not believed to be robust or adequately account for non-detects. To further complicate matters, the detection limit

for dissolved copper and total lead has changed during the period stormwater monitoring was conducted by LADPW.

In an effort to provide more reliable and accurate estimates of land use EMCs for the Soledad Townhomes water quality modeling, a robust method of estimating descriptive statistics for censored data with multiple detection limits was employed. The plotting position method described in Helsel and Cohn (1988) was used to estimate censored values using the distribution of uncensored values. Descriptive statistics were then estimated using the parametric bootstrap method suggested by Singh, Singh, and Engelhardt (1997).

Example Data Set

To illustrate the statistical methods used to obtain land use EMCs, the LADPW stormwater monitoring data collected for total lead from the transportation land use station is used. The data were collected from 01/1996 to 04/2001. At the beginning of March 1997 the detection limit for total lead changed from 10 to 5 µg/L. Table B-9 describes the data according to the number of censored and uncensored values in the example data set.

Table B-9. Number of Censored and Uncensored Data Points in the Total Lead Transportation Land Use Data Set

Total Lead EMC Data for Transportation Land Use	
Uncensored	37
Censored < 10 µg/L	2
Censored < 5 µg/L	38
Total Data Count	77

Prior to applying the plotting position method, it is necessary to check the normality of the data. Figure B-6 shows histograms and probability plots of the transportation land use total lead data above detection limits in normal and lognormal space. The lognormal distribution fits the data set more closely than the normal distribution.

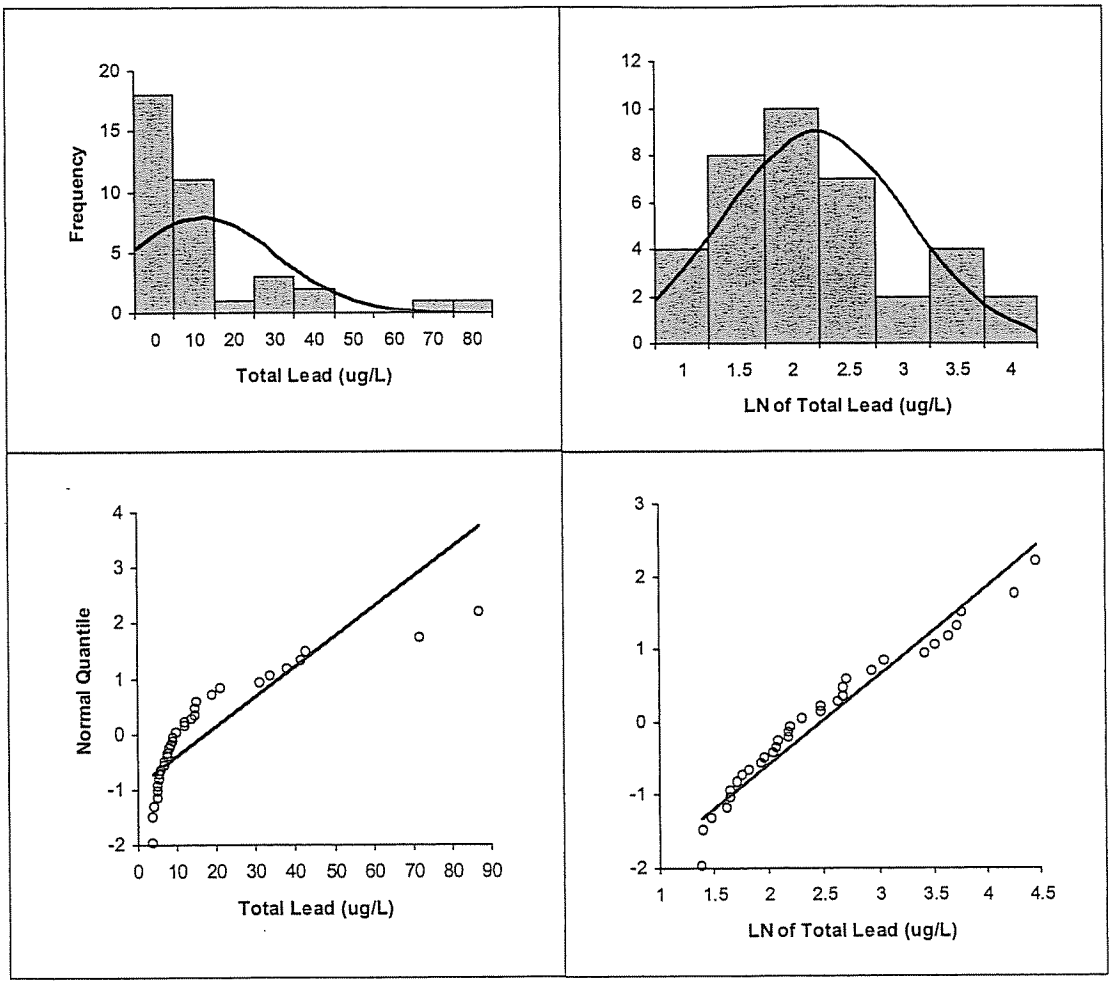


Figure B-6: Histograms and Probability Plots of Transportation Total Lead Data in Arithmetic and Lognormal Space.

To verify the visual check that the data are lognormally distributed, the Shapiro-Wilk goodness-of-fit test was used (Royston 1992). In this test, if $p > 0.1$, the null hypothesis that the log data follow a normal distribution cannot be rejected. For this example data set, the p-value of the log-transformed uncensored data is 0.293, which indicates that lognormal distribution is a good approximation of the distribution of the data set.

Method for Dealing with Multiple Detection Limits

To account for the multiple detection limits in the censored data sets, a regression on order statistics (ROS) method was employed. ROS is a category of robust methods for estimating descriptive statistics of censored data sets that utilize the normal scores for the order statistics (Shumway et al. 2002). The plotting position method by Hirsch and Stendinger (1987) (summarized by Helsel and Cohn, 1988) was the ROS method used. In this method, plotting positions are based on conditional probabilities and ranks, where the ranks of the censored

(below detection) and uncensored data (above detection) related to each detection limit are ranked independently. The method is summarized in the equations below.

After plotting positions for the censored and uncensored values have been calculated, the uncensored values are plotted against the z-statistic corresponding to the plotting position and the best-fit line of the known data points is derived. Using this line and the plotting positions for the uncensored data, the values for the uncensored data are extrapolated. Figure B-7 illustrates the results the application of the plotting position method on the total lead data for transportation land use.

$$pe_j = pe_{j+1} + \frac{A_j}{(A_j + B_j)} \times (1 - pe_{j+1}) \qquad (1)$$

Where:

A_j = the number of uncensored observations above the j detection limit and below the j +1 detection limit.

B_j = the number of censored and uncensored observations less than or equal to the j detection limit.

pe_j = the probability of exceeding the j threshold for j = m, m -1, ... 2, 1 where m is the number of thresholds; by convention $pe_{m+1} = 0$.

Equation 2 was used for plotting the uncensored data and equation 3 was used for the plotting censored data; the plotting positions of the data were calculated using the Weibull plotting position formula.

$$p(i) = (1 - pe_j) + \frac{(pe_j - pe_{j+1}) \times r}{(A_j + 1)} \qquad (2)$$

Where:

p(i) = the plotting position of the uncensored i data point.

r = the rank of the i observation of the A_j observations above the j detection limit.

$$pc(i) = \frac{(1 - pe_j) \times r}{(n_j + 1)} \qquad (3)$$

Where:

pc(i) = the plotting position of the censored i data point.

r = the rank of the i observation of the n_j censored values below the j detection limit.

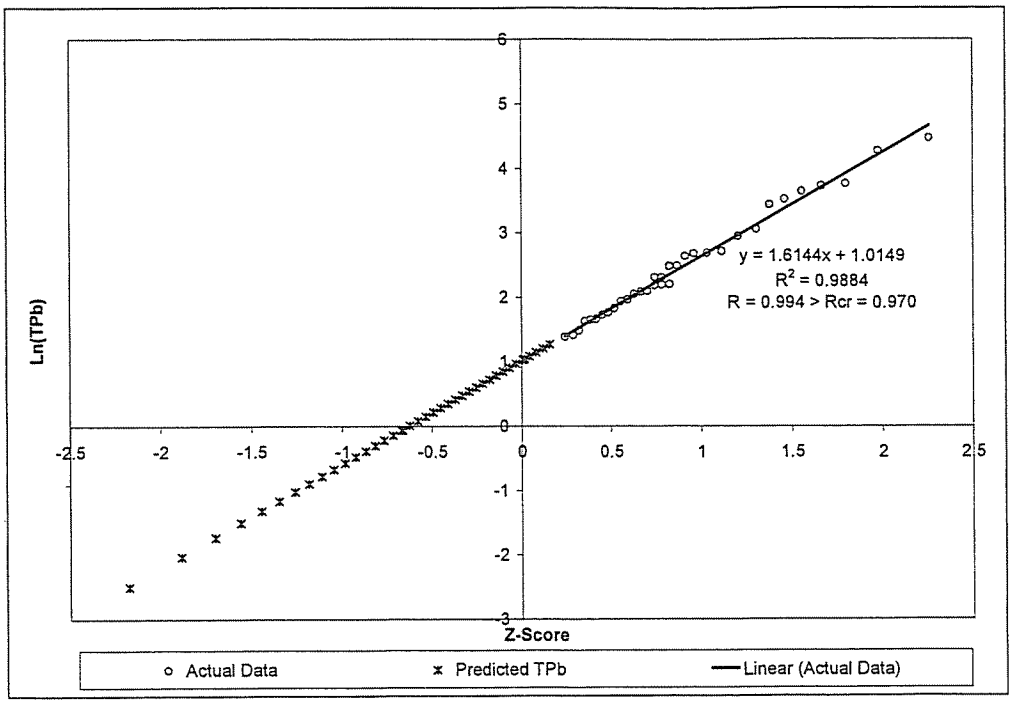


Figure B-7: Probability Plot of the Uncensored and Predicted (Censored) Total Lead Transportation EMCs.

Method for Calculating Descriptive Statistics

After the censored data are estimated (or for datasets without non-detects), descriptive statistics were computed using the bootstrap method (Singh et al. 1997). The bootstrap method samples from the data set with replacement several thousand times and calculates the desired descriptive statistics from the sampled data. The steps of the bootstrap estimation method are described below.

1. Take a sample of size *n* with replacement (the sampled data point remains in the data set for subsequent sampling) from the existing data set (Singh et al. recommends n be the same size as the original data set, this recommendation was followed for the analysis) and compute the descriptive statistic, θ_i, from the sampled data.
2. Repeat Step 1 independently N times (10,000 for this analysis) each time calculating a new estimate for θ_i.
3. Calculate the bootstrap estimate θ_B by averaging the θ_i's for i=1 to N

Fundamentally, the bootstrap procedure is based on the Central Limit Theorem (CLT), which suggests that even when the underlying population distribution is non-normal, averaging produces a distribution more closely approximated with normal distribution than the sampled distribution (Devore 1995). Figure B-8 compares the total lead data after estimating censored values using the ROS method described prior to applying the bootstrap method with bootstrapped means of the ROS data. Note the bootstrap means are more normally distributed than the original data and the central tendency of the data is centered around 8 ug/L.

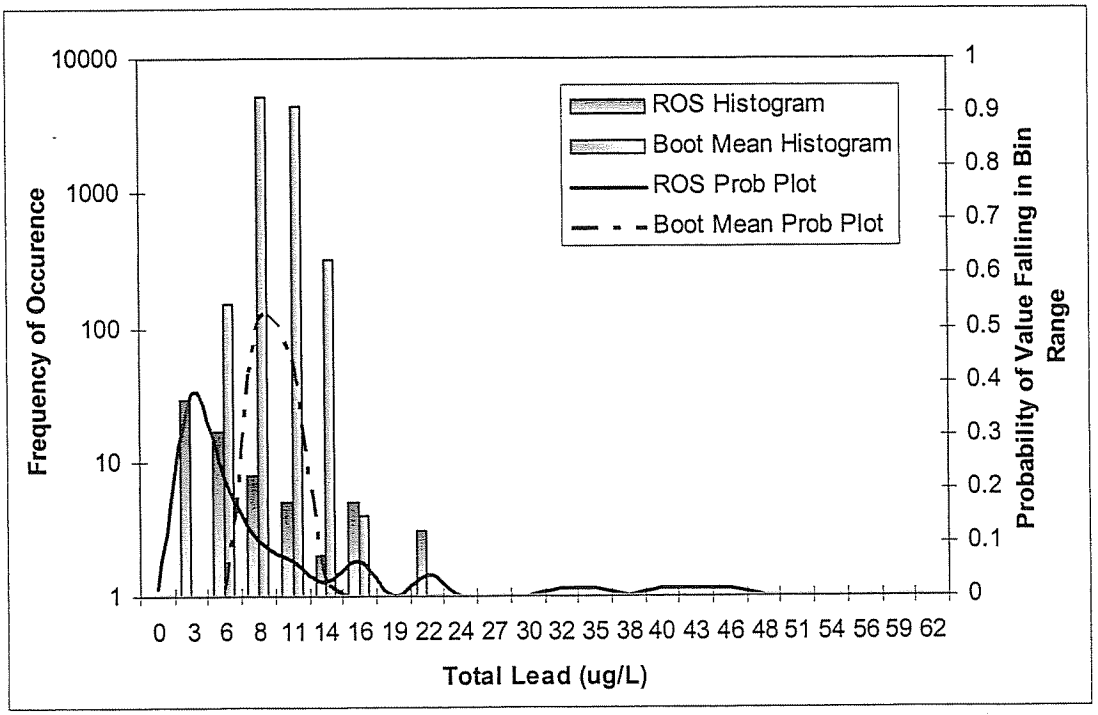


Figure B-8: Comparison of the Distribution of ROS Method Total Lead Data and the Bootstrap Means of the ROS Data.

The majority of the LADPW stormwater monitoring for the pollutant land use combinations analyzed fit a lognormal distribution. The data that did not statistically fit the lognormal distribution were more closely approximated with a lognormal distribution than a normal distribution. The bootstrap method was applied differently depending on the distributional fit of the data. If the pollutant EMC data for a particular land use fit a lognormal distribution according to the Shapiro-Wilk goodness-of-fit test the log-transformed data were bootstrapped and an estimate of the mean and standard deviation were obtained in log space and then converted to arithmetic space. The assumption of lognormality was more stringently applied than normal by using an alpha significance value of 0.1. This was done to improve the estimate of the standard deviation when the hypothesis of lognormality is rejected. When analyzing data in log space there is a tendency to overestimate the standard deviation for relatively symmetric data and underestimate the standard deviation for severely skewed data. For datasets that did not

fit the lognormal distribution, the raw data were bootstrapped to obtain the mean and standard deviation statistics. Bootstrapping the data in arithmetic space assumes no distribution in those instances when a distribution could not be confirmed through goodness-of-fit testing.

Conclusions

The plotting position method for multiple detection limits has been used in conjunction with the bootstrap procedure for calculating the descriptive statistics used to represent pollutant EMC distributions in the water quality model. If the uncensored data were determined to be lognormally distributed with less than 50% of the data below the detection limit (censored), the bootstrap procedure was coupled with lognormal theory (i.e. data were log transformed prior to the bootstrap analysis). Otherwise, the original data plus the estimates of the censored data were analyzed in arithmetic space to calculate the arithmetic mean and standard deviation. Table B-10 summarizes the lognormal descriptive statistics of the modeled pollutants and land uses that are used directly by the Monte Carlo water quality model for estimating land use specific pollutant EMCs.

Table B-10: Lognormal Statistics for Modeling Pollutants Concentrations from Land Uses.

Land Use		TSS	TP	NH3	NO3	NO2	TKN	Diss Cu	Tot Pb	Diss Zn	Cl
Commercial	Mean	3.966	-1.242	-0.832	-0.884	-2.721	0.711	2.210	1.292	4.778	3.043
	St. Dev	0.609	0.680	1.218	0.635	1.060	0.804	0.685	1.389	0.703	1.226
Transportation	Mean	3.935	-1.229	-1.271	-0.687	-3.011	0.345	2.806	1.902	4.783	1.261
	St. Dev	0.834	0.992	0.608	0.749	1.056	0.654	1.116	0.631	1.040	0.998
Multi-Family Residential	Mean	3.144	-1.788	-1.208	-0.180	-2.932	0.346	1.768	0.812	3.965	2.124
	St. Dev	0.920	0.728	0.886	0.930	1.102	0.556	0.576	0.985	0.707	1.119
Vacant / Open Space	Mean	3.342	-3.060	-3.075	-0.033	-3.976	-0.458	-2.573	-1.246	1.293 [1]	1.864
	St. Dev	1.859	1.064	0.811	0.548	0.459	0.784	1.505	1.616	1.312	0.226

1 – Dissolved zinc for open space was estimated from the total zinc analysis of LADPW monitoring data. Four data points for dissolved and total zinc from the National Stormwater Quality Database gave an average ration of dissolved to total zinc of 50 percent. For the open space land uses the variation of dissolved zinc was assumed to equal that of total zinc (i.e. same standard deviation) and the lognormal mean was set to give an average concentration of 8.6 ug/L for the open space land use, half of the average total zinc concentration of 17.2 ug/L.

Table B-11: Resulting Arithmetic Means from Lognormal Statistics for Modeling Pollutant Concentrations

Land Use	TSS	TP	NH3	NO3	NO2	TKN	Diss Cu	Tot Pb	Diss Zn	Cl
Commercial	63.5	0.364	0.913	0.505	0.115	2.81	11.5	9.55	152	44.5
Transportation	72.4	0.478	0.338	0.666	0.086	1.75	30.8	8.17	205	5.80
Multi-Family Residential	35.4	0.218	0.442	1.29	0.098	1.65	6.92	3.66	67.7	15.6
Vacant / Open Space	159	0.083	0.064	1.12	0.021	0.860	0.237	1.06	8.61	6.62

B.2.5. Estimate of BMP Performance Parameters

BMP performance is a function of the fraction of stormwater runoff receiving treatment (percent capture) and the effectiveness of removing pollutants from the treated stormwater. Capture efficiency calculations are discussed in Section B.2.5.1, and pollutant removal estimates are described in Section B.2.5.2.

B.2.5.1. BMP Capture Efficiency

The modeled structural BMPs were analyzed as flow or volume based. Different methods were used to calculate the capture efficiency of each type of BMP as discussed below.

B.2.5.1.1. Volume Based BMP Capture Efficiency

The GeoSYNOP program has the ability to provide descriptive statistics of storm events, based upon analysis of hourly rainfall records. Included in these statistics is the dry time between storms. This information, along with the storm depths and drainage rates of the volume based BMP (bioretention basins), was used to estimate the capture efficiency (the fraction of stormwater receiving treatment) of the bioretention basins for each storm in the period of record for use as inputs in the water quality model. The percent capture calculations for the bioretention basins were made with the following steps.

Step 1 – Estimate Runoff Volumes for Each Storm in the Period of Record Modeled

The runoff volume for each storm in the period of record (538 storms) was calculated for the tributary area draining to each water quality basin. The augmented Newhall gauge data was used in order to provide a conservative estimate which accounts for all (probable) storms and results in slightly lower capture efficiency than the Newhall data alone. This is due to the addition of some fairly large storms through correlation with the San Fernando gauge and a few more storms with short inter-event times.

Step 2 – Determine Bioretention Basin Storage Capacity

Next, the available storage capacity of the bioretention basins was calculated for each storm. If the time from the preceding storm was equal to or larger than 30 hours, the draw down time for the basin, then the BMP was considered empty at the time of the storm.

If the time between storms was less than 30 hours, then the capture volume was calculated to account for the size of the previous storm and the dry period between storms. This is done to account for insufficient time for the bioretention basins to completely empty before the next storm arrived. If the volume of stormwater runoff to the bioretention basin from the previous storm was larger than the storage capacity of the bioretention basin, then the basin was assumed to have filled completely and the initial storage capacity (*ISC*) in equation 4 is zero.

If the runoff volume (for a storm occurring less than 30 hours prior to the storm of interest) was less than the storage capacity of the BMP, then the difference between the storage capacity of the BMP and the runoff volume from the previous storm was considered available to capture runoff from the next storm. This volume is then added to the storage capacity created from outflow from the basin during the time of the storms as shown in equation 4.

$$TC = ISC + [BV \times DD \times T] \quad (4)$$

Where:

- TC = the treatment capacity (ft^3) of a water quality basin available to capture runoff over the duration of a storm
- ISC = the remaining storage volume after previous event (ft^3), initial storage capacity for storm of interest
- BV = the water quality basin volume (ft^3)
- DD = the draw down rate of water quality basin in percent per hour (hr^{-1}), 3.33% per hour for a 30 hour draw down time.
- T = the storm duration (hr)

The above equation accounts for storage capacity that is created during emptying of the bioretention basin while a storm occurs. That is, during long duration storms more runoff can be processed through the water quality basin than for a short storm of comparable rainfall intensities and runoff rates. This method has produced percent capture results that consistently are in close agreement with the overall results from EPA's Stormwater Management Model (SWMM), which are used to verify the results from this method.

Step 3 – Determine Bioretention Basin Percent Captures for Storms

The storage capacity estimated from step 2 is compared to the runoff volume estimate from step 1. If the storage capacity exceeds the storm runoff volume then the storm is considered to be completely (100%) captured. If the storage capacity is less than the runoff volume a volume of runoff equal to the storage capacity is considered treated by the bioretention basin. The percent capture for each storm estimated for each water quality basin is used in the Monte-Carlo model to calculate pollutant removals in the modeled BMPs.

B.2.5.1.2. Flow Based BMP Capture Efficiency

The flow based BMPs (swales) are sized to treat a flow capacity exceeding the LA County SUSMP sizing requirements in order to achieve treatment of approximately 80% of the stormwater runoff. Off-line swales (swales with a diversion structure for flows up to the swale treatment capacity) other BMPs such as CDS units that provide treatment even when a fraction of the runoff is bypassed achieve higher capture efficiency than in-line swales (swales that also act as a stormwater conveyance and receive all runoff from their tributary area).

High-intensity rainfall events can produce runoff rates that are in excess of the BMP design capacity. When the design flow rate for the swales is exceeded it was assumed that runoff depths exceed the design flow depth of the swale which limits treatment effectiveness. For this

situation, reductions in pollutant loads were not modeled, although some limited removal likely occurs, in order to provide a conservative estimate of the BMP performance. Only when the flow rate in the swales was less than the design flow rates (and therefore flow depth) was treatment modeled by estimating the fraction of flows that meet this condition. The percent capture calculations for flow based BMPs used the following steps.

Step 1 – Estimate the Depth of Runoff Captured on an Hourly Basis

The percent capture estimate for each storm is made through comparison of the hourly rainfall data comprising the storm event to the design rainfall intensity of the flow-based BMP. For BMPs without bypass capacity (e.g. in-line swales) if the depth of rainfall for a given hour exceeds the design rainfall intensity (the flow rate resulting from a rainfall intensity in inches per hour) then no treatment is credited for that hour of rainfall. If the design capacity (in inches per hour) of the BMP meets or exceeds the depth of rainfall occurring in a given hour then the resulting runoff during that hour is considered capture by the BMP.

For off-line BMPs or other BMPs with bypass capability (e.g. hydrodynamic devices) the fraction of runoff captured during a given hour of rainfall is the minimum of the rainfall depth for the hour of the design capacity of the BMP. For example an off-line swale with a flow capacity equal to runoff generated from a rainfall intensity of 0.3 inches per hour would capture 100 percent of the runoff during a hour of precipitation data with a depth of 0.2 inches, but would only capture 50 percent of the runoff during an hour of precipitation data in which 0.6 inches of rain occurred.

Step 2 – Sum the Depth of Rainfall Capture for Each Storm Event

The depth of rainfall captured for each of during the storm event is then summed to give the total depth of rainfall considered captured by the BMP for the storm of interest.

Step 3 – Calculate the Percent Capture for Each Storm Event

The depth of rainfall captured during a given storm event is divided by the total depth of the storm to give the percent capture for the storm event that is used in the water quality model input.

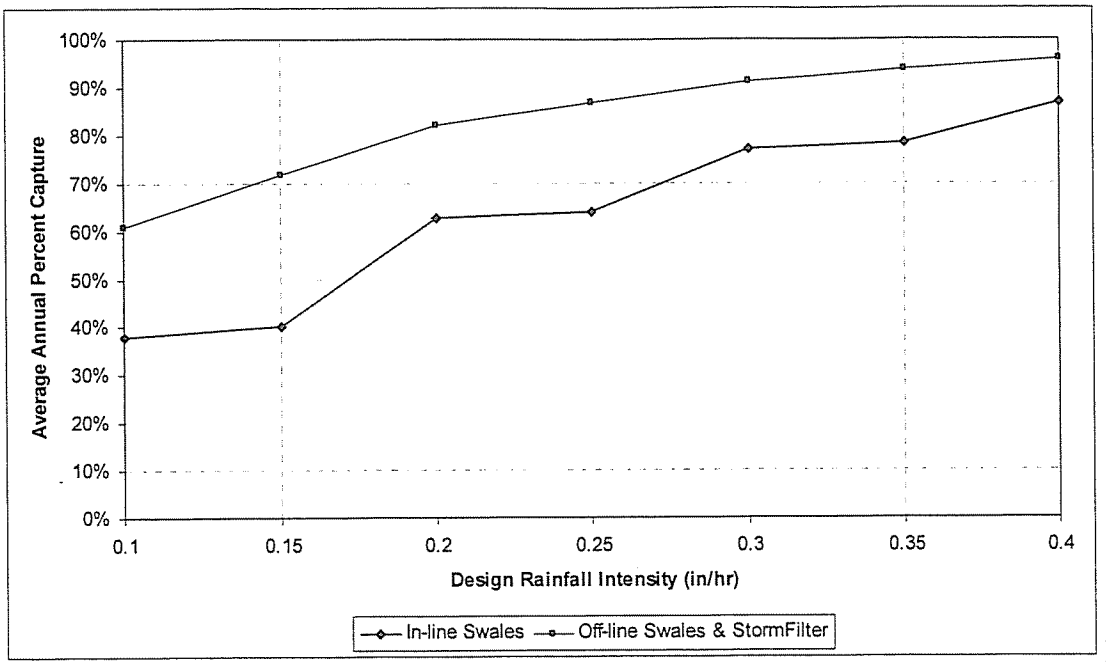
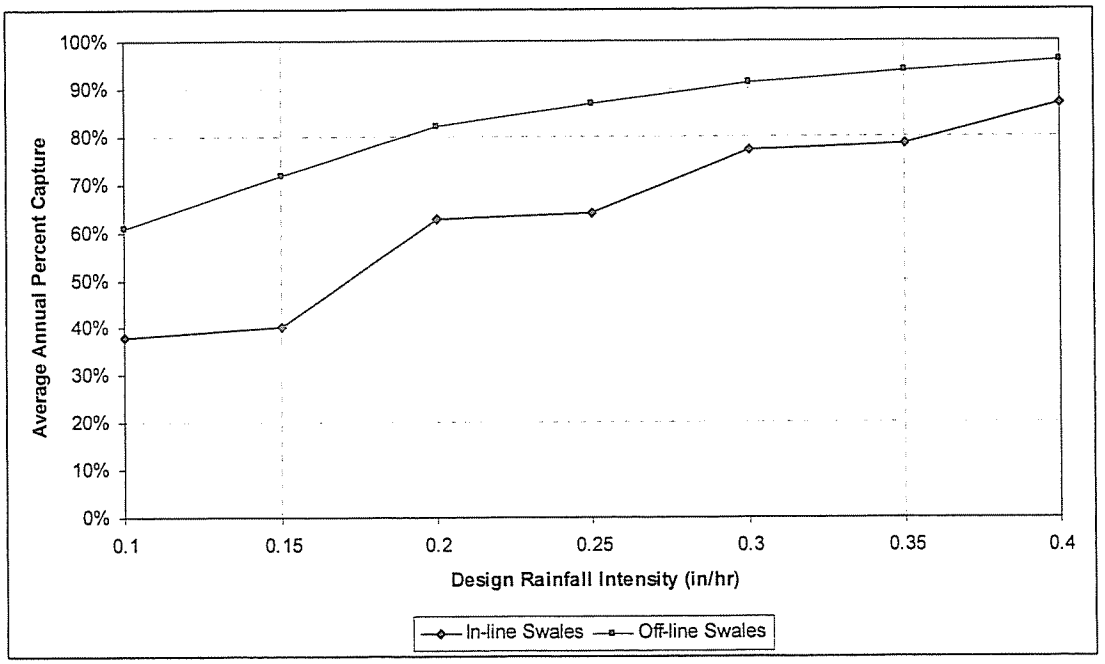


Figure B-9 shows the percent capture estimates for a range of design rainfall intensities for in-line and off-line (or BMPs with bypass capability) swales.



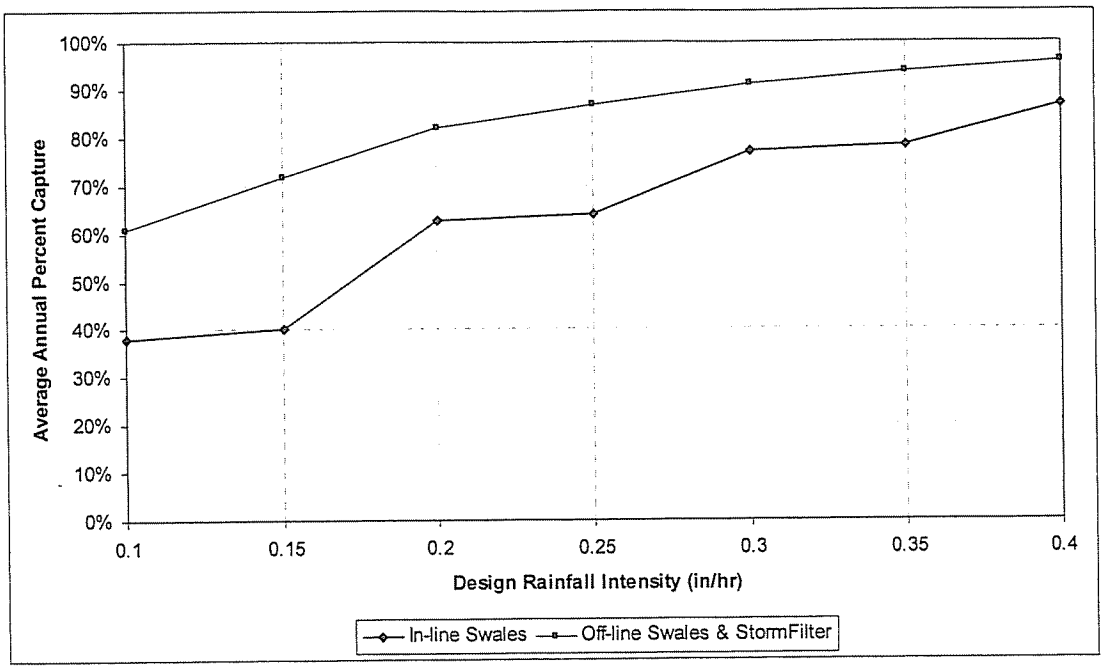


Figure B-9: Estimated Average Percent Capture for Swales as a Function of Design Rainfall Intensity

B.2.5.1.3. BMP Capture Efficiency Results

The estimated capture efficiencies for the structural BMPs in the Soledad Townhomes treatment system are shown in Table B-12 for the in-line swales and

Table **B-13** for the bioretention basins.

Data in the International BMP Database (IBMPDB) have shown that as much as 35 percent of runoff captured by swales can be lost to infiltration (Strecker et al., 2004). Bioretention basins are designed for 100% infiltration. Volume reductions achieved were conservatively modeled as 25 percent and 90 percent for the swales and bioretention basins respectively.

Table B-12: BMP Tributary Area Characteristics and Percent Capture Estimates for Swales

BMP	Sizing Method	Tributary Area (ac)[1]	% Impervious	Precipitation Intensity (in/hr) resulting in design Capture Efficiency (cfs)	Estimated Capture Efficiency (%)[1]	Modeled Volume Reduction (%)
In-line Swale	flow	12.6	75	0.30	77	25

1 – Capture efficiency was calculated with hourly rainfall data as described above and reported as an annual average.

Table B-13: Percent Capture Estimates for Bioretention Basins

BMP	Size (ac)	Tributary Area (ac)[1]	% Impervious	Runoff Coefficient	Estimated Capture Efficiency (%) [1]	Modeled Volume Reduction (%)
Bioretention Basin	1.1	20.5	67.0	0.66	81	90

1 – Capture efficiency was calculated as described in Section B.3.1 using the augmented data set for the Newhall gauge and reported as an annual average.

The overall weighted estimated (sum of [BMP tributary area × Rv × %] ÷ [total project area × Rv]) gives an overall percent capture estimate of 80 percent for the Soledad Townhomes Project area. Treatment BMPs will be sized such that overall a capture efficiency of 80 percent or greater is achieved for the treatment of stormwater runoff.

B.2.5.2. BMP Pollutant Removal

Various data sources were examined to estimate the anticipated performance of the treatment BMPs. A comprehensive source of BMP performance information is the American Society of Civil Engineers (ASCE) International Stormwater BMP Database (ASCE, 2001, Strecker et al., 2001). The ASCE BMP database is comprised of carefully examined data from a peer-reviewed collection of studies that have monitored the effectiveness of a variety of BMPs in treating water quality pollutants for a variety of land use types. The mean effluent water quality for treatment BMPs used for modeling purposes was based on values found in the International Stormwater BMP Database (ASCE/EPA, 2004). Recent work in characterizing BMP performance suggests that effluent quality rather than percent removal is more reliable in modeling stormwater treatment (Strecker et al. 2001).

As with the estimation of land use EMCs, final effluent values to be used in modeling analysis were determined using a combination of regression on order statistics and the "bootstrap" method (see Section B.2.4.2).

Once the data had been screened for design criteria, the normality and lognormality of all BMP effluent sample data sets were tested using the Shapiro-Wilk goodness-of-fit test (Royston 1992). The majority of the pollutant data fit a lognormal distribution. The data that did not statistically fit the lognormal distribution were more closely approximated with a lognormal distribution than a normal distribution. The bootstrap method was applied differently depending on the distributional fit of the data. If the data fit a lognormal distribution, the log-transformed data were bootstrapped and an estimate of the mean and standard deviation were obtained in log space and then converted to arithmetic space. The assumption of lognormality was more stringently applied than normal by using an alpha significance value of 0.1. This was done to improve the estimate of the standard deviation when the assumption of lognormality fails. When analyzing data in log space there is a tendency to overestimate the standard deviation for relatively symmetric data and underestimate the standard deviation for severely skewed data.

For datasets that did not fit the lognormal distribution, the raw data were bootstrapped to obtain the mean and standard deviation values. Bootstrapping the data in arithmetic space assumes no distribution in those instances when a distribution could not be confirmed through goodness-of-fit testing.

Table B-14 shows the lognormal effluent quality descriptive statistics for swales. These values were estimated using the above procedure on the ASCE/USEPA International BMP Database data (ASCE, 2003). Chloride removal was not simulated in the treatment BMPs. There is no effluent quality from bioretention basins, as bypass is assumed to be untreated.

Table B-14: Summary of Lognormal Effluent Quality Statistics & Arithmetic Mean Effluent Quality for Modeled BMPs.

Parameter	Swales (Lognormal)		Swales (Arithmetic mean)
	Mean	St. Dev	
TSS	3.089	0.821	30.7
Total P	-1.340	1.051	0.455
NH3	-3.363	1.064	0.061
NO3	-1.394	1.108	0.459
NO2	-5.028	1.311	0.015
TKN	0.336	0.593	1.67
Dissolved Cu	1.756	0.776	7.82
Total Pb	1.402	1.314	9.64
Dissolved Zn	3.231	0.714	32.6

NA - not available

B.2.6. Model Parameter Reliability & Assumptions

The input parameters for the water quality model fall into five main categories shown below. Each of the categories of input data is evaluated for accuracy reflecting the project site conditions.

- Rainfall data;
- Runoff Coefficients;
- Land Use data;
- Stormwater pollutant EMCs; and
- BMP performance estimates.

Rainfall Data: A limited period of record (about 12 years of hourly data) is available from the Castaic Junction gauge monitored by the LADPW. The Castaic Junction gauge is closer to the project site and consistently measures precipitation amounts lower than recorded at the Newhall gauge. However, the limited period of hourly data the data collected at the Castaic Gauge is insufficient for water quality modeling and the rainfall data collected at the Newhall gauge was

used. The rainfall data from the Newhall gauge are believed to overestimate the average annual rainfall by about 3 inches per year resulting in a conservative estimate of stormwater runoff volumes and changes in average annual volumes resulting from development.

Runoff Coefficients: The estimation of runoff coefficients, described in Section B.2.2, is highly dependant on soil properties (i.e. infiltration potential) and less dependant on parameters such as ET rates, slopes, and depression storage for example. Soil properties are estimated as accurately as possible from available data such as soil surveys and site specific geomorphology studies. The result is estimates for runoff coefficients that may somewhat overestimate or underestimate stormwater runoff. The net result on the water quality model is that this parameter is not conservatively estimated; however it is estimated as accurately as the available information permits. When combined with the overestimate of average annual rainfall and land use percent impervious values (discussed below), stormwater runoff volumes are somewhat conservatively predicted.

Land Use Data: Land use data is the most accurately quantified input parameter. The data for the existing and developed conditions has a high level of accuracy for classifying land use type and area. The percent impervious values used in the water quality model for the urban land uses in the developed project condition are based upon the values listed in the LA County Hydrology Manual. These percent impervious values assigned to types of urban land uses are somewhat conservative to provide a margin of safety when estimating flow rates for flood control analysis. These same percent impervious values are used for calculating runoff coefficients estimates which results in a conservative estimate of stormwater runoff volumes.

Stormwater Pollutant EMCs: Stormwater pollutant EMCs are estimated from monitoring data collected by the LADPW from land use characterization stations that do not have the same level (if any) of site design and source control BMPs that will be implemented for the Soledad Townhomes Project. Therefore the stormwater pollutant EMCs estimated from the LADPW data are probably slightly conservative compared to the pollutant concentrations in stormwater runoff that will occur from the developed conditions of the project site.

BMP Capture Efficiency & Effluent Concentrations: Stormwater capture efficiency estimates are calculated in Excel spreadsheets to provide results on a storm-by-storm basis for input into the water quality model. The method employed in the Excel calculations has been compared to percent capture estimate from SWMM modeling results which are believed to have a higher level of accuracy due to the continuous modeling approach. Table B-15 contains percent capture results from the Excel calculations described in Section B.2.5.1 and SWMM modeling. The SWMM percent capture estimates for bioretention basins were obtained directly from the storage-treatment block, (James and James, 2000). Results for the in-line and off-line swales were calculated with the SWMM flow rate output at 10-minute intervals for the period of record (01/01/1969 – 12/31/2003). Percent capture results calculated with the Excel method compare favorably to the results obtained with SWMM modeling. Overall the percent capture estimates for the structural BMPs are thought to provide an accurate estimate of the average annual capture efficiency they will achieve once constructed.

Table B-15: Comparison of Percent Capture Estimates from Excel Calculations & SWMM Results

BMP	Sizing Parameters	Percent Capture Result	
		SWMM	Excel
Bioretention Basin	0.5" ponding depth, 30 hour drain time	84.0	81.7
Swale (off-line)	2.0 cfs, (runoff from 0.20"/hr)	83.2	82.2
	2.5 cfs, (runoff from 0.25"/hr)	87.8	86.9
	3.0 cfs, (runoff from 0.30"/hr)	91.9	91.3
Swale (in-line)	2.0 cfs, (runoff from 0.20"/hr)	62.1	62.7
	2.5 cfs, (runoff from 0.25"/hr)	66.0	64.1
	3.0 cfs, (runoff from 0.30"/hr)	77.2	77.1

BMP effluent concentrations are based on studies contained in the International BMP database. These studies are screened to remove data for undersized (i.e. inadequate design criteria) BMPs that are likely to have pollutant removal performance substantially less than the BMPs to be constructed for the Soledad Townhomes Project. This screening is believed to improve the accuracy of BMP performance estimates; however it is only intended to remove BMPs that are clearly under designed. The screening process is intended to include BMPs with adequate performance that may not be as well designed or maintained as the structural BMPs that will be part of the stormwater management system. It is anticipated that the BMPs for the Soledad Townhomes Project will perform as well, if not better than, the estimated BMP performance. BMP pollutant removal does not include the effects of site design or source control BMPs that will help the overall effectiveness of the stormwater management system that will be incorporated into the Soledad Townhomes Project site.

Conclusions: The runoff coefficient, land use type & area, and BMP performance model input parameters are thought to be reasonably accurate representations of the real world conditions and do not increase the conservativeness of the water quality model. The rainfall data, land use percent impervious values, and stormwater pollutant EMC estimates are believed to result in conservative estimates of stormwater runoff volumes, pollutant concentrations and therefore pollutant loads. Overall the model input parameters likely result in conservative estimates of water quality. The water quality estimates for the developed project condition are believed to be a little more conservative due to the land use imperviousness values, pollutant concentration estimates, and BMP performance estimates that do not include the benefits of site design or source control BMPs.

B.3. Model Methodology

A Monte Carlo simulation method was used to develop the statistical description for water quality of storm water. In this approach, the storm water characteristics from a single arbitrary rainfall event are first estimated. The rainfall depth of an arbitrary event was determined by randomly sampling from the historical rainfall information. Similarly, an arbitrary EMC was

determined by randomly sampling from the distribution of EMCs in a manner that preserves the mean and standard deviation of the monitoring information. The randomly determined rainfall volume and EMC were used to determine runoff volume, pollutant concentration, and pollutant load of a single arbitrary storm event. Finally the BMP performance (effluent quality) is randomly determined to calculate the pollutant removal resulting from treatment in the BMP system. This procedure was then repeated thousands of times (≈ 20,000), recording the volume, EMC and load from each random storm event, without and with treatment for the developed project condition. The statistics of these recorded results provides a description of the average characteristics and variability of the volume and water quality of storm water runoff. The modeled pollutants were:

- Total Suspended Solids (sediment)
- Total Phosphorus
- Ammonia
- Nitrate
- Nitrite
- Total Nitrogen[1]
- Dissolved Copper
- Total Lead
- Dissolved Zinc
- Chloride

The steps in the Monte Carlo Water Quality Model are as follows:

1. Develop a statistical description of storm events and pollutant concentration in storm runoff, as necessary.
2. Estimate the volume of storm runoff from a random storm event for each land use area.
3. Estimate a random pollutant concentration in storm runoff for each land-use area.
4. Calculate the total runoff volume, pollutant load, and concentration in runoff from the modeled portion of the project.
5. Calculate the water quality improvements achieved in the structural BMPs (usually developed conditions only).
6. Estimate a random number of storms per year based on available historical records. To estimate a single random annual load, repeat steps 2 - 5 by the random number of storms per year, summing the loads from each random storm event.
7. Repeat steps 2 - 6 a total of 20,000 times for each pollutant modeled, recording the estimated pollutant concentration and annual load for each iteration.

[1] TKN is modeled, but the results are not reported. Total Nitrogen results are reported from the sum of nitrate, nitrite, ammonia, and TKN.

8. Develop a statistical representation of the recorded storm water loads and concentrations.

Each of the eight steps is described below.

B.3.1. Storms & Stormwater Runoff (steps 1 & 2)

Step 1 – Statistical Representation of Storm Events

Storm Depth

An arbitrary storm depth was determined by randomly sampling from the population of 538 storms generated by the rainfall analysis. The historical record of storm depths was sampled such that each storm had an equal chance of being selected.

Number of Storms per Year

The number of storm events per year was calculated for the 35 complete years in the available period of record from 1969 – 2003. The modeled average number of storm events per year (> 0.1 inches) was 15.4, with a standard deviation of 6.2. Figure B-10 illustrates a frequency histogram of the number of storm events per year at the Newhall gauge. The number of storm events per year was modeled with a normal distribution.

In the simulation, the number of storms per year was determined by randomly sampling from the normal distribution (~N (15.4, 6.2)) and rounding to the nearest whole number. If the arbitrary number of storms per year was zero or negative, then the normal distribution was re-sampled until a positive number was obtained.

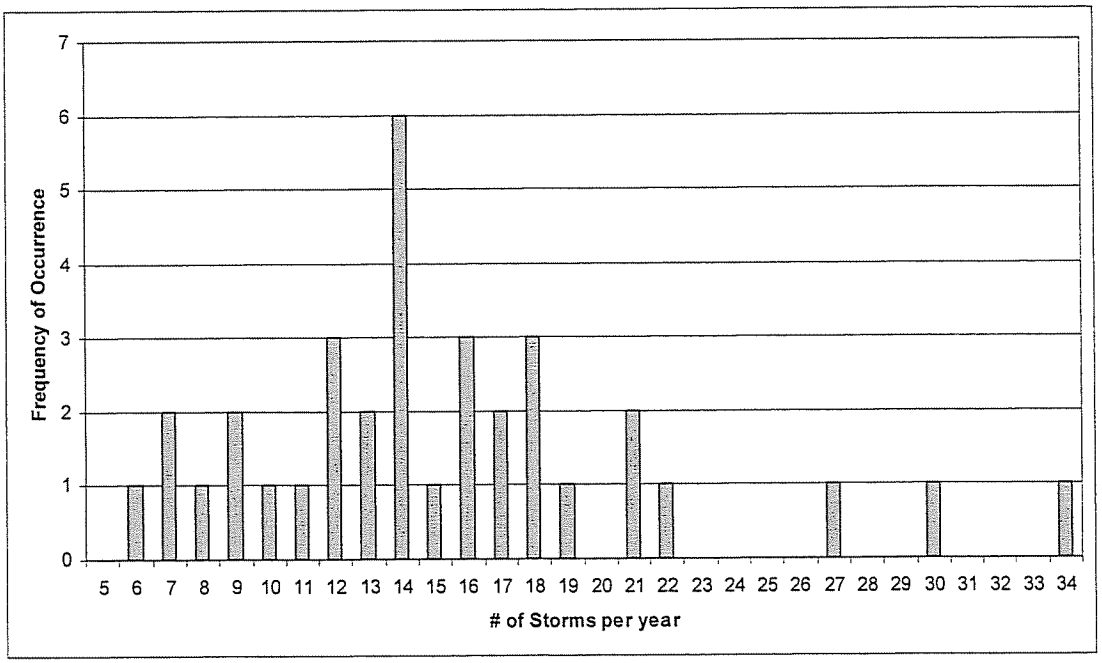


Figure B-10: Distribution of Storms per Year at the Newhall Gauge.

Step 2 – Estimate the Volume of Storm Runoff from a Random Storm Event.

The runoff volume from each storm was estimated with the following modification to the Rational Formula:

$$Q = R_v PA \tag{5}$$

where:

Q = the stormwater runoff volume (ft^3/year)

P = the rainfall depth of the storm (ft)

A = the drainage area (ft^2)

R_v = the mean volumetric runoff coefficient, a unit-less value that is a function of the imperviousness of the drainage.

- Existing Conditions: Runoff Coefficient = 0.0096 × % Impervious + 0.001
- Developed Conditions: Runoff Coefficient = 0.0093 × % Impervious + 0.031

For sub-basins that contain multiple land-use types, the total stormwater runoff volume is determined as the sum of runoff from each land-use type:

$$Q_{total} = \sum_{lu} Q_{lu} = R_{v\,lu} P A_{lu} \tag{6}$$

where *lu* designates the land-use type. It is assumed that rain falls uniformly over all land-uses in the sub-basin.

The steps used to calculate the volume of runoff from a random storm event were:

Step 2a Obtain a rainfall depth by randomly sampling from the 538 storm events.

Step 2b For each land-use area calculate a runoff volume using equation (5). The same rainfall depth is applied to each land-use area.

Step 2c Sum the runoff volumes from each land-use area to obtain the total runoff from the watershed for a particular storm event with equation (6).

B.3.2. Pollutant Loads & Concentrations (step 3 & 4)

Step 3 – Estimate a Pollutant Concentration in Storm Runoff from Each Land Use Area

Runoff Concentration

The distribution of land use-based pollutant concentration in storm runoff was obtained from targeted monitoring data collected in Los Angeles. Because only summary statistics were employed, it was assumed that the pollutant concentrations from all land-use areas are log-normally distributed. This assumption was evaluated by Los Angeles County using the Shapiro-Wilk Normality Test (LA County, 2000). For most cases the monitoring data were lognormally distributed, although in some instances the data were better fit with a normal distribution or were neither normally nor lognormally distributed. Stormwater EMCs were sampled randomly for

each modeled land use and water quality parameter from the developed lognormal distribution parameters (see Section B.2.4) for each modeled storm event.

The pollutant concentration in storm runoff from each land-use area was estimated by randomly sampling from the associated concentration distribution (lognormal) estimated from the LA County monitoring data. The runoff concentration from each land-use area was evaluated with the expression:

$$C_{land-use} = \exp(\mu_{\ln x} + \sigma_{\ln x} R_N) \quad (7)$$

where:

$\mu_{\ln x}$ = the log-normal mean

$\sigma_{\ln x}$ = the log-normal standard deviation

R_N = a standard normal random variable

Implicit in these calculations is the assumption that runoff concentration is independent of rainfall depth, and is also independent of runoff concentration in neighboring land-use areas. Environmental Defense Sciences (2002) examined the validity of the first assumption. They found that there was not a strong correlation between rainfall volume and event mean concentrations (EMCs) in the LA County data for education land-uses.

Step 4 – Calculate the Total Runoff Volume, Pollutant Load, and Pollutant Concentration in a Random Storm Event

Step 4A - The total runoff volume in the watershed was calculated with equation (6) as discussed in Step 2:

$$Q_{total} = Q_{land-use1} + Q_{land-use2} + \ldots + Q_{land-usei} \quad (8)$$

where the same random rainfall event was used to calculate runoff volume in each of the land-use areas.

Step 4B - The total pollutant load was calculated by:

$$L_{total} = Q_{land-use1} C_{land-use1} + \ldots + Q_{land-usei} C_{land-usei} \quad (9)$$

where the runoff from each individual land-use area was calculated with equation (5) discussed in step 2, and the concentration in each individual land-use area was calculated with equation (7) discussed in step 3.

The developed condition with treatment used additional calculations to determine the reduction in pollutant load and concentration achieved by treatment. The fraction of stormwater runoff receiving treatment was calculated for each storm event and runoff volume flowing to each BMP. That is, each storm event has an associated capture efficiency for the BMPs providing treatment. BMP performance was modeled with the randomly determined effluent concentration achieved within the BMP for each water quality pollutant.

$$L_{total} = \left[Cap_{\%} \times Q_{land-use} \times C_{eff} \times (1 - VR\%)\right] + \left[(1 - Cap_{\%}) \times Q_{land-use} \times C_{land-use}\right] \quad (10)$$

where:

$Cap_{\%}$ is the percent capture of the BMP. For the modeled BMPs the $Cap_{\%}$ is volume based.

C_{eff} is the randomly determined effluent concentration from the BMP. For the swales and water quality basins, C_{eff} was determined from sampling from the lognormal distribution described by the parameters contained in Table B-10.

$VR\%$ is the percent reduction in effluent volume achieved by the BMP (see Section B.2.5.1.3).

Step 4C - The average pollutant concentration in runoff from the entire watershed from a single storm event was calculated by dividing the total watershed load by the total watershed runoff volume:

$$C_{total} = L_{total} / Q_{total} \quad (11)$$

where the runoff from individual land-uses is calculated from step 2 and the concentration in individual land-uses in calculated by step 3.

B.3.3. Pollutant Loads & Concentrations Leaving Project Site

Step 5 – Calculate a Random Total Annual Pollutant Load

The annual pollutant load is simply the sum of pollutant loads generated from all storms in a given year. Thus, to compute an annual pollutant load, the number of storms in a random year must first be determined. This was accomplished by randomly sampling from the distribution using the expression:

$$N_{storms} = 15.4 + 6.2R_N \quad (12)$$

where:

R_N = a standard normal variant with a mean of 0 and a standard deviation of 1

The number of storms was rounded to the nearest whole number, and in cases where zero or a negative number of storms was obtained, the distribution was re-sampled until a positive number was obtained (years without any storms did not occur in the available period of record so this situation was not simulated in the water quality model).

Next, steps 2-4 were repeated N_{storms} times, recording the total pollutant load from each random storm event. Finally, the individual storm loads were summed to obtain the total annual pollutant load.

Step 6 & 7 – Determine Distribution of Storm Concentration and Annual Loads

Steps 2-5 were repeated a total of 20,000 times, recording the pollutant concentration and annual load from each iteration. The resultant distributions can be used to present frequency distribution for pollutant concentrations or loads using statistics calculated from the 20,000 Monte-Carlo iterations.

B.3.4. Model Methodology Assumptions

Five core assumptions are made for the Monte Carlo water quality modeling methodology:

1. The assumed probability distributions of model parameters;
2. The assumption of independence between model parameters (i.e. no correlation between randomly determined variables);
3. Assigning a Lower Limit to BMP Effluent Concentrations;
4. Limiting pollutant removals to pollutants with data; and
5. Modeling structural BMPs to removing pollutants only and not acting as a source.

Each of these assumptions is discussed in detail below.

1) Distribution Assumptions: Probability distributions are assumed to represent the number of storms per year, stormwater pollutant concentrations, and BMP effluent concentrations. Observed rainfall data (i.e. storm frequency) and stormwater monitoring data are fit with either a normal or lognormal distribution using standard statistical procedures. The distribution applied to the model parameters influences the sampling result (i.e. the frequency at which values within different magnitude ranges are selected). The type of distribution believed to best represent each model parameter was used in the model to determine random estimates of the input variables such that a large sample of these estimated variables will have same mean and variance that was observed in the rainfall and monitoring data.

Storms per Year: Figure B-10 shows the number of storms per year occurring at the Newhall rain gauge (augmented with data from the San Fernando gauge). The number of storms occurring per year at the Newhall gauge appears to lie between the normal and lognormal distributions. The normal distribution was used to determine the number of storms per year simulated in the water quality model as use of the lognormal distribution would overestimate the average annual rainfall, as well as its variability, when the distribution of the data is not heavily skewed. As discussed in Section B.2.6, use of rainfall data collected at the Newhall gauge already tends to overestimate the average annual rainfall for the Project site. When using the normal distribution to randomly determine the number of storm per year, the resulting average annual rainfall output from the water quality model is typically in the range of 17.9 to 18.0 inches per year. This is in close agreement with the average annual rainfall from runoff producing storms of 17.9 inches determine directly from the rainfall data (see Table B-1).

Stormwater Pollutant Concentrations: The Shapiro-Wilk Test was used to determine the statistical distribution that best represents the raw stormwater monitoring data collected in Los Angeles and Ventura Counties. In most instances the data were found to be log-normally

distributed at a confidence level of 0.10. In some instances, the data were not fit by either the normal or lognormal distributions, but were found to be more closely approximated by the log-normal distribution. For data sets with greater than 50 percent non-detects or that were not log-normally distributed according to the Shapiro-Wilk test, data were analyzed in arithmetic space as to not unreasonably overestimate the standard deviation of the data set. Since stormwater pollutant concentrations, in general, tend to be well approximated by the lognormal distribution (Helsel and Hirsh, 2002), the data sets that did not meet the lognormal criterion are still believed to belong to a log-normally distributed population, but the number of data points is too few to statistically confirm that this is the case. Therefore, simulations of stormwater concentrations in the water quality model were still conducted in lognormal space. This assumption is not believed to appreciably contribute to the conservativeness of the water quality model. Also the application of the lognormal distribution to determine all pollutant EMCs is believed to result in a more accurate prediction than would the application of the normal distribution.

BMP Effluent Concentrations: Goodness-of-fit tests conducted on the raw BMP effluent monitoring data from the International BMP Database with the Shapiro-Wilk Test either resulted in confirmation of the appropriateness of the lognormal distribution for the data or in the instances when the data did not meet the significance criteria of a p value > 0.1 the data were more closely approximated with the lognormal distribution than the normal. The use of the lognormal distribution to represent BMP effluent concentrations results in higher average estimates of BMP effluent concentration. This is believed to be a more accurate estimation of BMP performance than use of the normal distribution, and is considered to provide a conservative bias in the model results.

2) Assumption of No Correlation between Model Parameters: The water quality model randomly samples for stormwater pollutant concentrations independent of the storm depth or antecedent dry period. The validity of this assumption is supported by analyses conducted by Environmental Defense Sciences (2002) who did not find a strong correlation between rainfall volume and event mean concentrations (EMCs) in the LA County data for education land-use. Data analyses for the single family residential land use were found to be weakly correlated (R^2 of 0.6 ± 0.1) for some pollutants with storm depth; however some pollutant showed little correlation between these variables. Where weak correlations were present, stormwater pollutant concentrations decreased with storm size which is a reasonable expectation as more rainfall would result in greater dilution of the pollutants available for wash-off.

Correlations between pollutant concentration and antecedent dry period were similarly variable. For the single family land use correlations between pollutant concentration and antecedent dry period were moderately significant for a few pollutants (R^2 of 0.8 ± 0.03), and weak for other pollutants. Correlations between pollutant concentration and antecedent dry period varied widely for the educational and multi-family land uses.

The results of these analyses indicated that no consistent level of correlation was determined between the stormwater EMCs and the rainfall depth or the antecedent dry period and weak or no correlation was found for most pollutants and land-use. On this basis, stormwater pollutant concentrations are sampled independent of storm depth and antecedent dry period in the water

quality model. Consequently the mean and variance observed in the stormwater data will be preserved in the runoff concentrations that are estimated with the water quality model. In addition, this assumption results in conservative estimates of pollutant loads in the water quality model as pollutant concentrations are not constrained for the larger storm events or shorter antecedent dry periods.

Effluent concentrations are considered more reliable estimator of treatment performance than percent removal (Strecker et al. 2001). BMP effluent concentrations were sampled independently of stormwater concentrations (i.e. influent concentration to the BMP) in the water quality model. As with the pollutant EMCs, independent sampling of effluent concentrations preserves the mean and standard deviation in the monitoring data. The result of this assumption is that it does not limit the variability of pollutant concentrations and loads predicted by the model that would occur if the effluent concentration was correlated with the influent concentration. Due to the large number of iterations in the model and independent sampling for the EMC and BMP effluent distributions, this assumption is expected to result in a reasonable representation of average stormwater concentrations, BMP performance, and overall annual conditions in the model output.

3) BMP Performance – Irreducible Pollutant Effluent Concentrations: When sampling from the lognormal distribution to estimate BMP performance with an effluent concentration it is possible to select values approaching or equal to zero. While well functioning BMPs are capable of achieving high rates of pollutant removal, it is generally accepted that BMPs usually cannot completely remove pollutants from the water column. In effect BMPs can achieve what is called an "irreducible pollutant concentration" (Schueler, 1996). In an effort to prevent the water quality model from overestimating BMP performance lower limits were set for the effluent concentrations of each modeled pollutant and BMP. The lowest observed effluent value in each pollutant data set was used as the irreducible pollutant effluent concentration in the water quality model. This assumption is expected to provide a more accurate representation of BMP performance, and to prevent the estimation of unrealistic effluent quality achieved in the modeled BMPs.

4) BMP Performance – Limiting Pollutant Removal Estimates to Available Data: Table B-14 presents model parameters for estimating BMP pollutant effluent concentrations. Pollutant removal is only simulated for those pollutants with available data from the IBMPDB. As data is not available for ammonia or nitrate effluent concentrations for dry-extended detention basins, removal of these pollutants is not modeled for this BMP. While chloride data is available for swales, because this pollutant is water soluble and is not a nutrient for plants (i.e. is not likely to exhibit significant uptake) no chloride removal is credited in the BMPs. Limiting the simulation of pollutant removal only to pollutant / BMP combinations with available data prevents overestimating BMP performance for those pollutants.

5) BMP Performance – BMPs are not a Source of Pollutants: In instances when the randomly determined BMP effluent concentration exceeds the modeled influent concentration, no pollutant removal occurs and the effluent concentration is modeled as equal to the influent. This prevents BMPs from acting as a source of pollutants in the water quality modeling. The commitment to

regular and effective maintenance of the stormwater BMPs provides support for this assumption; however it is not the primary reason for this function of the water quality model.

Stormwater pollutant concentrations and BMP effluent concentrations are randomly and independently determined in the model. The greater the overlap between the EMC distribution for a pollutant and the BMP effluent distribution the closer the average values and the lower the overall pollutant removal simulated by the water quality model. The greater the overlap between these distributions also makes it more likely that sampled effluent concentration would be higher than the EMC (i.e. influent concentration). Therefore the less removal simulated for a given pollutant and less accumulation of that pollutant in a BMP the more likely it is that the BMP would act as a source of this pollutant in the model. This limitation of the water quality model tends to overestimate the pollutant loads for pollutant that occur at low concentrations in stormwater runoff and / or are not effectively removed by stormwater BMPs. Preventing BMPs from acting as a source of pollutants in the modeling methodology is believed to more accurately estimate pollutant loads transported from the project site and prevents overestimation of some water quality pollutants such as total lead.

Conclusions: The assumptions for the water quality modeling methodology described above generally do not contribute to the conservativeness of the model as is the case for the estimation of model input parameters as described in Section B.2.6. Furthermore, the method assumptions are not believed to contribute to over estimating BMP performance or under estimating stormwater pollutant concentrations or loads leaving the project site. The above assumptions are expected to improve the accuracy of the water quality model estimates. The net result for the model outputs are somewhat conservative estimates of pollutant loads and concentrations due to estimation of model input parameters that are not compromised by the model methodology.

B.4. Model Reliability

Factors that affect model reliability include variability in environmental conditions and model error. To account for environmental variability, a statistical modeling approach was used that takes into account the observed variability in precipitation from storm to storm and from year to year. The model also takes into account the observed variability in water quality from storm to storm, and for different types of land uses. One way to express this variability is the coefficient of variation (COV) which is the ratio of the standard deviation of the variable to the mean value. Based on the statistical model, the range of COVs for pollutant loads was about 0.40 to 1.5, depending on the pollutant. This variability is typical of storm water runoff.

Model error relates to the ability of the model to properly simulate the processes that affect storm water runoff, concentrations, and loads. Ideally model error is measured through calibration, but calibration is not feasible when considering a future condition. We are confident that the model is a reasonable reflection of storm water processes because the model relies largely on measured regional data. For example, the runoff water quality data are obtained from a comprehensive monitoring program conducted by LA County that has measured runoff concentrations from a variety of land use catchments and for a statistically reliable number of storm events. In

addition, parameter estimation is fairly conservative resulting in moderately conservative estimates of pollutant concentrations and loads

B.5. References

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C. TREATMENT BMP SIZING CRITERIA FOR THE NEWHALL RANCH PROJECT

The purpose of this memorandum is to provide treatment BMP sizing and design criteria guidance for the Soledad Townhomes Project. Methods and criteria used to size vegetated swales, media filtration devices, and bioretention areas are included. Figures are provided to assist in the preliminary determination of area requirements for the various BMPs. The size of the facilities should be finalized during the design stage by the project civil engineer with the final hydrology study, consistent with these sizing criteria.

C.1. SUSMP BMP Sizing Requirements

The County of Los Angeles' Standard Urban Stormwater Mitigation Plan (SUSMP) contains specific sizing criteria for stormwater treatment BMPs for new development and significant redevelopment projects. The SUSMP includes sizing criteria for both volume-based and flow-based BMPs. The sizing options for volume-based BMPs, such as extended detention basins, are as follows:

1. The 85th percentile 24-hour runoff event storm event determined as the maximized capture stormwater volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (WEF, 1998); or,

2. The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial (CASQTF, 1993); or,

3. The volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a stormwater conveyance system; or,

4. The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County Area) that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile, 24-hour runoff event.

Volume-based treatment control BMPs for the Soledad Townhomes Project will be sized to capture and treat 80 percent of the annual runoff volume, with a drawdown time of 48 hours. This methodology is consistent with criteria 2 above.

Flow-based BMPs such as vegetated swales and hydrodynamic separation systems (e.g., CDS) units must be designed to infiltrate or treat the maximum flow rate generated from one of the following scenarios:

1. The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity, or

2. The flow of runoff produced from a rain event equal to at least two times the 85th percentile hourly rainfall intensity for Los Angeles County, or

3. The flow of runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

Flow-based BMPs for Newhall Land projects will be sized using a rainfall intensity of 0.3 inches per hour, which will provide for 80 percent capture of the annual runoff volume, in compliance with criteria 3 above.

C.2. Volume-Based BMP Sizing Methodology

Volume-based treatment BMPs are designed to treat a volume of runoff, which is detained for a certain period of time to effect settling of solids and associated pollutants. Volume-based treatment BMPs for this project are limited to bioretention systems. Volume-based treatment control BMPs for the Soledad Townhomes Project will be sized to capture 80 percent of the annual runoff volume, as determined using SWMM runs and an excel spreadsheet model with a 48-hour drawdown time.

C.3. Flow-Based BMP Sizing Methodology

Flow-based BMPs are typically sized to capture and treat a flow rate resulting from a design rainfall intensity expressed as inches per hour. Flow-based BMPs for Newhall Land projects should be sized using the rational method with the simple method runoff coefficient equation and a design rainfall intensity of 0.3 inches per hour. This methodology will result in treatment of approximately the same fraction of runoff treated as using the volumetric standards above.

C.4. Treatment BMP Design Criteria

Treatment BMP design criteria and guidance are contained in Appendix B of the LA County SUSMP (LACDPW, 2002) and the LA County Technical Manual for Stormwater BMPs (LACDPW, 2004). The latter guidance document relies on, and has similarities to, design information in the California BMP Handbook for New Development and Redevelopment prepared by the California Stormwater Quality Association (CASQA, 2003). Engineering judgment was used in selecting design criteria where there are inconsistencies between the two LA County documents, and also between the LA County documents and the California BMP Handbook.

C.4.1. Vegetated Swale Design Criteria

Vegetated swales can be designed to be either on-line or off-line. On-line swales are used for conveying high flows as well as providing treatment of the water quality design flow. Off-line swales have flows up to the water quality design flow diverted to them from the conveyance

system. On-line swales are sized so that the low flow portion of the swale meets the treatment BMP design criteria, and the upper portion of the swale conveys high flows (e.g. flood conveyance), with a set freeboard (per the LA County Hydrology Manual, Los Angeles County 1991). Exceptions to the required freeboard are inlets or safe surface conveyances to carry excess water into a storm drain system that might occur in parking lots, for example. Off-line swales only provide freeboard if space is available. The following design criteria should be used for sizing vegetated swales:

- ***Design Rainfall Intensity***. The 85th percentile rainfall intensity for the Newhall rain gauge is 0.2 inches per hour. The design rainfall intensity that will be used for Newhall Land projects is 0.3 in/hour, to account for higher rainfall intensities not apparent in the hourly rainfall data and help achieve higher capture efficiencies.

- ***Longitudinal Slope***. The recommended longitudinal slope is 1 to 6 percent in the LA County SUSMP. The LA County Stormwater BMP Manual (LACDPW, 2004) recommends a maximum slope of 2.5 percent, but additionally states that slopes in the range of 2 to 5 percent can be managed with a series of small check dams. The use of check dams would also promote additional infiltration (LACDPW, 2004). For sizing calculations, the longitudinal slope is assumed to range between 1 to 6 percent, and if necessary, check dams would be used in the final design to reduce slopes and velocities to acceptable limits.

- ***Swale Geometry***. A trapezoidal channel shape should be assumed for sizing calculations, as recommended in both the LA County SUSMP and the LA County Stormwater BMP Manual (LACDPW, 2004).

- ***Side Slope***. The LA County Stormwater BMP Manual specifies a minimum side slope of 3:1 (H:V), whereas the LA County SUSMP specifies a minimum side slope of 2:1 and an optional side slope of 4:1. Swales designed for water quality treatment purposes only are anticipated to be fairly shallow, generally less than 1-foot. Therefore, a side slope of 2:1 (H:V) can be used for sizing calculations. Less steep slopes are preferable for traditional grass swales that need to be mowed.

- ***Hydraulic Residence Time and Swale Length***. Design criteria in the LA County SUSMP state that the swale length should provide a minimum residence time of 5 minutes and an optimal residence time of 9 minutes. The LA County Stormwater BMP Manual (LACDPW, 2004) recommends a swale length that provides a minimum hydraulic residence time of at least 10 minutes. Both manuals specify a minimum swale length of 100 feet. A minimum hydraulic residence time of 10 minutes and a minimum length of 100 feet should used for sizing calculations. If a length of 100 feet cannot be achieved (e.g., parking lot situations), then bioretention areas are an alternative (see below).

- ***Flow Depth.*** The LA County SUSMP recommends a design depth of flow of 3 to 4 inches. Similarly, the LA County Stormwater BMP Manual (LACDPW, 2004) states that the depth of flow not exceed 2/3 of the grass-height, which is recommended at 6 inches. For sizing calculations, the depth of flow should be set to a maximum of 4 inches.

- ***Swale Width***. The LA County SUSMP recommends a bottom swale width of 2 to 8 feet, with a maximum width of 10 feet. The LA County Stormwater BMP Manual recommends a maximum bottom of 10 feet. For sizing calculations, the maximum swale bottom width should be limited to 10 feet.

- ***Freeboard.*** Swales that are required to convey flood as well as water quality flows should be sized to meet the flood conveyance standard and include 1 feet of freeboard above the water quality depth (per the SUSMP Manual), unless it can be demonstrated that the swale freeboard is not needed as runoff would be safely conveyed to a drainage system.

Table C-1: Vegetated Swale Design Criteria

Design Criteria	Recommendations
Design Intensity	I = 0.3 in/hr
Impervious percentage	See 2002 LA County Hyd Manual Addendum Appendix F MFR Imp = use 0.682 to 0.855 SFR Imp = use 0.418 COM Imp = use 0.909 to 0.985 IND Imp = use 0.473 to 0.958 INST Imp = use 0.473 to 0.819
Runoff Coefficient	$C = 0.9i + 0.05$ Where i = Watershed imperviousness (range 0 to 1)
Drainage Area	A
Design Flow	Q = C x A x I
Swale Slope	0.01 <= S <= 0.06 where S is slope in ft/ft
Swale Shape	Trapezoidal
Manning's n	n = 0.25
Swale Bottom Width	W_b = 2ft to 8ft. Maximum limit on width is 10 ft
Swale Side Slope	Start with Z = 2H:1V flatten if space available
Swale Depth	Check that d = 3 to 4 in
Cross Sectional Area	$A_s = W_b + Zd^2$
Calculate Velocities	V = Q/A check that V <= 0.9ft/s if not decrease S or increase W_b.
Hydraulic Residence Time	Use t = 10 mins
Swale Bottom Length	L_b = 60 x t x V

Design Criteria	Recommendations
Freeboard	f >= 1ft
Swale Top Width	$W_t = W + 2(D + f)Z$
Swale Top Length	$L_t = L + 2(D + f)Z$
Surface area	$A_s = W_t \times L_t$
Area Ratio	$R = A_s/A$

The recommended velocity limitation of 0.9 ft/s combined with a maximum depth of 4 inches and bottom width of 10 feet results in a recommended maximum flow capacity of about 3 cfs. Limit the drainage area to each swale so as not to exceed the recommended maximum flow capacity. This can be accomplished by splitting roadside swales near high points in the road so that flows drain in opposite directions mimicking flow patterns on the road surface. Another way to limit drainage areas to long swales is to pipe flows in the swale off to the pipe system at regular intervals. For long swales, this limits the area that the swale is treating, thereby lowering flows and velocities in the calculations.

C.4.2. Bioretention Basin Design Criteria

Bioretention areas are assumed to function as multiple-distributed BMPs with small tributary areas incorporated into existing landscaping. The sizing methodology assumes that amended soils with the desired infiltration properties (1.8 in/hr infiltration rate) will be used. Bioretention areas are sized by estimating the amount of area that is required to capture and treat 80 percent of the runoff volume. Bioretention areas can also be designed just for infiltration through amended soils to an under-drain system, which routes the water to the storm drain system as opposed to infiltration into the underlying native soils without an under-drain. This allows their use in areas with low permeability native soils. Treatment is achieved mainly through filtration and adsorption. The design assumptions used in sizing bioretention areas are as follows:

- ***Design Area.*** The design area is the required footprint to achieve 80 percent capture of stormwater runoff volumes (see Figure C- below). The required footprint area is larger for bioretention areas that do not have under-drains due to a conservative assumption for infiltration rate (0.2 in/hr) into the underlying native soils.

- ***Design Infiltration Rate.*** The infiltration rate is assumed to be 1.8 in/hr based on the properties of amended soils as specified for the project. The LA County SUSMP recommends an underdrain for deeper infiltration rates that are less than 0.5 in/hr. Underdrains are therefore considered optional, although infiltration into native soils was conservatively assumed as 0.2 inches per hour for modeling purposes, and will be used in cases where tributary areas are large enough to warrant the extra level of protection provided by under-drains or where deeper infiltration is limited and/or unwanted (e.g. slope stability issues, etc.)

- ***Plant Soil Depth***. The LA County SUSMP recommends a plant soil depth of approximately 4 feet to provide a beneficial root zone for plants. For systems with limited deeper infiltration, these soils will need to be amended to allow for infiltration through this soil layer to under-drains and to increase its moisture holding capabilities.

- ***Maximum Ponding Depth.*** The LA County SUSMP recommends a maximum ponding depth of 6 inches. For sizing calculations, a volume-based approach that includes the ponding depth in addition to the storage volume available in the amended soil was used to estimate capture efficiency.

- ***Grass Buffer.*** Bioretention areas benefit from grass buffers that filter and spread incoming flows from land uses that are expected to generate higher TSS levels, such as roads. Bioretention areas that treat runoff from roofs, sidewalks, driveways, or other "cleaner" surfaces do not need a grass buffer.

- ***Minimum Surface Area.*** Both the LA County SUSMP and the LA County Hydrology Manual recommend a minimum area of 25 feet by 40 feet for bioretention areas. However, since the tributary areas to the proposed bioretention areas are likely very small and due to their distributed nature, the minimum size requirement of the bioretention areas is not justified. Therefore, no minimum surface area will be required, aside from the surface area required to treat the design flow from the tributary area.

Table C-2: Bioretention Design Criteria

Design Criteria	Formulas
Design Goal	Sufficient footprint area to achieve 80 percent capture of stormwater runoff.
Impervious percentage	See 2002 LA County Hyd Manual Addendum Appendix F MFR Imp = use 0.682 to 0.855 SFR Imp = use 0.418 COM Imp = use 0.909 to 0.985 IND Imp = use 0.473 to 0.958 INST Imp = use 0.473 to 0.819
Runoff Coefficient	$C = 0.9i + 0.05$ Where i = Watershed imperviousness (range 0 to 1)
Drainage Area	A
Design Volume	Volume required to treat 80% of runoff = Surface Area x [Pond Depth + (Porosity-Field Capacity) x Depth of Amended Soil]
Amended Soil Infiltration rate	Inf = 1.8 in/hr into amended soils, 0.2 in/hr into native soils (for bioretention w/o an under-drain)
Required Fraction of Drainage Area	R_f determined by SWMM modeling, results presented in Figure C-1.
Required Surface Area	$A_r = A \times R_f$
Under drain pipe slope	s = 0.005 ft/ft minimum
Under drain pipe size	$q = Inf/3600 * A_r$ $d = \frac{6.782Qn}{12(\pi\sqrt{s})^{3/8}}$ use d = 6 in minimum
Area Ratio	$R = A_r/A$

Bioretention areas are intended to treat small tributary areas, including parking lots. Limit the areas that drain to each bioretention area, since the area consumed by the bioretention area scale linearly with increase in tributary impervious areas. Since the flow rates used for design are based on the engineering properties of the underlying soils, the area required to treat various tributary areas are directly proportion to the runoff rates off the tributary sites.

C.4.3. Preliminary Sizing Nomographs

The assumptions and criteria discussed in the previous sections were used to evaluate the relationship between basin size ratio and tributary area imperviousness for vegetated swales and bioretention areas. The results of this analysis are shown in Figure C-1 for swales and bioretention. The design assumptions made for each BMP type were as follows:

Swales:

Area: 5 acres

Imperviousness: 20% to 100%

Geometry: Longitudinal slope = 4%, side slopes = 2H:1V

Roughness: 0.25

Residence time: 10 min
Freeboard: 1 foot

Bioretention:

Area: 5 acres
Imperviousness: 20% to 100%
Geometry: 4 foot depth of amended soils, ponding depth 0.5 feet
Infiltration Rate: 1.8 in/hr for amended soils, 0.2 in/hr for underlying native soils (bioretention without an under-drain)
Freeboard: N/A

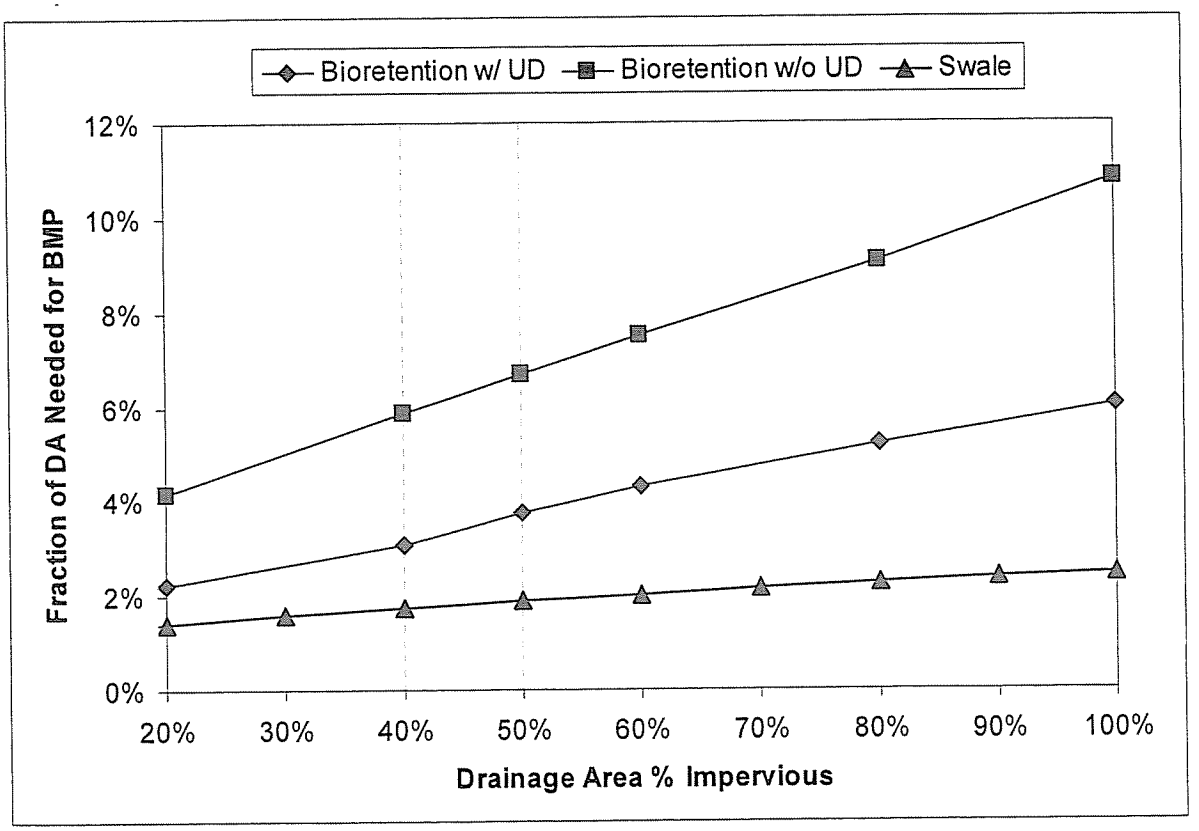


Figure C-1: Preliminary Sizing Nomograph for Swales and Bioretention Areas

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D. LOS ANGELES UNIFIED SCHOOL DISTRICT INTEGRATED PEST MANAGEMENT PLAN

LOS ANGELES UNIFIED SCHOOL DISTRICT

INTEGRATED PEST MANAGEMENT

PROCEDURES MANUAL

October 2000

LOS ANGELES UNIFIED SCHOOL DISTRICT
INTEGRATED PEST MANAGEMENT
PROCEDURES MANUAL

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LOS ANGELES UNIFIED SCHOOL DISTRICT
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I INTRODUCTION

In March 1999, the board of Education adopted a revised Integrated Pest Management (IPM) program. This procedure manual has been developed to reflect the revised IPM policy. IPM as defined in the District policy is as follows:

"Integrated Pest Management (IPM) is the coordinated use of pest and environmental information with available pest management methods to prevent unacceptable levels of pest damage by the most economical means, and with the least possible hazard to people and the environment. The goal of the IPM approach is to manage pests and the environment so as to balance costs, benefits, human health and environmental quality. IPM systems utilize a high quantity and quality of technical information on the pest and its interaction with the environment (site). Because IPM programs apply a holistic approach to pest management decision-making, they take advantage of all low risk management options, emphasizing natural biological methods, and the appropriate use of selective pesticides. IPM strategies incorporate environmental considerations by emphasizing pest management measures that minimize intrusion on natural bio-diversity ecosystems. Thus, IPM is:

- *A system utilizing multiple methods,*
- *A decision-making process,*
- *A risk reduction system,*
- *Information intensive,*
- *Biologically based,*
- *Cost effective, and*
- *Site specific."*

Implementation of the pest management policy is a challenging and rewarding endeavor to reduce and eventually eliminate the use of pesticides in all school environments. Everyone involved with the District including teachers, students, parents, principals, administrators, and maintenance and operations staff, has a role in the implementation and the responsibility to maintain the level of pest management attained through this program. The goal is to keep pest levels at or below the established threshold level as described in this manual and thus reduce the risk from pest presence and damage, without the potential risk from the means used, particularly pesticides, to manage pests. A comprehensive, concerted effort by all involved will achieve this goal in a relatively short time. This procedure manual will serve as a guide to accomplish this task.

II BACKGROUND

The District's Integrated Pest Management (IPM) development team was chartered by the board of Education's School Safety and Campus Environment Committee to develop a revised policy to regulate and reduce the use of pesticides in schools. The team included representatives from several Los Angeles Unified School District departments including Maintenance and Operations, the Child Development Division, the Environmental Health and Safety Branch, the Food Services Branch, and the Office of School Operations. In addition, community, labor and regulatory representatives from the Los Angeles Safe Schools Coalition, Action Now, Physicians for Social Responsibility, Pesticide Watch, Local 99 of the Service Employees International Union (SEIU), United Teachers Los Angeles (UTLA), 10th District PTA, State of California Department of Pesticide Regulation, and the Los Angeles County Health Department participated. The District, upon the recommendation of team members, retained Mr. William E. Currie, an Integrated Pest Management expert, for independent advice and counsel. Mr. Currie also serves as a team member.

III PURPOSE

The revised Integrated Pest Management policy charts a course for the immediate reduction and planned elimination of chemical pesticide and herbicide usage

within the Los Angeles Unified School District. Implementation of this policy is seen as a valuable component in ensuring the health and safety of students and staff.

Successful implementation of this policy will require thorough training of Maintenance and Operations and Food Services personnel. An intensive information program will also be necessary for school administrative and teaching staff. Training and information will include a ban on personal pesticide use in schools, limiting food to designated areas, and continuing to restrict purchase and application of pesticides to District pest management staff who are licensed and authorized to do so. Additional resources will enhance sanitation methods and procedures in the school cafeterias. An increase in gardening personnel will reduce herbicide use, as more weeds will be manually removed. Due to the size of the District, full implementation of the IPM policy is expected to take a minimum of three to four years.

IV POLICY

It is the District's policy to practice Integrated Pest Management (IPM). All aspects of this program will be in accordance with federal and state laws and regulations, and county ordinances. All District policies must conform to this IPM policy.

The District's goal is to provide for the safest and lowest risk approach to manage pest problems while protecting people, the environment and property. Pests must be managed to protect the health and safety of students and staff, maintain a productive learning environment, and maintain the integrity of school buildings and grounds. The District's IPM policy incorporates a focus on long term prevention and will give non-chemical methods first consideration when selecting appropriate pest management techniques. The District will strive to ultimately eliminate the use of all chemical methods since pesticides pose risks to human health and the environment, with special risks to children. It is recognized that pesticides cause adverse health effects in humans such as cancer, neurological disruption, birth defects, genetic alterations, reproductive harm, immune system dysfunction, endocrine disruption and acute poisoning.

The District's long term objective includes meeting the "precautionary principle" which states that:

- No pesticide product is free from risk or threat to human health, and

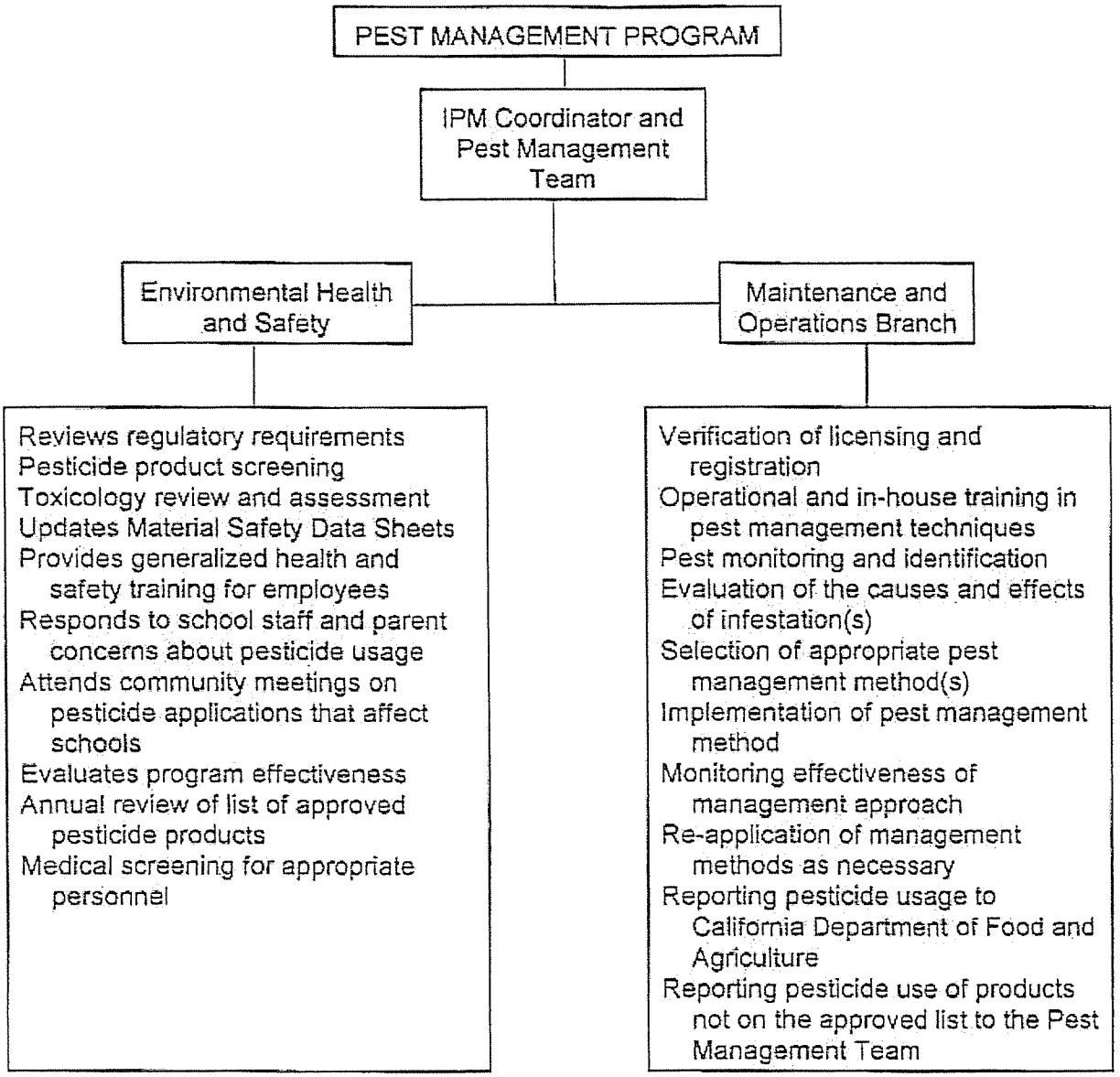
- Industrial producers should be required to prove that their pesticide products demonstrate an absence of the risks enumerated in paragraph two of the policy statement rather than requiring that the government or the public prove that human health is being harmed.

This policy realizes that full implementation of the precautionary principle is not possible at this time and may not be for decades. But the District commits itself to full implementation as soon as verifiable scientific data enabling implementation becomes available.

V ORGANIZATION

General Responsibilities

The Los Angeles Unified School District designated Maintenance and Operations and Environmental Health and Safety the responsibility for carrying out the Pest Management Program requirements. Figure 1 (following) outlines the Integrated Pest Management Program, responsibilities of Environmental Health and Safety, and Maintenance and Operations.



Integrated Pest Management Coordinator

The Integrated Pest Management Coordinator is the person responsible for implementation of the District's Pest Management program. District management will select this person from the ranks of existing staff. The Integrated Pest Management coordinator will assume the following responsibilities:

- Be knowledgeable of the components of the Los Angeles Unified School District Integrated Pest Management policy and this manual.
- Keep up to date with the current programs and techniques used in Integrated Pest Management by attending workshops, conferences and seminars.

- Pass on information about the Integrated Pest Management program to site administrators, plant managers, and maintenance and operations managers.

- Act as the primary contact for staff and the public about the Integrated Pest Management program.

- Understand what is expected of the Pest Management Unit. Inform the Pest Management Unit of any problems or complaints from the school sites.

- Ensure that recommendations from the Pest Management Unit for preventative action (such as keeping kitchen areas clean) are acted on through communication with appropriate management contacts.

- Chair regular Pest Management Team meetings to discuss pest management plans with the committee members, and vote on proposals for changes.

- Maintain a list of the pesticides used in the course of business within the Los Angeles Unified School District and the Material Safety Data Sheets (MSDS) for these products. This list will also be referred to as the "approved products list."

- Ensure that the Pest Management Unit keeps appropriate records of each pesticide application. The following information shall be included in the application records:

  Target pest
  Type and quantity of pesticide used
  Site and building within the site
  Date
  Name of applicator

  This information will be maintained in the Pest Management Unit and available for review upon request.

- Maintain a file of the sanitation reports and any other pertinent pest management records by school site. These records will be maintained in the Pest Management Unit and available for review upon request.

Pest Management Team Members

The Pest Management Team will be comprised of fifteen (15) independent members, including:

The District IPM Coordinator
One District non-management representative from Maintenance and Operations.
One District representative from the Environmental Health and Safety Branch
One District representative from the Food Services Branch
One independent IPM expert
Two parents of District enrolled students
Two community members
One public health representative
Two environmental representatives
One District teacher
One District principal
One medical practitioner

The Board of Education's Facilities Committee must approve all assignments to the Pest Management Team by a simple majority of all members. Selection of the initial Pest Management Team nominees was the responsibility of the groups whose members participated in and attended at least two (2) of the Policy Development Committee meetings. Thereafter, a member of that slot's constituency will submit nominations to the Pest Management Team to fill vacant positions. Pest Management Team membership will be solicited through the spotlight, recognized parent and teacher's organizations, unions and through notification and outreach to other independent community groups. Nominations will be screened by the Pest Management Team, then submitted to the Facilities Committee for approval at a public meeting.

Pest Management Team members will be randomly divided into two (2) classes of seven (7) and eight (8), comprised as closely as possible of equal numbers of District staff and non-District staff Pest Management Team member constituencies. The seats of the first class shall be vacated after the expiration of the second year; of the second class at the expiration of the third year, so that approximately one-half may be chosen every year. If vacancies happen by resignation or otherwise, the Facilities Committee may make appointments to fill the vacated seats consistent with the fifteen (15) constituency groups. With the exception of the first team of the second class, Pest Management Team terms will be two (2) years.

Decision Making Process

The Pest Management Team will provide guidance and verification regarding procedures, program implementation, and will recommend resolutions when this policy conflicts with other District policies. A quorum of ten (10) members must be present to convene a meeting. Decisions will be made by a simple majority of all Pest Management Team members voting at meetings. The Pest Management Team will decide the frequency of team meetings.

Pest Management Objectives

As stated above, pest infestations will be managed to a level that they do not adversely affect the learning environment or the health and safety of the students, staff or the general public. Action thresholds, a predetermined point at which action is taken to reduce a pest population, will be determined by:

- visual inspection
- monitoring areas with methods such as glue traps, and follow up inspection

Pest reduction actions include sanitation, elimination of harborage areas, and moisture management. These actions will reduce pest population as the sources of food, water and shelter are eliminated.

Food handling areas generally have the highest priority for action on a school campus due to health concerns associated with pest infestations. These areas include kitchens, serving areas, student and faculty dining rooms, outdoor lunch pavilions, and home economics classrooms. Some school sites may also operate a student store where food items are stored and sold.

The second highest priority is classrooms and other occupied areas on the school campus. Infestations in these areas may cause safety and health concerns, and may also be disruptive to the learning environment. Outdoor areas are generally the lowest priority for pest management concerns, although priorities may change depending on the level of risk a pest represents in any given area. For instance, bees and fleas pose health risks to students and would, therefore, demand higher priority. Pigeon and other bird infestations cause unsanitary and unhealthy environ-ments, and would also represent a high priority pest problem.

Designating Pest Management Roles

The concepts and methods of Integrated Pest Management were developed originally in agricultural settings. Later it was found that Integrated Pest Management had great value in urban pest management as well. The interactions between the people involved in the Los Angeles Unified School District pest management system are the key to the success or failure of the program. When the respective roles of all persons identified and agreed upon, and when these people communicate well with each other, effective protection of the sites and people can be achieved with reduced risk.

For the District's pest management systems to be successful, people must function effectively as occupants, pest managers or decision-makers. Each must gain the information they need, provide the information others need, cooperate with each other, and fulfill their special responsibilities to achieve the unique pest management objectives of the site. These functions and responsibilities are identified below.

The Occupants: Students, Staff and Parents

Occupants are concerned about the safety of the pest management methods used and their effectiveness. School staff, students, and their parents will receive notification as required under the Policy, and shall receive specialized training in accordance with the language of the Policy. They should also receive information regarding their role in the pest management system.

Sanitation and Elimination of Pest Harborage

The most important responsibility of the occupants (students and staff) is sanitation. Extremely small amounts of crumbs, grease or water can meet the food and water needs of most pests for many days of weeks. Much of the prevention and reduction of pest infestations depends on clean up of food leftovers, food in lockers, gum under desks, paper clutter, proper housekeeping, and performing good maintenance. Kitchens, where food is prepared, and dining rooms, where food is consumed, are particularly vulnerable to pest infestation. Special attention should be given to cleaning cooking utensils and appliances after each meal, and storing food in pest-proof containers. Food supplies should be rotated first in, first out. Food and standing water should not be left out overnight. All spaces should be thoroughly cleaned and vacuumed, and wet garbage and other trash removed from the premises often.

Observation and Early Detection of Problems

Since school occupants spend a great deal of time at their site, they should be aware of signs indicating the presence of pests. These signs must be noted and reported to the person on site responsible for reporting Maintenance and Operations' needs. At most sites, this will be the Plant Manager. This person will call the Trouble Call Desk at (213) 763-2906. The trouble call operator will forward the request to the Pest Management Supervisor, who will help in the detection and management of pests. Signs of infestation include live or dead insects, rodents, holes in paper or cardboard food containers, brown spots in corners of cabinets or woodwork, gnawing or scrambling sounds in the walls, "salt and pepper" droppings, fine sawdust piles, or olive-pit shaped droppings.

Other actions such as cleaning and limiting where food is stored and consumed may be required of or be undertaken by District students and staff, depending upon interest in the site, interest in the pest management system, and the nature of the assistance required at the site. The more that school occupants "buy in" to the Integrated Pest Management program at their school site, the better the system will work.

Parents have a Special Role in the Integrated Pest Management Process

Parents have the most responsibility for their children and they are their children's natural advocates. Thus, they can bring the need to reduce dependence on pesticides to the attention of school personnel, and they can assist greatly in the transition to an Integrated Pest Management program.

Parents' first school pest management responsibility is to learn about and follow Integrated Pest Management practices at home so that pests are not carried to school

in notebooks, lunch boxes, clothing or in the children's hair. Second, parents should be aware of the current pest management practices in their children's school. The school administration should welcome questions by the parents and encourage the parents to seek information. Visible interest and concern on the part of the parents is a valuable resource and stimulus for the implementation of the District school Integrated Pest Management program. Parents should express their views to the Site Administrator and/or the Pest Management Unit. Parents may also participate on the District's Pest Management Team.

Managing the Pests: The Pest Manager

The District's Integrated Pest Management Coordinator is responsible for the overall supervision and oversight of the pest management system. However, the Operations Program Coordinator and the Pest Management Supervisor are the people who observe and evaluate (or direct others to do so) the extent of the pest infestation and the site environment, and decide how to achieve the site management objectives. The Pest Management Supervisor designs a pest management system that takes into account applicator and occupant safety, effectiveness, customer or occupant concerns, potential liability, time required and costs. The Pest Management Supervisor also performs the necessary pest management actions or directs others to take action.

The Pest Management Supervisor draws on knowledge gained through training, experience and information from communication with the site-based staff. The Pest Management Supervisor uses information on the site environment, the pest and its biology, occupant health and concerns, appropriate management measures, and expected results.

Response to Occupant Pest Observations

Occupants have the means to report any signs of pest activity. Notify the person on site responsible for reporting Maintenance and Operations needs (usually the Plant Manager). This person will contact the Trouble Call Desk (213-763-2906) and the Pest Management Supervisor will assign a Pest Management Technician to respond quickly to such observations upon receipt of the trouble call.

Communication between Pest Managers and Occupants

Good communication, both oral and written, plays a vital role in the success of an Integrated Pest Management program. Communication between pest management technicians and occupants will help to solve pest problems more effectively.

Oral communication begins with the report of the pest problem to the Pest Management Technician. The occupant should report the pest problem as accurately as possible, so the Pest Management Technician has a clear understanding of the issues when he/she arrives at the school site. The occupant should give the following information when reporting the pest problem:

- Location code of the site with the pest problem
- Specific location(s) on the school site where the pest has been a problem
- The type of pest (if known)
- The severity of the infestation
- The priority of the call (emergency, urgent or routine)
- A contact person for the technician to see

Although the location code of the school site is basic information, an incorrect location code reported with the pest management call will result in delayed service. Specify the proper and accurate location code when the call is originated. Sometimes two or more locations share the same site, and use different location codes. In this case, be certain that the appropriate location code is used.

Give specific areas of the school site where the pest has become a problem. Give room numbers or name the areas affected (cafeteria, auditorium, main office, etc.). Do not report that the entire school is experiencing a pest problem. The pest management technician can solve the pest problem more efficiently if the area of concern is narrowed down to a specific location.

Specify the type of pest creating the problem. Be as specific as possible. For example, "a pigeon infestation in the outside lunch area" is more descriptive than "birds outside." If the caller knows the species of the pest, this information is helpful to the technician. With better information prior to visits to the site, the Pest Management Technician is more likely to have the proper tools and materials available to solve the problem.

Give an accurate description of the priority this call should receive. "Emergency" calls are reserved for situations that cause immediate danger to students or staff members. Some emergency situations include bee swarms, snakes, rodents observed in food service areas or classroom areas, and dead animals under buildings. "Urgent" situations may include problems that disrupt the learning environment in a classroom or pose an immediate obstacle in the daily functions at the school site. "Routine" calls include pest infestations that do not pose any immediate threat to safety or health, and are not causing major program disruption.

Communication from the Pest Management Technician to the occupants normally begins upon visitation to the school site. The primary communication will be with the person designated on that site as the contact person in the pest management trouble call. However, Pest Management Technicians will visit the main office and speak with the site administrator during each visit, if the administrator is available.

Initial communication will determine the specifics of the pest management problem. Key information needed by the Pest Management Technician includes where the problem is located, who is involved, cultural factors involved, and environmental conditions present that cannot be easily observed. This communication should start prior to inspection of the premises.

In food service areas, the Pest Management Technician will also review the pest sighting log maintained by the Cafeteria Manager.

After inspection of the problem area, the Pest Management Technician will communicate his/her findings with the site designee and/or the Site Administrator. This communication will include the following:

- What pest problems are present at the designated areas.
- What steps the school site staff need to take to help prevent or eradicate the pest problems. This may include sanitation, restricting eating areas, elimination of harborage areas, and maintenance items.
- Behavioral practices including eating, storage and sanitation routines that may adversely affect Integrated Pest Management efforts.
- Recommendations on correction of any of the above items, and recommendations for exclusion work to

restrict access by pests and prevent future infestations.

After verbally communicating these items to the Administrator and/or the Administrator's designated person, the Technician will provide an inspection report to outline the problems and recommended solutions. The recommendations will include any structural, sanitation, and chemical methods necessary to solve the problems. The Pest Management Technician will assist the school administration by making necessary trouble calls to maintenance for repairs needed to improve moisture management, sanitation, pest exclusion, and modification or elimination of harborage areas. Mechanical methods, monitoring for pest activity, exclusion work, and pesticide treatments to be performed by the Pest Management Unit will also be scheduled at this time as needed.

Prior to leaving the site, the Pest Management Technician will note all Integrated Pest Management related work performed on the Integrated Pest Management Site Log in the main office. This log will be kept current. The Pest Management Technician will review the Integrated Pest Management Site Log on each visit to determine if follow-up is necessary on previous work, to determine the effectiveness of the action taken at the site, and to ensure that proper notifications and posting have been made, as required under the IPM policy.

Inspect and Monitor the Sites

Pest management staff will routinely inspect all cafeteria or food service sites and take appropriate pest management actions on a quarterly basis. In addition, the Pest Management Supervisor will assign a Pest Management Technician to respond to occupant observations by conducting a thorough inspection of the environmental conditions of the site. This inspection will reveal how the site provides the biological needs (food, water, shelter) for pest populations, where pests are located, and the size of the pest population. Monitoring of the area will also help the technician determine the size, type, and extent of the pest population on the site.

Identify the Pests

The Pest Management Technician identifies the pest (to species, if possible) and determines the necessary sanitation and exclusion methods, and biological and physical methods that can be used to achieve the pest management objective.

Identify Preventive Measures

School occupants will be advised of their responsibilities in pest management, including vacuuming, sanitation, removal of clutter, handling wet garbage, food storage methods, and other cultural means to remove what pests need to survive in the site.

Make Recommendations

Some necessary actions to be taken, such as repair of leaks and exclusion measures may not be the responsibility of the Pest Management Technician. The Pest Management Technician will write recommendations for necessary repairs or exclusion to the Maintenance and Operations area responsible for the site. The Maintenance and Operations area will then respond to the repair request.

Manage the Pests

The Pest Management Technician should take whatever physical means are needed to manage the site's environment and pest populations, which may include the use of a low risk pesticide, if necessary.

IV PESTICIDE PRODUCT USE

Approval Process

The Pest Management Team, following a careful review of contents, precautions and low risk methods, must first approve products for routine use in the Los Angeles Unified School District. These approved products comprise the Approved List.

Purchasing of pesticides to be used on Los Angeles Unified School District property or sites requires the approval of the IPM Coordinator. Only District licensed pest management staff are authorized by the IPM Coordinator to bring or apply pesticides on District sites or property; no site-based employees are permitted to bring or apply pesticides on District property.

Products will be divided into two classifications:

- Products approved by a simple majority of all the members of the Pest Management Team members at team meetings for use at the discretion of the Pest Management Technician within the guidelines of this IPM program. This will be referred to as the "Approved List." Products on the approved list will adhere to the "Pest Management Methods and Product Selection Guidelines."

- Use of products other than those on the approved list requires the written approval of the IPM Coordinator and the team's independent IPM expert when reduced risk methods are unsuccessful. Information on the use of products not on the approved list will be provided to the Pest Management Team so that these pesticide applications may be reviewed on a case-by-case basis at the next scheduled Team meeting.

Pest Management Methods and Product Selection Guidelines

Pest management methods and product selection will be based on the following principles:

- In embracing the Precautionary Principle, the District will use only those pest management methods or products demonstrated to be the safest and lowest risk to children, and strive to use products that demonstrate an absence of the following health effects: cancer, neurological disruption, birth defects, genetic alteration, reproductive harm, immune system dysfunction, endocrine disruption and acute poisoning.

- In those instances where pesticides fall outside of these specific guide-lines, the District's decisions on pest management methods or product selection will conform to the spirit and intent of this policy and these guidelines.

- The District will use only those pest management products that can be applied in a manner and at a time where no person will inhale or come into direct contact with them, or be exposed to volatile agents.

- The approved list and categories listed below will be reviewed and approved annually by the Pest Management Team.

Only products that fall within the following categories will be placed on the approved list:

- Insecticide or rodenticide baits and traps
- Caulking agents and crack sealants
- Borates and silicates
- Soap based products
- Products on the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) 25(b) list [40 CFR 152.25 (g)(1)] or the

California Certified Organic Farmers' organic list

- Cryogenics, electronic products, heat and lights
- Biological controls such as parasites and predators
- Microbial pesticides
- Insect growth regulators
- Physical barriers

Notification, Record Keeping and Reporting

The District will notify parents, employees and students of all pesticide applications using the following guidelines:

Annual Notification

The District will provide annual notification to parents or guardians in the "Registration Packet" distributed at the beginning of each school year or upon enrollment. Notification will include:

- The IPM Policy statement
- The approved product list (Appendix D)
- The availability of IPM activity records in the Main Office of each school (Appendix E)
- A request that parents or guardians notify the school principal if their child's health and/or behavior would be influenced by exposure to pesticide products.
- A mechanism by which parents or guardians can request notification of all pesticide applications performed at the school site (Appendix F).

The Approved Product List

The approved product list will be conspicuously posted annually in the Main Office of each site and remain posted throughout the year.

Products not on The Approved List

Applications of products not on the Approved List will be preceded by a 72-hour notification to parents or guardians and school staff, except for emergencies as determined by the IPM Coordinator and the Team's independent IPM expert. In emergency situations, every effort will be made to give prior notification. Notification will include:

- The product name and active ingredient(s)
- The target pest
- The date of pesticide use
- The signal word indicating the toxicity category of the pesticide
- A contact source for more information
- The availability of further information at the school's Main Office
- The Pest Management Supervisor will maintain records to inform the Pest Management Team of the use of products not on the "Approved List."

Signs

Signs shall be conspicuously posted around any area where pesticides not on the approved list are to be applied in a non-emergency situation at least 72 hours before and for five (5) half-lives after any pesticide application. In the event of an emergency, posting will go up at the time of application, and shall include the information as indicated above (see sample sign in Appendix H).

For products on the approved list a warning sign shall be posted in the area of the facility or grounds where pesticides will be applied. The warning sign will include:

- The term "warning/pesticide treated area" prominently displayed
- The product name
- The signal word indicating toxicity category of the pesticide
- The manufacturer's name
- Active ingredient
- U.S. Environmental Protection Agency's product registration number
- Intended date and areas of application
- Reason for pesticide application and target pest
- Date sign may be removed
- Contact phone numbers for additional information

The warning sign shall be visible to all persons entering the treated area and shall be posted 24 hours prior to application and remain posted until 72 hours after application.

Provide Risk Communication

The Pest Management Supervisor will communicate any potential risk from the pest or pesticide use to the occupants and the school administrator or designee. This communication will include the following:

- An approved pesticide list. This is a list of pesticide products approved for use by the Pest Management Technicians. The Approved List" is distributed annually in school registration packages and is posted in the Main Office.
- Pest Management Technicians will consult with the site administrator or the administrator's designee prior to any pesticide application.

72-Hour Notice for use of Pesticides not on the Approved Products List

If pesticide products are to be used that are not on the approved product list, the following rules apply to their use:

- Pest Management Technician will consult with the Pest Management Supervisor prior to application to obtain approval to use "non-approved" pesticides.
- Post notices as required at the school site, including:

  "Pesticide Application Posting" notice. This notice shall be posted on the school site in the area of application every time a non-approved pesticide will be used on the school site. For non-emergency applications, this notice will be posted at least 72 hours before the application. In emergency situations, the notice shall be posted as early as possible. Notice will remain posted on site for five (5) half-lives of the product used.

Additional notifications are required as follows:

72-hour notification of pesticide use (product not on the "Approved List"). This document must be sent home with students at least 72 hours before application of a non-approved product, for non-emergency applications. The Pest Management Technician shall provide the notification to the site administrator for distribution to the students and staff in a timely manner to ensure that the 72-hour notification is achieved (see **Appendix I - 72-hour notification**).

Site Activity Log. The Site Activity Log is a document maintained on each school site to record actions taken by the Pest Management Unit. The technician will make an entry in this log on every visit to the site, including the date, pest activity, action taken, reason, and the technician's name. This Site Activity Log will be maintained in the Main Office of each school site.

The pest management system for the site should achieve the goals within the limitations posed by safety, time, budget and materials available. Pest Management Technicians monitor the site's environment and pest population to determine if actions taken were successful, and keep accurate records of any pesticides used, the amounts and treatment dates for each site.

VII DECISION MAKERS

The Board of Education establishes the overall policy and funding for the Integrated Pest Management program. The Pest Management staff, under the guidance of the IPM Coordinator, is responsible for the implementation and administration of the IPM policy, and for making decisions regarding the appropriate methods to manage pest problems. Requirements by others, such as the Los Angeles County Health Department, may impact decisions. In addition, concerns about health, safety, method effectiveness, liability, cost and customer or occupant satisfaction impact decisions. As previously noted, the Pest Management Team's role is to provide guidance and verification regarding procedures and program implementation, and to recommend solutions when the IPM policy conflicts with other District or regulatory policies.

The IPM Coordinator and support staff must determine if the pest management objectives are being met and if the Pest Management Technicians are performing at an acceptable level through monitoring complaints from site occupants, observation of the site environment, or by a combination of both. If not, the Pest Management Team should assist the Coordinator with development of recommendations for changes in policy, procedures, and/or funding necessary for the IPM program to succeed.

The decision-makers increase the chances of implementing a successful IPM program by performing the following:

Develop a Pest Management Plan. The site administrator and pest management staff should develop a pest management plan to resolve any given pest problem. The plan should include at least the eight (8) steps of a successful IPM system, as follows:

- Define roles of occupants, pest managers and decision-makers
- Set pest management objectives
- Set pest management action thresholds
- Inspection and monitoring of sites
- Habitat modification
- Appropriate low-risk pesticide application
- Evaluation of results
- Good record keeping

A good pest management plan will ensure the success of implementing Integrated Pest Management at a site.

Providing Maintenance Procedures. Proper maintenance of site buildings will eliminate opportunities for pest populations to develop. Routine maintenance includes leak repair, exclusion measures to keep pests out, and provision for timely garbage removal.

Recommendations of a professional pest manager. The Pest Management Technician should be a professional who knows the

biology and behavior of pests and will make recommendations for structural changes, repairs and innovative approaches that will economically achieve long-term pest management without the risks of excessive pesticide use.

A great deal of understanding, cooperation and commitment from everyone in the system – students and parents, all school staff, managers, administrators and the public – is needed for an IPM program to succeed.

VIII EDUCATING INTEGRATED PEST MANAGEMENT PARTICIPANTS

The District's IPM program includes a commitment to the education of the students and staff, and to the parents of the students. IPM principles will be taught to staff including teachers, school nurses, cafeteria employees, housekeeping and administrative employees. All occupants must understand the basic concepts of IPM and who to contact with questions or problems. Specific instructions should be provided on what to do and what not to do. For example, staff should not bring and use pesticides on their own in the school. Pesticide applications, including those purchased at a retail store, should only be made by designated District Pest Management Technicians who are certified and licensed pesticide applicators.

Educating and training staff to function within an IPM context is important to the success of an in-house IPM program. NOTE: More specific training is required for the Pest Manager.

Training for Integrated Pest Management Participants

District personnel, students and parents have roles and responsibilities in the IPM processes. Training of the participants is necessary to adequately familiarize each participant with the role and responsibility they will play in the success of the IPM program. Training will be specific to the job and/or responsibility of the participant, and will include IPM philosophy, pest identification and pest risks. "Train the trainer" courses will be designed for supervisory employees who will be required to provide IPM training to staff.

Operational training will be provided on an annual basis for IPM participants. The type of amount of training provided is based on job classification, and will include principals, administrators, pest management technicians, gardeners, carpenters, electricians, floor covering installers, HVAC fitters, painters, plumbers, roofers, sheet metal workers, plant managers, area operations supervisors, cafeteria managers, teachers, students and the community (PTA).

Pest Management Technicians and Gardeners will receive an initial 40 hours of practical training on IPM practices as they relate to their respective duties. Pest Management Technicians will also receive specific product training as new products or methods are introduced. Annual refresher training for Pest Management Technicians and Gardeners will consist of four hours or practical training in IPM practices. This training will supplement routine monthly safety training.

Carpenters, electricians, floor covering installers, HVAC fitters, painters, plumbers, roofers and sheet metal workers will receive initial three-hour training in IPM as it relates to their respective classifications. Annual one-hour refresher training will be provided the employees in these classifications.

Area operations supervisors and cafeteria managers will receive "train the trainer" instruction in IPM. This will consist of initial six-hour training with two-hour annual refresher courses.

Plant managers will receive six-hour initial IPM training with annual four-hour refresher courses.

Principals, administrators and teachers will be provided lectures and information handouts on their roles in IPM. Students will be given a written informative. The community, through the PTA, will be provided awareness training in IPM.

Training Program for Pest Management Technicians

The practical pest management training for Pest Management Technicians will be more comprehensive than the training provided for other participants, as the training will focus on specific tasks that the technician performs routinely. This includes inspection of facilities, identification of insect species, exclusion techniques, sanitation, moisture management concerns, various pest management methods, notification, record keeping, establishing pest threshold levels, pest population monitoring and tracking of pest infestations. Practical training will be administered in both classroom settings and practical (on the job) training courses. This training will be scheduled as needed, through monthly training sessions.

Pesticide health and safety training includes classroom instruction on reading and understanding pesticide labels, health and safety hazards, personal protective equipment, safe work procedures, personal hygiene, emergency spill or contamination procedures, common symptoms of pesticide poisoning, emergency medical information, medical examination, and applicable laws and regulations. The pesticide health and safety training is an annual training.

The pesticide health and safety, and operational training will be performed by a combination of the Pest Management Supervisor, industry experts, and Los Angeles Unified School District Health and Safety Officers.

IX SETTING PEST MANAGEMENT OBJECTIVES FOR SITES

A pest management objective is like a road map for pest management. It tells what we are trying to accomplish (where we are going) and when we have done enough. The pest management objective should be as specific to the school site as possible, considering the occupants, conditions, pest problems and resources available.

Pest management objectives will differ among sites and must be considered before setting action threshold levels. For example, with an athletic field, the objective would be to maintain aesthetics as well as a specific type of playing surface; i.e., grass length. With ornamentals, the objective would be strictly aesthetic value. With structures, the main objective might be controlling damage caused by termites. Pest managers for schools and other sites should clearly identify specific objectives in pest management plans.

Examples of Pest Management Objectives

"Manage pests that may occur on this site to prevent interference with the learning environment of the student; eliminate injury to students or staff; preserve the integrity of the school buildings or structures; and provide safe playing of athletic surfaces."

or

"Manage termites that may occur in the site to prevent or minimize damage to buildings, using appropriate monitoring, remedial, and preventive methods that also minimize injury or health risks to occupants or staff, and preserve the integrity of the site buildings and structures."

In managing pests to a level where they do not have adverse impacts upon health and property, "zero" pest presence may not always be possible. However, with the

utilization of IPM principles and practices, very low levels (near zero) of pest presence can be achieved with reasonable expenditure of money, time and material.

Realistic tolerance for the presence of pests is relative to the risk posed by exposure to that pest. A rat in a classroom is not tolerable and requires immediate action. However, the fruit fly or termite does not pose a threat to life, and may not call for immediate action. Individual tolerance for certain pests should be considered in establishing thresholds for each pest.

Setting Action Thresholds

An action threshold is a predetermined point at which action is taken determined by sensitivities of the occupants, and should reflect the pest management objective for the site. When pest populations exceed action thresholds, action should be taken to manage the pest. Precise recommendations or actions to achieve specific results are an essential part of an IPM program.

Specific recommendations for the management of the pest should be based on the evaluation of all available data obtained through monitoring. The presence of some pests does not in itself necessarily require pesticide action. An explanation of the risks and benefits of the pest and management methods will be discussed with the decision-makers involved.

Inspection and Monitoring

The identification of pests and the determination of the extent of infestation are vital steps in the District's pest management procedure. Eliminating the pest's desired habitat is another important step in IPM. Once the pests have been identified and the sources of their activity have been pinpointed, habitat modifications – primarily exclusion, repair and sanitation efforts – will reduce the prevalence of pests greatly.

An IPM program consists of a cycle of inspection, monitoring, evaluating, and choosing the appropriate method of pest management. Sites are inspected for evidence of pests, entry points, availability of food, water and harborage, and estimating pest infestation levels. Monitoring the sites can determine whether the pest population is increasing or decreasing over time, the extent of infestation, and the size (approximate number) of the pest population. The information attained through monitoring is evaluated to determine whether the action threshold has been exceeded and what type of prevention methods should be performed.

School occupants' reports and observations of the site will also give the Pest Management Technician an idea of the size of the pest population. An astute observation will provide signs or actual sightings of the pests for identification. On the basis of such information (to species, if possible) information can be obtained about the behavior and preferred habitat of the pest, and what methods will achieve management of the population.

All organisms have basic life needs including air, moisture, food, warmth, harborage and environments that will meet these needs. Unfortunately, buildings and grounds are constructed and maintained in ways that provide pests with access and environments that encourage pests to remain and multiply. Further, occupants and staff sometimes do not keep kitchens and other spaces adequately clean, which can invite and support pest populations.

One of the primary goals of an effective pest management program is to identify realistic and economically sound ways to eliminate those elements pests need for survival. Deny harborage, food and water to pests and those that enter the environment will not thrive. Neglecting any of these methods strengthens the pests' ability to survive and flourish.

Who Monitors for What Conditions

Occupant observations and reporting. The school occupants (teachers, students and staff) are in perhaps the best position to observe pests that occur within the school. Observations of pests, or their damage, should be reported to the person on site responsible for reporting maintenance and operations' needs. This person should call the Trouble Call Desk at (213) 763-2406 to allow the Pest Management Supervisor to conduct an inspection and monitor the location and extent of the pest population, and determine the corrective actions to be taken.

An IPM Site Activity Log (Appendix E) will be provided to all schools to note pest sighting. This log should be maintained in a notebook in the Main Office for review by the Pest Management Technician on subsequent visits to the site.

Maintenance observations and reporting. While performing inspections or repairs, the maintenance staff also has opportunities to observe the presence of pests or the results of their activities. These observations should be reported to the Pest Management Supervisor to assign a Technician to conduct a thorough inspection. Upon inspection and evaluation of the situation, the Technician can plan a course of action necessary to eliminate the problem. Maintenance observations should also be recorded in the IPM Site Activity Log.

Pest Management Technician's inspections and observations. The Pest Management Technician should schedule periodic inspections at each site to determine that sanitation standards are maintained and to detect any environmental conditions that may be conducive to the presence of pests. Inspection and monitoring in an IPM program are the most important functions of the Pest Management Technician.

Conditions that support pests

Air. The oxygen in air is basic to the maintenance of most life forms. In most situations at a school site, removing the air, or the oxygen it contains, is not practical. However, in some instances, removing the oxygen from a sealed container or replacing the air with a gas toxic to life may be necessary to manage a large or hidden infestation.

Moisture. Water is a basic element of life. Elimination of leaks, condensation and other moisture sources will reduce pest infestation and damage.

Food. Although many insects can go without feeding for a long time (weeks or months in some cases), eliminating access to food will reduce their number. Thus, keeping food in pest-proof containers, good sanitation and exclusion are important aspects of managing pests.

Shelter. Small, concealed and protected places that insects and other pests can use may provide shelter and harborage. Preventing access to these shelters by caulking or other exclusion methods will reduce available shelters. The Pest Management Technician should notice conditions that provide shelter to pests so action can be taken for their elimination.

Temperature. Most organisms have a relatively narrow range of temperatures within which they can function. Low and high temperatures can be lethal to insects, whereas temperatures between 65°F and 90°F enable insects to function well and reproduce rapidly. Observing temperature ranges can indicate potential pest growth rates.

Light. Many insects and other pests are active in the absence of light. Thus, the presence or absence of light can be a pest

management tool. Observation of light conditions and placement of light can give clues to pest presence or potential.

Inspection and Monitoring Methods

"Inspection and monitoring" includes the initial site survey and subsequent ongoing surveillance by the Pest Management Technician to determine the presence and harborage of pests, as well as the physical and human factors to decide what action and treatment measures are needed to reduce key pests to a manageable level.

To inspect or monitor effectively, the Pest Management Technician conducting the inspection must have proper monitoring tools, including a flashlight, a clipboard, pen and paper to record and diagram information, a pocket knife, a screw driver, and a hand lens to examine pests, pest droppings, exoskeletons and damage found. In addition, the Pest Management Technician should have a ladder available to access equipment, ceilings, attic spaces and otherwise inaccessible areas for inspection purposes. Additional monitoring tools include sticky traps, pheromone lures, glue boards or snap traps which assist in determining current pest activity, the degree of infestation, and routes of entry. The Pest Management Technicians should communicate essentials of the monitoring plan with the occupants of the site to prevent mishandling of the traps, lures or glueboards placed in the areas monitored.

The Pest Management Technician may use many monitoring tools to assess the level of pest infestation. Since some pests are elusive, monitoring tools may be in place for some time. These tools may capture the pest for counting (cockroach sticky traps) or merely note the presence of infestation (tracking powder). Some monitoring tools may attract pests from a long distance, so placement is very critical to avoid inviting more pests from outside the managed site. The monitoring methods provide data, over time, which are recorded and enable the Pest Management Technician to select the methods to achieve the desired level of management.

Inspecting the Exterior

A complete inspection of the exterior and the interior of the site are essential to identify the degree of specific pest problems and to provide insight as to the reasons and origins of the problems.

Site inspections should begin with the exterior of the facility. Evidence of insect and rodent infestation, damage, poor sanitation and the presence of breeding and harborage areas in the exterior environment will often help to interpret pest findings within the structure.

Exterior inspection must include not only the immediate perimeter of the facility but must extend to take in the overall environmental conditions and how they relate to the facility. The overall environment inspection should include adjacent vacant lots, roofs, parking lots, refuse areas, drainage ditches and sewer lines, among other areas. Inspect and record structural problems including cracks, holes, excessive moisture, and other structural deficiencies that may lead to infestation. Landscape conditions including excess vegetation, debris, general sanitation, and landscape runoff should also be considered. Environmental conditions that affect pest management are noteworthy and include exposure to the wind, rain and sunshine.

Inspecting the Interior

Interior inspections require the complete inspection of all potential breeding and harborage areas. These areas include, but are not limited to, kitchens, receiving areas, dining rooms, storage areas, doors, classrooms, teacher lounges, computer rooms, refuse areas, ceilings, administration offices, locker rooms, custodial closets, heat

ducts, ventilation systems and elevator shafts. Obvious sources of breeding and harborage such as cracks, voids, crevices, debris, unrotated supplies, water leaks, spillage and sanitation problems should be identified and recorded.

Evaluation involves the objective review and analysis of the information gained through the inspection, monitoring and identification process, as well as the subjective insight gained from past experience in dealing with similar pest situations.

Landscape Monitoring

Monitoring is the most important part of the ornamental IPM program. Regular monitoring avails the pest manager to the information necessary to fully access plant health and make rational pest management decisions. Basic information on the environmental factors, cultural conditions and pest populations are required to accurately predict pest population development and the potential for damage to plant material. The use of biorational pesticides, other biological agents, and beneficial arthropods is fully dependent on these regular observations.

Detecting and evaluating the numerous factors that contribute to loss of plant health, function and beauty requires a year long systematic approach to monitoring. These diverse factors may be classified as either cultural, environmental or pest related. The effects of environmental factors and the cultural conditions on pest development are the major concern.

The first step in this monitoring system is the initial site visit and evaluation. This visit may be conducted at any time of the year, but a dormant season visit may be best. Dormant season visits allow the pest manager to carefully inspect the landscape and plant material during the time of the year when insect and plant life are less active. Plant inventories and landscape maps can be completed during this visit. Plant health status and most cultural conditions may also be evaluated.

Many pest problems can be observed during the dormant season. Observations made at this time may help determine potential pest problems that may occur during the growing season. Pest management strategies may often be planned in advance. For example, azaleas growing in sunny locations are highly susceptible to lace bug. Having determined this potential pest problem in advance, the pest manager can begin monitoring early for this pest and detect the first signs of activity.

Unacceptable levels of mite damage on evergreen plant material and scale insect populations observed during these visits may indicate the need for dormant oil applications. Unfavorable cultural conditions observed during these visits may be remedied before the growing season begins. These initial visits are essential during the beginning stages of the IPM implementation. After the program has been established, annual dormant season visits will suffice.

Monitoring programs should be flexible to take into account variable environmental and cultural conditions and differences between sites. The number of visits and the timing of visits should be determined by the plant material and existing or potential pest problems at individual sites. This type of flexibility may not always be practical, but should be followed as closely as possible. Keep in mind that it is better to make too many visits to a site than too few.

During the growing season, monitoring visits should be regular and frequent. Fewer than ten monitoring visits per season allows an unacceptable amount of time to pass between visits. Pests with rapid reproductive capacities such as spider mites and lace bugs may cause serious damage if not monitored frequently. The fewer the monitoring visits, the greater the margins for error, and any misdiagnoses or overlooked problems are likely to spread into serious conditions.

The monitoring season should begin at bud break for most plants and extend into fall until pest activity ceases. Monitoring may begin earlier if certain pests of conifers are present. If dormant oil applications are to be made, earlier visits may be necessary to determine the best time for these applications. Monitoring should continue until all pest activity has ended in late fall. Spider mites, lace bugs and sawflies are active during cool autumn weather and will cause permanent damage to evergreen plants if they are not adequately managed during the fall months.

IPM programs rely on regular monitoring (also called scouting or inspecting) of the plants to be protected. The inspector should be knowledgeable in plant, insect, mite and disease identification and management. In addition to the insect and mite pests, the inspector also should be able to identify predators and parasites that aid in pest management.

The suggested interval for monitoring landscape plants is every two weeks, depending upon weather conditions. When inspectors find a pest population buildup, they must evaluate the problem. The following is a list of questions the inspector should consider when performing this evaluation:

- How many pests are present?
- How soon will this pest complete a generation and produce eggs for the next generation?
- How many more inspections are scheduled for this site before another generation is produced?
- Are predators or parasites present and will they be effective in managing this infestation?
- How much damage can the plants tolerate and how much damage will the school community tolerate?
- Are there cultural or management practices that will reduce pest activity without pesticides?
- Are there effective pesticides labeled for use on the plant and can they be spot treated in a way that minimizes exposure to students and staff, or damage to beneficial organisms?

A detailed discussion of many of these questions can be found in several texts on the subjects of IPM and biological management.

The conscientious, knowledgeable IPM practitioner will learn how to evaluate many of these questions by making careful notes in a field log book about the appearance times of diseases, pests and beneficial organisms, as well as soil, temperature and moisture conditions. Careful observations also should be made and recorded regarding attempted management methods. After reviewing these notes for a few seasons, the technician will begin to see that many problems and their solutions are relatively predictable. The use of a computer to store and analyze these data will facilitate the development of an IPM program.

X HABITAT MODIFICATION

General

Habitat modification is a term used to describe changes made to a site in order to reduce the number of pests the site can support. Living organisms need to have air, water or moisture, food or nutrients, adequate temperature, secure hiding or resting areas, and light for plant growth. These things make up the habitat of a site. By manipulating the access or availability of these necessities, the "habitat" can be modified to such an extent that the site is no longer attractive to the pest, or the site no longer supports the pest's life. Habitat

modification can take many forms and is usually directed toward the "life style" of a specific pest to be managed.

Maintenance

Good maintenance practices should include habitat modification. Maintaining the structural integrity of a building is excluding pests from entering the building.

The maintenance activities that repair leaks and other moisture management activities are modifying pest habitats that are reliant upon water. Temperature control can slow or increase the growth of fungi and molds. A good example is an interior humidity control. The lower the humidity, the fewer pests can live in a site. Good cleaning or sanitation practices will also reduce the carrying capacity of a site for pests.

Exclusion is another habitat modification that will reduce the capacity of a site for pests. Keeping food stored in pest proof containers such as glass or metal containers with tight fitting lids prevents pest access to food. Tight door sweeps keep crawling insects and rodents from entering. Similarly, repair of masonry and holes in walls and floors prevents potential pest access.

Changing the behavior of personnel who occupy the site is another means of habitat modification. Getting people to use trash receptacles, and removing trash at the close of business can be beneficial. Removing or rearranging clutter can improve the habitat to make it less desirable for pests. Convincing occupants to clean up after themselves has great benefits.

Modification of the landscape can also prevent or reduce pest presence. Keeping turf properly mowed to four inches reduces habitat for broadleaf weeds and ticks. Planting pest resistant varieties of turf and ornamental trees and plants also reduces pest presence and makes pest management easier. Proper watering regimens, fertilizing, and aeration of turf prevents insect, disease and weed pests on the site. If mulch is used, decorative rock is more desirable than wood mulch next to the building to reduce suitable habitat for rodents, termites and other pests, and also helps manage moisture around the building.

Physical controls can be instituted to manage pest populations, such as: installing screens, air doors, light traps, fencing, proper pruning of foliage, netting or tension wires to exclude birds, sticky traps, lethal snap traps, chimney screens, metal flashing, weather stripping, caulking cracks and crevices, and mosquito nets. Other desirable habitat modifications include moving stored materials outside away from the building, keeping tight lids on garbage cans, and frequent emptying of trash containers.

Biological changes of the habitat can include interplanting to repel pests, introduction of insect predators and parasites.

As you can see, there are many means to modify the habitat to make the site less attractive to pests, and to deny them the necessities for life.

XI MAINTENANCE AND SANITATION

Architectural Integrity

The architect that designs a building or structure should consider the prevention of pests in addition to the structural integrity, usefulness, and aesthetics of the building. If the architect is knowledgeable of water and moisture management, and includes these considerations in the building design, a large part of the battle to prevent pest invasion is won. Pest harborage can also be eliminated with proper architectural design. Window ledges and other structural artifacts should be designed at sufficient angle to eliminate attractive sites for bird nests or roosting.

Construction Practices

Construction practices also can contribute to the ease of maintenance and sanitation of the structure, and to prevent pest invasion. Knowledge of the site's previous condition can help determine specific construction practices to follow. A site previously covered with a forest or extensive woody plants is expected to have an abundant population of termites, mice and other potential pests. Planning construction should consider means to prevent termite and other pest penetration of the structure. Design to provide preventive measures for long-term results. Structural wood timbers, joists, and framing can be treated with borates to prevent wood-destroying organisms. Removing the roots, scrap wood and paper from the site avoids providing food for termites. Assuring all entry points into the structures fit tightly to prevent access by crawling or flying insects, or rodents. Door sweeps should fit tightly when doors are closed. Openable windows should have insect-proof screens. Site landscaping should allow water to run away from the structure, and ornamental plants and trees should be kept away from the building to prevent bridges that can be used by pests to access the building. Kitchens and bathrooms should be well caulked to provide good moisture management and to exclude pests from hiding places such as cracks and crevices. Quality materials and workmanship are important.

Maintenance

Maintenance of the structure and site plays a key role in a pest management plan. The importance of this role must be understood, not only from the standpoint of maintaining the structural integrity, usefulness and aesthetics of the site, but also from many aspects of the management of pests that may attempt to overcome the defenses of the site.

The first line of defense for a structure is the exclusion of pests from entering the structure. Unfortunately, the design, construction practices, and human activities within the structure provide an attractive habitat for invertebrate and vertebrate organisms that interfere with human objectives, and thus, become pests. "If you keep them out, they can't get in!"

Good exclusion of pests from the structure can mean placing tight fitting screens on operable windows to exclude flying insects, applying a good coat of quality paint on fascia boards to exclude carpenter bees, or installing tight fitting door sweeps to exclude crawling insects and mice. As structures age, they develop many openings available to pests. Cracks in masonry joints or cement, weathering of paint, or breaks in windows or screens should be repaired to prevent pest invasion. Keeping roof drains and gutters clear of debris can prevent breeding sites for aquatic insects such as mosquitos, and reduces moisture availability for other pests.

Exclusion also includes preventing pests that get inside the structure from gaining access to moisture, food or harborage. Repairing leaks, insulating cold water pipes to prevent condensation, and caulking around sinks and restroom fixtures are important to prevent access to moisture. Providing tight food storage can also prevent pests' access to nourishment. Caulking cracks and crevices, repairing holes in walls and masonry, and generally keeping things "ship shape" can prevent pest access to harborage. All are important to pest management.

Housekeeping

It is said that: If our bosses and the housekeeping staff were to leave for a month at the same time; we would miss the housekeeping staff first, and the most! Housekeeping is a very important aspect of site maintenance and pest management. The removal of food and other trash to the dumpsters (which are kept closed) at the close of business each evening is very

important to prevent pest access overnight from food and harborage. Additionally, the housekeeping staff is in all parts of the structure daily in their cleaning duties, and has many opportunities to observe pests or the results of pest activity. Housekeeping staff should be trained to recognize insects, rodents and other pests, and their droppings or damage from their activity, and to report observations for the pest manager to act upon. The pest manager may also suggest ways that the housekeeping staff can enhance the effectiveness of the pest management actions through more careful or directed cleaning methods. Pesticides cannot overcome dirty conditions in a building. Housekeeping procedures need to be thorough, with attention to details to assist in keeping a school site pest free.

Sanitation

Sanitation includes removing food, water and harborage from access by pests; and also removing or killing pathogens that may be present as a result of pest activity or other organisms. Sanitation is of critical importance in food handling or food service facilities. Kitchens in schools sites must have quality maintenance, housekeeping and sanitation.

Food Handlers' Responsibility

Estimates show that at least one half of the healthy population carries potentially virulent staphlococci in the nose, throat, mouth, and on the skin. Poor personal hygiene magnifies the problem and is said to cause 95% of the sanitation problems in the food business. Sneezes, improper or infrequent hand washing, carelessness in appearance, bad habits and poor health can contaminate food with pathogenic microorganisms. While a food service manager has an important role in screening applicants and enforcing the state health code, the burden of responsibility rests in the employee's integrity when nobody is looking.

Proper dress contributes to good pest management. Protective clothing should be light colored and cleaned every day. A dirty apron easily harbors bacteria that can be transferred from hands to food. Don't wear jewelry or hair ornaments while working. They can drop into food or provide breeding grounds for bacteria. Men should be clean shaven. Store clothing in clean lockers and change at work. It is recommended that you don't wear uniforms to and from work where they can pick up bacteria and dirt. Hair should be washed frequently and kept neat. Bathe at least once daily. Change undergarments daily.

The key principle is **watch your hands:** whenever possible substitute a utensil, piece of equipment, or protective device for using your hands. After you touch an unclean or unsanitary object or part of the body, and always before touching food, wash your hands by scrubbing for at least 20 seconds and rinsing the hands briskly. Keep your physical appearance and health up to par -- clean uniform, restrained hair, clean skin and hair, and stay home when ill. Kitchen managers are responsible to instruct employees in proper personal hygiene measures and observe their actions. In addition, good personal hygiene should be made as convenient as possible for employees.

Food Contamination

All food is contaminated to a certain extent. If contaminated to a dangerous level, it is **adulterated**, or unfit for human consumption. Food is considered adulterated if:

- a potentially hazardous food is held at 40° - 140°F for more than two hours;
- there is **excessive contact** during preparation or service;
- there is **rodent or insect** contact or infestation;

- it is exposed to toxic substances or filth;
- it is exposed to any condition that permits the introduction of disease-causing microbes or foreign matter.

Pathogens are disease-causing organisms. They are often present in food, but can reproduce to many millions under ideal conditions.

Microorganisms responsible for contamination are:

- bacteria
- fungi (molds, yeast)
- viruses
- protozoan
- worms in the cyst stage or larval stage

Bacteria

Description

Bacteria are the single-celled, living microorganisms that are responsible for the majority of food-borne illnesses.

Shape

Round bacteria are called cocci. When they form clusters, they are called staphylococci; when they form chains, they are called streptococci.

Rod-shaped bacteria are called bacilli. Some produce endospores, inactive cellular material with a protective coating that can survive more adverse conditions than the rest of the bacterium can handle. In other words, reheating stock may kill everything but the spores.

Fungi

A fungus is a plant that is not green and has a high tolerance for acid conditions. Fungi include yeast and molds.

YEAST

Description and reproduction

Yeast are single-celled, oval-shaped and reproduce by growing a sack until it breaks off, a process called "budding."

MOLD

Description and reproduction

Molds are the most adaptive of microorganisms in that they can grow in a wider range of environmental conditions (temperature, pH, moisture). These multicellular organisms reproduce by means of exospores found on thread-like structures called hyphae. The spores are transferred through the air and on clothes, while the hyphae remain on the food as a fuzzy growth.

Viruses

DESCRIPTION: A virus, translated "poison" in Latin, is the smallest living organism and has neither a cell wall, cell membrane, nor nucleus. A viral particle is crystal-like and is extremely small. A virus is the most resistant form of disease.

Protozoans

DESCRIPTION: Protozoans are single-celled organisms such as the amoeba, paramecium, and vorticella. They are indigenous to soil, water, and the intestines of animals.

Worms

DESCRIPTION: Certain worms can and will go into a dormant stage. They will later "break out" after being swallowed and invade the muscle tissue.

Chemical, physical, and biological substances can all cause food-borne illnesses, either by contamination within the

food (intoxification) or within the human intestine (infection). All food has some pathogens on it; however, food that is high in moisture, protein, and is an animal source is extremely susceptible to the multiplication of pathogens.

Bacteria are responsible for the majority of food-borne illnesses and thrive well where there is warmth, darkness, moisture and an available food source. Because bacteria grow best in warm temperatures (from 40° - 140°F), it is essential to hold foods above 140° and below 40°F. Cool and reheat quickly, watch for cross-contamination of raw and cooked food, maintain good personal hygiene, and cook to proper temperatures when reheating to kill the spores that survived the first cooking and have grown in number.

Specific measures should also be taken to avoid food contamination due to fungi, worms, viruses, and protozoans.

Refrigeration

Refrigeration slows the growth of bacteria and extends the lag phase, but will not kill existing bacteria. A lack of air circulation will distort temperatures and hasten chemical changes in food, so your refrigerator should be large enough to support the bulk of your food with shelves two inches from walls and the bottom shelf of the refrigerator six inches from the floor. In walk-ins, store food away from walls and floor to prevent insect infestation and increase air circulation. Clean refrigerator at least once a week, and more often if heavily used. Smooth corners and slatted, non-corrosive, removable shelves make your job easier. The refrigerator should not show signs of excess condensation and should be kept in good repair.

Freezer Storage

The freezer should be easy to clean, insulated and sealed to prevent condensation. Defrost often. Keep freezer at 0°F or lower. Because food can deteriorate in the freezer, wrap food so it is moisture-proof and no dehydration, freezer burn, or odor absorption will occur. Do not refreeze once thawed. Put food in freezer right after delivery, labeling it with the month and year date of freezing. Remove only what you need as you need it, not holding the door open for a long time.

Use storage areas for their sole purpose: storage. Date all foods upon receipt, identify by common name and maintain an accurate inventory with a first-in, first-out policy. Stock must be rotated; do not put new cans on top of old cans, or new meat in front of old.

Products should be wrapped in clean wrappers that are moisture-proof and air tight to prevent dehydration and prevent insect infestation. Temperature and humidity of storage area must be monitored carefully; area should be aerated and have no evidences of condensation. In addition, keep all products off the floor so areas can be cleaned and sanitized. Shelves and transporting vehicles should be sanitary as well.

Dry Storage

Dry storage comprises nonhazardous food with low perishability: canned food, spices, condiments, cereals, and staples such as flour and sugar. Date all food upon receipt and store away from perishable food and non-food items (soaps, paper, cleaners). Keep food at least six inches off the floor and away from the wall. Temperatures ranging from 60 - 70°F and 50 - 60% humidity range are adequate. Good ventilation and insulation will guard against temperature extremes.

Make sure storage area is clean. Dry food, particularly grain and cereal, is particularly susceptible to insect infestation. Rotate your stock and adhere to the first-in first-out policy (FIFO); if new cans are placed on top of old

cans, the old cans may never be used. Make sure all cans and dry food are labeled to avoid mistakes, especially if transferred to another container. Containers should be moisture-proof. Don't hold food longer than six months at 70°F.

There should be no sewer pipes in the storage area because of possible leakage. Steam pipes or hot water pipes can condense and change room temperature, so make sure they are insulated. Storage rooms should be adequately lit, but avoid direct sunlight which might increase room temperature, change the color of the food, and cause spoilage. Storage areas should be easy to clean; painted or sealed concrete floors with no crevices are best. Enamel paint is wiped easily. Shelves are preferred to be slatted metal that will not rust since wooden shelves absorb moisture and are hard to clean. The outside door should be screened and self-closing to prevent entrance of flies and other flying insects.

Floors and Walls

Floors should not be porous since bacteria can breed in these environments and cannot be removed easily. Terrazzo, linoleum and vinyl are nonabsorbent; concrete, if used, should be sealed.

Other factors to consider are:

- Does it stain easily?
- How much care and upkeep does it require?
- Is it slick when wet, especially in high-traffic areas such as behind the production line and in warewashing stations?
- Is it durable?

Paint walls with glossy, non-toxic paint for ease of cleaning. Never keep a dry wall unpainted. Use a light color on walls so soil will be visible. Ceramic tile is a popular kitchen wall option, but keep grouting smooth and in good repair. Always check for possible entrances for rodents or insects.

Equipment

Equipment should be easy to clean, have no sharp corners, crevices, or toxic surfaces that chip easily. If equipment is to be connected to the wall or another piece of equipment, make sure it either allows enough space in between the wall and the device to be cleaned, or is sealed with a non-toxic sealer. If the equipment is on a counter and cannot be lifted by one person, thus discouraging good cleaning, mount it on legs. Whenever possible, utensils should not be hung over food preparation area and should be allowed to air dry before stored. Glasses and cups are stored upside down.

Garbage Management

Again, effective sanitation measures begin before food is delivered to the facility and don't end until after the food leaves. Garbage can contaminate surrounding areas, permeate grounds and kitchens with odors, and attract and harbor pests if not stored and disposed of correctly.

All garbage stored indoors should be in containers that are easily cleanable, don't leak, and are large enough to hold whatever waste is accumulated. Clean the receptacle with detergent and hot water often, far away from the food preparation area. If the container is near utensil washing or food preparation area, keeping a tight-fitting lid on it when not in use is recommended.

Outdoor garbage is stored in dumpsters and other containers, either on flat, nonabsorbent surfaces such as asphalt and concrete, or elevated at least 18 inches off the ground. Setting out a plastic bag for garbage is similar to sending out an invitation to all neighboring rodents to come and partake. Compactors and pulpers can reduce the

amount of garbage.

A prime factor in choosing and designing the surrounding environment of a food service operation, as well as the equipment, should be how well it promotes good sanitation practices. Floors and walls should not be cracked or porous. If possible, equipment should not have any areas that are inaccessible to cleaning and sanitizing or have sharp corners, crevices, or toxic surfaces. Store garbage in clean, closed containers away from food preparation area. On the outside of the facility, store garbage on flat, nonabsorbent surfaces or elevate at least 18 inches off the ground. Maintain good ventilation, adequate lighting, enough electric outlets, correct water pressure and temperatures, as well as air gaps and vacuum breakers to prevent contaminating water.

Cleaning and Sanitizing

To "clean" and to "sanitize" do not mean the same thing. When food or other material is taken off a surface where it doesn't belong, the surface has been cleaned. If the amount of bacteria has been reduced to a safe level, the surface has been sanitized.

As a general rule, clean and sanitize anything that has come into contact with food, or if there has been a great time lapse between uses.

There are four different kinds of cleaning agents:

- **Soap** removes soil, but also doesn't rinse well and leaves residue if the water is hard.
- **Alkaline detergents** are synthetic detergents which are highly rinsable and chemically compatible with other compounds.
- **Abrasive** cleaners are designed to clean corroded metals and some porous surfaces. Again, these may scratch some surfaces.

Cleaning may remove visible soil, but it does not kill bacteria. There are two ways to kill bacteria:

- **Immerse in hot water.** Regulations usually state approximately 170°F for 30 seconds.
- Either **immerse object in chemical sanitizing compound** for one minute, or spray or rinse with twice the sanitizer concentration recommended.

Three types of sanitizers are:

- **Chlorine-based** sanitizers are inexpensive but corrosive on some metals.
- **Iodine-based** sanitizers (iodophors) are expensive and can stain porous objects and plastics, but have good penetration.
- **Quaternary ammonium compounds** (or "quats") are odorless, colorless, non-corrosive, have good penetration, a long shelf life, and are effective in both alkaline and acidic solutions.

Cleaning schedules help ensure jobs get done as often as needed. A manager should take responsibility in:

- Listing what needs to be done as an inventory.
- Making sure supplies (plastic gloves, brooms, mops, pans) are adequate and stored away from food.
- Designing a cleaning schedule that includes:

Specifically what is to be cleaned;

Who cleans - each employee should take care of his own cleaning and large jobs should be rotated;

When cleaning is to take place and how often. Schedule cleaning during off-peak hours if possible. Include a regular bathroom inspection throughout the day.

- Posting cleaning instructions near items or machines.
- Informing employees of procedures.
- Supervising subsequent action.

Simply removing material off a surface where it doesn't belong (cleaning) does not necessarily reduce the amount of bacteria to a safe level (sanitizing). Consider the type of soil, water and surface to be cleaned when choosing either soap, alkaline detergent, acidic, or abrasive cleaners. To kill bacteria, either immerse the object in 170°F to 180°F hot water for 30 seconds or in chemical sanitizing compound at approximately 75°F for one minute. Quaternary ammonium compounds seem to be the most effective sanitizers. If available, use a three-compartment sink to wash, rinse, and sanitize. Managers should post cleaning schedules and instructions, and supervise subsequent actions.

Pest Management

As in all other areas of sanitation, "an ounce of prevention is worth a pound of cure." Pesticides, traps, and other killing measures are only temporary weapons and the pests will return if sanitation methods are sloppy. The "integrated pest management" concept focuses on prevention rather than relying on treatment. Knowing a pest's vulnerabilities and habits will help keep your facility from becoming infested.

To avoid infestation, take away what pests crave:

- **Food and moisture:** Clean thoroughly and dispose of garbage frequently so there is no available food supply. Wipe up spills immediately and sweep up crumbs. Nuts, cocoa and powdered milk should be refrigerated.
- **Access to facility:** Check all incoming boxes for cockroaches or egg cases, or stored product pests, and remove as soon as items are unpacked.
- **Shelter and warmth:** Fill in all crevices and cracks. Store food away from walls and floors, and maintain good ventilation.

Prevent access to facility by screened doors that are kept closed on the outside with tight fitting door sweeps. It is a good practice to cover garbage and remove every four hours. It is recommended to keep food covered and the facility free from crumbs and spills.

Keep rodents out. Examine for any external openings or weak masonry and correct. Vents, basement windows, and drains should be covered with screens. A thick concrete wall that extends downward and outward from the foundation can compensate for decaying masonry. Don't let them hide. If possible, elevate garbage containers and store food at least six inches off the floor. Starve them by removing garbage, cleaning spills immediately, and sweeping regularly.

Preventive pest measures are far more effective than quick cures "after the fact." Wipe up spills and crumbs frequently and store food away from floors and walls. Check all incoming boxes, and fill in all crevices and cracks in walls to prevent insect infestation. Flies, which are dangerous carriers of disease, can be kept out with screened doors (keep closed) on the outside

of the facility. Elevated garbage containers and strong masonry will also discourage rodents.

Hazard Analysis and Critical Control Points

Food service personnel trained in sanitation can use the HACCP approach to safeguard against a food-borne illness outbreak. The HACCP approach, *Hazard Analysis and Critical Control Points,* assumes basic knowledge of sanitation as it relates to food service processes. The relationships between time, temperature, food and microbiology are paramount.

The first aspect of the HACCP concept deals with identifying the sources of hazards and the conditions that create outbreaks. As noted elsewhere in the text, the hazards are pathogenic microbes such as viruses, bacteria, molds, yeast, and parasites. Other hazards include particulates such as hair, slivers of glass, nail polish chips, pieces of jewelry; while other hazards can be chemical in nature, such as cleaning agents, pesticides, and bisulfites.

Conditions that allow hazards to manifest themselves are:

- human error in handling products, such as cross-contaminating a non-potentially hazardous food like fish with green leaf lettuce on a cutting board.
- inadequate or poorly maintained equipment, such as a refrigerator that is too small to properly cool hot or warm food for storage.
- an ineffective plan or strategy to deal with sanitation, such as an untrained staff.
- a poorly designed facility in terms of structural components, equipment, and their deployment.

In a school food service facility, standards should be set to assure quality of product to the consumer. This is done by managing the identified hazards. In a process, the hazards are typically pathogenic bacteria that have to be managed. The methods are those steps that we identify from the beginning, when we first receive the food, to the point we serve it to the consumer that are most likely to put the public at risk. Clearly evaluating each step of storing, handling, and serving as it relates to sanitation can drastically reduce the risk. Those steps that require attention based on this evaluation are the **Critical Control Points.**

APPENDIX A

PESTICIDE LAWS AND REGULATIONS

REGULATORY REQUIREMENTS

State and federal laws and regulations control many aspects of the manufacture, sale, transportation and use of pesticides.

At the federal level, the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) provides the basic regulatory framework governing pesticides. It was first enacted in 1947, and has been amended many times since. The original act required pesticides to be registered and labeled and provided for pesticide inspections. However, it did not regulate pesticide use, nor apply to pesticides manufactured and marketed solely in one state.

In 1972, Congress amended FIFRA to provide for a broader regulatory program, covering all pesticides used in the United States. FIFRA now requires the U.S. Environmental Protection Agency (EPA) to determine whether a pesticide "will perform its intended function without causing unreasonable adverse effects on the environment or human health."

In California, laws regulating pesticide use and pest control are part of the California Code of Regulations (3 CCR, 6700-6146). The California Department of Food and Agriculture (CDFA) enforces these regulations. Appendix B contains specific requirements that pertain to the health and safety protection of District pest management personnel.

At the county level, agricultural commissioners develop pesticide use policies or conditions specific to the needs of their counties. However, these policies or conditions must be approved by CDFA before they can become effective.

In California, regulations regarding vermin in food establishments are part of the California Health and Safety Code, Section 27603. The Los Angeles County Department of Health Services, Environmental Health Section, enforces this regulation.

APPENDIX B

RESPONSIBILITIES OF GOVERNMENT AGENCIES

This chart summarizes the responsibilities of the CDFA, county agricultural commissioners, and other state and federal government agencies.

Responsibilities of Government Agencies in California's Pesticide Regulatory Program

PROGRAM	RESPONSIBLE AGENCY
Registration of Pesticides	U.S. Environmental Protection Agency California Department of Pesticide Regulation
Classification of Pesticides	U.S. Environmental Protection Agency California Department of Pesticide Regulation
Permitting	County Agricultural Commissioner California Department of Food and Agriculture
Licensing of Commercial Applicators, Advisors, Pesticide Application businesses, Dealers and Maintenance Gardeners	California Department of Food and Agriculture
Registering applicators and advisors, certifying private applicators	County Agricultural Commissioner
Regulations Governing Pesticide Use and worker Safety	County Agricultural Commissioner California Department of Food and Agriculture California Department of Health Services
Pesticide Illness Investigation	County Agricultural Commissioner California Department of Food and Agriculture California Department of Health Services
Pesticide Disposal and Storage	County Agricultural Commissioner California Department of Food and Agriculture California Department of Toxic Substances Control California Water Resources Control Board
Protection of Wildlife	County Agricultural Commissioner California Department of Fish and Game California Department of Food and Agriculture U.S. Fish and Wildlife Service U.S. Environmental Protection Agency
Citing or Prosecuting Violators	California Department of Food and Agriculture County Agricultural Commissioner California Attorney General/District Attorney
Vermin Control in Food Establishments	Los Angeles County Department of Health Services

APPENDIX C

PESTICIDE REGISTRATION AND LABELING

Every pesticide product sold or used in California must be registered with the U.S. Environmental Protection Agency (EPA), as well as with the California Department of Pesticide Regulation (CDPR). The registration of pesticide products is necessary to provide for the proper and safe use of pesticides in protecting people and the environment from ineffective or detrimental chemicals.

PESTICIDE REGISTRATION

The registration procedure at the federal level begins with the manufacturer submitting to the EPA test data, an application to register the product, draft labeling and tolerance petition for food use pesticides.

A general use pesticide is one that can be sold without permit and can be used by the general public. A restricted use pesticide is one that can only be sold to and used by qualified pesticide applicators or by persons holding a valid permit from a county agricultural commissioner.

Pesticides that are to be sold or used in California must also obtain registration from CDPR. Registration procedures require the applicant to submit proof of EPA registration and all data and studies in support of EPA registration. CDPR performs an independent review of these data and also considers other factors such as carcinogenicity, wildlife toxicity, the analytical methods used to determine the materials present and the availability of workable alternatives.

In addition to EPA restricted use pesticides, the State of California designates certain EPA classified general use pesticides as restricted use pesticides due to local hazards or specific health problems. A permit from the county agricultural commissioner is required for all California restricted use pesticides. However, certain use exemptions are allowed.

PESTICIDE LABELING

To complete registration, the manufacturer must supply a label meeting all federal and state requirements. Labels are legal documents that contain important information for the user. Labels may also refer to other documents, such as material safety data sheets that must be considered part of the label.

The following information is required by the EPA (40 CFR Part 156) to be on a label:

Brand Name

The name the manufacturer has given to the product for all advertisement and promotion.

Chemical Name

Describes the chemical structure of a pesticide and is derived by chemists based on international rules for naming chemicals.

Common Name

Chemical names of active ingredients in a pesticide formulation are often complex. For clarity, most pesticides have been assigned official common, or generic, names. Common names and brand names are not the same and not all labels will list a common name for the pesticide.

Formulation

Pesticide labels always list the formulation type, such as emulsifiable concentrate,

wettable powder, or soluble powder. Manufacturers may include this information as a suffix in the brand name of the pesticide. For example, in the name Princep 80W, the "W" indicates a wettable powder formulation.

Ingredients

Pesticide labels list the percentage of active and inert ingredients. Active ingredients are those components that have, or synergize, pesticidal activity. Inert ingredients are all components of the formulation that do not have pesticidal action. Inert ingredients can be toxic, flammable, or pose a safety or environmental hazard. If a pesticide contains more than one active ingredient, the percentage of each will be given, but all inert ingredients may be grouped together and not specified.

Contents

Labels list the net contents, by weight or liquid volume, contained within the package.

Manufacturer

Pesticide labels always contain the name and address of the manufacturer of the product. Use this address if you need to contact the manufacturer for any reason.

Registration and Establishment Numbers

The Environmental Protection Agency and the State of California assign numbers to each pesticide as it is registered. In addition, the EPA establishment number is a code, which identifies the site of manufacture or repackaging of a pesticide.

Signal Word

An important part of every label is the signal word. The word "Danger," accompanied by the word "Poison" and a skull and crossbones, or the word "Danger" used alone, indicates that the pesticide is highly toxic or poses a dangerous health or environmental hazard (Toxicity Category I). "Warning" indicates moderate toxicity (Toxicity Category II) and "Caution" means low toxicity (Toxicity Category III). Part of the registration process assigns each pesticide to a toxicity category and prescribes which signal word must be used on the label.

Precautionary Statements

Precautionary statements are used to describe the hazards associated with a chemical. Instructions given in a precautionary statement should always be followed. Three areas of hazard may be included in the statements:

- Hazards to people and domestic animals.

  This section tells why the pesticide is hazardous, what adverse effects may occur, and describes the type of protective equipment that one must wear while handling packages, and mixing and applying the pesticide.

- Environmental hazards.

  Indicates if the pesticide is toxic to non-target organisms such as honeybees, fish, birds or other wildlife. It may also contain information on how to avoid environmental contamination.

- Physical and chemical hazards.

  Describes special physical and chemical hazards associated with the pesticide such as risks of explosion if the chemical is exposed to sparks or hazards from fumes in the case of a fire.

Statement of Practical Treatment

The statement of practical treatment tells what to do in case of accidental exposure. It describes what emergency first aid measures to take when the pesticide contacts skin,

splashes into eyes, or if dust or vapors have been inhaled. This section also tells when to seek medical attention.

Statement of Use Classification

Pesticides are classified by the EPA as either "General Use" or "Restricted Use," based on the potential of the pesticide to cause harm to people, animals or the environment. EPA restricted use pesticides have a special statement printed on the label in a prominent place. Pesticides that do not contain this statement are considered general use pesticides, although special state restrictions may apply. This information can be found on the CDFA list of state restricted use pesticides, available from the county agricultural commissioner. Labels may also have a restrictive statement indicating that they are for agricultural or commercial use only. A restrictive statement is different from a statement of use classification.

Directions for Use

The directions for use list all the target pests that the pesticide has been registered to manage, plus the crops, plant species, animals or other sites where the pesticide may be used. The directions may also include special restrictions that must be observed. These instructions tell how to apply the pesticide, how much to use, where to use the material, and when it should be applied. It is a violation to use pesticides in a manner inconsistent with the label unless federal or state laws specify acceptable deviations from label instructions.

Misuse Statement

The misuse statement reminds users to apply pesticides according to label directions.

Re-entry Statement

Sometimes restrictions apply to the time that must elapse before a person can enter an area treated with a pesticide. This re-entry interval is included on the pesticide label or in state regulations. There may also be other state or local restrictions which apply. Re-entry intervals may vary according to the toxicity and special hazards associated with the pesticide and the type of pest being treated, and may even vary from county to county. If no re-entry interval is given, the treated area can usually be entered once the spray dries or the dust settles.

Storage and Disposal Directions

Directions for proper storage and disposal of the pesticide and empty pesticide containers are another important part of the label. Some pesticides have special requirements. Improper storage causes the pesticide to lose its effectiveness or may cause a safety hazard. Pesticides must always be stored out of reach of children and animals in locked and posted areas. Proper disposal of unused pesticides and pesticide containers is essential to reduce human and environmental hazards. Federal, state and local regulations control pesticide disposal.

Warranty

Manufacturers usually include a warranty and disclaimer on their pesticide labels. This information informs you of your rights as a purchaser and limits the liability of the manufacturer.

Los Angeles Unified School District
Integrated Pest Management
Approved Pesticide Products List

PESTICIDE NAME	(1) ACTIVE INGREDIENT	PHYSICAL FORM	APPLICATION METHOD	TARGET PEST	USEPA TOXICITY CATEGORY	(2) LABEL DESIGNATION	COMMENTS	EPA REG. NO	Original Discussion
4 the Birds, Transparent Bird Repellent	polybutene 80%	Solid	Sticky type bird repellent	Pigeons	3	Caution	Use for low populations in isolated areas	8254-1-58	OK
Advance Granular Ant Bait	abamectin B1 0.011%	Granule	Indoor & outdoor granules used in food attractants	Ants	3	Caution		499-370	OK
Alluma Insect Sex Pheromone Lure, PT 4	n/a	Trap	funnel catch trap for storage pests	Food storage Pests	N/A	N/A		NONPESTICIDE	OK
Ascend Fire Ant Bait (Formula 1)	abamectin B1 0.05%	Solid	Indoor & outdoor granular bait	Fire, Pharoah, related Ants	3	Caution		499-370	12/0 of 12 approved
Avert Cockroach Bait Stations	abamectin B1 0.05%	Bait Puck		Cockroach	3	Caution		499-407	OK
Avert Cockroach Gel Bait (Formula 1 and Formula 2)	abamectin B1 0.05%	Gel (Formula 2 pressurized can / formula 3 syringe	Crack & crevice bait gel	Cockroach	3	Caution	Bait attractant	499-400 / 499-410	OK
Avert Crack & Crevice Bait (Dust)	abamectin B1 0.05%	Dust	Dust bait	Cockroach	3	Caution	Bait attractant	499-294	OK
Avitrol Whole Corn	4-aminopyridine 0.5%	Grain bait	Mixed with cracked corn for pigeon dispursement	Pigeons	3	Caution	Restricted use product. Used only when staff & students are not in the immediate area.	11649-7	7/1 of 12
Bioblast Biological Termiticide	metarhizium Anisplice Strain 50%	Powder	Biological (fungal) spread in termite colonies	Termites	2	Warning		64286-4	OK
Bioganic Weed & Grass Killer	Eugenol (Clove Oil) - 2%; Thyme Oil - 2%; Sodium Lauryl Sulfate - 1%	Liquid	Spray	Weeds	N/A	N/A		FIFRA exempt	10/0 of 10
Bioganic Broadleaf Killer	Sesame Oil - 4%; Sodium Lauryl Sulfate - 1%; Eugenol (Clove Oil) - 0.5%; Thyme Oil - 0.5%	Liquid	Spray	Broadleaf Weeds	N/A	N/A		FIFRA exempt	10/0 of 10
Boro-Care Termiticide, Insecticide and Fungicide Concentrate	disodium octoborate tetrahydrate 40%	Liquid Suspension	spray used for wood boring insects	Termites	3	Caution		64405-1	OK
CB ATTRAX Roach Bait	Orthoboric Acid 50%	Gel	Crack and Crevice application	Roaches	3	Caution	Protein and Carbohydrate Bait	9444-102	10/0 of 10
Contrac, All Weather Cake	bromadiolone 0.005%	Pellet	Rodent bait	Rodents	3	Caution	Used infrequently in bait stations	12455-34	OK
Delta Dust	Deltamethrin 0.05%	Powder	dusting burrows	Fleas	3	Caution	pyrethroid, for exterior use in subterranean or contained use only and for stinging insects in enclosed areas not designed for occupancy	432-772	10/0 of 10 with limitations - added approval 1-10-01, voted 11/1 of 12
Demize EC	Linalool 37% Piperonyl buloxide 40%	Liquid		Fleas	1	Danger	Pest Supv. to approve each use and distribute, Team to be notified at following meeting.	4758-181-57076	10/0 of 10 with limitations
Distant IGR	Pyriproxyfen 0.5%	Granule	Local or broadcast	Fire ants	3	Caution		1021-1728-59639	10/0 of 10, on 1-10-01 team appr by 10/0 o (10 allow general use
Drax Ant kil Gel	orthoboric acid 5%	Gel	Indoor sugar based bait	Ants	3	Caution		9444-131	OK

APPENDIX D

Los Angeles Unified School District
Integrated Pest Management
Approved Pesticide Products List

PESTICIDE NAME	(1) ACTIVE INGREDIENT	PHYSICAL FORM	APPLICATION METHOD	TARGET PEST	USEPA TOXICITY CATEGORY	(3) LABEL DESIGNATION	COMMENTS	EPA REG. NO.	Original Discussion
Embark 2S, Plant Growth Regulator	diethanolamine salt of mefluidia 28%	Liquid	Overall spray, plant growth regulator for fruit bearing trees	Fruit blossoms	3	Caution	Seasonal Use Only	2217-759	9/1 of 10
Gas Cartridge (for Burrowing Rodents)	Sodium nitrate 53%; Charcoal 28%	Cartidge	ignite fuse & seal in burrows	Ground Squirrels	2	Warning	produces carbon monoxide	56228-2	10/0 of 10
Generation Mini-Block	difethialone 0.0025%	Solid	bait used in station only	Rodents	3	Caution	To be used in tamper proof bait stations	7173-218	9/0 of 10
Gentrol IGR Concentrate	hydroprene 9%	Liquid	crack & crevice spray	Cockroach, fleas, storage pests	2	Warning	Structural use only. Insect growth regulator	2724-351-50809	OK
Gentrol Point Source	hydroprene 90.6%	Ampule	break ampule and normal air flow distributes	Cockroach, fleas, storage pests	3	Caution		2724-460	OK
Gopher Getter	diphacinone 0.005%	Granule	In runways of burrows	Gophers	3	Caution	Subterranean use only.	CA-770496	10/0 of 10
Jecta	Disodium Octaborate Tetrahydrate 40%	Gel	injection in crack and crevice	Termites and Decay Fungi	3	Caution		64405-4	10/0 of 10
Knox-Out 2FM	diazanon 23%	Liquid	Used in traps and mixed with a bait ONLY.	Yellow Jackets Only	3	Caution	Seasonal Use Only TO BE USED IN TRAPS AND ONLY FOR YELLOW JACKETS	4581-335	OK - specific use only, see notes
Maxforce Granular Insect Bait	hydramethylnone 1%	Granules	Interior and exterior bait	Ants	3	Caution		64248-6	OK
M-Pede	potassium salts of fatty acids 49%	Liquid	direct spray to pest	Africanized honey bees, thrip, and white fly	2	Warning		59219-6	OK for bees, 10/0 of 10 on 10-20-00 for thrip/white fly
Niban Granular Bait and Niban-FG	Orthoboric Acid-5%	Granules and Fine Granules	Interior and exterior bait	various insects	3	Caution		64405-2	10/0 of 10
Niflor-D	Disodium Octaborate Tetrahydrate 98%	Powder	applied wet or dry	various insects	3	Caution		64405-8	10/0 of 10
Nylar IGR	2-(methyl-2-(4 phenoxyphenoxy) ethoxyl pyridine	Liquid	spray	fleas and roaches	3	Caution		11715-307-57076	10/0 of 10
PT Wasp Freeze (515)	phenothrin 0.12% d-trans allethrin 0.129%	Aerosol	outdoor aerosol spray directly to wasps and bees	Wasps & Bees	3	Caution	Use only in event of imminent danger. Available from supv. only	499-382	9/1 of 10 Restrictions. See notes
PT 565 Plus XLO	pyrethrins 0.25% d-trans allethrin 0.25% piperonyl butoxide 1% n-octyl bicycloheptene dicarboximide 1%	Aerosol	Use according to label.	Fleas, Gnats, Mosquitos, bees, flies Mites	3	Caution	No Interior Spray for fleas in student occupied areas	499-310	10/0 of 12 - With Restrictions see notes
Roach-X	orthoboric acid 35%	Paste	Crack and Crevice application	Cockroach	3	Caution		71701-1	10/0 of 10
Round-Up Pro	Isopropylene salt of glyphosphate N-(phosphonomethyl) Glycine 41%	Liquid	mixed into water and sprayed as a contact herbicide	Weeds	3	Caution	See specified printed restrictions before use.	524-475	10/0 of 10 with limitations
Suspend SC	deltamethrin 4.75%	Liquid	spray	Fleas, Ticks, Fire Ants,	3	Caution	Use for exterior only, on fleas, ticks, and fire ants. 1/2 life is 11-19 days	432-763	10/0 of 10 with limitations
Terminator	d-limonene (orange peel extract) 5.6%	Liquid	spray directly on insects	Ants, roaches, palmetos, fleas, silverfish, etc.	3	Caution		61887-1-33170	10/0 of 10
Tim-Bor Professional	disodium octoborate tetrahydrate 98%	Powder	applied wet or dry	Wood destroying and fungus	3	Caution		64405-6	10/0 of 10
Victor Poison Free Wasp & Hornet Killer (No 604)	Mint Oil 8% and Sodium Lauryl Sulfate 1%	Aerosol	spray	Wasps, Hornets & Yellow Jackets	N/A	N/A	Exempt under FIFRA	52142-MO-2	10/0 of 10

Los Angeles Unified School District
Integrated Pest Management
Approved Pesticide Products List

PESTICIDE NAME	(1) ACTIVE INGREDIENT	PHYSICAL FORM	APPLICATION METHOD	TARGET PEST	USEPA TOXICITY CATEGORY	(2) LABEL DESIGNATION	COMMENTS	EPA REG. NO	Original Discussion
Weco Ground Squirrel Bait	2-[(p-chlorophenyl)]- 1,3-indandione 0.005%	Pellet	granular placed in runways of holes	Grount Squirrels	3	Caution	Used when cited by County Health Department	EPA SLN NO. CA-770007	9/0 of 10, 1 abstain
Volck Supreme Spray	Petroleum Oil 97.4%	Liquid	contact spray for insects	Horticultural Insects	3	Caution		69696-20AA	10/0 of 10

INTEGRATED PEST MANAGEMENT
SITE ACTIVITY LOG

SITE NAME: _____ FISCAL YEAR: _____

DATE	PEST INVOLVED	ACTION TAKEN	REASON	TECHNICIAN

APPENDIX E

APPENDIX F

ANNUAL PESTICIDE USE NOTIFICATION

The District has adopted an Integrated Pest Management (IPM) policy. This policy includes notifying parents/guardians of pesticide use. During the school year, it may be necessary to apply pesticides at your child's school to avoid serious health problems posed by pests and/or maintain the integrity of a structure. You are notified as follows:

- An application of products on the Approved List may be applied during the school year (the attached list of pesticide products has been approved for use at District sites).

- In the event the use of a product is required and is not on the Approved List, you will be notified 72 hours in advance (Exception: Emergency circumstances that warrant an immediate response)

If your child's health and/or behavior would be influenced by exposure to pesticide products and you would like to be notified each time a pesticide application takes place at your child's school, please complete the following form and return it to the Principal.

---------- *Cut here and return if applicable* ----------

PARENT/GUARDIAN REQUEST FOR NOTIFICATION

I would like to be notified every time a pesticide application is to take place at my child's school (i.e., in addition to annual notification). I understand that the notification will be sent home with my child at least 72 hours before application.

Child's name: _____

School: _____

Name of parent/guardian: _____

Signature of parent/guardian: _____ Date: _____

Note to Principal

Forward a copy of this notice via school mail to: Pest Management Department
Central Shops
Attn: Doug Anderson

APPENDIX G

INTER-OFFICE CORRESPONDENCE
Los Angeles Unified School District

TO: Lynn Roberts, Director
Maintenance and Operations

DATE:

FROM: _____School

SUBJECT: EVALUATION OF KITCHEN CLEANING PROGRAM

The following responses are provided regarding the special kitchen cleaning performed on _____.

1. Were you visited by _____ Cleaning Crew Leader at least two weeks prior to the crew's arrival and informed as to what would take place?

   ☐ Yes ☐ No If "No", please explain _____

2. Did the crew start and finish according to schedule?

   ☐ Yes ☐ No If "No", please explain _____

3. Were keys obtained at least one day prior to arrival and returned to site on completion of work?

   ☐ Yes ☐ No If "No", please explain _____

4. Please rate the cleaning tasks that were performed at your kitchen on this visit.

	Excellent	Satisfactory	Unsatisfactory
A. High dusting	☐	☐	☐
B. Washing walls to ceiling	☐	☐	☐
C. Washing light fixtures	☐	☐	☐
D. Washing Venetian blinds/fly fans	☐	☐	☐
E. Washing windows	☐	☐	☐
F. Washing oven hoods	☐	☐	☐
G. Scrubbing of floors	☐	☐	☐

- Please comment on services rendered: _____

- How would you rate the overall effectiveness of the cleaning provided? _____

Excellent ☐ Satisfactory ☐ Unsatisfactory ☐

Signature _____ Date _____
Principal

Signature _____ Date _____
Cafeteria Manager

DISTRIBUTION: White to Maintenance and Operations Branch Director, Canary to Food Services Branch, and Pink to your Maintenance and Operations Area.

WARNING

PESTICIDE TREATED AREA

An application of a pesticide was and deemed necessary to get control of pests that are invading this area.

This notice is ☐ a 24-hour (State req'd.) ☐ a 72-hour (Not on preapproved list)
☐ an EMERGENCY Posting

Product Name: _____ Mfg. Name: _____

Active Ingredient: _____ USEPA Reg No.:_____

Target Pest: _____

Date of Application: _____

Date Sign May Be Removed: _____ (No less than 72 hours from application)

Signal word: ☐ Danger ☐ Warning ☐ Caution

If you have questions regarding this notification or require additional information, you may contact the District's Pest Management Supervisor at (213) 763-2974, the IPM Coordinator at (213) 633-8478, or the Environmental Health and Safety Branch at (213) 743-5086.

This information as well as other IPM related records are maintained in the Main Office of the School site. You may review this information by contacting the site administrator or their designee.

APPENDIX H

APPENDIX I

PESTICIDE APPLICATION
72-HOUR NOTIFICATION

This notice is to inform you that a pesticide application is scheduled for _____ on _____.
school *date*

☐ Pesticide is on the Approved List ☐ Special application pesticide not on the Approved List

Product name: _____

EPA Registration No.: _____

Active ingredient: _____

Target pest: _____

Signal word: ☐ CAUTION (low toxicity)
☐ WARNING (moderate toxicity)
☐ DANGER (high toxicity)

Area/room pesticide is to be applied in: _____

This notification is in accordance with the Los Angeles Unified School District Integrated Pest Management (IPM) program. Further information is available at the school's main office. For technical questions regarding the product, call the Environmental Health and Safety Branch at (213) 743-5086. For questions pertaining to the IPM program, call the Pest Control Unit at (213) 763-2974.

APPENDIX J

LOS ANGELES UNIFIED SCHOOL DISTRICT
PEST MANAGEMENT INSPECTION

SCHOOL: LOCATION CODE: TECHNICIAN:

☐ INSPECTION ☐ TREATMENT ☐ FOLLOW UP ☐ RESPONSE TO TROUBLE CALL

☐ NO PEST ACTIVITY FOUND ☐ MONITORING LOG & DIAGRAM (SEE ATTACHED)

☐ PEST ACTIVITY FOUND, CONTROL MEASURES TAKEN

☐ PEST ACTIVITY FOUND, CONTROL MEASURES INITIATED. FOLLOW UP REQUIRED/SCHEDULED:_____

☐ PEST ACTIVITY FOUND, SPECIAL ARRANGEMENTS FOR SERVICING REQUIRED/SCHEDULED:_____

CODE: "A" – ANTS "M" – MICE "R" – RATS "GR" – GERMAN ROACHES "AR" – AMERICAN ROACHES

"OR" – ORIENTAL ROACHES "F" – STORED PRODUCT INSECT: _____ "O" – OTHER(SPECIFY): _____

PLACE CODE LETTER OPPOSITE NUMBER TO INDICATE PROBLEM PEST

MATERIALS USED	CONC.	DIL.
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

___ 1. DOORS, ENTRY	___ 8. DAIRY COOLERS	___ 15. STEAM EQUIPMENT
___ 2. DOORS, RECEIVING	___ 9. DINING AREAS	___ 16. EXTERIOR
___ 3. ELECTRICAL PANELS	___ 10. ICE MACHINE	___ 17. ORNAMENTALS
___ 4. RESTROOMS	___ 11. KITCHEN, GENERAL	___ 18. _____
___ 5. STORE ROOMS	___ 12. STOVES/OVENS	___ 19. _____
___ 6. LOCKERS	___ 13. REFRIGERATORS	___ 20. _____
___ 7. TRASH AREA	___ 14. SERVING LINE	___ 21. _____

ENVIRONMENTAL SANITATION

A. Exceptionally Clean
B. Needs Improvement
C. Sub Standard (See Comments)

REVIEWER'S FINDINGS & RECOMMENDATIONS

COMMENTS:_____

Comments:

Signature:_____

Title:_____

T/C REF#

STRUCTURAL DEFICIENCIES
SURFACE DETERIORATED ___
LOOSE WALL COVERING ___
LOOSE BASEBOARDS OR TILE COVERING
HOLES/GAPS IN WALLS ___
UNSEALED CRACKS & CREVICES ___
PLUMBING REPAIRS NEEDED___
DOOR SWEEPS/METAL FLASHING___
OTHER _____

Technician Signature _____ Date _____ Time In:_____
Time Out:_____

Reviewers' Signature_____ Date _____

GLOSSARY

GENERAL INFORMATION:

For further definition of terms consult:

- The Federal Insecticide, Fungicide, and Rodenticide Act, as amended. Public Law 92-516 October 21, 1972, as amended by Public Law 94-140 November 28, 1975 and Public Law 95-396 September 30, 1978.
- *Federal Register*, November 7, 1990, Part II Environmental Protection Agency 40 CFR Part 171 Certification of Pesticide Applicator; Proposed Rule.
- Regional Offices of the EPA.
- State Lead Agency for the State Plan for Commercial and Private Applicators.
- Federal Agency Secretary's Office (For federal employees using restricted pesticides in performance of official duties).
- Indian Governing Body or Indian Reservation Recertification Plan Administrator.
- Local, State, and National Pest Control Associations.

*****

ABSORPTION——The process by which a chemical or fluid is taken into the systems of human beings, plants, and animals.

ACARICIDE——A pesticide used to kill mites and ticks. A miticide is an acaricide.

ACTIVE INGREDIENT——The chemical or chemicals in a pesticide responsible for killing, poisoning, or repelling the pest. (Listed separately in the ingredient statement.)

ACUTE TOXICITY——The ability of a pesticide to cause injury within twenty-four hours following exposure. LD_{50} and LC_{50} are common indicators of the degree of acute toxicity. (See also Chronic Toxicity.)

ADJUVANT——A substance added to a pesticide to improve its effectiveness or safety. Same as additive. Examples: penetrants, spreader-stickers, and wetting agents.

ADSORPTION——The process by which chemicals are held or bound to a surface by physical or chemical attraction. Clay and high-organic soils tend to absorb pesticides.

AEROSOL——A material stored in a container under pressure. Fine droplets are produced when the material dissolved in a liquid carrier is released into the air from the pressurized container.

ALGAE——Simple aquatic plants that contain chlorophyll and are photosynthetic.

ALGICIDE——A pesticide used to kill or inhibit algae.

ANTI-SIPHONING DEVICE——A device attached to the filling hose that prevents backflow or backsiphoning from a spray tank into a water source.

ANTICOAGULANT——A chemical that prevents blood clotting. An active ingredient in some rodenticides.

ANTIDOTE——A treatment used to counteract the effects of pesticide poisoning or some other poison in the body.

ARACHNID——A wingless arthropod with two body regions and four pairs of jointed legs. Spiders, ticks, and mites are in the class Arachnida.

ARTHROPOD——An invertebrate animal characterized by jointed body and limbs. It is usually covered by a hard exoskeleton covering that is molted at intervals. For example, insects, mites, and crayfish are in the phylum Arthropoda.

ATTRACTANT——A substance or device that lures pests to a trap or poison bait.

AVICIDE——A pesticide used to repel or kill birds.

BACTERIA——Microscopic organisms, some of which are capable of producing diseases in people, plants and animals. Some bacteria are beneficial.

BACTERICIDE——Chemical used to kill bacteria.

BAIT——A food or other substance used to attract a pest to a pesticide or a trap.

BAND APPLICATION——Application of a pesticide in a strip alongside or around a structure, a portion of a structure, or any object.

BARRIER APPLICATION——See band application.

BENEFICIAL INSECT——An insect that is useful or helpful to people, such as insect parasites, predators, or pollinators.

BIOLOGICAL CONTROL——Management of pests using beneficial arthropods as predators, parasites, and disease-causing organisms which may occur naturally or are introduced to reduce pest populations.

BIOMAGNIFICATION——The process by which one organism accumulates chemical residues in higher concentration from other organisms which they have consumed.

BOTANICAL PESTICIDE——A pesticide produced from chemicals found in plants. Examples are nicotine, pyrethrins, and strychnine.

BRAND NAME——The name, or designation of a specific pesticide product or device made by a manufacturer or formulator. (A marketing name.)

CALIBRATE, CALIBRATION OF EQUIPMENT OR APPLICATION METHOD——Measurement and adjustment to control the output or rate of dispensing pesticides.

CARBAMATES——(N-Methyl Carbamates) A group of pesticides containing nitrogen, formulated as insecticides, fungicides, and herbicides. The N-Methyl Carbamates are insecticides and inhibit cholinesterase in animals.

CARCINOGENIC——The ability of a substance or agent to induce malignant tumors (cancer).

CARRIER——An inert liquid, solid, or gas added to an active ingredient for delivering a pesticide to the target effectively. A carrier is usually water, oil, or other solvent, used to dilute the formulated product for application.

CARRYING CAPACITY-----The number of organisms for which a specific site can provide life support.

CERTIFIED APPLICATORS——Individuals who are certified by the state to use or supervise the use of restricted-use pesticides.

CHEMICAL NAME——The scientific name of active ingredients found in formulated products. This complex name is derived from the chemical structure of the active ingredient.

CHEMICAL CONTROL——Pesticide application to kill pests.

CHEMOSTERILANT——A chemical compound capable of preventing animal reproduction.

CHEMTREC——The Chemical Transportation Emergency Center which has a toll-free number (800-424-9300) for providing 24-hour information only for chemical emergencies such as a spill, leak, fire, or accident.

CHLORINATED HYDROCARBON——A pesticide containing chlorine, carbon, and hydrogen. Many are persistent in the environment, such as Chlordane and DDT. Few are registered for use in the U.S.

CHOLINESTERASE, ACETYLCHOLINESTERASE——An enzyme in animals that helps regulate nerve impulses. This enzyme is depressed by N-Methyl carbamate and organophosphate pesticides.

CHRONIC TOXICITY——The ability of a pesticide chemical to cause injury or illness (beyond twenty-four hours following exposure) when applied in small amounts repeatedly for a longer period of time. (See also Acute Toxicity.)

COMMERCIAL APPLICATOR——A state-certified applicator who for compensation uses or supervises the use of pesticides classified for restricted use for any purpose or on any property other than that producing an agricultural commodity.

COMMON NAME——A name given to a pesticide's active ingredient by a recognized committee on pesticide nomenclature. Many pesticides are known by a number of trade or brand names, but the active ingredient has only one recognized common name.

COMMUNITY——The different populations of animal or plant species that exist together in an ecosystem (See also **Population** and **Ecosystem.**)

COMPETENT——Individuals properly qualified to perform functions associated with pesticide application. The degree of competency (capability) required is directly related to the nature of the activity and the associated responsibility.

CONCENTRATION——Refers to the amount of active ingredient in a given volume or weight of formulated product.

CONTACT PESTICIDE——A pesticide that causes death or injury to pests when in contact with it. The chemical does not have to be ingested. It is often used to describe a spray applied directly on a pest.

CONTAMINATION——The presence of an unwanted substance (sometimes pesticides) in or on a plant, animal, soil, water, air, or structure.

CULTURAL CONTROL——A pest management method that includes changing human habits, such as sanitation, changing work practices, or cleaning or garbage pick-up schedules.

DECONTAMINATE——To remove or break down a pesticidal chemical from a surface or substance.

DEGRADATION——A process by which a chemical compound or pesticide is reduced to simpler compounds by the action of microorganisms, water, air, sunlight, or other agents. Degradation products are usually, but not always, less toxic than the original compound.

DEPOSIT——The amount of pesticide on a treated surface after application.

DERMAL TOXICITY——The ability of a pesticide to cause acute illness or injury to human beings or animals when absorbed through the skin (see **Exposure Route.**)

DESICCANT——A type of pesticide that draws moisture or fluid from a plant or arthropod pest, causing it to die. Certain desiccant dusts destroy the waxy outer coating that holds moisture within an insect's body.

DETOXIFY——To render a pesticide's active ingredient or other poisonous chemical harmless.

DIAGNOSIS——The positive identification of a problem and its cause.

DILUENT——Any liquid, gas or solid material used to dilute or weaken a concentrated pesticide.

DISINFECTANT——A chemical or other agent that kills or inactivates disease-producing microorganisms. Chemicals used to clean or surface-sterilize inanimate objects.

DOSE, DOSAGE——Quantity, amount, or rate of pesticide applied to a given area or target.

DRIFT——The airborne movement of a pesticide spray or dust beyond the intended target area.

DUST——A finely ground, dry pesticide formulation containing a small amount of active ingredient and a large amount of inert carrier or diluent such as clay or talc.

ECOSYSTEM——The pest-management unit. It includes a community (of populations) with the necessary physical (harborage, moisture, temperature), and biotic (food, hosts) supporting factors that allow a population of pests to persist.

EMULSIFIABLE CONCENTRATE——A pesticide formulation produced by mixing or suspending the active ingredient (the concentrate) and an emulsifying agent in a suitable carrier. When added to water, a milky emulsion is formed.

EMULSIFYING AGENT (EMULSIFIER)——A chemical that aids the suspension of a liquid in another that normally would not mix together.

EMULSION——A mixture of two liquids which are not soluble in one another. One is suspended as very small droplets in the other with the aid of an emulsifying agent.

ENCAPSULATED FORMULATION——A pesticide formulation with its active ingredient enclosed in tiny capsules of polyvinyl or other materials; principally used for slow release. The enclosed active ingredient moves out to the capsule surface as pesticide on the surface is removed (volatilizes, or rubs off).

ENDANGERED SPECIES——Individual plants or animals with a population that has been reduced to the extent that it is near extinction and that has been designated to be endangered by a federal agency.

ENTRY INTERVAL——See Re-entry Interval.

ENVIRONMENT——Air, land, water, plants, people, animals, and the interrelationships which exist among them.

EPA - ENVIRONMENTAL PROTECTION AGENCY——The federal agency responsible for ensuring the protection of people and the environment from potentially adverse effects of pesticides and other contaminants.

EPA ESTABLISHMENT NUMBER——A number assigned to each pesticide-production plant by the EPA. The number indicating the plant at which the pesticide product was produced must appear on all labels of that product.

EPA REGISTRATION NUMBER——An identification number assigned to a pesticide product when it is registered by the EPA for use. The number must appear on all labels of pesticide products.

ERADICATION——The complete elimination of a (pest) population from a designated area.

EXPOSURE ROUTE OR COMMON EXPOSURE ROUTE——The manner—dermal (through the skin), oral (through the mouth), or inhalation/respiratory—in which a pesticide may enter an organism.

FIFRA——The Federal Insecticide, Fungicide, and Rodenticide Act; a federal law and its amendments that controls pesticide registration and use.

FLOWABLE——A pesticide formulation in which very finely ground solid particles are suspended (not dissolved) in a liquid carrier.

FOG TREATMENT——A pesticide in aerosol-sized droplets (under 40 microns). Not a mist or gas. After propulsion, the fog droplets fall on exposed surfaces.

FORMULATION——The pesticide product as purchased, containing a mixture of one or more active ingredients, carriers (inert ingredients), with other additives making it easy to store, dilute, and apply.

FUMIGANT——A pesticide formulation that volatilizes, forming a toxic vapor or gas that kills in the gaseous state, penetrating voids to kill pests.

FUNGICIDE——A chemical used to kill fungi.

FUNGUS (plural - fungi)——A group of small, often microscopic, organisms in the plant kingdom which cause rot, mold, and disease. Fungi need moisture or a damp environment (wood rots require at least 19 percent moisture). Fungi are extremely important in the diet of many insects.

GENERAL USE (UNCLASSIFIED) PESTICIDE——A pesticide which can be purchased and used by the general public. (See also Restricted Use Pesticide.)

GRANULE——A dry pesticide formulation. An active ingredient is either mixed with or applied as a coating to an inert carrier to form a small, ready-to-use, low-concentrate chemical which normally does not present a drift hazard. Pellets differ from granules only in their precise uniformity, larger size, and shape.

GROUNDWATER——Water source located beneath the soil surface from which springs and well water are drawn (see also Surface Water.)

HABITAT MODIFICATION——Removing food, water, shelter, and other conditions that support pests, or excluding access by pests to the site.

HALF LIFE——The time required for half of something to undergo a specific process, especially for half the nuclei in a sample of radioactive material to undergo decay.

HARBORAGE——Shelter that provides the basic needs, including a safe place for the pest population.

HAZARD——See Risk.

HERBICIDE——A pesticide used to kill or inhibit plant growth.

HIGH-RISK PERSON——A person who has some condition that may put him or her at risk from exposure to pesticides. Such persons include children, the elderly, pregnant women, newborns, asthmatics, the neurologically impaired, the environmentally ill (EI), and those with multiple chemical sensitivity (MCS).

HOST——Any animal or plant on or in which another lives for nourishment, development, or protection.

IGR, INSECT GROWTH REGULATOR JUVENOID——A pesticide which mimics insect hormones that control molting and the development of insect systems affecting the change from immature to adult (see Juvenile Hormone.)

INERT INGREDIENT——An inactive material without pesticidal activity in a pesticide formulation.

INGREDIENT STATEMENT——A portion of the label on a pesticide container that gives the name and amount of each active ingredient and the total amount of inert ingredients in the formulation.

INHALATION——Taking a substance in through the lungs (breathing in). (See Exposure Route.)

INSECT GROWTH REGULATOR——See IGR.

INSECTICIDE——A pesticide used to manage or prevent damage caused by insects.

INSECTS, INSECTA——A class in the phylum Arthropoda characterized by a body composed of three segments and three pair of legs.

INSPECTION——A process for detecting pests, pest damage, and evidence of pest activity in a managed site. (See Monitoring.)

INTEGRATED PEST MANAGEMENT——See IPM.

IPM——Integrated pest management. A planned pest management program in which methods are integrated and used to keep pests from causing economic, health-related, or aesthetic problems. IPM includes reducing pests to a tolerable level. Pesticide application is not the primary management method, but is an element of IPM, as are cultural and structural alterations. IPM programs stress communication, monitoring, inspection, and evaluation (keeping and using records).

JUVENILE HORMONE——A hormone produced by an insect that inhibits change or molting. As long as juvenile hormone is present the insect does not develop into an adult, but remains immature.

LABEL——All printed material attached to or on a pesticide container.

LABELING——The pesticide product label and other accompanying materials that contain directions for use that pesticide users are legally required to follow.

LARVA (plural - larvae)——The developmental stage of insects with complete metamorphosis that hatches from the egg. A mature larva becomes a pupa (some invertebrates have larvae, but they are not urban pests).

LC_{50}——Lethal concentration. The concentration of a pesticide, usually in air or water, that kills 50 percent of a test population of animals. LC_{50} is usually expressed in parts per million (ppm). The lower the LC_{50} value, the more acutely toxic the chemical.

LD_{50}——Lethal dose. The dose or amount of a pesticide that can kill 50 percent of the test animals when eaten or absorbed through the skin. LD_{50} is expressed in milligrams of chemical per kilogram of body weight of the test animal (mg/kg). The lower the LD_{50}, the more acutely toxic the pesticide.

LEACHING——The movement of a substance with water downward through soil.

METAMORPHOSIS——A change in the shape or form of an animal. Usually used when referring to insect development.

MICROBIAL DEGRADATION——Breakdown of a chemical by microorganisms.

MICROBIAL PESTICIDE——Bacteria, viruses, fungi, and other microorganisms used to manage pests. Also called biorationals.

MICROORGANISM——An organism so small that it can be seen only with the aid of a microscope.

MITICIDE——A pesticide used to kill mites (see Acaricide.)

MODE OF ACTION——The way in which a pesticide exerts a toxic effect on the target plant or animal.

MOLLUSCICIDE——A chemical used to kill snails and slugs.

MONITORING——Ongoing surveillance. Monitoring includes periodic inspection and record-keeping. Monitoring records allow technicians to evaluate pest population suppression, identify infested or non-infested sites, and manage the progress of the pest-management program.

MSDS—Material Safety Data Sheet required by Department of Labor to be provided by manufacturers to those that request information on chemnical substances.

NECROSIS——Death of plant or animal tissues which results in the formation of discolored, sunken, or necrotic (dead) areas.

NONTARGET ORGANISM——Any plant or animal other than the intended targets of pesticide application.

NYMPH——The developmental stage of insects with gradual metamorphosis that hatches from the egg. Nymphs become adults.

ORAL TOXICITY——The effect of a pesticide resulting in injury or acute illness when taken by mouth.

ORGANOPHOSPHATES——A large group of pesticides that contain phosphorus and inhibit cholinesterase in animals.

PARASITE——A plant, animal, or microorganism living in, on, or with another living organism for the purpose of obtaining all or part of its food.

PATHOGEN——A disease-causing organism.

PERSONAL PROTECTIVE EQUIPMENT——Devices and clothing intended to protect a person from exposure to pesticides, including items like long-sleeved shirts, long trousers, coveralls, hats, gloves, shoes, respirators, and other safety items as needed.

PEST MANAGEMENT——See IPM.

PEST——An undesirable organism including any insect, rodent, nematode, fungus, weed, or some terrestrial and aquatic plants and animals, virus, bacteria, or micro-organism which the Administrator declares to be a pest under FIFRA, Section 25(c)(1).

PESTICIDE——A chemical or other agent used to kill, repel, or otherwise manage pests or to protect from a pest.

pH——A measure of acidity/alkalinity of a liquid: acid below pH7; basic or alkaline above pH7 (up to 14).

PHEROMONE——A substance emitted by an animal to influence the behavior of other animals of the same species. Some are synthetically produced for use in insect traps.

PHOTODEGRADATION——Breakdown of chemicals by the action of light.

PHYSICAL CONTROL——Habitat alteration or changing the infested physical structure, such as by caulking holes, cracks, tightening around doors, windows, moisture reduction, ventilation, and other means.

PHYSIOLOGICAL SENSITIVITIES——Human physiological reaction from exposure in the environment to perhaps minute amounts of chemicals that produce an adverse response.

PHYTOTOXICITY——Injury to plants caused by a chemical or other agent.

POINT OF RUNOFF——The point at which a spray starts to run or drip from the surface to which it is applied.

POISON CONTROL CENTER——A local agency, generally a hospital, which has current information on the proper first-aid techniques and antidotes for poisoning emergencies. Such centers are listed in telephone directories.

POPULATION——Individuals of the same species. The populations in an area make up a community (see Ecosystem.)

PORT——Small sealable hole that allows injection of pesticidal material into a wall or other void in a structure.

PRECIPITATE——A solid substance that forms in a liquid and settles to the bottom of a container; a material that no longer remains in suspension.

PREDATOR——An animal that attacks, kills, and feeds on other animals. Examples of predaceous animals are hawks, owls, snakes, spiders, lady-bird beetles and other insects.

PROFESSIONAL——One who is trained to conduct an efficient operation and able to make judgments based on training and experience.

PROPELLANT——The inert ingredient in pressurized containers that forces an active ingredient from the container.

PUPA (plural - pupae)——The developmental stage of insects with complete metamorphosis when major changes from larval to adult form occurs.

QUALIFIED APPLICATOR——An applicator who is certified (and licensed in some states) to apply restricted-use pesticides in the state. Qualification may also include training or experience.

RATE OF APPLICATION——The amount of pesticide applied to a plant, animal, unit area, or surface; usually measured per acre, per 1,000 square feet, per linear foot, or per cubic foot.

RE-ENTRY INTERVAL——The length of time following an application of a pesticide during which entry into the treated area is restricted. Also known as Entry Interval.

REGISTERED PESTICIDES——Pesticide products which have been registered by the Environmental Protection Agency for uses listed on the label.

REPELLENT——A compound that keeps insects, rodents, birds, or other pests away from plants, domestic animals, buildings, or other treated areas.

RESIDUAL PESTICIDE——A pesticide that continues to remain effective on a treated surface or area for an extended period following application.

RESIDUE——The pesticide active ingredient or its breakdown products which remain in or on the target after treatment.

RESTRICTED USE PESTICIDE——A pesticide that can be purchased and used only by certified applicators or persons under their direct supervision. A pesticide classified for restricted use under FIFRA, Section 3(d)(1)(C).

RISK——A probability that a given pesticide will have an adverse effect on people or the environment in a given situation.

RMSF——Rocky Mountain Spotted Fever is an acute infectious rickettsial disease transmitted to humans by the American dog tick.

RODENTICIDE——A pesticide used to kill rodents.

RUNOFF——The movement of water and associated materials on the soil surface. Runoff usually proceeds to bodies of surface water.

SANITATION——The practice of removing undesirable substances that support a pest or pest population (for instance, food or water).

SIGNAL WORDS——Required wording which appears on every pesticide label to denote the relative toxicity of the product. Signal words are DANGER-POISON, DANGER, WARNING, or CAUTION.

SITE——Areas of actual pest infestation. Each site should be treated specifically or individually.

SOIL INJECTION——The placement of a pesticide below the surface of the soil, a common application method for termiticides.

SOIL DRENCH——To soak or wet the ground surface with pesticide. Large volumes of pesticides are usually needed to saturate the soil to a sufficient depth.

SOIL INCORPORATION——The mechanical mixing of a pesticide product with soil.

SOLUTION——A mixture of one or more substances in another substance (usually a liquid) in which all the ingredients are dissolved. Example: sugar in water.

SOLVENT——A liquid which will dissolve another substance (solid, liquid, or gas) to form a solution.

SPACE SPRAY——A pesticide which is applied as a fine spray or mist to a confined area.

STOMACH POISON——A pesticide that must be eaten by an animal in order to be effective; it will not kill on contact.

SURFACE WATER——Water on the earth's surface such as rivers, lakes, ponds, and streams. (See **Groundwater**.)

SUSPENSION——A pesticide mixture consisting of fine particles dispersed or floating in a liquid, usually water or oil. Example: Wettable powders in water.

TARGET——Plants, animals, structures, areas, or pests toward which the pesticide or other management method is directed.

TECHNICAL MATERIAL——Pesticide active ingredient in pure form, as it is manufactured by a chemical company. It is combined with inert ingredients or additives in formulations such as wettable powders, dusts, emulsifiable concentrates, or granules.

TOXIC——Poisonous to living organisms.

THRESHOLD——A level of pest density. The number of pests observed, trapped, or counted that can be tolerated without an economic loss or aesthetic injury. Pest thresholds in urban pest management may be site specific. For example, different numbers of cockroaches may be tolerated at different sites (hospitals and garbage rooms would have different thresholds).

TOLERABLE LEVELS OF PESTS——The presence of pests, at certain levels, is tolerable in many situations. Totally eliminating pests in certain areas is sometimes not achievable without major structural alterations, excessive control measures, unacceptable disruption, or unacceptable cost. The tolerable level in some situations will be near zero. Urban pest-management programs may have lower tolerable levels of pests than agricultural programs.

TOXICANT——A poisonous substance such as the active ingredient in a pesticide formulation.

TOXICITY——The ability of a pesticide to cause harmful, acute, delayed, or allergic effects. (The degree or extent that a chemical or substance is poisonous.)

TOXIN——A naturally occurring poison produced by plants, animals, or microorganisms. Examples: the poison produced by the black widow spider, the venom produced by snakes, the botulism toxin.

UNCLASSIFIED PESTICIDE——See General-Use Pesticide.

URBAN——A Standard Metropolitan Area (SMA) or a town of 2,500(+) occupants.

URBAN PEST MANAGEMENT——Management of pest infestations that are normally problems in urban areas. Urban pest management involves reducing pest populations to tolerable numbers in and around residences, in structures, and those pests that cause health-related problems. Urban pest management may or may not focus on reducing economic injury, but it always deals with health or aesthetic injuries.

USE——The performance of pesticide-related activities requiring certification including application, mixing, loading, transport, storage, or handling after the manufacturing seal is broken; care and maintenance of application and handling equipment; and disposal of pesticides and their containers in accordance with label requirements. Uses not needing certification are long-distance transport, long-term storage, and ultimate disposal.

VAPOR PRESSURE——The property which causes a chemical to evaporate. The higher the vapor pressure, the more volatile the chemical or the more easily it will evaporate.

VECTOR——A carrier, an animal (such as an insect, nematode, mite) that can carry and transmit a pathogen from one host to another.

VERTEBRATE——Animal characterized by a segmented backbone or spinal column.

VIRUS——Ultramicroscopic parasites composed of proteins. Viruses can only multiply in living tissues, and they cause many animal and plant diseases.

VOID——Space inside walls or other inaccessible space that may harbor pests.

VOLATILITY——The degree to which a substance changes from a liquid or solid state to a gas at ordinary temperatures when exposed to air.

WATER TABLE——The upper level of the water-saturated zone in the ground.

WETTABLE POWDER——A dry pesticide formulation in powder form that forms a suspension when added to water.

ZONE——The management unit, an area of potential pest infestation made up of infested sites. Zones will contain pest **food, water, and harborage**. A kitchen-bathroom arrangement in adjoining apartments might make up a zone; a kitchen, storeroom, and loading dock at food-service facilities may make up another. Zones may also be established by eliminating areas with little likelihood of infestation and treating the remainder as a zone. A zone will be an ecosystem.

E. REVIEW OF A REVIEW OF THE LOS ANGELES BASIN PLAN ADMINISTRATIVE RECORD

A REVIEW OF THE LOS ANGELES BASIN PLAN ADMINISTRATIVE RECORD

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FOREWORD

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EXECUTIVE SUMMARY

This report provides a detailed analysis of the administrative record as provided to date of the Water Quality Control Plan (Basin Plan) for the Los Angeles Region. The administrative record as reviewed consisted of thirty-six boxes of materials provided by the Regional Water Quality Control Board Los Angeles Region, the State Water Resources Control Board, and the U.S. Environmental Protection Agency. This study was undertaken over the past year to review national and state water quality regulations and policy documents, and to assess regulatory compliance actions within the Los Angeles Region for conformity with these policies and regulations. In particular, this study evaluated the designation of beneficial uses, the establishment of water quality objectives, and the implementation of the Basin Plan in the NPDES permitting process, the TMDL process, and other regulatory actions.

This review confirms that many concerns about water quality regulation on a national level are relevant and valid within the Los Angeles Region. The issues raised in this report have, in many cases, been raised repeatedly and have remained largely unaddressed since the development of the first Los Angeles Basin Plan in 1975. Many Basin Plan elements are found to lack a solid technical and scientific foundation and were not necessarily adopted in a manner that achieves the highest level of *reasonable* water quality protection consistent with California's Porter-Cologne Act. In addition, the existing Basin Plan regulatory framework and process frequently fail to identify and address the true sources of water quality degradation and impairment. Unless remedied, the deficiencies identified in this report render the Basin Plan vulnerable to significant legal and technical challenge and may result in the expenditure of public funds in exchange for little improvement in water quality.

Four priority areas for Basin Plan reform are identified in this report, including the following:

1. *Incorporation of the Porter-Cologne Section 13241 and 13242 Requirements.* The administrative record reflects substantial public concern that Basin Plan criteria and associated implementation programs have not been developed with adequate reference to the factors required by Porter-Cologne Sections 13241 and 13242. Section 13241 provides a framework for attaining the highest quality of water which is reasonable in consideration of economics, housing, and water quality conditions that could reasonably be achieved, among other factors, while Section 13242 provides implementation guidelines. Compliance with these sections is required by California law and is essential to assure that public resources are allocated in a sensible, reasonable manner and to build and maintain support for water quality protection. Existing and future Basin Plan water quality standards and programs of implementation should be explicitly assessed in accordance with the provisions of Sections 13241 and 13242 prior to implementation in waste discharge requirements and TMDLs. Where the cost or

other statutory factor impacts, such as housing, are likely to be significant, the RWQCB should provide a detailed rationale for any regulatory programs it wishes to pursue. Evaluation of these factors is especially important prior to the application of water quality standards to nonpoint sources, as the Porter-Cologne factors were not evaluated for nonpoint sources when water quality standards were established.

2. *Development and Implementation of Water Quality Objectives.* The administrative record shows that certain water quality objectives have been adopted in the Basin Plan that will require significant expenditures and controls, even though natural, ambient conditions contribute to or cause regulatory exceedances, and even though risk of harm is minimal under certain conditions. Significant issues include the Basin Plan bacterial, sediment, and mineral quality objectives. Water quality objectives that are known or likely to be influenced by natural or ambient conditions should be reassessed, consistent with Porter-Cologne Section 13241, to determine the extent to which regulation of human activities can measurably and usefully foster reasonable water quality protection. In addition, water quality objectives should be reassessed to ensure that they are based upon a sound scientific foundation and clearly defined in terms of frequency, magnitude, and duration.

3. *Correction and Revision of Beneficial Use Designations.* To a significant extent, the Los Angeles Basin Plan contains beneficial use designations that do not reflect actual or probable future beneficial uses and/or reflect uses that are illogical and contradictory. The criteria and framework used to create and apply beneficial use designations is often unclear. Examples include municipal and drinking water supply ("MUN") designations, recreational ("REC") use designations for limited or no-access flood control channels, and "potential" uses. New designations or water body categories, such as for flood control or effluent-dominated waters, should be added to reflect the actual, intended purpose of many regional water bodies. Where natural sources prevent attainment of water quality criteria, or where conflicts exist between the applicable beneficial uses and water quality criteria, seasonal or tiered uses and/or site-specific objectives should be created.

4. *Revision of the "Tributary Rule."* As reflected in the administrative record, the Basin Plan tributary rule has recently been interpreted to include even minor, ephemeral drainages and storm flow channels, and the beneficial uses of any water body identified in the Plan are applied to its tributary streams. This policy has been adopted with virtually no consideration of the Porter-Cologne statutory factors and with little reference to applicable precedent. Further, a strict interpretation of the tributary rule may be unnecessary, especially in cases where dilution occurs or where pollutants are removed or modified during transport. The tributary rule should be revised to reasonably protect designated beneficial uses without extending, at enormous potential expense, regulatory requirements to each and every ephemeral drainage and stormwater conveyance pipe in the Los Angeles watershed.

OVERVIEW

This report evaluates the technical and scientific basis of water quality regulations contained in the Water Quality Control Plan (Basin Plan) developed and administered by the Los Angeles Regional Water Quality Control Board (RWQCB) for the Los Angeles Region. This evaluation is based upon the administrative record compiled by the RWQCB, the SWRCB, and the U.S. EPA and provided to date. The analysis concludes that many Basin Plan elements lack adequate technical foundation and were not adopted in conformance with the California Porter-Cologne Act (Porter-Cologne). Several Basin Plan use designations and water quality objectives do not adequately consider economics, housing, hydrology, water quality conditions that could reasonably be achieved, or other factors mandated by the Act, fail to consider the full range of natural and ambient conditions, and result in unreasonable and contradictory regulatory priorities. As a result, the Basin Plan conflicts with the Porter-Cologne Act's stated objective of achieving the maximum "reasonable" protection of California water quality.

Section I of this report discusses the federal statutory basis for water quality regulation and summarizes recent scientific assessments of U.S. Clean Water Act policies and related programs. It focuses on the results of an important National Research Council critique of federal water quality regulation.

Section II reviews the state statutory basis for water quality regulation within California, including requirements that must be considered in adopting and implementing water quality standards.

Section III summarizes the results of a review of the administrative record supporting the Basin Plan as identified by the State Water Resources Control Board, the Los Angeles Regional Water Quality Control Board, and the United States Environmental Protection Agency. Part A shows that the Basin Plan does not adequately consider the mandatory factors and that the Basin Plan does not comply with the requirements listed in Porter-Cologne Sections 13241 and 13242. Part B identifies areas in which the Basin Plan fails to fully take into account natural processes and fails to provide sufficient rationale for the development of certain water quality objectives. Part C demonstrates that several Basin Plan beneficial use designations are illogical or unreasonable given applicable federal and state standards. Part D analyzes technical problems with the Basin Plan "tributary rule," a policy that potentially extends beneficial use designations appropriate for one water body to virtually all upstream water sources as well. Finally, Part E provides a brief listing of additional Basin Planning issues raised by stakeholders in the administrative record but not addressed in detail in this report.

Section IV presents the report's conclusions and recommendations for addressing the most significant Basin Plan areas of concern.

I. FEDERAL WATER QUALITY REGULATION

Water quality has been regulated in the United States for over one hundred years. The earliest regulations were established to promote navigability and to protect public health. Over time, water quality regulations have been promulgated to promote other goals (e.g., that waters should be "fishable" and "swimmable" wherever attainable, as specified by the Clean Water Act) and to attain the goals of restoring and maintaining the "chemical, physical, and biological integrity of the Nation's waters." Recent water quality legislation includes the Federal Water Pollution Control Act Amendments of 1972, the Clean Water Act (CWA) of 1977, and the Water Quality Act of 1987.

Federal law and regulations contain two strategies for managing water quality. The first, a technology-based approach, requires point source dischargers (e.g., wastewater treatment plants, industrial dischargers) to meet imposed concentration standards for certain pollutants within the effluent or within a zone of initial dilution in the receiving waters (i.e., effluent-based standards) as specified in National Pollutant Discharge Elimination System (NPDES) permits. The second is a water-quality based approach, which relies upon evaluating ambient water quality and limiting the quantity of "polluting" discharges to levels that do not adversely affect designated beneficial uses.

From the 1970s until relatively recently, most effort and funding on both federal and state levels addressed water quality improvement by controlling point source discharges. Early on, this effort placed high priority on technology-based control efforts. Some corrective actions were also implemented for certain specific nonpoint source pollution problems, generally by requiring "Best Management Practices," or BMPs. Although this approach has been largely successful in controlling point source discharges, nonpoint sources have experienced minimal regulation and in some cases may contribute to exceedances of water quality criteria established for receiving waters.

Beneficial uses and water quality objectives are the basis of water quality regulation. Together, designated beneficial uses (i.e., the desired uses to be attained by a specific water body, such as recreation or drinking water) and water quality criteria or objectives[1] (i.e., allowable concentrations of chemicals and other constituents that protect the designated beneficial uses) are known as water quality "standards." Designation of beneficial uses requires both a technical analysis and a policy decision. Both state and federal law intend that the selection of beneficial uses and water quality objectives should be made with consideration of the condition of a water body, the advantages of achieving a given designated use, and the costs of achieving a designated use. Water quality criteria represent the condition of the water body that is required to support a designated beneficial use. Water quality criteria may be either narrative or numerical, but ideally provide a measurable indicator that can be used to assess whether the beneficial uses can be attained.

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[1] Note that federal water quality regulations refer to "water quality criteria," while State of California regulations refer to "water quality objectives." In practical use, these terms are interchangeable.

Section 305(b) of the Clean Water Act requires each state to prepare a biennial water quality assessment report. These reports, commonly referred to as 305(b) reports, must include:

A. a description of the water quality of all navigable waters in such State during the preceding year, taking into account seasonal, tidal, and other variations;

B. an analysis of the extent to which all navigable waters provide fishable/swimmable uses;

C. an analysis of the extent to which elimination of the discharge of pollutants and a level of water quality that provides for fishable/swimmable uses have been or will be achieved by the requirements of the Clean Water Act, together with recommendations for additional action necessary to achieve these objectives;

D. an estimate of i) the environmental impact; ii) the *economic and social costs* necessary to achieve the objective of the Clean Water Act; iii) the *economic and social benefits* of such achievement; and iv) an estimate of the date of such achievement; (emphasis added) and

E. a description of the nature and extent of nonpoint sources of pollutants, and recommendations as to the programs that must be undertaken to control each category of sources, including an *estimate of the costs* of implementing such programs. (emphasis added)

Section 303(d) of the Clean Water Act attempts to meld both the technology-based and water quality-based approaches to managing water quality. As part of the water-quality based approach, EPA and the states are currently implementing a Total Maximum Daily Load (TMDL) program, which aims to meet water quality standards by addressing both point and nonpoint sources of pollution. Federal TMDL regulations promulgated in 1992 require states to develop a list of water bodies for which water quality standards are not being met (the "303(d) list"). A TMDL is then required that specifies the amount of a particular pollutant that may be present in a water body, allocates the existing and "acceptable" pollutant loads among sources, and provides the basis for attaining and maintaining water quality standards.

In many states, TMDL program requirements have been imposed via consent decrees or court orders, which require completion of large numbers of TMDLs according to specified schedules, which are often very restrictive. Often, as identified in a recent NRC report (discussed below), a scientific or technical basis for imposing TMDLs is lacking. Many states do not have the financial and personnel resources to assess waters and adequately complete TMDLs. Also, because TMDLs are founded upon the water quality standards identified by the relevant regulatory agencies, deficiencies in either

beneficial use designations or water quality objectives necessarily result in deficiencies in the TMDL process and in water quality regulation in general. This problem may be further exacerbated when consent decree time schedules preclude the establishment of a sound scientific and technical foundation for the TMDL.

For a variety of reasons, including the TMDL process, increasingly stringent NPDES permit terms, and a significant rise in third party litigation, the scope and cost of water quality regulations have dramatically expanded in recent years. A growing number of affected municipalities, private businesses and scientific observers have become increasingly concerned that the results are neither as economically efficient, nor as technically proficient, as they could be. In particular, many doubt that water quality regulations are being applied and enforced in a manner that achieves the greatest impact to, and improvements in, water quality.

Congress responded to these concerns in 2000 by suspending the EPA's implementation of newly promulgated federal TMDL regulations and requesting that the NRC examine the scientific basis for the TMDL program. The NRC published its findings in a report entitled *Assessing the TMDL Approach to Water Quality Management* (National Academy Press, Washington, D.C., 2001). The report made several important findings, including the following:

1. The TMDL program should focus on improving the condition of water bodies by measuring attainment of designated uses, rather than focusing upon administrative outcomes (e.g., achieving permit requirements).

2. The program should encompass all stressors, including both pollutants and pollution. Thus, the program should recognize activities that can "overcome the effects of 'pollution' and bring about waterbody restoration – such as habitat restoration and channel modification."

3. Scientific uncertainty cannot be avoided in water quality programs, and water quality regulation should recognize this inherent uncertainty by means of flexible, adjustable implementation programs.

The NRC report also contains several recommendations to improve the use of scientific information in water quality regulation. The recommended changes are designed to enable the incorporation and refinement of best available scientific information in the TMDL processes:

1. States must develop appropriate beneficial use designations and refine these designations prior to TMDL development. The NRC recommended that use attainability analyses be considered for all water bodies prior to the development of TMDLs.

2. States should create a "two-tiered" 303(d) list (listing of impaired water bodies). The NRC found that many water bodies were placed on state's 303(d) lists without adequate scientific basis, including inadequate ambient water quality data, inadequate water quality standards, and inadequate assessment and analysis. The NRC recommended that two lists be compiled: a primary, or action list, for which adequate data and information are available to justify a TMDL, and a preliminary, or "watch" list, designed to list waters for which adequate data are not yet available.

3. TMDL implementation plans should be adaptive, whereby the goals of the TMDL are periodically assessed and scientific data should be used to revise the plan if necessary.

Finally, the NRC recommended that water quality criteria be formulated so that they are reasonably measurable, that they incorporate magnitude, duration, and frequency elements, and that they recognize the natural variability that may occur, especially from high and low flow conditions.

This report follows the NRC's approach to evaluate the effectiveness of water quality regulations and their implementation within the Los Angeles Region of California.

II. STATE WATER QUALITY REGULATION

The Porter-Cologne Water Quality Control Act (Porter-Cologne) authorizes the California State Water Resources Control Board (SWRCB) and nine California Regional Water Quality Control Boards (RWQCBs) to implement the federal Clean Water Act and state water quality regulations. Article 3 of Porter-Cologne requires that each RWQCB formulate and adopt a water quality control plan (Basin Plan) for its region and provides guidelines for the development of water quality objectives. Both Porter-Cologne and the Basin Plans in turn provide for the regulation of point and nonpoint source discharges and for the enforcement of discharge requirements.

Two additional regulations are applicable to water quality regulation in California. In May 2000, the EPA promulgated the California Toxics Rule (CTR), which provides numeric water quality criteria for certain pollutants in California. In March 2000, the SWRCB adopted a "Policy for the Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California" (the State Implementation Policy, or SIP), which contains provisions implementing the CTR water quality criteria in NPDES permits, among other things. Together with the Basin Plan, the SIP and CTR provide the basis for NPDES permits issued for discharges to inland surface waters, enclosed bays, and estuaries in California.[2]

As a result of the implementation of the SIP and the CTR, and escalation of the TMDL program over the past 3-5 years, significant confusion has arisen in the NPDES permit program. Many new permits contain limitations aimed at achieving CTR criteria and TMDL requirements, and affected permittees (both point and nonpoint) contend that they will be forced to spend substantial amounts to comply with requirements that may not have a discernible effect on water quality or use attainment. For example, this situation may arise when natural sources of a specific constituent overwhelm the amount of the constituent added by human activities to the water body. Reducing the NPDES permittees' discharges would result in little or no detectable water quality improvement. In addition, dischargers may be forced to implement costly controls to address problems that may have insignificant public health or ecological consequences, such as meeting recreational water quality standards for flows that are not used for swimming and similar activities. Despite the often substantial cost and adverse effect on other social priorities, most of these new permit conditions and related Basin Plan elements are being adopted without consideration of the economic or social impacts (including the need for developing housing) required under Porter-Cologne.

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[2] Discharges to the ocean are regulated by the Regional Boards and the SWRCB under the California Ocean Plan, which is adopted and updated periodically by the SWRCB. The Ocean Plan contains water quality standards applicable to ocean waters within California (i.e., territorial marine waters of the State outside enclosed bays, estuaries, and coastal lagoons).

Section 13000 of Porter-Cologne sets forth California's fundamental requirement that state water quality regulation must balance competing concerns to achieve the highest "reasonable" level of water quality:

> The Legislature further finds and declares that activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.

California Porter-Cologne Act, Section 13000 ("Policy").

This policy specifically informs Section 13241 and 13242 of Porter-Cologne with respect to establishing and implementing water quality objectives. Section 13241 states that a variety of factors must be considered before a RWQCB may establish a water quality objective, as follows:

> "factors to be considered by a regional board in establishing water quality objectives shall include, but not necessarily be limited to, all of the following:
>
> (a) Past, present and probable future beneficial uses of water.
>
> (b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.
>
> (c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.
>
> (d) Economic considerations.
>
> (e) The need for developing housing within the region.
>
> (f) The need to develop and use recycled water."

Section 13242 states that:

> "the program of implementation for achieving water quality objectives shall include, but not be limited to:
>
> (a) A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private.
>
> (b) A time schedule for the actions to be taken.

(c) A description of surveillance to be undertaken to determine compliance with objectives."

The most pertinent authority on the interpretation of these sections of the Porter-Cologne Act is a January 4, 1994 memorandum by the SWRCB Office of the Chief Counsel, "Guidance on the Consideration of Economics in the Adoption of Water Quality Objectives" (reaffirmed in 1999 by the Office of the Chief Counsel in "Economic Considerations in TMDL Development and Basin Planning"). The 1994 Chief Counsel's memorandum concludes that:

- A RWQCB must balance environmental, beneficial use, and economic considerations in establishing a Basin Plan.

- The Porter-Cologne Act does not require that a RWQCB conduct a formal cost-benefit analysis when adopting a Basin Plan or an amendment thereto.

- Water quality objectives may be adopted despite significant economic consequences. In such cases, however, a RWQCB must clearly explain why the objective is otherwise necessary, such as the sensitivity of the receiving waterbody, the toxicity of the regulated substance, or public health implications. This rationale must be transparent and discernable from the staff report, resolution or findings that accompany the adoption of the objective at issue.

- A RWQCB has an affirmative duty to consider economics when adopting water quality objectives and will likely not meet its obligation to consider the factors required by Porter-Cologne simply by responding to economic or other information supplied by third parties. Rather, the RWQCB should review available information on receiving water and effluent quality to determine if the proposed objective is being attained or can be attained. The RWQCB should then identify methods presently available for complying with the proposed objective and consider available information on the costs associated with the treatment methods or other methods identified to achieve compliance.

- A RWQCB must consider and respond on the record to any economic or other information provided by third parties in the Basin Plan process.

III. ANALYSIS OF THE LOS ANGELES REGION BASIN PLAN

This report evaluates several of the national and state concerns identified above in the specific instance of water quality regulation within the Los Angeles Region of California. It examines the administrative record as provided to date by the SWRCB and the RWQCB[3] supporting the development of the Los Angeles Basin Plan, including the 1971 Interim Basin Plan, documents pertaining to the establishment of the 1975 Basin Plan, and documents related to the 1978 revisions to the Basin Plan. Only limited documentation was provided by the RWQCB for the 1980s period, largely related to a 1984 and 1985 proposed update of the Basin Plan (referred to as the "205(j) project"). Extensive administrative comments and documentation were provided for the 1994 Basin Plan update. Subsequent to 1994, the administrative record contains references to Basin Plan chloride water quality objective revisions (circa 1997), the proposed de-designation of MUN uses (circa 1998), revised bacteria water quality objectives, triennial review priorities, and selected TMDL proceedings, including three trash TMDLs and information on recently adopted bacteria TMDLs.

Utilizing the administrative record, the designation of beneficial uses and the establishment of water quality objectives in the Basin Plan process were examined for conformance with statutory objectives. Implementation of the Basin Plan in the NPDES and TMDL processes was also assessed. This report identifies four key areas of concern:

1. Basin Plan water quality criteria and associated implementation programs have been adopted with inadequate consideration of and adherence to the Porter-Cologne Section 13241 and 13242 requirements.

2. Certain water quality objectives, including bacterial, sediment, and mineral quality standards, inadequately consider natural processes, ambient data, the quality of water imported to the region, and hydraulic linkages between surface and ground waters.

3. The Basin Plan contains beneficial use designations that do not reflect current or probable future beneficial uses and that therefore trigger regulatory controls that seek to protect unlikely or inapplicable beneficial use protections.

4. The RWQCB interprets the Basin Plan's tributary rule (as defined below) to include even the most minor, ephemeral drainages and storm flow channels, as well as all upstream reaches of a water body. This approach represents a very significant expansion of water quality regulations that is

[3] The RWQCB and SWRCB provided this documentation in response to a request submitted pursuant to the Public Records Act. As noted within this report, the authors are concerned that the administrative record as provided to date may be incomplete.

not adequately supported by the administrative record or applicable legal precedent.

A. Consideration of Porter-Cologne Sections 13241 and 13242

Although Porter-Cologne mandates that consideration be given to a variety of public interest factors when water quality objectives are established, the administrative record shows that only a small portion of the Los Angeles Basin Plan was developed in this manner. For example, in conformance with Porter-Cologne Section 13241, economic analyses were performed in the early 1970s to assess the impact of regulations on municipal wastewater treatment and associated facilities. However, there is no evidence in the public record that economic analyses have been performed to evaluate the impact of extending the same water quality objectives to nonpoint sources, including stormwater and urban runoff and agricultural drainage. Similarly, the administrative record contains minimal, if any, analysis of the impacts of proposed water quality objectives on the need to develop housing within the region, or to water quality conditions that could be reasonably achieved through coordinated control of all factors affecting water quality.

As noted above, during the implementation process for the Basin Plan for the Los Angeles River Basin (4B)[4] in 1974, a detailed economic analysis was conducted for municipal wastewater treatment improvements.[5] The Abstract of the Water Quality Control Plan for Basin 4B provided information about "Basin 4B's municipal wastewater treatment improvements and estimated costs...[which] are considered necessary to achieve and maintain water quality objectives vital to protection of beneficial uses of water." The Abstract clearly stated, however, that because the referenced water quality objectives would not be extended to nonpoint sources, no economic analysis was performed for such regulations:

> "quantitative data on nonpoint sources are too limited and uncertain to be presented herein, but it should be noted that these sources that are controllable do not contribute damaging amounts of pollutants to the groundwaters or navigable waters. With respect to uncontrollable nonpoint sources, such as urban and rural runoff, there may be certain things that the public can accomplish to lessen the impact, even though much of the effect is unavoidable [the document references general housekeeping measures such as reduced spills of oils, minimizing runoff content of inorganic litter, etc.] ... No specific nonpoint source control facilities are proposed under the Recommended [Basin] Plan. It is

[4] Prior to 1994, separate Basin Plans existed for the Santa Clara River Basin (called "4A") and the Los Angeles River Basin ("4B").

[5] See, e.g., Table 7 of the Basin Plan Abstract, June 1974. The Abstract of the Water Quality Control Plan for Basin 4B was "intended to serve as a general public information document which will be circulated widely and will provide public understanding of the essential elements of the Water Quality Control Plan."

> impractical to attempt to treat runoff generally... No specific financial provisions are considered for the control of nonpoint sources of pollution, but generally those responsible for correction of the problem will pay for such correction [the document states that property owners will pay for sewers to eliminate subsurface disposal systems, vessel owners will pay for new sewage-holding facilities, and automobile owners will pay for emission control devices]."

Subsequent documents further emphasize that the 1975 Basin Plan did not contemplate applying water quality objectives to nonpoint sources and that the RWQCB acknowledged the need for analyzing the economic (and other) impacts should such action ever be considered.[6] Interested parties commented in the administrative record that the issue of responsibility (including economic responsibility) for controlling nonpoint sources was not addressed in the Basin Plan. For example, the Los Angeles County Flood Control District comments to the RWQCB in November 1976 stated that[7]:

> "...we request that Table 15-61 or the accompanying text clarify how the State will improve and maintain those waters of the State which fail to meet the Water Quality Objectives even after all discharges from point sources have met NPDES limitations and all other mandatory improvements have been made. For example, if the water in a water segment does not meet the Health Department's standards for the prescribed recreation activity, who assumes responsibility for correction?"

The analysis requested by the Flood Control District is not contained in the administrative record, nor does the administrative record contain a response to this query.

The record also demonstrates that the RWQCB failed to consider economic impacts in setting water quality objectives and establishing beneficial use designations. For example, the RWQCB was explicitly asked in 1976 to consider the economic impacts of ammonia objectives,[8] but no record of a response to this request has been found. The

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[6] For example, the RWQCB states in the May 1976 document "Program for Phase II Water Quality Control Planning in Los Angeles Region, 1976-1981", "water quality data should be updated, water quality standards should be established, (i.e., determination of whether Chapter 4 – "Water Quality Objectives" is applicable to storm runoff)." This document further states that "analyses should be made of the implementation plan for point and nonpoint source control including regulatory programs and management agencies, to determine their respective impacts on surface, marine and groundwaters, land and air environment, and social, financial, and economic aspects...[t]his element should deal with environmental assessment of inland areas, bays, estuaries, tidal prisms, and the ocean; and with air quality regulatory, management, social, financial, and economic impacts."

[7] "Comments on the Issue Statement for Phase II Water Quality Control Planning – Los Angeles River Basin – 4B", comments provided to the California Regional Water Quality Control Board – Los Angeles Region, November 5, 1976.

[8] Memo from Bill B. Dendy, Executive Officer, SWRCB, to Regional Board Executive Officers, dated November 22, 1976, which asks, "Can the present objective [maximum unionized ammonia concentration

City of Los Angeles and others raised the economic impact of the ammonia objectives during the revision process leading to the 1994 Basin Plan,[9] but economic considerations were not addressed in the RWQCB's response to these comments.[10]

Over the years, in reviewing proposed Basin Plan revisions, multiple interested parties repeatedly commented on the lack of economic analyses in setting beneficial use designations. The City of Burbank commented on this issue in 1978,[11] and multiple parties submitted similar comments in the 1994 Basin Plan revision process. For example, the United Water Conservation District questioned whether input had been obtained from those whose economic condition might be affected by habitat designations.[12] The Camarillo Sanitary District commented that it believed that the RWQCB was required to take economic impacts into account when setting standards.[13] The Simi Valley County Sanitation District noted that strict application of water quality objectives without allowance for site-specific objectives would result in significant

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of 0.025 mg/l] be achieved economically (with respect to treatment costs or agricultural production) in your Region? If not, cite some examples where problems may occur."

[9] See, e.g., letter from City of Los Angeles to Deborah J. Smith, Planning Unit, California RWQCB, dated February 1, 1994: "...ammonia limits given in [the Basin Plan] appear to apply to the Los Angeles River through its designation as a WARM beneficial use. If adopted, this designation would require considerable capital investment and O&M expense to the City for the construction of nitrification/denitrification facilities..."

[10] See Response to Comments at p. 32-33 of the Basin Plan Responsiveness Summary, Comment 3-5, which does not contain mention of economic impacts. Although apparently not part of the administrative record provided to the authors by the RWQCB, the *Staff Report, Regional Water Quality Control Plan, Los Angeles Region, Draft of April 29, 1994*, does contain a discussion of the economic impacts of implementation of the ammonia objective. This staff report notes that "potentially high costs associated with ammonia removal and the individual nature of the different discharges and stream reaches and groundwater basins leads to the conclusion that site-specific studies need to be undertaken. Therefore staff have determined that a generous compliance schedule for ammonia effluent limits (up to 8 years) may be necessary to determine if, and what kind of, ammonia reductions are necessary for each facility. Therefore, there will be no immediate economic impact of this objectives [sic] until each case is considered to determine the necessary additional treatment, if any."

[11] Letter from City of Burbank to RWQCB, November 21, 1978: "The final plan should consider not only wildlife habitat and beneficial uses, but the potential financial burden being placed on our citizens."

[12] See letter dated March 4, 1994, from United Water Conservation District to the RWQCB: "We are particularly concerned about the emphasis placed on habitats in the basin plan... Has there been input from landowners, water users, and others whose economic health depends on the water resources? ...[S]ome of the habitat lists in the draft document could have enormous impacts on economics, private rights, and water rights..."

[13] February 3, 1994 letter from Camarillo Sanitary District to RWQCB: "We believe the word 'reasonable' [referring to the 'reasonable protection' language of Section 13241] mentioned in the above definition requires that the Regional Board take into account economic impacts when setting standards for effluent-dominated streams... The taxpayers do not want their tax dollars to be squandered to pay for treatment plant improvements that do little to protect the beneficial uses, if any, of an effluent-dominated stream."

expenditures, and that the RWQCB "may be in violation of the Porter-Cologne Act."[14] It further urged the RWQCB to "provide 'ceiling cost' guidelines on reasonableness for the implementation of the proposed objectives."[15]

In its response to comments, the RWQCB noted that "economic guidelines are being developed by the State Board and USEPA at this time. These guidelines will be utilized by the Regional Board where appropriate."[16] However, no such economic guidelines exist in or have been added to the administrative record reviewed to date.

The record also reflects significant discussion regarding the economic impacts of the designation of municipal and domestic (MUN) beneficial uses pursuant to the State's Sources of Drinking Water Policy, particularly with regard to the 1994 Basin Plan update. This issue is discussed in greater detail in Part C, below.

Several parties have questioned whether the Basin Plan and associated documents constituted a California Environmental Quality Act (CEQA) Environmental Impact Report (EIR)-equivalent document. These comments centered on the requirements of Porter-Cologne Section 13241, noting that an analysis of the Section 13241 factors must be included in the Basin Plan or the Functional Equivalent CEQA Document.[17] Although many parties have repeatedly requested clarification of these issues, the RWQCB has referred in the record only to the CEQA statutory "checklist" in response. The checklist is an abbreviated document that does not constitute a sufficient assessment of the economic and other factors required under Porter-Cologne such as water quality conditions (including natural processes, see below) that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area, the

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[14] January 20, 1994 letter from Simi Valley County Sanitation District to RWQCB: "The District strongly disagrees with the addition of strict ammonia limitations... Additionally, the District disagrees with the proposed Basin Plan designation of beneficial use for the Arroyo Simi... Without provision of SSO [site-specific objectives] for ammonia, nitrate and nitrite, TDS, and chloride, the District will be forced to drastically and unnecessarily expand the existing WQCP and spend many millions of dollars of scarce public funds to comply with the objectives of the proposed Basin Plan limits... If the proposed basin plan is adopted in its present form with no provisions for SSO, we believe that the RWQCB may be in violation of the Porter-Cologne Act, by failing to consider if the new objectives could be achieved through reasonable control on the factors."

[15] See letter from Simi Valley County Sanitation District to RWQCB, dated May 27, 1994.

[16] See Regional Water Quality Control Board, Los Angeles Region, *Responsiveness Summary for the April 28, 1994 DRAFT Water Quality Control Plan, Los Angeles Region*, June 13, 1994, at p. 24.

[17] The basin planning process is exempted from the California Environmental Quality Act (CEQA) requirement for the preparation of an Environmental Impact Report (EIR) or Negative Declaration and Initial Study (see CA Code of Regulation, Title 14, Section 15261). Any regulatory programs of the Board that are certified as functionally equivalent must satisfy the requirements of California Code of Regulations (CCR) Title 23, Section 377(a). For the purposes of Basin Plan revisions, the RWQCB considers the FED to consist of the Basin Plan with proposed changes; the Staff Report on the Basin Plan changes; and a Notice of Filing and CEQA Checklist and Determination with Respect to Significant Environmental Impacts.

need for developing housing within the region, and the need to develop and use recycled water.[18]

The most recent Basin Plan (1994) and the Basin Plan administrative record do not appear to meet any of the Porter-Cologne Section 13242 requirements. These require the RWQCB to provide a description of the nature of actions that are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private, and a time schedule for actions to be taken. Such information is generally absent from the Basin Plan and its supporting record.

B. Development and Implementation of Water Quality Objectives

Appropriate consideration is often not given in the Basin Plan and administrative record to ambient processes and naturally-occurring sources of "contaminants." Because the RWQCB did not fully consider these processes when setting water quality objectives, application of these objectives (e.g., for bacteria or sediments) to naturally occurring sources of contaminants could require extensive collection of stormwater flows and costly treatment and/or disinfection with little effect. In addition, water quality objectives that were set with consideration of natural conditions (e.g., mineral quality objectives) often considered only a subset of the potential full range of conditions or relied upon samples from locations that were not representative of the entire water body. Many have been reinterpreted over time so that they are applied much more broadly and often more stringently than originally intended and than is justified by natural conditions.

Bacterial standards. The Los Angeles Basin Plan contains bacteria objectives that apply to the beneficial uses of water contact recreation (REC-1) and non-water contact recreation (REC-2). Until very recently, the Basin Plan contained only fecal coliform bacteria objectives that were developed by the National Technical Advisory Committee (NTAC) to the Federal Water Pollution Control Administration in 1968.[19]

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[18] For example, the original CEQA checklist (dated April 29, 1994) notes, "The need for higher levels of wastewater treatment may require higher levels of energy. The environmental benefits to be realized from the improvement in water quality are expected to more than offset impacts from increased energy consumption." In response to comments that this statement was without support, the statement was revised (June 13, 1994) to read, "The need for higher levels of wastewater treatment may require higher levels of energy. In the long term, environmental benefits to the people and ecology of California should offset the impacts from the increased energy consumption." The CEQA checklist document also contains the following statements with regard to costs: "Sewage treatment facilities will be required to limit concentrations of ammonia in their discharges. Some sewage treatment plants may be required to meet lower limitations on certain inorganic constituents. This may result in increased costs to dischargers" and "Continued implementation of the NPDES Stormwater Permitting Program may cause the local municipalities, industrial dischargers, and owners/operators of construction projects to expend resources to improve the quality of stormwater discharges."

[19] See *Water Quality Criteria, a Report of the National Technical Advisory Committee to the Secretary of the Interior*, Federal Water Pollution Control Administration: Washington, D.C., April 1, 1968, at p. 8 and p. 12:

The fecal coliform standards contained in the 1975 and 1994 Los Angeles Basin Plans were based upon prospective epidemiological studies conducted by the United States Public Health Service in 1948, 1949, and 1950. These studies found an "epidemiologically detectable health effect" at levels of 2300 to 2400 coliforms per 100 ml at bathing beaches on Lake Michigan (at Chicago) and in the Ohio River. Later work showed that approximately 18% of the coliforms present in the mid-1960s at the Ohio location belonged to the fecal coliform subgroup. The recreational contact water quality criteria suggested by the committee were based upon the fraction of coliforms present as fecal coliforms and a factor of safety of two.

The fecal coliform standards recommended in 1968 were adopted by many states and municipalities and remain in use in many locations. Several studies conducted since 1968 have questioned these criteria and recommended use of alternatives.[20] As early as 1972, a Committee formed by the National Academy of Science-National Academy of Engineers noted the deficiencies in the study design and data used to establish the recreational fecal coliform criteria, and stated that it could not recommend a recreational water criterion because of a paucity of valid epidemiological data.[21]

In response to these concerns, EPA in 1972 initiated studies at marine and freshwater bathing beaches that were designed to correct the deficiencies in the earlier studies and analyses. These studies were conducted at sites contaminated either with pollution from multiple point sources (usually treated effluents that had been disinfected) or by effluents discharged from single point sources. The studies examined three bacterial indicators of fecal pollution (*E. coli*, enterococci, and fecal coliforms) and found that fecal coliform densities showed "little or no correlation" to gastrointestinal illness rates in swimmers. In contrast, a good correlation was found between swimming-

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"Surface waters should be suitable for use in "secondary contact" recreation – activities not involving significant risks of ingestion – without reference to official designation of recreation as a water use. For this purpose, in addition to aesthetic criteria, surface waters should be maintained in a condition to minimize potential health hazards by utilizing fecal coliform criteria. In the absence of local epidemiological experience, the Subcommittee recommends an average not exceeding 2,000 fecal coliforms per 100 ml and a maximum of 4,000 per 100 ml, except in specified mixing zones adjacent to outfalls."

"Fecal coliforms should be used as the indicator organism for evaluating the microbiological suitability of recreation waters. As determined by multiple-tube fermentation or membrane filter procedures and based on a minimum of not less than five samples taken over not more than a 30-day period, the fecal coliform content of primary contact recreation waters shall not exceed a log mean of 200/100ml, nor shall more than 10 percent of total samples during any 30-day period exceed 400/100 ml."

[20] For a summary of these studies, see the discussion provided on pages 1-3 of the *Ambient Water Quality Criteria for Bacteria – 1986*, USEPA 440/5-84-002, January 1986.

[21] Committee on Water Quality Criteria. National Academy of Sciences-National Academy of Engineering. *Water Quality Criteria*. USEPA R3-73-033, Washington, D.C., 1972.

associated gastrointestinal symptoms and either *E. coli* or enterococci in swimming waters.[22] Based on these studies, EPA in 1986 proposed section 304(a) criteria for full body contact recreation based upon *E. coli* and/or enterococci but noted that "it is not until their adoption as part of the State water quality standards that the criteria become regulatory."[23]

As early as 1988, the RWQCB included a revision of bacteria criteria in a list of issues to be evaluated via the triennial review process.[24] Recently, the Los Angeles RWQCB adopted a Basin Plan amendment that revises the bacteria water quality objectives for fresh water contact recreation (REC-1) and for marine waters designated REC-1, as well as providing implementation provisions.[25] For fresh waters, this Basin

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[22] See Dufour, A.P., *Health Effects Criteria for Fresh Recreational Waters*. USEPA 600/1-84-004, August 1984.

[23] *Ambient Water Quality Criteria for Bacteria – 1986*, USEPA 440/5-84-002, January 1986.

[24] See the Work Plan for the Triennial Review of the Basin Plans for the Santa Clara River (4A) and the Los Angeles River (4B) Basins, Los Angeles RWQCB, July 1988, at p. 23: "Consider using enterococcus bacteria or pathogenic viruses as indicator organism. ...EPA has recently developed criteria to estimate pathogen presence based on the presence of enterococcus bacteria in the effluent... enterococcus has been found to have the highest correlation with human health effects of all other bacteria and viruses tested including coliforms... Another option is to monitor pathogenic organisms and viruses that actually cause disease rather than indicator bacteria."

[25] State of California, California Regional Water Quality Control Board, Los Angeles Region, Resolution No. 01-018, Amendment to the Water Quality Control Plan for the Los Angeles Region to Update the Bacteria Objectives for Water Bodies Designated for Water Contact Recreation. Adopted by the Los Angeles RWQCB on October 25, 2001. For fresh waters, the amended Basin Plan bacteria objectives are as follows:

1. Geometric mean limits
   - E. coli density shall not exceed 126/100ml.
   - Fecal coliform density shall not exceed 200/100 ml.
1. Single Sample Limits
   - E. coli density shall not exceed 235/100 ml.
   - Fecal coliform density shall not exceed 400/100 ml.

This Basin Plan amendment specifies bacteria criteria for marine waters designated REC-1 as follows:

1. Geometric mean limits
   - Total coliform density shall not exceed 1,000/100 ml.
   - Fecal coliform density shall not exceed 200/100 ml.
   - Enterococcus density shall not exceed 35/100 ml.
1. Single sample limits
   - Total coliform density shall not exceed 10,000/100 ml.
   - Fecal coliform density shall not exceed 400/100 ml.
   - Enterococcus density shall not exceed 104/100 ml.
   - Total coliform density shall not exceed 1,000/100 ml, if the ratio of fecal-to-total coliform exceeds 0.1.

Implementation provisions are as follows:

The geometric mean values should be calculated based on a statistically sufficient number of samples (generally not less than 5 samples equally spaced over a 30-day period).

Plan amendment has retained the numeric values for the fecal coliform water quality objective contained in the earlier Basin Plan and has added an *E. coli* objective, both to be evaluated as geometric means and as single sample exceedances (rather than <10% of samples during a 30-day period to be below specified limits).

In its justification for the revised objectives, the RWQCB cites both the EPA studies noted above and an epidemiological study of swimmers at three Los Angeles County beaches.[26] The RWQCB noted that total and fecal coliform concentrations were not strongly associated with increased risk for gastrointestinal illness, consistent with the EPA studies, and that these indicators "were associated with increased risk of skin rashes" in the Santa Monica Bay study.[27] However, the Santa Monica Bay epidemiological study examined only swimmers at ocean sites and in dry weather and provides no scientific support for retaining fecal coliform concentrations in water quality criteria for inland (fresh) waters or for wet weather events.

Several comment letters received by the RWQCB on the revised bacteria water quality objectives noted that the objectives failed to consider the level of use of a receiving water, seasonality, or the risk associated with the water quality objectives. For example, the City of Los Angeles noted that "the RWQCB included only bacteriological criteria specific to 'designated beach areas' for all waters designated as REC-1, and failed to include additional criteria for other levels of use in full contact recreation waters as identified in the 1986 U.S. EPA Bacteriological Criteria."[28] In response, the RWQCB stated that it had considered applying different use levels for some inland water bodies but decided against this approach because "EPA's use levels do not take into account

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If any of the single sample limits are exceeded, the Regional Board may require repeat sampling on a daily basis until the sample falls below the single sample limit in order to determine the persistence of the exceedance.

When repeat sampling is required because of an exceedance of any one single sample limit, values from all samples collected during that 30-day period will be used to calculate the geometric mean.

[26] See p. 5 of the California Regional Water Quality Control Board, Los Angeles Region Staff Report (draft), Proposed amendment of the Water Quality Control Plan – Los Angeles Region to revise bacteria objectives for waters designated for contact recreation, July 31, 2001. Note that no Final Staff Report is contained in the Administrative Record.

[27] Ibid.

[28] See letter from Judith A. Wilson, Director, Bureau of Sanitation, City of Los Angeles, to Dennis Dickerson, RWQCB, September 17, 2001. See also letter from Rod H. Kubomoto, County of Los Angeles Department of Public Works, September 18, 2001: "Standards should be based on intensity of use and applied to appropriate watercourses – As set forth in the EPA Pathogen Protocol, several States use fecal indicator standards that vary seasonally in accordance with use designations...We recommend that the Regional Board consider beneficial use designations through seasonal use analysis and develop appropriate water quality standards for each water body." Also, October 18, 2001 letter from Raymond C. Miller, Southern California Alliance of Publicly Owned Treatment Works (SCAP): "Our main concern is the fact that your proposed changes do not differentiate between different levels of use that occur in different water bodies due to their attractiveness and appropriateness for recreational use, and which may occur on a seasonal basis."

frequent exposure by vulnerable sub-groups of the population...such as children... Therefore, staff feels that it is important to protect these water bodies at the same levels as 'designated beach areas' per the U.S. EPA 1986 guidance."[29]

Comment letters also noted that assessment of compliance based upon a single sample result "may lead to erroneous conclusions...[by] finding noncompliance through an unusually high value for any single bacterial sample."[30] These comments further noted that use of "not-to-exceed" single sample standards "is not a mere statistical change; it greatly increases the likelihood that water quality objectives will be violated in a greater number of watercourses and require greater cleanup efforts to ensure compliance."[31] The County Sanitation Districts of Los Angeles County also expressed concern about how single-sample limits will be used in future impairment determinations.[32] Finally, a recently published study of fecal indicator bacteria at southern California beaches shows that concentrations vary significantly over even short (10-minute) timescales, suggesting that geometric mean standards, not single samples, should be used to assess beach water quality.[33]

Recent studies in southern California have shown that high concentrations of indicator bacteria are present in runoff from pristine, undeveloped areas that have little potential for human bacterial contamination.[34] For example, stormwater runoff from the head of the Rose Creek watershed in the San Diego Region contained levels of indicator bacteria well in excess of water quality objectives even though this area is nonurban, contains no sewer lines or lift stations, and is restricted from public access. Recent data collected within the Los Angeles Basin also show high levels of bacteria from natural sources. As noted by the County of Los Angeles Department of Public Works:

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[29] See Responsiveness Summary for the Proposed amendment of the Water Quality Control Plan – Los Angeles Region to revise bacteria objectives for waters designated for primary contact recreation, undated, response No. 2.

[30] Letter from County of Los Angeles Department of Public Works to the RWQCB, September 18, 2001.

[31] Ibid.

[32] Letter from Jose A. Saez, LACSD, to RWQCB, September 18, 2001: "...we are concerned about how receiving water data will be used to determine future impairment designations. The proposed objectives include single-sample limits for both freshwater and marine waters. None of the current objectives for bacteria represent single-sample limits. Implementation of single-sample limits, particularly the enterococcus limit proposed for ocean receiving waters, will likely result in occasional exceedences... These sources may contribute to occasional single results above the objective, without this being an indication of a real concern for contamination in the receiving water..."

[33] Boehm, A.B., Grant, S.B., Kim, J.H., Mowbray, S.L., McGee, C.D., Clark, C.D., Foley, D.M., and Wellman, D.E. Decadal and shorter period variability of surf zone water quality at Huntington Beach, California. Environmental Science & Technology 36(18):3885-3892.

[34] See, for example, Schiff, K., and P. Kinney. *Tracking sources of bacterial contamination in stormwater discharges to Mission Bay, California*, 2001. Water Environment Research, 73(5): 534-542, and Moore, D., *Bacteriological survey of San Juan Creek Watershed*, Task 3 report for the San Juan Creek Watershed Bacteriological Study, November 14, 2001.

> "Natural conditions often exceed the Basin Plan objectives by several orders of magnitude. Samples from Public Works' NPDES monitoring program during the 2000-01 storm season show that runoff from undeveloped land can reflect total coliform levels ranging up to 240,000 MPN/100ml, fecal coliform levels ranging up to 1,700 MPN/100ml, and fecal enterococcus levels ranging up to 160,000 MPN/100ml. The fact that natural loadings routinely exceed basin plan objectives must be addressed in this amendment as well as future TMDLs. This is required not only as a matter of good science, but also by State law."[35]

It is clear from scientific studies that high concentrations of indicator bacteria may not necessarily indicate human sources of contamination and may not indicate a significant potential for causing human illnesses.[36] Although EPA has recently changed its policy regarding high levels of indicator organisms from animal sources,[37] EPA has recognized that routine exceedances of ambient water quality criteria due to natural sources of pollution do occur. In response, EPA has recommended changes to designated uses as the most appropriate way to address these situations.[38] Such changes would also help to eliminate conflicts between certain designated uses and habitat uses in which

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[35] See comment letter from the County of Los Angeles Department of Public Works to the RWQCB on September 18, 2001.

[36] Epidemiological studies have generally been conducted during the summer recreational season and not during periods of stormwater runoff. See, for example, Haile, R.W., et al. 1999. *Health effects of swimming in ocean water contaminated by storm drain runoff.* Epidemiology 10:355-363, and Santa Monica Bay Restoration Project, 1996. *An epidemiological study of possible adverse health effects of swimming in Santa Monica Bay.* Santa Monica Bay Restoration Project, Monterey Park, CA. Results, therefore, may not be directly applicable to stormwater runoff. LACSD also noted in comments on the draft Santa Monica Bay Beaches Wet-Weather TMDL that a "confirmation epidemiological study that includes an evaluation of the reference site during wet weather conditions is needed" (see comment 22.5 in the RWQCB's responsiveness summary, dated September 23, 2002).

[37] See, e.g., Implementation Guidance for Ambient Water Quality Criteria for Bacteria, May 2002 draft, EPA-823-B-02-003, at p. 26: "The available data suggest that there is some risk posed to humans as a result of exposure to microorganisms resulting from non-human fecal contamination... Consequently, due to the potential for animal sources to contribute human pathogens to surface waters, EPA is changing its 1994 policy...to recommend that states and authorized tribes apply their water quality criteria for bacteria to all waterbodies designated for primary contact recreation in order to ensure protection of human health from gastrointestinal illness."

[38] See Implementation Guidance for Ambient Water Quality Criteria for Bacteria, May 2002 draft, EPA-823-B-02-003, at p. 28: "For waterbodies affected by natural sources such as these [resident wildlife populations, migrating waterfowl, wildlife refuges, or lakes frequented by waterfowl], where a significant portion of fecal contamination is shown to be from natural sources and a state or authorized tribe demonstrates the water quality criterion for bacteria and the primary contact recreation designated use is not attainable through the control of other sources, an intermittent, wildlife impacted, or secondary contact recreational use may be the most appropriate designated use."

natural conditions favored by wildlife would, illogically, have to be modified to meet water quality standards.[39]

The administrative record also shows that several water bodies within the Los Angeles Region are listed as REC-1 and/or REC-2 despite limited opportunity for recreational activities due to channel configurations, restricted access, or flood danger. Many stakeholders have commented that because of these considerations, Basin Plan recreational beneficial use designations are often inappropriate.[40] Particularly during periods of high stormflows, it is extremely unsafe to swim or wade in these waters, and the potential for human contact with bacteria and/or human pathogens that may be contained in these water bodies is minimal.[41]

The Basin Plan administrative record contains almost no consideration of the economic impacts of bacterial standards, applicable natural conditions, or reasonable use designations. In general, the record shows that RWQCB responds to such issues by contending that because the previous bacteria water quality objectives (as contained in the 1975 and subsequent Basin Plans) were not met over time, the methods and costs necessary to achieve compliance with any subsequent amended objectives "are not expected to be different from those necessary to achieve the existing [previous] objectives for total and fecal coliform."[42] This contention fails to meet the Section 13241 analysis requirements because it provides no rationale for the RWQCB's assertion and ignores the fact that no Section 13241 analysis was performed with respect to the original objectives. It also neglects to consider that the original bacteria objectives were not intended to be applied to nonpoint sources or storm flows and thus that no consideration of the cost associated with such regulations was ever made. Indeed, the RWQCB's own statements in the record expressly acknowledge that economic (and other) analyses

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[39] See letter from Paul H. Lane of the Department of Water and Power to Lee Spady of the San Fernando Valley Audubon Society, dated June 15, 1976, and written in response to a request for a bird sanctuary designation at the Van Norman Complex: "The development of a bird sanctuary adjacent to this important facility is not consistent with our responsibility to protect and maintain the quality of the water served to the citizens of Los Angeles. Although the Department intends to maintain as much of the natural environmental setting at the Van Norman Complex site as possible, we cannot encourage its use by waterfowl and other species of migratory and resident birds."

[40] See discussion in section on beneficial uses, below.

[41] Note that many of the water contact recreation (REC-1) beneficial use designations in the Los Angeles Basin Plan are accompanied by a footnote that acknowledges that access is prohibited by the Los Angeles County Department of Public Works or other relevant agency. However, water quality objectives are applied and enforced equally for all water bodies with the REC-1 designation, including those that carry this footnote. See also discussion in Section C.

[42] See p. 8 of the California Regional Water Quality Control Board, Los Angeles Region Staff Report (draft), Proposed amendment of the Water Quality Control Plan – Los Angeles Region to revise bacteria objectives for waters designated for contact recreation, July 31, 2001. Note that no Final Staff Report is contained in the Administrative Record.

should be performed before applying the water quality criteria contained in the 1975 Basin Plan to non-point sources.[43]

Many of the comment letters received in response to the revised bacteria objectives stated that RWQCB staff "has not properly considered economic considerations, the water quality conditions that could reasonably be achieved, and other factors required to be considered under Water Code section 13241... [and that the RWQCB] grossly underestimates the full costs for appropriate TMDL development, including those costs associated with dry weather diversion projects, treatment of diverted dry weather flow to established treatment facilities, and costs for wet weather control of bacteriological objectives."[44] The Basin Plan does not distinguish between periods of dry and wet weather in determining the applicability of bacterial standards, and these standards are routinely violated during storm flows. Treating stormwater flows to meet bacterial standards would require collection, treatment, and disinfection of very large volumes of water. The Basin Plan record contains no analysis of whether this process would be cost-prohibitive, the significant technical challenges involved in the collection and treatment of storm flows, and the anticipated benefits, if any, that would be achieved.

The record contains limited RWQCB responses to some of these issues in the context of TMDL development. For example, the RWQCB states in the Draft Santa Monica Bay Beaches Wet-Weather Bacteria TMDL, which implements the new bacteria objectives, that it is "not the intent of this TMDL to require diversion of natural coastal creeks or to require treatment of natural sources of bacteria from undeveloped areas."[45] However, comments received from a number of parties questioned whether the TMDL could be achieved without such diversion and treatment. Comments also criticized the draft TMDL economic analysis, implementation plans, and feasibility,[46] the scientific

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[43] See, e.g., footnote 6.

[44] Letter from Judith A. Wilson, City of Los Angeles Bureau of Sanitation, to RWQCB, September 17, 2001. See also a letter from Rod H. Kubomoto, County of Los Angeles Department of Public Works, September 18, 2001: "The staff report does not adequately consider the costs of implementing the amendment to the bacteria objectives in the basin plan. Full implementation of this basin plan amendment could require treatment of storm water. A 1998 Caltrans study estimates the capital cost of this basinwide treatment to be approximately $37 billion."

[45] See p. 40 of the Draft Santa Monica Bay Beaches Wet-Weather Bacteria TMDL, dated August 1, 2002. This TMDL proposes a "reference system/anti-degradation approach" to implementing the bacteria objectives, whereby TMDL compliance would be determined by comparing the number of days water quality at a given location exceeds water quality objectives (called "exceedance days") with a pre-determined number of exceedance days expected to occur during wet weather at a reference watershed that is predominantly open space.

[46] See the RWQCB's responsiveness summary to the Santa Monica Bay Beaches Wet-Weather TMDL, September 23, 2002: From comments provided by the City of Los Angeles, Department of Public Works (comment 6.28): "It is suggested that a UAA is developed to determine that there are no widespread and adverse economic and social impacts of treating wastewater." From the Stormwater Quality Task Force (comment 2.9): "The TMDL recognizes that there will be significant costs involved in [capturing and treating wet weather runoff], but does not adequately characterize the full implications of achieving

basis of the revised water quality objectives[47] and their implementation via a TMDL.[48] None of these concerns appear to have been adequately addressed by the RWQCB to date.

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compliance..." See also comment 2.14, which stated that "it is important under the Porter Cologne Act the Regional Board consider the full potential expenditures and implementation impact..." and the RWQCB's response: "The Regional Board is not required to conduct a cost-benefit analysis when amending its Basin Plan pursuant to Water Code section 13242. Regional Board staff have considered economic factors in its environmental analysis of reasonably foreseeable methods of compliance with the TMDL as required." See also comments from the City of Signal Hill (comment 8.5): "The TMDL does not sufficiently address the economics and financial considerations, and greatly underestimated the overall cost of implementation." Even after revision of the TMDL, many commenters expressed continued concern. For example, the County of Los Angeles, Department of Public Works stated (comment 15.1): "We are concerned that the stringent REC-1 bacterial objectives applied in this TMDL would require extraordinary resources to control bacteria during wet weather" and (comment 15.2): "We believe the Regional Board staff's cost is significantly underestimated because the capital cost for construction of new dedicated runoff treatment facilities that would be needed in these [south Bay and Palos Verdes] areas was not included." Similarly, the Executive Advisory Committee, Stormwater Program – Los Angeles County noted (comment 20.1) that there was a "Lack of Cost Estimates for Implementation Strategies" and that (comment 20.2) "the implementation chapter (9) is woefully inadequate in scope and detail to permit certification of the CEQA checklist or amendment adoption." The County Sanitation Districts of Los Angeles County noted (comment 22.1) that "the Districts oppose the intentional diversion of storm water to its collection system as an implementation strategy" as specified in the draft TMDL. CSDLAC further noted that (comment 22.2) "cost estimates associated with increasing capacity in the collection system should be identified" and "the Districts request that the RWQCB estimate and consider the cost impacts associated with necessary modifications of sewage collection systems to accommodate diverted flows or if necessary, dedicated treatment facilities." In response, the RWQCB noted that "if the CSDLAC will not allow diversion to its facility, other implementation strategies should be employed" and stated that "the cost estimates are based on diversion of some wet weather flows to existing wastewater treatment facilities. Sewer and treatment plant capacities were considered in this potential implementation strategy." Finally, multiple parties commented that the division of responsibility is not clear in case the TMDL is not met. For example, the City of Redondo Beach noted (comment 18.4) that "it would be helpful to provide clarity to the term 'jointly responsible'" and (comment 18.5) "additional clarification is needed to insure a clear understanding of all agencies that will have some responsibility in implementing the TMDL." The RWQCB maintains that these concerns are addressed adequately by the draft TMDL.

[47] See, for example, comments from the County of Los Angeles, Department of Public Works (comment 9.1): "We recommend different bacterial standards by season..." See also comments from the Executive Advisory Committee, Stormwater Program – County of Los Angeles (comment C.1): "The LARWQCB's choice of four bacterial standards is scientifically unsupportable" and (comment C.5): "Total and fecal coliforms do not protect public health." Comments were also received from the County of Los Angeles, Department of Public Works (comment 15.3): "We recommend that the Regional Board consider the application of less stringent bacterial objectives, such as the objectives for 'moderate full-body contact recreation,' 'lightly used full-body contact recreation,' ..."

[48] See, for example, comments from the County of Los Angeles, Department of Public Works (comment 9.5): "We recommend that bacteria dilution and die-off should be taken into consideration to establish accurate exceedance criteria." The County Sanitation Districts of Los Angeles County also commented (comment 10.6) that "the LACSD believes that the use of the 'wave wash', or 'point zero', where freshwater runoff initially reaches the ocean, to determine compliance, is inappropriate for several reasons."

Sediment water quality objectives. The Los Angeles Basin Plan contains only narrative standards for solid, suspended, or settleable materials (i.e., "waters shall not contain suspended or settleable materials in concentrations that cause nuisance or adversely affect beneficial uses"). This narrative standard is often applied without regard to natural, historic sediment levels, which can be very high, especially in runoff from storm flows originating in the San Gabriel Mountains.

Because the sediment water quality objective is narrative, application of the standard can vary substantially from situation to situation. Determining sediment levels that constitute a nuisance or an adverse impact to beneficial uses is subjective and is generally based upon perceived threats to habitat (e.g., spawning grounds).[49] Similarly, it may be very difficult to determine the contribution of a given project (e.g., a construction site) to total sediment loads or perceived impairment within a water body.

The Basin Plan administrative record contains numerous comments regarding suspended sediment objectives and implementation. Most comments focus on the high natural levels of sediments within the Los Angeles Basin, particularly during storm flows, and express concerns that implementation of sediment objectives do not account for these conditions. For example, in comments on revisions proposed for inclusion in the 1994 Los Angeles Basin Plan, the County of Los Angeles Department of Public Works (CLADPW) noted that the sediment water quality objectives do not account for natural sources and may be subject to "abuse in interpretation."[50]

CLADPW objected to proposed language stating that sediment sluicing (i.e., the practice of "flushing" sediments that collect behind flood control dams during winter rains through the reservoirs and downstream channels) may "destroy aquatic habitats."[51] The Basin Plan contains language discouraging the use of sediment sluicing: "The Regional Board strongly opposes sluicing of sediment from reservoirs for maintenance

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[49] See, for example, p. 4-40 of the Los Angeles Basin Plan: "Suspended solids (such as soil particles) can, upon settling, destroy spawning grounds and other habitats."

[50] See February 17, 1994 comment letter from James A. Noyes, County of Los Angeles Department of Public Works, to Deborah J. Smith, RWQCB: "The water quality objectives for solid, suspended, or settleable materials...do not take into account that the water quality of flows from and within naturally erosive watersheds are highly dynamic, and therefore the level of beneficial uses will also fluctuate. In addition, the term 'nuisance' is very subjective, vague, prone to abuse in its interpretation, and its use as a standard for discharger compliance is inappropriate. Therefore, based on the Basin Plan's proposed objective for turbidity, the objective for solid, suspended or settleable materials should be revised to read as follows: 'Waters shall not contain suspended or settleable material in concentrations in excess of 20% above natural levels as a result of waste discharges.'"

[51] See February 17, 1994 comment letter from James A. Noyes, County of Los Angeles Department of Public Works, to Deborah J. Smith, RWQCB. In response to comments, the language in the 1994 Basin Plan was revised to read as follows: "Further problems in the upper San Gabriel River occur as vast amounts of naturally eroding sediment from the rugged San Gabriel Mountains settle into reservoirs behind flood control dams. Improper sediment sluicing operations from these reservoirs can impact aquatic habitats and groundwater recharge areas."

purposes when this activity has the potential to impair downstream uses."[52] In its comment letter, CLADPW noted that the "San Gabriel Mountains...are among the most erosive in the world; therefore, 'vast amounts of sediment...' are expected and are a natural characteristic of the 'pristine' watershed."[53] CLADPW further noted that "the fluvial-geomorphic process plays an integral part in maintaining the dynamic nature of a river system," influencing "the form and condition of the stream, creating habitat niches and providing for a greater ecological biodiversity of species." The Main San Gabriel Basin Watermaster also expressed concern with the 1994 Basin Plan revisions that discourage sediment-sluicing operations.[54] Water bodies within the Los Angeles Region are the natural conveyances for beach replenishment material. If sediment loading within these water bodies is restricted, particularly during storm flows, beaches may be left with inadequate supplies of sand.[55] The net result would be more significant beach erosion than is currently occurring. Although the RWQCB identified an evaluation of the appropriateness of a prohibition on sediment sluicing as a high priority in the 2001 triennial review priority list, it is not conducting this task as part of the triennial review.[56]

As noted in Part C, below, CLADPW and others have repeatedly commented to the RWQCB that many of the habitat and recreational designations for flood control facilities are inappropriate, because accumulated sediments must be routinely cleaned from flood control facilities and such maintenance precludes sustained habitat vegetation. Nevertheless, the RWQCB has never provided an adequate rationale for adopting Basin Plan elements that conflict with the intended purpose and operation of such facilities.

Mineral quality objectives. The Los Angeles Basin Plan contains water body-specific objectives for various mineral quality parameters, including total dissolved solids (TDS), sulfate, chloride, boron, nitrogen (nitrate + nitrite), and sodium adsorption ratio

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[52] 1994 Los Angeles Basin Plan at p. 4-44.

[53] See February 17, 1994 comment letter from James A. Noyes, County of Los Angeles Department of Public Works, to Deborah J. Smith, RWQCB.

[54] See comment letter from the Main San Gabriel Basin Watermaster to Deborah J. Smith, RWQCB, dated January 31, 1994: "The Main San Gabriel Basin Watermaster would urge the Regional Board to also discuss and support alternate proposals to remove sediments from the reservoirs in order to maintain storage for water conservation and flood control."

[55] See, e.g., comments from County of Los Angeles Department of Public Works to RWQCB, May 26, 1994, Attachment B (at p. 7): "The Plan's sediment reduction mandate will thus increase the rate of siltation in the LACDPW' [sic] flood control and water conservation facilities... In addition, it is our understanding that some agencies such as the California Coastal Commission believe that upstream sediment retention interferes with beach replenishment. Therefore, impacts from this Plan's mandate to further decrease sediment delivery to the oceans may be considered by these agencies as adverse to beach replenishment."

[56] California Regional Water Quality Control Board, Los Angeles Region, Staff Report: 2001 Triennial Review: Prioritization of Basin Planning Issues, April 16, 2001, at p. 32.

(SAR). The 1971 Interim Basin Plan contained a limited subset of mineral quality objectives.[57]

The 1975 Basin Plan mineral objectives for TDS, sulfate, chloride, and nitrogen for selected reaches of the LA River, San Gabriel River, and tributaries were originally developed as flow-weighted mean mineral quality objectives for the Los Angeles Basin.[58] The mineral quality objectives were apparently developed from monitoring data collected at a limited number of locations in the listed reaches from November 1969 through August 1970, a very wet climatic period. In some cases, these samples were collected where concentrations within the reach were at their lowest levels. During drier periods, the RWQCB was forced to adopt measures such as the 1990 drought policy (Resolution 90-004) and 1997 amendment of chloride objectives to allow for more realistic mineral standards based on a wider, more normal distribution of wet and dry hydrologic conditions. Furthermore, in determining mineral objectives, the Basin Plan assumed that the Peripheral Canal around the Delta would be built, keeping southern California water supply imports low in chloride,[59] and that the soft-bottom section of the L.A. River could allow infiltration of minerals to the groundwater. Both of these assumptions proved erroneous, as the Peripheral Canal was never built and groundwater generally flows into the Los Angeles River in the river's soft-bottom reach.[60] As a result, the TDS, sulfate,

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[57] Water Quality Control Plan (Interim), Santa Clara River Basin 4-A and Los Angeles River Basin 4-B, June 1971, at p. 51. Mineral quality objectives are provided for the Los Angeles River and its tributaries upstream of Figueroa Street, and downstream from Figueroa Street to Tidal Prism.

[58] See Table 4-1 of the 1975 Los Angeles Basin Plan at pages I-4-11 and I-4-12.

[59] See, e.g., comments prepared by the City of Los Angeles Bureau of Engineering and presented to the Chloride Work Group at a workshop on (or about) April 13, 1993: One of "two important assumptions behind the Basin Plan projections [of water quality for the 1975 Basin Plan] that did not materialize as expected: 1. Construction of the Peripheral Canal in Sacramento Delta... The [1975] Basin Plan itself projects that failure to construct the Peripheral Canal would result in poorer quality State Project waters delivered to the Basin."

[60] As noted in "Assessment of long term impacts, Third quarterly report, July – September, 1995, Department of Public Works, Bureau of Sanitation," November 8, 1995: "[T]he City of Los Angeles conducted a more comprehensive study of the relationship between river water quality (as impacted by reclamation plant discharges) and that of local groundwaters (*Potential Infiltration of Chlorides from the Los Angeles River into the Groundwater Aquifer*, January 1993). This effort included input from the Upper Los Angeles River Area Watermaster and two consulting firms...(*Impact of Chloride, Sulfate and TDS Discharges on Beneficial Uses, Public Health, and Groundwater in the Upper Los Angeles River Basin*, February 1993) ... The results of these studies led to several primary conclusions:

1. Prevailing hydrologic (as well as drought) conditions in groundwaters adjoining the unlined portion of the Los Angeles River result in high groundwater levels (and in some areas rising groundwater) that preclude significant percolation of flows from the river into underlying aquifers. These conditions have been observed prior to and following the 1977 drought and throughout periods of local groundwater pumping.
1. Local groundwater levels have risen in response to the cessation or reduction of location groundwater pumping ... in 1979, further decreasing the potential for groundwater intrusion by percolating river flows.
1. Overall statistical correlation of river and groundwater quality data is generally poor, leading to the conclusion that there is no significant impact by river flows on underlying groundwater quality.

chloride, and nitrogen water quality objectives were based on unusually wet conditions and computed from an unspecified averaging period.[61] In response to comments received from EPA during the approval process of the 1975 Basin Plan, the RWQCB clarified that these objectives were to be interpreted as the flow-weighted annual (water year) average mineral concentrations, with no single sample exceeding 110% of the objective value.

When the 1994 Los Angeles Basin Plan was adopted, the mineral quality objectives remained substantially the same as in the 1975 Basin Plan. For the Los Angeles and San Gabriel River watersheds, one additional stream reach was added, but numeric objectives remained unchanged.[62] However, the RWQCB failed to include the footnote contained in the 1975 plan (and in the 1976 and 1978 amendments to the 1975 plan) specifying that mineral quality objectives were to be interpreted as flow-weighted annual average concentrations. This significant change in interpretation was made without public notice and without a Section 13241 analysis. As a result, the mineral quality objectives have been subsequently re-interpreted as instantaneous maxima to be achieved at any location within the reach. Natural mineral concentrations are, at any point in time, frequently higher than the applicable water quality objectives. Consequently, when such objectives are interpreted as instantaneous maxima, enormous expense may be required to comply compared with the achievement of flow-weighted annual average goals. To date the RWQCB has neither clarified nor resolved this significant concern with the Basin Plan mineral water quality objectives.

Chloride objectives. Water quality objectives for chloride have been among the most controversial issues in the Basin Plan. Chloride water quality objectives were set

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1. ...[T]he resumption of groundwater extractions from local well fields may create a potential for increased percolation due to local drawdown effects, and should be monitored."

See also the 1994 Los Angeles Basin Plan at p. 1-19: "One seven-mile reach in the narrows area (in the middle portion of the river system), where groundwater rises into the streambed, is mostly unlined along the stream bottom and provides natural habitat for fish and other wildlife in an otherwise concrete conveyance."

[61] See Table 4-1 of the 1975 Los Angeles Basin Plan at pages I-4-11 and I-4-12. Table 14-2 of the 1975 Basin Plan contains mineral monitoring data for selected surface waters in Basin 4B. The monitoring period varies among the listed reaches, but extends approximately from November of 1969 through August of 1970. This data set has probably been relied upon to set the mineral objectives listed in Table 4-1 of the 1975 Basin Plan. For example, some of the reaches (Rio Hondo above Spreading Grounds, Z-6-9780.00), the objectives seem to be based on only 6 data points. For the LA River at Figueroa (Z-6-1300) 11 samples were measured for minerals, including nitrate, which had an average at 19 mg/l as NO_3 (4.3 mg/l as NO_3-N) and ranged between 6.8 and 31 mg/l as NO_3 (1.5-7 mg/l as NO_3 - N). If these background data were used for the setting of the 8 mg/l NO_3 - N objective, it would appear that the maximum measured value of 31 mg/l as NO_3 (7 mg/l as NO_3 - N) would be the basis for setting the objective for this reach. However, for the Rio Hondo Station (Z-6-9780.00) it is unclear how the data were used to set the 8 mg/l NO_3 - N + NO_2 - N objective. From the available data at this station, the average measured nitrate was 17.4 mg/l as NO_3 (3.9 mg/l as NO_3 - N) with a range between 3.2 and 45 mg/l as NO_3 (0.7 - 10.3 mg/l as NO_3 - N).

[62] See Table 3-8 of the 1994 Los Angeles Basin Plan, at pp. 3-12 through 3-14.

for surface waters in the Los Angeles region in the 1975 Basin Plan, and some were subsequently amended in 1978 based on additional ambient water quality data.[63] As with other mineral objectives, chloride objectives were based on ambient surface water conditions at that time, a very wet period, and according to the EPA's national "anti-degradation" policy. As a result, they reflect unusually low baseline levels of chloride that are not consistent with normal, higher natural concentrations. Chloride objectives were also set using data collected at the downstream end of each reach but applied to the entire reach upstream of the sampling location (i.e., upstream to the next sampling location).

Through the drought years that occurred periodically during the 1970s, 80s, and 90s, wastewater dischargers found it difficult or impossible to meet the chloride objectives since the imported water supplying their service areas naturally contained chlorides in higher concentrations than the water quality criteria. In response, the RWQCB passed a resolution in 1990 known as the "drought policy" (Resolution No. 90-004) granting temporary relief from Basin Plan chloride objectives for some dischargers.[64]

When chloride concentrations in imported water supplies did not diminish over time, the RWQCB moved to implement a more permanent solution to the dischargers' dilemma using a similar strategy for computing chloride objectives as that employed under the drought policy. Revised standards were adopted in 1997 for most of Los Angeles County, while temporary, interim standards were adopted in the Santa Clara River and Calleguas Creek watersheds to allow further study of outstanding issues related to the sensitivity of local crops to chlorides.[65] Ultimately, these interim standards expired and the chloride standards contained in the 1994 Basin Plan were upheld in the Santa Clara and Calleguas Creek watersheds. As a consequence, several reaches in these watersheds were listed as impaired for chlorides based upon the 1994 Basin Plan water quality objectives. TMDLs have been adopted for certain reaches, although the RWQCB has not yet adopted implementation plans for these TMDLs.

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[63] See, e.g., letter from Victoria Conway, "Los Angeles County Sanitation Districts Comments on the Draft Basin Plan Amendment to Revise the Reach Definitions and Chloride Water Quality Objectives for Calleguas Creek" to Mr. Dennis Dickerson, CRWQCB LAR, and Ms. Alexis Strauss, EPA Region IX, February 11, 2002, at p. 2.

[64] Resolution No. 90-04, "Effects of Drought Induced Water Supply Changes and Water Conservation Measures on Compliance with Waste Discharge Requirements Within the Los Angeles Region," adopted March 26, 1990. This policy temporarily raised the chloride water quality objective to the lower of 250 mg/l (the secondary MCL for chloride) or the water supply plus an 85 mg/l loading factor.

[65] Resolution No. 97-02, "Amendment to the Water Quality Control Plan to incorporate a Policy for Addressing Levels of Chloride in Discharges of Wastewaters," adopted on January 27, 1997. This resolution permanently revised chloride objectives for certain reaches of the Los Angeles River, Rio Hondo, and the San Gabriel River. The resolution also established interim chloride limitations valid for three years for certain reaches of the Santa Clara River, the Arroyo Simi, and Calleguas Creek and tributaries.

Although interim measures in the past provided some temporary relief, the chloride objectives contained in the 1994 Basin Plan for the Santa Clara River and Calleguas Creek watersheds remain unchanged, and significant concern remains among stakeholders. As with other mineral quality objectives, a footnote from the 1975 Basin Plan indicating that chloride objectives were to be applied as flow-weighted annual average concentrations was dropped in the 1994 update of the Basin Plan, and no analysis of the Section 13241 public interest factors was conducted to assess the impact of this change. As a result, the chloride objective is now applied as an instantaneous maximum concentration. Although the 1990 drought policy (Resolution No. 90-004) and the 1997 Basin Plan amendment (Resolution No. 97-02) addressed, at least temporarily, the issue of high-chloride *imported* water supplies, they did not provide relief for dischargers in areas supplied by high-chloride *local groundwater*.[66] Several parties have commented that the Basin Plan's chloride objectives are not based upon representative data[67] and that dilution and groundwater recharge produce a chloride concentration gradient along the Santa Clara River, so that it may be inappropriate to apply chloride objectives to "end-of-pipe" discharges upstream.[68] Stakeholders and RWQCB staff have also noted that

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[66] Just like dischargers in areas supplied by imported water with high chloride concentrations, dischargers in areas supplied by local groundwater are often unable to meet chloride objectives through no fault of their own. For example, as noted by the Ventura Regional Sanitation District (VRSD) in a letter to the RWQCB dated February 1, 1990: "The District recommends that the proposed resolution be amended to allow for communities with water supplies which are not exclusively derived from imported water. As long as these communities are making every legal effort to control chlorides, they should not be penalized with a limit which cannot reasonably or economically be met." Furthermore, in a letter dated May 1, 1990, the VRSD wrote, "None of the three facilities affected by this Resolution receive imported water. The District has proven in numerous reports to the Board that chlorides [sic] levels in the potable water supply derived from local wells have steadily risen as the result of over drafting during drought conditions. With that rise in chlorides comes the installation of more domestic water softening units which further exacerbate the chlorides levels in the treatment plant's discharge." In a letter to the RWQCB dated February 2, 1990, the LACSD noted, "The Saugus and Valencia Water Reclamation Plants have existing limits of 100 mg/L. Groundwater supplies in their service area can have average concentrations as high as 97 mg/L. With this in mind background groundwater concentrations should not be eliminated from consideration. Both groundwater and imported water contribute to the chloride concentration of the supply water, and this factor is beyond the control of most water users/waste dischargers."

[67] For example, an analysis conducted by LACSD showed that the chloride objective for the Santa Clara River at the Blue Cut gauging station was based upon data collected for the years 1970 through 1975, which yielded a mean chloride concentration of 71 mg/l and a maximum of 95 mg/l. However, LACSD showed that incorporating the full data record from 1951 through 1975 resulted in a mean chloride concentration of 147 mg/l and a maximum of 585 mg/l (April 7, 1998, LACSD letter to the RWQCB). Although LACSD recognized that the RWQCB excluded much of the early data due to valid concerns over discontinued industrial practices in the watershed that unnaturally elevated chloride levels, the RWQCB's exclusion of all such information to establish the chloride objective (such as the magnitude of wet and dry weather variance) at Blue Cut may be unwarranted.

[68] Data have shown that the average chloride concentration in the river downstream of the wastewater discharges is lower than the average discharge concentration. For example, a letter from Victoria Conway (CSDLAC) to Dennis Dickerson (RWQCB), February 28, 2000, states: "Monitoring data shows [sic] that gradients in chloride concentration exist between our plants and downstream receiving water station. Though our plants have historically discharged chloride levels above the proposed objective of 143 mg/l, concentrations reported for the LA/Ventura County Line have remained below this objective. In addition, Santa Clara River agricultural interests have stated publicly that there is no current impairment due to

chloride objectives are likely lower than necessary to protect agricultural beneficial uses.[69] Finally, several parties have commented that economic factors have not been adequately considered in establishing final chloride objectives.[70]

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chloride in surface or groundwater." Moreover, a Kennedy-Jenks study showed that chloride concentrations at the Freeman diversion have never exceeded 100 mg/l, even under dry conditions (Kennedy-Jenks Consultants, January 1, 1998, Phase I Development of a Water Quality Model to Evaluate Chloride Contributions to the Santa Clara River, for the CSDLAC, pp. 5-6): "It should be noted that during the dry season an approximately 15-mile dry gap in the river bed exists near the LA/Ventura county line. Because of this condition it is believed that the amount of Saugus and Valencia POTW effluent flow, if any, that reaches the Freeman Diversion is insignificant in volume... [The] geometric mean for chloride concentration in the Saugus POTW effluent is 120 mg/l for the wet season and 116 mg/l for the dry season...[For the] Valencia POTW, [the] geometric mean [during the] wet season [is] 140 mg/l and [during the] dry season [is] 143 mg/l...The average chloride concentrations at the Freeman diversion do not exceed the Basin Plan objective of 100 mg/l during the wet season (geometric mean = 49 mg/l) or the dry season (geometric mean = 55 mg/l). The analysis also shows that the 95th percentile chloride concentrations at the Freeman diversion are below 100 mg/l during both the wet season (98 mg/l) and the dry season (90 mg/l)." Furthermore, statistical analysis conducted for the Upper Santa Clara River Chloride TMDL shows that 'dilution' occurs between LACSD discharge locations and the Blue Cut gauging station (LARWQCB, 2002. "Total Maximum Daily Load for Chloride in the Upper Santa Clara River, Staff Report." August 21, 2002. 32.).

[69] Scientific publications note that chloride concentrations between 100 and 142 mg/l will likely have no impact on even sensitive crops, particularly if non-foliar irrigation practices are used (as is generally the case in the Santa Clara watershed), and if a low-chloride source is periodically used to leach soils. For example, "Water Quality for Agriculture," (R.S. Ayers and D.W. Westcot, 1985, Food and Agriculture Organization of the United Nations-Irrigation and Drainage Paper No. 29, Rev. 1, Rome) provides a non-impact chloride concentration level of 3.3 meq/l, which translates to 117 mg/l. In a December 20, 1999, letter from Jon Bishop (RWQCB) it is noted that "the guidelines of the UC Committee of Consultants, 1974, use 143 mg/l as the chloride concentration value below which all crops can be safely irrigated for long periods of time." In an April 26, 1999, letter to the RWQCB, the LACSD stated the following: "It appears that the threshold of 100 mg/L originally cited in the 1976 Basin Plan for protection of agriculture, was incorrectly interpreted from a reference, as no distinction was made between the threshold for spray irrigation (100 mg/L) and surface irrigation (142 mg/L). The literature review revealed that agricultural experts intended the 100 mg/L to be used as a guideline and not as an absolute threshold limit for protection of chloride sensitive crops... Based on the review of more recent literature, the 142 mg/L chloride concentration seems to be a reasonable long-term average value for the protection of avocados (Mexican rootstock) and other chloride sensitive surface irrigated crops." Many factors influence the toxicity of chloride in irrigation water, such as irrigation practice, amount of water applied, soil structure and drainage, and even climate with evapotranspiration factors. Historic production in Ventura County indicates that crops may be more tolerant to chloride than the current water quality objective of 100 mg/l suggests. Jon Bishop (RWQCB), December 20, 1999: "Minimum historical levels in surface water at various locations in the Santa Clara River have ranged from 49 to 143 mg/l. Successful cultivation of avocado in the Calleguas watershed has been reported when concentrations of 150 mg/l were typical. Growers and experts report that in the Calleguas watershed, avocado had been grown with diminishing success at concentrations between 150 mg/l and 180 mg/l." Furthermore, in an August 2, 1999, letter to the RWQCB, the Newhall Ranch Company notes, "Raising the objective to 142 mg/L will not result in any change to the current chloride concentrations in the Santa Clara River because there is no effect on the operational practices of the dischargers. Chloride concentrations will remain at the status quo; dischargers will not suddenly increase chloride loadings, particularly since the current interim limit of 190 mg/L is higher that [sic] the proposed objective of 142 mg/L."

[70] The lack of an economic analysis has been noted by agencies in the Calleguas watershed. If the agriculturally preferable chloride objective is lower than what is reasonably achievable by wastewater dischargers, the marginal costs of advanced wastewater treatment (such as reverse osmosis) and

Water quality objectives for color, taste, and odor. The 1994 Los Angeles Basin Plan contains narrative standards for color and for taste and odor.[71] Although the text accompanying the color criterion acknowledges that "color in water can result from natural conditions (e.g., from plant material or minerals)," the criterion itself contains no such language. In fact, the original color water quality objective contained in the 1971 Interim Basin Plan specified "no significant increase beyond natural background levels."[72]

In comments received during the 1994 Basin Plan revision process, the RWQCB was encouraged to consider ambient conditions for color, taste, and odor.[73] The RWQCB's response to these comments addressed only color (not taste or odor), and stated that the RWQCB did not intend to regulate natural color.[74] The Basin Plan (and the response to this comment) did not clarify how (or if) the RWQCB intends to regulate naturally occurring nonpoint sources of color, taste, and odor that are perceived to violate the narrative water quality objectives.

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agricultural loss should be considered to arrive at an appropriate, reasonable solution as mandated by Porter-Cologne. The Camarillo Sanitary District wrote the following in a July 16, 1999 letter to the RWQCB: "Presentations to date have not included economic analysis of alternatives to a restrictive discharge limitation...For example, is the benefit of higher crop yield greater than the annualized cost of installing membrane filtration and constructing brine disposal lines? Would demineralization of irrigation water (wellhead treatment) be less expensive than attempting to reduce chlorides in all surface flows and groundwater through super-treatment of permitted discharges?"

[71] For inland surface waters, the water quality criterion for color reads as follows: "Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses." The water quality criteria for taste and odor reads as follows: "Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible aquatic resources, cause nuisance, or adversely affect beneficial uses." See Basin Plan at p. 3-9 and at p. 3-16, respectively.

[72] Water Quality Control Plan (Interim), Santa Clara River Basin 4-A and Los Angeles River Basin 4-B, June 1971, at p. 49.

[73] See February 17, 1994 comment letter from James A. Noyes, County of Los Angeles Department of Public Works, to Deborah J. Smith, RWQCB: "The water quality objectives...for color, taste, and odor should take ambient conditions into account, and the objectives should clearly state that dischargers shall not be held to standards greater than the ambient conditions. For example, if a discharger is discharging into a water body which already has poor color, taste, and odor, then the discharger should be responsible only for ensuring that his actions do not further degrade that water quality; the discharger should not be responsible for cleaning up conditions created by others or by nature."

[74] See Basin Plan Responsiveness Summary, RWQCB, April 28, 1994: "This objective has been in effect in the Basin Plan since 1975 (and in previous interim plans). The Board regulates color problems that arise from discharges, both point and nonpoint, to waters of the state. It is not the Board's intent to regulate natural color."

C. Beneficial Use Designations

Because beneficial use designations determine which water quality objectives will be applied to a given water body, logical and reasonable designations are essential to regulating water quality efficiently and appropriately. Beneficial uses must be designated as "existing" for uses that have been attained for a water body on (or after) November 28, 1975 (whether or not they are included in the water quality standards). The Basin Plan also includes designated "existing" uses that likely have not been attained since 1975; the RWQCB criteria for these designations are unclear. Intermittent beneficial uses can be designated for streams that have intermittent flow.[75] Although such a phrase does not appear in federal or state water quality law, the Los Angeles Basin Plan provides that "potential" uses can be designated, whether or not they have been attained, in order to implement either federal or state mandates and goals (such as the CWA's goals of fishable and swimmable waters).[76] The Basin Plan cites several circumstances that justify a "potential" use designation, including[77]:

- Implementation of the State Board's policy entitled "Sources of Drinking Water Policy" (Resolution No. 88-63)
- Plans to put the water to the designated future use
- Potential to put the water to such future use
- Designation of a use by the RWQCB as a regional water quality goal
- Public desire to put the water to such future use

As detailed below, the Basin Plan's "potential use" guidelines and other beneficial use designations have been controversial. The administrative record contains a number of comments regarding beneficial use designations that interested parties feel are inappropriate, including many municipal and domestic supply (MUN) designations and the presumption of the MUN designation for waters that the RWQCB has identified as having the groundwater recharge (GWR) use designation. Other comments concern the Basin Plan contact and non-contact recreational beneficial use (REC-1 and REC-2) and habitat beneficial use (e.g., COLD, WARM, SPWN) designations for water bodies where such uses do not exist and are not reasonably likely to occur.

MUN beneficial use designations. The Basin Plan designates the municipal and domestic supply (MUN) beneficial use for "uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply."[78] Other than water supply reservoirs and associated conveyances, few water bodies within

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[75] Note that the RWQCB considers "intermittent" uses to be "existing" uses for implementing water quality standards.

[76] Section 13241 of Porter-Cologne uses the term "probable future," not potential future use.

[77] 1994 Los Angeles Region Basin Plan at p. 2-1.

[78] 1994 Los Angeles Region Basin Plan at p. 2-1.

the Los Angeles Region are used directly for municipal or domestic supply. In part, this is because flows within many water bodies vary from little to no flow during the dry months to very high, but brief flows associated with storms during the wet weather season. Even when year-round flow is present, dry season flow in urbanized areas tends to be dominated by urban runoff and treated wastewater, neither of which has been seriously considered as a direct source of drinking water. However, water bodies receiving urban runoff and/or treated wastewater within the Los Angeles Region (e.g., the San Gabriel River) may contribute to groundwater recharge, and this groundwater may then be used for municipal and domestic supplies (i.e., indirect use).

When the EPA approved the 1975 Los Angeles Basin Plan, it conditioned its approval upon the adoption of certain improvements in water quality standards. Among these improvements was the specification that "surface waters which recharge groundwaters designated for MUN supply should be designated MUN..."[79] In the 1975 Los Angeles Basin Plan and the 1978 revisions to present and potential beneficial use designations, few water bodies were designated for the MUN beneficial use.

In 1988, the SWRCB adopted Resolution No. 88-63, the "Sources of Drinking Water" policy, which specified that, with certain exceptions, "all surface and ground waters of the state are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards."[80] In March 1989, the Los Angeles RWQCB adopted Resolution No. 89-03, "Incorporation of Sources of Drinking Water Policy into the Water Quality Control Plans (Basin Plans) – Santa Clara River Basin (4A)/Los Angeles River Basin (4B)." The administrative record as provided by the RWQCB contains no documentation of hearings conducted or comments received in conjunction with either of these policies and does not contain the text or accompanying documentation for this Basin Plan amendment. This resolution and related information were obtained independently and reveal that the Los Angeles RWQCB did not create new MUN designations for water bodies listed in the Basin Plan as part of Resolution No. 89-03. Specifically, the RWQCB noted that:

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[79] Letter from Paul De Falco, Jr., to Governor Edmund G. Brown Jr., dated January 8, 1976, with attachments. From p. 2 of Enclosure 3: "Surface waters which recharge groundwaters designated for MUN supply should be designated MUN, or otherwise be protected by the chemical constituent, radioactivity and pesticide limits set forth in the California Administrative Code. DISCUSSION: In the present Basin Plan, numerous surface waters are indicated for the beneficial use of groundwater recharge (GWR) in basins where the groundwater is used for MUN. Most of the constituents limited in the California Administrative Code (Title 17, Ch. 5(1)(9), Article 4, Section 7019) are not removed by percolation or normal treatment, and therefore should be limited in the contributory surface waters."

[80] See SWRCB Resolution No. 88-63. Exceptions include: surface and groundwaters with TDS concentrations above 3,000 mg/l; surface and groundwaters that are contaminated, "either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices; " surface waters where "the water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards; or the water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters..."

"Water bodies listed in Table 4 (as amended in 1978) without an existing MUN beneficial use would retain this designation as stipulated under the Exceptions of the Policy. Current water quality information indicated that these water bodies were not suitable or potentially suitable as a source of drinking water. In addition, the water quality criteria used by the basin plan contractors in the 1970s for designating MUN sources originally appear to be consistent with those listed under the Policy."[81]

In contrast, the 1994 Los Angeles Basin Plan designated all inland surface and groundwaters as MUN, "presuming at least a potential suitability for such a designation."[82] Multiple interested parties commented that such MUN designations were inappropriate because the waters in question either had no potential use for water supply,[83] were in modified channels inappropriate for municipal supply,[84] or predominantly contained treated effluent.[85] Commenters also noted that a MUN

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[81] Finding 1 of Resolution No. 89-03 states: "...Water bodies within the Region that do not have beneficial uses designated for them in Table 4 (in the updated Appendices with the 1978 revisions) are assigned MUN designations in accordance with the provisions [of SWRCB Resolution No. 88-63]... These MUN designations in no way affect the presence or absence of other beneficial use designations in these water bodies." The memorandum transmitting Resolution No. 89-03 to the SWRCB (dated April 12, 1989), further clarifies this policy, stating that "[w]ater bodies listed in Table 4 (as amended in 1978) with an existing MUN beneficial use would retain this designation as provided for under the Policy. Based on available water quality information and Exception #4 under the Policy, it was determined that these water bodies were still a source of drinking water... Water bodies listed in Table 4 (as amended in 1978) without an existing MUN beneficial use would retain this designation as stipulated under the Exceptions of the Policy. Current water quality information indicated that these water bodies were not suitable or potentially suitable as a source of drinking water. In addition, the water quality criteria used by the basin plan contractors in the 1970s for designating MUN sources originally appear to be consistent with those listed under the Policy."

[82] See 1994 Los Angeles Basin Plan at p. 2-3.

[83] See letter dated February 15, 1994, from City of Los Angeles Department of Water and Power to RWQCB: "LADWP feels that even if the wastewater treatment plants and other river dischargers treated their effluent to meet drinking water standards, which is unfeasible, technically difficult, and expensive, the amount of polluted urban runoff entering the [Los Angeles and San Gabriel] rivers would still render the river water unusable as a drinking water source." See also letter dated January 20, 1994, from Simi Valley County Sanitation District to RWQCB: "...the District disagrees with the proposed Basin Plans [sic] designation of beneficial use for the Arroyo Simi...There is no known drinking water use for the Arroyo Simi, and therefore, this designation should be reconsidered." From January 28, 1994 letter from Ojai Valley Sanitary District to RWQCB: "The Lower Ventura River (LVR) hydrology has a high dissolved solids content...previous regulatory decisions recognized the high mineral content and low water quality as an unsatisfactory 'existing or potential' municipal water source... The Lower Ventura River should maintain the No-MUN status."

[84] See letter from County Sanitation Districts of Los Angeles County (LACSD), February 4, 1994, to RWQCB: "In general, we believe that, under the State policy regarding Sources of Drinking Water (SWRCB Resolution No. 88-63), the potential beneficial use category MUN should not be assigned to water bodies that are concrete-lined and/or effluent-dominated."

[85] See, e.g., letter from Simi Valley County Sanitation District to RWQCB, February 3, 1994, at p. 1: "Request for change: Under Inland Surface Waters insert 'Waters not appropriate for municipal use

designation based solely on the potential for groundwater recharge was inappropriate[86] and questioned whether the MUN designation should apply to stormwaters.[87] In many cases, these potential MUN designations occurred in apparent violation of the Sources of Drinking Water Policy, which provides exceptions for modified channels that are used to convey wastewater or stormwater.

In its summary of significant comments to the 1994 Basin Plan Update, the RWQCB stated that:

> "The Regional Board adopted a policy in 1989, officially bringing these MUN uses into our Basin Plan. We have been operating under this policy ever since. Our current Draft Update simply adds the designations to the tables; however, they are not new designations. The Basin Plan is just clarifying what happened in 1988... Because these designations have been on the books since 1988, there is no impact to the dischargers."[88]

This statement contradicts the RWQCB's 1989 actions, as noted above. Although exceptions were not pursued at the time the 1994 Basin Plan was adopted, the Basin Plan recognized that exceptions to the new policy could be possible in the future and stated the RWQCB's intent to review the criteria and identify waters that should be excepted from MUN designation. These exceptions were to be proposed as a Basin Plan amendment. In the interim, the RWQCB added a footnote to these potential MUN uses stating that "no new effluent limitations will be placed in Waste Discharge Requirements as a results [sic] of these designations until the Regional Board adopts this amendment."[89] The beneficial use tables within the Los Angeles Basin Plan designate the affected waters with an

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including waters which are predominantly effluent waters and too costly to treat to drinking water standards will not be designated MUN.'"

[86] See comments submitted on February 4, 1994, by County Sanitation Districts of Los Angeles County (LACSD) to the RWQCB: "...where the MUN designation is based on infiltration to groundwater basins, we believe that this beneficial use is more appropriately designated – and is adequately protected – with the GWR (groundwater recharge) beneficial use category." It should also be noted that the designation of GWR for certain reaches (most notably the unlined seven-mile portion of the Los Angeles River at the Narrows (Elysian Valley) is controversial. Commenters to the 1994 Basin Plan revisions cite evidence that this portion of the river is unlined because it is now and will be in the future a "gaining" stream (i.e., groundwater flows upward into the river channel), despite RWQCB assertions that it may become a recharge area in the future. See also footnote 60.

[87] See comments submitted on February 4, 1994, by County Sanitation Districts of Los Angeles County (LACSD) to the RWQCB: "Will stormwater discharges be required to meeting drinking water standards in those cases where stormwater discharges drain to water bodies designated potential MUN? We recommend that...natural background levels of contaminants be used as the objective for those cases where background levels may exceed water quality objectives based on state or national drinking water standards."

[88] See Basin Plan Briefing, Regional Board Member Briefing, Summary of Significant Comments, 1994 Basin Plan Update, dated February 25, 1994.

[89] See 1994 Los Angeles Basin Plan at p. 2-4.

asterisk (*), and footnotes state that some of these designations may be considered for exemptions at a later date.

In 1998, the RWQCB initiated de-designation proceedings for eight surface water bodies and two groundwater basins. These proceedings led to discussion of the rationale for the MUN designation. The RWQCB supported the de-designation of ground water for two sections of the west basin, and this approach was subsequently adopted as a Basin Plan amendment.[90] However, the RWQCB did not concur with the request for de-designation of coastal groundwater suggested by the City of Malibu due to saltwater intrusion and the dependence on septic systems in the region,[91] stating that "groundwater in the area has been a historical source of drinking water; prior to the mid-1960s, it was the sole source of drinking water. Today, residents in the outlying areas continue to depend on domestic wells."[92]

The surface water bodies that were proposed in 1998 for de-designation are paved for flood control, with contiguous paving from the upstream point of proposed de-designation to the estuary. They thus have no potential for interaction with groundwater resources. The RWQCB's requirements for de-designation of surface water bodies have been conservative. For example, the City of Los Angeles Bureau of Sanitation quoted a 1991 study that rationalized the de-designation of the Los Angeles River by showing it to be 85% effluent in the summer and to convey significant volumes of stormwater runoff in the winter.[93] The RWQCB maintained the MUN designation was appropriate due to the

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[90] The groundwater de-designations included the portion of the West Basin underlying the Chevron facility in El Segundo and the portion of the West Basin underlying Terminal Island, which have been filled with marine dredge sediments during the past 100 years. RWQCB MUN Policy: Staff Report August 28, 1998, at p. 3.

[91] See letter from Harry R. Peacock of the City of Malibu to Wendy Phillips of the RWQCB, dated September 15, 1998. "The City has argued for many years about the impracticality of listing the groundwater within the entire jurisdiction of Malibu for potential municipal use as drinking water. This is especially true in the low lying areas along the coast adjacent to the salt water intrusion layer and, as of course you know, most of the development is on septic systems. There is not even a remote possibility of a need to preserve this groundwater for municipal use. Please consider "dedesignation" of the coastal areas within the City of Malibu from the MUN beneficial use preserving groundwater for drinking purposes. The City is actively developing and implementing measures for regulating on-site septic systems for the protection of public health. The MUN designation will impose costly requirements which WILL NOT PROVIDE ANY PUBLIC BENEFIT."(emphasis in original)

[92] See 1998 *Changes in Beneficial Use Designation for Selected Waters Comments and Responses,* RWQCB, at p. 2.

[93] See October 22, 1998 *Responses to Written Comments on a Proposed Amendment to the Water Quality Control Plan to incorporate "Changes in Beneficial Use Designations for Selected Waters"* at p. 4: "A study conducted in 1991 showed the Los Angeles river to be 85% effluent during summer. During the winter rainy season, it conveys significant volumes of storm runoff." The commenter states that "these criteria meet the requirements of State Board Resolution No. 88-63 and therefore the Los Angeles River should have it's [sic] MUN beneficial use dedesignated at this time."

7-mile stretch in Glendale Narrows where the river base is not lined and provides an opportunity for interaction between surface flows and groundwater.[94]

Heal the Bay (HTB) and the Natural Resources Defense Council (NRDC) expressed opposition to the argument that channel modifications precluded attainment of the designated MUN use.[95] The RWQCB contended that the channel modifications in fact did preclude the use of these surface waters as sources of drinking water. The RWQCB stated that if in the future there were plans to divert the flows to recharge basins, then the groundwater recharge (GWR) designation would be appropriate.[96] Consistent with these arguments, it was proposed that the San Gabriel River and Coyote Creek be de-designated for MUN[97] because the large point source dischargers in the region (POTWs) already exceed their required level of treatment, and stormwater dischargers are required to implement reasonable best management practices under existing permits. Yet, these controls have not resulted in the attainment of water quality suitable for MUN use.[98]

Economic concerns were raised in 1999 in comments opposing the RWQCB's proposed *Basin Plan Amendment Revising Beneficial Use Designations for Selected Surface and Ground Water Bodies*. The Natural Resources Defense Council (NRDC) cited the Clean Water Act, which requires economic analysis as one criterion for de-designation, arguing that the RWQCB did not provide adequate economic and other rationales for de-designation.[99] At the February 3, 1999 State Board Workshop, the County Sanitation Districts of Los Angeles County (LACSD) pointed out that the cost of the "no action" alternative (maintenance of the MUN designations) to the proposed

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[94] Ibid at p. 3.

[95] See Heal the Bay and Natural Resources Defense Council letter to Dennis Dickerson RWQCB dated October 12, 1998. HTB and the NRDC opposed de-designation pursuant to Section 40 CFR 131.10(g)(4), which states that: "de-designation of uses may occur when hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such a modification in a way that would result in the attainment of the use."

[96] 1998 *Changes in Beneficial Use Designation for Selected Waters Comments and Responses,* RWQCB, at p. 3.

[97] Ibid.

[98] 1998 *Changes in Beneficial Use Designation for Selected Waters Comments and Responses,* RWQCB, at p. 3.

[99] See letter from Steve Fleischli and Alex Helperin of the Natural Resources Defense Council to the State Water Resources Control Board, dated February 8, 1999: "The federal regulations specifically provide for consideration of such factors, in Section 131.10(g)(6). However, as is clear from the record, the Los Angeles Regional Water Quality Control Board ("Regional Board") issued the Proposed Amendment under Section 131.10(g)(4), not 131.10(g)(6). As a consequence, there was no analysis - or even any evidence presented - on the economic questions. The Regional Board did not even mention 131.10(g)(6) at any point in its presentation or in its own analysis. In short, the Board has <u>not</u> relied on economic factors in support of its decision."

amendment would be substantial.[100] The RWQCB maintained that the exemption criteria found in the State Board Resolution were the basis for the initial stages of this Basin Plan amendment. Economic concerns, although addressed by LACSD and NRDC comment letters, were viewed as secondary to the fact that the surface waters proposed for dedesignation were designed or modified to collect industrial wastewaters and/or storm water runoff, thereby meeting criterion 2(a) of State Board Resolution No. 88-63.[101]

Several commenters expressed concern about the criteria set forth in 40 CFR 131.10 (h) that prohibit de-designation when the beneficial use can be met through limits required under 301(b) and 306 of the Clean Water Act.[102] De-designation of MUN uses was also characterized in some comment letters as a reduction in water quality standards.[103] The RWQCB staff report regarding de-designation of the affected water bodies noted that the exemption criteria of the Sources of Drinking Water Policy were applicable because the surface waters proposed for de-designation were designed or modified to collect industrial wastewaters and/or storm water runoff. Consequently, the requirements of CFR 131.10 (federal requirements for removal of designated uses) were met.[104] The Resolution to de-designate the eight surface water bodies was subsequently approved by the State Water Resources Control Board on February 18,1999 (State Board

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[100] See letter from Sharon Green of LACSD to Dennis Dickerson of the LARWQCB dated October 9, 1998 at p. 6: "[I]n terms of regulatory requirements anticipated in the near future associated with the MUN use, we expect that compliance costs could be significant. For instance, we project that we would have to add reverse osmosis treatment at the Long Beach, Los Coyotes, and San Jose Creek WRPs to comply with several of the human health criteria for water and organisms. It is estimated that this treatment could result in as much as $217 million in capital costs, with up to $48 million in annual operations & maintenance costs. If the MUN use did not apply, it is anticipated that those costs could be avoided." See also the October 22, 1998, State Water Resources Control Board's *Changes in Beneficial Use Designations for Selected Waters Comments and Responses* at p. 7. The RWQCB responded to LACSD by noting the comment.

[101] October 28, 1998 Response to Written Comments on a Proposed Amendment to the Water Quality Control Plan to incorporate "Changes in Beneficial Use Designations for Selected Waters" at p. 10. "Staff disagree that the August 28, 1998 Staff Report specifically stated that the exemption criteria found in State Board Resolution No. 88-63 do not need to be met. Be that as it may, staff points out that these criteria were the basis for the initial stages of this Basin Plan amendment and staff believes that all waters proposed for dedesignation comply with one or more of the exemption criteria set forth in State Board Resolution No. 88-63. All surface waters proposed for dedesignation were designed or modified to collect industrial wastewaters and/or storm water runoff, thereby meeting criteria 2(a) of State Board Resolution No 88-63."

[102] See Heal the Bay and Natural Resources Defense Council letter to Dennis Dickerson RWQCB dated October 12, 1998.

[103] See letter from Jacqueline Lambrichts of Friends of the Los Angeles River to Mary Jane Forster of the State Water Resources Control Board dated Tuesday, February 16, 1999. "In your deliberations and vote this upcoming Thursday, please consider not supporting the de-designation of the Lower San Gabriel River from MUN Beneficial Uses designation. The following support this position: MUN de-designation will reduce the water quality standards, resulting in the potential for increased pollution."

[104] See August 28, 1998 Staff Report entitled *Revised Beneficial Use Designations for Sources of Drinking Water* at p. 5.

Resolution 99-20) and transmitted to the Office of Administrative Law (OAL) for review on June 2, 1999. The OAL, however, did not approve the resolution.[105]

In May 2000, the EPA approved the 1994 Los Angeles Basin Plan in its entirety but required that the asterisked MUN designated uses be immediately enforced.[106] In August 2000, LACSD, in conjunction with the Cities of Los Angeles, Burbank, and Simi Valley, filed a lawsuit against the EPA with regard to the agency's action regarding the asterisked MUN designations. On December 5, 2001, the U.S. Federal District Court issued an order in favor of the plaintiffs, effectively invalidating EPA's action. As a result, the EPA submitted a letter to the state in February 2002 that affirmed that any potential drinking water supply beneficial uses in the Basin Plan had no legal effect, and therefore should not be used to set effluent limitations in NPDES permits.[107]

Despite the court's decision, ambiguity remains concerning the MUN designations in the Los Angeles Basin Plan and implementation of water quality objectives for MUN-designated waters. For example, it remains unclear whether storm flows in MUN-designated channels will be expected to meet water quality objectives for MUN use, or whether a Section 13241 analysis was ever conducted for the application of MUN-triggered water quality objectives to storm flows. Additionally, it is not clear that remaining MUN designations (those without the asterisk in the 1994 Los Angeles Basin Plan) represent uses that existed after 1975 or that they comply with the State Sources of Drinking Water Policy.

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[105] California Regulatory Notice Register 99, Volume No. 32-Z at p. 1529. State of California Office of Administrative Law AOL File No. 99-0602-01. The OAL did not approve the resolution for the following reasons:

1. The administrative record does not contain substantial evidence to demonstrate that the removal of the municipal and domestic (MUN) beneficial use designation from the specified parts of the eight surface water bodies is allowed under 40 CFR 131.10 (g)(4).
1. The Regional Board's position that physical preclusion of the use attainment resulting from the concrete lining renders the issue of attainment of drinking water quality moot appears to be inconsistent with the prohibition of removal in 40 CFR 131.10(h).
1. The Regional Board's response to public comments does not comply with the public participation requirements of the Federal Water Pollution Control Act (33 U.S.C. Sec. 1251 et seq.).

Significantly, it should be noted that both the RWQCB and the SWRCB found that these Los Angeles Region de-designations did meet the exception criteria in the State Sources of Drinking Water Policy; the Office of Administrative Law did not disapprove that finding.

[106] May 26, 2000 letter from Alexis Strauss, USEPA, to Edward C. Anton, Acting Executive Director, California State Water Resources Control Board.

[107] See Order granting plaintiffs' motion for summary judgment and remanding action to EPA, No. CV 00-08919 R(RZx), City of Los Angeles et al. v. United States Environmental Protection Agency..., dated December 18, 2001. See also letter dated February 15, 2002, from Alexis Strauss, USEPA Region IX, to Celeste Cantu, Executive Director, California SWRCB: "...waters identified with an ("*") in Table 2-1 do not have an MUN as a designated use until such time as the State undertakes additional study and modifies its Basin Plan." EPA also stated that this conditional use designation has no legal effect.

Beneficial use designations for flood control channels, concrete-lined channels, and water bodies with limited access. The 1994 Los Angeles Basin Plan contains multiple beneficial use designations for concrete-lined channels, including contact and non-contact recreation (REC-1 and REC-2) and habitat designations. These designations were first advocated in Basin Plan revisions proposed by the RWQCB in November 1978, with the understanding that they would be reconsidered if warranted by available evidence.[108] The City of Burbank commented on the proposed 1978 beneficial use designations, stating that it disagreed with the REC-2 designation for the Burbank Western Drain, a deep rectangular concrete channel that is fenced along its entire length.[109] The City of Burbank also recommended changes to beneficial use designations (including recreation and habitat designations) for the Burbank Western Drain and for the Los Angeles River.[110]

Many of these issues were raised again during the 1994 Basin Plan revision process. Within the 1994 Basin Plan, most water bodies were assigned potential (P) or existing (E) REC-1 and/or REC-2 designations, even though the 1993 study upon which many beneficial use designations were ostensibly based recommended either no or only potential (P) REC-1 uses, respectively, for several of the region's water bodies.[111] The

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[108] See memo from RWQCB to Interested Persons, dated December 20, 1978: "At its November 27, 1978, meeting the Regional Board adopted revisions to the Water Quality Control Plan for the Los Angeles River Basin (4B). That adoption included an amendment to designate beneficial uses for selected lined flood control structures, whereby recognition was provided for these watercourses having the potential to support warm freshwater and wildlife habitats. However, the Board took this action with the understanding that staff could request reconsideration of this issue for any watercourse if available documentation so warranted."

[109] See letter from City of Burbank to RWQCB, November 21, 1978: Re: the Burbank Western Drain: "We are in agreement with all the proposed designations with the exception of ... REC-2...The Burbank Western Drain is a deep rectangular concrete channel. Fencing along the entire length of channel exists on top of the sidewalls prohibiting entry. The channel by itself provides none of the recreational uses listed under REC-2 for either present or potential beneficial uses...However, the physical nature of this right-of-way [adjacent to the channel] severely limits this possibility [of bicycle paths]... Any access to the channel, now or in the future, is virtually impossible."

[110] See letter from City of Burbank to RWQCB, dated May 15, 1978.

[111] See Saint, P.K., Hanes, T.L., and Lloyd, W.J., *Waterbodies, wetlands, and beneficial uses in the Los Angeles Region, a report presented to L.A. Regional Water Quality Control Board, Volume 1: Waterbodies and their beneficial uses*, 1993. Note that this report was not provided as part of the administrative record but was produced only after a specific request. This report was commissioned by the RWQCB "to survey and research beneficial uses of all waterbodies throughout the Region" (see 1994 Basin Plan at p. 2-3). Examples of beneficial uses from the 1994 Basin that are inconsistent with the recommendations of Saint et al. (1993) include: Saint et al. recommended no REC-1 designation for the Burbank Western Channel (405.21), while the 1994 Basin Plan lists this water body as potential (P) REC-1 with a footnote stating that access is prohibited by Los Angeles County DPW in concrete-channelized areas. Saint et al. recommended no REC-1 designation for Lower Van Norman Reservoir (405.21), which is assigned an existing (E) REC-1 use in the 1994 Basin Plan. Another example is the Los Angeles River (reach 405.15), which Saint et al. recommended be given a potential (P) REC-1 designation, but which carries an existing (E) REC-1 designation in the 1994 Basin Plan, again with a footnote stating that access is prohibited by Los Angeles County DPW.

City of Burbank again questioned the application of the REC-2 (intermittent) and MUN, WARM, and WILD (potential) designations for the Burbank Western Channel.[112] Similarly, the City of Los Angeles and Department of Public Works questioned the recreational designations for the Los Angeles River (both REC-1 and REC-2), particularly where access is limited.[113] Several commenters also questioned the basis for habitat designations. Finally, concerns have been expressed that the designation of certain beneficial uses for flood control facilities are inconsistent with the "operating parameters and function" of the facilities.[114] Although many of these concerns were recognized by the RWQCB in 1978,[115] the Los Angeles Basin Plan has not been modified to reflect the inconsistencies in these dual uses.

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[112] See letter from City of Burbank to Dr. Robert P. Ghirelli, RWQCB, January 31, 1994: "We question whether the existing physical nature of the Burbank Western Channel, flow quantities and source of waters carried in this channel could support the beneficial uses cited above."

[113] Letter from City of Los Angeles to Deborah J. Smith, RWQCB, February 1, 1994: "...the Los Angeles river was modified with concrete bottom and side slopes by the U.S. Army Corps of Engineers to control storm water flows, and as such there was no intention for the river to be utilized as a recreational area as defined. Portions of the river may occasionally be utilized by a limited number of individuals in a REC-1 capacity, although this was clearly not the intent when the channel bottom and sides were concreted. As there appears to be limited potential to modify existing conditions to create a situation where a REC-1 designation would apply, we request that the REC-2 designation be assigned as it more accurately reflects the river's actual and potential recreational uses." See also comments submitted by CLADPW on May 26, 1994: "We believe that the CRWQCB's claim that it needs to protect uses which occur despite fences and prohibitions is incorrect. Fences and prohibitions exist on our facilities for reasons of public safety and health, and violators are subject to prosecution under the law. We do not believe that the CRWQCB has the authority to encourage or sanction illegal activities by designating inappropriate beneficial uses to facilities where such uses are legally and properly prohibited."

[114] See, e.g., letter from James A. Noyes, County of Los Angeles Department of Public Works, to Deborah J. Smith, RWQCB, May 26, 1994, and attachments: "The designation of beneficial uses ...[by the RWQCB]...on the LACDPW's flood control facilities are often inconsistent with the operating parameters and function of the facilities. The Plan does not address this concern in many places with regard to recreational uses. It should reflect that revision for all concrete-lined flood control channels under our jurisdiction...No concrete-lined flood control channels should have designations for the following existing, intermittent, or potential beneficial uses: Groundwater Recharge (GWR) Support of Habitats (AQUA, WARM, COLD, SAL, EST, WET, MAR WILD, BIOL, RARE, MIGR, SPWN, and SHELL)...We have always disputed the CRWQCB's designation of "potential" beneficial uses to flood control channels and will continue to do so because we believe the designations were incorrect in 1975 and are still incorrect."

[115] See RWQCB notes from Paul Martyn to Ray Hertel Re: Basin Plan Update (4B), undated (likely from August 1978): "The LACFCD [Los Angeles County Flood Control District] reservoirs were constructed to conserve water, entrap sediment and control flooding from storm flows. It is of paramount importance that these facilities be cleaned on a periodic basis in order to maintain their effective capacity. In addition..., these reservoirs must be drawn-down before the winter rains so as to provide storage capacity. Both these operations are not necessarily conducive to the maintenance of either COLD or WARM habitats; however, without such maintenance procedures, these reservoirs would eventually cease to function as viable waterbodies. Therefore it is desirable to incorporate wording in the beneficial use table, whereby COLD and WARM habitats in such facilities will be recognized as being of secondary importance. The following wording was suggested: 'The existence of an aquatic habitat in this reservoir is incidental to its operation as a flood control/water conservation structure.'"

In response to comments, the RWQCB stated that the federal Clean Water Act includes the goal that all waters of the nation be designated swimmable (i.e., REC-1) and fishable (i.e., WARM, COLD, EST, or MAR), and that a formal exemption via a use attainability analysis is required for any water body not so designated. The RWQCB further contended that "uses that are or have been attained since 1975...are required to be designated including activities that are illegal such as homeless bathing in the Los Angeles River." Finally, the RWQCB argued that "all waterbodies of the region, including concrete lined channels, are considered waters of the state and of the nation, by definition (per USEPA guidance)."[116]

The RWQCB position fails to consider the economic and other required implications of these designations. Additionally, the designations fail to account for flow conditions. For example, recreational uses are highly unlikely during periods of wet weather, when conditions within flood control channels are dangerous. During such high flow periods, enforcement of water quality objectives related to recreational uses will generate virtually no public health benefits despite substantial expense. The RWQCB's failure to include flood control as a beneficial use, or to even consider flood control needs when establishing other beneficial uses, impairs the function of flood control facilities and potentially endangers lives and property within the region.

Implications of potential beneficial use designations. The administrative record demonstrates that the RWQCB's position on potential beneficial uses has changed significantly over time. In the earliest iterations of the Los Angeles Basin Plan, fewer potential designated uses were assigned, and it appears that the RWQCB at that time did not intend to require water bodies with potential beneficial use designations to meet the associated water quality objectives.[117] In fact, in the proposed 1978 revisions to the present and potential beneficial uses contained in the Basin Plan for the Los Angeles River Basin (4B), the RWQCB included language specifying that potential beneficial

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[116] See Regional Water Quality Control Board, Los Angeles Region, *Responsiveness Summary for the April 28, 1994 DRAFT Water Quality Control Plan, Los Angeles Region*, June 13, 1994, at p. 6.

[117] See, e.g., undated file notes (likely from December 1978) from Paul Martyn to Ray Hertel Re: Basin Plan Revisions: "The proposed deletions [deletions of WARM and WILD designations and use of a "P" potential designation for these uses in certain channels] do not change existing water quality standards, as potential designations are not recognized in the preparation of waste discharge requirements...a potential designation could be used as a catalyst for needless additional protection." See also file notes (likely from May 1976) from Paul Martyn to Ray Hertel Re: Draft Revisions to the Water Quality Control Basin Plan 4B: "F&G [Department of Fish and Game] tentatively agreed to our potential designations if a general wording is placed in the Basin Plan to account for last minute discoveries of habitats in affected reaches during permit adoption processes. Specifically, if F&G determines a habitat does exist where only a 'P' was listed and we concur, then during the waste discharge adoption process we would strengthen the requirements without modifying the Basin Plan beneficial uses."

uses were only to be regulated via point source waste discharge requirements as those uses were actually attained.[118]

Despite this background and express intent, the EPA specified that all beneficial uses were to be protected according to the designation itself and without regard to qualifiers (e.g., existing, intermittent, and potential).[119] The SWRCB affirmed to EPA in a February 8, 1980 letter that the EPA's position would be enforced. The RWQCB acknowledged in response to the EPA's comments and the SWRCB's letter that the RWQCB's original implementation policy for existing and potential uses was intentional and had informed such designations in the Basin Plan.[120] Yet, the EPA and SWRCB effectively converted what the RWQCB explicitly intended to be unenforced "potential" designations into immediate enforcement priorities. This unintended result has never been addressed or corrected in subsequent Basin Plans, nor has a Section 13241 analysis been done to assess this change in interpretation.

Many parties have commented on the potential beneficial use designations contained in the 1994 Basin Plan revisions. For example, CLADPW commented that many of the potential beneficial uses in the Plan are neither realistic nor consistent with the current functions of the region's infrastructure.[121] Extensive comments submitted by the County Sanitation Districts of Los Angeles County (LACSD) request that the

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[118] See *Present and Potential Beneficial Uses, Proposed Revisions, October, 1978*: "The footnotes in the table of beneficial uses identify existing physical constraints (such as structural modifications, flow characteristics, accessibility) in water bodies or identified reaches thereof which prevent or effectively impede the attainability of the beneficial uses as footnoted. In the formulation of waste discharge requirements these limitations are taken into account. The waste discharge requirements will protect the listed beneficial uses as they are attained. This is in harmony with the intent of the Board to require that degree of treatment consistent with state and Federal guidelines but not to impose further treatment beyond these guidelines except where the Board finds such further treatment is warranted to protect attained and readily attainable beneficial uses."

[119] See USEPA comment letter to Carla Bard, SWRCB, dated January 9, 1980, with the following language in an attachment (which is dated November 1979): "It is our understanding that the use designations of 'E' (existing), 'I' (intermittent), 'P' (potential), or 'A' (anticipated) have value in the fact that they identify the present relation of the use to the water referenced. We further understand that when designated as 'E', 'I', 'P' or 'A', the water is to be protected at all times for the beneficial use and that there is no difference in value between the designations."

[120] File notes from Tom Schaffer to Ray Hertel, February 19, 1980: "Note: SWRCB's response to EPA says EPA's understanding that 'E', 'P', and 'I' applied to beneficial uses have no difference in value. The last paragraph of our justification (see attached last sheet [referenced in footnote 118]) does show a difference." (emphasis in original)

[121] Letter from Dave Yamahara, County of Los Angeles Department of Public Works, to Deborah J. Smith, RWQCB, February 2, 1994: "Many of the beneficial uses designated in this plan as 'existing uses' are not practical. Many of the 'potential' beneficial uses of various water bodies are neither realistic, in a technical or financial sense, nor are they consistent with the current functions of the existing infrastructure...the designation of many of our existing channels as potential municipal and domestic sources of potable water is not reasonable...It is crucial that beneficial designations be carefully and appropriately established, to avoid confusion and impractical regulations that may not be implementable."

RWQCB clarify the meaning of potential uses, noting that Porter-Cologne requires the designation of probable beneficial uses, which may be quite different than potential beneficial uses.[122] Other parties have submitted similar comments[123] and noted specific cases where the potential designation seemed inappropriate.[124]

In its responses to comments, the RWQCB stated that "'potential' is the term that has been used since the original 1975 Basin Plans."[125] But the RWQCB's response failed to acknowledge that when such potential uses were first developed, it was never intended that water quality objectives would be enforced to protect such uses. The RWQCB has also stated that "'probability' can be considered in site-specific circumstances in setting

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[122] See comment letter from Robert P. Miele, LACSD, to Deborah J. Smith, RWQCB, February 4, 1994, with enclosures. "What does 'potential' use mean? The list of possibilities included [in the Basin Plan] is quite broad, and the likelihood of these occurring range [sic] from probable to unlikely. We believe that this broad range is inappropriate, and that the definition should be more precise. How are factors...that may limit attainment of beneficial uses, such as physical or biological modifications, considered in designating potential beneficial uses? Such limiting factors should be considered when setting water quality objectives; otherwise, requiring attainment of chemical water quality objectives may be a futile – and costly – exercise. The Porter-Cologne Water Quality Act directs the Regional Boards, in setting water quality objectives, to consider the 'past, present, and *probable future* beneficial uses of water.' (§13241) (emphasis added) This suggests that the term 'probable' may be a more accurate representation of the intent of the Porter-Cologne Act than 'potential.'" See also comments from Robert P. Miele, County Sanitation Districts of Los Angeles County, to Deborah J. Smith, RWQCB, May 27, 1994: "In our previous comments, we expressed concern regarding the meaning and application of beneficial use designations applied as 'potential' uses. We continue to be troubled by the wide range of meanings offered by the Board, and lack of clarification given as to how designation of a potential use affects water quality objectives and effluent limitations in permits...We believe that this broad range of reasons for designation of a use as 'potential' is inappropriate...Legally, we believe that both the Clean Water Act and the Porter-Cologne Water Quality Act provide the flexibility necessary for a reasonable, more realistic interpretation of the term 'potential.' **Therefore, we recommend that the explanation of potential uses on p. 2-1 (and the application of it in Table 2-1) be modified to reflect only those potential uses that are: 1) planned in the reasonably foreseeable future, and 2) not precluded by institutional, physical, thermal, biological, or other factors affecting the waterbody**." (emphasis in original)

[123] See, e.g., comments from County of Los Angeles Department of Public Works to Deborah J. Smith, RWQCB, February 17, 1994: "The Basin Plan does not include the criteria used in determining how a particular beneficial use is designated for a waterbody. The Federal Clean Water Act (CWA) calls for the designation of 'probable potential beneficial uses' (emphasis added) while the Basin Plan employs the undefined term 'potential beneficial use,' (i.e., it leaves out the word 'probable')...The Basin Plan does not explain how its beneficial use designations specifically conform to the objectives of the CWA..."

[124] See, e.g., comments from James A. Noyes, County of Los Angeles Department of Public Works, to Deborah J. Smith, RWQCB, May 26, 1994: "In addition, the CRWQCB's reference to the re-configuration of the Los Angeles River to provide for greater recreation should also include that such action is not definite, and that public safety will be the primary consideration in any re-configuration plan for a flood control channel. Until a formal plan is actually adopted by the entities charged with the responsibility of providing flood control, recreational uses do not yet meet the CWA's criterion of 'attainability' and thus cannot be considered 'potential.' Therefore, we believe the Plan's designation of potential or existing recreational beneficial uses to the Los Angeles River is inappropriate."

[125] See Regional Water Quality Control Board, Los Angeles Region, *Responsiveness Summary for the December 29, 1993 DRAFT Water Quality Control Plan, Los Angeles Region*, April 28, 1994, at p. 15.

effluent limits, cleanup levels, and water quality objectives"[126] and that EPA guidance "is broad and includes those uses that reflect the *goals* of the Clean Water Act and other polices [sic] and regulations."[127] (emphasis in original)

To date, the administrative record shows that the RWQCB has failed to clarify the requirements for potential designations or to correct the historically unintended enforcement of such designations by means of water quality objectives. The RWQCB also apparently failed to conduct a Section 13241 analysis for the application of water quality objectives to potential beneficial uses. Although protecting potential beneficial uses is likely to be expensive and to pose considerable technical challenges (e.g., if bacterial standards are enforced for stormwater in channels, such as the Burbank Western Channel, that are designated potential REC-1), it is unlikely that any significant benefits will be derived from protecting uses that are highly unlikely to ever be achieved.

Beneficial uses in effluent-dominated streams. Within the Los Angeles Region, many water bodies would be dry (or nearly dry) during the dry season if not for the discharge of treated effluent to these streams. The Basin Plan record shows that, because such watercourses experience flows due to effluent discharges, the RWQCB has increasingly designated them for potential and existing beneficial uses that would otherwise not occur. Paradoxically, however, enforcement of water quality objectives associated with such new beneficial uses may preclude the effluent flows that give rise to the designations in the first place. In addition, there is concern as to whether designation "requires" the maintenance (i.e., the delivery) of water flows in effluent-dominated channels in lieu of use of the water (commonly called "reclaimed" or "recycled" water) for other purposes (e.g., irrigation).

In its review of the 1975 Los Angeles Basin Plan, the EPA requested that the state upgrade beneficial use designations for streams that are augmented by year-round reclaimed water discharges.[128] The California Department of Fish and Game addressed related issues in its Wastewater Reclamation Policy, issued August 10, 1976. This policy specified that, "in streams or lakes where permanent surface water would not exist without discharge of reclaimed water, the quality of reclaimed water for protection of fish and wildlife need not necessarily meet as stringent criteria as for discharge to the existing permanent waters," but instead must satisfy certain basic criteria.[129] The policy also

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[126] Ibid.

[127] See Regional Water Quality Control Board, Los Angeles Region, *Responsiveness Summary for the April 28, 1994 DRAFT Water Quality Control Plan, Los Angeles Region*, June 13, 1994, at p. 5.

[128] See Enclosure 3 to the letter from Russell Freeman, USEPA, to Edmund G. Brown, Jr., State of California, April 16, 1976: "Therefore, as part of the continuing planning process, the beneficial uses of intermittent streams in this basin which will be augmented by year-round wastewater discharges to provide continuous stream flow should be upgraded to reflect additional potential uses such as warm and cold water fish habitat, fish migration, and spawning."

[129] See California Department of Fish and Game Wastewater Reclamation Policy, August 10, 1976: "...In streams or lakes where permanent surface water would not exist without discharge of reclaimed water, the quality of reclaimed water for protection of fish and wildlife need not necessarily meet as stringent criteria

stated that other beneficial uses (e.g., agricultural irrigation, groundwater recharge, etc.) should take precedence over stream flow augmentation or creation of new lakes "except when (1) a designated rare or endangered species will be adversely affected; (2) the overall negative instream impacts to fish and wildlife habitat would be greater than the overall benefits to fish and wildlife gained from the proposed consumptive use of reclaimed wastewater; or (3) a population of fish or wildlife species will be lost without compensation as a result of stream flow cessation or reduction resulting from wastewater reclamation project operation."[130]

As early as April 1976, interested parties expressed concern that revised designations would obligate reclaimed water producers to meet higher restrictions to preserve the designated beneficial uses they were generating in the first place.[131] Similar concerns were raised in comments on the 1994 Basin Plan revisions[132] and some parties suggested the creation of a new beneficial use category for effluent-dominated waters.[133]

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as for discharge to the existing permanent waters, but must satisfy the following: 1) Reclaimed waters discharged shall be free of substances in amounts acutely toxic to aquatic life (including all forms, e.g., plankton, insect larvae, other invertebrates, fish and mammals) or wildlife, 2) shall not contain bioaccumulatory substances in amounts known to be detrimental to biota or capable of rendering aquatic life or wildlife unfit for human consumption, 3) shall provide for the sustenance and maintenance of aquatic life and/or wildlife resources, and 4) shall meet standards imposed by the State Department of Public Health."

[130] Ibid.

[131] See RWQCB file notes from Larry [Meyerson] to John Joham (re our Plan amendments), dated April 21, [1976]: "Maint. of rare species in some streambeds may require higher restrictions and prevent use for recharge conveyance. Some conveyance channels carry only water for spreading, Replen. Dist. doesn't want to be in position of having to maintain flows to preserve these uses." See also Letter from John G. Joham, Jr., Central and West Basin Water Replenishment District, to Raymond M. Hertel, RWQCB, October 25, 1976, quoting earlier April 20, 1976 letter: "In many of the cases, the stream flow which would appear to make possible the consideration of maintenance of fish and wildlife is the imported and/or reclaimed water on its way to the spreading grounds. Therefore, it seems to me that the Replenishment District could end up in a position of placing water in what would otherwise be a dry stream channel; then have it said that, by virtue of flow in the channel, the maintenance of fish and wildlife would be reasonable; as a result have standards set which require better water quality than the imported and/or reclaimed water; and, therefore, have the use of the channel for conveyance of imported water and/or reclaimed water not compatible with the objectives. Such a result would obviously be ridiculous."

[132] See, e.g., letter from John W. Elwell, Camarillo Sanitary District, to Debra J. Smith, RWQCB, February 3, 1994: "In our view, these systems [effluent-dominated streams] should not be regulated carte blanche with the same standards that are applied to perennial streams wherein flow is predominately [sic] from natural rather than man-made sources. The Board should strongly consider setting site specific limits for wastewater facilities...that discharge into effluent-dominated streams... Before establishing beneficial uses for an effluent-dominated stream, the Board should consider the practicality of designating each beneficial use for the effluent-dominated stream." These comments also noted that the RWQCB is required to take economic impacts and environmental considerations into account when setting standards for effluent-dominated streams.

[133] See letter from Donald H. Nelson, City of Thousand Oaks, to Deborah J. Smith, RWQCB, January 26, 1994: "The Basin Plan does not address effluent-dominated waters or effluent created ecosystems (EDWs)...A formal means to deal with EDWs is necessary to allow beneficial regional planning and project development activities to proceed. The Basin Plan must explicitly recognize these effluent-

Other comments contended that beneficial uses assigned to effluent-dominated streams were contraindicated by the very presence of the effluent flows.[134]

In response to these concerns, the RWQCB stated that "the issue of effluent- or reclaimed water-dominated streams will be placed on the Triennial Review list for the next Basin Plan update."[135] The RWQCB also stated that "the Board will consider site-specific beneficial uses and other conditions when establishing effluent limits on a case-by-case basis for individual dischargers, or in the future, on a watershed basis."[136]

Although the RWQCB committed to revisiting these issues, the administrative record contains no evidence that they were addressed. As a result, the contradictions between effluent discharge stream flows and designations that undermine the maintenance of such flows remain in the Basin Plan.

Conflicts between beneficial use designations and the intended uses. In several cases, a designated beneficial use may not be appropriate for a given water body, either (1) because enforcement of the water quality objectives associated with that use would preclude the use or (2) because the use would impair the quality of the water for its intended purposes.

An early example of such a conflict is the potential beneficial use designation of WARM within Coyote Creek. In 1978, the Department of Fish and Game requested a WARM designation for Coyote Creek due to the presence of tilapia, a non-native, warm water fish introduced in 1973 to control benthic midges. According to DFG, these fish reproduced within the tidal prism and migrated upstream during warm weather periods.

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dominated waters and created systems, acknowledging that they are unique and warrant site specific consideration and management techniques...the Basin Plan needs to address how such EDWs will be managed for the greatest all-around benefit. The City of Thousand Oaks, in its specific comments, is proposing a new use designation, **Reclaimed Water-Created Aquatic Ecosystems (RWC)**, that will provide the flexibility to achieve this goal." (emphasis in original)

[134] Letter from Ora E. Lampman, City of Burbank, to Robert P. Ghirelli, RWQCB, January 31, 1994: "We don't believe that the GWR, REC-1 and WARM are the existing beneficial uses in the stream [the Los Angeles River]. This contradicts the statements in Page 1-9 which states [sic] that, generally, the flows in the stream are dominated by tertiary treated wastewater effluent from the municipal wastewater treatment plants, urban runoff, and rising ground water in the unlined reaches of the stream."

[135] See Regional Water Quality Control Board, Los Angeles Region, *Responsiveness Summary for the December 29, 1993DRAFT Water Quality Control Plan, Los Angeles Region*, April 28, 1994, at p. 16. Although identified as a high priority for consideration in the 2001 triennial review priority list, determination of the "most appropriate approach to address effluent and agriculturally dominated water bodies" is not being addressed in the 2001 Triennial Review. See California Regional Water Quality Control Board, Los Angeles Region, Staff Report: 2001 Triennial Review: Prioritization of Basin Planning Issues, April 16, 2001, at p. i and p. 24.

[136] Regional Water Quality Control Board, Los Angeles Region, *Responsiveness Summary for the December 29, 1993DRAFT Water Quality Control Plan, Los Angeles Region*, April 28, 1994, at p. 32.

Thermal discharges from power plants ensured the survival of the tilapia during winter periods.

The administrative record demonstrates that the RWQCB understood that a WARM beneficial use would preclude the discharge of treated effluent, including the warm power plant water, that actually sustained the tilapia. The temperature water quality objective for a WARM beneficial use specifies that a discharge shall not raise receiving water temperatures by more than 5°F, a standard that would be violated by the power plant discharges during winter months. The RWQCB noted that "[this] situation is particularly ironic in that the LBWRP effluent would stabilize temperatures below the point of discharge and could possibly allow for the year-round presence of tilapia within the creek."[137] Coyote Creek currently carries a potential (P) WARM designation in the 1994 Basin Plan.

Operators of reclaimed water facilities have pointed to a similar potential conflict in the Basin Plan. As detailed above, reclaimed water in various water bodies, even water bodies constructed explicitly for the storage of reclaimed water, can result in designations for habitat and other beneficial uses. The water quality objectives for these beneficial uses, however, often require a higher degree of treatment (i.e., "better" water quality) for the reclaimed water than would be required in the absence of the designations. As a result, to protect the beneficial uses created solely by reclaimed water discharges, reclaimed water producers would have to illogically cease making the very same discharges or treat to a level that may provide no tangible benefit to the environment.

A similar contradiction results from Basin Plan use designations for drinking water supply reservoirs, some of which are open to the environment (uncovered). Although public access to these reservoirs is strictly prohibited, most have been designated for potential REC-1 and/or REC-2 uses by the RWQCB. As a result, they are regulated to protect potential uses that are not compatible with their actual functions and which will almost certainly never be allowed. Operators of the affected reservoirs have repeatedly stated in the record that these water bodies should not be regulated as "waters of the State" or "waters of the nation" because they are part of a closed water distribution system[138] and that recreational uses would result in the degradation of water quality.[139]

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[137] See RWQCB file notes from Paul Martyn to Ray Hertel, undated (likely August 1978).

[138] See, e.g., letter from Bruce Kuebler and J. Alan Walti, Los Angeles Department of Water and Power (LADWP), to Robert P. Ghirelli, RWQCB, February 15, 1994: "The reservoirs and forebay proposed or currently listed in the Table of Inland Surface Water Bodies of the Basin Plan that are owned and operated by the LADWP are not 'waters of the state' and should be deleted from Table 2-1 and Table 4-20. The reservoirs are integrated components of a treated, closed domestic supply system and are not open to other waters of the state...Complete maintenance and operational flexibility for these reservoirs, as with any other part of our distribution system, ... is essential to meet varying demands and seismic safety."

[139] Letter from James A. Noyes, County of Los Angeles Department of Public Works, to Deborah J. Smith, February 17, 1994: "The Basin Plan states that recreational use has contributed to the degradation of the Los Angeles Region's surface waters. However, the Basin Plan's attempt to increase recreational activity around certain waterbeds by designating 'potential' recreational 'beneficial uses' to them would seem to

In its response to such comments, the RWQCB has stated that "these waterbodies are and have previously been considered waters of the state...they are not 'closed' to the environment and support several beneficial uses. In most cases, existing natural streambeds and washes were dammed up or lined with concrete to create these facilities."[140] The RWQCB has also noted that "the Regional Board shares the concern that these important waterbodies be protected from contamination. All impoundments of water (open to the environment), however, are considered waters of the nation according to USEPA guidance, with the exception of certain wastewater facilities. These waterbodies are often impoundments of portions of natural watersheds that prior to damming would have had beneficial uses and potentially in the future, if these reservoirs are abandoned, would be designated a full complement of beneficial uses...These reservoirs are designated as 'P' [potential] for REC1 use because the Clean Water Act includes the goal that all waterbodies have swimmable and fishable goals."[141] Although these statements recognize the problem of conflicting designations, they do not resolve the practical issues surrounding the designation of potential uses for reservoirs that cannot support those uses, nor do they recognize that "fishable/swimmable" uses are required by the Clean Water Act to be designated "wherever attainable."

D. Interpretation Of The Tributary Rule

Most of the inland surface waters within the Los Angeles Region are subject to several beneficial use designations. The Basin Plan contains a rule, however, that can be read to extend the designated uses to virtually every water body's tributary system (i.e., extending the downstream uses to the upstream tributaries). The Plan also provides that "those waters not specifically listed (generally smaller tributaries) are designated with the same beneficial uses as the streams, lakes, or reservoirs to which they are tributary."[142]

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have the effect of degrading waters even further, which would appear to be in conflict with the Basin Plan's very goals of improving water quality." Letter from Gary H. Yamamoto, California Department of Health Services, to Robert Ghirrelli, May 26, 1994: "The 'finished water' distribution reservoirs are part of a clearly defined drinking water distribution system and serve as 'open' storage tanks...Water in these reservoirs is considered to be of 'finished quality' because it has received prior treatment at approved water treatment facilities to meet all federal and state drinking water standards. Water from these reservoirs is served directly to residents and businesses without further treatment other than chlorination. As such, public access to these distribution reservoirs and surrounding watershed is strictly prohibited by this Department...These reservoirs should not be included as waters of the state...Our primary concern is the beneficial use designations, REC1 and REC2. Beneficial uses of recreation and drinking water are incompatible for distributions reservoirs...If recreational activities were allowed then water from these reservoirs could no longer be used for drinking and domestic purposes."

[140] See Regional Water Quality Control Board, Los Angeles Region, *Responsiveness Summary for the December 29, 1993 DRAFT Water Quality Control Plan, Los Angeles Region*, April 28, 1994, at p. 22.

[141] See Regional Water Quality Control Board, Los Angeles Region, *Responsiveness Summary for the April 28, 1994 DRAFT Water Quality Control Plan, Los Angeles Region*, June 13, 1994, at p. 9.

[142] See 1994 Los Angeles Basin Plan at p. 2-4.

This policy is commonly called the "tributary rule." Because pollutant concentrations may decrease as a result of dilution or via physical and chemical transformations, it is important to consider downstream impacts prior to applying downstream beneficial uses to tributaries. The Los Angeles RWQCB's approach gives rise to numerous problems noted in the administrative record, including questions about which tributaries are properly classified as "waters of the state," (e.g., with respect to finished drinking water reservoirs) and whether flows in gutters, or rivulets in small canyons, should be subject to designations applied to perennial streams or lakes.

These issues were raised in connection with the 1978 revision process for the Los Angeles Basin Plan. In a letter submitted on June 2, 1978, LACFCD requested that Table 2-3 (which contained beneficial use designations) be reorganized and that differences between natural streams, open channels, and closed conduits be specifically identified. Further, LACFCD requested that the Basin Plan clarify which beneficial uses were to be protected in closed conduits.[143]

In response, the RWQCB recommended no change to the beneficial use table because "closed flood control conveyance facilities do not meet designated beneficial use criteria due to physical constraints. Such structures do not conform to federal fishable/swimmable criteria for the same reason."[144] A subsequent internal memo from the same period reached a similar conclusion[145]:

> "[LACFCD] contends that non-visible surface waters within underground or covered pipes, tunnels, and channels are navigable waters and must be included in the Basin Plan. In our original evaluation of this request we stated: 'No change recommended, as closed flood control conveyance facilities do not meet designated beneficial use criteria due to physical constraints. Such structures do not conform to federal fishable/swimmable criteria for the same reason.' To expand further on this initial response, staff believes the system of covered pipes, tunnels, and channels constructed to transport storm waters are excluded from the term 'navigable waters...'"
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> "Staff believes that, inasmuch as these structures do not have separate existence, but are part of a system tributary to waters of the state which are

[143] See letter from John K. Mitchell, Los Angeles County Flood Control District, to RWQCB, dated June 2, 1978, and associated enclosures: "Table 2-3 is not restricted to natural or open channels, but this is not indicated. Many major drainage areas receiving NPDES permitted and other flows are not included because closed conduits service them. The Basin Plan is used to determine the beneficial uses to be protected in these closed conduits. A few major closed conduits systems are Kenter Canyon Drain, Storm Drain 1105, and DDI 23."

[144] See Mail Checklist, Basin Plan 4B Revisions, undated.

[145] Internal memo from Los Angeles Region to Regional Board Members, Subject: Staff analysis of Los Angeles County Flood Control District's requested changes to Basin Plan 4B (LACFCD's December 4, 1978, letter and November 27, 1978 Board meeting), dated March (unclear), 1979.

protected by the Board, this protection, in effect, serves to protect the flood control structures. The waters in lined flood control conduits are presently protected from any adverse impacts from point source discharges via the NPDES program. Thus, in setting waste discharge requirements, although the goal is to protect the receiving waters, the requirements themselves, in the form of effluent limitations, also protect the flood control structures. Thus, putting beneficial uses on the waters in these conduits would be superfluous and completely unrealistic."

"As for water quality standards for all navigable waters, the Basin Plan does this in a practical manner. Obviously it is extremely difficult to list in the Plan each unnamed canyon in the entire region; however, in the event of a waste discharge to such a canyon, its omission from the Basin Plan would not, and in fact does not, preclude the Board from regulating the discharge."

"As for water quality standards for non-visible surface waters contained in closed LACFCD conduits, *these waters have no beneficial use* (as discussed above); therefore *no water quality standards are applicable* (water quality standard equals beneficial use plus water quality objectives; cf. 40CFR 130.17 (b))." (emphasis added)

Although the RWQCB intended to limit the tributary rule and its implementation, the subsequent administrative record can be read to significantly expand the rule's scope without proper consideration of the Porter-Cologne Section 13241 factors. In 1994, the Los Angeles County Department of Public Works commented that the application of "beneficial uses for named streams to all tributaries of those streams may limit the use of local sediment placement sites [used in cleaning debris basins], because some of the sediment placement sites are located in watercourses which are 'tributaries,' albeit small ones, to the streams named in the Plan."[146] LACDPW expressed concern that such an interpretation could hamper flood control efforts.

In response, the RWQCB stated, "LACDPW may not be aware that in the current Basin Plan, a tributary rule is in effect which states that all beneficial uses for any stream also apply to all tributaries to that stream. There are no new sediment-related water quality standards (beneficial uses and objectives) or other regulatory provisions as a result of this proposed update that would affect flood control operations."[147] This position suggests that the RWQCB intends to apply the tributary rule as broadly as possible and include the smallest tributaries of a water body within each designated use. In its 2001 triennial review priority list, the RWQCB acknowledges that "in the highly

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[146] Letter from Gary Hildebrand, Los Angeles County Department of Public Works, to RWQCB, May 26, 1994.

[147] See Regional Water Quality Control Board, Los Angeles Region, *Responsiveness Summary for the April 28, 1994 DRAFT Water Quality Control Plan, Los Angeles Region*, June 13, 1994, at p. 22.

developed Los Angeles Region, many 'tributaries' to a water body may be underground storm drains... [The region also includes] numerous coastal streams, which are essentially tributaries to the ocean."[148] Such an approach would require collection and treatment of storm flows, urban runoff, and other nonpoint sources on a very small, localized scale, a requirement that would likely be impractical and extremely costly. Thus, there is considerable uncertainty about where the waters of the United States begin, and how far upstream the "tributary rule" extends. However, although the RWQCB has recognized at least some of the issues related to the tributary rule, no action is scheduled to address them in the foreseeable future.[149] The issue of defining the "waters of the United States" subject to the jurisdiction of the Clean Water Act is the subject of an Advance Notice of Proposed Rulemaking published for public comment in January 2003 by the U.S. EPA and the U.S. Army Corps of Engineers.[150]

E. Additional issues

While this report addresses a number of key concerns raised in our review of the administrative record, this report should not be considered an exhaustive or complete listing of issues that should be addressed in a Basin Plan update or review process. Among the additional issues that have been identified by stakeholders in the administrative record are the following:

- The application of water quality objectives contained in the Basin Plan to all water bodies throughout the Los Angeles Region, regardless of the beneficial use designations of those water bodies (e.g., nitrogen objectives);
- The development and interpretation of water quality objectives for pH and temperature, especially the interpretation of these objectives with respect to natural conditions;
- The lack of "translators" for certain Basin Plan narrative objectives (including, but not limited to, trash and toxicity);
- The appropriateness of automatically applying water quality objectives for the protection of drinking water to surface water bodies that are designated with the ground water recharge (GWR) use;
- The appropriateness of the methylene blue activated substance (MBAS) water quality objective in effluent-dominated water bodies;

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[148] California Regional Water Quality Control Board, Los Angeles Region, Staff Report: 2001 Triennial Review: Prioritization of Basin Planning Issues, April 16, 2001, at p. 11.

[149] Ibid., at p. i and p. 11.

[150] 68 Fed. Reg. 1001 ("Advance Notice of Proposed Rulemaking on the Clean Water Act Regulatory Definition of 'Waters of the United States,'" January 15, 2003.

- The appropriateness of designating water contact recreation (REC-1) for fishing activities, when the quantity of fish present may be inadequate to sustain the designated use;
- The appropriateness of designating water contact recreation (REC-1) for wading.

IV. CONCLUSIONS AND RECOMMENDATIONS

This report is based upon an examination of the administrative record as provided by the Regional Water Quality Control Board for the Los Angeles Region of the Water Quality Control Plan (Basin Plan), which was first adopted in 1975. This review confirms that many of the concerns that exist about water quality regulation on a national level are relevant and valid within the Los Angeles Region, and that many of these concerns have been raised repeatedly since the 1970s. Many Basin Plan elements are found to lack technical foundation and were not necessarily adopted in a manner that achieves the highest level of *reasonable* water quality protection consistent with California's Porter-Cologne Act. In addition, this report shows that the existing Basin Plan regulatory framework and process frequently fails to identify and address the true sources of water quality degradation and impairment. Four priority areas for Basin Plan reform identified in this report include the following:

1. *Evaluation of Porter-Cologne Factors*

2. *Development and Implementation of Water Quality Objectives*

3. *Designation of Appropriate Beneficial Uses*

4. *Application of the "Tributary Rule"*

These four priority areas, and recommendations for addressing them, are summarized below. Although discussed in detail in this report, the issues raised below are not intended to provide a complete or exhaustive listing of stakeholder concerns with the Basin Plan.

Evaluation of Porter-Cologne factors. This report's examination of the administrative record shows that the Los Angeles Basin Plan has failed to adequately consider the factors mandated by Porter-Cologne in the designation of beneficial uses and the establishment of water quality objectives. In many cases, the administrative record contains no significant discussion or reference to the required Section 13241 factors. In others, the record shows that the RWQCB made at most cursory or summary references to third party comments relating to economics, housing, hydrology and other concerns. These responses appear to fall well short of the requirements for economic analysis set forth in the Chief Counsel's 1994 memorandum. As with the Section 13241 factors, the administrative record reflects that Section 13242 has been given minimal (or no) consideration in the development of the Los Angeles Basin Plan.

An example of the lack of consideration of Section 13241 and 13242 factors is the application of water quality objectives to nonpoint sources. When the RWQCB initially established water quality objectives in the mid 1970s, it explicitly did not intend those objectives to be applied to nonpoint sources (including stormwater and urban and rural

runoff). Thus, the RWQCB never considered the Section 13241 factors or set forth a program of implementation as required by Section 13242 for the application of water quality standards to nonpoint sources. Yet, in recent years, the RWQCB has been applying these objectives to nonpoint sources, despite the potentially significant cost and without any substantive Porter-Cologne analysis.

Existing and future Basin Plan water quality standards should be assessed in accordance with Section 13241 public interest factors. A program of implementation should then be developed with consideration of Section 13242 guidelines. Consideration of the provisions of Sections 13241 and 13242 should be completed prior to implementation via waste discharge requirements or TMDLs to ensure that public resources are spent in a manner that optimizes water quality protection. Where cost or other impacts, such as housing impacts, are likely to be significant, the RWQCB should provide a detailed rationale for its regulatory programs and decisions, consistent with SWRCB guidance.

Development and implementation of water quality objectives. In addition to Porter-Cologne Section 13241 considerations, certain water quality objectives (including but not limited to bacterial standards, sediment water quality objectives, and mineral quality objectives) in the Los Angeles Basin Plan lack adequate consideration of natural processes and ambient data. For example, the bacterial standards contained in the Los Angeles Basin Plan do not fully reflect newer studies or scientific research and EPA guidance regarding risk-based analysis and appropriate indicator bacteria species. Beneficial use designations and associated bacterial water quality objectives do not distinguish between high and low flow periods, even though the potential for human exposure to bacteria and human pathogens can vary greatly depending upon the season. Recent studies conducted in southern California show that high concentrations of indicator bacteria are present even in stormwater runoff from pristine, undeveloped areas. Treating vast quantities of stormwater runoff to meet current bacterial standards would be costly and technically challenging (especially during high flow events, when the potential for human contact is low) and would not necessarily result in better water quality than would occur naturally in the absence of human influences.

Similarly, the narrative water quality objectives contained in the Los Angeles Basin Plan can be interpreted subjectively. For example, sediment water quality objectives are often applied without regard to natural, historic sediment levels. Comment letters in the Basin Plan administrative record have repeatedly observed that naturally-occurring erosion levels are very high within the Los Angeles Basin and historically cause high sediment concentrations in stormflows. As with the bacterial standards, eliminating or minimizing sediment concentrations in stormflows to meet sediment water quality objectives is a costly and technically difficult undertaking and represents a departure from naturally occurring conditions. In particular, restricting sediment loadings during stormflows could reduce the natural supply of sand and greatly increase the region's already significant rate of beach erosion.

The Los Angeles Basin Plan also contains water quality objectives for various mineral quality parameters, including total dissolved solids (TDS) and chloride. These mineral quality objectives are based on water samples collected during a wet climatic period (when naturally occurring concentrations were low) and were initially intended to be applied as flow-weighted annual averages at specific locations within a reach. However, the current Basin Plan no longer contains the intended language specifying application of the objectives as flow-weighted annual averages. Thus, the objectives are being applied as instantaneous maximum permitted concentration levels throughout the entire reach, even though naturally occurring mineral concentrations often exceed water quality objectives, particularly in dry periods. Because concentrations of these constituents in general do not cause non-attainment of designated beneficial uses, it makes little sense and would be needlessly costly to meet high-flow related water quality objectives. In addition, these objectives discourage the development of recycled water projects, because recycled water often contains mineral concentrations higher than the applicable objectives.

These and other water quality objectives that are known or likely to be influenced by natural or ambient conditions should be reassessed to determine the extent to which regulation and treatment can measurably and reasonably contribute to water quality improvement and the attainment of beneficial uses. The public interest factors specified in Porter-Cologne Sections 13241 and 13242 should be used in this evaluation. Special priority should be given to assessing the reasonableness of applying water quality objectives to nonpoint sources. Consistent with the NRC's recommendations, special effort should be given to translating narrative into numeric criteria and to developing water quality objectives that are clearly defined in terms of frequency, magnitude, and duration.

Designation of beneficial uses. Because beneficial use designations determine which water quality objectives will apply to a specific water body, appropriate, reasonable designations are essential to efficiently and effectively regulate water quality. However, the Los Angeles Basin Plan contains beneficial use designations that many parties feel were defined without proper technical or scientific support. For example, many waters within the Los Angeles Region have been designated for municipal and domestic supply (MUN), including drinking water, despite the fact that few water bodies within the Los Angeles Region are used, or will ever be used, for such purposes. In part, this is because of the transient nature of flows within the region during dry months. Even when year-round flow is present, flow during the dry season in many water bodies is dominated by urban runoff and treated wastewater, neither of which has ever been considered as a desirable source of drinking water. Further, many water bodies have been designed or modified specifically to efficiently convey stormwater runoff to the ocean. These water bodies are, by design, not appropriate for municipal drinking water use, and these use designations were apparently made without consideration of the public interest factors required by Porter-Cologne.

Several water bodies for which questionable MUN designations were made in the 1994 Basin Plan were proposed for de-designation in 1998. Although approved by the RWQCB and the SWRCB, these de-designations were not approved by the California Office of Administrative Law, largely for procedural reasons. In 2000, the EPA approved the 1994 Los Angeles Basin Plan in its entirety with the sole exception of a Plan provision that suspended the application of certain questionable MUN designated uses. The EPA's decision effectively forced the RWQCB to enforce MUN designations that were recognizably in error. In response to a lawsuit, a U.S. District Court eventually held that the original intent of the RWQCB in suspending the application of these MUN designated uses must be maintained in EPA's approval of the Los Angeles Basin Plan. Despite this ruling, the MUN designations in the Los Angeles Basin Plan and implementation of water quality objectives for MUN-designated waters remain questionable and problematic. For example, it remains unclear whether or not storm flows in MUN-designated channels will be expected to meet MUN-level water quality objectives, or whether groundwater recharge (GWR) designations generate similar requirements, and, if so, how this goal can be achieved in a reasonable, cost-effective manner.

The 1994 Los Angeles Basin Plan contains multiple beneficial use designations for concrete-lined, highly modified channels, including both contact and non-contact recreation (REC-1 and REC-2) and habitat designations. The administrative record contains numerous comments that the REC-1 and REC-2 designations are inappropriate for these channels, particularly where access is restricted and/or illegal, and that these designations do not reflect the level of recreational use. Further, the REC designations trigger restrictive water quality objectives (e.g., bacterial water quality objectives), and require correspondingly expensive treatment, even though the potential for human contact and harm is minimal. Many parties have commented that habitat designations for these streams are also inappropriate, as the presence of habitat may conflict with flood control functions, which require routine maintenance and preservation of largely unvegetated stream channels. Oddly enough, there is no beneficial use or water body category within the Los Angeles Basin Plan for flood control, despite the fact that flood control is the primary reason why many channels within the Basin were modified in the first place. The administrative record shows that Basin Plan REC designations and associated water quality objectives for flood control and related channels generally fail to consider the economic and other Section 13241 factors required by Porter-Cologne.

The Los Angeles Basin Plan specifies a number of "potential" beneficial use designations, although this term is not clearly defined and departs from the Porter-Cologne statutory reference to "probable" future uses. Initially, the RWQCB included potential beneficial use designations in the 1975 and 1978 Basin Plans but intended to regulate such uses via waste discharge requirements applicable to point sources only if and when those uses were actually attained. In its approval of proposed 1978 Basin Plan revisions, however, the EPA specified that all beneficial uses, including those designated as "potential" beneficial uses, were to be protected equally. This decision extended costly and extensive regulatory requirements to what were previously speculative Basin Plan references to highly unlikely, if not implausible "potential" uses. If attainment of

these uses is only possible by means that involve major expense, meeting the associated water quality objectives would not be an efficient use of public resources.

Finally, the Los Angeles Basin Plan does not currently contain a beneficial use or water body category for "effluent-dominated streams," although such a category has been proposed on numerous occasions. Many water bodies within the region would be dry (or nearly dry) for the majority of the year if not for the discharge of treated effluent or dry weather urban runoff to these streams. In adopting water quality objectives, the RWQCB has given minimal consideration to the benefits of recycled water use in the stream channels used for conveyance of recycled water to downstream use sites. As a result of treated effluent flows, however, the RWQCB has designated potential and existing beneficial uses, such as habitat beneficial uses, that paradoxically may preclude the same effluent discharges that create the stream flow and associated habitat in the first place. This contradictory approach highlights the need to more logically and reasonably regulate effluent dominated water bodies in the Basin Plan. Despite the fact that Porter-Cologne and SWRCB policy call for the consideration of the need to develop and use recycled water in Basin Plan development, no such beneficial use exists for reservoirs that are constructed solely for the purpose of storing recycled water.

The RWQCB should clarify the requirements for creating and applying beneficial use designations, including "potential" designations. New designations or water body categories, such as flood control or effluent-dominated waters, should be added to reflect the actual, intended uses of many regional water bodies. Seasonal or tiered uses and/or site-specific objectives should be created for areas in which conflicts exist between the applicable beneficial uses and water quality criteria, or where natural sources of 'contaminants' prevent attainment of water quality objectives. Consistent with the NRC's recommendations, Use Attainability Analyses (UAAs) should be conducted for designations in the Basin Plan that are known to be inappropriate, such as MUN designations and REC designations for restricted access flood control channels.

Interpretation of the tributary rule. Most of the inland surface waters within the Los Angeles Region are subject to several beneficial use designations within the Los Angeles Basin Plan. The Basin Plan states that "those waters not specifically listed (generally smaller tributaries) are designated with the same beneficial uses as the streams, lakes, or reservoirs to which they are tributary." This provision is more commonly known as the "tributary rule," and it has stimulated increasing controversy about the extent to which it can and should be applied in the basin. In the interpretation that the RWQCB appears to have adopted in recent administrative documents, the tributary rule could result in the application of water quality objectives to even very small flows (e.g., flows in gutters or rivulets of flow in small canyons). The application of water quality objectives to all tributary streams via the tributary rule disregards the public interest factors of Porter-Cologne Sections 13241 and 13242. Such an interpretation could require the collection and treatment of storm flows, urban runoff, and other nonpoint sources on a very small, localized scale. This would result in impractical, costly and

inefficient methods for improving water quality in the larger receiving water bodies that the Clean Water Act and the Porter-Cologne Act primarily intended to protect.

The tributary rule should be revised to reasonably protect designated beneficial uses without extending, at enormous potential expense, regulatory requirements to each and every upstream drainage facility within the Los Angeles Region. For example, the tributary rule could be applied only where there is a hydrologic connection that exists not just in response to storm events, and/or where the hydrologic connection is such that a commingling of water and an exchange of aquatic life is possible.

F. EFFECT OF URBANIZATION ON GROUNDWATER RECHARGE IN THE SANTA CLARITA VALLEY

Effect of Urbanization on Aquifer Recharge in the Santa Clarita Valley

TO: Tom Worthington/Impact Sciences, Inc.

FROM: John Porcello/CH2M HILL

DATE: February 22, 2004

Introduction

In a groundwater basin, the effect of urbanization on recharge to underlying groundwater is dependent on land uses, water uses, vegetative cover, and geologic conditions. Groundwater recharge from undeveloped lands occurs from precipitation alone, whereas areas that are developed for agricultural or urban land uses receive both precipitation and irrigation of vegetative cover. In an urban area, groundwater recharge occurs directly beneath irrigated lands and in drainages whose bottoms are not paved or cemented. This memorandum discusses the general effects of urbanization on groundwater recharge and the specific effects in the Santa Clarita Valley.

Summary of Findings

In the Santa Clarita Valley, stormwater runoff finds its way to the Santa Clara River and its tributaries, whose channels are predominantly natural and consist of vegetation and coarse-grained sediments (rather than concrete). The stormwater that flows across paved lands in the Santa Clarita Valley is routed to stormwater detention basins and to the river channels, where the porous nature of the sands and gravels forming the streambeds allow for significant infiltration to occur to the underlying groundwater.

Increased urbanization in the Valley has resulted in the irrigation of previously undeveloped lands. The effect of irrigation is to maintain higher soil moisture levels during the summer than would exist if no irrigation were occurring. Consequently, a greater percentage of the fall/winter precipitation recharges groundwater beneath irrigated land parcels than beneath undeveloped land parcels. In addition, urbanization in the Santa Clarita Valley has occurred in part because of the importation of State Water Project (SWP) water, which began in 1980. SWP water use has increased steadily, reaching nearly 44,500 acre-feet (AF) in 2003. Two-thirds of this water is used outdoors, and a portion of this water eventually infiltrates to groundwater. The other one-third is used indoors and is subsequently routed to local water reclamation plants (WRPs) and then to the Santa Clara River (after treatment). A portion of this water flows downstream out of the basin, and a portion infiltrates to groundwater.

Records show that groundwater levels and the amount of groundwater in storage were similar in both the late 1990s and the early 1980s, despite a significant increase in the

urbanized area during these two decades. This long-term stability of groundwater levels is attributed in part to the significant volume of natural recharge that occurs in the streambeds, which do not contain paved, urban land areas. On a long-term historical basis, groundwater pumping volumes have not increased due to urbanization, compared with pumping volumes during the 1950s and 1960s when water was used primarily for agriculture. Also, the importation of SWP water is another process that contributes to recharge in the Valley. In summary, urbanization has been accompanied by long-term stability in pumping and groundwater levels, plus the addition of imported SWP water to the Valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater that is in storage within the Valley.

Effect of Pavement on Recharge Beneath Specific Land Parcels

The amount of paved cover on the ground affects the degree to which rainfall and outdoor-applied urban water will be able to infiltrate to groundwater. In heavily industrialized areas with high percentages of paved cover, such as exist in portions of the Los Angeles Basin, less rainfall recharge will occur than if the land is in an undeveloped condition. Furthermore, if the bottoms of rivers and other drainages are paved, then the majority of stormwater generated during a rainfall event will be unable to infiltrate to groundwater. In contrast, the amount of recharge to groundwater will be greater in urbanized areas, such as the Santa Clarita Valley, that have natural soils in the bottoms of rivers and local drainages or that have lower percentages of paved cover on the developed areas lying outside the principal drainages. In these areas, the outdoor use of water for irrigation landscape vegetation or agricultural lands can notably increase the amount of groundwater recharge, particularly if the outdoor water is imported from outside the local groundwater basin. This is discussed further below.

Effect of Vegetative Cover and Water Use

From the 1930s through the 1960s, H.F. Blaney and other researchers at the U.S. Department of Agriculture performed numerous studies to measure the amount of infiltration to groundwater that occurs beneath undeveloped lands and irrigated farmlands, and the differences in recharge rates for different types of native vegetation and crops. In California, these studies included a 1933 study by Blaney in Ventura County, a 1963 study by Blaney and others in the Lompoc Uplands, studies by the U.S. Geological Survey and various consultants in the Montecito and Carpenteria groundwater basins, and a groundwater basin study by Santa Barbara County[1] that incorporated the results of these earlier studies.

Together, these studies concluded that deep percolation to groundwater from undeveloped lands occurs only during years of average or above-average precipitation. This occurs because:

1. Southern California's rainfall is highly seasonal in nature, whereupon most rainfall occurs during the relatively cool period November through March, when plant water

[1] See Santa Barbara County Water Agency, December 15, 1977. *Report on Adequacy of the Groundwater Basins of Santa Barbara County.*

requirements are low, and little, if any, rainfall occurs during the remaining (and warmer months) when plant water requirements increase.

2. During the summer, when little or no rainfall occurs, the native vegetation extracts the residual moisture that is present in the soil, which substantially decreases the soil moisture within the root zone of the vegetation. At the end of the dry season, soil moisture levels on undeveloped lands are below the soil's field capacity, which is the amount of moisture that must be present in the soil before free drainage of water can occur below the rooting zone of the native vegetation.

3. When the seasonal rains arrive, the incident rainfall that is not consumed by plants and does not become stormwater runoff must first raise the soil moisture level to the soil's field capacity before any groundwater recharge will occur. The various studies indicate that about 17 inches/year of rainfall is necessary to raise the soil moisture to the field capacity on an undeveloped parcel of land. This is similar to the average annual rainfall in the Santa Clarita Valley and in other lowland coastal and near-coastal valleys in southern California.

On irrigated lands, irrigation occurs during several months of the year, with the exact duration depending on the amount and timing of rainfall and also the crops or type of urban landscaping being irrigated. The principal effect of converting undeveloped land to land that receives agricultural or urban irrigation is to increase the amount of water that is applied to the land during the low-rainfall months. This application of water to the vegetative cover on the surface of the developed land parcel results in the maintenance of higher soil moisture levels during the warm, dry months than would occur without development. This has three effects:

1. Because irrigation will generally be performed in a manner that maintains the health of the vegetative cover, enough water will be applied to maintain the soil moisture at, or close to, the field capacity of the soil. This in turn will allow some deep percolation to occur from the irrigation water itself.

2. When the rainy season begins, because irrigation has maintained soil moisture at or near field capacity, less of the initial rainfall entering the root zone needs to be stored in the soil (to meet soil moisture deficits) beneath an irrigated parcel than in the case of an undeveloped parcel. Therefore, a greater percentage of the initial rainfall and annual rainfall will be able to infiltrate to groundwater. The southern California studies estimated that irrigated land parcels would allow rainfall infiltration to occur in years when annual rainfall is at least 10.5 inches/year. This threshold rainfall value is 6.5 inches less than the threshold rainfall value that the studies estimated to be necessary for generating groundwater recharge beneath undeveloped land parcels.

3. Because the majority of irrigation occurs during the dry (low-rainfall) months, the total annual recharge to groundwater from irrigated developed lands is the sum of: (a) the deep percolation arising from irrigation (during the low-rainfall months); and (b) rainfall (during the months when less irrigation is occurring). Therefore, groundwater recharge beneath developed lands is greater and occurs for a longer period of time each year than in the case of undeveloped lands where no irrigation is occurring.

Historical Observations of Groundwater Conditions in the Santa Clarita Valley

The findings of the studies described above for other groundwater basins in southern California are consistent with observations that have been made in the Santa Clarita Valley, which are based on long-term water level records, water budget analyses, and groundwater modeling. Based on a month-by-month calibration to a 20-year record of historical water level records (throughout the Valley) and stream gaging records (at the Los Angeles – Ventura County line), the model simulates 10 percent of the applied outdoor water as being available for recharge to groundwater in retail and residential areas, with greater percentages infiltrating beneath golf courses and agricultural lands. This is consistent with a 1980 study by DWR of the groundwater resources of the Santee and El Monte hydrologic subareas of San Diego County. In that study, which was performed to evaluate reclaimed water use plans, DWR concluded that approximately 20 percent of the applied outdoor water in municipal areas infiltrates to the water table, with the remaining 80 percent going to evapotranspiration and direct evaporation. DWR also concluded that there would likely be no significant change in these percentages as urbanization continues.[2]

In the Santa Clarita Valley, as in any urbanized area, urbanization increases the paved area and can increase the magnitude and intensity of stormwater runoff from paved land areas. In the Santa Clarita Valley, this stormwater runoff will find its way to the Santa Clara River and its tributaries, whose channels are predominantly natural and consist of vegetation and coarse-grained sediments (rather than concrete). The stormwater that flows across paved lands in the Santa Clarita Valley is routed to stormwater detention basins and to the river channels, where the porous nature of the sands and gravels forming the streambeds allow for significant infiltration to occur to the underlying groundwater. Consequently, for a developed land parcel, the water that runs off of the paved portion of the land parcel will infiltrate to groundwater from a detention basin or a riverbed, rather than infiltrating onsite.

Riverbed infiltration is a significant percentage of total recharge in the Santa Clarita Valley in any given year. Streamflow records and the model calibration process together demonstrate that year-to-year fluctuations in total recharge in the Valley arise not just from year-to-year variations in incident rainfall within the Valley, but also from year-to-year variations in streamflows in the Santa Clara River and its tributaries. Because the areas contributing flow to the rivers are located both within and outside of the Valley, the recharge that occurs from riverbeds is a significant source of groundwater recharge within the Valley.

Evidence that stormwater infiltration to groundwater is not significantly decreased by urbanization comes from long-term water level records at wells completed in the Alluvial aquifer. These records show that groundwater levels and the amount of groundwater in storage were similar in both the late 1990s and the early 1980s, despite a significant increase in the urbanized area during these two decades. This long-term stability is attributed in part to the significant volume of natural recharge that occurs in the streambeds, which do not contain paved, urban land areas. Also, groundwater pumping volumes have not increased

[2] See State of California, Department of Water Resources, Southern District. August 1984, *San Diego County Cooperative Ground Water Studies: Reclaimed Water Use, Phase II.* Pages 40-41.

due to urbanization, compared with pumping volumes during the 1950s and 1960s when water was used primarily for agriculture. Additionally, beginning in 1980, water was imported into the Santa Clarita Valley from the State Water Project (SWP) for urban use, with SWP water use reaching nearly 30,000 acre-feet per year (AF/yr) by the end of the 1990s, and progressively increasing from about 32,500 AF in 2000 to nearly 44,500 AF in 2003. Because two-thirds of the total urban water demand is used outdoors, a substantial portion of the imported SWP water has been and continues to be applied to urban landscaping, thereby increasing the amount of recharge to groundwater. The remaining urban water is used indoors, and is subsequently routed to local water reclamation plants (WRPs) and then to the Santa Clara River (after treatment). A portion of this water flows downstream out of the basin, and a portion infiltrates to groundwater.

In summary, urbanization has been accompanied by long-term stability in pumping and groundwater levels, plus the addition of imported SWP water to the Valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater that is in storage within the Valley.

Appendix H
WATER STUDY

SOLEDAD VILLAGE
WATER SUPPLY STUDY

Prepared by:

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September 2005

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SOLEDAD VILLAGE WATER SUPPLY STUDY

1. EXISTING CONDITIONS

a. Preface

This report describes the existing water purveyors in the Santa Clarita Valley and their service areas, and summarizes important characteristics applicable to the water service area in the Santa Clarita Valley, which includes the project site. The data found in the report provides an important backdrop to understanding water supplies and demand in the Santa Clarita Valley generally, as well as understanding the Soledad Village project's water demand and supplies. Please see **Figure 1** for an illustration of the existing water reclamation plants and sanitation districts.

The following list identifies all of the documentation that has been relied upon in the preparation of the Water Supply Assessment (WSA). The listed documents are herein incorporated into this report by reference. Copies of the referenced documents are available for review at the City of Santa Clarita.

- 2005 Groundwater Perchlorate Contamination Amendment and Other Amendments, *2000 Urban Water Management Plan*, Castaic Lake Water Agency (CLWA) et al., January, herein cited as "Amended 2000 UWMP";
- *Impact and Response to Perchlorate Contamination, Valencia Water Company Well Q2*, prepared by Luhdorff & Scalmanini Consulting Engineers, April 2005;
- *Santa Clarita Valley Water Report 2004*, May 2005, prepared by Luhdorff and Scalmanini, Consulting Engineers for CLWA, Los Angeles County Waterworks District #36, Newhall County Water District (NCWD), and VWC;
- *Santa Clarita Valley Water Report 2003*, May 2004, prepared by Luhdorff and Scalmanini, Consulting Engineers for CLWA, Los Angeles County Waterworks District #36, Santa Clarita Water Division of CLWA, and VWC;
- *Santa Clarita Valley Water Report 2002*, April 2003, prepared by Luhdorff and Scalmanini, Consulting Engineers for CLWA, Los Angeles County Waterworks District #36, NCWD, and VWC;
- *2001 Update Report, Hydrogeologic Conditions in the Alluvial and Saugus Formation Aquifer Systems*, Richard C. Slade & Associates LLC, July 2002;
- CLWA, Capital Improvement Program (CIP), Kennedy-Jenks Consultants, 2003;
- *The State Water Project Delivery Reliability Report*, Final, California Department of Water Resources (DWR), 2002;

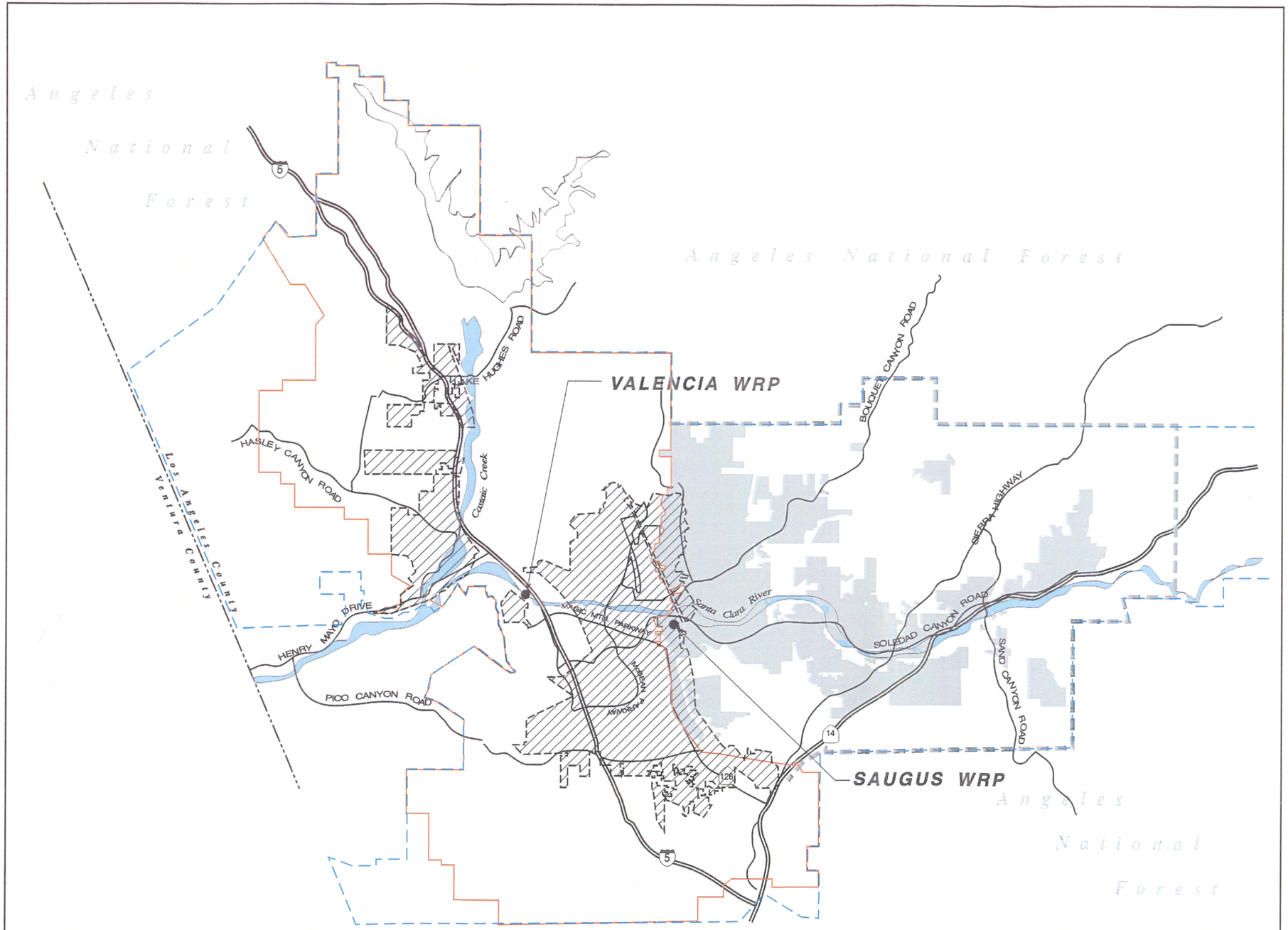
- Water Supply Contract Between the DWR and the CLWA, 1963 (plus amendments, including the "Monterey Amendment," 1995, and Amendment No. 18, 1999, the transfer of 41,000 acre-feet of entitlement from Kern County Water Agency [KCWA] to CLWA);[1]
- 2002 Semitropic Groundwater Storage Program and Point of Delivery Agreement Among the DWR, CLWA and KCWA;[2]
- 2003 Semitropic Groundwater Storage Program;
- *Water Management Program*, VWC, 2001;
- A two-volume report prepared by Richard C. Slade & Associates (Slade) entitled, *Hydrogeologic Investigation of the Perennial Yield and Artificial Recharge Potential of the Alluvial Sediments in the Santa Clarita Valley of Los Angeles County*, California, dated December 1986;
- A two-volume report prepared by Slade entitled, *Hydrogeologic Assessment of the Saugus Formation in the Santa Clarita Valley of Los Angeles County, California*, dated February 1988;
- A technical memorandum prepared by Slade, dated November 16, 2000;
- A letter from Joseph C. Scalmanini, Luhdorff and Scalmanini Consulting Engineers, dated December 15, 2000, regarding review of the groundwater components of the UWMP;
- A report prepared by Slade entitled, *Assessment of the Hydrogeologic Feasibility of Injection and Recovery of Water in the Saugus Formation, Santa Clarita Valley, California*, dated February 2001, including the Technical Appendix by Slade entitled, *Hydrogeologic Conditions in the Saugus Formation, Santa Clarita Valley, California*, February 2001;
- A report prepared by CH2MHILL entitled, *Newhall Ranch ASR Impact Evaluation*, dated February 2001; and
- A report prepared by CH2MHILL entitled, *Newhall Ranch Updated Water Resources Impact Evaluation*, dated September 2002.

Other reports and documents referenced in this report are available at City of Santa Clarita, Department of Community Development, 23920 Valencia Boulevard, Suite 300, Santa Clarita, California. Attention: Jason Mikaelian.

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1 CLWA's contract rights to the SWP water total 95,200 acre-feet per year (AFY), including a water transfer of 41,000 AFY approved in 1999 from Wheeler Ridge-Maricopa Water Storage District (WRMWSD), a member unit of the KCWA. CLWA's Environmental Impact Report prepared in connection with the 41,000 water transfer was challenged in *Friends of the Santa Clara River v. Castaic Lake Water Agency* (Los Angeles Superior Court, Case Number PC018110). On appeal, the Court of Appeal, Second Appellate District, held that since the 41,000 AFY EIR tiered off the Monterey Agreement EIR that was later decertified, CLWA would also have to decertify its EIR as well and prepare a new EIR (*Friends v. Castaic Lake Water Agency* [2002] 95 Cal. App 4th 1373). CLWA has not been enjoined from using any water that is part of the 41,000 AFY transfer. CLWA has since prepared and circulated a new Draft EIR for the transfer. The public comment period ended for the draft EIR and two separate hearings were held by CLWA regarding public comments. CLWA approved and certified the new EIR for the transfer on December 22, 2004. Two challenges to the new EIR were filed on January 24, 2005 in the Ventura County Superior Court (*Planning and Conservation League v. CLWA and California Water Impact Network v. CLWA*). The new certified EIR remains valid unless affected by a future judgment or order of the court.

2 Due to availability of SWP water during 2002, CLWA entered into a groundwater banking agreement in 2002. 24,000 acre-feet of SWP water, contracted by CLWA, were stored within the Semitropic Groundwater Storage Program in Kern County so that CLWA may withdraw the water in future years of shortage. The Negative Declaration prepared by CLWA was challenged in *California Water Network v. Castaic Lake Water Agency* (Ventura County Superior Court Case Number CIV 215327), which held in favor of CLWA. That case is presently on appeal in the Second District Court of Appeal, Sixth Division, Case Number B177978.



LEGEND

- County Sanitation District No. 32 Sphere of Influence Boundary as Adopted by the Local Agency Formation Commission on April 24, 2002
- Projected Service Area for the 2015 Plan
- County Sanitation District No. 26
- County Sanitation District No. 26 Current Sphere of Influence
- County Sanitation District No. 32 *Previous Sphere of Influence*

NOT TO SCALE

Source: Impact Sciences, Inc., 2003

FIGURE **1**

Existing Water Reclamation Plants and Sanitation Districts

b. Existing Water Service Area Characteristics

To understand water supplies and demand in the Santa Clarita Valley, it is important to highlight some of the important local conditions or characteristics of the area. These local conditions affect water demand and supplies in the Santa Clarita Valley and surrounding areas. The report describes local climatic conditions, regional demographics, existing topography and regional area geology and surface water flows in the Santa Clarita Valley and downstream.

In addition, the report briefly summarizes the effects of statewide drought conditions on the Santa Clarita Valley. As explained below, in general, there was minimal impact on the Santa Clarita Valley prior to the 1990–1991 statewide drought conditions. The 1990–1991 statewide drought impacted water supplies in the Santa Clarita Valley; however, on balance, the Santa Clarita Valley responded well to those drought conditions. Since the 1990–1991 drought, the CLWA and the other retail water purveyors have continued to work cooperatively to ensure that water demands are met in response to varying hydrologic conditions and increasing demand from existing and planned growth. This effort includes the decision by the Santa Clarita Valley's water agencies[3] to jointly prepare the Urban Water Management Plan (UWMP). The UWMP describes current and future implementation of water conservation measures (called Water Demand Management Measures) within the CLWA service area (shown on **Figure 3,** which is provided on p. 5.8-6), and it updates the Santa Clarita Valley's Water Shortage Contingency Plan.

(1) Climate

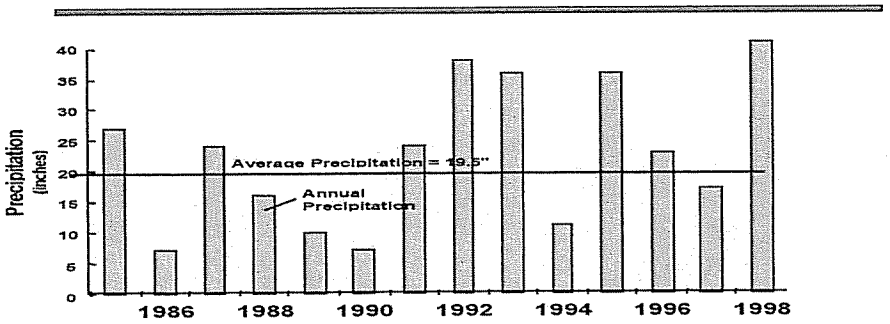
The climate in the Santa Clarita Valley is generally characterized as semi-arid and warm. Summer months are dry with temperatures that can reach as high as 110° F. Winter months are somewhat cool with temperatures that can drop as low as 20° F. Typically, "dry" years (less than 10 inches of rainfall per year) are followed by "wet" years (greater than 20 inches of rainfall per year) in a cyclical pattern. Average rainfall is approximately 18 inches per year in the lower elevations and approximately 27 inches per year in the mountains. The region, including the Santa Clarita Valley, is subject to wide variations in annual precipitation.[4] **Figure 2** illustrates the annual rainfall in the Santa Clarita Valley and graphically depicts the periods with low rainfall.

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3 Los Angeles County Waterworks District 36 is not required to prepare a UWMP because it has less than 3,000 connections and, consequently, did not participate in this effort.

4 See, *Newhall Ranch ASR Impact Evaluation,* prepared by CH2MHILL, February 2001, Section 4.

Figure 2
Rainfall in the Santa Clarita



(2) Regional Demographics

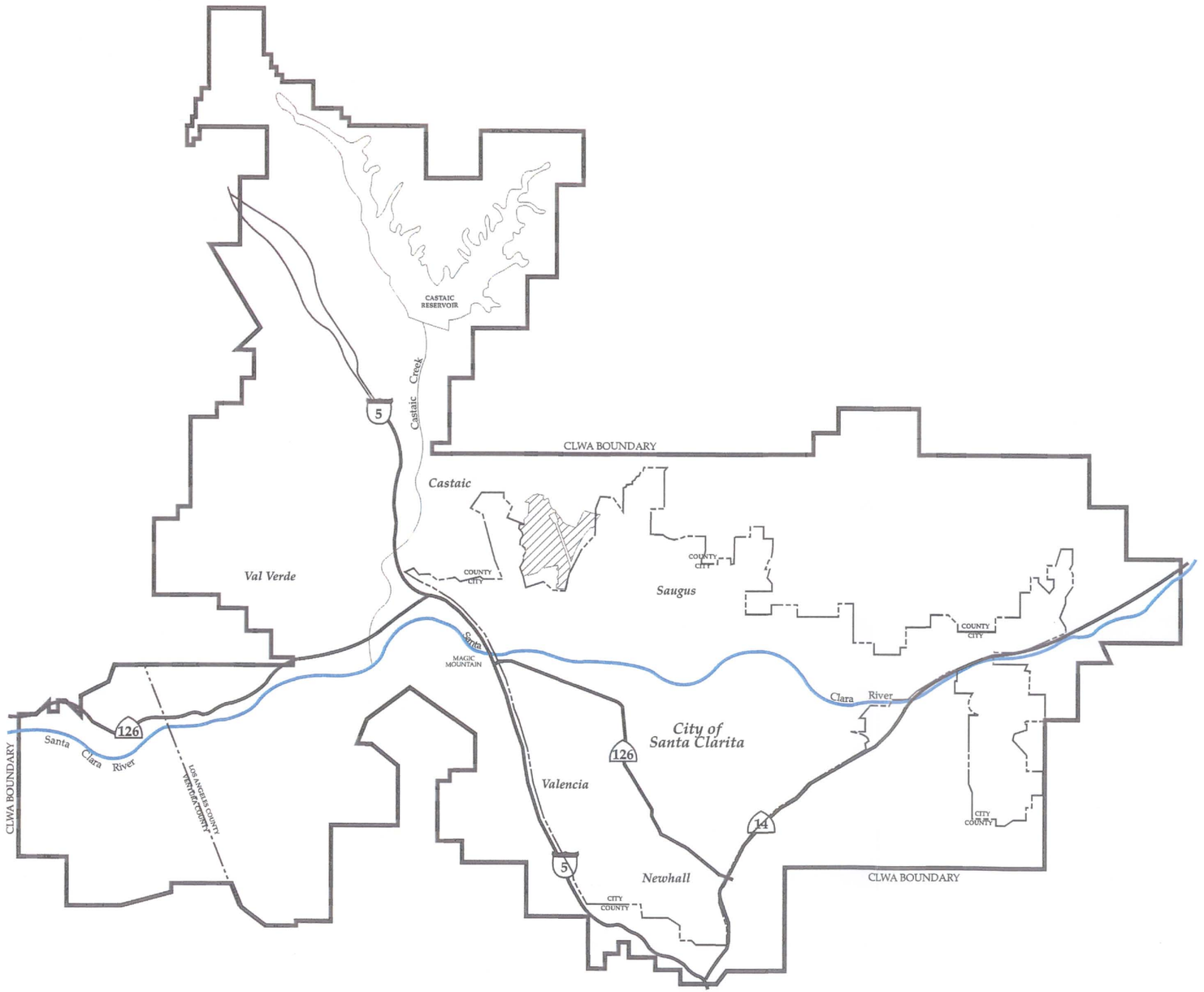
The purveyors provide water service to residential, commercial, and industrial customers within CLWA's service area, including Santa Clarita Valley. Water service is also provided for other uses, such as fire service and utility line cleaning.

CLWA reports that the number of new service connections in its service area increased from 40,734 in 1992 to 64,775 in 2004 (See **Table 1**). The increase in the number of new service connections is an average annual increase of approximately 2,000 new service connections.

Table 1
Historical Number of Service Connections

Service Connections	1992	1994	1996	1998	2000	2002	2004
VWC	14,854	15,703	17,420	19,863	22,000	25,286	28,296
Newhall	6,144	6,294	6,477	6,585	7,200	7,700	9,010
CLWA Santa Clarita Water Division	19,000	19,400	19,650	20,300	22,000	24,175	26,161
LA County #36	736	752	768	774	700	1,060	1,308
Total	**40,734**	**42,149**	**44,315**	**47,522**	**51,900**	**58,221**	**64,775**

Source: CLWA 2000; 2000, 2002 and 2004 Santa Clarita Valley Water Reports.



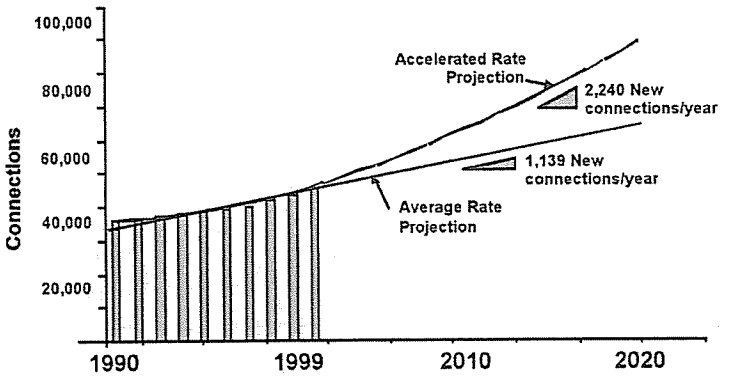
Source: PSOMAS and Associates, 1/99.

FIGURE 3

CLWA Service Area

To determine the future number of service connections in the CLWA service area, CLWA used two different projection techniques. Using an "average rate" regression technique, the number of connections is projected to be about 70,000 in the year 2020. Under the second technique (accelerated rate projection), CLWA projects the connections to be about 96,000 by the year 2020. **Figure 4** depicts the historical and projected number of service connections in the CLWA service area.

Figure 4
Historical and Projected Number of Service Connections



(3) Topography

The CLWA service area encompasses the relatively flat-lying Santa Clarita Valley, the eastern portion of the Santa Clara River Valley and portions of the surrounding hills and mountains. The mountains include the Santa Susana and San Gabriel Mountains to the south and the Sierra Pelona and Leibre-Sawmill Mountains to the north. Elevations range from about 800 feet on the valley floor to about 6,500 feet in the San Gabriel Mountains. The headwaters of the Santa Clara River are at an elevation of about 3,200 feet at the divide separating this hydrologic area (i.e., the Upper Santa Clara River Hydrologic Area) from the Mojave Desert.

The Soledad Village project is located within the Santa Clara River Valley Groundwater Basin, East Subbasin (Basin No. 4-4.07).[5] This area is upstream of the other groundwater basins in the Santa Clara River Valley drainage. The western end of the East Subbasin extends to roughly the Los Angeles County/Ventura County boundary line. The Piru groundwater basin is located to the west in Ventura County. The two groundwater basins are connected through relatively thin alluvial deposits (in the Alluvial aquifer) that overlie relatively impermeable Pico Formation bedrock deposits at this location.

5 DWR Bulletin 118.

Groundwater in the Santa Clarita Valley also discharges to the Santa Clara River, which flows into Ventura County.

(4) Regional Geology

The geology within and adjacent to the CLWA service area consists of relatively thin alluvial deposits (Alluvium) overlying a deeper, relatively thick Saugus Formation in certain areas. **Figure 5** delineates the location of the Alluvium and the Saugus Formation. As discussed in further detail below, both the Alluvium and Saugus Formation contain water-bearing sediments capable of becoming saturated so as to provide water to wells. These water-bearing sediments constitute the local "groundwater reservoir" for the Santa Clarita Valley.[6]

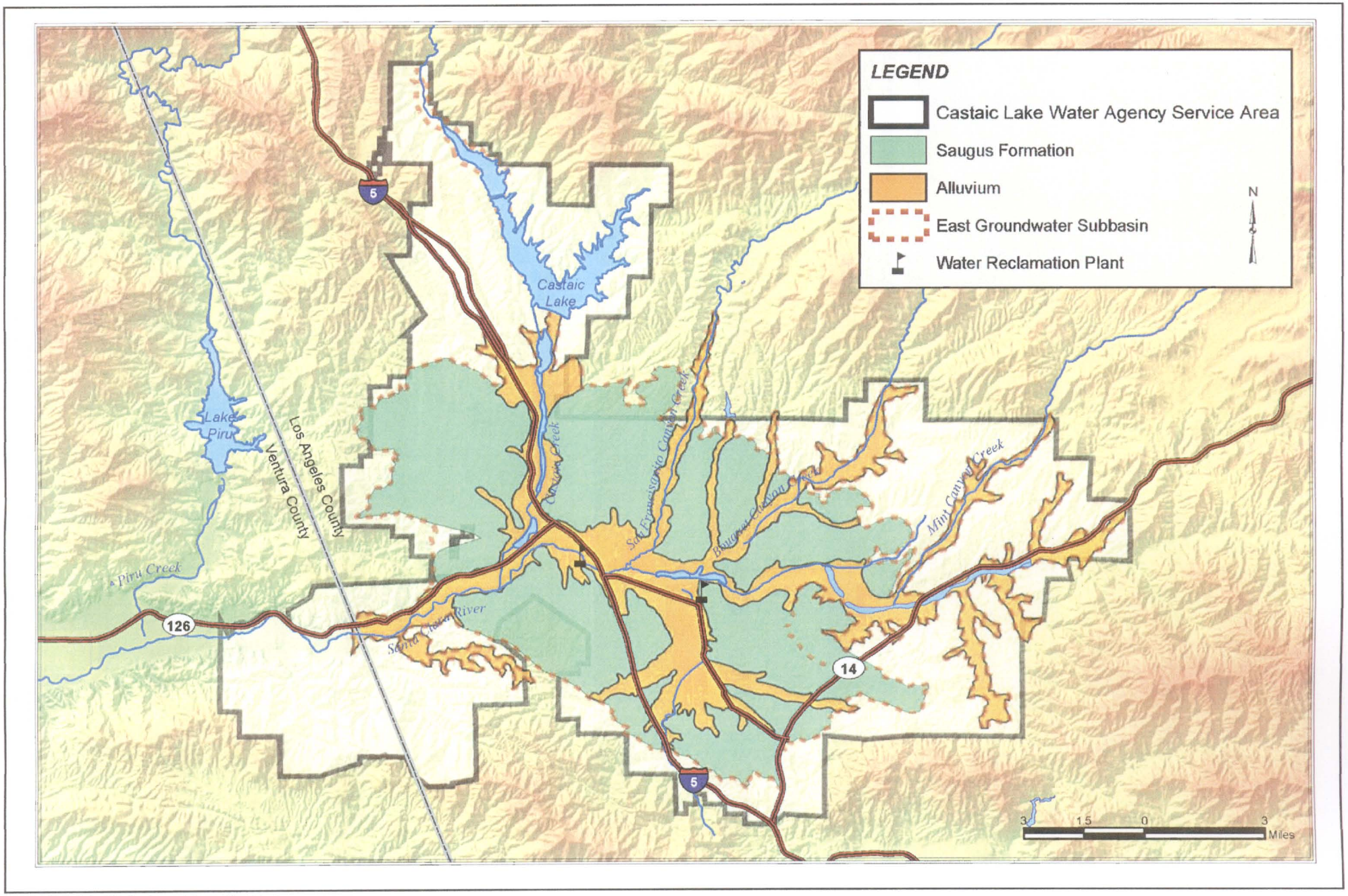
The upper basin, called the Alluvium or Alluvial aquifer, generally underlies the Santa Clarita Valley and side canyons. The main river valley consists of medium-grained sand on the west to cobbly sand in the east. Due to the unconsolidated to poorly consolidated condition of the Alluvium, and its lack of cementation, the Alluvium has relatively high permeability and porosity. The maximum thickness of the Alluvium varies along the Santa Clarita Valley but is generally considered to be 200 feet.

The groundwater is pumped from wells up to 200 feet in depth. The Alluvium is estimated to store over 240,000 acre-feet of water. It has supplied approximately 30,000–40,000 acre-feet per year (AFY) in average/normal years, and 30,000–35,000 AFY in dry years. The annual average groundwater production from the Alluvial aquifer during the 1990s was approximately 33,500 AFY.

Underlying the Alluvium deposits in the main portion of the Santa Clarita Valley is the Saugus Formation. The Saugus Formation consists of unconsolidated to semi-consolidated sandstone and conglomerate materials. Two faults, the active San Gabriel Fault, and the potentially-active Holser Fault, traverse the Santa Clarita Valley. Although maximum thickness of the Saugus Formation is reported to be 8,500 feet, the estimated water-bearing thickness of the formation ranges from 5,500 feet between the San Gabriel Fault and the Holser Fault to 1,500 feet northeast of the San Gabriel Fault. It is estimated that the amount of groundwater in storage in the Saugus Formation is about 1.65 million acre-feet. Of the 1.65 million acre-feet, the area north of the San Gabriel Fault is estimated to contain approximately 130,500 acre-feet, the area between the Holser and San Gabriel Faults is estimated to contain approximately 641,000 acre-feet and the area south of the Holser Fault is estimated to contain approximately 641,000 acre-feet. The Saugus Formation is pumped by wells extending to about 2,000 feet in depth. It has supplied approximately 7,500–15,000 AFY in average/normal years, and 11,000–15,000 AFY in dry years.

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6 This section is based on information from the *Newhall Ranch ASR Impact Evaluation*, prepared by CH2MHILL, February 2001, Sections 3 and 4, and *Hydrogeologic Conditions in the Saugus Formation, Santa Clarita Valley, California*, prepared by Richard C. Slade & Associates, LLC, January 2001.



SOURCE: Luhdorff & Scalmanni Consulting Engineers

FIGURE 5

Location of the Alluvium and Saugus Formation

(5) Hydrology of the Santa Clarita Valley

Most of the CLWA service area is within the Santa Clarita Valley Groundwater Basin, East Subbasin. The primary drainage course in the service area is the Santa Clara River.[7] **Figure 6** depicts the geology and hydrologic cycle in Santa Clarita Valley. **Figure 7** shows the Santa Clara River, East Subbasin, with respect to other groundwater basins downstream of the Specific Plan area. **Figure 8** shows the locations of production wells in the Alluvial aquifer and Saugus Formation.

The Santa Clara River and its tributaries flow generally westward from the Santa Clarita Valley to the Pacific Ocean. The principal tributaries to the Santa Clara River include Mint Canyon, Bouquet Canyon, San Francisquito Canyon and Castaic Creek. Water flow in the canyon areas is ephemeral, and diminishes rapidly after most rainfall events. The local surface water bodies include the Santa Clara River, Bouquet Reservoir and Castaic Lake. Various reaches of the Santa Clara River were listed by EPA in 1999 as impaired due to high concentrations of chloride, nitrogen, nitrates and nitrites, high coliform count and dissolved oxygen.

The sources of surface water in the Santa Clarita Valley include precipitation, irrigation return flows, groundwater discharge, stormwater releases from Castaic Lake and Bouquet Reservoir, and treatment plant discharges to the Santa Clara River from the two existing water reclamation plants (WRPs). Another significant source of surface flow comes from the increased importing of State Water Project (SWP) water supplies by CLWA to its service area.

Since 1980, CLWA has been importing SWP water as a supplemental water source to the retail water purveyors in its service area. The total amount of SWP water delivered to the service area from 1980 through 2002 was 405,062 acre-feet.

In order to evaluate historical and projected surface flow to downstream from imported SWP water in Santa Clarita Valley, an updated technical memorandum was prepared by CH2MHILL (February 2001). The objective of the updated technical memorandum was to estimate the historical and projected flow to downstream due to the importation of SWP water by CLWA and the use of that water in the Santa Clarita Valley.

Based on the updated technical memorandum, imported SWP water is used to meet both residential and non-residential interior and exterior water demands. A portion of the imported SWP water finds its way

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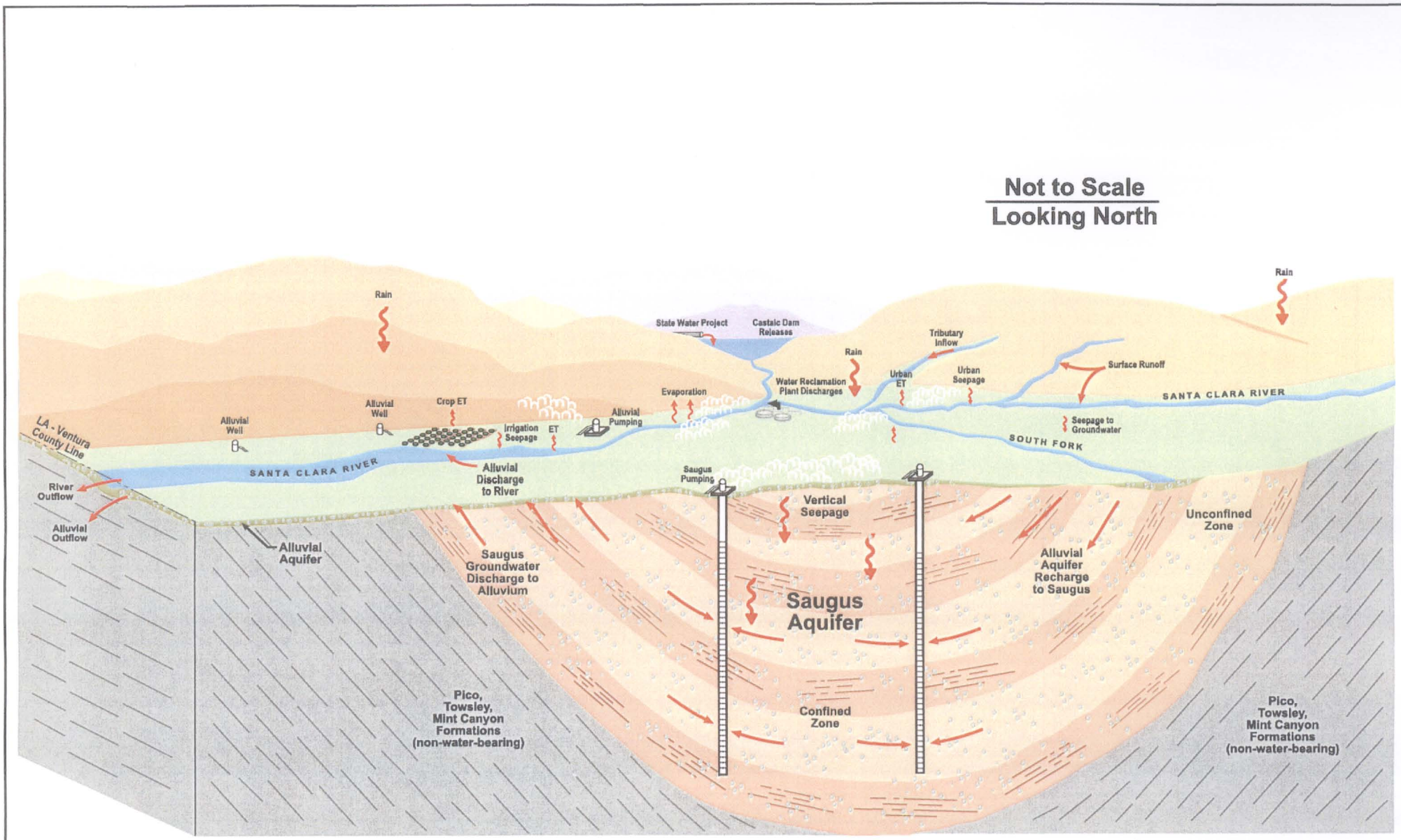
7 The information contained in this section is from *Newhall Ranch ASR Impact Evaluation*, prepared by CH2MHILL, February 2001, and an updated technical memorandum prepared by CH2MHILL.

into the Santa Clara River watersheds where it recharges local aquifers and flows downstream to Ventura County. Stream gage data collected at the County line (USGS Gage No. 11108500) from 1953–1996 demonstrates a 60 percent increase in average annual flow since the importation of SWP water, even during dry years (the annual flow of 17,596 cubic feet per second [cfs] in 1991, a drought year, exceeds the annual average flow prior to importation of 16,479 cfs). The source of this additional flow in the Santa Clara River watershed includes imported SWP water.

The SWP water used to meet residential and non-residential interior water demands ultimately reaches the local existing WRPs in the Santa Clarita Valley. Historically, the treated water has been discharged to the Santa Clara River, where it contributes significantly to the natural surface water and groundwater flows reaching Ventura County. As discussed below, although a significant portion of the imported water used for irrigation is lost through evapotranspiration to the atmosphere, SWP water has significantly increased the flow of surface water and groundwater flows in the Santa Clara River watershed.

Again, the total amount of SWP water delivered to the service area from 1980 through 2002 was 405,062 acre-feet. Based on the updated technical memorandum, it is estimated that approximately 136,544 acre-feet of imported SWP water has been added to the Santa Clara River through return flow and discharges from existing water treatment plants in Santa Clarita Valley. It is estimated that approximately 18,000 AFY enhanced the watershed and flowed downstream to Ventura County in 1999.

In the future, when CLWA takes its full 95,200 AFY allocation of SWP water, CH2MHILL estimates that approximately 22,160 AFY will enhance the watershed and flow to Ventura County (CH2MHILL, 2001). Consequently, similar to other watersheds where water importation has occurred (e.g., Santa Ana River), the flow in the Santa Clara River watershed is, and will continue to be, significantly enhanced by importing SWP water to the watershed. The importing of SWP water, and the use of that water in the CLWA service area, will continue to result in a net benefit in the amount of surface flow into Ventura County.



SOURCE: Impact Sciences, Inc.

FIGURE 6

Geology And Hydrologic Cycle in the Santa Clarita Valley

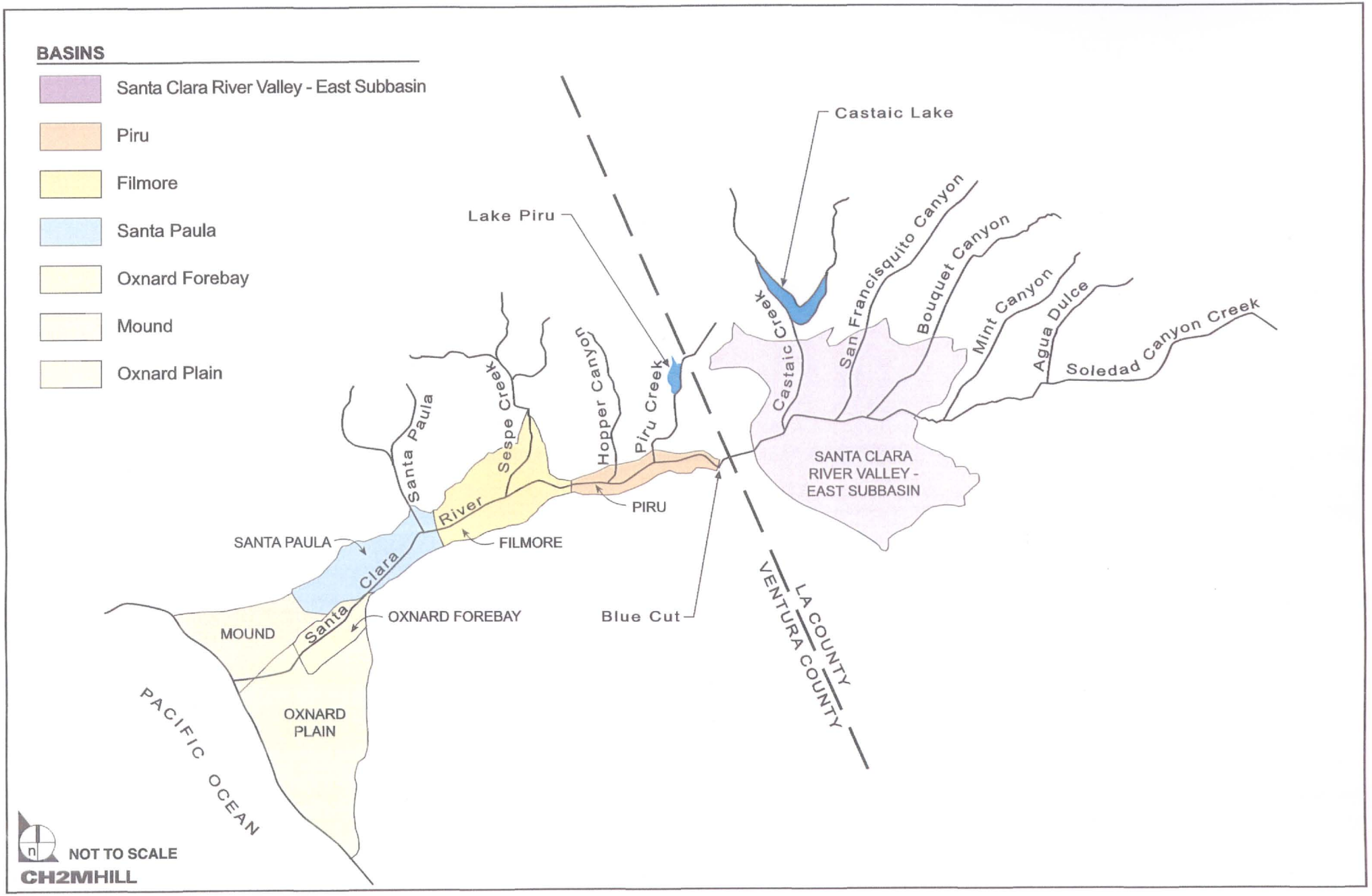
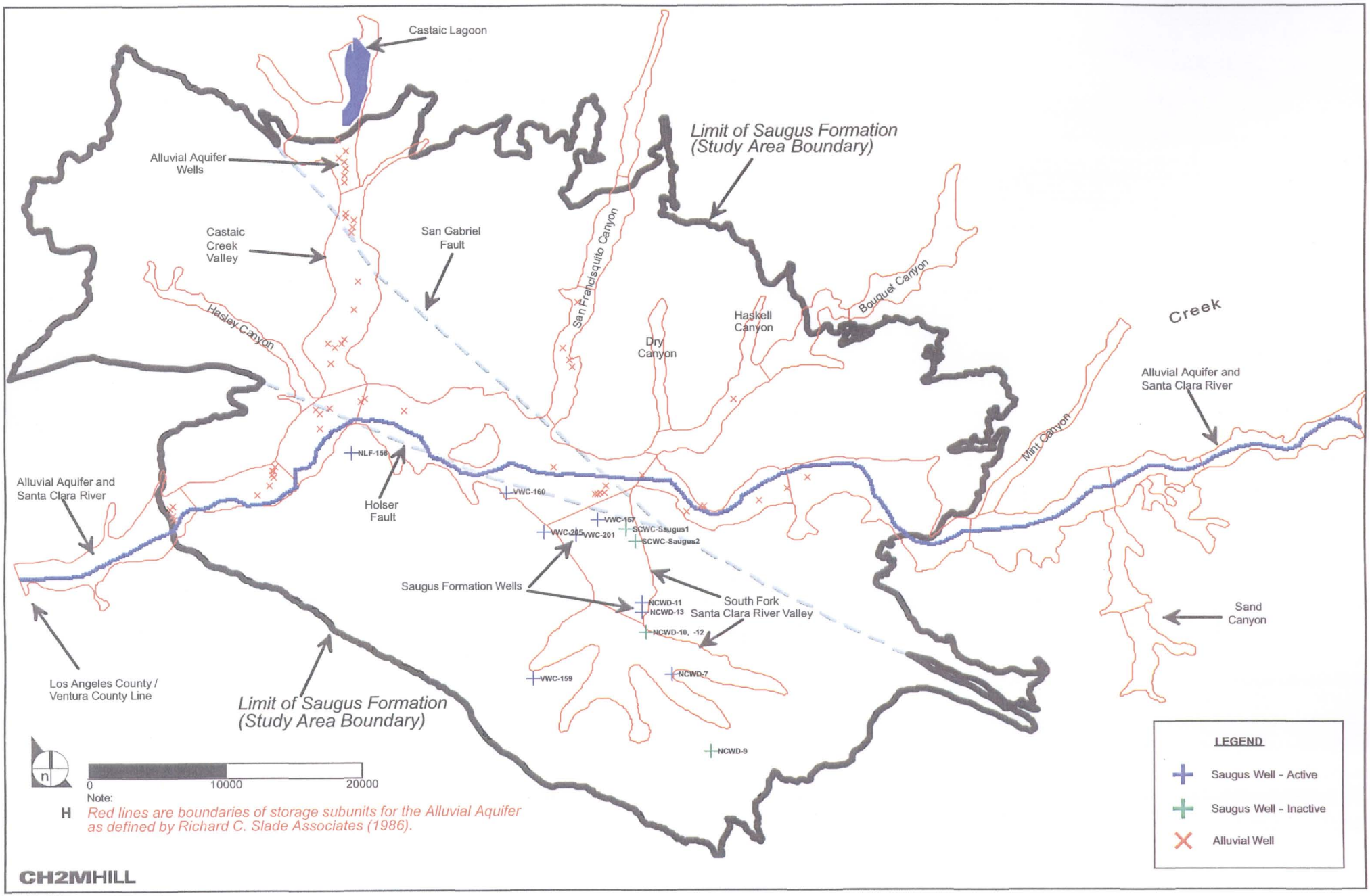


FIGURE 7

Santa Clara River, East Subbasin, with Respect to Other Groundwater Basins Downstream of the Specific Plan Area



CH2MHILL

FIGURE 8

Locations of Production Wells in the Alluvial Aquifer and Saugus Formation

32-47•10/03

(6) Effects of Drought

Drought cycles will affect the project in two ways. First, local droughts in the Santa Clarita Valley historically have resulted in short-term increased water demand, short-term increased groundwater pumping and short-term decreased recharge to the local groundwater system. Second, a statewide drought affects water availability in the SWP system and ultimately deliveries from the SWP system. Droughts have occurred locally in 1947–1950, 1958–1960 and 1990–1991. Recent statewide droughts have occurred in 1976–1977 and 1987–1992.[8] Since the area's water supplies are dependent upon rainfall conditions both locally and statewide, it is important to note that wet and dry year conditions do not generally occur at the same time in Northern and Southern California. As a result, the water purveyors in Santa Clarita Valley are able to adjust the mix of available water resources on a year-to-year basis in response to local and statewide hydrologic conditions.

Prior to 1990–1991, drought conditions statewide had a minimal impact upon the Santa Clarita Valley other than requiring additional water supply to compensate for the lack of spring rainfall for irrigation (e.g., crops, lawns and gardens). In 1990–1991, however, for the first time, statewide drought conditions caused cutbacks in imported SWP supplies in the Santa Clarita Valley. Water production also declined in some wells operating in the shallow, outlying reaches of the Alluvial aquifer. However, because Santa Clarita Water Division's alluvial wells are located in the major water bearing reaches of the aquifer, none of Santa Clarita Water Division's alluvial wells experienced loss of production during 1990–1991 (CLWA acquired the Santa Clarita Water Company, an investor-owned retail water company serving the eastern part of the Santa Clarita Valley. The former Santa Clarita Water Company was incorporated into CLWA's Santa Clarita Water Division, which continues to serve the same area with Santa Clarita Water Company's facilities. Additional details regarding the Santa Clarita Water Division of CLWA is provided below). In addition to the alluvial groundwater supplies, the water purveyors in Santa Clarita Valley pumped more water from the Saugus Formation in 1990–1991, and requested that their customers voluntarily conserve water by 10 percent. Actual water use in the valley decreased more than 10 percent as a direct result of water conservation efforts.

Due to the steps taken by the local purveyors, water demands in the Santa Clarita Valley were met for the duration of the 1990–1991 drought. CLWA also elected not to participate in the state's Drought Water

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8 The 1987–1992 drought was notable for its six-year duration. Statewide reservoir storage was about 40 percent of average by the third year of the drought. The SWP met contractors' delivery requests during the first four years of the drought, but then was forced by declining reservoir storage to reduce deliveries substantially. The SWP terminated deliveries to agricultural contractors and provided about 30 percent of requested urban deliveries in 1991, the single, driest year of the drought. A 1991 Governor's executive order resulted in implementation of a state drought water bank. (Critical Water Shortage Contingency Plan, Governor's Advisory Drought Planning Panel, December 29, 2000.)

Bank because alternate local supplies were available to meet water demands in the Santa Clarita Valley. In addition, members of the Santa Clarita Valley water purveyors signed a Drought Emergency Water Sharing Agreement, agreeing to share water from all sources, and to facilitate beneficial water transfers, exchanges and wheeling arrangements. The purveyors also worked with the City of Santa Clarita and the County of Los Angeles to implement water use ordinances for Santa Clarita Valley residences, review water consumption and supply data and recommend measures to encourage conservation.

Since the 1990–1991 drought, CLWA and the other retail water purveyors have continued to work cooperatively to ensure customer demands are met under varying hydrologic conditions and with overall increasing demands from planned growth. These efforts have included water resource planning activities, acquisition of new water supplies and construction of transmission and treatment facilities, as discussed in further detail below. These efforts include the decision by most of the Santa Clarita Valley's water agencies to jointly prepare the UWMP. The UWMP describes current and future implementation of water conservation measures (called Water Demand Management Measures) within the CLWA service area. These conservation measures are described in Chapter 5.0 of the UWMP. The UWMP also includes an update to the Santa Clarita Valley's Critical Water Shortage Contingency Plan. The updated plan is based on the water agencies' actual experience in addressing water shortages in the Santa Clarita Valley in 1991 (due to the continuation of the 1990–1991 statewide drought) and in 1994 (due to the 1994 Northridge earthquake). The updated plan is described in Chapter 6.0 of the UWMP.

At the state level, significant changes have also occurred in California's water management framework since the last statewide drought of 1987–1992. For further information regarding these statewide changes, please refer to the heading, **Imported SWP Water Supplies; SWP Reliability** and Critical Water Shortage Contingency Plan, Governor's Advisory Drought Planning Panel, December 29, 2000 (Chapter 2).

(7) Effects of Urbanization on Aquifer Recharge in the Santa Clarita Valley

In a groundwater basin, the effect of urbanization on recharge to underlying groundwater is dependent on land uses, water uses, vegetative cover, and geologic conditions. Groundwater recharge from undeveloped lands occurs from precipitation alone, whereas areas that are developed for agricultural or urban land uses receive both precipitation and irrigation of vegetative cover. In an urban area, groundwater recharge occurs directly beneath irrigated lands and in drainages whose bottoms are not paved or cemented. A memorandum prepared by CH2MHILL entitled, *Effect of Urbanization on Aquifer Recharge in the Santa Clarita Valley* (February 22, 2004) discusses the general effects of urbanization on groundwater recharge and the specific effects in the Santa Clarita Valley. The findings of that memorandum are presented below.

In the Santa Clarita Valley, stormwater runoff finds its way to the Santa Clara River and its tributaries, whose channels are predominantly natural and consist of vegetation and coarse-grained sediments (rather than concrete). The stormwater that flows across paved lands in the Santa Clarita Valley is routed to stormwater detention basins and to the river channels, where the porous nature of the sands and gravels forming the streambeds allow for significant infiltration to occur to the underlying groundwater.

Increased urbanization in the valley has resulted in the irrigation of previously undeveloped lands. The effect of irrigation is to maintain higher soil moisture levels during the summer than would exist if no irrigation were occurring. Consequently, a greater percentage of the fall/winter precipitation recharges groundwater beneath irrigated land parcels than beneath undeveloped land parcels. In addition, urbanization in the Santa Clarita Valley has occurred in part because of the importation of SWP water, which began in 1980. SWP water use has increased steadily, reaching nearly 44,500 acre-feet in 2003. Two-thirds of this water is used outdoors, and a portion of this water eventually infiltrates to groundwater. The other one-third is used indoors and is subsequently routed to local WRPs and then to the Santa Clara River (after treatment). A portion of this water flows downstream out of the basin, and a portion infiltrates to groundwater.

Records show that groundwater levels and the amount of groundwater in storage were similar in both the late 1990s and the early 1980s, despite a significant increase in the urbanized area during these two decades. This long-term stability of groundwater levels is attributed in part to the significant volume of natural recharge that occurs in the streambeds, which do not contain paved, urban land areas. On a long-term historical basis, groundwater pumping volumes have not increased due to urbanization, compared with pumping volumes during the 1950s and 1960s when water was used primarily for agriculture. Also, the importation of SWP water is another process that contributes to recharge in the valley. In summary, urbanization has been accompanied by long-term stability in pumping and groundwater levels, plus the addition of imported SWP water to the valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater that is in storage within the valley.

c. Water Purveyors in Santa Clarita Valley and Their Service Areas

(1) Castaic Lake Water Agency

For most residents within the Santa Clarita Valley, domestic water service is provided by four retail water purveyors: Los Angeles County Waterworks District 36, NCWD, Santa Clarita Water Division of CLWA and VWC. However, these four retail water purveyors actually obtain all or a portion of their water supplies from the CLWA.

CLWA was formed in 1962 as a wholesale water agency for the purpose of contracting with the DWR to provide a supplemental supply of imported water from the SWP to serve retail water purveyors in the Santa Clarita Valley.[9] CLWA is one of 29 agencies with long-term water supply contracts with DWR for SWP water.[10] CLWA obtains SWP water from the upper reservoir at Castaic Lake, a storage reservoir of the SWP. CLWA serves the City of Santa Clarita, the unincorporated Santa Clarita Valley in Los Angeles County and portions of Ventura County. CLWA's service area covers approximately 195 square miles. **Figure 3** depicts CLWA's service area (shown previously).

CLWA's physical water delivery system is comprised of facilities needed to treat and convey SWP supplies to the retail water purveyors. The funding for CLWA's expansion, modification, and addition to its current facilities and programs is through its CIP. As part of CLWA's annual budget process, the CIP is reviewed and updated as necessary. An integral part of CLWA's CIP is its capital facilities fee, or development impact fee, which is a source of revenue to fund additional facilities and programs required to accommodate growth within the service area. As part of CLWA's CIP, funding has been established to provide for the purchase of additional imported supplies, implementation of reclaimed water (also referred to as "recycled water") programs and enhancement of groundwater, as well as groundwater banking/conjunctive-use programs both inside and outside the CLWA service area. According to CLWA, implemented over time, these measures will provide assurance that there will be sufficient supplies to meet water demands. Seawater and local brackish water desalination coupled with other contractual water exchanges could also provide the additional water supplies to meet anticipated community needs. It should be noted that desalination water would not likely be delivered to the Santa Clarita Valley. Desalination water would be exchanged for non-desalination water owned by another water agency located nearer to the desalination source. According to CLWA, the priority for implementation of some of these supply approaches will be driven in part by the relative cost. CLWA has also recently prepared a draft document entitled, *Draft Report, Water Supply Reliability Plan,* dated September 2003. As indicated in the *Draft Report, Water Supply Reliability Plan* (also referred to as the Draft Water Supply Reliability Plan), SWP supply is variable due to its dependence on hydrology (i.e., precipitation and snowpack of the present and past years) and, therefore, deliveries can be curtailed. When sufficient SWP water is not available, the balance of the valley's demand is met with local groundwater provided by the Santa Clarita Valley water purveyors. In recognition of the need to evaluate the technical, environmental, and economic issues associated with potential water supply reliability projects, CLWA has developed the long-term Draft Water Supply Reliability Plan. Because available groundwater is limited, it is anticipated that water demands will increasingly rely on SWP

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9 See, California Water Code Appendix Sections 103-1, 103-15.

10 CLWA also provides retail water service through a contract with the Santa Clarita Water Division of CLWA since September 1999.

supplies. As CLWA's water requirements utilize increased proportions of its SWP Table A Amount, water banking opportunities, together with water transfers, water conservation, recycled water, and local aquifer storage and recovery, become important elements of CLWA's long-term water supply strategy and are included in its CIP. In particular, water banking programs are essential to optimizing the use of CLWA's SWP Table A Amount.

The primary objectives of the Draft Water Supply Reliability Plan are to develop a protocol to identify current opportunities, evaluate opportunities using uniform economic criteria, and recommend a water supply reliability plan that focuses CLWA's efforts on the cost effective and beneficial opportunities.

The Draft Water Supply Reliability Plan includes the following primary elements:

- Near-term acquisition of water banking capacity to allow banking of excess SWP water until the selected long-term banks have been developed;
- Acquisition of water banking capacity south of the Tehachapi Mountains to provide reliability for potential SWP conveyance disruptions; and
- Acquisition of water banking capacity north of the Tehachapi Mountains to meet the additional identified water banking requirements not provided south of the Tehachapi Mountains.

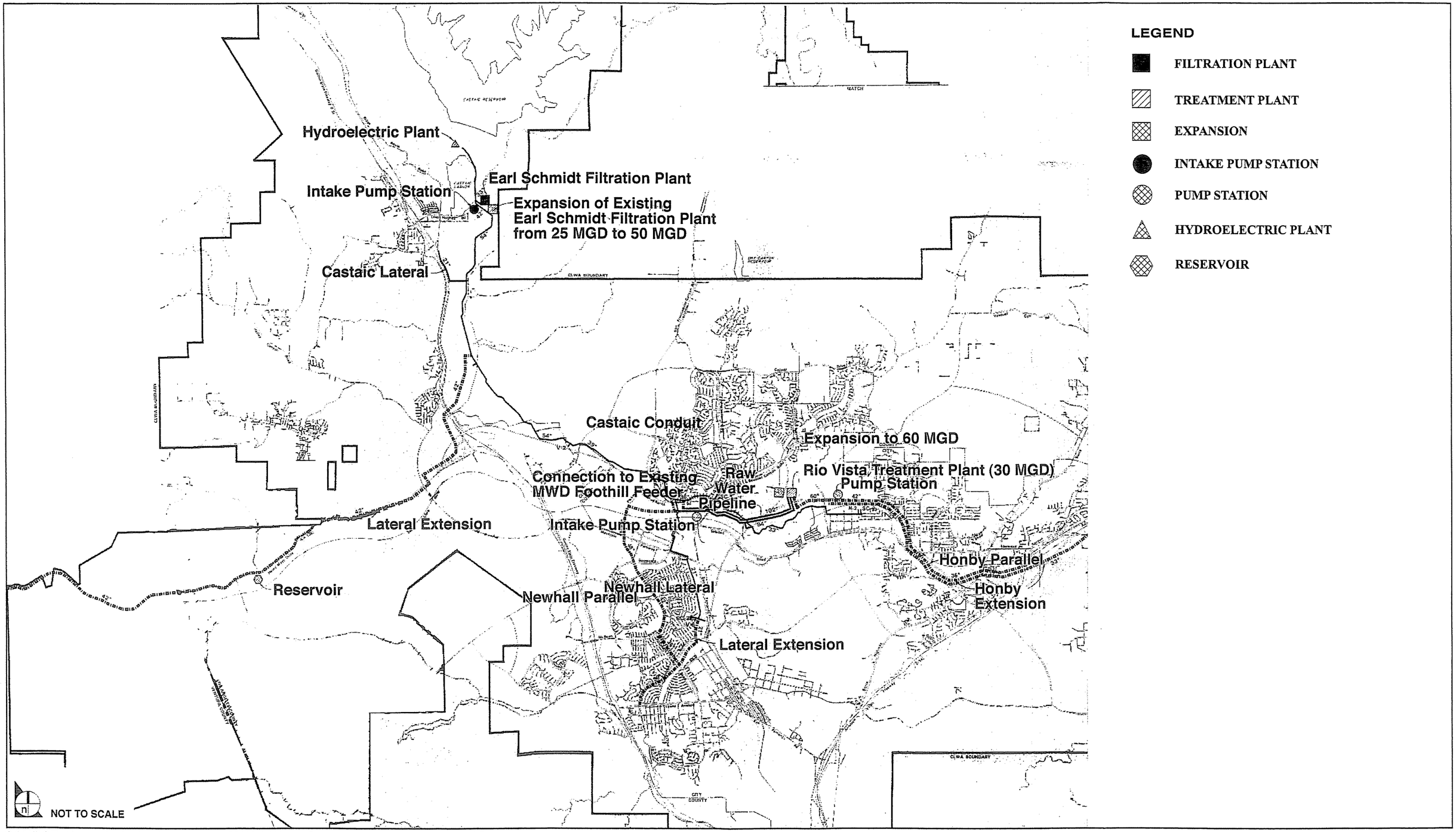
The Draft Water Supply Reliability Plan also includes a discussion of key implementation issues and a recommended implementation plan. The plan recommends that CLWA provide a minimum storage capacity of 50,000 acre-feet by 2005, rising to 183,000 acre-feet by 2050. Recent experience illustrating that CLWA is already participating in such programs comes from the Semitropic Water Storage District (Semitropic) in Kern County. Semitropic is expanding its existing groundwater banking program to include the Stored Water Recovery Unit (SWRU). The SWRU will provide 650,000 acre-feet of additional groundwater storage capacity. CLWA has contracted with Semitropic to participate in this phase of the program. As part of this program, up to 50,000 acre-feet of guaranteed annual recovery capacity could be made available to CLWA immediately. CLWA fulfilled the following accomplishments in order to enhance, preserve, and strengthen the quality and reliability of existing and future supplies:

- Stored 24,000 and 32,522 acre-feet of SWP water in the Semitropic Water Storage District's Groundwater Bank in 2002 and 2003, respectively.
- Continued construction for expansion of the Earl Schmidt Filtration Plant from 33.5 million gallons per day (mgd) to 56 mgd;
- Continued implementation of various water supply programs recommended in the Amended 2000 UWMP;
- Amended the 2000 UWMP to reflect updated information about perchlorate contamination;

- Continued implementation of the water conservation Best Management Practices, as recommended in the UWMP;
- Continued work under the Interim Settlement Agreement toward a possible long-term settlement that will accomplish containment of perchlorate and restoration of perchlorate impacted water supply wells and associated cost recovery;
- Continued cooperative effort with the U.S. Army Corps of Engineers for characterization studies of the former Whittaker-Bermite site and in a task force effort with the City of Santa Clarita, local legislators, and state agencies to affect the cleanup and remediation of all aspects of the former Whittaker-Bermite site, including the perchlorate groundwater contamination;
- Obtained $700,000 in federal funding for continued analysis of perchlorate contamination and $500,000 for expansion of recycled water system;
- Continued recycled water service.
- Adopted in September 2005 a Mitigated Negative Declaration for the Groundwater Containment, Treatment and Restoration Project.

CLWA's existing water delivery system is presented in **Figure 9**. As shown in that figure, CLWA owns and operates two water filtration plants, the ESFP, with a current water capacity of 33.5 mgd, and the Rio Vista Water Treatment Plant (RVWTP), with a water capacity of 30 mgd. The two plants have a current capacity to treat a total of 63.5 mgd. These plants were designed to accommodate expansion as required. CLWA has nearly completed construction of the ESFP expansion to increase the plant's treatment capacity to a total of approximately 56 mgd. Construction of the treatment plant expansion began in August 2003 and is scheduled to be on-line in 2005. CLWA also owns and operates an intake pump station at the ESFP, a pump station at the RVWTP, major water transmission lines, and storage tanks and reservoirs. CLWA has also begun the design and environmental review process for expanding the capacity of the RVWTP from 30 mgd to 60 mgd.

CLWA treats the SWP water at its two water filtration plants and then distributes the water to the local retail water purveyors in the Santa Clarita Valley. From CLWA's two existing plants, the treated SWP water is delivered by gravity to the retail water purveyors through CLWA's distribution network of pipelines and turnouts. Local water retailers, such as CLWA's Santa Clarita Water Division, combine SWP water with groundwater from their own municipal supply wells in the Alluvial aquifer and Saugus Formation to meet water demand within their respective service areas. The actual mix between SWP and groundwater distributed by the water retailers to their respective service areas is variable over time and is based upon availability and operational and cost considerations.



SOURCE: Kennedy Jenks Consultants, "CLWA Water System Master Plan", May 1995

FIGURE 9

CLWA Water Delivery System

CLWA's current total maximum contracted water allocation of SWP water is 95,200 AFY.[11] Of that amount, CLWA obtained 41,000 AFY from KCWA, through its member district Wheeler Ridge-Maricopa Water Storage District (WRMSD), pursuant to a March 1999 water transfer agreement. CLWA analyzed the potential environmental impacts of the water transfer in a Final EIR entitled, Supplemental Water Project Environmental Impact Report, dated February 1999 (SCH No. 98041127) (the CLWA EIR). A project opponent filed a petition for Writ of Mandate in April 1999, challenging the adequacy of the CLWA EIR under CEQA. The trial court rejected the petition, finding that the CLWA EIR complied with CEQA, and the petitioner appealed.

In a decision issued in January 2002, the appellate court reversed the trial court's judgment but not on any of the specific grounds urged by the petitioner. Rather, the appellate court found that, since the appeal had been filed, another EIR, which studied the environmental effects of the Monterey Agreement (the Monterey Agreement EIR), had been ordered decertified (detailed information regarding the Monterey Agreement is provided in the heading below entitled, **Imported SWP Water Supplies**. Because it found that the CLWA EIR had "tiered" on the now-decertified Monterey Agreement EIR, the appellate court held that the CLWA EIR also must be decertified. Notably, the appellate court found that, were it not for the intervening decertification of the Monterey Agreement EIR, it "...would have affirmed [the trial court's] judgment." See, *Friends of the Santa Clara River v. Castaic Lake Water Agency* (2002) 95 Cal.App.4th 1373, 1387.

Importantly, although the appellate court ordered the CLWA EIR decertified, it did *not* order CLWA to void its approval of the water transfer agreement itself. Instead, the appellate court remanded the matter to the trial court for further proceedings concerning the remedy, stating that the trial court was in a "better position" than the appellate court to make the factual determinations necessary to devise an appropriate remedy. (Id. at 1388.)

The trial court held a hearing on September 24, 2002, to hear argument on whether the water transfer agreement should be allowed to remain intact while CLWA completes a new EIR. As directed by the appellate court, the trial court ordered CLWA to vacate its certification of the CLWA EIR. However, the trial court did not order CLWA to vacate its approval of the water transfer agreement itself. Rather, the court ruled that CLWA may utilize and rely on the 41,000 AFY. The trial court allowed that the petitioner may renew its application for a prohibition on CLWA's use of the 41,000 AFY if the petitioner could provide evidence that CLWA is actually using the additional entitlement for purposes the petitioner

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11 An acre-foot represents 43,560 cubic feet, or 325,850 gallons, of water. An acre-foot of water has been generally defined as "an irrigation-based measurement equaling the quantity of water required to cover an acre of land to a depth of one foot." See, *Brydon v. East Bay Mun. Utility Dist.* (1994) 24 Cal.App.4th 178, 182, fn. 1.

considers improper. In December 2004, CLWA certified a new EIR for the water transfer agreement. Certification of that document is presently the subject of a legal challenge.

(2) Retail Water Purveyor Service Areas

CLWA and the four retail water purveyors provide water to most residents of the Santa Clarita Valley. A description of the service areas of the local retail purveyors is provided below.

The Los Angeles County Waterworks District 36 service area encompasses approximately 7,635 acres in the Hasley Canyon area and the unincorporated community of Val Verde. The district obtains its full water supply from CLWA turnouts. The district presently has no operating groundwater extraction facilities.

The Newhall County Water District service area lies within four distinct geographical areas of the Santa Clarita Valley: Newhall, Pinetree, Tesoro Del Valle, and Castaic. The district's service connections are located over a 34-square-mile area. The district's water supplies are obtained from groundwater wells and SWP water from CLWA turnouts.

CLWA's Santa Clarita Water Division service area includes portions of the City of Santa Clarita, including the proposed project site, and unincorporated portions of Los Angeles County in the communities of Saugus, Canyon Country and Newhall. Santa Clarita Water Division is expected to be the retail water purveyor for the project.

In September 1999, CLWA acquired the Santa Clarita Water Company, an investor-owned retail water company serving the eastern part of the Santa Clarita Valley.[12] The former Santa Clarita Water Company was incorporated into CLWA's Santa Clarita Water Division, which continues to serve the same area with Santa Clarita Water Company's facilities. **Figure 10** illustrates the service area of the Santa Clarita Water Division.

As build out of the project proceeds over time, the tentative subdivision map would require preliminary and final water plans for review and approval by the Santa Clarita Water Division. The plans would

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12 CLWA acquired 100 percent of the capital stock in Santa Clarita Water Company by way of a judgment in eminent domain in Los Angeles County Superior Court Case Number BC 215065, entered on September 2, 1999. Subsequently, CLWA's authority to own the Santa Clarita Water Company and to provide retail water service through the former assets of the Company has been challenged in *Klajic v. Castaic Lake Water Agency* (California Court of Appeal, 2nd Dist, Case Number B161069). In addition, the public agency borrowing undertaken by CLWA to finance the acquisition of the Santa Clarita Water Company has been challenged in *Plambeck v. Stone and Youngberg* (LASC Case No. BC249168). The cases are currently pending, but neither case seeks relief affecting the availability of water to Santa Clarita Water Company, Santa Clarita Water Division or CLWA.

indicate anticipated water demand, required water storage facilities, booster pump stations, and on-site and off-site piping needed for adequate domestic and fire water flow pressure to the site. The company's water supplies are obtained from groundwater wells and SWP water from CLWA turnouts.

The Valencia Water Company service area serves a portion of the City of Santa Clarita and the unincorporated communities of Castaic, Newhall, Saugus, Stevenson Ranch and Valencia in Los Angeles County. VWC's service area is approximately 25 square miles. VWC's water supplies are obtained from groundwater wells and SWP water from CLWA turnouts. **Figure 11** illustrates the respective service areas of CLWA and the four retail water purveyors in the Santa Clarita Valley.

As of 2002, the four retail water purveyors service over 58,000 connections in the Santa Clarita Valley. The specific breakdown by purveyor is provided in **Table 2.**

Table 2
Santa Clarita Valley Retail Water Purveyors

Purveyor	Connections
Los Angeles County Waterworks District 36	1,308
NCWD	9,010
CLWA Santa Clarita Water Division	26,161
VWC	28,296
Total	**64,775**

Source: 2004 Santa Clarita Valley Water Report.

(3) CLWA's Allocation of Imported Water Supplies

CLWA's fixed-percentage allocation to retail purveyors is based on a "first-come, first-served" allocation method. CLWA distributes imported water supplies among "water service areas" established by CLWA on a basis that allows imported water to be delivered to these areas where it is needed. CLWA's current allocation system, defined by Section 103-29.5 of CLWA's governing act as interpreted by CLWA, is based on the collection of developer impact fees paid by new development and other contributions collected within each "water service area." Under CLWA's allocation method, water supplies available to CLWA are allocated among the CLWA-defined "water service areas" based on the payment of developer impact fees, property taxes, and other contributions that fund CLWA's Capital Program. Historically, however, CLWA has not been required to allocate imported water supplies to the retail water purveyors, because the available supply of imported water has been sufficient to meet all purveyor requests. Even in the extreme drought year, 1991, no allocation was necessary, because the four retail purveyors entered into a water sharing agreement by which the purveyors shared all available water supplies and, with the help

of significant conservation, were able to meet all water demand in the Santa Clarita Valley. Accordingly, absent the need for an allocation during times of limited supply under CLWA's method, CLWA supplies are delivered to retail water purveyors on a first-come, first-served basis. However, should CLWA need to allocate water resources, Santa Clarita Water Division's allocation would likely increase due to the increased amount of connection fees paid to CLWA.

In light of CLWA's allocation method, Santa Clarita Water Division expects that its share of water supplies from CLWA is expected to increase for the following reasons: (a) Santa Clarita Water Division's "water service area" includes significant amounts of existing and planned development; (b) water supplies are now allocated among CLWA-defined "water service areas," and Santa Clarita Water Division's "water service area" significantly contributes to the funding of the CIP; and (c) water supplies are delivered by CLWA to the purveyors, including the Santa Clarita Water Division, on a first-come, first-served basis. Accordingly, SWP water supplies in the Santa Clarita Valley are evaluated on a valley-wide basis, rather than on individual percentage allocations to retail purveyors.

(4) Santa Clarita Valley Water Purveyors

The wholesale and retail water purveyors in Santa Clarita Valley meet regularly as a technical group to coordinate the water resources of the valley. The group has been commonly known as the Santa Clarita Valley purveyors (purveyors). One of the highest priorities of this group is to provide an adequate water supply for the CLWA service area, safeguard existing water resources and develop both short-term and long-range plans for the efficient use of water in the Santa Clarita Valley.

Over the years, the purveyors have documented the availability of water resources in the region, assessed the condition of the local groundwater aquifers and their hydrogeologic character and reviewed aquifer storage capacity and the perennial yield and recharge rate of the aquifers. The purveyors have also studied the potential for conjunctive use of both groundwater and imported water resources. In addition, the purveyors continue to monitor water quality, including plans for the treatment of water to maintain good quality water for use in the Santa Clarita Valley.

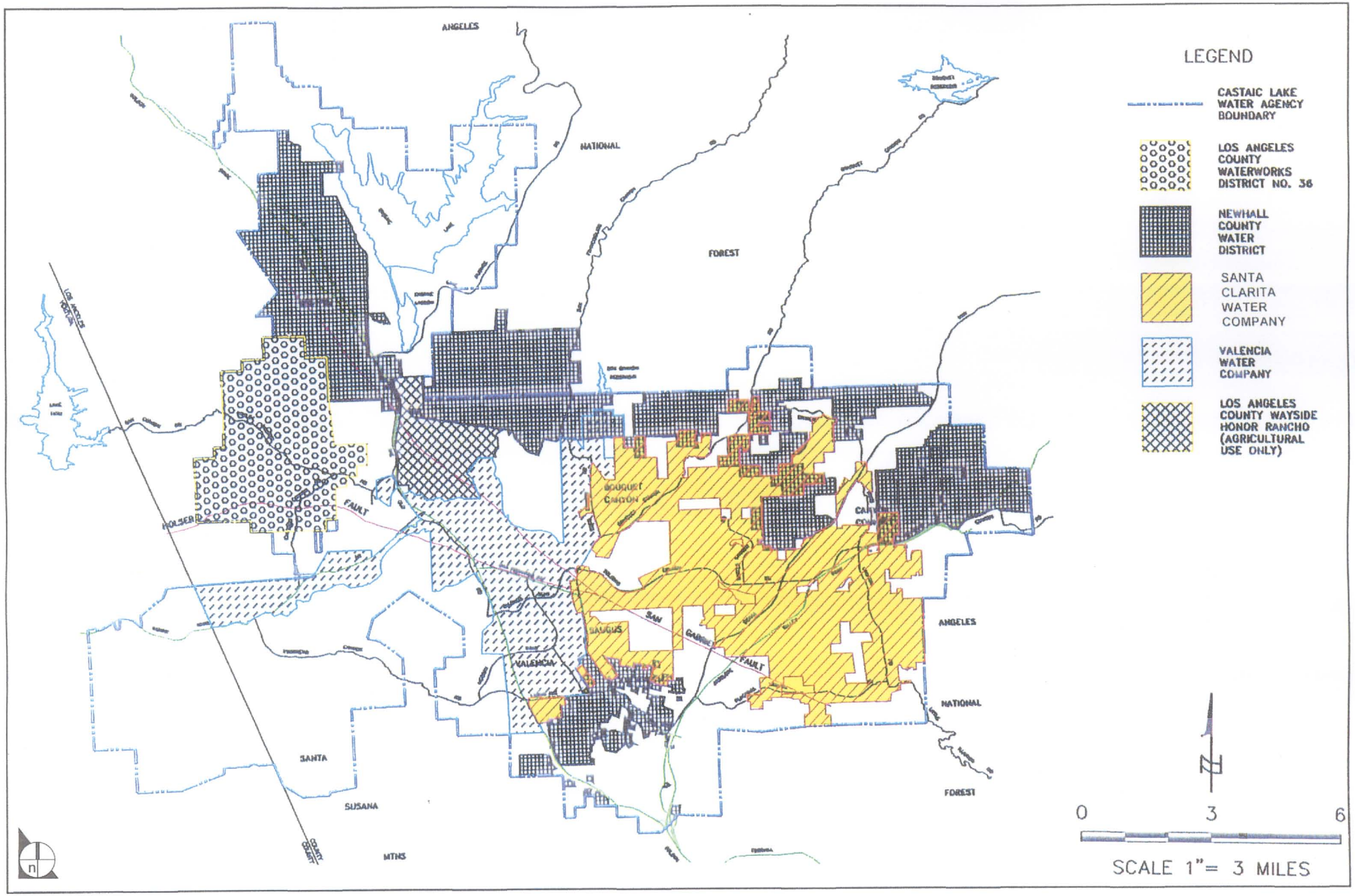


FIGURE **10**

Santa Clarita Water Division Service Area

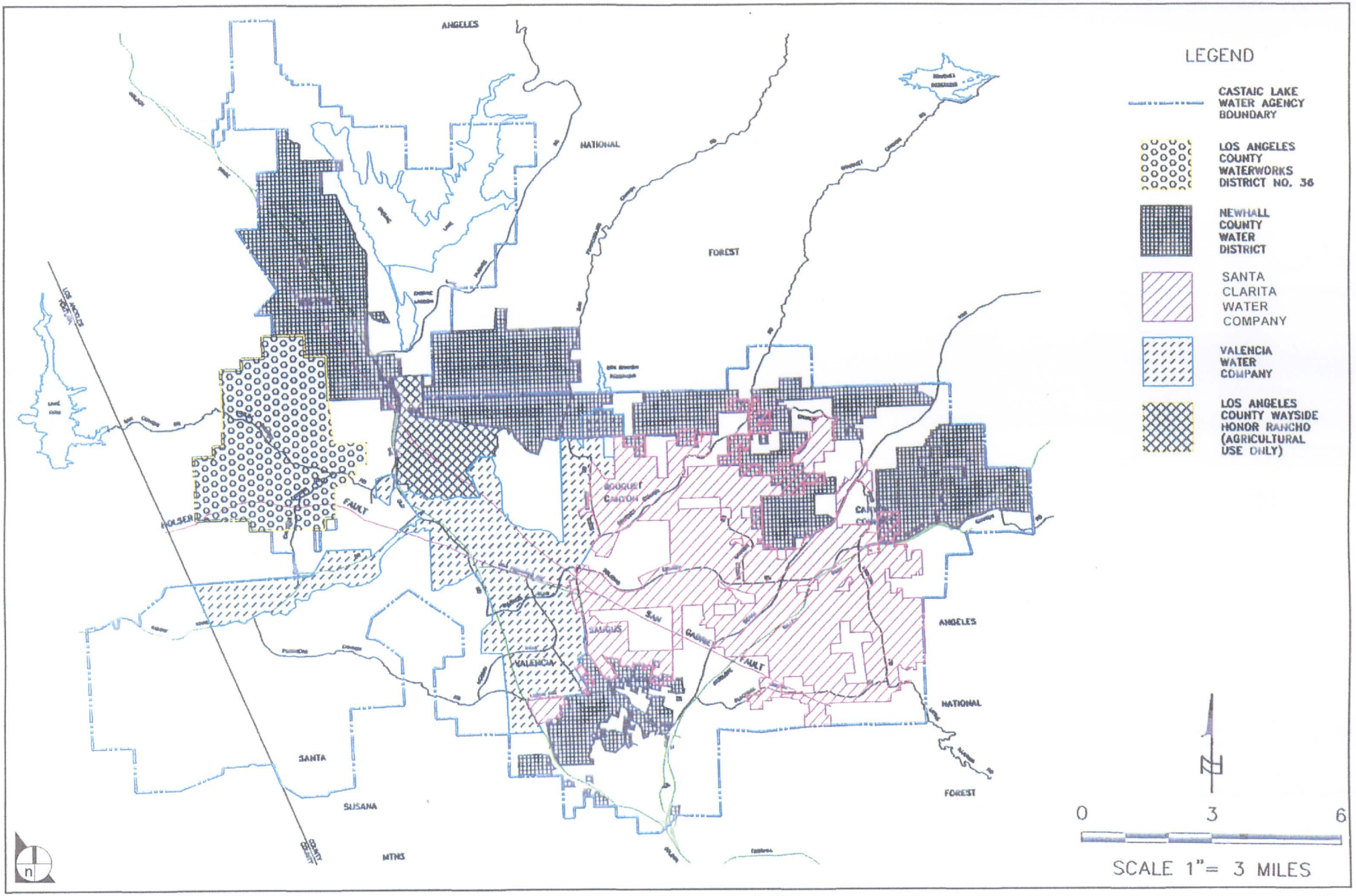


FIGURE **11**

Water Service Area for All SCV Purveyors

Other cooperative efforts of the purveyors have included development of drought contingency plans, evaluation of landfill impacts on the groundwater basin, coordination of emergency response procedures and implementation of valley-wide conservation programs. In 1985, the purveyors prepared the area's first UWMP. In 1998, the purveyors participated with CLWA in the preparation of a *Draft Integrated Water Resources Plan* (IWRP), which assessed the existing and long-term water supply and demand of the Santa Clarita Valley. In addition to identifying the range of water demands and supplies, the IWRP addressed opportunities to improve water supply reliability for the Santa Clarita Valley. The plan suggested a phased approach toward development of the supplies needed to meet projected demands. This approach combined additional acquisition of imported water, water conservation, surface and groundwater storage, water transfers and exchanges and water reclamation in an integrated strategy designed to meet increasing water demands while assuring a reasonable degree of supply reliability.

In years 1998 through 2005, the purveyors prepared annual water reports (also referred to as "water reports") providing information about the local water supplies and water demands in Santa Clarita Valley. The information presented in the water reports is intended to supplement information already required by the County's Development Monitoring System (DMS). The DMS is used by both the County and the City of Santa Clarita to track development activity in the Santa Clarita Valley, and it requires that adequate water supplies be in place prior to development taking place. The information presented in the water reports is used by the County and City of Santa Clarita in connection with future land use decisions in the Santa Clarita Valley in general.

In addition, in December 2000, the Santa Clarita Valley's water agencies jointly sponsored preparation of the 2000 UWMP. The UWMP covers the CLWA service area, which includes the service areas of the four retail water purveyors. The UWMP presents information about the water supply, water demand, water reclamation (also referred to as "water recycling"), water conservation and reliability planning in the CLWA service area over a 20-year time frame. Consultants with expertise in water resource management were retained to assist CLWA and retail water purveyors in preparing the UWMP.

In April 2001, opponents of the UWMP filed a lawsuit against CLWA and the retail water purveyors challenging the adequacy of the UWMP under the Urban Water Management Planning Act and the Public Trust doctrine. In *County of Ventura v. Castaic Lake Water Agency*, (Kern County Superior Court Case No. 245365-RJO), the validity and sufficiency of the regional 2000 UWMP prepared by VWC, CLWA and NCWD was challenged. The Court of Appeal issued a decision which focused on the 2000 UWMP's discussion regarding perchlorate contamination as it relates to groundwater supplies and concluded that the 2000 UWMP must have a discussion as to the time needed to implement the method for treating the affected groundwater as well as a discussion as to the reliability of groundwater during the treatment

period. The decision also required the trial court to vacate the approval of the 2000 UWMP. The information and conclusions provided herein rely upon the Amended 2000 UWMP and also incorporate additional information related to water supply. A copy of the Amended 2000 UWMP is included in **Appendix A** to this report.

In response to the court decision, CLWA and the retail water purveyors in the Santa Clarita Valley directed the joint preparation and completion of the "Groundwater Perchlorate Contamination Amendment and Other Amendments" (Amendment) to the 2000 UWMP. CLWA and the Santa Clarita Valley local retail water purveyors (Santa Clarita Water Division of CLWA, NCWD and VWC) readopted, as amended, the 2000 UWMP after a public hearing held on January 24, 2005. The Amendment provides information responsive to, and consistent with, both the Court of Appeal's decision and the UWMP Act. The focus of the Amendment is on updating the significant progress made by CLWA, the local water purveyors and others, in responding to the perchlorate-contaminated groundwater in portions of the Saugus Formation and Alluvial aquifer, the two aquifer systems that comprise the local Santa Clara River Valley East Groundwater Subbasin. This subbasin is the source of the local groundwater used to meet portions of the Santa Clarita Valley's potable water supply.

A summary of the Amendment to the 2000 UWMP is presented below.[13]

2. GROUNDWATER PERCHLORATE CONTAMINATION AMENDMENT AND OTHER AMENDMENTS

a. Introduction

The Amendment to the 2000 UWMP was prepared by CLWA and Santa Clarita Valley retail water purveyors to revise or replace selected sections of the 2000 UWMP in response to the recent court decision, which concluded that the 2000 UWMP did not fully meet the requirements of the UWMP Act. The Amendment, which has been independently reviewed by City staff, addresses the time needed to implement perchlorate treatment, and describes the reliability of the groundwater supply during treatment implementation. The Amendment was the subject of a noticed public hearing at CLWA on January 24, 2005.

13 For a copy of the Amendment to the 2000 UWMP, please see **Appendix A** to this study.

b. Background and Summary of Amendment Findings

In all cases (near-term operation and long-term operation scenarios for all hydrologic conditions) total existing supply will be sufficient to meet projected demand for the Soledad Village project and the Santa Clarita Valley as a whole, and the conclusions reached in the Soledad Village regarding water supply and demand remain unchanged. The water purveyors' treatment plan for perchlorate is scheduled to come on line in 2006, at which time treated well water would become available. In the near term, the treatment plan projects that the impacted water will remain unavailable through 2006, and, during that time, the non-impacted groundwater and other available supplies will be sufficient to meet near-term supply water requirements of the Santa Clarita Valley. After treatment, the total groundwater capacity will be sufficient to meet the normal and dry year conditions as provided in the long-term operating plan for groundwater supply. Before plan completion, issuance of a permit by the DHS will be required to verify that water is considered potable and safe for delivery to customers.

The Amendment focuses on the following:

- Restoring the impacted water supply capacity in the perchlorate-contaminated wells;
- Controlling the movement of perchlorate-contaminated groundwater and protecting other municipal supply wells;
- Selecting treatment methods;
- Restoring the perchlorate-impacted groundwater to safe drinking water standards; and
- Analyzing the reliability of the local groundwater supplies, both during the interim of the containment treatment period (2006) and through the 20-year planning horizon of the 2000 UWMP.

As indicated above, the Amendment determines that, in all cases (near-term operation and long-term operation scenarios for all hydrologic conditions), total existing supply will be sufficient to meet projected demand.

c. Alluvial Aquifer

Reliability of Aquifer: According to the Amendment to the 2000 UWMP, existing active wells operating in the Alluvial aquifer have a full-time source capacity of nearly 56,000 AFY, based on the pumping capacity from wells not contaminated by perchlorate. This is confirmed to be more than sufficient to meet the total planned Alluvial pumping of 30,000–40,000 AFY, which includes the planned municipal

use of Alluvial groundwater (20,000–25,000 AFY), as reported in the *2003 Santa Clarita Valley Water Report*.[14]

Treatment and Protection of Alluvial Aquifer Water: According to the Amendment, the plan for integrated control of contamination migration and restoration of impacted pumping well capacity is mainly focused on stopping migration of perchlorate at the source in the northern Alluvium. At present, one municipal supply well has been removed from service due to the detection of perchlorate. On-going monitoring of the active Alluvial municipal wells located near the Whittaker-Bermite property has shown no detection of perchlorate. However, the proximity to other impacted private Alluvial wells in the Whittaker-Bermite site and prevailing groundwater flow prompted the Amendment to include provisions to respond to Alluvial perchlorate contamination, should it occur.

d. Saugus Formation

Reliability of the Formation: According to the Amendment, existing active wells operating in the Saugus Formation presently have a full-time source capacity of about 24,000 AFY, based on the combined pumping capacity from active wells not contaminated by perchlorate. This is confirmed to be more than sufficient to meet the total planned use in normal years of 7,500–15,000 AFY, as reported in the *2003 Santa Clarita Valley Water Report*. Combined with other available sources, it is more than sufficient to meet water demands through the currently scheduled time frame for restoration of impacted Saugus capacity.

Treatment and Protection of Saugus Formation Water: According to the Amendment, the program and schedule for the plan to restore impacted capacity and control migration of perchlorate calls for completion in 2006.

The Amendment also confirms that, between now and completion in 2006, a groundwater flow model was used to determine whether existing active Saugus wells were likely to be contaminated by perchlorate migration prior to treatment and contamination control measures. The model determined that in order to assure that perchlorate contamination did not affect active Saugus wells during the interim period, an overall operating plan would allow currently active downgradient Saugus wells to remain active on a generally low planned pumping schedule. Once treatment has restored capacity, normal planned operations for utilizing groundwater from the Saugus Formation would resume.

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14 The *2003 Santa Clarita Valley Water Report*.

e. Groundwater Contamination Treatment Plan

According to the Amendment, during the planning for remediation of perchlorate and restoration of impacted well capacity, imported water from CLWA and non-impacted groundwater production facilities will offset quantities of water otherwise projected to be available from the Alluvial and Saugus wells. The state Department of Toxic Substance Control (DTSC) will oversee on-site investigations and clean-up activities. The first objective of the remediation plan is to control subsurface flow and protect downgradient wells. The second objective is restoration of some or all contaminated water supplies.

The Amendment notes that the treatment program is expected to be online by the end of 2006. The treatment plan projects that the impacted water will remain unavailable through 2006, during which time the non-impacted groundwater supply and other available supplies will be sufficient to meet near-term water requirements. Afterward, the total groundwater capacity will be sufficient to meet the normal and dry year conditions as provided in the long-term operating plan for groundwater supply. Before plan completion, issuance of a permit by DHS will be required to verify that water is considered potable and safe for delivery to customers.

f. Reliability Assessment

The Amendment states that the reliability analysis prepared by CH2MHILL of production wells located near the Whittaker-Bermite property considers the impact on water supply operations while the planning, design and construction of treatment and other restoration activities are implemented. Therefore, all hydrologic conditions (normal, single dry year, and multiple-dry year) were assessed based on two sets of operational scenarios: (1) near-term conditions (2005–2007 to include the transition of local groundwater supplies from impacted to restored) and (2) long-term conditions (2007–2020 through the end of the planning horizon for the plan). In all cases (near-term operation and long-term operational scenarios for all hydrologic conditions), total existing water supply will be sufficient to meet projected water demand for the Santa Clarita Valley.

g. Stetson Water Supply Assessment Summary

NCWD requested and funded preparation of an independent water supply assessment to assist NCWD in determining if currently available and reasonably feasible future water supply sources will be sufficient to meet future water demands resulting from anticipated growth in the Santa Clarita Valley. NCWD retained the services of Stetson Engineers, Inc., a water resources engineering firm, to complete the water supply assessment.

In December 2004, NCWD voted to accept the *Final Draft Water Supply Assessment*, dated November 29, 2004, prepared by Stetson Engineers, Inc. (Stetson Report). A summary of the Stetson Report is presented below.

Based on a review of relevant water supply contracts, agreements, financing plans, water studies and other reports, the Stetson Report concludes that sufficient water supplies are available to meet the current and projected water demands over the next 20 years of the water purveyors in the Santa Clarita Valley, including NCWD.

The Stetson Report assesses both available water supplies and the development of feasible new water supplies, and determines that such supplies are adequate to meet and exceed future demands for the next 20 years under all of the hydrologic conditions considered (normal, single-dry, and multiple-dry years). In reaching these conclusions, the Stetson Report took into account the groundwater supplies impacted by perchlorate contamination, and the progress made to date on remedial actions for the containment of groundwater contamination, and the removal of perchlorate from impacted groundwater supplies, including wellhead treatment for impacted municipal supply wells. The findings in the Stetson Report are generally consistent with the findings reported in the recently released Amendment to the 2000 UWMP.

In December 2004, NCWD issued a press release reporting its acceptance of the Stetson Report. In the press release, based on the Stetson Report, Steve Cole, Acting General Manager for NCWD, stated that NCWD is pleased to be "able to continue to provide adequate water to serve our customers' needs."[15]

The projected water demand associated with the proposed project was accounted for in the Amended 2000 UWMP. The timing of the project places it within the timeframe for calculating "planned future uses" within the 2020 water supply projection included in the Amended 2000 UWMP.

The Santa Clarita Valley water purveyors adopted resolutions approving the UWMP, as amended. The DWR accepted the UWMP for filing. The UWMP is considered by CLWA and the Santa Clarita Water Division to be in compliance with the Urban Water Management Planning Act. All of the data cited in this report is provided for informational purposes only and has been independently reviewed and considered by the City of Santa Clarita prior to use in this analysis. State law requires that UWMPs be updated every five years. The Santa Clarita Valley water purveyors are in the process of updating the 2000 UWMP. The updated UWMP is expected to be completed in late 2005.

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15 NCWD Press Release, dated December 7, 2004, and the Stetson Report.

(1) Water Reclamation Plants in the Santa Clarita Valley

Most wastewater generated within the Santa Clarita Valley is treated at two existing WRPs, which are operated by the County Sanitation Districts of Los Angeles County (CSDLAC). These two treatment facilities, the Saugus WRP (District 26) located at 26200 Springbrook Avenue in Saugus, and the Valencia WRP (District 32), located at 28185 The Old Road in Valencia have been interconnected to form a regional treatment system known as the Santa Clarita Valley Joint Sewerage System (SCVJSS). The relationship between the two districts was established through a joint powers agreement that created the regional treatment system and permits the Valencia WRP to accept flows that exceed the capacity of the Saugus WRP. These two facilities provide primary, secondary and tertiary treatment. The SCVJSS has a combined permitted treatment capacity of 19.1 mgd and treated an average of 18.1 mgd.[16] Existing facilities can be expanded to handle a daily capacity of 34.1 mgd, which is sufficient to meet demand up until 2015.[17]

The CSDLAC has prepared a Facilities Plan, with a horizon year of 2015, for the SCVJSS and a Draft EIR. The Facilities Plan estimates future wastewater generation for the probable future service area of County Sanitation Districts 26 and 32 in order to anticipate future treatment capacity and wastewater conveyance needs. According to CSDLAC estimates, total flows projected from the Santa Clarita Valley in 2015, exclusive of Newhall Ranch, would be 34.1 mgd. This projection is based upon Southern California Association of Governments (SCAG) 96 population projections exclusive of Newhall Ranch. As a result of this finding, CSDLAC proposed to incrementally expand the treatment facilities to meet future needs in two expansions to a total of 34.1 mgd.[18] This two-phase expansion plan, which would increase treatment capacity by approximately 15 mgd, was recently approved. The first phase would expand treatment capacity by approximately nine mgd, or approximately a 47 percent increase over existing capacity. This expansion, when complete, will meet the expected wastewater treatment demand through 2010. The second-phase would increase treatment capacity an additional 6 mgd.

It should be noted that the Newhall Ranch Specific Plan includes a new 6.8 mgd WRP on the Newhall Ranch site to exclusively serve the Specific Plan. The Newhall Ranch WRP would be located near the western edge of the Specific Plan site along the south side of State Route 126 (SR-126). Effluent from the Newhall Ranch WRP would be used to partially meet non-potable water demands within the Specific Plan site.

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16 Written correspondence from the County Sanitation Districts of Los Angeles County, March 29, 2004.

17 Written correspondence from the County Sanitation Districts of Los Angeles County, October 1, 2002.

18 Ibid.

For further information regarding use of reclaimed water from the existing WRPs and the Newhall Ranch WRP, please refer to the section below.

3. WATER SUPPLIES AND DEMAND IN THE SANTA CLARITA VALLEY

a. Preface

This portion of this report provides important regional information regarding available water sources for the Santa Clarita Valley, including the project site. The report summarizes two important aspects of the water picture, which provide context to the water supply and demand analysis of the project. First, the report summarizes the existing and planned future water supplies for the CLWA service area, including the project site. Second, the report summarizes the historic, existing and projected water demands within the CLWA service area.

Historically, local groundwater extracted from the Alluvial aquifer and Saugus Formation has been the primary source of water in the Santa Clarita Valley. However, since 1980, local groundwater supplies have been supplemented with imported water from the SWP. These current water supplies are described in this report.

This report also briefly describes the groundwater resources of the Santa Clarita Valley and SWP water supplies, including reclaimed water, groundwater banking supplies, water transfers and desalted water. In addition, in recent years, water conservation has become an increasingly important factor in water supply planning. In a dry year (i.e., a year of below average rainfall) following a year of average or normal rainfall, experience in the Santa Clarita Valley indicates that the demand for water typically increases by approximately 10 percent. For example, in a dry year a homeowner may notice that his or her lawn is drying out during the winter months, a time of year when people normally decrease lawn sprinkler use to take advantage of winter rains. In response, the homeowner increases sprinkler use in the winter to compensate for reduced rainfall. This type of action causes water demand to increase in a dry year when compared with years of average or above average rainfall. Conservation planning is a required component of the UWMP prepared by the water purveyors in the Santa Clarita Valley. Water purveyors expect that during a critical dry year, or during a prolonged drought, water demand can be reduced by up to 20 percent below the single dry year demand. This is due to the fact that during such critically dry periods, purveyors are able to enact voluntary and mandatory water conservation programs (however, this analysis conservatively assumes that critical dry year demand would decrease by 10 percent below dry year demand). This report describes the UWMP's current drought contingency planning for the Santa Clarita Valley.

b. Local Groundwater Supplies

Prior to 1980, local groundwater extracted from the Alluvial aquifer and the Saugus Formation was the primary water source for the Santa Clarita Valley. The current capacities and future potential of these aquifers are discussed below, including the reliance on these sources during drought periods. The groundwater information presented below is based on (a) a report prepared by Slade entitled, *2001 Update Report Hydrogeologic Conditions in the Alluvial and Saugus Formation Aquifer Systems*, dated July 2002; (b) a two-volume report prepared by Richard C. Slade & Associates (Slade) entitled, *Hydrogeologic Investigation of the Perennial Yield and Artificial Recharge Potential of the Alluvial Sediments in the Santa Clarita Valley of Los Angeles County, California*, dated December 1986; (c) a two-volume report prepared by Slade entitled, *Hydrogeologic Assessment of the Saugus Formation in the Santa Clarita Valley of Los Angeles County, California*, dated February 1988; (d) a technical memorandum prepared by Slade, dated November 16, 2000; (e) a letter from Joseph C. Scalmanini, Luhdorff and Scalmanini Consulting Engineers, dated December 15, 2000, regarding review of the groundwater components of the UWMP; (f) a report prepared by Slade entitled, *Assessment of the Hydrogeologic Feasibility of Injection and Recovery of Water in the Saugus Formation, Santa Clarita Valley, California*, dated February 2001, including the Technical Appendix by Slade entitled, *Hydrogeologic Conditions in the Saugus Formation, Santa Clarita Valley, California*, February 2001; (g) a report prepared by CH2MHILL entitled, *Newhall Ranch ASR Impact Evaluation*, dated February 2001; and (h) a report prepared by CH2MHILL entitled, *Newhall Ranch Updated Water Resources Impact Evaluation*, dated September 2002.

As stated above, the groundwater basin underlying the CLWA service area consists of two aquifers comprised of the Alluvial aquifer and the deeper underlying Saugus Formation (See previous **Figure 7**). The two aquifers occupy approximately 84 square miles in the central portion of CLWA's service area.

The geologic sediments in the Alluvial aquifer and the underlying Saugus Formation have been assessed according to their relative water-bearing characteristics. The term "water-bearing characteristics" means the relative ability of the geologic materials to contain, transmit, and yield groundwater to wells. As such, two geologic divisions are recognized in the Santa Clarita Valley: a water-bearing sediment group and a non-water-bearing rock group. Depending upon water levels, the water-bearing sediments are capable of becoming saturated, which allow the sediments to provide water that can be extracted by pumping through wells. As such, the sediments in these aquifers constitute the "groundwater reservoir" in the Santa Clarita Valley.

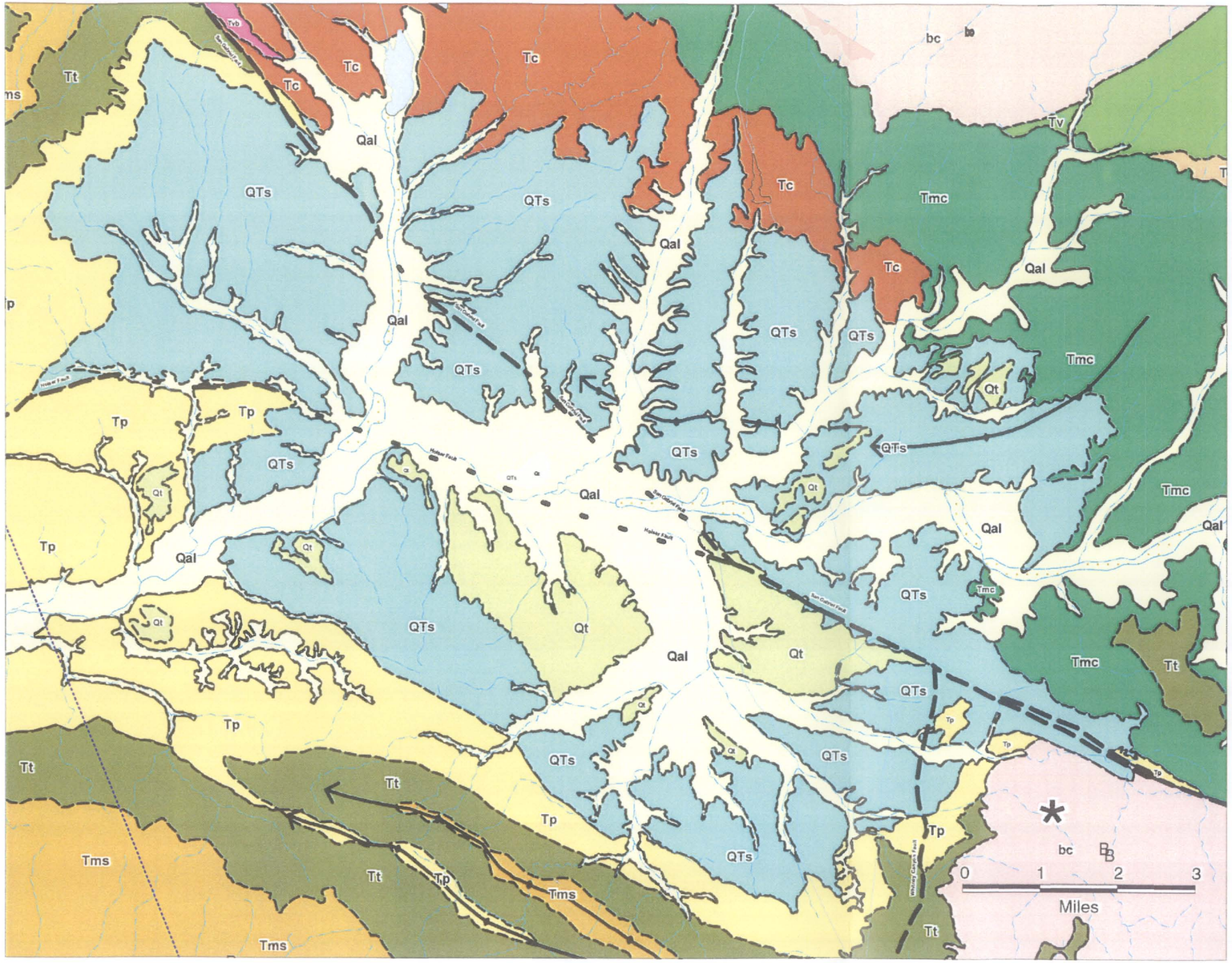
The water-bearing sediments have been penetrated to various depths by numerous water wells in the region and historically have provided virtually all of the groundwater extracted in the Santa Clarita Valley. Underlying the water-bearing sediments is the relatively impermeable, non-water-bearing bedrock.

Figure 12 illustrates the water-bearing sediments in the Alluvium (shown as map symbol, Qal), in the terrace deposits (shown as Qt) and in the geologically older sediments known as the Saugus Formation (shown as QTs). For the most part, the water-bearing sediments are geologically younger, more permeable, less consolidated and less structurally deformed than the underlying relatively impermeable, non-water-bearing bedrock.

(1) Alluvial Aquifer

The primary water source for the Soledad Village project is groundwater from the Alluvial aquifer. The Alluvial aquifer system, of Quaternary to Holocene (recent) geologic age, consists primarily of stream channel and flood plain deposits of the Santa Clara River and its tributaries. The Alluvium is deepest along the center of the present river channel, with a maximum thickness of about 200 feet near the area known as Saugus. It thins toward the flanks of the adjoining hills and toward the eastern and western boundaries of the basin and, in the tributaries, becomes a mere veneer in their upper reaches.

Groundwater generally moves toward the outlet of the basin, which is also the outlet of the Upper Santa Clara River HA. Thus, groundwater movement in the Alluvium beneath the tributaries is toward their confluence with the Santa Clara River and then westward in the Alluvium. From about Castaic Junction to Blue Cut, the Alluvium thins and narrows. This configuration forces groundwater to rise, keeping the depth to water at or close to the land surface. As discussed in more detail below, the general groundwater flow direction has remained unchanged whether groundwater levels are high or intermittently depressed. The San Gabriel and Holser Faults traverse the basin but neither fault measurably affects groundwater levels or flows in the Alluvium.



LEGEND

Mapped Geologic Formations

Qal = Undifferentiated Alluvium (Quaternary Age)	Potentially Water Bearing
Qt = Terrace Deposits (Pleistocene Age)	
QTs = Saugus Formation (Plio-Pleistocene Age)	
Tp = Pico Formation (Miocene Age)	Non Water Bearing
Tt = Towsley Formation (Miocene Age)	
Tms = Modelo Formation (Miocene Age)	
Tc = Castaic Formation (Miocene Age)	
Tvb = Violin Breccia (Miocene Age)	
Tmc = Mint Canyon Formation (Miocene Age)	
Ttc = Tick Canyon Formation (Miocene Age)	
Tv = Vasquez Formation (Oligocene Age)	
bc = Undifferentiated Basement Complex (pre-Tertiary Age)	

Mapped Geologic Structures

- Approximate Surface Trace of Fault
- Approximate Concealed Trace of Fault
- Approximate Surface Trace of Anticlinal Fold Axis with Direction of Plunge
- Approximate Surface Trace of Synclinal Fold Axis with Direction of Plunge
- Approximate Geologic Contact

Note: Only major faults and fold axis are shown.
Geology adapted from Oakeshott (1958), Winterer & Durham (1958), Nelligan (1978), Stitt (1980), Saul & Woottan (1983), Smith (1984), Dibblee (1991, 1992a,b, 1993, 1996a,b,c, 1997a,b,c)

FIGURE **12**

Water-Bearing Sediments in the Alluvium, Terrace Deposits, and Saugus Formation

Alluvial wells are distributed throughout the basin along the Santa Clara River and its southwest draining tributaries. The Alluvium is the most permeable of the local aquifer units. Based on well yields and aquifer testing, estimated transmissivity values of 50,000–500,000 gallons per day per foot have been reported for the Alluvium, with the higher values where the Alluvium is thickest in the center of the valley and generally west of Bouquet Canyon. The amount of groundwater in storage in the Alluvium can vary considerably because of the effects of recharge, discharge, and pumping from the aquifer. The maximum storage capacity of the Alluvium has been estimated to be 240,000 acre-feet.

Consistent with the 2001 Update Report (Slade) and the UWMP, the current management practice of the purveyors is to maximize use of the Alluvium because of the aquifer's ability to store and produce good quality water on a sustainable basis, and because the Alluvium is capable of rapid recovery of water levels and storage in wet periods. As with many groundwater basins, it is possible to intermittently exceed a long-term average yield for one or more years without long-term adverse effects. Higher pumpage for short periods may temporarily lower groundwater storage and related water levels, as has been the case in the Alluvium several times since the 1930s. However, subsequent decreases in pumpage limit the amount of water level decline, and normal to wet-period recharge result in a rapid return of groundwater levels to historic highs. Historical groundwater data collected from the Alluvium over many hydrologic cycles provide assurance that groundwater elevations, if locally lowered, recover in average or wet years following dry periods during which the groundwater elevations have declined. Such water level response to rainfall is a significant characteristic of permeable, porous, alluvial aquifer systems that occur within large watersheds. In light of these historical observations, complemented by the results of the recently developed groundwater flow model, there is ongoing confidence that groundwater can continue to be a sustainable source of water supply at the rates of pumping described in the 2001 Update Report (Slade) and in the 2000 UWMP.

Long-term adverse impacts to the Alluvium could occur if the amount of water extracted from the aquifer exceeds the amount of water that recharges the aquifer over an extended period. However, the quantity and quality of water in the Alluvium and pumpage from the Alluvium are routinely monitored, and no long-term adverse impacts are evident. However, the purveyors have identified cooperative measures to be taken if needed, to ensure sustained use of the aquifer. Such measures include but are not limited to the continuation of conjunctive use of imported SWP surface water with local groundwater, artificial recharge of the aquifer with local runoff or other surface water supplies, financial incentives discouraging extractions above a selected limit, and expanded use of other alternative supplies such as recycled water.

Man-made sources of recharge to the Alluvial aquifer include deep percolation of irrigation seepage; percolation of stormwater runoff from urban areas; percolation of surface flow and underflow from

Castaic Dam in the Castaic Creek area; percolation of water released by the Los Angeles Department of Water and Power from its reservoir facilities in Dry Canyon and upper Bouquet Canyon; and percolation of discharges to the Santa Clara River from the existing WRPs.

Outflow or discharge from the Alluvial aquifer occurs by water well extractions. Additional discharge occurs by subsurface outflow through the Alluvial aquifer to the downstream Piru groundwater basin to the west, and by seepage to underlying permeable portions of the Saugus Formation, particularly in the eastern portion of the basin. Discharge also occurs by evapotranspiration in areas where deep-rooted riparian vegetation grows along the main Santa Clara River channel, particularly along the western reach of the river.

As to the municipal supply water well extraction from the Alluvial aquifer, the NCWD, the CLWA Santa Clarita Water Division, VWC and the Wayside Honor Rancho (WHR) own and operate municipal supply wells and extract water from this aquifer. The Newhall Land and Farming Company also owns and operates private agricultural-supply wells and extracts water from this aquifer.[19] As described further below, this agricultural water will be the source of potable water for the Soledad Village project. The supply of water from this source is considered to be adequate today and in the future as the Santa Clarita Valley and the Newhall Ranch Specific Plan are developed. For additional information regarding the condition of the Alluvial aquifer, please see the documents referenced above.

(a) Historical and Current Conditions of the Alluvial Aquifer

Over the last 50 years, groundwater production from the Alluvial aquifer has ranged from 20,000 AFY to more than 40,000 AFY. Since the introduction of SWP supplies to the CLWA service area, total pumpage from the Alluvial aquifer has ranged from a low of about 20,000 AFY (in 1983) to a high of 43,000 AFY (in 1999); average pumpage from the Alluvium over that period has been 28,500 AFY. Agricultural pumpage of the aquifer throughout the 1950s was consistently in the range of 33,000 AFY to 41,000 AFY. (2002 *Santa Clarita Valley Water Report*, p. 15)

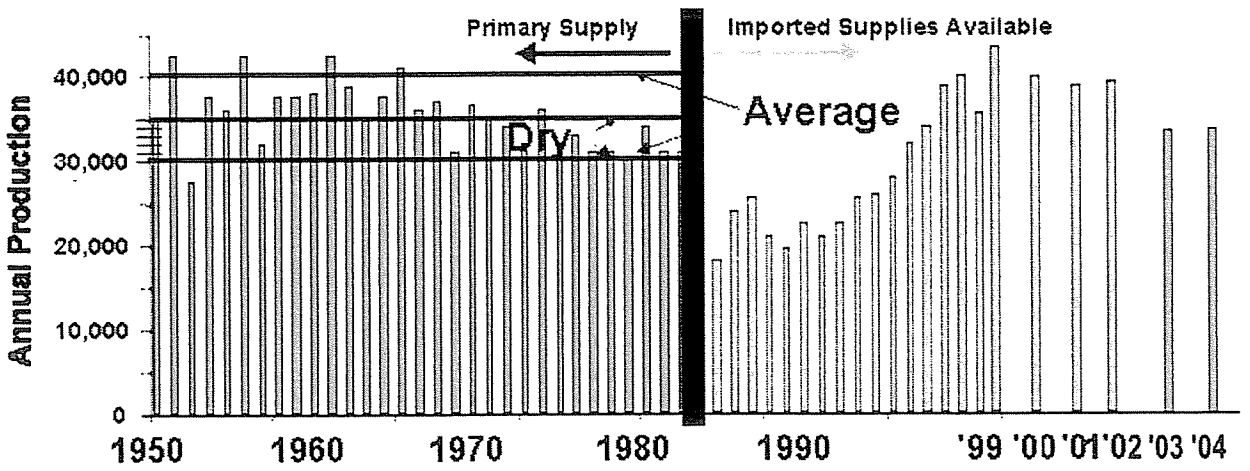
Figure 13 depicts historical Alluvial aquifer groundwater production from 1950–2002. The historical data and all technical information indicate that the Alluvial aquifer is in good operating condition. The data and related information show that the Alluvial aquifer has produced annually up to 43,000 AFY without any undesirable results (such as long-term water level declines or degradation of the water quality).

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19 The wells identified above do not include pumping of water from this aquifer by other privately-owned industrial, agricultural, ranch or domestic-supply wells. Production of water from these other wells is estimated to be 500 AFY.

Total pumpage from the Alluvium in 2004 was about 33,800 acre-feet, essentially the same as the preceding year with an increase of about 200 acre-feet. Of the total Alluvial pumpage in 2004, about 56 percent (19,000 acre-feet) was for municipal water supply, and the balance, about 44 percent (14,800 acre-feet), was for agriculture and other (minor) miscellaneous uses.

Figure 13
Historical Groundwater Production – Alluvial Aquifer



(b) Groundwater Levels in the Alluvial Aquifer

Based on available data, the groundwater levels over the last 20 years are generally higher than over the preceding 30 years. In some locations of the Alluvial aquifer, there are intermittent dry period declines (and an associated use of some groundwater from storage) followed by wet-year recoveries (and associated refilling of storage space). On a long-term basis, whether over the last 23 years since importation of supplemental SWP water, or over the last 40–50 years (since the 1950s–60s), the Alluvial aquifer shows no trend toward decreasing water levels or storage decline (i.e., overdraft). Based on the available data, pumpage from the Alluvial aquifer has been and continues to be within the operational yield of the aquifer. (*2004 Santa Clarita Valley Water Report*, p. 27)

(c) Groundwater Flows in the Alluvial Aquifer

In general, groundwater movement in the Alluvium beneath the side canyons is toward the east-west trending Santa Clarita Valley and then westward in the Alluvium toward the Los Angeles County/Ventura County line. This general pattern of groundwater flow in a westerly direction remains unchanged whether groundwater levels are high or intermittently depressed. This finding is based on an

examination of aquifer extent and historical groundwater levels. Long-term stream flow data gauged near the County line shows notably higher flows from the Santa Clarita Valley into the uppermost downstream basin, the Piru Basin, over the last 30–35 years. (*2002 Santa Clarita Valley Water Report*, p. 29 and Figure III-6)

(2) Saugus Formation

Late Pleistocene older Alluvium, known as terrace deposits, is elevated along the Santa Clara River to form terraces and mesas. These terrace deposits define the extent of the Saugus Formation in the groundwater basin. Because they are elevated, they usually lie above the regional water table and act as areas of infiltration and percolation to the underlying formation.

The Saugus Formation, of Pliocene to Pleistocene geologic age, has traditionally been divided into two stratigraphic units: the lowermost, geologically older Sunshine Ranch Member, which is of mixed marine to terrestrial (non-marine) origin; and the overlying, or upper, portion of the Saugus Formation which is entirely terrestrial in origin. The Sunshine Ranch Member of the Saugus Formation has a maximum thickness of about 3,000–3,500 feet in the central part of the valley; however, due to its marine origin and fine-grained nature, it is not considered to be a viable source of groundwater for municipal or other water supply. Above the Sunshine Ranch Member, the Saugus Formation is coarser grained, consisting mainly of lenticular beds of sandstone and conglomerate that are interbedded with lesser amounts of sandy mudstone, which were deposited in stream channels, flood plains, and alluvial fans by one or more ancestral drainage systems in the valley. The sand and gravel units that represent aquifer materials in the upper part of the Saugus Formation are generally located between depths of about 300 and 2,500 feet.

While much thicker and more spatially extensive throughout the basin when compared to the Alluvium, and while significant in terms of groundwater storage and individual well capacity, the Saugus Formation has typically lower values of transmissivity, in the range of 80,000–160,000 gpd/foot, with the higher values in the upper portions of the formation. The storage capacity of the Saugus Formation has most recently been estimated to be 1.65 million acre-feet between depths of 300 feet and approximately 2,500 feet (to the base of the Saugus Formation, or to the base of fresh water if shallower than 2,500 feet). Groundwater in the Saugus Formation generally moves north along the South Fork of the Santa Clara River, towards the Santa Clara River and the outlet of the basin. Saugus Formation wells operated by the purveyors are located in the southern portion of the basin, south of the Santa Clara River.

For long term planning purposes, the UWMP includes pumping from the Saugus Formation in the range of 7,500–15,000 AFY in average/normal years, a conservative estimate in light of historical estimates of

potential recharge to the Saugus Formation, complemented by observations of high groundwater levels in the overlying Alluvium over the last 30 years. The UWMP also includes planned dry year pumping from the Saugus Formation of 15,000–35,000 AFY for one to three consecutive dry years, when shortages to CLWA's SWP water supplies could occur. Such high pumping would be followed by periods of lower pumpage (the 7,500–15,000 AFY in average/normal years as noted above) in order to allow recharge to recover water levels and storage in the Saugus Formation. Maintaining the substantial volume of water in the Saugus Formation is an important strategy to help maintain water supplies in the Santa Clarita Valley during drought periods.

Based on the results of Slade (1988, 2000), and the operating experience of the water purveyors, Scalmanini (2000) undertook an independent review of the information regarding the Saugus Formation, and concluded the following:

> *"The Saugus Formation is the more difficult of the two aquifers in the area to assess, both in terms of dry period water supply and long-time dependability, primarily because there is no historical operating experience in the range of dry-year Saugus pumping cited in the UWMP. The memorandum in Appendix C [Slade 2000] includes a brief discussion of historical pumpage (up to a maximum of nearly 15,000 AFY, and an average of slightly more than 7,000 AFY over the last 20 years), limited historical water levels (no long-term change or other evidence of overdraft, with current levels comparable to pre-development levels), and ground-water storage (on the order of one million acre-feet in storage in the depth zone of 500 to 2,500 feet). Based on these conditions and a couple of other considerations (large areal extent and substantial vertical depth of the Saugus, and typically deep well completions with sufficient available drawdown in wells), it is concluded that it is hydrogeologically feasible to increase pumpage from the Saugus for short-term periods in a ramped manner from 15,000 to 25,000 to 40,000 AFY. The memorandum is not specific with regard to pumping outside the "short-term" periods when pumpage might be increased; however, it implies that increased pumpage would occur only during dry periods, and that pumpage would decline to lower values in wet and normal period such that the long-term stability in water levels and storage discussed in the memorandum would be maintained." (Emphasis added) (Scalmanini 2000)*

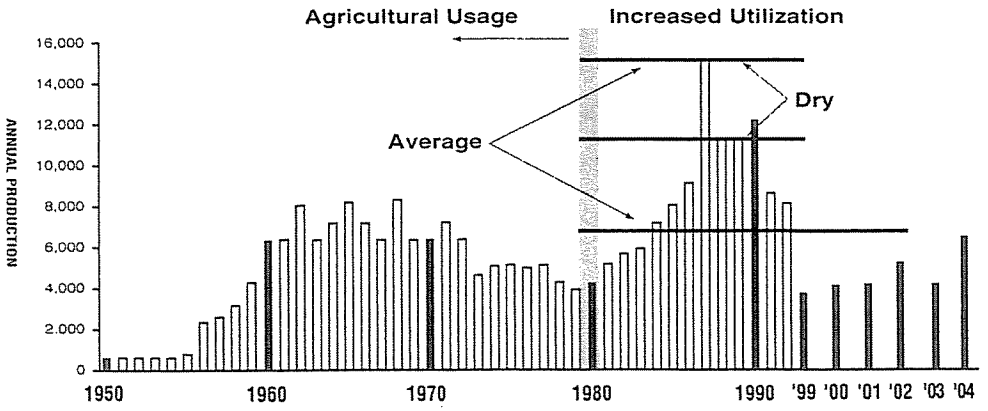
Focusing on the projected groundwater supplies depicted in the UWMP and whether those supplies were "realistic" under average and dry year conditions, Scalmanini (2000) concluded that "[b]oth the Alluvium and the Saugus are reasonable and sustainable sources at the yields represented in the Plan. As such, those yields are not overstated and will not deplete or "dry up" the ground-water basin; and there is no need to 'reduce' them for purposes of planning within the context of an Urban Water Management Plan." (Scalmanini 2000)

For additional information regarding the condition of the Saugus Formation, please see the documents referenced above.

(a) Historical and Current Conditions of the Saugus Formation

From 1980 through 2002, total pumpage from the Saugus Formation has ranged from a low of about 3,850 AFY in 1983 to a high of nearly 15,000 AFY in 1991. Average pumpage over that period has been nearly 6,700 AFY (*2004 Santa Clarita Valley Water Report*, p. 28). Slade has estimated that the historical annual production of this formation is 7,500 AFY to 15,000 AFY. (Slade 2000) **Figure 14** depicts the historical groundwater production from the Saugus Formation from 1947–2004.

Figure 14
Historical Groundwater Production from the Saugus Formation



Wells drilled into the Saugus Formation south of the San Gabriel Fault are anticipated to produce 1,500–2,000 gallons per minute (gpm), from a depth of 1,500–2,500 feet.

Total pumpage from the Saugus Formation in 2004 was 6,500 acre-feet, an increase of about 2,300 acre-feet from the preceding year. Of the total Saugus Formation pumpage in 2004, most (5,700 acre-feet) was for municipal water supply, and the balance (800 acre-feet) was for agricultural and other (minor) uses. The majority of pumpage from the Saugus Formation (an average of about 90 percent of total Saugus Formation pumpage) is for municipal supply. Groundwater pumpage from the Saugus Formation peaked in the early 1990s and then steadily declined through the remainder of that decade. Saugus Formation pumpage has subsequently increased gradually since 1999.

(b) Groundwater Levels of the Saugus Formation

Although there have been seasonable water level changes, in response to groundwater pumping, the long-term trend in the Saugus Formation (over the last 35–40 years) shows relatively stable groundwater levels. There is no trend toward a sustained decline in Saugus Formation water levels or storage, which

would be indicative of overdraft conditions. (*2004 Santa Clarita Valley Water Report*, p. 28) On that basis, and with recognition that historical (pre-1980) pumpage was quite small, and that average pumpage over the last two decades has been less than the reported range of potential recharge to the Saugus Formation, pumpage from the Saugus Formation has been and continues to result in the long-term stability of water levels and storage capacity.

Scalmanini (2000) has concluded that it is feasible to increase pumping from the Saugus for short-term periods in a ramped manner from 15,000 AFY to 25,000 AFY to 40,000 AFY based on (a) historical pumping data; (b) the amount of groundwater in storage (on the order of 1.4 million acre-feet in the depth zone of 500–2,500 feet); (c) the areal extent and substantial vertical depth of the Saugus Formation; and (d) typically deep-well completions with sufficient available drawdown in the wells. The increased pumping from the Saugus Formation would occur in dry periods, and the pumping would decline to lower values in wet and normal/average periods, to allow for recharge, such that the long-term stability in groundwater levels and storage would be maintained.

Based on recent studies (Slade, 1998, 2002; Amended 2000 UWMP; CH2MHILL, 2004), the purveyors estimate (*2004 Santa Clarita Valley Water Report*) that water supplies from the Saugus Formation can be withdrawn up to approximately 35,000 AFY in multiple, dry year periods without any adverse effects for short-term periods. It is also projected that the drilling of additional wells in the Saugus Formation would be required to obtain these production levels for future water supplies (*2004 Santa Clarita Valley Water Report*).

(c) Groundwater Flows of the Saugus Formation

Groundwater movement in the Saugus Formation is toward the center of the valley from the highlands and then toward the western end of the Santa Clarita Valley where it discharges naturally into the Alluvial aquifer.

(3) Water Quality in the Alluvial Aquifer and Saugus Formation

Given that Alluvial aquifer is to be the source of water for the Soledad Village project, the quality of the water available is an important consideration. The quality of water found in the Alluvial aquifer is described below.

Water delivered by the purveyors consistently meets drinking water standards set by the Environmental Protection Agency (EPA) and the DHS. The purveyors in turn supply this safe and potable water to their

customers. An annual Consumer Confidence Report is provided to all Santa Clarita Valley residents who receive water from one of the four water retailers. In that report, there is detailed information about the results of quality testing of the groundwater and treated SWP water supplied to the residents of the Santa Clarita Valley during 2004. Water quality regulations are constantly changing as contaminants that are typically not found in drinking water are being discovered, and new standards are adopted. In addition, existing water quality standards are becoming more stringent in terms of allowable levels in drinking water. In light of these changes, several constituents of particular interest are discussed in more detail below.

Total Trihalomethanes (TTHM): In 2002, the EPA implemented the new Disinfectants and Disinfection Byproducts Rule. In part, this rule establishes a new maximum contaminant level (MCL) of 80 ug/l (based on an annual running average) for TTHM. TTHMs are a byproduct that is created when free chlorine is used as a means for disinfection. In December 2004, as part of regular quarterly TTHM monitoring, NCWD detected TTHM concentrations that resulted in the running annual average TTHM concentrations to slightly exceed the MCL of 80 parts per billion (ppb) in its Pinetree and Tesoro service areas. The respective running average annual TTHM concentrations for the fourth quarter 2004 were 82.6 ppb and 80.8 ppb. In August 2004, Los Angeles County Waterworks District 36 reported its running annual average TTHM concentration to also exceed the MCL, in that case at 88 ppb. To address potential TTHM formation in the future, CLWA and the purveyors are implementing an alternative method of disinfection (i.e., chloramination) to be able to maintain compliance with the new rule and future regulations relating to disinfection byproducts.

Arsenic: The EPA has revised the federal MCL for arsenic from 50 ug/l to 10 ug/l. Compliance with the federal standard is not required until 2006. In April 2004, the Office of Environmental and Health Hazard Assessment (OEHHA) finalized a new Public Health Goal (PHG) for arsenic at four parts per trillion (ppt). State Health and Safety Code required DHS to establish a new MCL for arsenic by June 30, 2004. Because the PHG was not available until April of that year, the process for establishing the new arsenic MCL has been delayed. DHS has not made public a revised schedule for the MCL process. Historically, naturally occurring arsenic has been detected at concentrations of less than 5 ug/l in a few local groundwater supplies, and at concentrations of less than 3 ug/l in SWP water supplies. Most groundwater wells in the valley have non-detectable (less than 2 ug/l) concentrations of arsenic.

Perchlorate: Perchlorate has been a water quality concern in the valley since 1997 when it was originally detected in four Saugus wells operated by the purveyors in the eastern part of the Saugus Formation, near the former Whittaker-Bermite facility. In late 2002, perchlorate was detected in a fifth municipal well, in this case an Alluvial well also located near the former Whittaker-Bermite site. In early 2005,

perchlorate was detected in a second Alluvial well near the former Whittaker-Bermite site. The six perchlorate-impacted wells have been removed from active water supply service. In the meantime, the impacted purveyors (Santa Clarita Water Division, NCWD, and VWC) and CLWA are developing a plan for a water treatment process to restore the impacted pumping capacity as soon as possible. The plan for restoring "severely impaired" water sources such as the perchlorate-impacted wells must comply with the provisions of the DHS Policy Memo 97-005. Work on the documentation required by Policy Memo 97-005 continued in 2004 on interrelated fronts: (1) development of a pumping plan for restoration of some perchlorate-impacted groundwater supply by installing treatment at two impacted wells, together with a plan for construction of replacement wells to restore the balance of impacted groundwater supply; (2) analysis of the capture zones around wells to contain further migration of perchlorate and protect non-impacted wells; (3) analysis of overall groundwater reliability during the period before restoration of impacted supply, currently scheduled for 2006; and (4) analysis of overall groundwater resource sustainability under long-term pumping that would both contain perchlorate migration and meet municipal and agricultural water requirements in accordance with the UWMP. Pilot studies of an ion exchange treatment system and two biological treatment systems were completed in 2003; the results of those studies were the basis for selection of ion exchange as the treatment process for removal of perchlorate from groundwater pumped for control of perchlorate migration in the aquifer system.

The numerical groundwater flow model was originally envisioned as a tool for analysis of basin wide water supply and management issues. In addition to that use, which is ongoing, the model was initially approved by regulatory agencies in 2003 and formally approved in 2004 for use in evaluating the effectiveness of pumping on the extraction of contaminants and the control of contaminant migration in the affected aquifers. The initial use of the model in 2003 was to evaluate the effectiveness of pumping at capacities equivalent to replacement of the perchlorate impacted wells. In 2004, the model was used to simulate long-term aquifer response to basin wide pumping in accordance with the operational plans in the UWMP; included in that analysis was the selective pumping of impacted wells, with treatment, for a combination of restoring some impacted water supply and controlling perchlorate migration. The results, derived from simulation over a 78-year period that includes a range of wet/normal/dry hydrologic conditions, showed the aquifer system to be sustained with no long-term adverse conditions such as groundwater level decline, groundwater storage depletion, or depletion of surface stream flows. The modeled results also showed that the pumping of selected impacted wells for water supply, with treatment, will contain the migration of perchlorate and thus provide a level of protection against contamination of additional downgradient wells. The modeling results and the evaluation of treatment alternatives are being submitted to DHS for its approval of a program to restore the impacted water supply in accordance with its Policy Memo 97-005. The development and implementation of a cleanup plan for the Whittaker-Bermite site and the impacted groundwater is being coordinated among CLWA,

the impacted purveyors, the DTSC, and ACOE. DTSC is the lead agency responsible for regulatory oversight of the Whittaker-Bermite site. In February 2003, DTSC and the impacted purveyors entered into a voluntary cleanup agreement entitled, Environmental Oversight Agreement. Under the agreement, DTSC is providing review and oversight of the response activities being undertaken by the impacted purveyors related to the detection of perchlorate in the five impacted wells. Under the agreement's Scope of Work, the impacted purveyors have prepared a Work Plan for sampling the production wells, prepared a report in the results and findings of the production well sampling, prepared a draft Human Health Risk Assessment, prepared a draft Remedial Action Work Plan, completed the evaluation of treatment technologies, and completed the development of the groundwater model described above.

In 2000, CLWA and the impacted purveyors had filed a lawsuit against Whittaker Corporation (the former owner of the contaminated property) and Santa Clarita LLC and Remediation Financial, Inc. (the current owners). The lawsuit seeks to have the defendants pay all necessary costs of response, removal of the contaminant, remedial action costs, and any liabilities or damages associated with the contamination. In late summer 2003, CLWA, the purveyors and Whittaker entered into an Interim Settlement Agreement (ISA) wherein the parties agreed to work cooperatively for a minimum of a one-year period to further define long-term costs and reach a long-term settlement. The ISA expired in September 2004 but was extended by mutual consent of all parties until the end of January 2005. The ISA specifies that Whittaker and its insurers would reimburse certain past costs as well as ongoing costs incurred by CLWA and the purveyors in responding to perchlorate contamination. Activities since execution of the ISA have continued on developing the elements of a remedial strategy that will entail, among other details, the pumping of two impacted wells for containment of perchlorate migration, utilization of the pumped water, after treatment, for water supply, and installation of replacement wells in non-impacted portions of the basin to restore the remainder of groundwater supply impacted by perchlorate. Activities since execution of the ISA have also involved negotiation of a long-term Settlement Agreement.

(a) Groundwater Quality – Alluvium

Groundwater quality is, of course, a key factor in assessing the Alluvial aquifer as a municipal and agricultural water supply. Groundwater quality details related to drinking water standards are discussed below. In terms of the aquifer system, however, there is no convenient long-term record of water quality, i.e., water quality data in one or more single wells that span several decades and continue to the present. Thus, in order to examine a long-term record of water quality in the Alluvium, one approach is to integrate individual records from several wells completed in the same aquifer materials and in close proximity to each other. Several such integrated records are illustrated in Figures III-10 and III-11 of the

2004 Santa Clarita Valley Water Report, which show trends in groundwater quality for the Above Saugus WRP, Below Saugus WRP, Bouquet Canyon and Castaic Creek areas. Specific conductance (or Electrical Conductivity [EC]) was chosen to represent water quality because it is generally a good indicator of overall trends in water quality, and because the records for this parameter are the most comprehensive. Based on these records of groundwater quality, wells within the Alluvium have experienced historical fluctuations in EC, which correlate with fluctuations of individual constituents that contribute to EC. The limited historic water quality data indicate that on a long-term basis, there has not been a notable trend and specifically, there has not been a decline in water quality within the Alluvium.

Specific conductance within the Alluvium exhibits a westward gradient, corresponding with the direction of groundwater flow in the Alluvium, which is also westward. EC is lowest in the easternmost portion of the basin, and highest in the west. Water quality in the Alluvium generally exhibits an inverse correlation with precipitation and streamflow, with a stronger correlation in the easternmost portion of the basin where groundwater levels fluctuate the most. Wet periods have produced substantial recharge of higher quality (low EC) water and dry periods have resulted in the notable declines in water levels described above, with a corresponding increase in EC (and individual contributing constituents) in the deeper parts of the Alluvium.

In the Above Saugus WRP area, EC correlates strongly and inversely with precipitation and streamflow, showing an increase during periods of lower-than-average precipitation and a decrease during periods of higher-than-average precipitation. There is inadequate data for this area to determine the relationship of current levels of EC with long-term historic trends. The limited historic data from other areas indicate that, despite the recent increase, overall levels of EC around 1960 were higher than current levels. Water quality in the Mint Canyon area is similar to that in the Above Saugus WRP area.

Water quality in the Below Saugus WRP area has also historically exhibited noticeable inverse fluctuations with precipitation and streamflow. Limited data from the early 1960s indicates that the recent increases (since 2001) in levels of EC in this area have not resulted in measured historic highs. EC in this area has experienced similar increases to those in the Above Saugus WRP area, and is currently within the same range. This is an indication that the recent increase in EC in the Below Saugus WRP area may not be a result of salt loading from recharge of treated wastewater discharged to the Santa Clara River from the Saugus WRP.

In the Bouquet Canyon area, water quality appears to have generally improved since the 1950s and 1960s and has remained fairly stable for the last 30 years. The San Francisquito Canyon area has exhibited similarly consistent water quality. Fluctuations in water quality in the Castaic Creek area have been

recorded since the 1950s, but there has been no long-term change in overall level of EC. Levels of EC generally declined in the 1990s, and limited recent data indicates that levels may be increasing, but are still below historic highs. Water quality in the Below Valencia WRP area is similar to that in the Castaic Creek area; however, no water quality data within the last 25 years is available for this area.

Throughout the Alluvium, measurements of EC have generally been made about every three years, as is typically required for public water supply wells. While this frequency is adequate to determine long-term trends and fluctuations in EC, it is not sufficient to identify the timing of the water quality response to wet or dry conditions. Occasional more frequent measurements of EC indicate that in the central to eastern portions of the basin there is a lag time in water quality response to precipitation, and levels of EC do not appear to decline substantially until there are at least two consecutive years of higher-than-average precipitation. The last such instance was in 1992–1993, which corresponded to the last significant decline in EC. It is likely that levels of EC will not decline substantially until a period of consecutive years of higher-than-average precipitation occurs. Monthly data collected by VWC in 2004 show that EC levels declined gradually during the year. Analysis of water quality data to be collected in 2005 may provide a better understanding of the correlation between groundwater levels and water quality within the Alluvium, and allow for better characterization of the Alluvial water quality response to precipitation. Specific conductance throughout the Alluvium is currently below the Secondary (aesthetic) Upper MCL of 1,600 μmhos/cm (Salinity may also be measured by EC and is then expressed as reciprocal micro ohms per centimeter [umhos/cm] or decisiemens per meter [dS/m]. There is a close correlation of EC and parts per million [ppm] with the values of ppm being about 3/5 of those for EC [@ 300 ppm, EC = 500umhos/cm and @ 3,000 ppm, EC = 5,000 umhos/cm]). The presence of long-term consistent water quality patterns, although intermittently affected by wet and dry cycles, supports the conclusion that the Alluvial aquifer is a viable ongoing water supply source in terms of groundwater quality.

As discussed above, in 2002, one Alluvial well located near the former Whittaker-Bermite facility was inactivated for municipal water supply due to detection of perchlorate slightly below the Notification Level. In early 2005, perchlorate was detected in a second Alluvial well, VWC's Well Q2. In response, VWC removed the well from active service, and commissioned the preparation of an analysis and report assessing the impact of, and response to, the perchlorate contamination of that well. The Q2 Report (Luhdorff and Scalmanini, 2005) documents that the perchlorate detected in Well Q2 will not significantly impact the water supplies used to meet demand in the Santa Clarita Valley for the period required to respond to the contamination. The results of the Q2 analysis and report are consistent with the analysis and conclusions in the Amended 2000 UWMP. VWC's response plan for Well Q2 is to pursue permitting and installation of wellhead treatment by the fall of 2005, which will return the well to water supply service. All other Alluvial wells operated by the purveyors continue to be used for municipal water

supply service. Those Alluvial wells near the Whittaker-Bermite property are routinely sampled and perchlorate has not been detected. As detailed in the Amended 2000 UWMP and the Q2 Report, the inactivation of two Alluvial wells due to perchlorate contamination does not limit the purveyors' ability to produce groundwater from the Alluvium in accordance with the capacities delineated in the UWMP. The characterization and plan for control and cleanup of perchlorate, initially focused on the Saugus Formation due to the contamination and resultant inactivation of four Saugus wells in 1997, includes the Alluvial aquifer as well.

(b) Groundwater Quality – Saugus Formation

As discussed above for the Alluvium, groundwater quality in the Saugus Formation is a key factor in assessing that aquifer as a municipal and agricultural water supply. As with groundwater level data, long-term Saugus groundwater quality data are not sufficiently extensive (few wells) to permit any sort of basin-wide analysis or assessment of pumping-related impacts on quality. As with the Alluvium, EC has been chosen as an indicator of overall water quality, and records have been combined to produce a long-term depiction of water quality within the Saugus Formation (Figure III-12 of the *2004 Santa Clarita Valley Water Report*). Water quality in the Saugus Formation has not historically exhibited the precipitation-related fluctuations seen in the Alluvium. Based on the historical record over the last 50 years, groundwater quality in the Saugus has exhibited a slight overall increase in EC. More recently, several wells within the Saugus Formation have exhibited an additional increase in EC similar to that seen in the Alluvium. This is possibly a result of recharge to the Saugus Formation from the Alluvium. In 2004, monthly data collected by VWC for two Saugus wells shows that the overall level of EC remained fairly stable during the year. Levels of EC in the Saugus Formation remain below the Secondary (aesthetic) Upper MCL for EC. Groundwater quality within the Saugus Formation will continue to be monitored to ensure that degradation that presents concern relative to the long-term viability of the Saugus Formation as an agricultural or municipal water supply does not occur.

As previously noted, in 1997, ammonium perchlorate was discovered in four Saugus wells located generally on the east side of the basin in the vicinity of the former Whittaker-Bermite facility. All four impacted wells were removed from active water supply service, and are expected to remain inactive until the extent of contamination is fully characterized and appropriate treatment facilities are installed for contaminant control and removal. The other Saugus wells owned and operated by the purveyors continue to be sampled on a routine basis and have not detected perchlorate.

The Amended 2000 UWMP specifically addressed the adequacy of groundwater supply in light of the inactivation of the four impacted Saugus wells; and it addressed the plan and schedule for restoration of

perchlorate-impacted wells, including the protection of existing non-impacted wells. The Amended 2000 UWMP analysis showed that the inactivation of the impacted wells does not constrain the ability to meet the groundwater component of water supply through the scheduled period for restoration, through 2006. The same analysis showed that the restoration of pumping capacity, with treatment to meet drinking water standards, will effectively contain perchlorate migration and protect downgradient wells from perchlorate impacts.

Perchlorate Treatment Technology: Effective technologies presently exist to treat perchlorate in water in order to meet drinking water standards. In a publication from the EPA, *Region 9 Perchlorate Update*, June 1999,[20] the EPA discussed the current state of perchlorate treatment technology, and the current and planned treatment development efforts being carried out as part of EPA Superfund program studies, U.S. Air Force research, water utility-funded studies, and the federally funded research effort underway by the East Valley Water District, California and the American Water Works Association Research Foundation (AWWARF). The EPA also summarized two of the technologies that are in use today, which are capable of removing perchlorate from groundwater supplies. Each technology is discussed below, along with a brief summary of the specific application of each method used to remove perchlorate from groundwater supplies in the Alta Dena area, San Gabriel Valley, and many other location throughout California.

Ion Exchange Method: The first of the two perchlorate-removal technologies receiving the most attention is ion exchange, in which the perchlorate ion is replaced by chloride, a chemically similar but nontoxic ion. Ion exchange processes have been used in homes and businesses for water softening for decades. The ion exchange treatment method already has been approved for use by the DHS in the San Gabriel Basin, La Puente Valley County Water District, and elsewhere in California. Other locations where this treatment method has been approved for use by DHS include Lincoln Avenue Mutual Water Company near Altadena, San Gabriel Valley Water Company in El Monte, California Domestic Water Company in Whittier, City of Riverside, West San Bernardino Water District in Rialto, City of Rialto, City of Colton, Fontana Union Water Company, and the City of Pomona.

Consistent with its application to amend its water supply permit allowing treatment at Well Q2, VWC has contacted USFilter to install and maintain ion exchange treatment at Well Q2, which is capable of removing perchlorate pumped from the well to a non-detect level. Wellhead treatment of Well Q2 is expected to be in place in 2005. The well treatment will incorporate USFilter HP1220HF ion exchange

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20 See, EPA Internet website, *Perchlorate, and Region 9 Perchlorate Update*, found at http://www.epa.gov/ogwdw/ccl/perchlor/perchlo.html.

pressure vessels operating in a lead/lag configuration. The vessels are 12-feet in diameter and each will contain a selective resin designed to remove perchlorate. There is no waste brine generated from this treatment system.

Biological Treatment Methods: To date, considerable effort has been directed at developing biological treatment methods for removing perchlorate from groundwater. In the biological treatment process, microbes destroy perchlorate by converting the perchlorate ion to oxygen and chloride. In most cases, nutrients must be added to sustain the microbes. Microbes have been used for decades in the treatment of drinking water supplies as part of a process known as slow sand filtration.

A six-month pilot-scale study of a biological process has been completed for the San Gabriel Basin, demonstrating the reduction of perchlorate from approximately 75 ppb to below detectable levels. The same process is being used in a recently constructed full-scale system at the Aerojet site in Northern California, where perchlorate concentrations exceed 1,000 ppb. A biological process also has been used to treat perchlorate-contaminated wastewaters resulting from the manufacture and maintenance of rocket motors, where perchlorate concentrations may exceed 500,000 ppb.

Biological treatment methods are believed to be capable of producing potable water, but additional testing must be completed to determine whether a biological process can reliably and cost-effectively produce drinking water-quality water. However, the necessary tests are planned for later this year, when a biological treatment system designed to produce potable water for use in the San Gabriel Valley will be in operation.

The San Gabriel Valley project involves the installation of not only the ion exchange technology to remove perchlorate, but also a second groundwater treatment system utilizing a biological process to remove perchlorate. The biological treatment train system will be constructed at LPVCWD's well site and will initially be used to demonstrate the ability to biologically reduce perchlorate concentrations using microbes. The biological treatment system will consist of a bioreactor to remove perchlorate, followed by a standard multi-media filter, followed by UV/hydrogen peroxide (oxidation) to lower contaminant concentrations to comply with DHS drinking water standards. The treated water will flow through granular activated carbon (GAC) pressure vessels to "polish" the treated water to ensure that all contaminants are removed. The fully-treated water will then be disinfected.

During the demonstration, all water treated by the biological treatment system will be discharged in compliance with an NPDES permit, which will be obtained from the Regional Water Quality Control Board. After the demonstration phase, a permit will be requested from DHS to provide the full-treated water to LPVCWD's customers. Following receipt of the DHS permit, the biological treatment train system will continue to operate and provide fully-treated water to LPVCWD customers. As part of the biological treatment system, ethanol will be stored on site and used to foster microbial growth. A permit will be obtained from the local agency to store the ethanol on site.

Biological treatment methods are new to many water utilities. However, biologically-active filters have been used in drinking water treatment for decades to help remove particles and biodegradable organic matter. As stated above, the San Gabriel Valley project will rely on biological treatment for primary perchlorate removal, and is expected to include GAC as a backup process capable of limited perchlorate removal.

Other Treatment Methods: Other technologies have also been demonstrated as capable of removing perchlorate, but probably at higher cost. Reverse osmosis and nanofiltration were tested by researchers at the Metropolitan Water District of Southern California and shown to be effective in removing perchlorate, but they are likely to be much more expensive to operate than ion exchange processes. Liquid phase GAC also removes perchlorate, but only for a limited period of time before regeneration or replacement of the carbon is required. Frequent carbon replacement would make relying solely on GAC for perchlorate removal very expensive. Perchlorate cannot be removed from water by conventional filtration, sedimentation or air stripping technologies.

In addition to the proven treatment methods, a U.S. patent was recently granted for a new treatment device that reportedly renders perchlorate harmless. The device is a hollow-fiber membrane biofilm reactor, which, through a natural biochemical process of electron transfer, turns perchlorate into innocuous chloride. Perchlorate contaminated water is run through the biofilm reactor, which contains a bundle of thousands of hollow fiber membranes into which hydrogen gas is fed. The hydrogen gas diffuses through the membrane walls into the water as it flows past the fibers. Bacteria attach to the surface of the membrane because they gain energy from the process of transferring electrons and act as catalysts for the transfer of electrons from hydrogen gas to the oxidized contaminant, such as perchlorate. The contaminants are reduced to harmless end products while the hydrogen gas is oxidized to water.

The advantage of the biofilm reactor method over existing methods is that it destroys the contaminant without creating brine or other waste products, which must then be disposed of. The creators of the biofilm reactor device have embarked on a pilot study of the treatment method in La Puente, California,

treating groundwater that is highly contaminated with perchlorate. Results of the study have shown that the biofilm reactor can effectively treat 0.3 gpm. The current research is supported by a grant from the EPA and administered by AWWARF.

In the coming year, the results of perchlorate treatment research funded by a $2 million federal appropriation to the AWWARF will be available. AWWARF is funding studies into biological treatment methods, ion exchange, reverse osmosis, nanofiltration and other processes. The result of the AWWARF research should allow more efficient design and operation of the ion exchange and biological treatment processes, and may identify other technologies capable of cost-effectively removing perchlorate from water.

Summary: Due to the high value of this local water resource, the purveyors have placed a high priority on replacing the impacted groundwater extraction capacity by installing wellhead treatment and the construction of new wells, as evidenced by the action VWC has taken at its Well Q2. The "best" technology for removal of perchlorate will probably vary from site to site. At this time, however, ion exchange and biological treatment systems have been approved for construction and operation in many locations in California. The results from recent and ongoing studies will also be of use to water utilities in need of reliable, easy-to-operate treatment methods that can reduce perchlorate concentrations to low or non-detectable levels.

Other Water Contaminants: Water quality regulations are constantly changing as contaminants that are not typically found in drinking water are being analyzed by DHS and EPA. In addition, existing water quality standards are becoming more stringent in terms of allowable levels in drinking water.

Hexavalent Chromium: Hexavalent chromium (chromium 6) has become an important new water quality concern in Southern California. In a letter dated March 27, 2001, DHS asked the California EPA to establish a specific public health goal (PHG) for chromium 6. The PHG would formally identify a level of chromium 6 in drinking water that does not pose a significant human health risk. DHS has adopted regulations adding chromium 6 to the list of unregulated chemicals requiring monitoring, effective January 3, 2001. The regulations require drinking water systems to monitor for unregulated chemicals for which drinking water standards have not been established. The objective of the regulations is to collect data throughout the state to determine the occurrence of these chemicals to help DHS make regulatory decisions that will adequately protect public health.

DHS currently regulates chromium in drinking water as total chromium. DHS's drinking water standard for total chromium is 50 ppb. Total chromium is comprised of chromium 3 and chromium 6. Both are

naturally occurring and are found in groundwater. Chromium 3 is an important dietary supplement necessary for public health. While chromium 6 is a known occupational carcinogen through inhalation, scientists differ over the potential health effects posed when consumed in water. Due to the level of public concern about chromium 6, the DHS regulations were adopted on an emergency basis to expedite monitoring for this chemical. All drinking water systems with sources determined by DHS to be vulnerable to chromium 6 must monitor to enable DHS to determine both its occurrence and the proportion of chromium 6 in the "total chromium" level.

The retail water purveyors in the Santa Clarita Valley have implemented a monitoring schedule in compliance with these regulations. Preliminary scanning samples taken throughout the Santa Clarita Valley have shown trace levels (<1 ppb) of chromium 6. These levels are likely attributed to naturally occurring chromium in the rocks and soil. For further information, please refer to the following DHS website, http://www.dhs.ca.gov/ps/ddwem/chemicals/Chromium6/Cr+6index.htm.

MTBE: Additional water quality regulations have been promulgated and/or revised over the past several years. For example, MTBE (methyl-tertiary butyl ether) has been a concern for the past several years, and on May 17, 2000, DHS adopted a primary MCL for MTBE of 0.013 mg/L. CLWA and the local water purveyors have been testing for MTBE since 1997, and, to date, have not detected it in any of the production wells or in the treated SWP water supplies.

(4) Summary of Local Groundwater Supplies

(a) Near-Term Operational Scenario

Tables 3 and **4** delineate the mixes of water supplies expected to be used to meet demands in the next three years (2005-2007) under average/normal water supply conditions (**Table 3**) and under dry water supply conditions (**Table 4**). This three-year period was selected to specifically respond to concern over the reliability of supply during the implementation phase of the perchlorate contamination treatment project to restore currently impacted groundwater supplies. This scenario takes into account the impact of perchlorate on the reliability of groundwater supplies from the Alluvial aquifer and Saugus Formation under an average/normal year, single dry year and three consecutive dry years. It also includes delivery of dry year "firming" supplies that were planned but not yet available when the 2000 UWMP was adopted. The mix of water supplies from available groundwater not impacted by perchlorate contamination in combination with other available supplies is sufficient to meet customer demands with a high degree of reliability over the next three years, which includes the transition to full restoration of groundwater production currently impacted by perchlorate contamination.

Table 3
Example Near-Term Operation Scenario – Average/Normal Water Year
Water Supply and Demand Assessment (acre-feet)

Existing Water Supply	2005	2006	2007
Local Supplies			
Alluvial Aquifer	35,000	35,000	35,000
Saugus Formation	5,000	5,000	9,000
Recycled Water	700	1,000	1,300
Imported Supplies			
SWP Table A Amount	41,000	42,380	39,760
Draw From Short-Term Semitropic Bank Acct	0	0	0
Draw From Flexible Storage Account	0	0	0
Existing Supply	81,700	83,380	85,060
Existing Demand	81,700	83,380	85,060

Source: Groundwater Perchlorate Contamination Amendment and Other Amendments, 2000 Urban Water Management Plan, CLWA, CLWA Santa Clarita Water Division, Newhall County Water District, Valencia Water Company, January 2005.

Available existing supply actually exceeds the amounts shown above. Again, this table reflects only one of many possible supply scenarios which meet estimated demand for each of the three years.

Table 4
Example Near-Term Operation Scenario – Single Dry Year and Multiple Dry Year
Water Supply and Demand Assessment (acre-feet)

	Single Dry Year	Multiple Dry Years		
Existing Water Supply	2005	Year 1 2005	Year 2 2006	Year 3 2007
Local Supplies				
Alluvial Aquifer	32,500	32,500	32,500	32,500
Saugus Formation	5,000	5,000	5,000	11,000
Recycled Water	700	700	1,000	1,300
Imported Supplies				
SWP Table A Amount [1]	37,900	37,900	37,900	37,900
Draw From Short-Term Semitropic Bank Acct	916	4,039	5,419	2,360
Draw From Flexible Storage Acct	4,684	1,561	1,561	0
Existing Supply	**81,700**	**81,700**	**83,380**	**85,060**

Source: Groundwater Perchlorate Contamination Amendment and Other Amendments, 2000 Urban Water Management Plan, CLWA, CLWA Santa Clarita Water Division, Newhall County Water District, Valencia Water Company, January 2005.

[1] *Since the 2000 UWMP was adopted, DWR released its SWP Delivery Reliability Report (May 2003), which analyzes the reliability of SWP supplies. During infrequent dry periods, deliveries are projected to be less than 50 percent, and possibly as low as 19 percent during an unusual single dry year condition that occurs about once every 70 years. During very wet years, full deliveries can be expected. Thus, the amount of water available to CLWA in the worst-case single dry year would be 19% of 95,200 af, or 18,088 af. In a worst-case multiple dry-year period, the amount of water available to CLWA in each of those dry years would be 37% of 95,200 af, or 35,244 af. The 2005 UWMP will reflect this new information.*

For the 2000 UWMP, water supplies reflected in this table are based on SWP reliability as of 2000. Use of the 2003 SWP reliability figures would reduce existing Single Dry Year and Consecutive Dry Year Table A Amounts to 18,088 af and 35,244 af respectively. The operational scenario would then be revised to recover the difference from the Semitropic Bank Account, about 20,000 af in a Single Dry Year and about 2,650 afy in multiple dry years.

Available total existing supply actually exceeds the amounts shown above. Again, this table reflects only one of many possible supply scenarios which meets estimated demand for each of the three years.

(b) Long-Term Operational Scenario

In summary, **Table 5**, shows the existing and projected groundwater supplies from the Alluvial aquifer and Saugus Formation. The groundwater projections are from the Amended 2000 UWMP and the updated analysis by Slade (UWMP 2000, **Appendix A**) and reflect implementation of the perchlorate treatment project.

Table 5
Existing and Planned Water Supplies (through 2020 in acre-feet)

	Available During		Available During Single Dry Year	Available During Each of 3 Consecutive Dry Years
	Average Year	Wet Year		
EXISTING WATER SUPPLIES (2004)				
Local Supplies				
Alluvial Aquifer	35,000	40,000	32,500	32,500
Saugus Formation	11,000	11,000	15,000	24,000
Recycled Water	1,700	1,700	1,700	1,700
Imported Supplies				
SWP Table A Amount[1]	56,800	95,200	37,900	37,900
Draw From Short-Term Semitropic Bank Account (thru 2013)	0	0	50,870	16,950
Draw From Flexible Storage Account	0	0	4,684	1,561
Total Existing Supplies	**104,500**	**147,900**	**142,654**	**114,611**
PLANNED WATER SUPPLIES (THROUGH 2020)				
Local Supplies				
Restored Impacted Wells			10,000	10,000
New Saugus Wells	0	0	10,000	
Recycled Water	15,300	15,300	15,300	15,300
Imported Supplies				
Draw From Long-Term Water Banking Programs	0	0	40,000	13,000
Total Planned Supplies	**15,300**	**15,300**	**75,300**	**38,300**
Total Existing and Planned Supplies Through 2020 (not including Short-Term Semitropic Bank After 2013)	**119,800**	**163,200**	**167,084**	**135,961**

Source: Amended 2000 UWMP and the Santa Clarita Valley Water Report 2004, *May 2005.*

[1] *Since the 2000 UWMP was adopted, DWR released its SWP Delivery Reliability Report (May 2003), which analyzes the reliability of SWP supplies. During infrequent dry periods, deliveries are projected to be less than 50 percent, and possibly as low as 19 percent during an unusual single dry year condition that occurs about once every 70 years. During very wet years, full deliveries can be expected. Thus, the amount of water available to CLWA in the worst-case single dry year would be 19% of 95,200 acre-feet, or 18,088 acre-feet. In a worst-case multiple dry year period, the amount of water available to CLWA in each of those dry years would be 37% of 95,200 acre-feet, or 35,244 acre-feet. The May 2003 DWR report also assumes average year SWP deliveries of 76 percent. This would result in 72,352 acre-feet of CLWA's Table A Entitlement. The 2005 UWMP will reflect this new information.*
For the Amended 2000 UWMP, water supplies reflected in this table are based on SWP reliability as of 2000. Use of the 2003 SWP reliability figures would reduce the existing single dry year and consecutive dry year Table A Amounts to 18,088 acre-feet and 35,244 acre-feet, respectively. The corresponding total existing supplies would be reduced to 122,842 acre-feet and 111,955 acre-feet, respectively. Total existing and planned supplies in single dry and consecutive dry years would be reduced to 147,272 acre-feet and 133,305 acre-feet, respectively. Assuming 76 percent reliability in the average year, total existing supplies would be 120,052 acre-feet and total existing and planned supplies would be 135,352 acre-feet.

c. Reclaimed Water Supplies

Water reclamation (or recycling) is defined as the treatment and disinfection of municipal wastewater to provide a water supply suitable for non-potable reuse (e.g., landscape irrigation). Under specified conditions, the state now requires the use of reclaimed water when available. (See Senate Bill [SB] 2095 [Johnston] and Government Code Section 65602 relating to water recycling.) Section 65602 states in part the following:

> *"(a) The waters of the state are of limited supply and are subject to ever-increasing demands.*
>
> *(b) The continuation of California's economic prosperity is dependent on adequate supplies of water being available for future uses.*
>
> *(c) It is the policy of the state to promote the efficient use of water through the development of water recycling facilities.*
>
> *(d) Landscape design, installation, and maintenance can and should be water efficient.*
>
> *(e) The use of potable domestic water for landscaped areas is considered a waste or unreasonable use of water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available that meets conditions described in Section 13550 of the Water Code."*

Section 65605(b) also requires that a local agency adopt a recycled (or reclaimed) water ordinance that will

> *"...state that it is the policy of the local agency that recycled water determined to be available pursuant to Section 13550 of the Water Code shall be used for non-potable uses within the designated recycled water use area set forth by the local agency when the local agency determines that there is not an alternative higher or better use for the recycled water, its use is economically justified, and its use is financially and technically feasible for projects under consideration by the local agency."*

Reclaimed water is available for use in the Santa Clarita Valley from two existing WRPs operated by the County Sanitation Districts of Los Angeles County, the Saugus WRP, located in District 26 and the Valencia WRP, in District 32.

CLWA is currently in the process of updating its *Reclaimed Water System Master Plan* (Master Plan). The purpose of the Master Plan is to evaluate and plan for the use of reclaimed water as a reliable water source to meet a portion of the non-potable water demand in the Santa Clarita Valley. The prior version of the Master Plan (Kennedy-Jenks Consultants, 1993) outlined a multi-phase program to deliver reclaimed water to the valley totaling 10,000 acre-feet. CLWA's reclaimed water supply is approximately 1,700 AFY. Projections by CLWA show a total reclaimed water supply of 17,000 acre-feet by the year

2020. This amount is in addition to the reclaimed water originating at the proposed Newhall Ranch WRP.[21]

Reclaimed Water Demand: The Master Plan identified potential reclaimed water users with existing and future demands totaling 10,361 AFY. Of the total demand, 1,215 AFY of demand is outside the CLWA service area.

Since reclaimed water is used for non-potable purposes such as landscape irrigation, demand for reclaimed water follows a highly seasonal pattern. Reclaimed water demand is generally low during wet winter months and increases dramatically during hot, dry summer months to meet greater irrigation requirements. For the annual demand of 10,361 AFY identified in the Master Plan, the total peak monthly demand is 1,922 acre-feet and the total peak daily demand is 20.5 mgd (1 acre-foot of water is equivalent to 325,850 gallons).

In addition to the reclaimed water demand identified in the Master Plan, when the proposed Newhall Ranch Specific Plan is constructed, the non-potable water demand in the CLWA service area could increase by 9,035 AFY (Newhall Ranch non-potable demand). The peak monthly non-potable demand for Newhall Ranch has been estimated to be 1,275 acre-feet (approximately 13.8 mgd). Assuming construction of the Newhall Ranch Specific Plan, the total non-potable water demand within the CLWA's service area is expected to reach approximately 19,396 AFY. This demand will be highly seasonal, with peak demands during summer months when the weather is hot and dry and irrigation needs are greatest.

Table 6, below, summarizes the reclaimed water demands.

Table 6
Reclaimed Water Demand Summary

Item	Annual Demand (AFY)	Peak Monthly Demand (acre-feet)	Peak Demand (acre-feet)	Daily (mgd)
Within CLWA Service Area[a]	9,146	1,690	55.6	18.00
Outside CLWA Service Area[a]	1,215	233	7.5	2.45
Newhall Ranch[b]	9,035	1,275	42.5	13.81
Total	**19,396**	**3,198**	**105.6**	**34.26**

[a] *CLWA Reclaimed Water Master Plan, September 1993.*
[b] *CLWA Integrated Water Resources Plan, Water Demand and Supply Evaluation, February 1998; Technical Memorandum, Update to: Addendum to Water Resources and Wastewater Management for the Newhall Ranch Project, January 18, 1999, CH2MHILL.*

21 See, CLWA's Draft *Reclaimed Water System Master Plan* (Kennedy-Jenks Consultants, 1993), which is incorporated by reference and available for public review at the City of Santa Clarita Planning Department.

Reclaimed Water Supplies: Recycled water is available from two existing WRPs operated by the Sanitation Districts of Los Angeles County. In 1993, CLWA prepared a Draft *Reclaimed Water System Master Plan* that outlined a multi-phase program to deliver recycled water in the valley. CLWA has completed environmental review on the construction of Phase I of the project, which will deliver 1,700 AFY of water. Deliveries of recycled water began in 2003 for irrigation water supply at a golf course and in roadway median strips. In 2004, recycled water deliveries were 448 acre-feet. Surveys conducted by CLWA indicate an interest for recycled water by existing water users as well as future development when it becomes available. The purveyors encourage and support the use of recycled water to help augment and drought proof existing supplies. Overall, the program is expected to ultimately reclaim up to 17,000 acre-feet of treated (tertiary) wastewater suitable for reuse on golf courses, landscaping and other non-potable uses, as set forth in the UWMP. In October 2004, CLWA began California Environmental Quality Act (CEQA) analysis of the *Recycled Water Master Plan* (2002). This analysis will result in a Program Environmental Impact Report covering the various options for a recycled water system outlined in the Master Plan. A Notice of Preparation was released for public review in April 2005.

d. Imported SWP Water Supplies

(1) SWP Overview

In 1951, the California legislature authorized construction of a large state water storage and delivery system.[22] Eight years later, in 1959, the legislature authorized the submission for voter approval of a $1.75 billion general obligation bond issue to build the SWP system. The voters approved the measure, which enabled DWR to commence construction of the SWP.[23]

The DWR operates and manages the SWP facilities.[24] The SWP is the largest state-built, multi-purpose water project in the country. The SWP was designed and built to deliver water, control floods, generate power, provide recreational opportunities and enhance fish and wildlife habitats. SWP water supplies are used for both urban and agricultural uses throughout California. The SWP facilities consist of a complex system of dams, reservoirs, power plants, pumping plants, canals and aqueducts to deliver water.[25]

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22 DWR, Bulletin No. 132-95 (Nov. 1996) p. xxiii; DWR Bulletin No. 132-98 (Nov. 1999) p. xxvii-xxxv.

23 Wat. Code §12930 et seq.; DWR, Bulletin No. 132-93 (Sept. 1994) p. 15.

24 DWR, Bulletin No. 132-93, (Sept. 1994) p. 15.

25 DWR, Bulletin No. 132-98 (Nov. 1999) p. xxvii.

At the inception of the SWP, DWR entered into individual water supply contracts with agricultural and urban water suppliers (SWP contractors) throughout California. The contracts were the method used to fund construction and operation of the SWP facilities for the delivery of water to the SWP contractors. Each such contract sets forth a maximum annual allocation of SWP water, which is stated in Table A to the contract (Table A Amount, or allocation).

There are currently 29 SWP contractors with water supply contracts with DWR. A SWP contractor may annually request that DWR deliver water in the following year in any amount up to the SWP contractor's Table A Amount. The SWP contracts provide that in a year when DWR is unable to deliver the full amount of contractor requests, deliveries to contractors will be reduced so that total deliveries equal total available supply for that year. Some SWP contractors, including CLWA, historically have never requested delivery of their full annual amount because lower growth, other water supplies and water conservation efforts have held their demand below projections. Other SWP contractors historically have ordered their full Table A Amount nearly every year.

Existing long-term SWP water supply contracts called for the annual delivery of 4,103,651 acre-feet of Table A water by 1997 through SWP facilities, gradually increasing to a maximum of 4,172,686 acre-feet by 2020. Actual demand, however, has also not developed as projected, owing to circumstances, which have changed since the long-term contracts were signed in the 1960s. The changes include slower population growth, changes in local land use, local water conservation programs and conjunctive-use programs. The most SWP Table A water delivered to date (2003) in any year was about 3.5 million acre-feet in 2000.[26] The demands for SWP water are expected to increase as the population of California continues to increase.[27]

(2) Monterey Agreement

By 1994, disputes arose among the many agricultural and urban SWP contractors and DWR regarding the availability and distribution of water through SWP facilities. To avoid potential litigation, DWR and agricultural and urban SWP contractors met in Monterey, California to attempt to resolve the ongoing disputes. After negotiations, DWR and the agricultural and urban SWP contractors agreed to a statement of principles, which became known as the "Monterey Agreement."

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26 See, The State Water Project Delivery Reliability Report, 2003, Final, Department of Water Resources, Bay Delta Office.

27 See, DWR, Bulletin 132-98 (Nov. 1999), p. xxvii.

The Monterey Agreement, signed by DWR and many of the agricultural and urban SWP contractors in 1994, established principles to be incorporated in contract amendments (the Monterrey Amendments) to be offered to the SWP contractors. To date, all but two SWP contractors (Plumas County Flood Control and Water Conservation District and Empire West Side Irrigation District) have accepted the amendments. The amendments have three primary objectives: (i) to increase the reliability of all SWP contractors' water supplies; (ii) to stabilize the rate structure in order to improve the financial viability of the SWP; and (iii) to increase water management flexibility for all SWP contractors.

The Monterey Agreement provided a number of water management tools that have allowed local agencies to maximize their use of available supplies, thus meeting increased demand without construction of new SWP facilities. Most of these tools are environmentally beneficial or neutral. They include the following:

(a) **Water Transfers**: SWP contractors can transfer unneeded Table A water to other contractors on a permanent basis. This provides financial relief from SWP charges for the seller and additional water supplies for the buyer.

(b) **Turnback Pool**: SWP contractors with unneeded supplies on a short-term basis can turn their water back into a pool for purchase by other contractors.

(c) **Storage Outside Service Area**: SWP contractors are permitted to store water outside their service area (for example, in a groundwater banking project) for later use within their service areas.

(d) **Terminal Reservoirs**: SWP contractors are permitted to utilize flexible storage in Castaic Lake and Lake Perris to enhance their water supply reliability.

(e) **SWP Allocation**: Allocation of available SWP supply is made based on the proportion of each contractors' maximum contractual Table A water, rather than historical use with agricultural SWP contractors being cut first as in the past. This provides additional reliability to agricultural contractors earlier in the year, which improves their planning capability.

(f) **Interruptible Water**: Interruptible water (available surplus water) is distributed on an equal basis among SWP contractors rather than to agricultural SWP contractors first.

(g) **Flexibility**: Additional flexibility is granted to SWP contractors wishing to increase or decrease the Table A Amounts in their contracts.

(h) **Banking**: The Kern Water Bank was transferred to SWP agricultural users for development and use. This transfer has provided agricultural users as well as other local agencies with additional flexibility and water supply reliability.

(i) **Non-Project Water**: Use of project facilities for conveyance of non-project water is permitted to assist SWP contractors, which are able to locate additional sources of water.

As stated above, the Monterey Agreement has facilitated water transfers among SWP contractors. These water transfer provisions have resulted in 130,000 acre-feet of agricultural SWP contractors' Table A Amount being available for sale to urban SWP contractors. Agreements already have been executed

among contractors to purchase the additional Table A water from the agricultural SWP contractors. Agreements for the additional Table A Amount of SWP water are effective upon execution (DWR Bulletin No. 132-96, August 1997, Ch. 1, p. 5), and, therefore, are considered permanent water reallocations of SWP Table A water. These permanent transfers of SWP Table A Amounts have allowed urban SWP contractors to obtain additional SWP Table A Amounts, thereby increasing their overall deliveries, even in times of drought. The permanent transfers of SWP Table A Amounts have also allowed SWP urban contractors to increase the reliability of their deliveries by having more Table A Amounts available overall.

The DWR now has approximately eight years of experience in implementing the Monterey Agreement and the associated water management tools identified above. The SWP contractors have come to rely on the Monterey Agreement water management tools and other provisions in their planning activities. Some of the results to date include the following:

(a) Up to 200,000 acre-feet transferred annually in the Turnback Pool program;

(b) Nearly 114,000 acre-feet transferred in permanent Table A water transfers;

(c) Nearly 1,000,000 acre-feet stored outside SWP contractors' service areas;

(d) Utilization of terminal reservoirs' flexible storage; and

(e) Delivery of up to 200,000 acre-feet annually in Interruptible water (available surplus water).

(3) Monterey Agreement Environmental Review and Litigation

The Monterey Agreement gave rise to potentially significant environmental effects requiring analysis under CEQA. Therefore, a Program EIR was prepared to address the potentially significant environmental effects of implementing the Monterey Agreement. The Final Program EIR was certified in October 1995. The adequacy of the Final EIR was challenged in litigation arising under CEQA. The Sacramento Superior Court upheld the adequacy of the EIR. Before and after the trial court's decision, DWR and the agricultural and urban SWP contractors who had executed the Monterey Agreement began implementing various amendment provisions, including the completion of permanent transfers of Table A Amounts among agricultural and urban SWP contractors. The trial court's decision was subsequently appealed. On appeal, the petitioners sought a writ to prevent further implementation of the Monterey Agreement during the appeal. However, the appellate court denied the requested writ (DWR Bulletin 132-98, November 1999, Ch. 6, p. 2).

The appellate court reversed the trial court's decision. The appellate court held that the Program EIR for the Monterey Agreement was improperly prepared by the Central Coast Water Agency, as "Lead Agency" under CEQA, rather than by DWR, which should have been the "Lead Agency." The appellate court also found that the EIR did not sufficiently discuss implementation of a "no project" alternative.

The court then concluded that a new EIR must be prepared and certified. Finally, the court held that the trial court improperly dismissed the plaintiffs' challenge to DWR's transfer of title to the Kern Water Bank from DWR to KCWA.

The appellate court then remanded the case to the trial court and directed that the trial court issue a writ of mandate vacating certification of the EIR and retaining jurisdiction until DWR certifies an EIR in accordance with CEQA. The appellate court further directed that the trial court consider whether the Monterey Agreement may continue to be implemented while the new EIR is being prepared. (*Planning & Conservation League v. Department of Water Resources* (2000) 83 Cal.App.4th 892.)

The appellate court decision invalidated certification of the EIR, but did not set aside, invalidate or otherwise vacate the Monterey Agreement. In addition, no court orders have been issued to "stay" further implementation of the Monterey Agreement.

In October 2000, DWR filed a petition asking the California Supreme Court to review the appellate court decision. The California Supreme Court denied the petition for review and the matter was remanded to the trial court for further proceedings, consistent with the appellate court's decision. The trial court has not issued a final ruling in the action.

In March 2001, the parties to the Monterey Agreement litigation commenced confidential mediation discussions in San Francisco. In a "Joint Statement on the Monterey Amendments Litigation," dated July 18, 2002, the parties to the litigation stated that they "have reached a joint agreement on the principles for settling the lawsuit...." The parties also stated that DWR had commenced preparing a new EIR for the Monterey Agreement. In May 2003, the DWR, Central Coast Water Authority, Kern Water Bank Authority and certain SWP contractors entered into a Settlement Agreement (Settlement) with the Planning and Conservation League, Plumas County Flood Control and Water Conservation District, and Citizens Planning Association of Santa Barbara County, Inc. Pursuant to the Settlement, the department agreed to public negotiation of certain amendments to the long term water supply contracts, including contract amendments to transfer Table A Amounts between existing SWP contractors. The settlement also contains an "Acknowledgment and Agreement Regarding Kern-Castaic Transfer" (i.e., the 41,000 acre-foot CLWA/WRMWSD water transfer described under the heading **Santa Clarita Valley SWP**

Supplies, below). The settlement states: "...nothing in this Settlement Agreement is intended to predispose the remedies or other actions that may occur in [the] litigation [on the 41,000 acre-foot transfer]." Consequently, the decisions reached in that litigation stand. The full text of the Settlement and further information regarding the Monterey Agreement and Monterey Amendment, including future opportunities for public involvement are available on the worldwide web at http://www.montereyamendments.water.ca.gov/.

(4) Santa Clarita Valley SWP Supplies

CLWA SWP Table A Amount: Imported water from the SWP has been a supplemental source of supply to the Santa Clarita Valley since 1980. The SWP is contracted (and designed) to deliver approximately 4.2 million acre-feet of water per year to 29 contracting agencies. However, because the SWP has not been completed, it cannot yet deliver the entire 4.2 million acre-feet. CLWA is a contracting agency with a current maximum annual SWP Table A Amount of 95,200 AFY, or about 2.3 percent of the total (The CLWA/WRMWSD water transfer of 41,000 AFY has been completed, CLWA has paid approximately $47 million for the additional Table A Amount, the monies have been delivered, the sales price has been financed through CLWA by tax-exempt bonds, and DWR has increased CLWA's SWP maximum Table A Amount to 95,200 AFY because it was a permanent transfer/reallocation of SWP Table A Entitlement between SWP contractors).

Prior to completion of the CLWA/WRMWSD water transfer, the proposed transfer was the subject of environmental review by the water agencies. The agencies selling the 41,000 acre-feet of SWP Table A Amount to CLWA assessed the environmental consequences of the proposed transfer within their service area in a Final EIR, dated June 1998. This EIR was certified in 1998 and has never been the subject of judicial review. As a result, the EIR is conclusively presumed to be valid. (Pub. Res. Code §21167.2)

CLWA also prepared a supplemental Final EIR, which assessed the environmental effects of CLWA's acquisition of the 41,000 acre-feet within its service area. The Board of Directors of CLWA certified the Supplemental Final EIR in March 1999. Thereafter, in April 1999, a lawsuit was brought challenging the adequacy of the EIR under CEQA (*Friends of the Santa Clara River, et al. v. Castaic Lake Water Agency, et al.*, Case No. BS 056954). The trial court ruled in favor of CLWA and upheld the adequacy of the EIR under CEQA.

In October 2000, the plaintiffs filed an appeal. The appellate court reversed the trial court's judgment and ordered CLWA's EIR decertified. However, the appellate court did not order CLWA to void its approval of the water transfer. Instead, the appellate court remanded the matter to the trial court for further

proceedings. After a hearing on September 24, 2002, the trial court concluded that CLWA could utilize the 41,000 AFY to which it is entitled. In December 2004, CLWA certified a new EIR addressing the impacts of the water transfer agreement. That document is now the subject of legal challenge.

Status of CLWA's Acquisition Under the Monterey Agreement: The CLWA/WRMWSD transfer of SWP Table A Amount was the type of water transfer that fell within the provisions of the Monterey Agreement. As stated above, under the Monterey Agreement, certain SWP agricultural contractors agreed that 130,000 acre-feet of their Table A Amount could be transferred to urban contractors. The CLWA 41,000 acre-feet acquisition was a part of the 130,000 acre-feet of SWP Table A Amount, which has been transferred under the Monterey Agreement.

The Monterey Agreement provides for those transfers by the participating SWP contractors, thus facilitating transfers of Table A Amounts from agricultural to urban SWP contractors. As stated above, the environmental documentation for the Monterey Agreement has been decertified. However, the legal proceedings (*Planning and Conservation League v. Department of Water Resources* [2000] 83 Ca.App.4th 892 [PCL litigation]) have not invalidated the Monterey Agreement or enjoined either the Monterey Agreement or further implementation of the Monterey Agreement. In addition, the subsequent settlement agreement in the PCL litigation did not invalidate or otherwise enjoin the Monterey Agreement.

Even in the absence of the Monterey Agreement, CLWA's permanent acquisition of an additional 41,000 acre-feet of SWP Table A Amount could occur under existing SWP water supply contract provisions, subject to appropriate environmental review.

Nothing in the existing SWP water supply contracts, or applicable law, prohibit such water transfers with or without the Monterey Agreement. The Monterey Agreement simply provides a specific vehicle for accomplishing transfers of SWP Table A Amounts from agricultural to urban SWP contractors; the amendments under the Monterey Agreement are not the exclusive means by which that amount may be transferred. In support of that fact, in 1981 (almost 15 years before the Monterey Agreement), the entire SWP Table A Amount of the Hacienda Water District was permanently transferred to the Tulare Lake Basin Water Storage District, pursuant to an agreement approved by DWR.

The acquisition of the 41,000 acre-feet could proceed as a water transfer under existing law. See, e.g., Water Code §§382, 383 (authority for transferring surplus water) and Water Code §1745, et seq. (authority for transferring non-surplus water). The KCWA has reaffirmed its willingness to allow transfers of up to

130,000 acre-feet of SWP Table A Amounts under pre-Monterey Agreement conditions even if the Monterey Agreement is ultimately invalidated.

If it were not for existing SWP water supply contract provisions which allow such transfers (without the need for the Monterey Agreement), and existing law which enables CLWA to enter into contracts outside the context of the Monterey Agreement, an adverse final judgment invalidating the Monterey Agreement could affect CLWA's completed acquisition of the 41,000 acre-feet, which could in turn impair CLWA's supply of SWP water through its contracts with DWR and other SWP contractors. However, CLWA believes that an adverse outcome in the Monterey Agreement litigation is not likely to adversely affect CLWA's water supplies over the long term because CLWA believes that such a result is unlikely to "unwind" executed and completed agreements with respect to the permanent transfer of SWP Water Amounts.

(5) CLWA SWP Deliveries

With limited exception, as shown below, DWR's allocation to CLWA has been 100 percent of CLWA's actual request for SWP water supplies. Based on annual water supply information provided by DWR, there have been only two years on record since 1980 (1991 and 1992) when DWR's delivery to CLWA was not 100 percent of CLWA's requested need. Despite the reduced DWR allocation in those two years, the amount of SWP water delivered to CLWA was sufficient to meet all local water supply needs in the Santa Clarita Valley. **Table 7,** below, summarizes the DWR's annual SWP supply to CLWA from 1990–2004.

Table 7 includes several important features regarding CLWA's annual water supply since 1990. The features of this table are discussed below.

The "Maximum Table A Amount" column represents CLWA's possible maximum total annual allocation of SWP Table A water. From 1990 until 1999, CLWA's full (maximum) annual SWP Table A Amount was 54,200 AFY. The full annual SWP Table A Amount of 95,200 AFY, shown in the "Maximum Table A Amount" column in the years 2000–2004 reflects the permanent acquisition of an additional 41,000 AFY of SWP Table A Amount in 1999 from the KCWA.

The "DWR Allocation" column represents the amount (%) of the Table A water allocated to CLWA by DWR. Note that it has often been the case (e.g., 1995–2004) that CLWA received from DWR an allotment of Table A water far in excess of its actual need. Consequently, CLWA turned back (returned) significant amounts of water into the turn back pool.

Table 7
CLWA Annual SWP Water Supply Information from DWR

Year	CLWA Maximum Table A Amount (acre-feet)[1]	DWR Allocation (%)[2]	Table A Amount Allocated (acre-feet)	Imported Water Delivered/ Need (acre-feet)	Percent of Table A Amount Delivered (%)
1990	54,200	100%	54,200	21,613	40%
1991[3]	54,200	30%	16,260	7,968	49%
1992	54,200	45%	24,390	13,911	57%
1993	54,200	100%	54,200	13,393	25%
1994	54,200	50%	27,100	14,389	53%
1995	54,200	100%	54,200	16,996	31%
1996	54,200	100%	54,200	18,093	33%
1997	54,200	100%	54,200	22,148	41%
1998	54,200	100%	54,200	20,254	37%
1999	54,200	100%	54,200	27,282	50%
2000	95,200	90%	85680	32,579	38%
2001	95,200	39%	37,128	35,369	95%
2002[4]	95,200	70%	66,640	41,768 [4]	62%
2003	95,200	90%	85,680	44,419 [4]	52%
2004	95,200	65%	61,880	47,205	76%

[1] *CLWA Maximum Table A Amount: Represents CLWA's contract rights to SWP water since 1990. There are 29 contracting agencies with a maximum SWP Table A Amount totaling 4,172,786 acre-feet. In 1992, CLWA acquired the water supply of the Devil's Den Water District (i.e., its 12,700 AFY Table A Amount). By 2000, CLWA had acquired 41,000 AFY of Table A Amount from the KCWA and the WRMWSD.*

[2] *DWR Allocation: Represents the Table A Amount allocated to CLWA by DWR. Note that it has often been the case (e.g., 1995–2004) that CLWA received from DWR an allotment of their Table A Amount far in excess of its actual need. Consequently, CLWA turned back (returned) significant amounts of water into the turn-back pool.*

[3] *Actual imported water delivered by CLWA in 1991 was 3,846 acre-feet and 11,890 acre-feet in 1992. The difference between these deliveries and the Imported Water Delivered/Need column is the amount of groundwater pumped into CLWA's system during 1991 and 1992.*

[4] *CLWA also delivered to the Semitropic Water Storage District a total of 24,000 acre-feet in 2002 and 35,000 acre-feet in 2003 to be stored for CLWA's future use.*

Other Observations: In 1994, CLWA deliveries were disrupted by the Northridge Earthquake. The table does not account for Devil's Den deliveries, carryover provisions of the SWP contract, Article 21 water deliveries, turn-back water pool purchases, flexible storage account balance and deliveries, transfers to Westlands Water, Flood Flow deliveries, groundwater pumped during the 1991 drought into CLWA's system, etc.

The "Table A Amount Allocated" column is the amount of CLWA's Table A Amount available for delivery to CLWA in a given year by DWR. Many factors can affect the amount of water delivered by DWR, including environment conditions and weather. The "Imported Water Delivered/Need" column is the actual amount of SWP water required by CLWA to meet local water demand. Since 1990, this amount is typically far less than the amounts available to CLWA. These deliveries include not only the Table A water, but also local groundwater, "Carry-Over," "Interruptible" and "Local Flood Flow Water" supplied by DWR over the years. Had CLWA participated in any "Drought Water Bank" programs, DWR deliveries under such programs would have been reflected in this column as well; however, CLWA has not needed to participate in any of the statewide drought programs due to available local supplies and voluntary conservation programs.

DWR's annual Turnback Pool program has been in place since execution of the Monterey Amendments. The program is an internal SWP mechanism that provides for pooling potentially unused SWP supplies early in the year for purchase by other SWP contractors at a set price. The program is intended as an incentive to return unneeded water early in the year for reallocation among SWP contractors on willing-

buyer/seller basis. See, Critical Water Shortage Contingency Plan, Governor's Advisory Drought Planning Panel, December 29, 2000, p. 3-11.

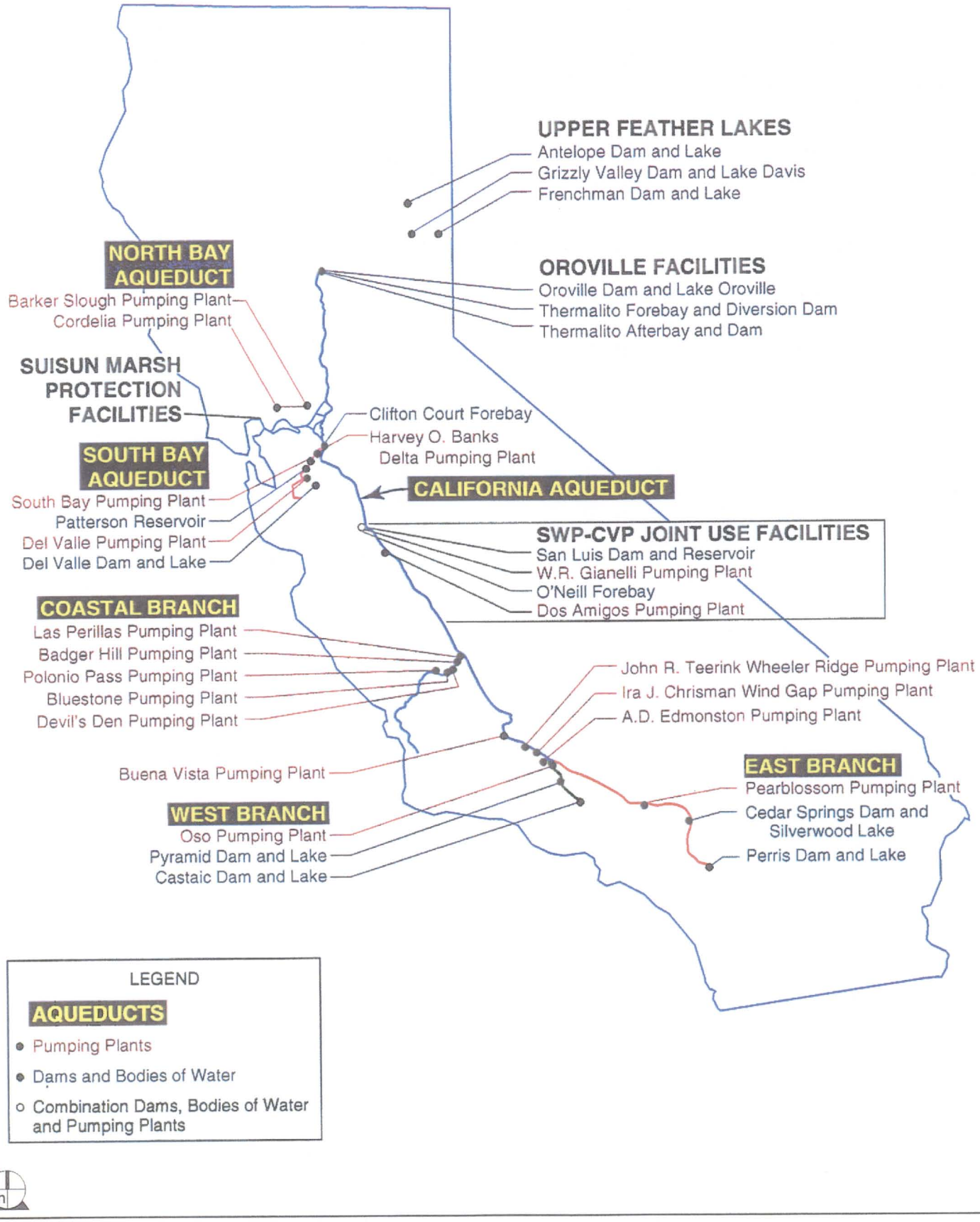
Through this program, any SWP water that CLWA deems is not needed in a given year is returned to DWR. This unused water is then made available to the SWP and other SWP contractors. CLWA participated as a "seller" in this program from 1996 through 2000, with over 127,000 acre-feet in sales of unused water. Several other SWP contractors have also returned unused SWP water to DWR, with a five-year total return of over one million acre-feet. Under this program, CLWA could participate as a "buyer," rather than a "seller," in the event additional SWP supplies were needed for storage, water banking projects or other conjunctive use programs.

DWR also conducts a "Dry Year Program" to allow water users such as CLWA to obtain supplemental supplies during dry years. The program provides "options" purchases as well as direct purchases of water. Under the program, DWR attempts to negotiate water purchases from farmers in the Sacramento Valley. Participating farmers will receive funds that will enable them to fallow, pump groundwater, or shift to an alternative (lower water use) crop. The water sold by the farmers will then be placed into a pool of water that will be allocated among water users who wish to participate in the Dry Year Program. This pool will be allocated based on the total number of participants and the relative amounts of water they request. The program is open to all water users in California. In 2001, CLWA submitted an initial request to purchase up to 12,000 acre-feet through the program. While CLWA did not participate in the Dry Year Program for 2001 and 2002 because CLWA ultimately received a large enough SWP allocation from DWR, the program was available to the agency showing the considerable flexibility of DWR, SWP contractors, and the retail purveyors to adapt to changing water supply forecasts and reliability levels.

(6) SWP Facilities

As discussed above, the SWP is a large water supply, storage, and distribution system authorized by the California Legislature in 1959. In 1960, California voters approved the $1.75 billion bond issue to begin building SWP facilities. The SWP currently includes 32 storage facilities, reservoirs and lakes, 17 pumping plants, three pumping-generating plants, five hydroelectric power plants, and about 660 miles of aqueducts and pipelines. Principal SWP facilities are shown in **Figure 15**.

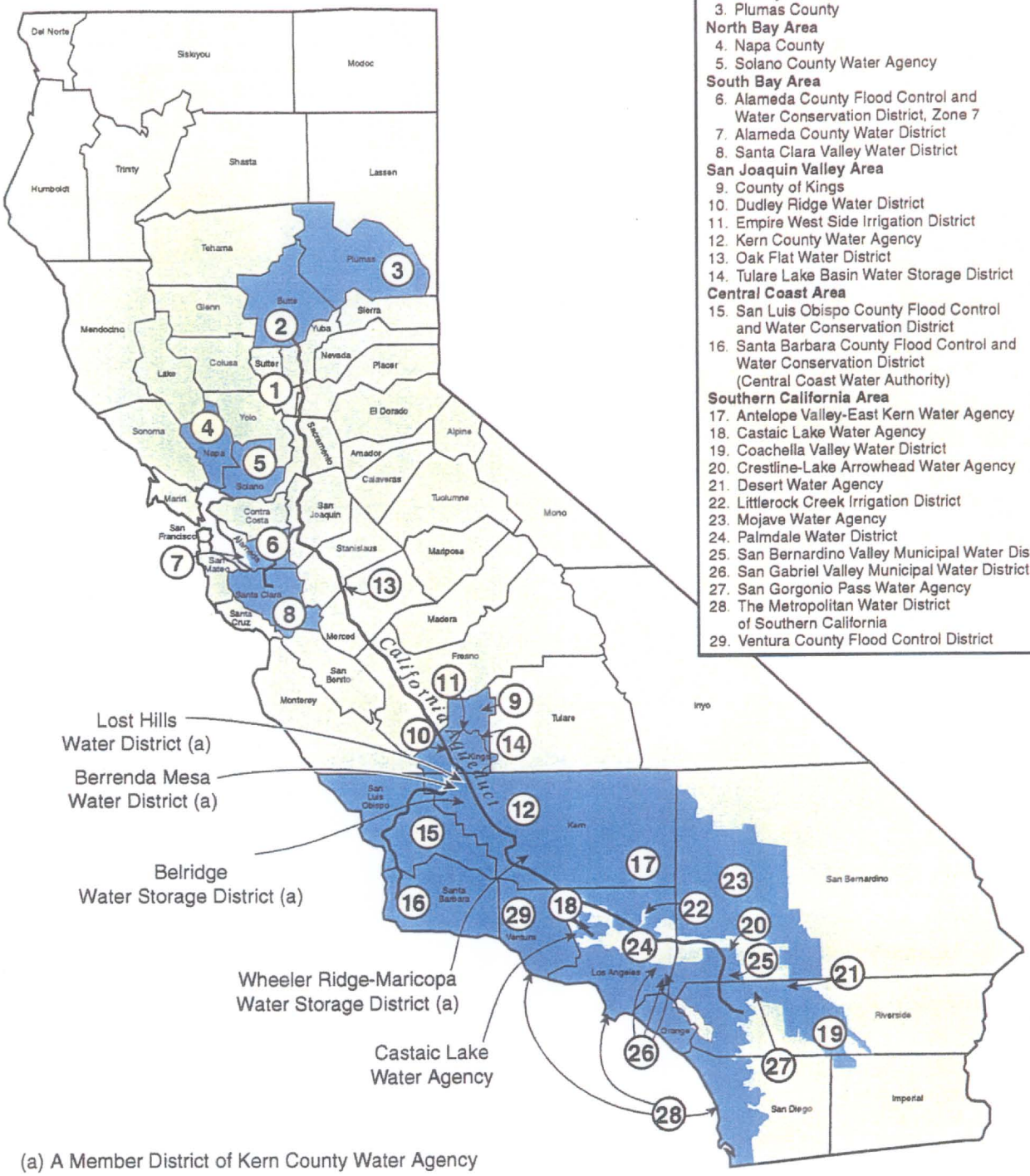
The primary purpose of the SWP is to distribute water to 29 urban and agricultural water contractors in Northern California, the San Francisco Bay Area, the San Joaquin Valley and Southern California. The 29 SWP contractor service areas are shown in **Figure 16**.



SOURCE: DWR (1997a)

FIGURE **15**

Principal SWP Facilities



(a) A Member District of Kern County Water Agency

NOT TO SCALE

SOURCE: DWR 1999a. b

FIGURE 16

SWP Contractor Service Areas

The primary water source for the SWP is within the drainage of the Feather River, a tributary of the Sacramento River. Runoff is stored behind Oroville Dam in Butte County, which is the project's largest storage facility. The water is then released down natural channels to the Sacramento-San Joaquin Delta.

In the southern delta, water is pumped by the Harvey O. Banks Delta Pumping Plant into the 444-mile-long California Aqueduct. The South Bay Aqueduct, located just south of the Banks Pumping Plant, conveys water to Alameda and Santa Clara counties. Water in the California Aqueduct travels along the west side of the San Joaquin Valley. Some SWP water is stored in the San Luis Reservoir, which is jointly operated by the DWR and the U.S. Bureau of Reclamation. From the San Luis Reservoir, waters in the SWP continue southward.

SWP water then flows south to the Tehachapi Mountains, where the A.D. Edmonston Pumping Plant lifts the water 1,926 feet to enter 10 miles of tunnels and siphons that traverse the Tehachapi Mountains. After crossing the Tehachapis, the aqueduct divides into two branches. The West Branch Aqueduct delivers water to Pyramid and Castaic reservoirs to serve CLWA and other SWP contractors in Southern California. The East Branch Aqueduct flows through the Antelope Valley and delivers water to Silverwood Lake. The water is then transported to San Bernardino and Riverside Counties, and stored in the Lake Perris reservoir.

Many other reservoirs add to the storage capacities of the SWP. **Table 8** lists the major storage facilities of the SWP and their storage capacity. In addition to the water storage facilities included in the SWP system, additional storage is available within the SWP contractors' service area (e.g., 800,000 acre-feet of storage in the Diamond Valley Reservoir and 300,000 acre-feet in the Las Posas Basin within the service area of the Metropolitan Water District of Southern California).

Table 8
Major SWP Reservoirs

SWP Division (Location)	Reservoir	Total Storage (acre-feet)
Oroville Field Division		3,762,670
	Frenchman Lake	55,480
	Antelope Lake	22,570
	Davis Lake	64,370
	Oroville Reservoir	3,537,580
	Thermalito Diversion Pool	13,350
	Thermalito Forebay	11,700
	Thermalito Afterbay	57,040
	Small Storage Facilities	580
	Aqueduct Pools	0
Delta Field Division		130,909
	Clifton Court Forebay	31,260
	Bethany Reservoir	5,070
	Lake Del Valle	77,110
	Small Storage Facilities	142
	Aqueduct Pools	17,327
San Luis Field Division (Joint Use)		1,148,967
	O'Neill Forebay (Total Storage = 56,430)	29,500
	San Luis Reservoir (Total Storage = 2,027,840)	1,062,183
	Los Banos Reservoir	34,560
	Little Panoche Reservoir	5,580
	Small Storage Facilities	0
	Aqueduct Pools	17,144
San Joaquin Division		27,541
	Small Storage Facilities	16
	Aqueduct Pools	27,525
Southern Division		979,182
	Silverwood Reservoir	74,970
	Lake Perris	131,450
	Quail Lake	7,580
	Pyramid Reservoir	171,200
	Elderberry Forebay	32,480
	Castaic Lake	323,700
	Castaic Lagoon	5,560
	Small Storage Facilities	1,580
	Aqueduct Pools	230,662
	SWP Total	**6,049,269**
	Reservoirs & Small Storage Facilities	5,756,611
	Aqueduct Pools	292,658

Source: Data Handbook, *State Water Project, 1997.*

(7) SWP Water Deliveries

SWP Deliveries: In the early 1960s, DWR entered into individual water supply contracts with various agricultural and urban water suppliers or contractors. Each contractor (shown previously in **Figure 16**)

was provided with a contract amount (Table A Amount) and capacity rights to the SWP aqueduct and storage system in return for payments intended to cover operation and maintenance, bondholder obligations and repayment of moneys loaned from the California Water Fund.

DWR water supply contracts require the SWP to deliver 4.2 million AFY to 29 SWP contractors. Although the SWP is not fully constructed and cannot, on a regular basis, deliver the full 4.2 million AFY, since the end of the six-year drought in 1992, the SWP has fully met SWP contractors' water needs every year, except the dry years of 1994 and 2001. Of SWP water deliveries, about 70 percent is delivered to SWP urban contractors and about 30 percent is delivered to SWP agricultural contractors. In 2003, DWR indicated that it can deliver 90 percent (or 3.71 million acre-feet) of SWP Table A Amount to its contractors. Ninety percent of CLWA's SWP maximum Table A Amount of 95,200 AFY equates to 85,680 acre-feet of water.[28] However, as discussed more fully below, the maximum Table A Amount contractually allocated does not necessarily result in equivalent deliveries of SWP water in any given year.

From statewide perspective, the maximum capacity of the overall SWP transportation system is generally limited by the capacity of the system pumps. Therefore, the capacity of the California Aqueduct is 10,300 cubic feet per second (cfs) at its northern end and 4,480 cfs below the Edmonston pumping plant. (1,000 cfs is approximately 82.6 acre-feet per hour, 1,980 acre-feet per day and 725,000 AFY.) If these transportation rates were maintained for a full year, they would result in the transport of approximately 7.2 million acre-feet near the delta and 3.2 million acre-feet to users in Southern California. Examples of the capacity of the canals and tunnels in the SWP transportation system are shown in **Table 9**.

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28 DWR NEWS, State Water Project Plans 100 Percent Deliveries, March 14, 2000, (http://wwwdwr.water.ca.gov/dir-dwr...00R2/Mar.14,00-SWP_Full_Deliv.html).
The DWR annually issues a series of allocation estimates, starting with conservative estimates in early winter months. Estimates are subject to change during the winter and spring months as more rainfall and snowpack data becomes available. DWR conducts five monthly snow surveys each winter and spring to assess snow conditions and make estimates about snowmelt runoff and future water supply. During the last six years, watersheds feeding the SWP have experienced heavy precipitation, which resulted in high volumes of water delivery through the SWP. Deliveries in wet years typically range around three million acre-feet. The current delivery projection is higher than prior years. For example, DWR estimates that the SWP can deliver about 3.71 million acre-feet during calendar year 2003. This current delivery allocation projection, although subject to change, is approximately 90 percent of the maximum Table A Amount requested by SWP contractors. See, Department of Water Resources, State Water Project Delivery Update, Water Deliveries, 2003 State Water Project Allocation Increase, May 16, 2003, http://www.dwr.water.ca.gov/water.html.

Table 9
Examples of SWP Transportation System Capacity

Location	Facility or Structure	Design Capacity (cfs)
Delta Intake	Clifton Court Forebay Channel	10,300
Near Kings/Kern County Line	SWP Aqueduct Canal	7,300
Grapevine	SWP Aqueduct Canal	4,400
South of the Tehachapis and before the East Branch/West Branch Split	SWP Aqueduct Canal	5,360
West Branch to Castaic Lake	Lower Quail Lake Canal	1,564

Source: Compiled by Impact Sciences, Inc.

The local supplies received by CLWA from the SWP are treated, filtered and disinfected at the two existing filtration plants in Santa Clarita Valley. The plants have a current capacity to treat a total of 58 mgd. From the existing plants, the treated water is delivered by gravity throughout the CLWA service area through a distribution network of pipelines and turnouts. One of the existing plants, the ESFP, has a current design capacity of 33 mgd. CLWA is currently expanding the plant's treatment capacity to a total of 56 mgd. In addition, the process performance of the plant is being evaluated and will be improved to assure continuous compliance with state and federal water quality regulations. The expanded plant is scheduled to be on-line by mid-2005. CLWA has also begun the design and environmental review process for the expansion of the Rio Vista Water Treatment Plant from 30–60 mgd. Ultimate plant design planning by CLWA indicates that the combined treatment capacity of the treatment plants would be approximately 180 mgd.

(8) SWP Reliability

The maximum contractual amount of SWP Table A Amounts do not necessarily result in equivalent deliveries of SWP water in any given year. The demands of SWP contractors vary from year-to-year depending on many factors, including the amount of winter rains, agricultural markets, the availability (and cost) of other water resources, municipal and industrial demands and environmental requirements associated with the Sacramento-San Joaquin Delta, where the water supplied by the SWP originates. To account for these variable supplies and demands, DWR and the SWP contractors have developed a system that annually allows for the identification of the anticipated demands of each SWP contractor (a request of supply) and the system supplies (a DWR allocation of those supplies). Other water resources (Turnback Pool and Interruptible Water) are available from time-to-time to SWP contractors whose needs are not met by the annual allocation of Table A Amounts. The total planned annual delivery capability of the SWP (approximately 4.2 million acre-feet) is distributed by contract among the 29 SWP contractors,

based on their respective contractual Table A Amount. As a result of various factors, the SWP annual deliveries of both Table A Amount water and non-Table A Amount water have ranged from approximately 550,000 acre-feet to 3.52 million acre-feet (DWR 2003). In 1999, the SWP delivered approximately 3.1 million AFY of both Table A Amount and non-Table A Amount water. The SWP delivered approximately 3.5 million acre-feet of Table A Amount and non-Table A Amount water in 2000.[29] In 2003, DWR was able to deliver 90 percent (or 3.71 million acre-feet) of the maximum contractual SWP Table A Amount to its contractors. Ninety percent of CLWA's maximum SWP Table A Amount of 95,200 AFY equates to 85,680 acre-feet of water. In 2004, DWR was able to deliver 65 percent (or 2.7 million acre-feet) of the maximum contractual SWP Table A Amount to its contractors. Sixty five percent of CLWA's maximum SWP Table A Amount of 95,200 AFY equates to 61,880 acre-feet of water.

CLWA's current maximum SWP Table A Amount of 95,200 AFY is affected by, and can be reduced due to, a number of factors, including hydrologic conditions, the status of SWP facilities' construction, environmental requirements and evolving policies for the delta. Because of these factors, SWP supplies are subject to reduction, particularly during drought periods. The programs listed below have the potential to improve the reliability of SWP water.

Monterey Agreement/Amendments: As discussed above, the Monterey Agreement between DWR and the agricultural and urban contractors provides substantial opportunities for SWP contractors, including CLWA, to increase water management flexibility by providing more tools to maximize the use of existing facilities and, in doing so, increase water supply reliability. The Monterey Agreement changed SWP water allocation rules by specifying that, during drought years, project supplies are to be allocated proportionately based on the maximum contractual Table A Amount. Water is allocated to urban and agricultural purposes on a proportional basis, deleting a previous initial supply reduction to agricultural contractors. The agreement further defines and permits permanent sales of SWP Table A Amounts and provides for transfer of up to 130,000 acre-feet of annual Table A Amounts from agricultural use to municipal use, of which CLWA has purchased 41,000 acre-feet. The agreement also allows SWP contractors to store water in another agency's reservoir or groundwater basin, facilitates the implementation of water transfers and provides a mechanism for using SWP facilities to transport non-project water for SWP water contractors. The agreement provides greater flexibility for SWP contractors to use their share of storage in SWP reservoirs. CLWA currently has access to about 4,700 acre-feet of storage in Castaic Lake.

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29 The Final *State Water Project Delivery Reliability Report*, 2003, found at http://swpdelivery.water.ca.gov.

CALFED Bay Delta Program: The CALFED Bay Delta program is a cooperative state-federal process with the goal of developing a long-term solution to the many competing water needs of the Sacramento-San Joaquin Bay-Delta. The program is a 30-year, three-phased effort addressing a number of issues including ecosystem quality, water quality, water system reliability and system vulnerability. Implementation of the CALFED improvements over time can significantly improve CLWA's ability to maintain delivery of high quality water and provide needed water supplies during dry years.

Interim Delta Improvements: Potential supply development for the SWP includes interim delta improvements that involve the following: (1) south delta channel enlargements and construction of four barriers to improve south delta flow circulation and (2) installation of acoustic fish barriers on the Sacramento River. The interim improvements would enable the use of additional pumps at Banks Pumping Plant when flow conditions are sufficient, and permit the relaxation of certain current operational constraints. It is also anticipated that these improvements would change the delta fisheries on a positive basis. Therefore, the expected supply yield would improve. Although this solution is considered viable and cost-effective, it does not constitute a permanent solution to the delta.

Full Delta Fix: As the overall demand for water increases and the need for low-salinity imported water intensifies, a long-term solution to the delta becomes critical. It is expected that a delta transfer facility would provide a long-term solution to delta problems, increase supply reliability, reduce habitat impacts and improve the water quality of delta diversions. Goals would be to minimize the effects of the SWP export pumps on delta fisheries and greatly improve the quality of the exported water.

South of Delta Storage: The potential exists for additional storage south of the delta. This storage could include both reservoir projects and groundwater banking/conjunctive-use storage. The reliability of the SWP supply would increase significantly, especially during dry years, with the development of south of delta storage. However, the benefits of the storage would be maximized if a full delta fix were implemented. As part of the CALFED analysis, approximately three million acre-feet of total storage capacity could be implemented south of the delta.

Figure 17 and **Table 10**, below, summarize the variability in SWP supplies available to CLWA by the year 2020 under the following different CALFED improvement scenarios:

(a) **Under Existing Conditions**, based on the DWRSIM model and historical hydrologic conditions, CLWA would receive approximately 37,900 acre-feet about 10 percent of the time (which is considered to be in a dry period) and approximately 56,800 acre-feet about 50 percent of the time (which is considered to be in average/normal rainfall periods).

(b) **Under Interim Delta Improvements**, CLWA would receive approximately 40,200 acre-feet about 10 percent of the time and approximately 73,700 acre-feet about 50 percent of the time.

(c) **Under a Full Delta Fix,** CLWA would receive approximately 63,900 acre-feet about 10 percent of the time and approximately 95,200 acre-feet about 50 percent of the time.

(d) **Under a South of Delta Storage,** CLWA would receive its full Table A Amount about 50 percent of the time.

Figure 17
Projected State Water Deliveries

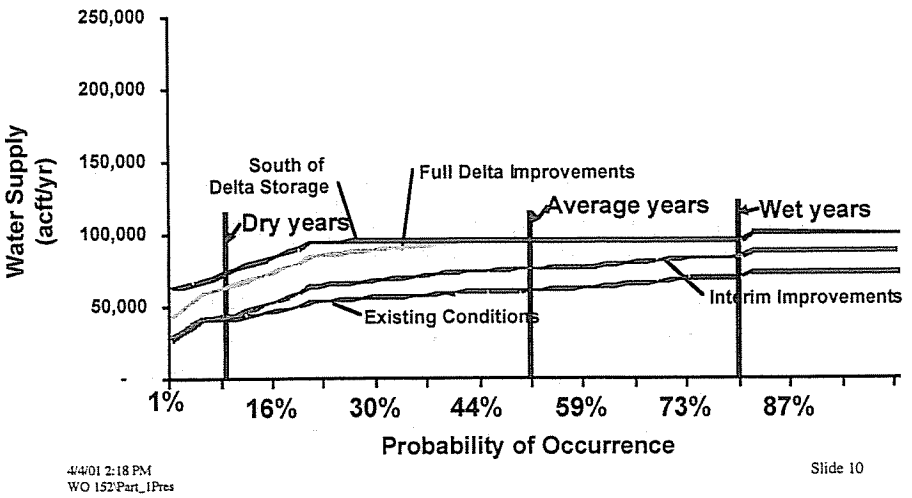


Table 10
Projected State Water Project Supplies
(AFY)

	Wet Year	Average/Normal Year (50% Occurrence)	Dry Year (10% Occurrence)
Existing Conditions	66,300	56,800	37,900
Interim Delta Fix	82,900	73,700	40,200
Full Delta Fix	95,200	95,200	63,900
South of Delta Storage & Full Delta Fix	95,200	95,200	75,800

Based on DWRSIM modeling (assuming full requests for all contractors).

DWRSIM and CALSIM II – Modeling Results: As stated above, the amount of water available to CLWA was calculated through the use of computer models, commonly known as the DWRSIM model and the CALSIM II model. The DWRSIM model, developed by DWR, was used to forecast CLWA water supply under various meteorological and land use changes as well as regulatory constraints. The reliability analysis derived from the DWRSIM model generally provides a conservative projection of SWP operations. For example, SWP delivery projections are usually based on *advance* requests reported by SWP contractors. These requests generally overstate the *actual* need for SWP deliveries. Therefore, there

is additional SWP water available for actual distribution despite the DWRSIM modeling results shown above. In addition, as a mathematical model, DWRSIM is limited to the amount of water actually requested and does not include water available in excess of requests. Therefore, as noted below, the modeling results should be supplemented with information based on historic availability of additional SWP water supplies.

DWR has prepared a new computer model, known as CALSIM II. CALSIM II simulates the operation of the SWP on a monthly basis over a 73-year historical record of rainfall and runoff (1922–1994). When compared with DWRSIM, CALSIM II forecasts that more water will be available in average/normal years (i.e., 59.7 percent under DWRSIM versus 75 percent under CALSIM) and less water will be available in single critical dry years (i.e., 39.8 percent under DWRSIM versus 20 percent under CALSIM). The analysis presented in this document utilizes a worst-case combination of the DWRSIM and CALSIM II models. (See, DWR's Final *The State Water Project Delivery Reliability Report*, dated May 2003)

Historically, the SWP has delivered water in excess of SWP contractors' requests. From 1962–1999, the SWP delivered water in excess of the SWP contractors' requests in all but four years.

Drought Water Bank: Another program with the potential to improve the reliability of SWP water in drought periods is the state's Drought Water Bank. The Drought Water Bank is implemented as needed by an Executive Order by the Governor, or a finding by the DWR's director that water deliveries will be curtailed. The purpose of the Bank is to help California's urban, agricultural and environmental interests meet their water supply needs during dry years. The procedure was used successfully in 1991, 1992 and 1994 when DWR purchased water from willing sellers and sold the water to willing buyers under a set of allocation guidelines. However, in future dry years, the use of the state's Drought Water Bank would have to take into consideration local groundwater management ordinances, which restrict or control groundwater export. The proliferation of these local ordinances makes it less likely that the state's Drought Water Bank would rely on water transfers involving groundwater export in future dry years.

Drought Planning: In addition to the Drought Water Bank, the CALFED Record of Decision (August 28, 2000) called for the Governor to convene a panel, chaired by the DWR director, to develop a contingency plan for reducing the impacts of critical water shortages primarily for agricultural and urban water users. The contingency plan, known as the Governor's Advisory Drought Planning Panel, Critical Water Shortage Contingency Plan, December 29, 2000, building upon experience gained from implementing the Drought Water Bank, identifies available water resources (e.g., water transfers, water exchanges, groundwater programs) and funding mechanisms to minimize the impacts created by drought conditions. The plan has been completed, circulated for public comment and finalized.

The contingency plan provides a brief background on California's water supplies and the hydrologic conditions potentially associated with critical water shortages. Chapter 2 describes changed water management conditions since the most recent statewide drought of 1987–1992. Chapter 3 describes the challenges in dealing with critical water shortages given these changed conditions. The challenges include constraints on availability and capacity of conveyance and storage facilities, regulatory restrictions and uncertainties, competition for limited water supplies among existing water purchasing programs and other identified issues. Chapter 4 presents the panel's recommendations for actions to be undertaken to address critical water shortages.

In the plan, the panel focused on the significant water management changes that have occurred since the statewide drought in 1987–1992. These developments include changes in water demand due to population growth, changes in institutional conditions affecting use of surface water and groundwater, construction of new water supply facilities, legislative changes and pending implementation of CALFED actions.

Since the last statewide drought of 1987–1992, two of the beneficial changes that have occurred in California are the construction of new water supply facilities and an expansion in groundwater recharge/storage capacity. **Table 11**, below, shows the major water conveyance facilities constructed or under construction since the last statewide drought.

Table 11
Large-Scale Conveyance Facilities Constructed Since the Last Drought

Facility	Agency	Length (miles)	Maximum Capacity (cfs)
Coastal Branch Aqueduct	DWR	100	100
Eastside Reservoir Pipeline	MWD of Southern California	8	1,000
East Branch Enlargement	DWR	100	2,100
	(this phase increased existing capacity by approximately 750 cfs)		
Mojave River Pipeline	Mojave Water Agency	70	94
Old River Pipeline (Los Vaqueros Project)	Contra Costa Water District	20	400
East Branch Extension (under construction)	DWR	14	104
Inland Feeder Project (under construction)	MWD of Southern California	44	1,000
Morongo Basin Pipeline	Mojave Water Agency	71	100
New Melones Water Conveyance Project (Farmington Canal)	Stockton East Water District and Central San Joaquin Water Conservation District	21	500

Source: Critical Water Shortage Contingency Plan, Governor's Advisory Drought Planning Panel, December 29, 2000.

In addition, there has been an expansion in groundwater recharge/storage capacity since the last statewide drought. **Table 12**, below, describes some of the larger groundwater recharge/storage projects currently operating in California. The projects that are now operational since the last drought are those operated by the Semitropic Water Storage District, the Arvin-Edison Water Storage District, the Kern Water Bank Authority, the Mojave Water Agency and the Calleguas Municipal Water District. These groundwater recharge/storage projects rely either wholly or in part on recharge supplies from the SWP. Therefore, the project's operations are subject to SWP restrictions in drought periods, as well as the availability of conveyance capacity. If water transfers provide a component of recharge supplies, availability of SWP conveyance capacity becomes a limiting factor (Critical Water Shortage Contingency Plan, November 2000). As discussed above, the maximum capacity of SWP storage and conveyance facilities is extensive (4.2 million acre-feet); however, those facilities have not been completed. This capacity has been enhanced by the aforementioned groundwater recharge/storage facilities since the statewide drought of 1987–1992.

Table 12
Examples of Groundwater Storage Projects

Agency and Project Location	Comments
Alameda County Water District Niles Cone, Alameda County	Seawater intrusion management and conjunctive use, district recharges local runoff and imported surface supplies from its SWP 42 thousand acre-feet (taf) annual contractual Table A Amount. Average annual recharge of 25 taf.
Arvin Edison Water Storage District Kern County	A 350 taf banking program is being developed with MWD. Estimated extraction capability is 40–75 taf/year.
Calleguas Municipal Water District Las Posas Basin, Ventura County	Uses injection wells to recharge its imported MWD supplies. Maximum storage capacity of 300 taf. At full implementation, maximum annual extraction rate estimated to be 72 taf. Providing local emergency storage is a major project purpose.
City of Bakersfield Kern River Fan Area, Kern County	Initial operation of 2,800-acre recharge facility began in 1978. City has rights to Kern River water, and long-term contracts with three water agencies that store and extract water in coordination with the city.
Coachella Valley Water District Upper Coachella Valley, Whitewater River Channel Area	Recharge from local Whitewater River supplies and from MWD's imported Colorado River Aqueduct water exchanged for SWP contractual Table A Amounts of CVWD and Desert Water Agency.
Kern Water Bank Authority Kern River Fan Area, Kern County	6,800 acres of recharge basins. The Authority is a joint powers agency that operates the project on behalf of local water agencies. Recharge supplies may be local surface water or imported supplies.
The County of Los Angeles Department of Public Works, Los Angeles River and San Gabriel River watersheds, Los Angeles County	Extensive recharge facilities employing about 2,400 acres of spreading areas, and injection wells at three seawater intrusion barriers (Alamitos, Dominguez Gap, and West Coast). County operates the river systems for the dual purpose of flood control and groundwater recharge, and also recharges imported and reclaimed water provided by others.
Monterey County Water Resources Agency (MCWRA) Salinas River Valley, Monterey County	Releases from MCWRA's Nacimiento and San Antonio Reservoirs are managed to provide recharge for upper valley. MCWRA distributes reclaimed water produced by the Monterrey Regional Water Pollution Control Agency for in-lieu recharge in the lower valley, to help reduce seawater intrusion. MCWRA's 45-mile distribution system can convey 19.5 taf of reclaimed water.
Mojave Water Agency Mojave River Basin, San Bernardino County	Basin has been adjudicated by court. The ephemeral Mojave River is the only local surface supply. To reduce overdraft, MWA's two new 71-mile pipelines import SWP supplies for recharge in spreading areas in the river channel. MWA's initial SWP contractual Table A Amount of 50.8 taf annually was augmented by the 1997 purchase of an additional 25 taf of annual Table A Amount.
Pioneer Project, KCWA, Kern County	Recharge project with 1,200 acres of ponds capable of recharging 146 taf per year. Annual recovery capacity of 98 taf. Estimated storage of 400 taf. Project began operation in 1995.
Orange County Water District Santa River Watershed, Orange and Riverside Counties	Recharges Santa Ana River water regulated at Prado Dam, also recharges reclaimed water. Operates series of recharge basins along lower river and two seawater intrusion barriers. One barrier is jointly operated with the County of Los Angeles. Typically recharges about 300 taf annually.

Table 12
Examples of Groundwater Storage Projects

Agency and Project Location	Comments
Santa Clara Valley Water District Santa Clara County	District formed in 1929 to combat declining groundwater levels and associated land subsidence. Has 20 recharge basins covering about 390 acres, and also recharges in stream channels. District typically recharges over 100 taf annually, with a combination of local and imported supplies. Estimated operational storage is 550 taf.
Semitropic Water Storage District Kern County	Banking (in-lieu recharge) program with one million acre-feet (maf) storage capacity. Banking partners include MWD (350 taf), Santa Clara Valley WD (350 taf), Alameda County WD (50 taf), Zone 7 Water Agency (65 taf), Vidler Water Company (185 taf), The Newhall Land and Farming Company and the CLWA.
United Water Conservation District Santa Clara River Watershed, Ventura County	Operates Lake Piru on Piru Creek and Freeman Diversion Dam on the Santa Clara River in conjunction with spreading areas at Saticoy, El Rio and Piru.
Zone 7 of Alameda County Water Conservation and Flood Control District Alameda County	Recharges imported SWP water (46 taf annual contractual Table A Amount) in local stream channels.

Source: Critical Water Shortage Contingency Plan, Governor's Advisory Drought Planning Panel, December 29, 2000.

(9) SWP – Other Water Deliveries

In addition to delivering Table A Amounts to the SWP contractors, the SWP conveys water to and stores water for contractors and other public agencies through other contracts and programs. (DWR Bulletin 132-98, November 1999, Ch. 9) These contracts and programs include, for example, the following:

Turnback Water Pool Program: Under Article 56(d) of the Monterey Amendments, the Turnback Water Pool Program was initiated through Notice to the SWP Contractors No. 97-3, dated February 5, 1997. (DWR Bulletin 132-98, November 1999, Ch. 9) All SWP contractors who signed Monterey Amendments are permitted to participate in the program. The program allows SWP contractors to offer a portion of their approved Table A Amounts for sale in a turnback pool for use outside their service area. Other contractors interested in purchasing this water can then request a portion or all of it. Based on supply and demand, the turnback water is then allocated between the selling and purchasing contractors. This program allows "excess" water to be made available to SWP contractors throughout the State of California.

Interruptible Water Program: The Interruptible Water Program allows an SWP contractor to take delivery of water over the approved and scheduled allocations for the current year. Interruptible water is available for delivery on a short-term basis as determined by the DWR, when scheduled project demands are being delivered and operational requirements for project water deliveries, water quality and other requirements are being met. (DWR Bulletin 132-98, November 1999, Ch. 9) CLWA is one of the SWP contractors that can participate in this program based upon its proportionate maximum Table A Amount.

Surplus Water Provisions: Pursuant to the Monterey Amendments, the Surplus Water Provisions allow certain SWP contractors to take delivery of "surplus" water; that is, water in excess of that required to meet all demands for Table A water. CLWA is one of the SWP contractors that can avail itself of surplus water as needed based upon its proportionate Table A Amount.

Carryover Water: For several years, DWR has offered SWP contractors the opportunity to carryover a portion of their undelivered Table A Amounts from one year for delivery during the next year. The carryover program was designed to encourage the most effective and beneficial use of water and to avoid obligating the contractors to use or lose the water by December 31 of each year. The SWP contractors' long-term water supply contracts and amendments state the criteria of carrying over Table A Amounts from one year to the next. CLWA is one of the SWP contractors that can avail itself of carryover water. In 1997, 263,759 acre-feet of carryover water were approved by DWR for future delivery to SWP contractors. (DWR Bulletin 132-98, November 1999, Ch. 9)

Both CLWA's SWP Table A Amount and SWP water from the foregoing programs are water supply sources that could be used in groundwater banking programs. These water supply sources are available during average/normal years for injection or "banking" in groundwater basins. The stored water can then be pumped when SWP supplies are reduced in dry years. In particular, these water supply sources could be available from CLWA for use in the Semitropic Groundwater Banking Project, which is discussed in further detail below.

e. Groundwater Banking and Conjunctive-Use Projects

With recent developments in conjunctive-use and groundwater banking programs, there are significant opportunities currently exist to improve the reliability of local and imported water supplies in Santa Clarita Valley. The term "conjunctive-use" generally means the coordinated operation of multiple water supplies to achieve improved supply reliability. Most conjunctive-use concepts are based on storing water supplies in times of surplus for use in times of drought. A typical program involves importation of additional surface supplies from the SWP during wet periods, recharging the water in a local groundwater basin and pumping out the stored water from wells when SWP supplies are reduced during a drought.

Groundwater banking programs generally involve storing available SWP supplies during wet years in groundwater basins (e.g., the San Joaquin Valley and the Saugus Formation). The water would be stored either directly by surface spreading or injection/extraction wells, or indirectly by supplying surplus SWP water to farmers in-lieu of groundwater pumping for agricultural uses. During dry periods, the stored

water could be pumped out and exported to the Aqueduct, or used by farmers in exchange for their surface water allocations and delivered to CLWA through SWP facilities. Several potential conjunctive use and groundwater banking opportunities are available for use in the Santa Clarita Valley. Upon implementation, such programs can provide the following significant benefits in terms of water management and planning:

(a) A location to store available supplies in wet years, thus maximizing the efficient use of water resources;

(b) A dry year supply that augments existing supplies reduced by drought or other shortages; and

(c) A storage "reservoir" that can be drawn upon when supplies are insufficient during unforeseen emergencies.

These benefits allow such programs to "firm up" and enhance the reliability of both existing and future water supplies. **Table 13** below summarizes the projected water supply benefits for each of the identified groundwater banking and conjunctive use projects projected by CLWA.

Table 13
Projected Groundwater Banking and Conjunctive-Use Supplies – CLWA (2020)[1]
(AFY)

Source	Dry Year
Kern Water Bank	25,000
Semitropic Water Bank	30,000
Kern Delta Water Bank	40,000
North Las Posas Water Bank	10,000
Total	**105,000**

[1] *Assumes groundwater banking programs would only be called on in dry years. All groundwater banking programs are available in wet and average/normal years. In 2010, the amount of supply expected from groundwater banking and conjunctive use projects is approximately 50,000* AFY.

Ongoing groundwater banking programs include the Kern Water Bank, the Semitropic Water Storage District, the Kern Delta Water District and the North Las Posas Water Bank. Each program is discussed in further detail below.

Kern Water Bank: *The* Kern Water Bank was established by DWR in 1988 as a statewide conjunctive-use program to increase the yield and enhance the reliability of the SWP. Eight elements were identified, seven sponsored by local agencies with the eighth being DWR's Kern Fan Element. The Kern Fan Element (later transferred to Kern Water Bank Authority) included the purchase of 19,900 acres of land and construction of recharge basins, extraction wells and related facilities. The original plan was to store

SWP water underground in years of abundant supply and extract the banked water in dry years for use by SWP contractors. This original plan was divided into elements, such as Kern Fan, Semitropic and Cawelo. Initial studies indicated that the Kern Fan Element could store as much as 1,000,000 acre-feet of water and provide up to 140,000 acre-feet of water to the SWP in dry years. The other seven elements vary significantly in size. The Semitropic Local Element is the largest of these with more than 1,000,000 acre-feet of storage, while Cawelo Water District is the smallest with a storage capacity of about 110,000 acre-feet. The Semitropic element is discussed further below.

In 1994, the Kern Water Bank Authority (KWBA) was established to develop and operate the Kern Water Bank. The KWBA is a joint powers authority consisting of six water agencies. The KWBA constructed recharge basins and began recharging water in 1995. KWBA is now constructing additional basins, extraction wells and water conveyance facilities.

In October 1997, the KWBA, in conjunction with state and federal fish and wildlife agencies, established a Habitat Conservation Plan and Natural Community Conservation Plan that is preserving wildlife in the area while ensuring an adequate water supply for the future. When the KWBA's new water recharge facilities are completed, they will provide Kern County farming interests with the capability of storing more than 1,000,000 acre-feet of water on a permanent basis. Currently, more than 760,000 acre-feet are in storage.

Semitropic Water Storage District: The Semitropic Water Storage District (also referred to as Semitropic or District) provides SWP for irrigation. The District is located in the San Joaquin Valley in the northerly part of Kern County immediately east of the California Aqueduct. Using the immense groundwater storage capacity available to Semitropic (one million acre-feet), the District has developed a groundwater-banking program. The District operates the program by taking additional SWP supplies in wet years and returning the water in dry years. As part of this dry year return, Semitropic can leave its Table A Amount in the Aqueduct and increase its groundwater production. Semitropic has also constructed facilities so that groundwater can be pumped into their canal and, through reverse pumping plants, actually delivered to the California Aqueduct. Semitropic currently has six banking partners: the Metropolitan Water District, Santa Clara Valley Water District, Alameda County Water District, Alameda County Zone 7, Vidler Water Company and The Newhall Land and Farming Company. The total amount of storage under contract is approximately 1,000,000 acre-feet. The stored water may be extracted in annual amounts of up to 90,000 acre-feet for all banking partners except Newhall; Newhall can extract up to 4,950 acre-feet annually from the bank. In 2002, CLWA entered into an agreement with DWR and the KCWA for the interim banking of water in Semitropic.

In addition, Semitropic has recently completed environmental documentation to construct new storage and return facilities. These new facilities will provide Semitropic with the additional capability to extract and pump-back to the California Aqueduct approximately 200,000 acre-feet annually. The total return capability of Semitropic in dry years is expected to be approximately 290,000 acre-feet.

Kern Delta Water District: Kern Delta Water District is in the process of developing a banking agreement with the Metropolitan Water District. Kern Delta is in the San Joaquin Valley southwest of Bakersfield and obtains imported supplies from the Kern River, 180,000 acre-feet of pre-1914 rights, and the SWP under contract through KCWA for a maximum annual Table A Amount of 25,000 acre-feet. Under the proposed Kern Delta banking program, in wet years, additional water would be supplied to Kern Delta where it would augment groundwater supplies through either direct groundwater recharge by spreading or by in-lieu replenishment. In dry years, previously stored supplies would be returned to the Metropolitan Water District, either by direct groundwater pumpback or through exchange of other supplies available to Kern Delta. Total return capability in dry years would be 40,000 acre-feet, with a total storage capacity of 200,000–240,000 acre-feet.

North Las Posas Water Bank: The North Las Posas Groundwater Basin is about 18 miles long, 4.5 miles wide and is located in Southern California near Los Angeles. Water to this area is supplied by the Colleagues Municipal Water District, which imports all of its water from the Metropolitan Water District.

Investigations have shown that the North Las Posas Groundwater Basin has available storage capacity of about 300,000 acre-feet, primarily as a result of historic groundwater production. It is projected that the North Las Posas Water Bank could be used to return up to 10,000 acre-feet of previously stored water when needed.

f. Water Transfers

Another opportunity available to CLWA for increasing water supplies and enhancing reliability is to participate in voluntary water transfer programs (UWMP, Ch. 2.0). Since the statewide drought of 1987–1992, water transfers have developed into a viable supplemental source to improve supply reliability. The initial concept for water transfers was codified into law in 1986 when the California Legislature adopted the "Katz" Law (California Water Code Sections 1810–1814) and the Costa-Isenberg Water Transfer Law of 1986 (California Water Code Sections 470, 475, 480–483). These laws help to define the parameters for water transfers and establish a variety of approaches through which water or water rights can be transferred among individuals or agencies.

A water transfer can involve water sales, water ranching/farming and water sharing, and usually occurs as a form of spot, option and core transfers agreements. The cost of water transfer varies depending on the type, term and location of the transfer. Up to 27 million acre-feet of water are delivered for agricultural use every year. Over half of this water is in the Central Valley, and much of it is delivered by, or adjacent to, SWP and Central Valley Project conveyance facilities. This allows for the voluntary transfer of water to many urban areas through SWP facilities, including the CLWA service area.

One of the most important aspects of any resource planning process is flexibility. A flexible strategy minimizes unnecessary or redundant investments (or stranded costs). The voluntary purchase of water between willing sellers and buyers can be an effective means of achieving flexibility. However, not all water transfers have the same effectiveness for ensuring flexibility. Within the resource planning process and through ultimate implementation, several different types of water transfers have been undertaken:

Core Transfers: Agreements to purchase a defined quantity of water every year, whether needed or not. These transfers have the benefit of more certainty in costs and supply, but tend to offset surplus imported water (available in most years) that is already paid for.

Spot Market Transfers: Water that is purchased only during the time of need (usually a drought). Payment for these transfers occurs only when water is needed, but there is usually greater uncertainty in terms of costs and availability of supply. An example of such a transfer was the state's Drought Water Bank. An additional risk of spot market transfers is that the purchase may be subject to institutional limits or restricted access (e.g., requiring the purchasing agency to institute rationing before it is eligible to participate in the program).

Option Contracts: Agreements that specify the amount of water needed and the frequency or probability that the supply will be called upon (an option). These transfers have the best characteristics of both core and spot transfers. With option contracts, the potential for redundant capacity is minimized, as are the risks associated with cost and supply availability.

The most viable types of water transfers are core and option transfers and, as such, represent the CLWA's long-term strategy. (UWMP, Ch. 2.0) The costs for these types of transfers have been estimated to be about $60–$160 per acre-foot for core transfers (compared to the initial cost of $1,100–$2,000 per acre-foot for SWP Table A water), and $250 per acre-foot for option transfers. Although the option transfer costs might seem high, the equivalent average annual cost is much less, about $65–$112 per acre-foot. The reason the average annual option transfer costs are much lower is due to the variable likelihood that the transfers will be needed.

g. Water Exchanges: Brackish and Seawater Desalting

Water exchanges represent the use of water that belongs to another entity either by trading water for water or by paying the cost of the water development and transmission. One opportunity for future exchange is through brackish and seawater desalting. (UWMP, Ch. 2.0)

Large-scale seawater desalination processes usually occur by one of two means: membrane processes and thermal processes. Membrane processes such as reverse osmosis (RO) use pressure to push seawater through semi-permeable membranes. The membrane acts as a filter allowing water to pass but not dissolved solids and impurities. Thermal processes utilize heat to separate the water from the salt and other impurities in the seawater. Thermal facilities tend to be more common but are often located in areas where fuel is inexpensive. Therefore, as membrane technology closes the cost gap, RO will become a less costly and more energy efficient desalination technology.

Desalination of seawater is technically feasible, but has historically been an expensive procedure. However, recent seawater desalination projects seem to indicate that the cost of seawater desalination, in some site-specific situations, has decreased in recent years. The competitive proposal process for the design, construction, and operation of the 25 mgd Tampa, Florida, seawater desalination plant gained worldwide attention. The best and final offer had a first year water cost of $560.00/acre-feet and a 30-year nominal cost of water of $680.00/acre-feet. This compares favorably to past desalination costs reported to be in the range of $1,300.00 to over $2,000.00 per acre-feet. The Tampa project includes a number of favorable factors that contribute to the low water price.

In Trinidad, a 23-year contract was awarded to build, own, and operate a 28.8 mgd seawater desalination facility. The plant will supply water at a first-year price of $865.00/acre-feet (1999).

A third example is the Long Beach Desalination project, currently in the planning stages. Poseidon Resources, the Long Beach Water Department and Southern California Edison are key participants in this project. The project includes a 20–40 mgd desalination plant and appurtenant facilities. The $90–$180 million private investment will present no financial risk to the public partners, while at the same time providing substantial water supplies.

Current projects would seem to indicate that the cost of seawater desalting is at a point where it could become a viable resource option. As discussed above, 20,000–40,000 AFY will be available as part of the proposed Long Beach project. CLWA has assumed that between 2,000 and 5,000 AFY of desalted water could be purchased for use in the CLWA service area.

h. Water Conservation and Water Supply Planning

In recent years, water conservation has become an increasingly important factor in water supply planning (UWMP, Ch. 5.0, 7.0). Although not considered a "supply" source, water conservation measures have the same effect by reducing overall water demand, making more water available for use at the local and state level. In the Santa Clarita Valley, CLWA and the four retail water purveyors have actively implemented water conservation programs for many years, and additional programs are planned for the future. (UWMP, Ch. 5.0) CLWA is now a signatory to the Urban Water Conservation Council Memorandum of Understanding regarding the use of best management practices.

In summary, CLWA and the purveyors have developed extensive water conservation efforts, and the CLWA service area has achieved significant reductions in actual water usage through these programs. During the early 1990s (hot/dry period), the overall water requirements, due to the effects of weather, were projected to increase by approximately 10 percent. As a result of the conservation efforts, the overall water requirement actually decreased by 20 percent.

CLWA has adopted the water conservation goal of an overall 10 percent reduction in normal demand. Residential and commercial water usage can be expected to decrease through the implementation of existing and future programs. CLWA and the purveyors assume that water conservation can decrease water usage in normal years by approximately 10 percent (which is considered a conservative estimate).

Water Demand Measures and Best Management Practices: The Urban Water Management Act lists 14 Demand Management Measures that correspond to the 14 urban BMPs, or water use efficiency measures, promulgated by the California Urban Water Conservation Council. Adoption of the BMPs is presently voluntary; about 250 water agencies throughout the state have committed to implement them.

The recent CALFED Bay-Delta Program required mandatory adoption of the BMPs by December 2002. The water agencies of the Santa Clarita Valley have committed to implement the BMPs.

Implementation of Best Management Practices: The Demand Management Measures/BMPs that are currently being implemented by the Santa Clarita Valley water agencies, or planned for implementation, are listed below.

- **Water Survey Programs for Single and Multi-Family Residential Customers.** The programs target and market the identified residential customers. The water agencies in Santa Clarita Valley will continue to implement these surveys and later implement the BMP.

- **Residential Plumbing Retrofit.** The program identifies residences constructed since 1992 and develops distribution strategy for water saving devices. The water agencies in Santa Clarita Valley will continue to implement this program and later implement the BMP.

- **System Water Audits, Leak Detection and Repair.** This programs involves leak detection and repair. The water agencies in Santa Clarita Valley will continue to implement this activity.

- **Metering with Commodity Rates for New Connections and Retrofit of Existing Connections.** The metering of all new connections and retrofitting is already done by agencies in Santa Clarita Valley.

- **Large Landscape Conservation Programs and Incentives.** These programs offer water use surveys to non-residential customers with large landscape areas. The water agencies in Santa Clarita Valley are partially complying with this activity, and will later implement the BMP.
- **High Efficiency Washing Machine Rebate Program.** This program offers rebates for purchase of horizontal-axis washing machines. The water agencies in Santa Clarita Valley do not offer rebates (nor do local energy providers or wastewater agencies). Local agencies are exempt from implementation.

- **Public Information Program.** This program implements an appropriate public information program on water efficiency. The water agencies in Santa Clarita Valley offer a very extensive and effective, award-winning program.

- **School Education.** This program provides water efficiency classes and information to schools. The water agencies in Santa Clarita Valley offer an extensive and effective award-winning program.

- **Conservation Programs for Commercial, Industrial, and Institutional (CII) Customers.** These programs identify such accounts, rank them according to water use and offer water use surveys and incentives. The water agencies in the Santa Clarita Valley not yet implementing the programs will implement the BMP at a later date.

- **Wholesale Agency Programs.** CLWA provides financial incentives or equivalent to retailers, along with technical support and information. Local water agencies will continue to implement this activity.

- **Conservation Pricing.** The water agencies in the Santa Clarita Valley institute conservation pricing. Local agencies will continue to implement a variety of pricing structures that meet the terms of this requirement.

- **Water Conservation Coordinator.** The water agencies in the Santa Clarita Valley designate staff to oversee water conservation program implementation. Local agencies will continue to implement.

- **Water Waste Prohibition.** CLWA enforces measures prohibiting water waste; however, CLWA does not possess police powers.

- **Residential Ultra-Low-Flow Toilet (ULFT) Replacement Program.** The programs determine number of service connections constructed before 1992 and offer toilet replacements. Local agencies will implement this BMP at a later date.

In September 2003, CLWA developed a long-term *Draft Report, Water Supply Reliability Plan.* The primary objectives of the draft Water Supply Reliability Plan are to develop a protocol to identify current

opportunities, evaluate opportunities using uniform economic criteria, and recommend a water supply reliability plan that focuses CLWA's efforts on the cost effective and beneficial opportunities. The recommended draft Water Supply Reliability Plan includes the following primary elements:

- Near-term acquisition of water banking capacity to allow banking of excess SWP water until the selected long-term banks have been developed.
- Acquisition of water banking capacity south of the Tehachapi Mountains to provide reliability for potential SWP conveyance disruptions.
- Acquisition of water banking capacity north of the Tehachapi Mountains to meet the additional identified water banking requirements not provided south of the Tehachapi Mountains.

The draft Water Supply Reliability Plan also includes a discussion of key implementation issues and a recommended implementation plan. The plan recommends that CLWA provide a minimum storage capacity of 50,000 acre-feet by 2005, rising to 183,000 acre-feet by 2050.

i. Local Water Contingency Planning

In addition to the conservation programs, during the 1991 drought year, the local water agencies in the Santa Clarita Valley prepared and implemented a Water Shortage Contingency Plan. It was again implemented in 1994 due to the Northridge earthquake. In both instances, the Water Shortage Contingency Plan worked effectively. The summary provided below describes various aspects of the updated Water Shortage Contingency Plan for the Santa Clarita Valley. (UWMP, Ch. 6.0)

Drought Committees: In past droughts, two committees were formed to address drought conditions: the Upper Santa Clara Valley Water Committee, consisting of the local water agencies in the Santa Clarita Valley, and the City of Santa Clarita Drought Committee. Each reviewed information on water production and demand. The Water Committee agreed to cooperate in sharing water resources regardless of contractual or water rights during the emergency. The City committee made recommendations to the City Council and the water purveyors.

Drought Conditions: In the event of a continued drought, it is assumed that the SWP Table A deliveries to CLWA would be curtailed, and that a State Drought Water Bank would be formed. In addition, a combination of supplies would be available such as short-term water exchanges, participation in DWR's dry year water program, deliveries from CLWA's flexible water account in Castaic Lake Reservoir, and local groundwater pumping in accordance with groundwater studies. Reclaimed water availability is also assumed to be available.

Earthquake or Other Natural Catastrophes: If a major earthquake were to occur, or if other catastrophic natural events were to occur elsewhere in the state, it could affect the Santa Clarita Valley. Local storage in reservoirs, combined with requests to the public to reduce consumption, would provide an adequate supply for about seven days. Experts agree that at least 72 hours may elapse before outside help is received; during this period and beyond, the pumping capacity of the retail agencies should provide sufficient water.

Contamination: No extended problems with water contamination are anticipated, since the quality of local supplies is good, and steps can be readily taken to isolate a contamination problem. As discussed above, the presence of perchlorate found in one area of the Saugus Formation is currently being addressed through the development of a cleanup plan for this aquifer.

Stages of Action: The agencies have agreed on a four-stage rationing plan, when needed. The trigger points for these stages have been established, priorities set and consumption limits established. A public hearing must be called to implement the rationing plan, and various monitoring procedures have been adopted.

Taken together, an updated Water Shortage Contingency Plan for the Santa Clarita Valley is in place, and has been successfully implemented. (UWMP, Ch. 6.0)

j. Summary Of Water Supplies For Santa Clarita Valley

The reliability of water supplies available to the CLWA service area does not depend on the "Full Delta Fix" and other water supply improvements recommended by the CALFED Program. CLWA and the retail water purveyors in the Santa Clarita Valley continue to pursue and fund their own local water supply programs. Recently, local water reliability enhancement programs have been undertaken to ensure that the water needs of the service area can be met into the future. As part of this endeavor, numerous programs are being undertaken simultaneously to safeguard against the onset of the next dry year.

As an example, CLWA's long-term CIP is currently funding the purchase of additional SWP supplies, groundwater storage programs both inside and outside CLWA's service area, surface water storage programs, water conservation and recycling programs, short-term pumping from the Saugus Formation and short-term exchanges from other agencies on an as-needed basis. In 2001 and 2002, CLWA took several specific actions to enhance, preserve and strengthen the quality and reliability of existing and future water supplies in the Santa Clarita Valley. Those actions included, among others, completing the preliminary design for expansion of the ESFP from 25 mgd to 56 mgd; obtaining permission from DHS to

increase filter flow at the ESFP; negotiating a transfer of 8,786 AFY of 2001 Castaic Creek flood flows to CLWA for treatment and use; negotiating with DWR an extended carry-over program for 2001 SWP allocations; signing the Memorandum of Understanding Regarding Urban Water Conservation in California; working to complete acquisition of an additional 16,000 AFY of SWP Table A Amount, following appropriate environmental review, which is underway; and entering into an agreement to bank water in the Semitropic Water Storage District on an interim basis. These measures implemented over time provide the assurance that alternative supplies will be available in the CLWA service area to meet local water demands well into the future. For long-term planning purposes, water supplies and facilities are added on an incremental basis and in advance of need.

At the same time, however, CLWA, the four local retail water purveyors and other purveyors in the state readily acknowledge that it would be economically imprudent now, or in the short-term, to acquire all of the water supplies and facilities needed for the next 25–30 years. This type of an approach would represent an unfair shift of costs from future customers in new developments to existing customers in existing developments. In fact, water agencies in California are generally prohibited by law from imposing fees and charges for water supplies and facilities unless those fees and charges are reasonably related to actual services provided.

(1) Availability of Local Supplies

As shown in **Table 14**, projected total future supplies from local groundwater and reclaimed water sources range from 85,000 AFY in a dry year to 63,000 AFY in an average/normal year.

Table 14
Planned Local Supplies
(AFY)

Source	Average/Normal Year	Dry Year
Groundwater		
Alluvial Aquifer	35,000	32,500
Saugus Formation	11,000	15,000–24,000
Restored Impact Wells	--	10,000
Saugus Formation (new wells)*	--	10,000
Reclaimed Water	17,000	17,000
Total Local Supplies	**63,000**	**8,500–93,500**

Source: Santa Clarita Valley Water Report *2004, May 2005.*

* *Planned program for future implementation. According to the CLWA, prior to implementing increases in production from groundwater supplies, CLWA will analyze the feasibility, cost and potential water quality and environmental effects of such a program. However, preliminary analyses and recent studies have concluded that additional pumping can be carried out.*

(2) Availability of Imported Supplies

As shown below in **Table 15**, projected supplies from the SWP, water banking/conjunctive-use projects, and water transfers range from 56,800 AFY in average/normal years to 113,642–133,454 AFY in dry years.

Table 15
Planned Imported Supplies
(AFY)

Source	Average Year	Dry Years
SWP Supplies *	56,800	18,088–37,900
Banking/Conjunctive Use**	--	90,870
Flexible Storage Account	--	4,684
Total Imported Supplies	**56,800**	**113,642–133,454**

Source: Amended 2000 UWMP and the Santa Clarita Valley Water Report 2004, May 2005.
* *56,800 acre-feet = 59.7 percent of maximum Table A Amount; 18,088 acre-feet = 19 percent of maximum Table A Amount; and 37,900 acre-feet = 39.8 percent of maximum Table A Amount.*
** *Planned programs for future implementation pursuant to the Amended 2000 UWMP, Table 2-5 and the* Santa Clarita Valley Water Report 2004, *May 2005.*

(3) Total Water Supply Availability

As shown below in **Table 16**, for long-term planning purposes, total water supplies available to the CLWA service area range from 198,142–226,954 AFY in dry years, and from 119,800 AFY in average years. For critical dry years, when the reliability of the SWP can be reduced to approximately 20 percent of SWP maximum Table A Amount, CLWA would utilize dry year supplies available from the Saugus Formation, and water banking and conjunctive use projects as indicated in **Table 16**.

Table 16
Total Supplies
(AFY)

Source	Average Year	Dry Years
Local Supplies Groundwater		
Alluvial Aquifer	35,000	32,500
Saugus Formation	11,000	15,000–24,000
Restored Impacted Wells		10,000
Saugus Formation (new wells)*	--	10,000
Reclaimed Water*	17,000	17,000
Imported Supplies		
SWP Supplies	56,800	18,088–37,900
Water Banking/Conjunctive Use*	--	90,870
Flexible Storage Account*	--	4,684
Total Supplies	**119,800**	**198,142–226,954**

Source: Amended 2000 UWMP and the Santa Clarita Valley Water Report 2004.
* *Planned programs for future implementation pursuant to the Amended 2000 UWMP, Table 2-6 and the* Santa Clarita Valley Water Report 2004, May 2005.

The remaining portion of this report summarizes "water demand" in the Santa Clarita Valley.

k. Water Demand in the Santa Clarita Valley

This section describes the historic, existing and projected water use (demand) within the CLWA service area.

CLWA provided historic and existing water usage in the Santa Clarita Valley and the methodology used to forecast future water demand for the valley. Water usage consists of residential, commercial, industrial, recreational, agriculture and other uses. Existing land-use data, new housing construction information and population data were also compiled for the Santa Clarita Valley. The information was then compared to historic trends in water service connections and customer water usage to determine the reasonableness of the projected information. In addition, the CLWA considered the effects of weather and conservation on historic water usage.

This section summarizes the historical and existing water demand in the Santa Clarita Valley and forecasts the water demand in the valley through 2020.

(1) Historical and Existing Water Demand in Santa Clarita Valley

The historical and existing water usage was based upon service connections from the four retail water purveyors in the CLWA service area. As shown in **Table 17**, the total number of new service connections has increased from 40,734 in 1992 to 64,775 in 2004. This increase in the number of service connections represents approximately 2,000 per year. Existing water demand in 2005 is expected to be 81,700 afy.

Table 17
Historical Number of Service Connections

Service Connections	1992	1994	1996	1998	2000	2002	2004
VWC	14,854	15,703	17,420	19,863	22,000	25,286	28,296
Newhall	6,144	6,294	6,477	6,585	7,200	7,700	9,010
CLWA Santa Clarita Water Division	19,000	19,400	19,650	20,300	22,000	24,175	26,161
LA County #36	736	752	768	774	700	1,060	1,308
Total	**40,734**	**42,149**	**44,315**	**47,522**	**51,900**	**58,221**	**64,775**

Source: CLWA 2000; 2000, 2002 and 2004 Santa Clarita Valley Water Reports.

(2) Projected DMS Water Demand in Santa Clarita Valley (2015)

The DMS is an important regulatory component of the County's General Plan. The DMS acts as an early warning system to County decision-makers by providing information about the existing capacity of certain infrastructure, facilities and public services at the time a new development is considered in the four major "urban expansion areas" of the County's General Plan, including the Santa Clarita Valley. The goal of DMS is to identify the new infrastructure, facilities and public services that will be required for new development, and to ensure that the appropriate costs of expanding such infrastructure, facilities and services will be paid for by new development and not assumed by taxpayers in existing developments.

In accomplishing the goals stated above, the DMS determines the availability of certain infrastructure, facilities and services, including water services, on an individual and cumulative basis. The DMS utilizes a computer database that incorporates information supplied by service providers and determines capital facility capacity and demand placed on the system by existing, pending, approved and recorded projects for which land divisions have been filed within the four major "urban expansion areas" of the County's General Plan, including Santa Clarita Valley. The DMS is used to quantitatively determine project and cumulative impacts on certain essential infrastructure, facilities and services, including water service. In EIRs prepared for the County, whenever a proposed project would result in an exceedance of applicable infrastructure, facilities or services, a significant impact is identified and recommended mitigation measures are provided.

The "DMS Build-Out Scenario" entails build out of subdivision projects listed in the County's DMS, plus the Soledad Village project. A DMS analysis is required by the County's General Plan for the cumulative analysis of certain utilities and services, including water service.

The County's DMS database includes all pending, recorded and approved projects for which land divisions have been filed within County unincorporated lands and within the City of Santa Clarita. The City plus County unincorporated area together constitute the County's Santa Clarita Valley Planning Area. **Table 18** illustrates cumulative water demand for the Santa Clarita Valley service area under the DMS Build-Out Scenario.

Table 18
Scenario 1: DMS Build-Out Scenario Demand for the Santa Clarita Valley – 2015 (AFY)

	Average Years		Dry Years[a]	
Santa Clarita Valley DMS Demand				
- Existing Plus DMS Demand	100,808		110,889	
Existing Demand		64,350		64,350
Pending Demand less Project		6,890		6,890
Approved Demand		9,372		9,372
Recorded Demand		5,984		5,984
Other Demand (including Agriculture)[b]		7,100		7,100
Portion of Newhall Ranch Specific Plan[c]		6,958		6,958
Dry Year 10% Increase in Demand		0		10,065
Soledad Village Demand		154		169
- Less Conservation	(10,081)		(11,089)	
Total[a]		**90,727**		**99,800**

[a] *Demand is increased by approximately 10 percent in dry years.*
[b] *This demand figure reflects a reduction in agricultural demand that would occur as the projects shown in the County's DMS are built. According to the VWC (DiPrimio, Personal Communication, 2003) water demand in a critical dry year can be expected to decrease by up to 20 percent through implementation of future water conservation practices in the CLWA service area.*
[c] *The Newhall Ranch Specific Plan would only be partially builtout by 2015. It is assumed that development on the Specific Plan site would start to be occupied in 2008 and would be fully builtout by 2030. This figure represents eight years worth of development on the Specific Plan site.*

With the water demand of the Soledad Village project (154 AFY in an average year and 169 AFY in a single dry year) and taking into consideration expected water conservation (10,081 AFY in an average year and 11,089 AFY in a dry year), total cumulative demand under the DMS Build-Out Scenario would be approximately 90,727 and 99,800 acre-feet of water per year in an average and dry year, respectively. While no one can precisely predict the year build out of all projects listed in the DMS would occur, this analysis estimates that DMS build out would likely occur over the next 10–11 years. This analysis assumes that all projects on the DMS build out in 2015.

(3) Projected Water Demand In Santa Clarita Valley Up To 2025

In order to forecast future water demand through 2025, CLWA utilized both the extrapolation method (based on service connections) and the econometric method (based on land-use analysis) as the most accurate means of forecasting water demand through 2025. This combined forecast took the projected growth in new service connections, accounted for the effects of housing trends, land-use changes, development trends, weather and conservation effects to create an estimated increase in water demand through 2025.

Normal/Average Year Water Demand: **Table 19** depicts the projected average/normal year water demand for the Santa Clarita Valley through 2020.

Table 19
Projected Normal/Average Year Water Demand
(AFY)

	2005	2010	2015	2020
Urban Uses	66,600	77,700	90,900	106,000
Agricultural Uses[1]	15,100	12,400	9,800	7,100
Total Projected Demand[2]	**81,700**	**90,100**	**100,700**	**113,100**

Source: Water Supply Assessment for the Riverpark Project, Santa Clarita Water Division of the CLWA, August 7, 2003 and the Santa Clarita Valley Water Report 2004, *May 2005.*

[1] *Agricultural water usage is expected to decrease from 17,800 AFY in 1999 to about 7,100 AFY by 2020 due to increased development in the Santa Clarita Valley. This decrease in agricultural demand includes the approximately 7,038 AFY of Newhall Land and Farming Company agricultural water that would be used to partially meet the potable water demands of the Newhall Ranch Specific Plan as Newhall Land and Farming Company's agricultural lands in Los Angeles County are converted to urban uses.*

[2] *Does not include expected long-term water conservation savings of 10 percent.*

Using a straight-line projection, water demand is expected to increase to 123,570 AFY by 2025.

Single Dry Year Water Demand: CLWA evaluated the estimated dry year demands and projected supplies for the year 2010 for the purpose of assessing a single dry year. This year was selected in order to show the results of local and imported water supply development over the next 10 years. In May 2003 DWR finalized its *State Water Project Delivery Reliability Report*. For the worst-case scenario single critical dry year (1977, with a one in 73 year probability of occurrence), DWR estimates that SWP deliveries to contractors would be approximately 20 percent of contract Table A Amounts. Single dry year demand in 2010 is estimated at 81,090 AFY (i.e., 90,100 acre-feet less 9,010 acre-feet (10 percent) to account for expected voluntary conservation).

Multiple Dry Year Water Assessment: CLWA estimated the minimum water supply available during each of the three water years, 2001, 2002, and 2003.[30] The surface and groundwater supplies included in this analysis are reflective of supplies available during the 1987–92 drought years, and in particular, 1990, 1991, and 1992. The supplies available from recycling projects are assumed to experience no reduction in a dry year but are also assumed not to be fully on-line at this early stage of the 20-year projection. Demand reductions of 10 percent based on short-term water conservation programs are assumed for these dry year scenarios (this level of conservation was achieved during the 1987–1992 drought). If projected imported and local supplies are developed as indicated, no shortages are anticipated within the agency's service area in the dry year scenarios analyzed.[31] Years 1, 2, and 3 in **Table 20** represent

30 UWMP p. 4-3. Hot, dry weather may generate a 10 percent increase above normal in both urban and agricultural water usage.

31 UWMP p. 4-4.

demand projections for 2005–2007. The single and multiple dry year water supply and demand assessments from the UWMP are summarized in the following table.[32]

Table 20
Projected Dry Year and Multi-Dry Year Demand
(AFY)

		Multiple Dry Years		
	Single Dry Year	Year 1 2005	Year 2 2006	Year 3 2007
Total Estimated Demand	90,100	81,700	83,380	85,060
Voluntary 10% Conservation	9,010	8,170	8,338	8,506
Total Net Demand	81,090	73,530	75,042	76,554

Source: Amended 2000 UWMP and the Santa Clarita Valley Water Report 2004, *May 2005.*

Information concerning "Future Planned Water Supply Programs" as listed below, from the UWMP and other sources was included to indicate examples of how CLWA would add reliability and flexibility to its water supply portfolio. Programs such as these will be analyzed by CLWA and contracts entered into as need and cost-effectiveness are determined through time. Future Water Supply Assessments will reflect these contractual agreements.

Long-Term (2025) Dry Year Demand: To determine the projected water demand in dry years, CLWA relied on studies showing that hot-dry weather may generate a single-year 10 percent increase in both urban and agricultural water usage above and beyond the average/normal year water demand. Therefore, this percentage was used to generate the dry year demands shown in **Table 21**. No conservation savings are reflected in the water demand projections shown in **Table 21**. **Table 21** also provides the overall projected water demand for the Santa Clarita Valley through 2020 in average/normal years and dry years.

Table 21
Projected Dry Year Water Demand
(AFY)

	2005	2010	2015	2020
Total Projected Normal/Average Year Demand	81,700	90,100	100,700	113,100
Plus 10% Increase in Usage in Dry Years	8,170	9,010	10,070	11,310
Total Projected Dry Year Demand	**89,870**	**99,110**	**110,770**	**124,410**

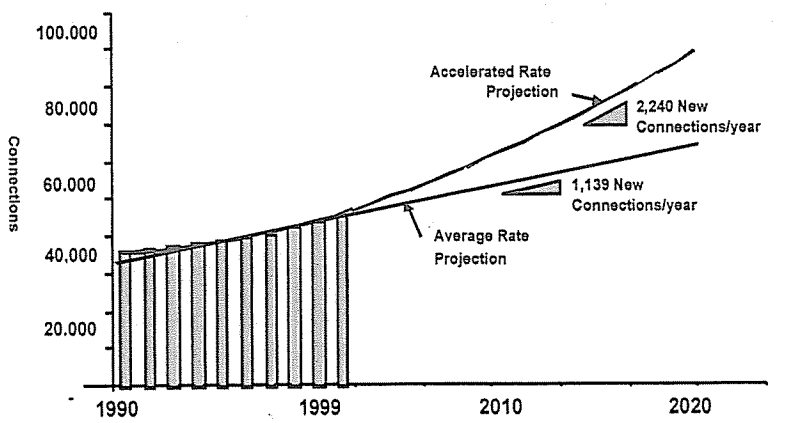
Source: UWMP 2000, Table 3-5 and Table 4-2.

32 Excerpted from Table 4-2 of the UWMP.

Water demand in dry years would increase to 135,927 AFY by 2025. In considering the future number of service connections needed within the CLWA service area, CLWA utilized the methodology, referred to as the extrapolation method. This method evaluates projected water usage based on the extrapolation of service connections throughout the CLWA service area. Using this method, service connections are exponentially projected for the CLWA service area through 2025. Under this method (exponential projection), the number of new service connections is projected to increase from 49,550 in 1999 to about 96,000 in 2020 and 107,200 in 2025, representing an annual average increase of about 2,240 new connections per year. Recent service connection data is generally consistent with this projected average. Connection data compiled and maintained by CLWA since 2000 shows 2,249 new connections in 2000, 2,822 new connections in 2001, and 2,080 new connections in 2002.[33]

Figure 17, below, depicts the historical and projected number of service connections in the CLWA service area by the year 2020. The figure shows about 96,000 new connections in 2020, with an average annual increase of 2,240 connections per year from 2000–2020, using the accelerated rate projection); and it shows about 70,000 new connections in 2020, with an average annual increase of 1,139 connections per year from 2000–2020, using an average rate projection).

Figure 18
Historical and Projected Number of Service Connections



33 See, CLWA's *SB 610 Water Supply Assessment for the Riverpark Project.*

4. SOLEDAD VILLAGE WATER DEMAND AND SUPPLIES

An adequate supply of water is available to meet the demands of the Soledad Village project without creating significant environmental impacts.

a. Preface

This section is the "heart" of the **Water Supply Study**. This section demonstrates that adequate water sources will be available for buildout of the project by showing that the water purveyor serving the project site has a sufficient supply of water for its customers including those ultimately on the project site.

b. Water Demand and Delivery

(1) Soledad Village Water Demand and Delivery

This section presents the water demand for the Soledad Village project. In this discussion, the project's water demand is assessed in conjunction with the existing water demand in the Santa Clarita Valley, as well as the future cumulative water demand in the Santa Clarita Valley under near-term and long-term conditions.

The Soledad Village project is a proposed residential development consisting of multi-family housing on a 30-acre site in the City of Santa Clarita. It includes 437 townhomes, 8,000 square feet of commercial building area, and a recreation center.

Using water demand factors provided by Santa Clarita Valley Water Division, the proposed project would consume approximately 154 AFY. The anticipated project demand for water is summarized in **Table 22, Estimated Water Demand,** below.

Table 22
Estimated Water Demand

Land Use Category	Amount	Water Duty Factor	Water Demand (AFY)
Townhomes	437 units	0.24 acre-feet/unit	104.9
Recreation Area	0.75 acres	3 acre-feet per acre	2.2.0
Other Misc. Landscaping (irrigated common landscaping, etc.)	15 acres	3 acre-feet per acre	45.0
Commercial (8,000 sq. ft.)	1 acre	0.0289 acre-feet / 100 sq. ft.	2.3
TOTAL			**154.4**

The proposed project will be served by a proposed looping system of water lines connecting to existing 10-inch and 14-inch mains, owned and operated by Santa Clarita Water, within Soledad Canyon Road. The proposed project's water delivery system will consist of 12- to 16-inch water mains that generally follow the roadway system within the project site. Additionally, a series of fire hydrants will be located along Soledad Canyon Road. **Figure 20, Proposed On-Site Potable Water System**, illustrates the proposed project's water distribution system and the locations of the existing water facilities adjacent to the property. The following is a description of the proposed project's potable water delivery system.

Existing Infrastructure: An existing 10-inch water main located on the north side of Soledad Canyon Road at the east end and adjacent to the project site connects to a 14-inch main installed along the remaining project frontage in the south side of Soledad Canyon Road.

Proposed Improvements: The entire project is located within Santa Clarita Water Division Pressure Zone E. The proposed improvements consist of a looping system of mains and local service lines within the proposed private street and driveway system.

Project Fire Flows: The Los Angeles County Fire Department requires sufficient capacity for fire flows of 5,000 gpm at 20 pounds per square inch (psi) for a five-hour duration for multi-family and commercial uses with a first floor area of 35,000 square feet or greater (actual fire flow requirements would be confirmed for each use by the Los Angeles County Fire Department prior to final tract map approval). According to the project engineer, Pacific Coast Civil, Inc., the proposed water system would be able to meet both domestic and fire flow requirements of the project.

(2) Existing Conditions Plus Project Water Demand

This section describes the existing development in the Santa Clarita Valley, as well as the project water demand. **Table 23, Existing Plus Project Demand for the Santa Clarita Valley**, illustrates the project demand, in conjunction with existing demand in the Santa Clarita Valley.

As shown, existing water demand in the Santa Clarita Valley is approximately 82,503 AFY in average years (this figure accounts for a dry year increase in water demand in 2004 of approximately 10 percent). Of this demand, approximately 66,364 acre-feet are related to urban or developed areas and approximately 16,000 acre-feet is related to other uses in the Santa Clarita Valley, including agricultural uses. When combined with the Soledad Village water demand of 154 AFY, the total water demand in the Santa Clarita Valley would be approximately 82,518 acre-feet if Soledad Village were completely built out today. The land use-related water demand would increase by approximately 10 percent in dry years,

such as occurred in 2004, resulting in a water demand of approximately 89,169 AFY. In a critical dry year, such as occurred in 1991, demand could decrease by up to 20 percent due to conservation measures that would be enacted by the local water purveyors and CLWA. However, this analysis conservatively assumes that critical dry-year demand would decrease by 10 percent from the dry-year demand. During such extreme conditions, water demand in the Santa Clarita Valley with the Soledad Village project would be approximately 80,252 acre-feet.

Table 23
Existing Plus Project Demand for the Santa Clarita Valley
(AFY)

	Average Year	Dry Year[b]	Critical Dry Year[c]
Existing Demand[a]	66,364	73,000	73,000
Other Demand (Agricultural)[a]	16,000	16,000	16,000
Soledad Village Demand	154	169	169
Critical Dry Year 10% Demand Decrease (Conservation)			(8,917)
Total Demand	**82,518**	**89,169**	**80,252**

[a] *Source:* Santa Clarita Valley Water Report 2004, *Prepared by the CLWA, Los Angeles County Waterworks District #36, Newhall County Water District, VWC, May 2005.*

[b] *Demand is increased by approximately 10% in dry years. 2004, the year from which this demand was derived, was a dry year and already reflects the 10% increase in demand over a normal or average year. A dry year is a year when below average rainfall occurs after a normal or wet year.*

[c] *Demand in a critical dry year is expected to decrease by as much as 20% due to voluntary and mandatory planned purveyor conservation programs. This analysis assumes a critical dry year 10% reduction in demand from the dry year demand. A critical dry year is a year when rainfall is at a critically low level (i.e., a year that occurs once every 73 years). Such a demand reduction occurred in the last critical dry year experienced in the Santa Clarita Valley (1991).*

(3) Cumulative Water Demand

In order to analyze the cumulative water impacts of Soledad Village in combination with other expected future growth, the amount and location of growth expected to occur in addition to that of the project must be predicted. Section 15130(b) of the *CEQA Guidelines* allows two methods of prediction. The two methods are described as follows: "(a) a list of past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those projects outside the control of the agency; or (b) a summary of projections contained in an adopted general plan or related planning document which is designed to evaluate regional or area-wide conditions." In response to the CEQA requirements, three separate cumulative development scenarios are analyzed for this water analysis in order to meet CEQA requirements. Although SB 610 does not apply to the proposed project because it contains fewer than 500 dwelling units, an SB 610 scenario is provided for information purposes. The three cumulative scenarios analyzed are referred to below as the "SB 610 Water Supply Assessment Scenario," the "DMS Build-Out Scenario," and the "Santa Clarita Valley Cumulative Build-Out Scenario."

The list of cumulative projects used in this water analysis to assess cumulative impacts is not static. From time to time, the list of cumulative projects is increased or decreased as specific development proposals are applied for, withdrawn, approved, or denied by lead agencies. As part of this analysis, an attempt has been made to be as current as possible; however, it is possible that the list of projects maintained by the City of Santa Clarita or other surrounding jurisdictions will change while this analysis is a subject of public review.

(a) SB 610 Water Supply Assessment Scenario – Demands

Water demands were estimated under three scenarios for the SB 610 Water Supply Assessment. They include the average/normal water year, the single dry year, and multiple dry years. Under the average/normal conditions, water demand in the Santa Clarita Valley would be 81,700 acre-feet in year 2005, 90,100 acre-feet in year 2010, 100,700 acre-feet in year 2015 and 113,100 acre-feet in year 2020.

For the critical dry year (2010), which occurs once every 73 years, water demand in the Santa Clarita Valley would be 90,100 acre-feet less 9,010 acre-feet due to voluntary conservation of 10 percent for a net demand of 81,090 acre-feet (While in the last critical dry year, 1991, a conservation level of 20 percent was achieved, this portion of the analysis is using a 10 percent reduction in demand is assumed in order to be conservative).

Under the multiple-dry year scenarios and after conservation of 10 percent, year 1, 2 and 3 demands would be 73,800 acre-feet, 74,970 acre-feet, and 76,140 acre-feet, respectively.

(b) DMS Build-Out Scenario – Demands

The County's DMS database includes all pending, recorded, and approved projects for which land divisions have been filed within County unincorporated lands and within the City of Santa Clarita. The City plus County unincorporated area together constitute the County's Santa Clarita Valley Planning Area. **Table 18** (shown previously) illustrates cumulative water demand for the Santa Clarita Valley service area under the DMS Build-Out Scenario. It should be noted that this scenario also includes a portion of the Newhall Ranch Specific Plan. The Newhall Ranch Specific Plan would only be partially built out by 2015, and it is assumed that development on the Specific Plan site would start to be occupied in 2005 and would be fully built out by 2030. The water demand of Newhall Ranch shown in **Table 18** represents 10 years worth of development on the Specific Plan site.

With the water demand of the Soledad Village project (154 AFY in an average year and 169 AFY in a single dry year) and taking into consideration expected water conservation (10,081 AFY in an average

year and 11,089 AFY in a dry year), total cumulative demand under the DMS Build-Out Scenario would be approximately 90,727 to 99,800 acre-feet of water per year in an average and dry year, respectively.

(c) Santa Clarita Valley 2025 Build-Out Scenario – Demand

CLWA and other retail water purveyors in the Santa Clarita Valley prepared the UWMP, December 2000. CLWA estimated of future water demand for the CLWA service area to the year 2020. The CLWA service area includes the Santa Clarita Valley and a portion of Ventura County. In all, the service area is approximately 192 square miles in size. CLWA and the local retail water purveyors undertook a comprehensive effort to project future water demands and supplies.

CLWA indicates that an extrapolation service connection analysis method produces the most accurate predictions of near-term demand (i.e., 10–20 years), but does not account well for economic changes over the long term (i.e., 50 years). However, the Santa Clarita Valley is not expected to reach buildout by the year 2020. Therefore, another method is needed to estimate the water demand for the Santa Clarita Valley by the year 2025. Given that this project would begin construction in approximately 2005 if approved, 2025 was selected for the 20-year analysis.

In order to obtain the most accurate forecast of long-term water demand, CLWA combined the extrapolation/service connection analysis with the econometric/land-use analysis to project the estimated increase in water demand through 2020. **Table 24**, below, presents the predicted water demand of the Santa Clarita Valley, including Soledad Village and the portion of Newhall Ranch constructed, in the year 2020.

Table 24
Scenario 2: Santa Clarita Valley 2025 Build-Out Scenario Water Demand (AFY)

	Partial Buildout (year 2020)		Full Buildout (year 2025)	
Build-Out Demand	Average	Dry	Average	Dry
- DMS Demand	90,573	99,631	90,573	99,631
- Newhall Ranch Specific Plan [a]	10,437	11,481	13,972	15,369
- Soledad Village Demand	154	169	154	169
- Additional Urban Demand	11,936	13,129	18,477	20,325
Total	**113,100[c]**	**124,410[b]**	**123,176[c]**	**135,494[b]**

[a] *Newhall Ranch buildout is assumed to occur from 2008–2030 at a rate of 864 dwelling units per year, with average water demands of 707 AFY.*

[b] *Demand is increased by approximately 10% in dry years (113,100 x 1.10 = 124,410 and 123,176 x 1.10 = 135,494). Water demand in a critical dry year can be expected to decrease by up to 20% through implementation of water conservation practices in the CLWA service area.*

[c] *Source: 2000 UWMP, December 2000, Table 3-5.*

Note: It is expected that the existing plus DMS demand would reach its peak in approximately 2015. The Newhall Ranch Specific Plan demand would begin in approximately 2008 and would reach its peak in approximately 2030. The additional urban demand would begin in approximately 2015, after DMS demand peaks.

As shown in **Table 24**, partial buildout of the valley by the year 2020 would create an average year water demand of approximately 113,100 AFY. This water demand figure includes the water demand generated by the project and the portion of the Newhall Ranch Specific Plan that would be expected to build out by that time (i.e., a land use water demand of approximately 10,437 AFY). It also includes the water demand of additional urban development that would occur after the buildout of all projects listed in the County's DMS (i.e., approximately 11,936 AFY). In dry years, total demand would increase to approximately 124,410 AFY.

As shown in **Table 24**, again using this combined projection method and extrapolating out to 2025, the total water demand in the Santa Clarita Valley by the year 2025, including the project and other development over and above DMS, would be approximately 123,176 AFY in average years and approximately 135,494 AFY in dry years.

c. Soledad Village Water Supplies

This section identifies the water sources that will be available to meet the water demand generated by buildout of the Soledad Village project. This section also discusses Soledad Village water supplies in conjunction with existing near-term development and future cumulative long-term development in the Santa Clarita Valley.

As discussed in the above section, the projected total water demand for the Soledad Village project is 154 AFY in years with average rainfall (an average year). Project water demand increases by approximately 10 percent in years with lower than average rainfall (a single dry year) to a total of 169 AFY. To meet this demand, water would be provided to the project by the Santa Clarita Water Division. The project site is located completely within the Santa Clarita Water Division service area. Water sources expected to be used by Santa Clarita Water Division include a combination of SWP water delivered through CLWA and local groundwater resources in the Alluvial aquifer and Saugus Formation. The amount delivered from each source varies year to year due to hydrologic and atmospheric conditions in the state.

(1) Existing Conditions Plus Project Water Demand and Supply

This section describes the existing development demand in the Santa Clarita Valley as well as the project water demand, measured against existing supplies. **Table 25, Existing Plus Project Demand and Supply for the Santa Clarita Valley**, illustrates that existing supplies exceed the project demand, in conjunction with existing demand in the Santa Clarita Valley. Existing water supplies exceed demand by 42,590 to 62,485 AFY in dry years and by 21,982 AFY in an average/normal year after adding the proposed project

to existing demands. It should be noted that dry year supplies available above demand reflect water supplies that would be available to purveyors in dry years. Purveyors would typically secure water from these supplies only in amounts necessary to meet demand.

Table 25
Existing Plus Project Demand and Supply for the Santa Clarita Valley
(AFY)

	Average Year	Dry Year[b]	Critical Dry Year[c]
Existing Demand[a]	66,364	73,000	73,000
Other Demand (agricultural)[a]	16,000	16,000	16,000
Soledad Village Demand	154	169	169
Critical Dry Year 10% Demand Decrease (Conservation)			(8,917)
Total Demand	**82,518**	**89,169**	**80,252**
Existing Water Supply Programs Available:			
Local Supplies			
Alluvial Aquifer	**35,000**	**32,500**	**32,500**
Saugus Formation	**11,000**	**24,000**	**15,000**
Recycled Water	**1,700**	**1,700**	**1,700**
Imported Supplies[b]			
SWP Table A Amount	**56,800**	**37,900**	**18,088**
Semitropic Bank Account		**50,870**	**50,870**
Flexible Storage Account		**4,684**	**4,684**
Total Existing Supplies	**104,500**	**151,654**	**122,842**
Surplus/(Deficit)	**21,982**	**62,485**	**42,590**

[a] *Source:* Santa Clarita Valley Water Report 2004, *Prepared by the CLWA, Los Angeles County Waterworks District #36, Newhall County Water District, VWC, May 2005.*

[b] *Demand is increased by approximately 10% in dry years. 2004, the year from which this demand was derived, was a dry year and already reflects the 10% increase in demand over a normal or average year. A dry year is a year when below average rainfall occurs after a normal or wet year.*

[c] *Demand in a critical dry year is expected to decrease by as much as 20% due to voluntary and mandatory planned purveyor conservation programs. This analysis assumes a critical dry year 10% reduction in demand from the dry year demand. A critical dry year is a year when rainfall is at a critically low level (i.e., a year that occurs once every 73 years). Such a demand reduction occurred in the last critical dry year experienced in the Santa Clarita Valley (1991).*

Tables 3 and **4**, above, delineate the mixes of water supplies expected to be used to meet demands in the next three years (2005-2007) under average/normal water supply conditions (**Table 2**) and under dry water supply conditions (**Table 3**). These tables can be viewed in the subsection above entitled "Summary of Local Groundwater Supplies, Near-Term Operational Scenario." This three-year period was selected to specifically respond to concern over the reliability of supply during the implementation phase of the perchlorate contamination treatment project to restore currently impacted groundwater supplies. This scenario takes into account the impact of perchlorate on the reliability of groundwater supplies from the Alluvial aquifer and Saugus Formation under an average/normal year, single dry year and three consecutive dry years. It also includes delivery of dry year "firming" supplies that were planned but not yet available when the 2000 UWMP was adopted. The mix of water supplies from available groundwater not impacted by perchlorate contamination in combination with other available supplies is sufficient to meet customer demands with a high degree of reliability over the next three years, which includes the

transition to full restoration of groundwater production currently impacted by perchlorate contamination.

d. Cumulative Water Supply Analysis

The following discussion focuses on the cumulative impacts to water availability for the Santa Clarita Valley. The analysis evaluates cumulative impacts under the following three future water demand and supply scenarios:

Scenario 1: Existing development within the CLWA service area, plus near-term projections, plus the project (referred to as the "SB 610 Water Supply Scenario");

Scenario 2: Existing development within the CLWA service area, plus Development Monitoring System ("DMS") projections, plus the project (referred to as the "DMS Build-Out Scenario"); and

Scenario 3: Buildout within the CLWA service area by 2025, plus active pending General Plan Amendment requests, plus the project (referred to as the "Santa Clarita Valley 2025 Build-Out Scenario").

(1) SB 610 Water Supply Scenario

As indicated previously, a water supply assessment is not required for the Soledad Village project. However, for information purposes, an SB 610 scenario was prepared. As indicated below, there will be a sufficient water supply available at the time the Soledad Village project is ready for occupancy to meet the needs of the project in addition to existing and other planned future uses.

CLWA has existing water allocation rights and contracts to meet future demand as needed over time, and has committed sufficient capital resources and planned investments in various water programs and facilities to serve all of its existing and planned customers, including Santa Clarita Valley Water Division's customers. Santa Clarita Valley Water Division's (universal) water rights and contracts for local supplies, in addition to imported supplies provided by CLWA, are sufficient to serve all of its existing and planned customers. Santa Clarita Valley Water District has also identified an operational strategy combined with a prudent and flexible management approach to ensure water reliability.

Santa Clarita Valley Water District's current service area-wide demand is approximately 29,191 AFY.[34] As mentioned previously, the Soledad Village project will require 154 AFY at buildout. The conclusions as stated in the 2000 UWMP related to the requirements of the SB 610 for Soledad Village are as follows:

Average/Normal Year Water Assessment: The UWMP indicates that no shortages are anticipated within the agency's service area in an average water year through 2020 if planned water supply programs are developed as estimated.[35] Without such programs, a deficit is possible in 2020. Total projected water demands for the CLWA through the year 2020 are compared with the supplies projected to be available to meet demands in this analysis. The following table, **Table 26,** summarizes the data from the UWMP.

Table 26
Long-Term Projection Average/Normal Water Year Water Supply and Demand Assessment
(acre-feet)

	2005	2010	2015	2020
EXISTING WATER SUPPLY				
Local Supplies				
Alluvial Aquifer	35,000	35,000	35,000	35,000
Saugus Formation	5,000	11,000	11,000	11,000
Recycled Water	700	1,700	1,700	1,700
Imported Supplies				
SWP Table A Amount	41,000	56,800	56,800	56,800
Draw From Short-Term Semitropic Bank Account	0	0	0	0
Draw From Flexible Storage Account	0	0	0	0
Total Existing Supply	**81,700**	**104,500**	**104,500**	**104,500**
PLANNED WATER SUPPLY				
Local Supplies				
Recycled Water	0	7,300	12,300	15,300
Imported Supplies				
Draw From Long-Term Water Banking Programs	0	0	0	0
Total Planned Supply	**0**	**7,300**	**12,300**	**15,300**
Total Supply (Existing Plus Planned)	**81,700**	**111,800**	**116,800**	**119,800**
Estimated Demand (without conservation)	**81,700**	**90,100**	**100,700**	**113,100**

Source: Amended 2000 UWMP.

"Planned Water Supply," as described in the tables below, are included in the UWMP to indicate examples of how CLWA would add reliability and flexibility to its water supply portfolio. Programs such as these will be analyzed by CLWA and contracts entered into as need and cost-effectiveness are determined through time. Future water supply assessments will reflect these contractual agreements.

Single Dry Year Water Assessment: The UWMP evaluated the estimated dry-year demands and projected supplies for the year 2010 for the purpose of assessing a single critical dry year. This year was

34 This represents average year demand. Dry year demand is approximately 10 percent higher.

35 CLWA, 2000 UWMP (December 2000) p. 4-2.

selected in order to show the results of local and imported water supply development over the next 10 years. In May 2003, DWR finalized its *State Water Project Delivery Reliability Report*. For the worst-case scenario single dry year (1977, with a one in 73 year probability of occurrence), DWR estimates that SWP deliveries to contractors would be approximately 20 percent of contract amounts. If projected imported and local supplies are developed as indicated, no shortages are anticipated within the agency's service area for the extreme-case single dry-year scenario analyzed.[36] In fact, as shown in **Table 26**, water supplies exceed demand by 56,484 acre-feet in the single, critical-dry year (2010). It should be noted that dry year supplies available above demand reflect water supplies that would be called upon by purveyors in dry years. Purveyors would typically secure water from these supplies only in amounts necessary to meet demand.

Multiple Dry Year Water Assessment: The UWMP estimated the minimum water supply available during each of the three water years, 2005, 2006, and 2007. The surface and groundwater supplies included in this analysis are reflective of supplies available during the 1987–1992 drought years, and in particular, 1990, 1991, and 1992. The supplies available from recycling projects are assumed to experience no reduction in a dry year but are also assumed not to be fully on-line at this early stage of the 20-year projection. Demand reductions of 10 percent based on short-term water conservation programs are assumed for these dry-year scenarios (this level of conservation was achieved during the 1987–1992 drought). If projected imported and local supplies are developed as indicated, no shortages are anticipated within the agency's service area in the dry-year scenarios analyzed.[37] Years 1, 2 and 3 in **Table 27** represent demand projections for 2005 through 2007. The multiple dry year water supply and demand assessments from the UWMP are summarized in the following table.[38]

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36 UWMP p. 4-3. Hot, dry weather may generate a 10 percent increase above normal in both urban and agricultural water usage. This percentage was used to generate the dry year demands.

37 UWMP p. 4-4.

38 Excerpted from Table 4-4 of the UWMP.

Table 27
Long-Term Projection Single Dry Year and Multiple Dry Year Water Supply and Demand Assessment
(acre-feet)

	Single Dry Year	Multiple Dry Years		
	Year 1	Year 2	Year 3	
	2010	2018	2019	2020
EXISTING WATER SUPPLY				
Local Supplies				
Alluvial Aquifer	32,500	32,500	32,500	32,500
Saugus Formation	15,000	15,000	15,000	15,000
Recycled Water	1,700	1,700	1,700	1,700
Imported Supplies				
SWP Table A Amount[1]	37,900	37,900	37,900	37,900
Draw From Short-Term Semitropic Bank Account (through 2013)	17,500	0	0	0
Draw From Flexible Storage Account	4,684	1,561	1,561	1,561
Total Existing Supply	**109,284**	**88,661**	**88,661**	**88,661**
PLANNED WATER SUPPLY				
Local Supplies				
Restored Contaminated Wells	10,000	10,000	10,000	10,000
New Saugus Wells	0	0	0	10,000
Recycled Water	7,300	12,300	12,300	15,300
Imported Supplies				
Draw From Long-Term Water Banking Programs	20,000	13,000	13,000	13,000
Total Planned Supply	**37,300**	**35,300**	**35,300**	**48,300**
Total Supply (Existing plus Planned Future)	**146,584**	**123,961**	**123,961**	**136,961**
Estimated Demand (without conservation)	**90,100**	**108,140**	**110,620**	**113,100**

Source: Amended 2000 UWMP.
Since the 2000 UWMP was adopted, DWR released its SWP Delivery Reliability Report (May 2003), which analyzes the reliability of SWP supplies. During infrequent dry periods, deliveries are projected to be less than 50 percent, and possible as low as 19 percent during an unusual single dry year condition that occurs about once every 70 years. During very wet years, full deliveries can be expected. Thus, the amount of water available to CLWA in the worst-case single dry year would be 19% of 95,200 acre-feet, or 35,244 acre-feet. The 2005 UWMP will reflect this new information.
For the 2000 UWMP, water supplies reflected in this table are based on SWP reliability as of 2000. Use of the 2003 SWP reliability figures would reduce the existing single dry year and consecutive dry year Table A Amounts to 18,088 acre-feet and 35,244 acre-feet, respectively. The corresponding total existing supplies would be reduced to 89,472 acre-feet and 86,005 acre-feet, respectively. Total existing plus planned supplies in single dry, consecutive dry years 1–2 and consecutive dry year 3 would be reduced to 126,772 acre-feet, 121,305 acre-feet and 134,305 acre-feet, respectively.

Information concerning "Planned Water Supply" as listed below from the UWMP and other sources was included to indicate examples of how CLWA would add reliability and flexibility to its water supply portfolio. Programs such as these will be analyzed by CLWA and contracts entered into as need and cost-effectiveness are determined through time. Future water supply assessments will reflect these contractual agreements. As shown, water supplies exceed demand by 13,341–23,861 acre-feet in multiple dry years. Again, it should be noted that dry year supplies available above demand reflect water supplies that would be called upon by purveyors in dry years. Purveyors would typically secure water from these supplies only in amounts necessary to meet demand.

(2) DMS Build-Out Scenario (2015)

The DMS Build-Out Scenario entails existing development, buildout of the near-term subdivision projects listed in the County's DMS, plus a portion of the Newhall Ranch Specific Plan, plus the project. The analysis of this cumulative development scenario is required by the City for the cumulative analysis of water service. The County's DMS lists all pending, recorded and approved projects for which land divisions have been filed within County unincorporated lands and within the City of Santa Clarita. The City plus County unincorporated areas together constitute the County's Santa Clarita Valley Planning area.

Table 28, below, illustrates both the cumulative water demand (existing plus DMS) and supply for the Santa Clarita Valley. This cumulative water demand is compared to the near-term projected Santa Clarita Valley water supplies and the additional Newhall Ranch Specific Plan water supplies. As shown, there is an adequate supply of water expected in both average years and dry years and no cumulative water supply impacts would occur. In fact, the table shows that water supplies exceed demand for the DMS Development Scenario by 15,876 to 24,913 acre-feet in average years and by 45,145 to 82,994 acre-feet in a single dry year. However, it should be noted that dry year supplies available above demand reflect water supplies that would be available to purveyors in dry years. Purveyors would typically secure water from these supplies only in amounts necessary to meet demand.

(a) DMS General Plan Consistency

The purpose of this subsection is to assess the Soledad Village project's consistency with the County's General Plan DMS policies as they relate to water supply. As indicated previously in this section, the County's General Plan includes provisions known as the DMS to give decision makers information about the existing capacity of available public services at the time a new development proposal is considered in the four major Urban Expansion Areas of the County of Los Angeles General Plan (Antelope Valley, Santa Clarita Valley, Malibu/Santa Monica Mountains, and East San Gabriel Valley).[39] The goal of DMS is to identify what new public facilities will be required for the new development, and to ensure that the appropriate cost of any expansion of facilities will be paid for by that new development, and not assumed by the taxpayers.

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39 Resolution of the County of Los Angeles Board of Supervisors, Plan Amendment Case No. S.P. 86-173.

Table 28
Scenario 1: DMS Build-Out Scenario Demand and Supply for the Santa Clarita Valley (AFY)

	Average Years		Dry Years	
Santa Clarita Valley Demand				
- Existing Plus DMS Demand[a]	100,654		110,720	
- Soledad Village Demand	154		169	
- Less Conservation	(10,081)		(11,089)	
Total	**90,727**		**99,800**	
Santa Clarita Valley Supply[b]				
- Local Supply				
a. Groundwater				
Alluvial Aquifer	35,000		32,500	
Less Newhall Ranch Agricultural Water	(3,402)		(4,534)	
Saugus Formation	11,000		15,000–24,000	
Restored Impacted Wells			10,000	
Saugus Formation (new)	0	0	10,000	
Newhall Ranch Agricultural Water	3,402		4,534	
b. Reclaimed Water	1,700	10,737	1,700	10,737
Less CLWA Reclaimed Water Supply for Newhall Ranch	(1,017)		(1,017)	
Newhall Ranch WRP Supply	2,103		2,103	
CLWA Newhall Ranch Supply	1,017		1,017	
- Imported Supplies				
a. SWP Supplies [c]	56,800		18,088–37,900	
b. Water Banking/Conjunctive Use			50,870	
c. Flexible Storage Account			4,684	
Total Supplies	**106,603–115,640**		**144,945–182,794**	
Total Supplies above Demand	**15,876–24,913[d]**		**45,145–82,994[e]**	

[a] *Complete buildout of DMS land uses is estimated to occur in 2015.*
[b] *Source: 2000 UWMP, December 2000, Tables 2-6 and 4-1, and the* Santa Clarita Valley Water Report 2004, *May 2005.*
[c] *Consistent with the DWRSIM model, the figures show SWP allocation reduced in average years to approximately 59.7 percent of maximum allocation and in multiple dry years to approximately 39 percent of maximum allocation. The CALSIM II model projects that reliability in average years raises to approximately 75 percent and decreases to 20 percent in a single dry year. In any given year, the actual amount of SWP water deliveries could be above or below these model projections. Deliveries of water associated with the agency's SWP maximum allocation of 95,200 AFY are affected by a number of factors, including hydrologic conditions, the status of SWP facilities' construction, environmental requirements and evolving policies for the Bay-Delta. Programs are in place that have the potential to improve the reliability of imported water. As these programs are needed in dry years, they could be used up to the amounts indicated (as needed).*
[d] *The surplus shown above is the net water available for injection into banking programs (e.g., Semitropic Groundwater Banking Project, other groundwater banking projects, etc.).*
[e] *Dry year supplies available above demand reflect water supplies that would be available to purveyors in dry years. Purveyors would typically secure water from these available supplies only in amounts necessary to meet demand.*

In accomplishing the goal stated above, the DMS determines the availability of school, fire, sewerage, library, water and road services and facilities on an individual and cumulative basis. The DMS data used for this analysis includes the following:

(a) Inventory information reports for water, sewer and library services in the Santa Clarita Valley;

(b) Service Provider Reports for the water wholesaler (CLWA) and water retailers in Santa Clarita Valley and County Sanitation Districts Nos. 26 and 32; and

(c) A list of all pending, approved and recorded projects where land divisions have been filed within both the unincorporated area of the County and the City of Santa Clarita.

The DMS also works toward ensuring that the expansion costs of new development are paid for by that development.

To ensure new development is located in proximity to services and existing development, DMS states that in no event is the proposed development to be located beyond one mile of an existing development or service. Also, DMS states that new development is to be located within, generally, five miles of commercial services and job opportunities.

The DMS includes a computerized database that incorporates information supplied by service providers and determines capital facility capacity and demand placed on the system by existing, pending, approved and recorded projects for which land divisions have been filed within the four major Urban Expansion Areas. The DMS is used to quantitatively determine project and cumulative impacts on many County and other public services. In EIRs, wherever a proposed development project would result in an exceedance of applicable County infrastructure or facilities (such as water supply), a significant impact is identified and mitigation is recommended as appropriate. The General Plan DMS requirements apply to "subdivisions" proposed within the Santa Clarita Valley.

This analysis addresses water supply requirements resulting from buildout of all pending, recorded, and approved projects listed in the County's DMS, plus the Soledad Village project and a portion of the Newhall Ranch Specific Plan. As indicated in **Table 28, Scenario 1: DMS Build-Out Scenario Demand and Supply for the Santa Clarita Valley**, under the DMS analysis there is sufficient water supply for the entire demand of the Soledad Village project and all pending approved and recorded projects in DMS. In fact, available water supplies would exceed demand by 15,876–24,913 acre-feet in average years and by 45,145–82,994 acre-feet in a dry year (dry year supplies available above demand reflect water supplies that would be available to purveyors in dry years. Purveyors would typically secure water from these supplies only in amounts necessary to meet demand). Therefore, the Soledad Village project is not expected to create any significant cumulative water availability impacts.

In addition to ensuring that an adequate supply of water is available for a project, DMS requirements also indicate that the project in question must be located within one mile of an existing development or service and that the development be located within generally five miles of commercial services and job opportunities. The Soledad Village site is located immediately adjacent to existing development and is within the retail water service area of the Santa Clarita Water Division of CLWA. It is also within the wholesale service area of the CLWA.

Based on the information provided in this analysis, the Soledad Village project is consistent with the General Plan DMS policies as they relate to water supplies.

(3) Santa Clarita Valley 2025 Build-Out Scenario

The Santa Clarita Valley 2025 Build-Out Scenario entails buildout of lands under the current land-use designations indicated in the County's Area Plan and the City of Santa Clarita's General Plan by the year 2025, plus the proposed Soledad Village project, plus all known active pending General Plan Amendment requests for additional urban development in the County unincorporated area and the City of Santa Clarita.

Table 29, Scenario 2: Santa Clarita Valley 2025 Build-Out Scenario Water Supplies, and **Table 30, Scenario 2: Santa Clarita Valley 2025 Build-Out Scenario Water Demand and Supply**, summarize the cumulative water demand and supply for this build-out scenario. As shown, at partial buildout by the year 2020, there are adequate water supplies for the project. As a result, the Soledad Village project is not expected to create any significant cumulative water availability impacts in either average/normal or dry years. In addition, as shown, at buildout by the year 2025, there are adequate water supplies for the project, with no significant cumulative water supply impacts occurring in either average/normal or dry years. In fact, the two tables show that water supplies exceed demand under this scenario in average and dry years in both 2020 and 2025.

Dry year supplies available above demand reflect water supplies that would be available to purveyors in dry years. Purveyors would typically secure water from these supplies only in amounts necessary to meet demand. For a critical dry year, when reliability of the SWP could be reduced, CLWA would utilize both dry-year supplies available from the Saugus Formation, and water banking and conjunctive use projects as indicated in **Table 29**, which follows.

Table 29
Scenario 2: Santa Clarita Valley 2025 Build-Out Scenario Water Supplies
(acre-feet per year)

	Buildout (year 2020)		Buildout (year 2025)	
	Average Years	Dry Years	Average Years	Dry Years
Santa Clarita Valley Water Supplies[a]				
Local Supply				
a. Groundwater				
Alluvial Aquifer	35,000	32,500	35,000	32,500
Saugus Formation	11,000	15,000–24,000	11,000	15,000–24,000
Restored Impacted Wells		10,000		10,000
Saugus Formation (new wells)	0	10,000	0	10,000
b. Reclaimed Water	17,000	17,000	17,000	17,000
Newhall Ranch WRP Supply	3,155	3,155	5,258	5,258
Imported Supplies				
a. CLWA SWP Table A Water[b]	56,800	18,088–37,900	56,800	18,088–37,900
Newhall Nickel Water			1,468	1,607
· Newhall Semitropic Grour				712
Bank Storage				
b. Water Banking/Conjunctive Use, etc.	0	90,870	0	90,870
Flexible Storage Account		4,684		4,684
Total Supply	**122,955**	**201,297–230,109**	**126,526**	**205,719–234,531**

[a] *Source: 2000 UWMP, December 2000, Tables 2-2, 2-6 and 4-1.*
[b] *SWP maximum allocation reduced in average years to approximately 59.7% of maximum allocation and in dry years to approximately 39.8% of maximum allocation. In any given year, the actual amount of SWP water deliveries could be above or below these model projections.*

As depicted in **Table 30**, purveyors have access to an amount of water supplies that exceed demand during dry conditions. Therefore, no cumulatively significant water availability impacts would occur due to buildout of the Soledad Village project.

Table 30
Scenario 2: Santa Clarita Valley 2025 Build-Out Scenario Water Demand and Supply
(AFY)

	Buildout (year 2020)		Buildout (year 2025)	
	Average Years	Dry Years	Average Years	Dry Years
Total Build-Out Demand[b]	113,100[a]	124,410	123,176[c]	135,494
Santa Clarita Valley Water Supplies[d]	122,955	201,297–230,109	126,526	205,719–234,531
Total	9,855	76,887–105,699	3,350	70,225–99,037

[a] *Source: 2000 UWMP, December 2000, Table 3-5 and the* SB 610 Water Supply Assessment for the Soledad Village Project.
[b] *Demand is increased by approximately 10% in dry years.*
[c] *Source: 2000 UWMP, December 2000, Table 3-5, using a straight-line projection from 2020–2025.*
[d] *Source: 2000 UWMP, December 2000, Tables 2-2, 2-6 and 4-1.*
[e] *Dry year supplies available above demand reflect water supplies that would be called upon by purveyors in dry years. Purveyors would typically secure water from these supplies only in amounts necessary to meet demand.*

(4) Conclusion – Cumulative Impacts

Because cumulative water supplies exceed demand, cumulative development (including the proposed Soledad Village project) would not result in unavoidable significant cumulative impacts on Santa Clarita Valley water resources. This includes potential impacts to groundwater resources related to recharge potential. Based on the memorandum prepared by CH2MHILL entitled *Effect of Urbanization on Aquifer Recharge in the Santa Clarita Valley* (February 22, 2004), development of the proposed project site and other sites proposed for development in the Santa Clarita Valley, no significant project-specific or cumulative impacts would occur to the groundwater basin with respect to aquifer recharge. This is due to the fact that urbanization in the Santa Clarita Valley has been accompanied by long-term stability in pumping and groundwater levels, plus the addition of imported SWP water to the valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater that is in storage within the valley. Therefore, cumulative mitigation measures are not required with respect to water resources.

e. Mitigation Measures

5.8-1. Landscape concept plans shall include a palette rich in drought-tolerant and native plants.

5.8-2. Major manufactured slopes shall be landscaped with materials that will eventually naturalize, requiring minimal irrigation.

5.8-3. Water conservation measures as required by the State of California shall be incorporated into all irrigation systems.

5.8-4. Prior to commencement of use, all uses of recycled water shall be reviewed and approved by the State of California Health and Welfare Agency, Department of Health Services.

5.8-5. Prior to the issuance of building permits that allow construction, the applicant of the proposed project shall finance the expansion costs of water service extension to the subdivision through the payment of connection fees to the appropriate water agency(ies).

f. Unavoidable Significant Impacts

No unavoidable significant impacts have been identified.

APPENDIX A

2000 Urban Water Management Plan

2000 Urban Water Management Plan

December 2000

prepared for

Castaic Lake Water Agency • Newhall County Water District

Santa Clarita Water Company • Valencia Water Company

prepared by

SA Associates • Reiter/Lowry/Consultants • Black & Veatch



URBAN WATER MANAGEMENT PLAN
2000

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Chapter 1.0

INTRODUCTION AND SUMMARY

This volume presents the *Urban Water Management Plan 2000* (UWMP) for the Castaic Lake Water Agency (Agency) service area, which includes the service areas of the four local retail water agencies. This chapter discusses the process used to develop this Plan, summarizes its chapters, and presents information about the water demand, water supply, water conservation, water recycling, and reliability planning in the Agency's service area.

The Urban Water Management Plan (referred to simply as "Plan" throughout this report) is a planning tool that generally guides the actions of water management agencies. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan include a section in which it "describes the opportunities for exchanges or water transfers on a short-term or long-term basis." (California Urban Water Management Planning Act, Article 2, Section 10630(d).) The identification of such opportunities, and the inclusion of those opportunities in a general water service reliability analysis, neither commits the water management agency to pursue a particular water exchange/transfer opportunity nor precludes the water management agency from exploring exchange/transfer opportunities that are not identified in the Plan. When specific projects are chosen to be implemented, detailed project plans are developed, environmental analysis, if required, is prepared, and financial and operational plans are detailed.

In short, the plan is a management tool, providing a framework for action but not functioning as detailed project development or action. It is important that this Plan be viewed as a long-term, general planning document, rather than as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty, and planning projections may change in response to a number of factors. From this perspective, it is appropriate to look at the Urban Water Management Plan as a general planning framework, not a specific action plan. It is an effort to determine, generally, the answers to a series of planning questions, including:

?? What are the potential sources of supply and what is the reasonable probable yield from them?

?? What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?

?? How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?

Using these "framework" questions and resulting answers, the implementing agency will pursue feasible and cost-effective options and opportunities to meet demands. The agency will explore enhancing basic supplies from traditional sources such as the State Water Project as well as other options. These include such options as groundwater extraction, water exchanges, reclamation, desalination and water banking/conjunctive use. Specific planning efforts will be undertaken in

regard to each option, involving detailed evaluations of how each option would fit into the overall supply/demand framework, how each option would impact the environment and how each option would affect customers. The objective of these more detailed evaluations would be to find the optimum mix of conservation and supply programs that ensure that the needs of customers are met.

1.1 THE URBAN WATER MANAGEMENT PLAN

A. Purpose of the Plan

The opening sentences of the California Urban Water Management Planning Act (Appendix A) state the principal purpose of the Urban Water Management Plan:

> "*...The ...[Plan] is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water...*"

The Act requires preparation of a plan that:

?? Accomplishes water supply planning over a 20-year period in five-year increments.

?? Identifies and quantifies adequate water supplies, including recycled water, for existing and future demands, in normal, dry and drought years.

?? Implements conservation and efficient use of urban water supplies.

In short, the Plan answers the question, *Will there be enough high quality water for the Santa Clarita Valley community in future years and what is the mix of programs that should be explored for making this water available?*

B. Valley's Water Agencies Are Jointly Preparing the Plan

Water agencies are permitted by the State to work together to develop a cooperative regional plan. This approach has been adopted by the water agencies in the Santa Clarita Valley, which are jointly sponsoring the current Plan. Water resource specialists with expertise in water resource management have been retained to assist the local water agencies in preparing the details of the Plan.

1.2 THE WATER AGENCIES OF THE SANTA CLARITA VALLEY

A. Castaic Lake Water Agency

Local citizens early recognized that local groundwater would not be sufficient to supply the needs of the Valley communities. Thus, Castaic Lake Water Agency was formed in 1962 for the purpose of contracting with the California Department of Water Resources to provide a supplemental supply of imported water to the water purveyors in the Valley.

The Agency's contract with the State Water Project in 1966 was for 41,500 acre-feet of annual water entitlement. The Agency in the 1980s purchased 12,700 acre-feet of annual State Project water entitlement from a Kern County water district, and recently purchased 41,000 acre-feet of annual entitlement from another water district, for a current total annual entitlement of 95,200 acre-feet of State Project water. The Agency wholesales this imported water to each of the local retail water purveyors through an extensive transmission pipeline system.

Permanent increases of entitlement to State Project water can be purchased through market sources, and the Agency is currently exploring opportunities for increasing its entitlement. Though the reliability of State Project water is variable due to weather-related issues and environmental factors, State Project water remains a promising and important supplemental water supply source for the Valley in the long-term. An important element to enhancing the long-term water supply reliability of SWP supplies is the effective use of Water banking/Conjunctive-use programs such as those described in this Plan.

B. The Retail Water Purveyors

In addition to Castaic Lake Water Agency, four retail purveyors provide water to most residents of the Santa Clarita Valley.

Newhall County Water District service area lies in three distinct geographical areas of the Valley: Newhall, Pinetree, and Castaic. The District's service connections are spread over a 34-square mile area. The District supplies water from both groundwater wells and Agency imported water.

The Los Angeles County Waterworks District No. 36 service area encompasses approximately 7,635 acres in the Hasley Canyon area and the unincorporated community of Val Verde. The District obtains its full water supply from the Agency.

Santa Clarita Water Company service area includes portions of the City of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Saugus, Canyon County, and Newhall. The Company supplies water from both groundwater wells and Agency imported water.

Valencia Water Company service area includes a portion of the City of Santa Clarita and several unincorporated communities. The service area is approximately 25 square miles. The Company supplies water from both groundwater wells and Agency imported water.

At the end of 1999, the retail water purveyors served about 50,000 connections, as follows:

Newhall County Water District	6,758
Los Angeles County Water Works District No. 36	827
Santa Clarita Water Company	21,100
Valencia Water Company	20,865
Total Connections	**49,550**

C. Water Management Planning

The five water agencies meet regularly as a technical group to coordinate the water resources of the Valley. One of the highest priorities of this group is to provide an adequate water supply within Castaic Lake Water Agency's service area, safeguard the existing resources, and develop both short-term and long-term plans for efficient water use.

This *Urban Water Management Plan 2000* has been prepared for the Agency and three of the purveyors: Santa Clarita Water Company, Newhall County Water District, and Valencia Water Company. The fourth purveyor, Los Angeles County Waterworks District 36, is not required to prepare a Plan.

D. Public Involvement

The water agencies have encouraged community participation in water planning. For the current Plan, public sessions were held for review and comment on the draft plan before its adoption. Interested groups were informed about the development of the Plan along with the schedule of public activities. Notices of public meetings were published in the local press. Copies of the draft plan were made available at the water agencies' offices and local public libraries, and sent to the City of Santa Clarita, the County of Los Angeles, the County of Ventura, as well as interested parties. Water agencies have also convened meetings with various interests to gather data, concerning planned development and the probable implementation of approved development. Such informed data gathering on important issues is a means of checking the short-term "reality" of official projections and understanding the concerns of various groups.

1.3 SERVICE AREA CHARACTERISTICS

A. Service Area

Castaic Lake Water Agency's service area encompasses lands in Los Angeles and Ventura Counties. The total service area covers about 192 square miles. Within this area, the Agency provides service to the four retail agencies shown on Figure 1-1.

B. Regional Economy and Demographics

Water service is provided to residential, commercial, industrial, institutional, recreational, and agricultural customers, and for environmental and other uses, such as fire protection and pipeline cleaning.

Recently, the Santa Clarita Valley area (along with most of California) has experienced significant increases in both single family and multi-family residential construction, as well as in commercial and industrial construction. As the local population has increased, the demand for water has also increased.

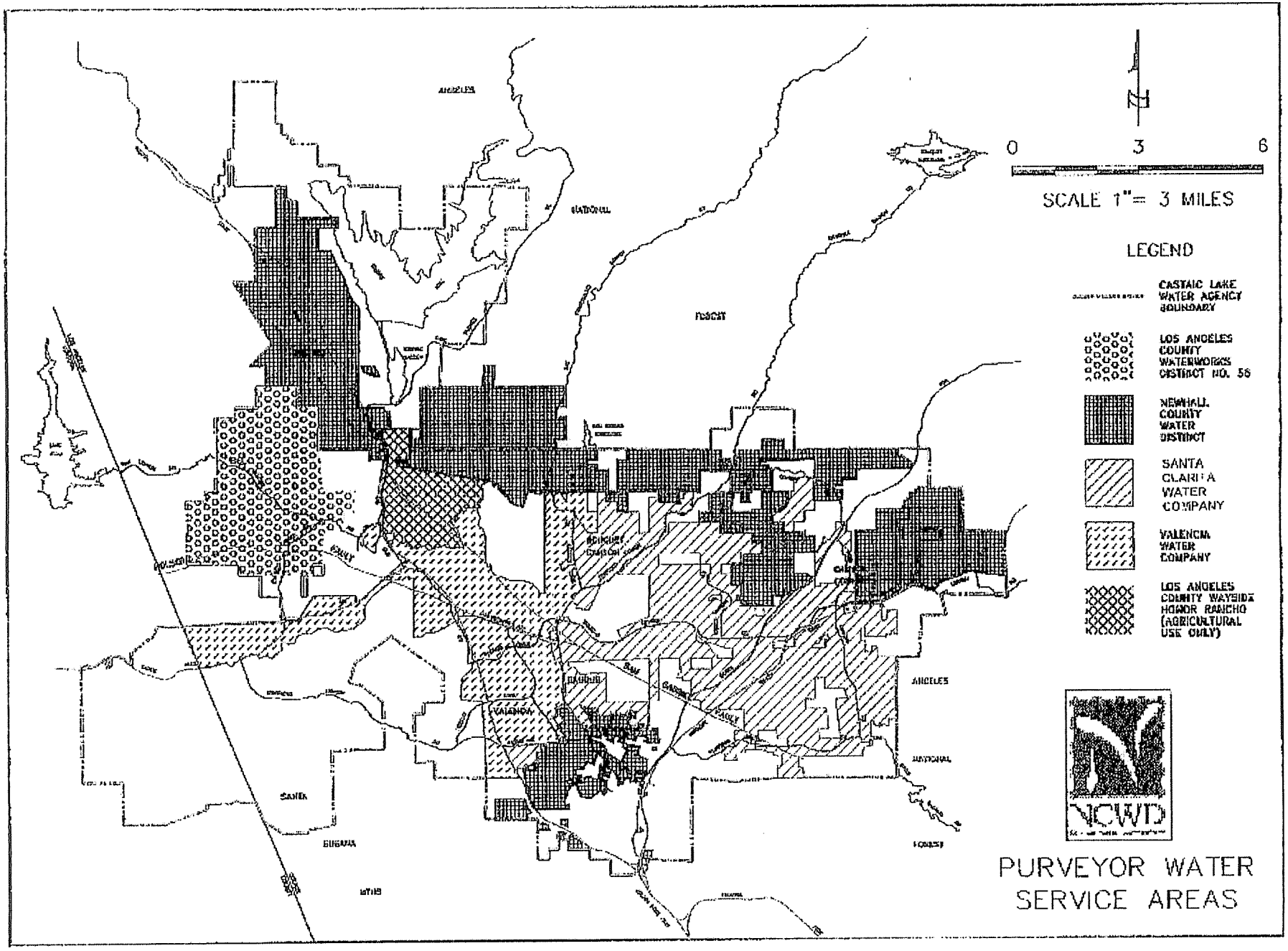
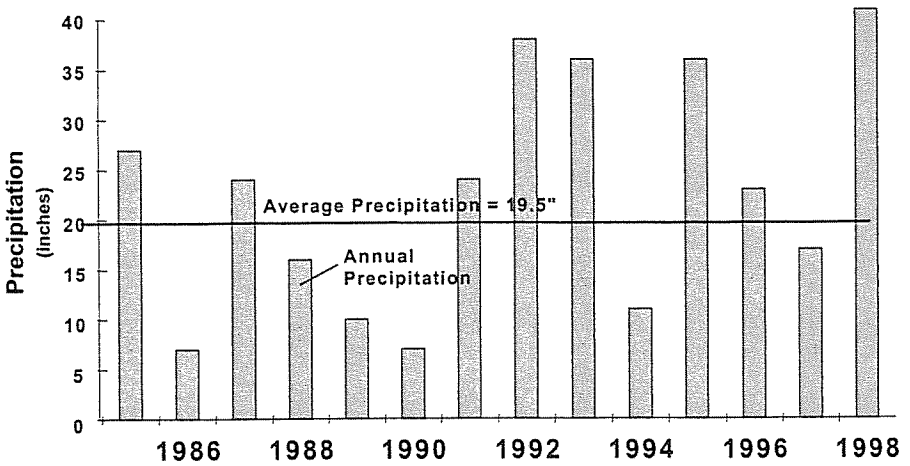

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0
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SCALE 1"= 3 MILES
LEGEND
CASTAIC LAKE WATER AGENCY BOUNDARY
LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 36
NEWHALL COUNTY WATER DISTRICT
SANTA CLARITA WATER COMPANY
VALENCIA WATER COMPANY
LOS ANGELES COUNTY WAYSIDE HONOR RANCHO (AGRICULTURAL USE ONLY)
NCWD
PURVEYOR WATER SERVICE AREAS

Figure 1-1

C. Climate

The climate in the Agency's service area is generally semi-arid and warm. Summers are dry with temperatures that can reach as high as 110?F. Winters are somewhat cool with temperatures that can dip as low as 20?F. Average rainfall is about 18 inches per year in the flat areas and about 27 inches in the mountains. The region is subject to wide variations in annual precipitation, and also experiences periodic wildland fires (Figure 1-2).

Figure 1-2
Annual Rainfall in the Santa Clarita Valley



1.4 CONTENT OF THIS PLAN

The chapters of the *Urban Water Management Plan 2000* are briefly described below.

Chapter 1.0 – Introduction and Summary

This chapter describes the planning process and provides an overview of the service area. The chapter also summarizes the key elements of the Plan, and can serve the reader as a quick introduction and summary of the Plan.

Chapter 2.0 - Water Supply Resources

This chapter describes the existing and potential water supplies available to the service area. This listing of water supply resources is a "menu" of supply options which are available or can reasonably be expected to become available over the planning period from the present through 2020. The Agency will use this "menu" of options as a framework for more focused and detailed planning as it proceeds through the 20-year planning period.

Historically, local groundwater extracted from the Alluvial Aquifer and the Saugus Formation has been the primary water source. The current capacities and the future potential of these aquifers are discussed, including the possibility of using them more intensively during drought periods.

Future local sources are also discussed, such as stormwater, which, subject to future agreements, can be captured during rainy seasons, stored in Castaic Lake, and subsequently used. Another source is recycled water (municipal wastewater that is highly treated, disinfected and reused for purposes such as landscape irrigation and other applications). Development of water recycling is currently underway, and the future potential of this source is considerable.

Since 1980, local supplies have been supplemented with imported water from the State Water Project. The reliability of SWP supplies is subject to both hydrologic cycles and planned improvements to the system. This Plan evaluates a range of future SWP supplies that would depend upon negotiations being conducted as part of CalFed, a State-Federal program with the goal of developing a long-term solution for the many competing water uses of the Delta. The operational plan covered in Chapter 4 does not depend on improvements recommended in the CalFed program, but conservatively assumes existing conditions.

Other potential future water supplies described in this Plan are options to increase SWP supply reliability, conjunctive use and groundwater banking, transfers from other water suppliers, and desalted ocean and brackish water.

Chapter 3.0 - Water Use Provisions

This chapter on water demand describes historic, current, and projected water usage within the Agency's service area. Three ways to determine historic water usage patterns and future water demand are presented: by population, by land use, and by water services. In addition, the effects of weather and water conservation on historic water usage are discussed. This chapter also describes the results of additional studies: an extensive sampling of actual water use in the Agency's service area, and verification of water usage per service connection and per land use.

Chapter 4.0 - Reliability Planning

This chapter presents the water reliability assessment for the Agency's service area. It compares the total projected water demand with the expected water supply over the next 20 years, in 5-year increments (2005, 2010, 2015, and 2020). Assessments are also presented for a single dry year and multiple dry years (droughts). In addition, potential water supplies beyond 2020 are examined. The purpose of this analysis is to determine whether there is a reasonable likelihood of meeting projected future demands with the mix of resources currently under consideration. The conclusion of this chapter is that, if projected imported and local supplies are developed as indicated, no water shortages are anticipated in the Agency's service area during the plan period and beyond.

Chapter 5.0 - Water Demand Management Measures

This chapter addresses the 14 water conservation measures called Demand Management Measures, specified in the latest revision of the Act, and describes current and future implementation of these water conservation measures within the Agency's service area. The measures range from public information/education programs to physical solutions such as residential plumbing retrofit, as well as policy/financial incentives, such as rebate programs and pricing policies. Many of the conservation measures are already being implemented in the area.

These measures are essentially the same as the 14 urban Best Management Practices (BMPs) developed by the California Urban Water Conservation Council. At present, the CalFed program includes mandatory implementation of the BMPs by the end of 2002 by any agency subject to the Act and located in the CalFed solution area; this requirement includes the water agencies in the Santa Clarita Valley.

Chapter 6.0 - Water Shortage Contingency Analysis

This chapter presents the activities to be utilized in the event of a catastrophic water supply interruption, such as an earthquake or a drought. Stages of action are described, including rationing stages and reduction goals, priorities of use, water shortage stages and triggering mechanisms, water allotment methods, mandatory prohibitions on water use, and excessive use penalties.

Chapter 7.0 - Water Recycling

This chapter presents an overview of the water recycling activities underway in the Valley and a summary of the draft Reclaimed Water System Master Plan prepared in 1993 by the Agency. An update of this draft plan is in preparation indicating an increase in the development of this resource. The chapter includes information on recycled water demand, supplies, and projects.

1.5 WATER USAGE

A. Methods of Determining Usage

Determining historic water usage patterns and future water supply needs requires a water usage forecast that is as accurate as can be developed. There are a variety of ways to forecast water usage:

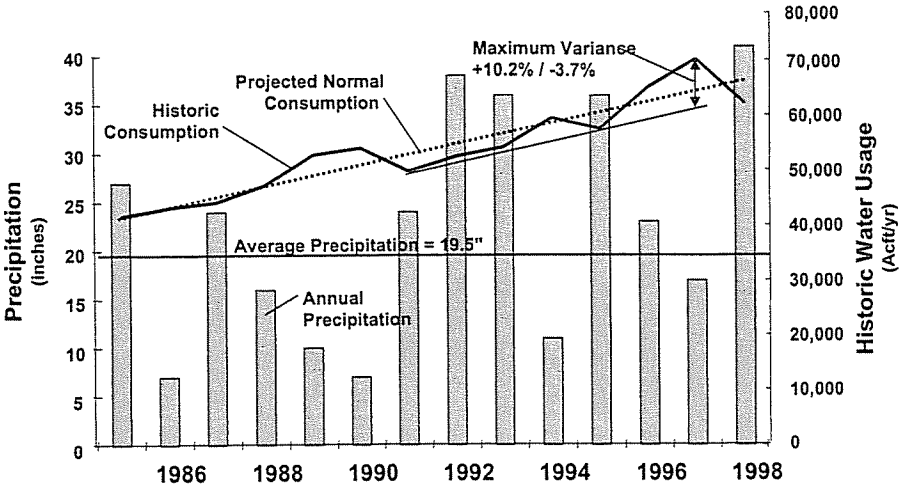
?? Per Capita: projects historical per capita water usage. Takes into account regional economic trends, jobs, housing, and population migration (used by the Southern California Association of Governments [SCAG]).

?? Per Connection: projects water usage by extrapolating historical records of new service connections, taking into account historic housing trends and local influences on housing starts.

?? Per Acre: projects water usage by evaluating planned land uses (residential, commercial, industrial, recreational, agricultural, etc.) and demographic trends.

Although all three methods are discussed in this report, the "per connection" and "per acre" approaches have in the past proven to be accurate methods for forecasting water usage and have been emphasized. Other factors taken into account by all methods include: trends in single-family/multi-family housing; local development and land use regulations, permitting, and zoning decisions which affect development; and the effects of dry/wet weather cycles (Figure 1-3).

Figure 1-3
Weather Effects on Water Usage



B. Households

Evaluations prepared for this report show that the number of occupied households in the Agency's service area increased from about 38,000 to 58,000 in the 1990s. This represents an average annual increase of about 2,000 households per year.

The number of households projected by 2020 varies depending upon the analytical method used. Projections developed by SCAG estimate that the number of occupied households in the Agency's service area by 2010 will increase to about 96,200 reflecting an average annual increase of about 3,800 new households per year. By 2020, SCAG forecasts more than 149,000 households within the Agency's service area. Thus between 2010 and 2020, an average annual increase of about 5,300 new households per year would need to accrue. This would be a significant increase of 190 percent in the years between 2000 and 2010, and 265 percent in the years between 2010 and 2020.

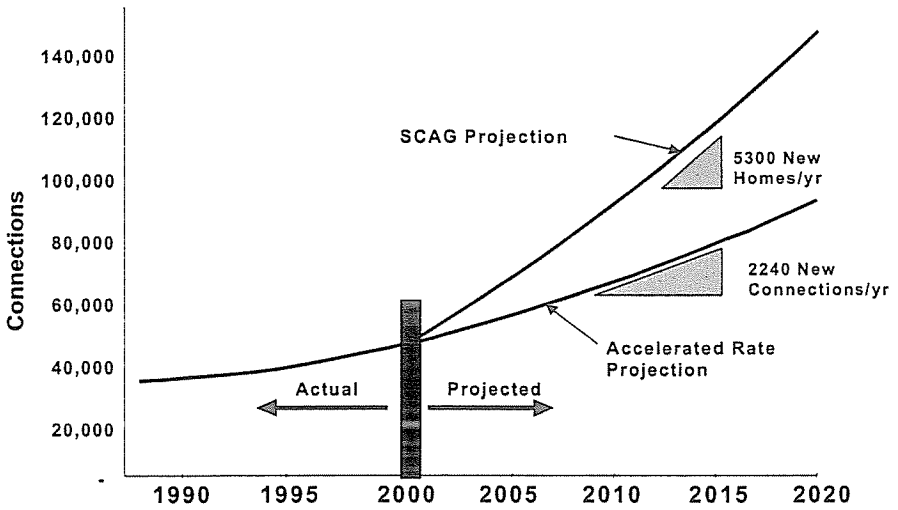
However, projections based on actual historic customer connection data provided by the water purveyors indicate that the total number of connections in the service area by 2020 would be 96,000, which correlates realistically to the average actual growth rate observed during the 1990's.

Population growth projections for the Agency's service area have been made several times by SCAG (Series II projection, and the RTP). The first projection accomplished by SCAG was part of the Series II projection published in 1994. As part of this projection, SCAG projected the total population of the Agency's service area would be in excess of 575,000 people by 2020. The second, most recent, projection accomplished by SCAG was part of the 1998 RTP. As part of this projection, SCAG projected the total population of the Agency's service area would be about 506,000 people by 2020.

As evident between these two SCAG projections (four years apart) the projected total population for the Agency's service area has been reduced by 15 percent. A significant assumption built into the SCAG projections is the relationship of upper income to lower income housing. Recent history indicates that middle to upper income housing dominates new construction, thereby reducing the number of people who can afford new housing. By taking into account this change in the housing mix and its effects on the ultimate growth rate of new connections per year, a more realistic growth rate can be determine for the Agency's service area. Using this more realistic growth rate, the projected population of the Agency's service would be approximately 330,000 to 350,000 people by 2020.

Taking this approach, which is less speculative than many other approaches, reduces the potential for planning that would result in an "over supply" of water which some believe might "encourage" additional development. Instead, the planning framework is focused on meeting what the Plan finds is a realistic needs projection. If there is evidence that regional growth is actually proceeding at a faster rate, that would trigger the preparation of appropriate changes in the Plan to respond to the new information.

Figure 1-4
SCAG Household Projection vs. Historical Trends



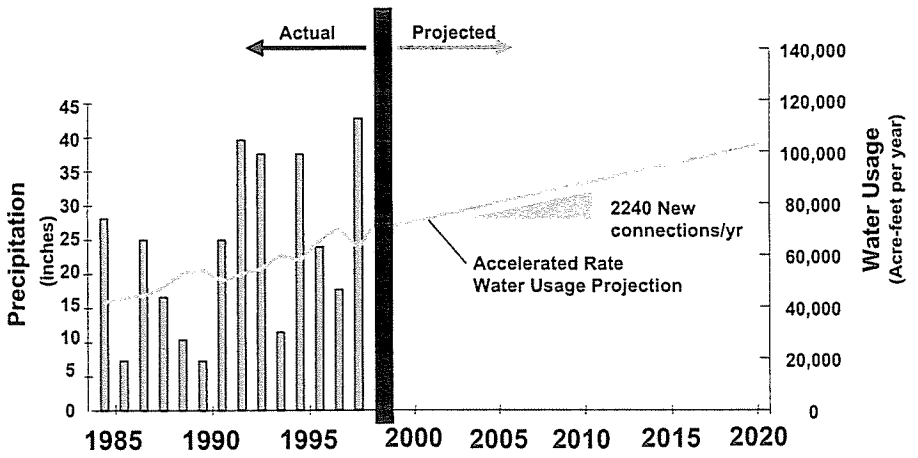
C. Verification of Water Usage

In order to verify the calculated water demand, two separate studies were made: (1) a sampling of over 1,000 individual households throughout the Agency's service area, taking into account seasonal fluctuations, lot size, and number of dwellings per acre, in order to arrive at average household water usage; and (2) a verification of actual water usage per service connection for residential, commercial, industrial, recreational, and other water uses by study of water bills. Both studies confirmed the accuracy of assumptions made in the demand calculations.

D. Total Water Demand

A comprehensive display of actual water demand from 1985 to 1999 and projected water demand from 2000 to 2020, is shown on Figure 1-5. Precipitation is displayed with a range for wet and dry-year demands. It can be seen that the "normal year" projected demand rises along roughly the same slope as the actual demand in the past 15 years, and suggests that the projection is realistic.

Figure 1-5
Historical and Projected Water Usage



1.6 WATER SUPPLY

The current water supply for the Santa Clarita Valley derive from a number of sources:

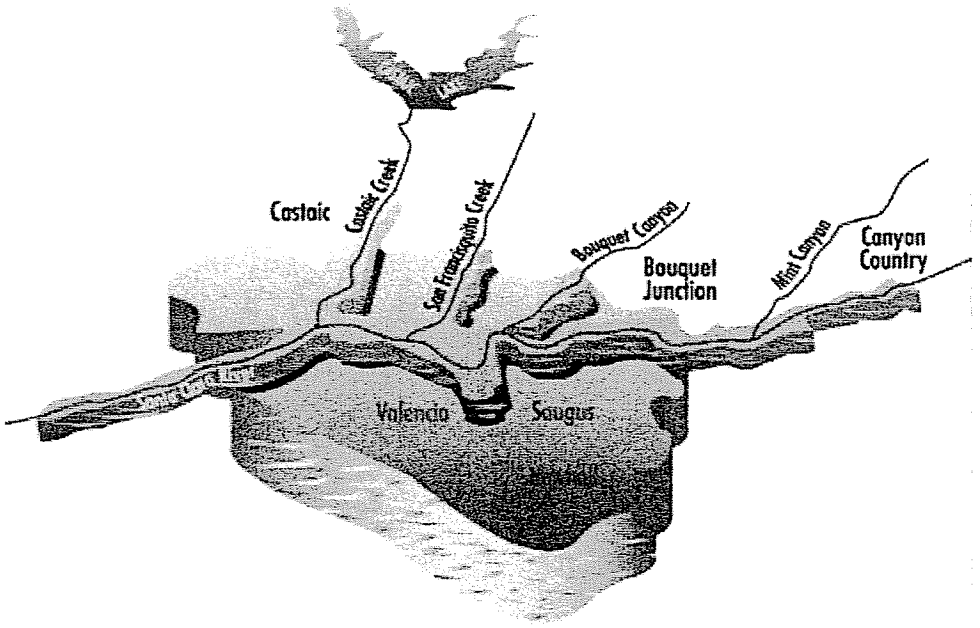
?? Groundwater from the Alluvial Aquifer
?? Groundwater from the Saugus Formation
?? Imported State Project water

A variety of future water resources, including recycled water, desalting, stormwater runoff, increased Saugus pumping, and SWP reliability projects, are also briefly described in this section.

A. Groundwater

The Santa Clarita Valley has historically depended for its water supply on an underground water basin, or aquifer, divided into upper and lower levels. Overall, the groundwater basin covers about 84 square miles located in the center of the service area (Figure 1-6).

Figure 1-6
Santa Clara River and Groundwater Aquifers



The shallow upper basin, called the Alluvial Aquifer, generally underlies the Santa Clara River and its tributary creeks. Water seeps down into the sands and gravels beneath the river, where it is pumped from relatively shallow wells (to 200 feet in depth). The aquifer is estimated to store over 200,000 acre-feet of water. It has supplied about 30,000 to 40,000 acre-feet per year in normal weather years, and 30,000 to 35,000 acre-feet per year in dry years.

Underlying the Alluvial Aquifer is another, deeper layer of groundwater called the Saugus Formation, which receives some of its water from seepage of the Alluvial Aquifer as well as from parts of the aquifer exposed to the surface. While information about the Saugus Formation is more limited, it is estimated to store about 1.0 million acre feet of water and is pumped by wells extending to about 2,000 feet in depth. It has supplied about 7,500 to 15,000 acre-feet per year in normal weather years, and 11,000 to 15,000 acre-feet per year in dry years.

As part of this Plan, Luhdorff and Scalmanini, Consulting Engineers, undertook a review of the information supplied by Richard Slade & Associates. This review (Appendix D) focused on the information presented in this plan, most notably projected groundwater supplies as summarized in Table 2-1, and whether these projections are realistic under average and dry conditions. The results of this review drew three basic conclusions: 1) "...both the Alluvium and the Saugus are reasonable and sustainable sources at the yields represented in the Plan..."; 2) "....As such, those yields are not overstated and will not deplete or 'dry up' the groundwater-basin..."; and 3) "...there is no need to 'reduce' them for the purposes of planning within the context of an Urban Water Management Plan."

Prior to implementing increases in production from groundwater supplies, the Agency will analyze the feasibility, cost, and potential water quality and environmental effects of each program. Preliminary analyses and recent studies have concluded that additional pumping can be safely carried out in both aquifers as discussed in Chapter 2.

Groundwater Quality. Overall, the quality of the groundwater in the Santa Clarita Valley is considered good. Groundwater produced by the local purveyors is regularly tested and found to consistently meet Federal and State drinking water standards. It is characterized as being moderately hard to hard.

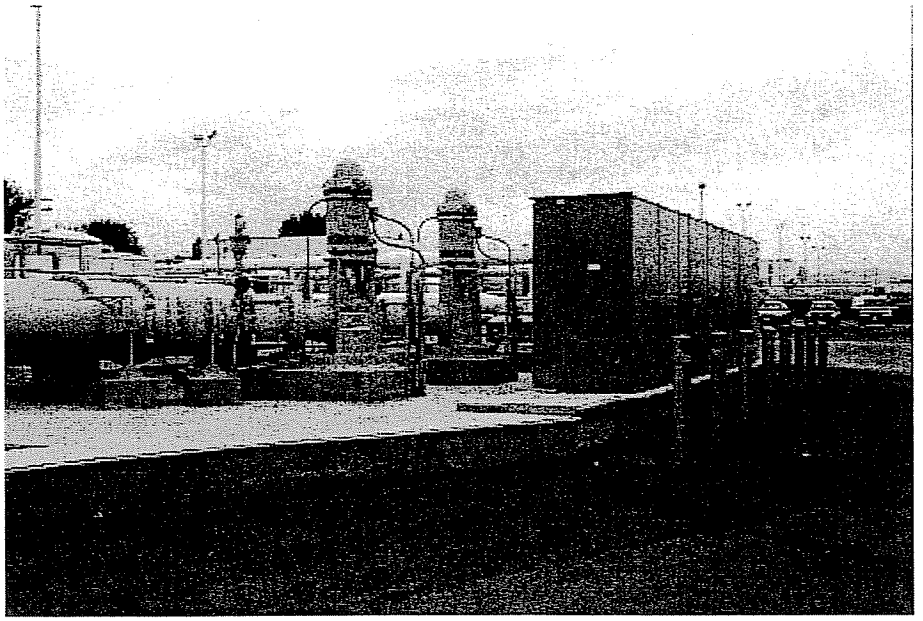
Groundwater quality can be compromised by the presence of contaminants. Perchlorate was recently discovered in Saugus Formation groundwater at a site formerly occupied by an industry located in the area. Wells found exceeding the legal limit of this contaminant were shut down, and a groundwater cleanup plan is being developed using proven treatment methods which can restore full production capability.

B. Recycled Water

Wastewater that has been highly treated and disinfected can be reused for landscape irrigation and other purposes, though it is not currently considered suitable for use as potable water. In 1993, the Agency completed a draft *Reclaimed Water System Master Plan* to use recycled water as a reliable water source to meet some of the non-potable demand within the Santa Clarita Valley. The Master Plan is being updated, and the amount of recycled water expected to be produced in the future reaches about 17,000 acre-feet per year. Implementing this element of the Plan will probably require some changes in water delivery infrastructure and, depending on the extent of these changes, it may be feasible to increase the use of recycled water in the future.

Two existing water reclamation plants in the Santa Clarita Valley can potentially supply enough recycled water to meet most of this demand, and a third reclamation plant is planned for the Newhall Ranch project. The first Agency project in the Reclaimed Water System Master Plan is currently in development and is expected to yield about 1,700 acre-feet. Future expansions of the system are expected to produce the remainder (Figure 1-7).

Figure 1-7
Recycled Water Pump Station



C. Stormwater Runoff

In wet years, stormwater is available. The Agency has the opportunity to make greater use of the storage allocated to it in Castaic Lake. There is currently available about 4,700 acre-feet of storage in these reservoirs which can be used within the Agency's service area. The use of this storage would afford the Agency greater operational flexibility. A modification of the contract with the State is currently being pursued to make use of stormwater and lake storage. Note that yields from those changes in reservoir storage use have not been included in projected local supplies. Their primary use will be to enhance potential for water banking and water exchanges, and to provide more flexibility in the timing of deliveries from other sources

D. Total Local Supply

A summary of the total quantities of local supplies in average and dry years is shown in Table 1-1.

Table 1-1
Existing and Planned Local Supplies
(acre-feet per year)

Source	Average/Normal year	Dry-year
Groundwater		
Alluvial Aquifer	30,000-40,000	30,000-35,000
Saugus Formation	7,500-15,000	11,000-15,000
Saugus Formation (new wells)*	--	10,000-20,000
Stormwater*	--	--
Recycled Water*	1,700-17,000	1,700-17,000
Total Local Supplies	**39,200-72,000**	**52,700-87,000**

*Planned programs for future implementation.

E. Imported Water Supply

State Water Project. Imported water, obtained from the State Water Project through the Agency, is expected to continue to be the largest source of water for the Valley in the future (Figure 1-8).

The Project was initially developed in the 1950's, and was planned originally to convey 4.2 million acre-feet per year. In 1999, the Project delivered 3.1 million acre-feet to contractors throughout the State, and the projection for 2000 is about 3.3 million acre-feet (Figure 1-9).

Figure 1-8
Castaic Lake
(Storage Reservoir of the State Water Project)

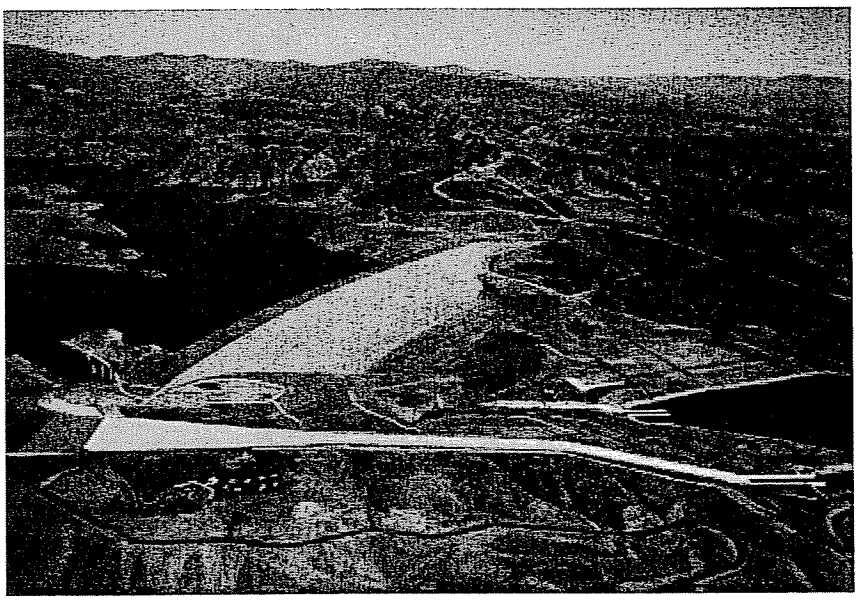
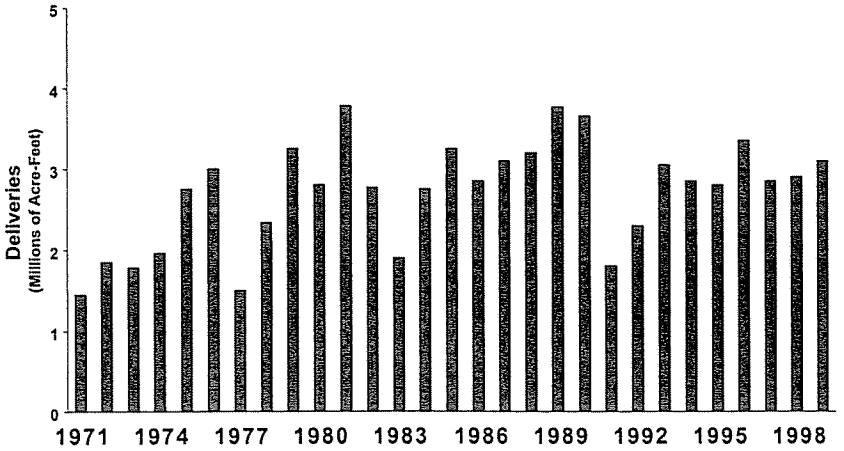


Figure 1-9
Historical State Water Project Deliveries

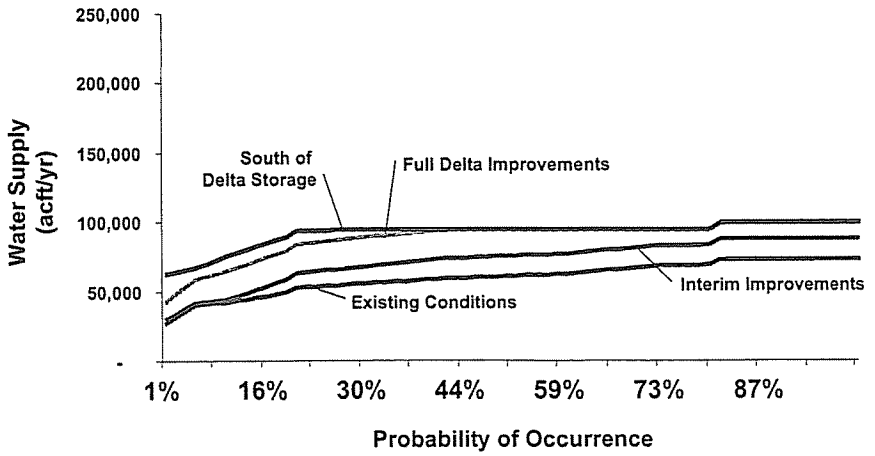


The State Water Project is operated by the California Department of Water Resources (DWR). It includes 660 miles of aqueduct and conveyance facilities, from Lake Oroville in the north through the Bay-Delta to Lake Perris in the south. The Agency is a contracting agency with a current entitlement of 95,200 acre-feet. The local supplies received from the State Water Project are treated, filtered, and disinfected at the Agency's Earl Schmidt Filtration Plant and Rio Vista Water Treatment Plant and transmitted to the retail purveyors via an extensive pipeline system.

SWP Reliability. The Agency's current SWP entitlement of 95,200 acre-feet per year is affected by a number of factors, including hydrologic conditions, the status of SWP facilities construction, environmental requirements, and evolving policies for the Bay-Delta. While several programs may improve the reliability of SWP imported water, such as Interim Delta Improvements and future improvements called the Full Delta Fix and South of Delta Storage, this Plan has conservatively projected the water supply available under existing conditions. Based on this information, we draw two reasonable planning conclusions regarding the reliability of SWP supplies. First, a number of factors will probably reduce entitlement deliveries to some extent in coming years and, second, at least some of the improvements to the SWP facilities are likely to be implemented, which will result in increases in reliability. The net change in SWP supplies cannot be projected accurately, so the Plan's approach to evaluation of SWP reliability is to evaluate potential SWP supplies under current conditions. The Agency is aware of and will closely track changes in law, policy, and project facilities which may affect SWP reliability in the future. As such changes are made, the Plan will be adjusted.

Under existing conditions, the Agency would receive approximately 37,900 acre-feet per calendar year about 10 percent of the time and if the agency requested 100 percent of its entitlement, approximately 56,800 acre-feet per calendar year about 50 percent of the time. It would receive significantly more under the other Delta improvement scenarios (Figure 1-10).

Figure 1-10
Potential State Water Project Deliveries



F. Groundwater Banking

Groundwater banking programs provide a significant opportunity to improve the supply reliability of the SWP for the Agency's service area.

Groundwater banking programs involve storing available SWP supplies or other supplies during wet years in a groundwater basin; for example, the San Joaquin Valley and the Saugus Formation. During water shortages when (demands exceed supplies) the stored water can be pumped out and exported to the Acqueduct, or used by the others in exchange for their surface water allocations and delivered to the Agency via SWP facilities.

Several potential conjunctive use and groundwater banking opportunities are currently available to the Agency. These include the Kern Water Bank, the Semitropic Water Storage District, the Kern Delta Water District, and the North Las Posas Water Bank/Exchange. Other conjunctive use and groundwater banking opportunities are expected to be developed during the planning period.

Benefits. When a groundwater banking and conjunctive use program is implemented, it provides important benefits: a groundwater basin in which to store available SWP supplies in wet years, providing a dry-year supply that augments supplies reduced by drought or other shortages. These benefits allow groundwater banking and conjunctive use programs to "firm up" and enhance the reliability of current and future water supplies (Table 1-2).

Table 1-2
Planned Groundwater Banking
& Conjunctive-use Supplies[1]
(acre-feet per year)

Source	Dry-year
Kern Water Bank[2]	25,000
Semitropic Water Bank[2]	30,000
Kern Delta Water Bank	40,000
North Las Posas Water Bank	10,000
Saugus (ASR)	---
Total Groundwater Banking & Conjunctive-use Supplies	**105,000**

1. Assumes Groundwater Banking Programs would only be called on in dry-years. All groundwater banking programs are available in wet, average/normal years.
2. Programs provide for acquisition of water from others already in storage and available for return.

G. Desalting

Desalting of sea or brackish water can provide a reliable supply of potable water to the Agency's service area. The desalted water need not be transported to the Valley; exchanges with agencies that produce the desalinated water could arrange for transport or exchange of that water to local agencies, while the Agency receives water supplies via SWP facilities. New technologies are successfully producing desalted water at increasingly competitive costs. In the past, the Agency has evaluated oil field water and brackish water recovery, and determined it is feasible.

H. Total Imported Supply Availability

A summary of the imported supplies are provided in Table 1-3.

Table 1-3
Existing and Planned Imported Supplies
(acre-feet per year)

Source	Wet-year	Average/Normal Year	Dry-year
SWP Supplies	66,300-95,200	56,800-95,200	37,900-75,800
Water Banking/Conjunctive-use*	--	--	105,000
Water Transfers*	6,400-9,200	5,500-9,200	3,700-7,300
Desalination*	2,000-5,000	2,000-5,000	2,000-5,000
Total Imported Supplies	**74,700-109,400**	**64,300-109,400**	**148,600-193,100**

*Planned programs for future implementation.

I. Water Supply Availability

Total water supply available to the Agency's service area consists of a combination of Local Supplies, Table 1-1 and Imported Supplies, Table 1-3. A summary of the total quantities of supplies in average and dry years is presented in Table 1-4.

Table 1-4
Total Existing and Planned Supplies
(acre-feet per year)

Source	Average/Normal Year	Dry-year
Local Supplies		
Groundwater		
Alluvial Aquifer	30,000-40,000	30,000-35,000
Saugus Formation	7,500-15,000	11,000-15,000
Saugus Formation (new wells)*	--	10,000-20,000
Stormwater*	--	--
Recycled Water*	1,700-17,000	1,700-17,000
Imported Supplies		
SWP Supplies	56,800-95,200	37,900-75,800
Water Banking/conjunctive-use*	--	105,000
Water Transfers*	5,200-8,700	3,500-6,900
Desalination*	2,000-5,000	2,000-5,000
Total Supplies	**103,200-180,900**	**201,100-279,700**

*Planned programs for future implementation.

1.7 COMPARISON OF WATER USAGE WITH SUPPLY

To meet Act requirements, this Plan assesses water supply reliability, comparing the total projected water demand with the expected water supply over the next 20 years in 5-year increments. Assessments for a single dry year and multiple dry water years are also provided.

A. Reliability Criteria

The criterion set for this Plan is that there must be a water supply sufficient to meet projected demands 90 percent of the time, or in 18 out of the next 20 years. In the remaining 10 percent of the time, it is assumed that the maximum allowable supply shortage will be 10 percent of the normal demand. Note that the community's tolerance for a reduced water supply has been amply demonstrated during past drought periods in the area: 15 percent or even 20 percent voluntary reductions have been achieved.

B. Program to Achieve Water Supply Reliability

The Agency has developed a capital improvement program with funding that provides for the following activities to achieve the desired water supply reliability level. It includes:

?? Purchase of additional State Water Project supplies

?? Implementation of recycled water programs

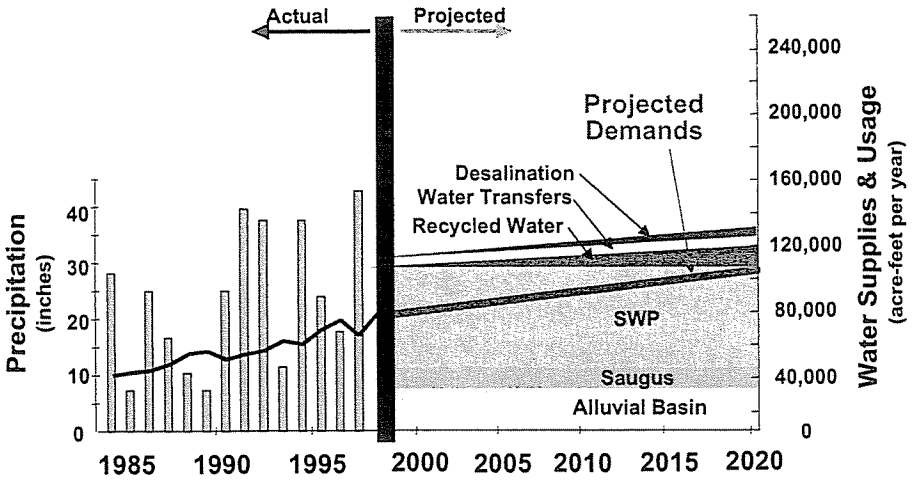
?? Development of additional dry-year Saugus Formation Supplies (New Wells)

?? Enhancement of groundwater banking programs both inside and outside the Agency's service area

?? Seawater desalination/water exchange

Figure 1-11 compares the average/normal-year water usage with the available supplies.

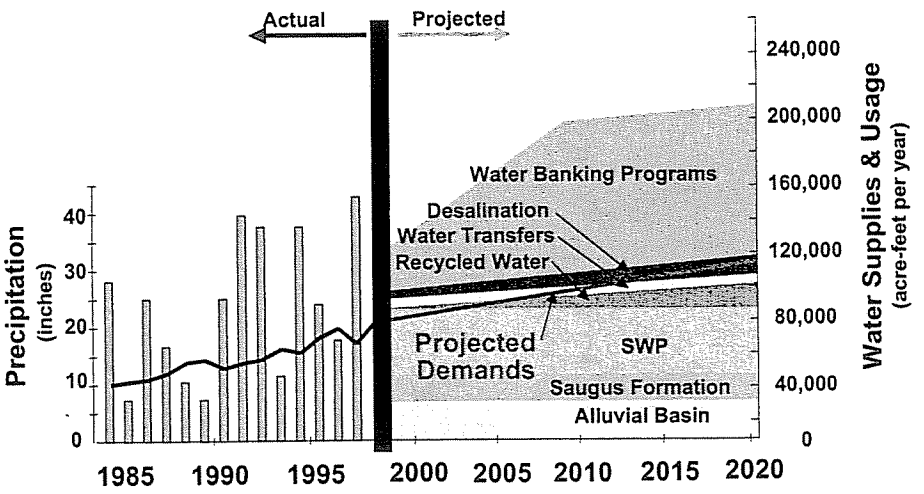
Figure 1-11
Average/Normal-year Water Supplies and Usage



As shown on Figure 1-11 projected supplies in an average/normal water year exceed projected usage from the present to 2020. *It shows that no shortages would be indicated within the Agency's service area in an average or normal water year throughout the 20-year Plan period.*

In a dry year, studies have shown that hot, dry weather may generate a 10 percent increase in normal water usage. Correspondingly, the reduction of water use through conservation methods was assumed to be 10 percent, although experience has shown greater voluntary decreases in water use (see Figure 1-12). *As shown on Figure 1-12, if projected imported and local supplies are developed as indicated, no shortages are anticipated within the Agency's service area in the dry-year scenarios analyzed.* In short, water supplies are expected to be adequate throughout the 20-year Plan period under all conditions.

Figure 1-12
Dry-year Water Supplies and Usage

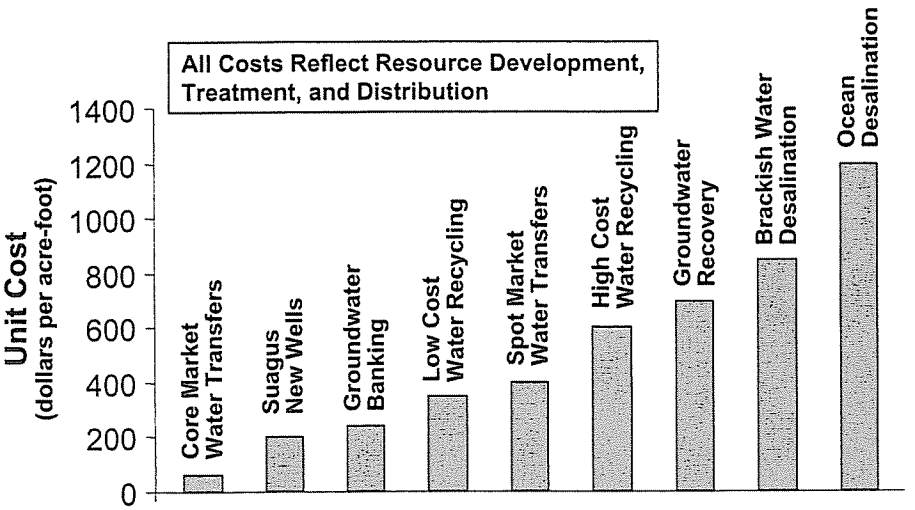


Capital Improvement Plan. As part of the Agency's long-term Capital Improvement Plan (CIP), funding has been established to provide for the purchase of additional imported supplies, implementation of recycled water programs, and enhancement of groundwater, as well as groundwater banking/conjunctive-use programs both inside and outside the Agency's service area. Implemented over time, these measures will provide assurance that there will be sufficient supplies to meet water demands. Seawater and local brackish water desalination coupled with water exchanges can also provide the additional water supplies to meet anticipated community needs. However, the priority for implementation of some of these supply approaches will be driven in part by the relative cost (Figure 1-13).

The Urban Water Management Plan is a long-range planning document that projects water needs and identifies water supplies to meet those needs. The Plan is actually implemented through the Agency's CIP. As demands rise, specific projects are selected for incorporation into the CIP. Environmental documentation and project financing are then developed.

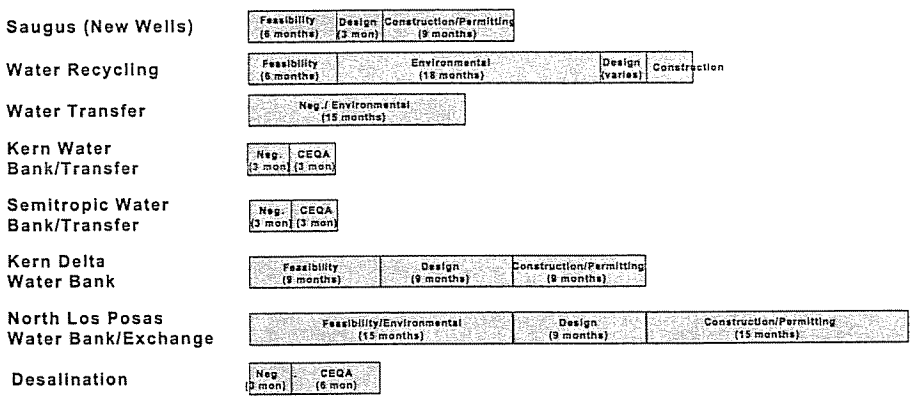
After evaluation, the selected projects will be included in the Agency's CIP. Each project will be analyzed to determine what portion benefits existing users and what portion benefits future users. This is in keeping with the Agency's Fairness Policy, which provides that benefiting users pay the costs of the program that generates the benefit. In short, the cost of capital improvements built by the Agency is divided between those costs that benefit existing users versus those that benefit future users. It is envisioned that the Policy will be applied to all programs identified in the CIP that are part of the Urban Water Management Plan.

Figure 1-13
Average Unit Cost of Water Resources



Time needed to implement potential water programs vary according to various factors (Figure 1-14). To ensure sufficient water to meet projected demands programs will be selected for further study, feasibility analysis, environmental documentation, design and construction will undertaken in accordance with the Agency's normal practice of the CIP.

Figure 1-14
Program Implementation Schedule



1.8 WATER CONSERVATION

The Agency and the purveyors have actively implemented water conservation programs for many years, and additional programs are planned for the future.

A. Water Conservation

In recent years, water conservation has become an increasingly important factor in water supply planning. The Agency's service area has achieved significant reductions in actual water usage through conservation programs. During the early 1990s (hot/dry period), the overall water requirements, due to the effects of weather, were projected to increase by approximately 10 percent. The Agency and its purveyors have developed extensive water conservation efforts and as a result of the conservation efforts, the overall water requirement actually decreased by 20 percent.

The Agency's Board of Directors has adopted the water conservation goal of an overall 10 percent reduction in normal demand. Residential and commercial water usage can be expected to decrease through the implementation of existing and future programs. This Plan assumes water conservation programs can decrease water usage in normal years by approximately 10 percent.

B. Water Demand Measures and Best Management Practices

The Urban Water Management Planning Act lists 14 Demand Management Measures that correspond to the 14 urban Best Management Practices (BMPs), or water use efficiency measures, promulgated by the California Urban Water Conservation Council. Adoption of the BMPs is presently voluntary; some 250 water agencies throughout the State have signed up to implement them.

A recent CalFed Bay-Delta Program decision requires mandatory adoption of the BMPs by December 2002. The water agencies of the Santa Clarita Valley have not yet signed up to implement the BMPs, and are not required to do so, although local agencies have voluntarily complied with many of them, as summarized below. This Plan recommends that the individual local agencies agree to implement the BMPs beginning in 2001.

C. Implementation of Best Management Practices

The Demand Management Measures/Best Management Practices that are currently being implemented by Santa Clarita Valley water agencies, or planned for implementation, are listed below.

1. Water Survey Programs for Single and Multi-Family Residential Customers: Targets and markets to these residential customers. Valley agencies will continue to implement this activity and later implement the BMP.

2. Residential Plumbing Retrofit: Identifies residences constructed prior to 1992 and develops distribution strategy for water saving devices. Agencies will continue to implement this activity and later implement the BMP.

3. System Water Audits, Leak Detection and Repair: Conducts leak detection and repair. Agencies will continue to implement this activity.

4. Metering with Commodity Rates for New Connections and Retrofit of Existing Connections: Metering of all new connections and retrofitting is already done by agencies.

5. Large Landscape Conservation Programs and Incentives: Offers water use surveys to non-residential customers with large landscape areas. Agencies are partially complying with this activity, and will later implement the BMP.

6. High Efficiency Washing Machine Rebate Program: Offers rebates for purchase of horizontal-axis washing machines. Local agencies are exempt from implementation.

7. Public Information Program: Implements an appropriate public information program on water efficiency. Agencies offer a very extensive and effective, award-winning program.

8. School Education: Provides water efficiency classes and information to schools. Agencies offer an extensive and effective award-winning program.

9. Conservation Programs for Commercial, Industrial, and Institutional (CII) Customers: Identifies such accounts, ranks according to water use, and offers water use surveys and incentives. Agencies not yet implementing; will implement BMP later.

10. Wholesale Agency Programs: Agency provides financial incentives or equivalent to retailers, along with technical support and information. Local water agencies will continue to implement this activity.

11. Conservation Pricing: Institutes conservation pricing. Local agencies will continue to implement a variety of pricing structures that meet the terms of this requirement.

12. Water Conservation Coordinator: Designates staff to oversee water conservation program implementation. Local agencies will continue to implement.

13. Water Waste Prohibition: Enforces measures prohibiting water waste. The Agency does not possess police powers; Valencia Water Company and Santa Clarita Water Company enforce per California Public Utility Commission regulations.

14. Residential Ultra-Low-Flow Toilet (ULFT) Replacement Program: Determines number of service connections constructed before 1992 and offer toilet replacements. Local agencies will implement this BMP later.

D. Expansion of Conservation Program

The local water agencies are studying the development and implementation of a comprehensive water conservation program, and the adoption of the BMPs in early 2001. The 10-year implementation schedule would apply to all the Agency's water conservation programs.

1.9 WATER SHORTAGE MANAGEMENT

During the 1991 drought year, the local agencies prepared and implemented a Water Shortage Contingency Plan. It was again implemented in 1994 after the Northridge earthquake. In both instances, the contingency plan worked effectively.

Drought Committees. In past droughts, local water committees addressed drought conditions: the Upper Santa Clara Valley Water Committee consisting of the water agencies and the City of Santa Clarita Drought Committee. Each reviewed information on water production and demand. The Water Committee agreed to cooperate in sharing water resources regardless of contractual or water rights during the emergency. The City committee made recommendations to the City Council and the water purveyors.

Drought Conditions. It is assumed that at least 30 percent of the State Project water entitlement will be delivered, and that a State Water Bank would be formed in the event of a continued drought. The Saugus Formation could be pumped beyond its normal amount, and additional wells can be drilled in the Alluvial Aquifer. Recycled water availability is assumed to be available.

Earthquake or Other Natural Catastrophes. If a major earthquake were to occur along the San Andreas Fault, or other catastrophic natural events that occur elsewhere in the State, it would affect the Santa Clarita Valley. Local storage in reservoirs, combined with requests to the public to reduce consumption, would provide an adequate supply for about seven days. Experts agree that at least 72 hours may elapse before outside help is received; during this period and beyond, the pumping capacity of the retail agencies should provide sufficient water.

Contamination. No extended problems with water contamination are anticipated, since the quality of local supplies is good, and steps can readily be taken to isolate a contamination problem. The presence of perchlorate found in one area of the Saugus Formation is currently being addressed through the development of a cleanup plan for the aquifer.

Stages of Action. The agencies have agreed on a four-stage rationing plan, when needed. The trigger points for these stages have been established, priorities set, and consumption limits established. A public hearing must be called to implement the rationing plan, and various monitoring procedures have been adopted.

Taken all together, the water shortage plan is in place, and has been successfully implemented in practice.

1.10 DETAILED URBAN WATER MANAGEMENT PLAN 2000

The following chapters set forth the *Urban Water Management Plan 2000* for the Santa Clarita Valley. The format follows the requirements of the Urban Water Management Plan Act.

Chapter 2 WATER SUPPLY RESOURCES

Chapter 2.0
WATER SUPPLY RESOURCES

Historically, local groundwater extracted from the Alluvial and Saugus Aquifers has been the primary source of water in the Agency's service area. However, since 1980, local groundwater supplies have been supplemented with imported water from the State Water Project.

Currently, within the Agency's service area, two major sources of water supplies are utilized: (1) local supplies, consisting of groundwater, local surface flows, and recycled water, and (2) imported supplies, transported via the SWP, consisting of SWP entitlement and other water supplies (transferred water). This chapter describes the existing and potential supplies available within the Agency's service area, which include groundwater-banked supplies and desalted water. In addressing these sources of supply, the Plan recognizes that estimates of production from different sources may vary. There is a range of opinion about issues such as the annual yield capability from groundwater basins. Accordingly the Plan recognizes that active management of the resources may be necessary to achieve the projected supply. A number of management activities are thus described in this chapter, such as a water treatment program to remove perchlorates from the Saugus Formation. Many similar programs have been successfully implemented, including the water recharge and water quality management programs of groundwater in Orange County, which in recent years have enhanced the annual yield from this important source of local supply. Although there are water supply and water quality issues to be addressed in relation to groundwater supplies, the availability of active management options to address these issues creates a high probability that the annual yields discussed in this chapter can be sustained.

In reviewing the information in this chapter of the Plan, it is also important to recognize that the various programs described will be part of a flexible, adaptive approach to water management. All of the water management tools discussed will be analyzed and adjustments may be made for any given source as needed and as changes in supply occur. Monitoring of these supplies on an on-going basis to ensure sustain ability of yield will be undertaken. For example, if groundwater basin water levels appear to be adversely affected by a given production level, over the long-term, then management decisions may be made to reduce reliance on this source of supply along with an increased reliance on other sources, such as water transfers and water banking. This may be done on a temporary or permanent basis. Because there are many options considered in this Plan, such flexibility is both feasible and realistic.

It is also important to note that the Plan includes a number of programs which are not currently on-line because they are not yet needed, but which will be explored and developed in the future to meet project needs.

2.1 LOCAL WATER SUPPLIES

In addition to groundwater, which comprises about 54 percent of the current water supply, stormwater based on Castaic Creek allocation, and soon recycled water, are components of the local water supply. Although recycled water will initially contribute a small portion of the local

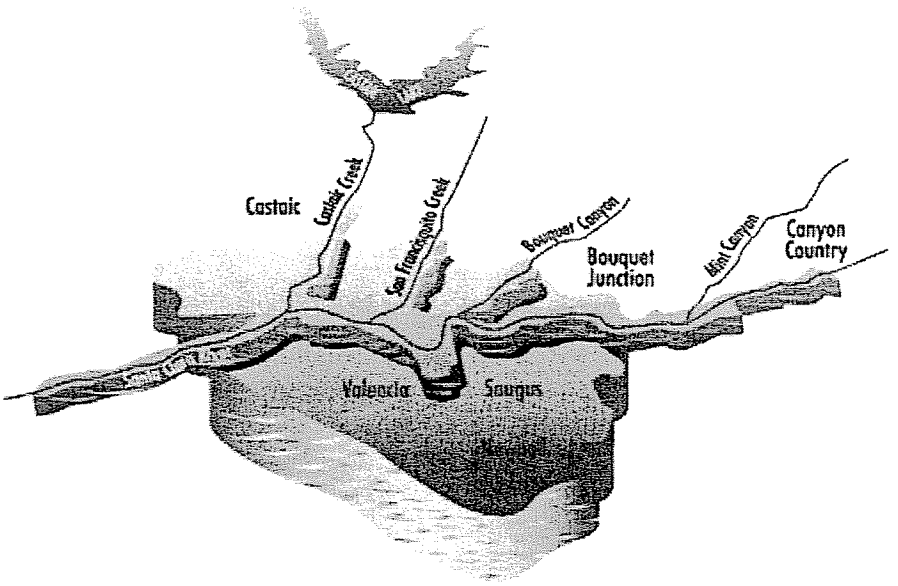
supply, this source will eventually provide a substantial contribution to the Valley's future water supply mix.

A. Groundwater

Groundwater production data is based on information developed by Richard Slade & Associates, Consulting Groundwater Geologists, the Agency's hydrogeologic consultant. Documents include a 3-volume report dated December 1986 provided to the Upper Santa Clara River Water Committee, and another 3-volume hydrogeologic evaluation of the Saugus Formation dated February 1988, and data from current evaluations by Richard Slade, CH_2M Hill, and others.[1]

The groundwater basin underlying the Agency's service area is a two-aquifer system comprised of the shallow Alluvial Aquifer and the deeper underlying Saugus Formation, depicted on Figure 2-1. These aquifers occupy approximately 84 square miles in the central portion of the service area. Richard Slade & Associates has estimated the historic quantity of water stored in the Alluvial Basin at 201,000 acre-feet following periods of high rainfall. Data for the Saugus Formation is more limited, but it is estimated that over one million acre-feet of usable groundwater is available. The historical annual production of the Alluvial Basin is estimated between 30,000 to 40,000 acre-feet per year and for the Saugus Formation 7,500 to 15,000 acre-feet per year.

Figure 2-1
Groundwater Basins within Agency's Service Area



[1] A recent study by Richard Slade & Associates updated production information for the Alluvial and Saugus Aquifers (see Appendix C).

Although the Alluvial is the smaller of the two aquifer systems as measured by storage capacity, most wells within the Agency's service area are drilled into the Alluvial Aquifer (Figure 2-2).

Recharge to this aquifer is primarily from the percolation of stream-flow in the Santa Clara River and its tributaries. The principal source of recharge to the Saugus Formation is precipitation on exposed outcrops and direct infiltration from the overlying saturated alluvium of the Santa Clara River channel (Figure 2-3).

Figure 2-2[1]
Typical Well Configuration

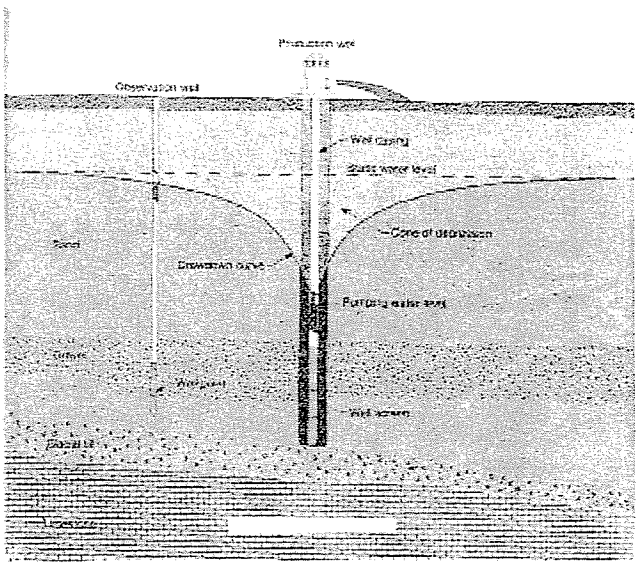
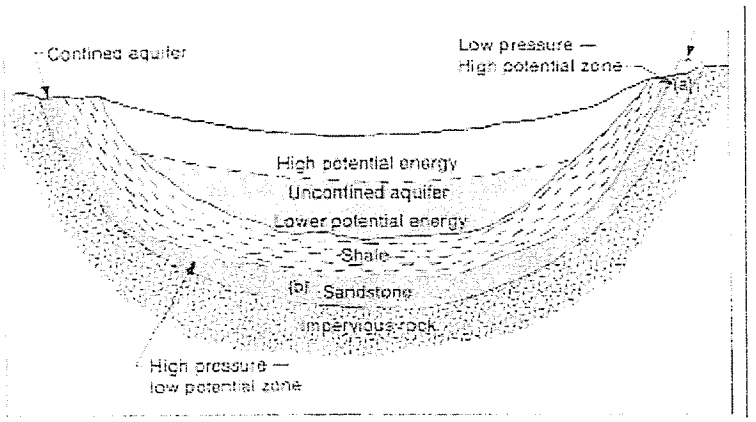


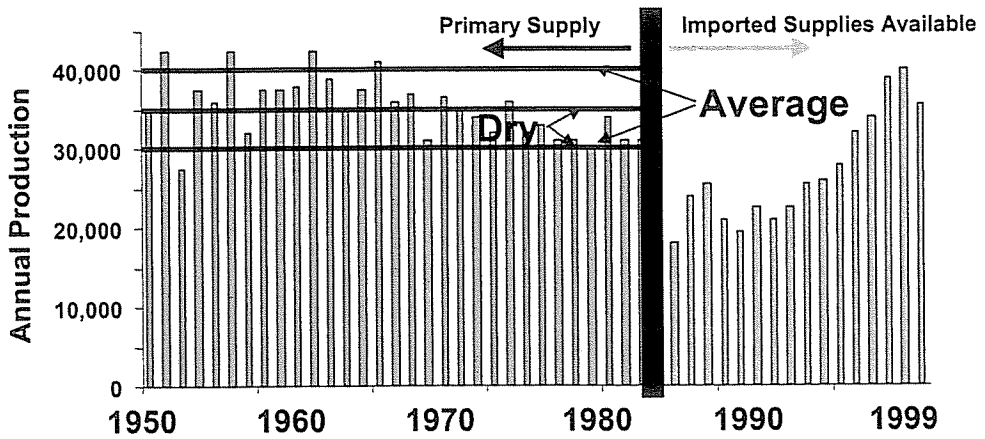
Figure 2-3[2]
Cross Section of Groundwater Basin



[1] Groundwater and Wells, Second Edition.
[2] Groundwater and Wells, Second Edition.

Figure 2-4 depicts historical Alluvial Aquifer groundwater production from 1950 to 1999. The historical data and all technical information indicate that the Alluvial Aquifer is in good operating condition and has produced annually up to 40,000 acre-feet per year without adverse results such as long-term water level decline or degradation of groundwater quality. Spreading of surplus water in the Alluvial Aquifer could increase the dry year pumping, although surplus water for spreading may not be available in dry years. In any case, the storage capacity of the Alluvial Aquifer provides moderate amounts of long-term storage.

Figure 2-4
Historical Groundwater Production
Alluvial Aquifer
(acre-feet per year)



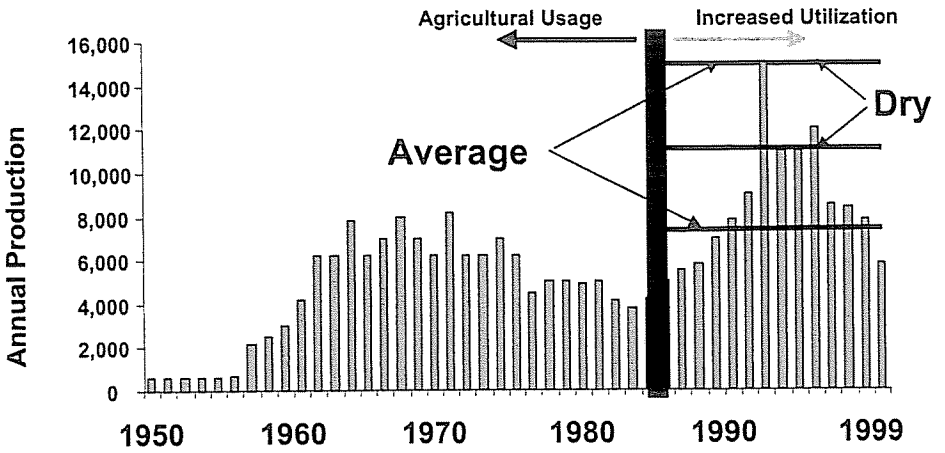
Recharge of local water captured by Castaic Reservoir could be spread. Difficulties are that wet year inflow to Castaic could occur when the Alluvial Aquifer is full. Nevertheless, the supply is available, and may add to the Agency supply and result in a cost saving.

Figure 2-5 depicts historical Saugus Formation groundwater production. The Saugus Formation is an important part of drought-proofing the Agency's service area water supplies. Recent studies by Richard Slade & Associates, CH_2M Hill and others demonstrate that using wells to inject imported and other supplies into the Saugus Formation is feasible. By undertaking this method of groundwater recharge for the Saugus Formation, the recovery of the Saugus Formation after extended use during a prolonged dry period could be accomplished, thereby operating the Saugus Formation in a conjunctive manner. Recent studies by Richard Slade & Associates, indicate that water supplies from the Saugus Formation can be withdrawn up to approximately 40,000 acre-feet per year by drilling of additional wells for multiple dry-years without any adverse effects (Table 2-1).

As part of this Plan, Luhdorff and Scalmanini, Consulting Engineers undertook a review of the information supplied by Richard Slade & Associates. This review (Appendix D) focused on the information presented in this plan, most notably projected groundwater supplies as summarized

in Table 2-1, and whether these projections are realistic under average and dry conditions. The results of this review drew three basic conclusions: 1) "...both the Alluvium and the Saugus are reasonable and sustainable sources at the yields represented in the Plan..."; 2) "....As such, those yields are not overstated and will not deplete or 'dry up' the groundwater-basin..."; and 3) "...there is no need to 'reduce' them for the purposes of planning within the context of an Urban Water Management Plan."

Figure 2-5
Historical Groundwater Production
Saugus Formation
(acre-feet per year)



Several steps could be taken which may increase the local groundwater production capability. These include:

?? In-lieu recharge of the Saugus Formation through reduced groundwater pumping in wet years.
?? Recharge by spreading in the Alluvial Aquifer.
?? Injection into the Saugus Formation using multi-purpose injection/extraction wells (ASR).
?? Management of Alluvial Aquifer water levels to induce winter recharge.

Table 2-1
Existing and Planned Groundwater Supplies(1)
(acre-feet per year)

Source	Average/Normal Year	Dry-year
Alluvial Basin	30,000-40,000	30,000-35,000
Saugus Formation	7,5000-15,000	11,000-15,000
Saugus Formation (New Wells)*	-	10,000-20,000
Total Supply	37,500-55,000	51,000-70,000

(1) Studies by Richard Slade & Associates in October 2000 (Appendix C).

Review by Luhdorff and Scalmanini in December 2000 (Appendix D)
*Planned programs for future implementation.

Groundwater Quality. To the extent that groundwater quality depends on the quality of the surface water recharging the basin, the surface flows of the main stem of the Santa Clara and its larger tributaries rank fair in terms of water quality standards. Total dissolved solids (TDS) typically range from 400 to 700 milligrams per liter (mg/L), and the water is considered moderately hard to hard.

In addition to TDS concerns, water quality problems have been observed in Southern California recently that could affect groundwater supply availability, in particular, the local discovery of perchlorate. Perchlorate is used in the manufacture of solid rocket propellants, munitions, and fireworks, and can be treated and removed from groundwater. Aerojet has implemented biological treatment in Rancho Cordova, California and is re-injecting the treated water into the ground. The California Department of Health Services has not yet approved biological treatment for a drinking water end use.

An ion exchange process has also been developed that successfully treats and removes perchlorate. This process is called the continuous ion exchange system. The system has been successfully piloted at Jet Propulsion Laboratory and at a location in the Main San Gabriel Basin. The treatment cost for this process is about $300 per acre-foot excluding the cost of brine disposal. Discussions are currently underway with the owners of the property identified as the source of the local contamination on groundwater cleanup. No perchlorate has been detected in Alluvial Aquifer wells to date, although some has been detected in monitoring wells located on the contaminating site.

B. Stormwater

As provided through agreement with the State Water Project Contractors, the Agency has the opportunity to make greater use of the storage allocated to it in Castaic Lake. Under current allocations, the Agency has access to about 4,700 acre-feet of storage in this reservoir. The use of this storage provides greater operational flexibility for the Agency to regulate available supplies into groundwater basins for long-term storage and provides some potential for stormwater use through the temporary storage of surplus SWP supplies in wet years.

The County of Los Angeles, Newhall Land & Farming Company, Newhall County Water District, and United Water Conservation District—which together constitute the "Downstream Water Users"--had certain rights to water flowing in Castaic Creek when the Castaic Dam was built. The DWR entered into agreements with the Downstream Water Users regarding their rights to the water; this resulted in an agreement between DWR and those parties dated October 24, 1978. Under the terms of the agreement, DWR would release the first 100 cubic feet per second (cfs) of inflow. At the time of the agreement, flows in excess of 100 cfs were estimated to be wasted to the ocean. When the local inflow to Castaic Reservoir exceeds 100 cfs, the excess of 100 cfs inflow will be retained in the reservoir. Until May 1 of each year, parties to the agreement can receive the retained local stormwater by paying specified storage charges. The storage charge for 25 percent of the water stored is $0.50 per acre-foot, and the storage charge for the remaining 75 percent is $10 per acre-foot. After May 1, any retained water becomes the

property of DWR. The allocation of stored water among the Downstream Water Users is specified in a separate agreement and is as follows:

??	Newhall County Water District	2.662 percent
??	United Water Conservation District	48.000 percent
??	Los Angeles County	4.471 percent
??	Newhall Land & Farming Co.	44.867 percent

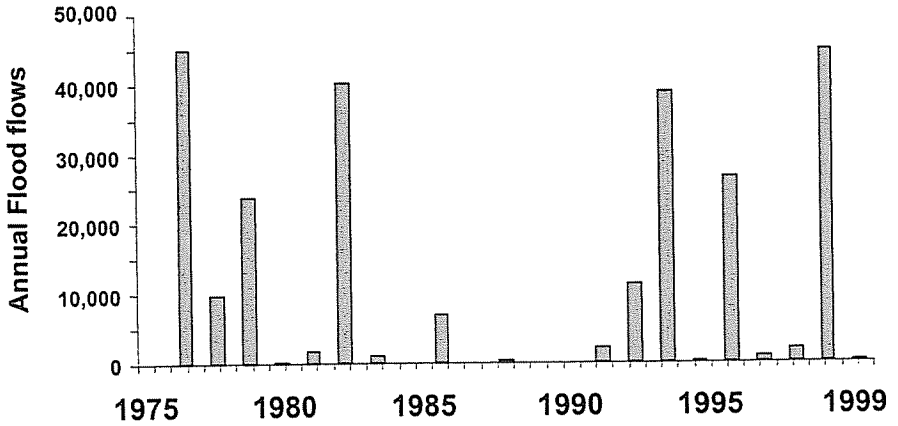
Under the agreement, if one of the Downstream Water Users elects not to receive its share of stored water, the others may receive this water on a pro rata basis. The basic intention of the agreement is to minimize the loss of local water to the ocean while maintaining the water supply of the Downstream Water Users and allowing for normal operation of reservoirs. One of the considerations in development of the agreements is that under normal operations, Castaic Reservoir would be filled by May 1 of each year, and storage capacity for local stormwater would then be unavailable.

Potential Future Stormwater Supplies. Stormwater runoff can greatly enhance the use of available water supply in the future. Capturing and regulation could be accomplished by in-lieu replenishment, spreading untreated water in the Santa Clara River (transmitted via The Metropolitan Water District of Southern California and other existing facilities), injection into the Saugus Formation by wells, or aggressively spreading water in the Santa Clara River or Castaic Creek by construction of sand levees or other temporary levee structures, including inflatables.

To better manage these supplies, the stormwater generated in the Castaic Lake watershed should be stored in the reservoir beyond the May 1 deadline, thus allowing this stored water to meet peak demands in summer months. Inflow to Castaic Reservoir from Castaic Creek can be captured by the reservoir under a permit issued by the State Water Resources Control Board and downstream user agreements. Alternatively, the stored water could be reserved for dry periods or emergencies. Kennedy/Jenks Consultants prepared initial studies in 1995 that analyzed stormwater availability in three years (1992, 1993, 1994).

These studies indicated that up to 18,000 acre-feet per year of water was available under wetter conditions decreasing to zero in dry years. On average (50 percent occurrence), the amount of available water was estimated to be approximately 11,500 acre-feet per year, Figure 2-6. In addition, recent studies have demonstrated that the long-term average of flood flows (1977-1999) has averaged (50 percent occurrence) 22,266 acre-feet. As a result of the established allocation, above 52 percent is available to entities operating within the Agency's service area. At this time downstream water users within the Agency are having on-going negotiations with the Department of Water Resources concerning future use of flood waters within the Agency and Ventura County. Because this supply is highly variable and not available in many years, it was not considered as a future planned supply at this time by the Urban Water Management Plan.

Figure 2-6
Stormwater Runoff
(acre-feet per year)



Note that yields from these changes in reservoir storage use have not been included in projected local supplies. Their primary use will be to enhance the potential for water banking and water exchanges and to provide more flexibility in the timing of deliveries from other sources.

C. Recycled Water

Water recycling is defined as the treatment and disinfection of municipal wastewater to provide a water supply suitable for non-potable reuse. Recycled water is available from two existing water reclamation plants operated by the County Sanitation Districts of Los Angeles County, the District 26 and 32 facilities.

In September 1993, the Agency completed a draft *Reclaimed Water System Master Plan* (Kennedy/Jenks, 1993). The purpose of the Master Plan was to evaluate and plan the feasibility of the use of recycled water as a reliable water source to meet a portion of the non-potable water demand within the Santa Clarita Valley. The Master Plan outlined a multi-phase program to deliver recycled water to the Valley totaling 10,000 acre-feet. The Agency's recycled water supply is projected to be 1,700 acre-feet per year by January 2001. Projections in an updated draft Master Plan, currently in preparation, show a total recycled water supply of 17,000 acre-feet.

Recycled Water Demand: The Agency's draft *Reclaimed Water System Master Plan* identified potential recycled water users with existing and future demands totaling over 17,000 acre-feet. Of the total, 1,215 acre-feet of demand is outside the Agency service area.

In addition to the recycled water demand identified in the Agency's Master Plan, if the proposed Newhall Ranch development is approved, the non-potable water demand in the Agency service area would increase by 9,251 acre-feet (Impact Sciences, 1996). The peak monthly non-potable demand has been estimated to be 1,305 acre-feet (14 million gallons per day). Assuming approval of the Newhall Ranch project, the total non-potable water demand within the Agency's

service area is expected to reach approximately 19,600 acre-feet. This demand will be highly seasonal, with peak demands during summer months when the weather is hot and dry and irrigation needs are greatest.

Recycled Water Supplies: The two existing water reclamation plants within the Santa Clarita Valley mentioned above that can potentially supply recycled water to meet the identified non-potable water demands in the Agency service area are the Valencia Water Reclamation Plant and the Saugus Water Reclamation Plant. A third plant has been proposed as part of the Newhall Ranch development.

The total projected effluent flow of the Saugus Water Reclamation Plant is 6.01 million gallons per day (MGD) (6,731 acre-feet), approximately 92 percent of its design capacity (CSDLAC, 1996), and the total projected effluent flow of the Valencia Water Reclamation Plant is 9.2 MGD (10,326 acre-feet), approximately 68 percent of its current design capacity (CSDLAC, 1996).

Future Recycled Water Use: Surveys by the Agency indicate a high interest in recycled water by existing users as well as future development. In order to augment and "drought proof" existing supplies, the Agency and its purveyors support the use of recycled water. The Reuse Water Master Plan compiled in 1993 indicated that the reuse program is expected to reclaim up to 10,000 acre-feet of highly treated (tertiary) wastewater suitable for reuse on golf courses, landscaping, and other non-potable uses. This plan will soon be updated. Discussions with the consultants evaluating the potential for water recycling indicate that with future development also comes an increase of wastewater generated and therefore increases in the amounts of water available for recycling and reuse. Therefore, the total effluent able to be used for recycled water from the two plants is expected to reach approximately 17,000 acre-feet per year over the next 20 years. An additional amount will be made available by the Newhall Ranch recycled plant, should the Newhall Ranch project proceed.

2.2 IMPORTED WATER SUPPLIES

Since about 1980, imported SWP water has been a supplemental source of supply to meet community water requirements. Imported supplies are transported to the Agency's service area via the SWP. This water has historically consisted of SWP entitlement. In the future, imported supplies could include a combination of SWP entitlement, banked groundwater, water transfers from other sources, and desalted brackish and ocean water. Each of these supplies is described further in the following paragraphs.

A. State Water Project Supplies

The SWP is operated by DWR for the benefit of SWP contractors. The SWP includes 660 miles of aqueduct and conveyance facilities, from Lake Oroville in the north to Lake Perris in the south.

The SWP is contracted to deliver 4.2 million acre-feet per year to 29 contracting agencies. The Agency is a contracting agency with a current annual contracted entitlement of 95,200 acre-feet, or about 2.3 percent of the total. The acquisition of 41,000 acre-feet in 1999 from a water agency in Kern County increased the Agency's entitlement to its present level.

The local supplies received from the SWP are treated, filtered, and disinfected at the Earl Schmidt Filtration Plant and the Rio Vista Water Treatment Plant. The plants have a current combined capacity to treat a total of 58 MGD. From the treatment plants, the treated water is delivered by gravity throughout the Agency's service area through a distribution network of pipelines and turnouts.

The Earl Schmidt Filtration Plant has a design capacity of 28 MGD. The Agency is currently designing an expansion of the plant's treatment capacity to 50 MGD. In addition, the process performance of the plant is also being evaluated and will be improved to assure continuous compliance with all State and Federal water quality regulations. The expanded plant is scheduled to be on line by mid 2003. When completed, the total projected treatment capacity of both plants will be 80 MGD

Reliability of State Project Water. Issues concerning the SWP are among the most complex in the resource planning process. The SWP supply offers some of the most significant opportunities for meeting the future water supply needs of the region. On the other hand, the ability to take advantage of these opportunities has been uncertain in recent years. Water supplied by the SWP flows through and is pumped from the Sacramento-San Joaquin Delta (Delta). Certain fishery populations in the Delta have been declining and are probably adversely affected by, among other factors, the location of the SWP export pumps in the southern Delta. To protect several fish species that are listed under the Endangered Species Act, additional operational constraints have been imposed on the SWP. Finding solutions to these complicated environmental problems in the Delta is a challenge and may take some time to implement. SWP transportation facilities, which represent a fixed cost commitment for the Agency, have existing capacity to transport additional supplies, making the marginal cost of future SWP supplies competitive.

Contractors' requests for SWP water have been increasing, and in 1994, they reached 3.85 million acre-feet. While this level of request exceeds the dependable yield from existing SWP facilities, the SWP has been able to meet all contractors' requests for water except during the drought periods in 1977, 1990 through 1992, and 1994. Only during 1991 was the Agency unable to receive its full request for SWP delivery. In addition, surplus water has been delivered to contractors in many years. In 1999, the SWP delivered 3.1 million acre-feet; in 2000, the SWP is expected to deliver 3.3 million acre-feet.

Deliveries of water associated with the Agency's SWP entitlement of 95,200 acre-feet per year are affected by a number of factors, including hydrologic conditions, the status of SWP facilities' construction, environmental requirements, and evolving policies for the Bay-Delta. The following programs have potential to improve the reliability of imported water.

Monterey Agreement Contract Amendments: This Agreement among the Department of Water Resources and SWP contractors was signed by multiple parties in December 1994 and provides substantial opportunities for the Agency to increase its water supply reliability. The Agreement clarified SWP water allocation rules by specifying that, during drought years, project supplies are to be allocated proportionately based on entitlements. Water is allocated to urban and agricultural purposes on an entitlement proportional basis, deleting a previous initial supply reduction to agricultural contractors. The agreement also further defines and permits permanent

sales of SWP entitlements and provides for transfer of up to 130,000 acre-feet of annual entitlement from agricultural use to municipal use, of which the Agency has purchased 41,000 acre-feet. The Agreement also allows SWP contractors to store water in another agency's reservoir or groundwater basin, facilitates the implementation of water transfers, and provides a mechanism for using SWP facilities to transport non-project water for SWP water contractors. The Agreement provides greater flexibility for SWP contractors to use their share of storage in SWP reservoirs. The Agency currently has access to about 4,700 acre-feet of storage in Castaic Lake.

CalFed Bay Delta Program: The CalFed Bay Delta program is a cooperative State-Federal process with the goal of developing a long-term solution to the many competing water needs of the Sacramento-San Joaquin Bay-Delta. The program is a 30-year, three-phased effort addressing a number of issues including ecosystem quality, water quality, water system reliability, and system vulnerability. Implementation of the CalFed improvements over time can significantly improve the Agency's ability to maintain delivery of high quality water and provide needed water supplies during dry years.

Interim Delta Improvements. Potential supply development for the SWP includes interim Delta improvements that involve: (1) south Delta channel enlargements and construction of four barriers to improve south Delta flow circulation and (2) installation of acoustic fish barriers on the Sacramento River. The interim improvements would enable the use of additional pumps at Banks Pumping Plant when flow conditions are sufficient, and permit the relaxation of certain current operational constraints. It is also anticipated that these improvements would change the Delta fisheries on a positive basis. Therefore, the expected supply yield would improve. Although this solution is considered viable and cost-effective, it does not constitute a permanent solution to the Delta.

Full Delta Fix. As the overall demand for water increases and the need for low-salinity imported water intensifies, a long-term solution to the Delta becomes critical. It is expected that a Delta transfer facility would provide a long-term solution to Delta problems, increase supply reliability, reduce habitat impacts, and improve the water quality of Delta diversions. Goals would be to minimize the effects of the SWP export pumps on Delta fisheries and greatly improve the quality of the exported water.

South of Delta Storage. Finally, the potential exists for additional storage south of the Delta. This storage could include both reservoir projects and groundwater banking/conjunctive-use storage. The reliability of the SWP supply would increase significantly, especially during dry years, with the development of south of Delta storage. However, the benefits of the storage would be maximized if a full Delta fix were implemented. As part of the CalFed analysis, approximately 3 million acre-feet of total storage capacity could be implemented south of the Delta.

Figure 2-7 and Table 2-2 summarize the variability in SWP supplies available to the Agency by the year 2020 under the different improvement scenarios.

?? Under Existing Conditions, the Agency would receive approximately 37,900 acre-feet per year about 10 percent of the time and approximately 56,800 acre-feet per year about 50 percent of the time.

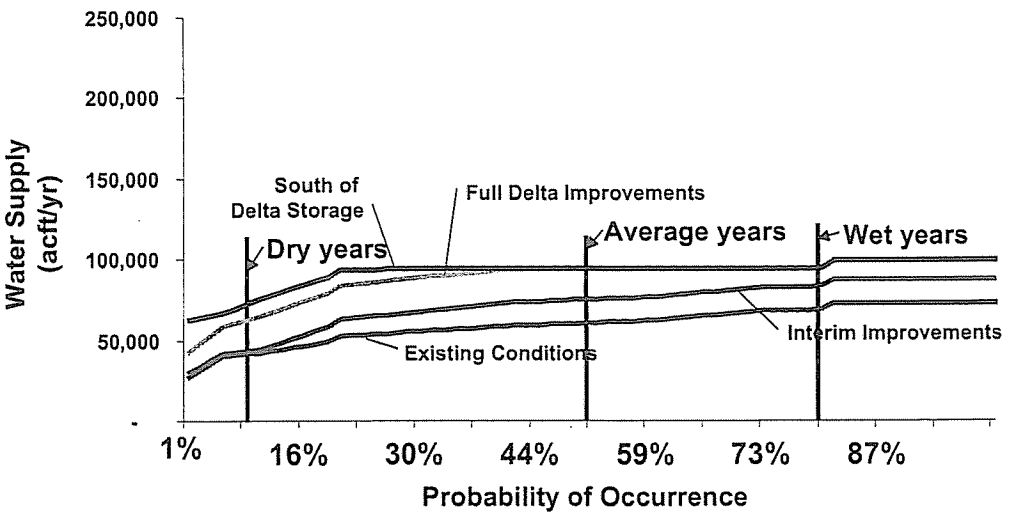
?? Under Interim Delta Improvements, the Agency would receive approximately 40,200 acre-feet per year about 10 percent of the time and approximately 73,700 acre-feet per year about 50 percent of the time.

?? Under a Full Delta Fix, the Agency would receive approximately 63,900 acre-feet per year about 10 percent of the time and approximately 95,200 acre-feet per year about 50 percent of the time.

?? In addition, South-of-Delta Storage would allow the Agency to receive its full entitlement about 50 percent of the time.

The amount of water available to the Agency has been calculated through the use of the DWRSIM model. This model forecasts Agency water supply under various meteorological and land use changes as well as regulatory constraints.

Figure 2-7
State Water Project Deliveries



From the analysis of SWP supplies, two conclusions are made. First, a number of factors will probably reduce entitlement deliveries to some extent in coming years. These factors include changes in law and policy affecting SWP operations, the probability of more stringent environmental regulations, and greater competition for California's available supplies as the population grows. Second, there are a number of CalFed-sponsored programs that should at least result in some improvement to SWP facilities that will in turn result in increased reliability. In addition, there may be incidental water supply benefits from the CalFed ecosystem restoration

program. The net change in SWP supplies as a result of these factors cannot be projected accurately at this time. The Plan's approach to evaluation of SWP reliability is to evaluate potential SWP supplies under current conditions. The Agency is aware of and will closely track changes in law, policy, and project facilities which may affect SWP reliability in the future. As such changes are made, adjustments in the planned mix of supply sources will be undertaken as necessary to meet projected demands.

Table 2-2
Projected State Water Project Supplies
(acre-feet per year)

	Wet-year	Average/Normal year (50 % occurrence)	Dry-year (10 % occurrence)
Existing Conditions	66,300	56,800	37,900
Interim Delta Fix	82,900	73,700	40,200
Full Delta Fix	95,200	95,200	63,900
South of Delta Storage & Full Delta Fix	95,200	95,200	75,800

*Based on DWRSIM Modeling (assuming full requests for contractors).

B. Groundwater Banking and Conjunctive Use

With recent developments in conjunctive use and groundwater banking, significant opportunities exist to improve the water supply reliability for the Agency. Conjunctive use is the coordinated operation of multiple water supplies to achieve improved supply reliability. Most conjunctive use concepts are based on storing water supplies in times of surplus for use in times of drought. A typical program might involve importation of additional surface supplies from the SWP during wet periods, recharging the water in a local groundwater basin, and pumping out the stored water later when the SWP supplies are reduced during a drought.

Groundwater banking programs involve storing available SWP supplies during wet years in groundwater basins in, for example, the San Joaquin Valley and also in the Saugus Formation (ASR). Water would be stored either directly by surface spreading or injection, or indirectly by supplying surface water to farmers in-lieu of groundwater pumping. During water shortages, the stored water could be pumped out and exported to the Aqueduct, or used by the farmers in exchange for their surface water allocations and delivered to the Agency via the California Aqueduct. Several potential conjunctive use and groundwater banking opportunities are available to the Agency.

Several ongoing banking programs can be utilized to store these supplies. These include the Kern Water Bank, the Semitropic Water Storage District, the Kern Delta Water District, and the North Las Posas Water Bank. Each of these locations has unique features that present both advantages and disadvantages for the Agency. A significant difference between these banking programs is that two of the potential programs, Kern Water Bank and the Semitropic Water Banking, could involve the purchase of water previously banked by others. A benefit of these programs is that it allows the Agency to receive needed supplies in early years below water initially stored by the Agency.

Kern Water Bank/Transfer: The Kern Water Bank was established by DWR in 1988 as a statewide conjunctive-use program to increase the yield and enhance the reliability of the SWP. Eight elements were identified; seven sponsored by local agencies with the eighth being DWR's Kern Fan Element. The Kern Fan Element (later transferred to Kern Water Bank Authority) included the purchase of 19,900 acres of land and construction of recharge basins, extraction wells, and related facilities. The original plan was to store SWP water underground in years of abundant supply and extract the banked water in dry years for use by SWP contractors. This original plan was divided into elements, such as Kern Fan, Semitropic, and Cawelo. Initial studies indicated that the Kern Fan Element could store as much as 1 million acre-feet of water and provide up to 140,000 acre-feet of water to the SWP in dry years.

In 1994, the Kern Water Bank Authority (KWBA) was established to develop and operate the water bank. The KWBA is a joint powers authority consisting of six water agencies. The KWBA constructed recharge basins and began recharging water in 1995. KWBA is now constructing additional basins, extraction wells, and water conveyance facilities.

In October 1997, the KWBA, in conjunction with state and federal fish and wildlife agencies, established a Habitat Conservation Plan and Natural Community Conservation Plan that is preserving wildlife in the area while ensuring an adequate water supply for the future. When the KWBA's new water recharge facilities are completed, they will provide Kern County farming interests with the capability to store more than 1.0 million acre-feet of water on a permanent basis. Currently, more than 760,000 acre-feet is in storage. As a part of this Water Banking Program, KWBA allows participants to borrow water from the water bank prior to storage. The Agency could rely on the borrowed water in the near-term, if required.

Semitropic Water Banking/Transfer: Semitropic Water Storage District provides SWP water for irrigation. The District is located in the San Joaquin Valley in the northerly part of Kern County immediately east of the California Aqueduct. Using the immense groundwater storage capacity available to Semitropic (approximately one million acre-feet), the District has developed a groundwater-banking program. The District operates the program by taking additional SWP supplies in wet years and returning the water in dry years. As part of this dry-year return, Semitropic can leave its entitlement in the Aqueduct and increase its groundwater production. Semitropic has also constructed facilities so that groundwater can be pumped into their canal and, through reverse pumping plants, actually deliver to the California Aqueduct. Water can be placed in storage in amounts up to 90,000 acre-feet for all banking partners. Semitropic currently has five banking partners: the Metropolitan Water District of Southern California, Santa Clara Valley Water District, Alameda County Water District, Alameda County Zone 7, and Vidler Water Company. The total amount of storage under contract is approximately 1 million acre-feet. One of these Banking Partners, Vidler Water Company, currently has water in storage and available for transfer. This water could be acquired by the Agency and delivered to the Agency in the near-term, if required.

In addition, Semitropic has recently completed environmental documentation to construct new storage and return facilities. These new facilities will provide Semitropic with the additional capability to pump-back to the California Aqueduct approximately 200,000 acre-feet annually. The total return capability of Semitropic in dry years would be approximately 280,000 acre-feet.

Kern Delta Water District: Kern Delta Water District is in the process of developing a banking agreement with Metropolitan Water District of Southern California. Kern Delta lies in the San Joaquin Valley southwest of Bakersfield and obtains imported supplies from the Kern River, 180,000 acre-feet of pre-1914 rights, and the SWP under contract through Kern County Water Agency for a annual entitlement of 25,000 acre-feet. Under the proposed Kern Delta banking program, in wet years, additional water would be supplied to Kern Delta where it would augment groundwater supplies through either direct groundwater recharge by spreading or by in-lieu replenishment. In dry years, previously stored supplies would be returned to Metropolitan, either by direct groundwater pumpback or through exchange of other supplies available to Kern Delta. Total return capability in dry years would be 40,000 acre-feet, with a total storage capacity of 200,000 to 240,000 acre-feet.

North Las Posas Water Bank/Exchange: The North Las Posas Groundwater Basin is about 18 miles long and 4.5 miles wide, and is located in Southern California near Los Angeles. Water to this area is supplied by the Calleguas Municipal Water District, which receives all of its water from The Metropolitan Water District of Southern California.

Investigations have shown that the North Las Posas Groundwater Basin has available storage capacity of about 300,000 acre feet, primarily as a result of historic groundwater production. It is projected that the North Las Posas Water Bank could be used to return up to 10,000 acre-feet of previously stored water when needed. Water would most likely be returned via an exchange of previously stored water for other imported supplies available to Calleguas Municipal Water District.

Future Groundwater Banking. Groundwater banking and conjunctive-use programs provide a significant opportunity to improve the supply reliability for the Agency's service area. If a groundwater banking and conjunctive-use program is implemented, it provides the following benefits:

?? A location to store available supplies in wet years, thus maximizing the efficient use of water resources.
?? A dry-year supply that augments existing supplies reduced by drought or other shortages.
?? A storage "reservoir" that can be drawn upon when supplies are inadequate during emergencies.

These benefits allow groundwater banking and conjunctive-use programs to enhance the reliability of both the existing and future supplies. Summarized in Table 2-3 are the projected water supply benefits for each groundwater banking and conjunctive-use project.

Table 2-3
Planned Groundwater Banking
and Conjunctive Use Supplies[1]
(acre-feet per year)

Source	Dry Year
Kern Water Bank/Transfer[(2)]	25,000
Semitropic Water Bank/Transfer[(2)]	30,000
Kern Delta Water Bank	40,000
North Las Posas Water Bank/Exchange	10,000
Saugus (ASR)	---
Total Groundwater Banking & Conjunctive-use Supplies	105,000

1 Assumes Groundwater Banking Programs would only be called on in dry-years. All groundwater banking programs are available in wet, average/normal years.

2 Programs provide for acquisition of water from others already in storage area available for purchase.

C. Water Transfers

Another opportunity available to the Agency to increase water supplies is to participate in voluntary water transfer programs. Due to the California drought of 1987-1992, the concept of water transfer has evolved into a viable supplemental source to improve supply reliability. The initial concept for water transfers was codified into law in 1986 when the California Legislature adopted the "Katz" Law (California Water Code, Sections 1810-1814) and the Costa-Isenberg Water Transfer Law of 1986 (California Water Code, Sections 470, 475, 480-483). These laws help define parameters for water transfers and set up a variety of approaches through which water or water rights can be transferred among individuals or agencies.

Up to 27 million acre-feet of water are delivered for agricultural use every year. Over half of this water is in the Central Valley, and much of it is delivered by, or adjacent to, SWP and Central Valley Project conveyance facilities. This proximity to an existing water conveyance facility could allow for the voluntary transfer of water to many urban areas, including the Agency, via the SWP. Such water transfers can involve water sales, water ranching/farming, and water sharing, and usually occurs as a form of spot, option, and core transfers agreements. The cost of water transfer would vary depending on the type, term, and location of the transfer. Because of the Agency's location, the most likely voluntary water transfer program would involve the southern San Joaquin Valley area.

One of the most important aspects of any resource planning process is flexibility. A flexible strategy minimizes unnecessary or redundant investments (or stranded costs). The voluntary purchase of water between willing sellers and buyers can be an effective means of achieving flexibility. However, not all water transfers have the same effectiveness for ensuring flexibility. Within the resource planning process and through ultimate implementation, several different types of water transfers have been undertaken;

Core Transfers. Agreements to purchase a defined quantity of water every year, whether needed or not. These transfers have the benefit of more certainty in costs and

supply, but tend to offset surplus imported water (available in most years) that is already paid for.

Spot Market Transfers. Water that is purchased only during the time of need (usually a drought). Payment for these transfers occurs only when water is needed, but there is usually greater uncertainty in terms of costs and availability of supply. An example of such a transfer was the 1991 Governor's Water Bank. An additional risk of spot market transfers is that the purchase may be subject to institutional limits or restricted access (e.g., requiring the purchasing agency to institute rationing before it is eligible to participate in the program).

Option Contracts. Agreements that specify the amount of water needed and the frequency or probability that the supply will be called upon (an option). These transfers have the best characteristics of both core and spot transfers. With option contracts, the potential for redundant capacity is minimized, as are the risks associated with cost and supply availability.

Future Water Transfers. The most viable types of water transfers are core and option transfers and, as such, represent the Agency's long-term strategy. The costs for these types of transfers have been estimated to be about $60 to $110 per acre-foot (equivalent to $1,100 to $2,000 per acre-foot for SWP Entitlement) for core transfers and $250 per acre-foot for option transfers. Although the option transfer costs might seem high, the equivalent average annual cost is much less - about $65 to $112 per acre-foot. The reason the average annual option transfer costs are much lower is due to the variable likelihood that the transfers will be needed. Currently, the Agency is considering acquiring an additional 8,719 acre-feet of SWP entitlement (core transfer).

D. Brackish and Seawater Desalting

Water exchanges represent the use of water that belongs to another entity either by trading water for water or by paying the cost of the water development and transmission. One opportunity for future exchange is through brackish and seawater desalting.

Large scale seawater desalination processes usually occur by one of two means: membrane processes and thermal processes. Membrane processes such as reverse osmosis (RO) use pressure to push seawater through semi-permeable membranes. The membrane acts as a filter allowing water to pass but not dissolved solids and impurities. Thermal processes utilize heat to separate the water from the salt and other impurities in the seawater. Thermal facilities tend to be more common but are often located in areas where fuel is inexpensive. Therefore, as membrane technology closes the cost gap, RO will become a less costly and more energy efficient desalination technology.

Cost of Desalination. Desalination of seawater is technically feasible, but has historically been an expensive procedure. However, recent seawater desalination projects seem to indicate that the cost of seawater desalination, in some site-specific situations, has decreased in recent years.

The competitive proposal process for the design, construction, and operation of the 25 MGD Tampa, Florida, seawater desalination plant gained worldwide attention. The best and final offer had a first year water cost of $560/acre-feet and a 30-year nominal cost of water of $680/acre-

feet. This compares favorably to past desalination costs reported to be in the range of $1,300 to over $2,000 per acre-feet. The Tampa project includes a number of favorable factors that contribute to the low water price.

In Trinidad, a 23-year contract was awarded to build, own, and operate a 28.8 MGD seawater desalination facility. The plant will supply water at a first-year price of $865/acre-feet (1999$).

A third example is the Long Beach Desalination Project, currently in the planning stage. Poseidon Resources, the Long Beach Water Department, and Southern California Edison are key participants. The Project includes a 20-40 MGD desalination plant and appurtenant facilities. The $90 to $180 million private investment will present no financial risk to the public partners while at the same time providing substantial water supplies.

Future Seawater Desalting. Current projects would seem to indicate that the cost of seawater desalting is at a point where it could become a viable resource option for the future. Given anticipated continued technology improvements and interest in seawater desalination as a resource option, future steps should include establishing a possible location for a seawater desalination facility. The most likely location would be at or near an existing coastal power station primarily because:

?? The availability of the power plant intake and discharge facilities allow brine discharge to be mixed with cooling water discharge to lower the salinity of the brine.
?? Electrical distribution costs are lowered by locating a significant electrical load near the power plant.

As discussed above, 25,000 to 45,000 acre-feet per year, as part of the proposed Long Beach project will be available. It was assumed that 5,000 of acre-feet per year of desalted water could be purchased for use in the Agency's service area.

2.3 SUMMARY OF SUPPLIES

As discussed above, the reliability of water supplies available to the Agency's service area does not depend on the "Delta Fix" and other water supply improvements recommended by the CalFed Program. Recently extensive water reliability enhancement programs have been undertaken to ensure that the water needs of the service area can be met into the future. As part of this endeavor, numerous programs are being undertaken simultaneously to safeguard against the onset of the next dry-year.

From the above supply analysis, it is clear that there are a number of supply sources that are relatively elastic; that is, the amount of supply available from each source is subject to change. Planning for supply reliability is an effort that requires flexibility. The objective is to balance reliability and cost. Initial planning will focus on firming up supplies from relatively low-cost sources of good quality water. Additional supply sources will be added to the mix as needed. For example, if SWP deliveries are reduced, then the plan describes other options, such as; water transfers/banking and other options such as desalination. Reliable supplies to meet the projected (realistic) demand are enhanced by flexible and realistic water management.

A flexible supply strategy has been pursued for the Agency's service area. For example, the proposed long-term CIP is currently funding the purchase of additional SWP supplies as well as evaluating groundwater storage programs both inside and outside the Agency's service area. It also anticipates short-term exchanges from other agencies on an as-needed basis. It is believed that these measures implemented over time provide the Agency's service area assurance that alternative supplies will be available to meet local water demands well into the future.

A. Local Supplies Availability

As shown in Table 2-4, local supplies from local groundwater, surface water, and recycled water sources range from 52,700 to 87,000 acre-feet per year in a dry-year and in a normal/average-year range from 39,200 to 72,000 acre-feet per year.

Table 2-4
Existing and Planned Local Supplies
(acre-feet per year)

Source	Average/Normal year	Dry-year
Groundwater		
Alluvial Aquifer	30,000-40,000	30,000-35,000
Saugus Formation	7,500-15,000	11,000-15,000
Saugus Formation (new wells)*	--	10,000-20,000
Stormwater*	--	--
Recycled Water*	1,700-17,000	1,700-17,000
Total Local Supplies	**39,200-72,000**	**52,700-87,000**

*Planned programs for future implementation.

B. Imported Supplies Availability

As shown in Table 2-5, imported supplies from the SWP, water banking/conjunctive use, water transfers, and desalination range from 74,700 to 109,400 acre-feet per year in wet years up to 148,600 to 193,100 acre-feet per year in dry years. The estimated range for an average/normal year is 64,300 to 109,400 acre-feet per year.

Table 2-5
Existing and Planned Imported Supplies
(acre-feet per year)

Source	Wet Year	Average/Normal Year	Dry-year
SWP Supplies	66,300-95,200	56,800-95,200	37,900-75,800
Water Banking/conjunctive-use*	--	--	105,000
Water Transfers*	6,100–8,700	5,200-8,700	3,500-6,900
Desalination*	2,000-5,000	2,000-5,000	2,000-5,000
Total Imported Supplies	**74,400-108,900**	**67,000-108,900**	**148,400-192,700**

*Planned programs for future implementation.

C. Total Water Supply Availability

The total water supply available to the Agency's service area ranges from 279,700 acre-feet in dry years, to 103,200 acre-feet in normal years.

As shown in Table 2-6, total water supplies available to the Agency's service area could range from 201,100 to 279,700 acre-feet per year in dry years, and from 103,200 to 180,900 in average/normal years.

Table 2-6
Total Existing and Planned Supplies
(acre-feet per year)

Source	Average/Normal Year	Dry-year
Local Supplies		
Groundwater		
Alluvial Aquifer	30,000-40,000	30,000-35,000
Saugus Formation	7,500-15,000	11,000-15,000
Saugus Formation (new wells)*	--	10,000-20,000
Stormwater*	--	--
Recycled Water*	1,700-17,000	1,700-17,000
Imported Supplies		
SWP Supplies	56,800-95,200	37,900-75,800
Water Banking/conjunctive-use*	--	105,000
Water Transfers*	5,200-8,700	3,500-6,900
Desalination*	2,000-5,000	2,000-5,000
Total Supplies	**103,200-180,900**	**201,100-279,700**

*Planned programs for future implementation.

Chapter 3 WATER USE PROVISIONS

Chapter 3.0
WATER USE PROVISIONS

This chapter describes historic/current water usage and the methodology used to project future demands within the Agency's service area. Water usage is divided into sectors such as: residential, industrial, institutional/ governmental, landscape/recreational, agricultural, and other purposes. To undertake this evaluation, existing land-use data, new housing construction information, and population data were compiled for the Agency's service area. This information was then compared to historical trends such as new water service connections and customer water usage information to determine the reasonableness of projected information. In addition, weather and water conservation effects on historical water usage were factored into the evaluation.

3.1 HISTORIC/CURRENT WATER USE

Predicting future water supply needs requires an accurate historic water-use pattern and water usage records. Water management agencies generally make long-term plans based on several independent methods, each with differing assumptions and differing data sources. Each projection method has strengths and weaknesses. Using several methods makes it possible to compare the projections and choose the results that appear to make the most sense considering past experience. There are many ways to project water usage, such as:

?? regional projections of per capita water use estimates

?? extrapolation of historic new service connections

?? econometric approaches using water demand or land-use.

Each approach has advantages and disadvantages, as shown in Table 3-1.

Advantages with the per capita use method are savings in time and expense to produce the forecast. However, the disadvantage associated with this approach is that it often produces forecasts that are not related to economic trends such as major shifts from low- to high-density land/water uses, and local regulatory influence on land-use changes. Another problem with this method is verifying the accuracy of data bases for existing and/or future population projections.

The extrapolation method produces the most accurate method of near-term forecast for future water needs (i.e. 10 to 20 years), but does not account for economic changes over the long-term (i.e. 50 years). In addition, the extrapolation method combines all types of water use; residential, commercial, industrial, into a single quantity.

Land-use estimates statistically relate water usage with explanatory variables such as population, housing trends, employment, income, price, and others. This type of approach produces the most accurate long-term forecasts (i.e. 50 years), but is more costly to develop and does not predict the expected time frame of realizing the projected water usage.

However, when the extrapolation method is combined with the land-use method as a means to estimate when demands will materialize from the land use model, the best of both methods is realized.

To undertake this evaluation, existing land-use data developed by Reiter-Lowry, a consultant to the Agency; new housing construction information published by Meyers Group, California Department of Finance and the Southern California Association of Governments (SCAG); and population data information published by SCAG were compiled for the Agency's service area.

Table 3-1
Water Use Projections

Methodology	Advantages	Disadvantages
Regional Projections Per Capita Projections	?? Takes into account regional (Southern California) aspects such as: housing needs and population.	?? Does not account for local regulatory control over land-use changes. ?? Does not account for economic effects on affordability in sub-regional areas. ?? Does not account for shifts in land-use density. ?? Verification of population counts is not accurate. ?? Small sample sizes decrease accuracy.
Extrapolation Analysis Service Connection Projections	?? Takes into account sub-regional (Agency's service area) aspects such as: historic housing and permitting trends. ?? Water-use and service connections are verifiable.	?? Does not account for regional economic downturn. ?? Does not account for future local regulatory control over land-use changes, assumes existing regulatory influences.
Econometric Analysis Land-use Projections	?? Takes into account land-use and demographic trends. ?? Assigns water use by projected land-use. ?? Accounts for land-use density changes.	?? Does not predict when projected land-use changes will occur in time.

A. Regional Projection Method – Per Capita Water-use Analysis

As discussed above, one method to determine projected water usage is the per capita water use method. This method takes into account regional aspects such as housing needs and overall population migration, but does not account for water usage changes due to density shifts within a

particular area. For Southern California, SCAG is responsible for analyzing economic trends and managing growth throughout the region. As part of its analysis, SCAG develops regional and sub-regional demographics, which include projected housing, jobs, and population migration patterns, and then produces regional growth management plans such as the 1998 Regional Transportation Plan (RTP). Some agencies and utilities use this information provided by SCAG to determine long-term trends. Currently, SCAG has determined the existing and projected demographics for the Agency's service area through 2020.

Population growth projections for the Agency's service area have been made several times by SCAG (Series II projections, and RTP). The first projection accomplished by SCAG was part of the Series II projection published in 1994. As part of this projection, SCAG projected the total population of the Agency's service area would be in excess of 575,000 people by 2020. The second most recent projection accomplished by SCAG was part of the 1998 RTP. As part of this projection, SCAG projected the total population of the Agency's service area would be about 506,000 people by 2020. As evident between these two SCAG projections (four years apart) the projected population for the Agency's service area has been lower by 15 percent. Projected SCAG trends for the Agency's service areas are presented in Table 3-2. As discussed in SCAG's 1998 RTP, to provide for population growth, employment and new households will need to increase within the Agency's service area. According to SCAG's plan, the total number of occupied households in the Agency's service area will increase from 58,526 to 96,262 by 2010, representing an annual increase of about 3,775. In addition, to meet SCAG's projection, by 2020 the number of occupied households in the Agency's service area will increase from 96,262 in 2010 to 149,215 in 2020, reflecting an average annual increase of about 5,300 new households per year.

A significant assumption built into the SCAG projections is the relationship of upper-income to lower-income housing. Recent history indicates that, for the Agency's service area, middle to upper income housing dominates new construction, thereby reducing the number of people who can afford new housing throughout the Agency's service area. By taking into account this change in the housing mix and its effects on the ultimate growth rate of new connections per year, a more realistic growth rate can be determined. Using this more realistic growth rate, the projected population is projected to be approximately 330,000 to 350,000 people by 2020. Taking this approach, which is less speculative than many other approaches, reduces the potential for planning that would result in an "over supply" of water, which some believe might "encourage" additional development. Instead, the planning framework is focused on meeting what the Plan finds is a realistic needs projection. If there is evidence that regional growth is actually proceeding at a faster rate, that would trigger the preparation of appropriate changes in the Plan to respond to the new information.

Table 3-2
Employment, Population and Housing Projections

	California Department of Finance		Southern California Association of Governments (SCAG)				
	1990	1994	2000	2005	2010	2015	2020
Employment	45,122	53,334	71,422	85,102	102,459	124,268	145,646
Population	110,642	162,436	226,346	288,020	353,733	423,696	506,063
Households	38,474	51,853	58,526	73,164	96,262	124,229	149,214

B. Extrapolation Method – Service Connections Analysis

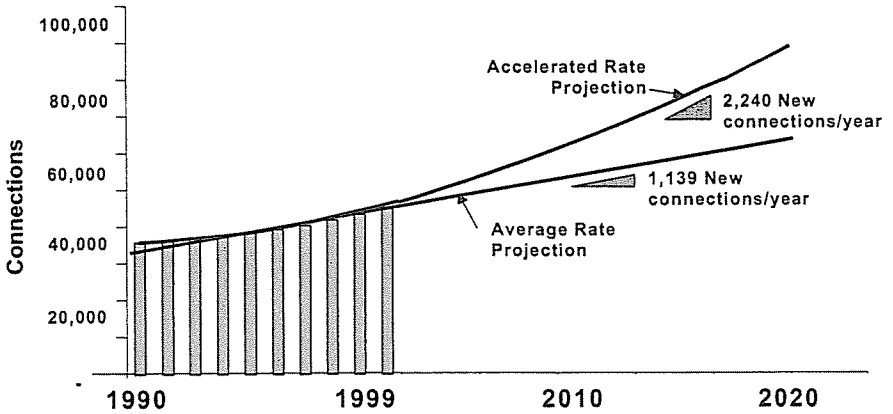
The second method undertaken to evaluate water usage is the extrapolation of service connections throughout the Agency's service area. As discussed above, this method takes into account sub-regional aspects such as housing trends and local influences on housing starts and permitting, but does not account for economic changes such as downturns in the economy. To determine the total historic water usage and water usage per service connection (extrapolation method), information was collected from the Agency's four purveyors: Valencia Water Company, Santa Clarita Water Company, Newhall County Water District, and Los Angeles County Waterworks District #36, Table 3-3. As shown in Table 3-3, the total number of new service connections have increased from 39,299 in 1990 to 49,550 in 1999. This increase in the number of service connections represents slightly more than 500 per year in 1991, to a maximum of 2,028 during 1999, representing an average annual increase of 1,139 per year.

Table 3-3
Historical
Service Connections

	1990	1992	1994	1996	1998	1999
Valencia	14,272	14,854	15,703	17,420	19,863	20,865
Newhall	5,854	6,144	6,294	6,477	6,585	6,758
Santa Clarita	18,550	19,000	19,400	19,650	20,300	21,100
LA County #36	623	736	752	768	774	827
Total	**39,299**	**40,734**	**42,149**	**44,315**	**47,522**	**49,550**

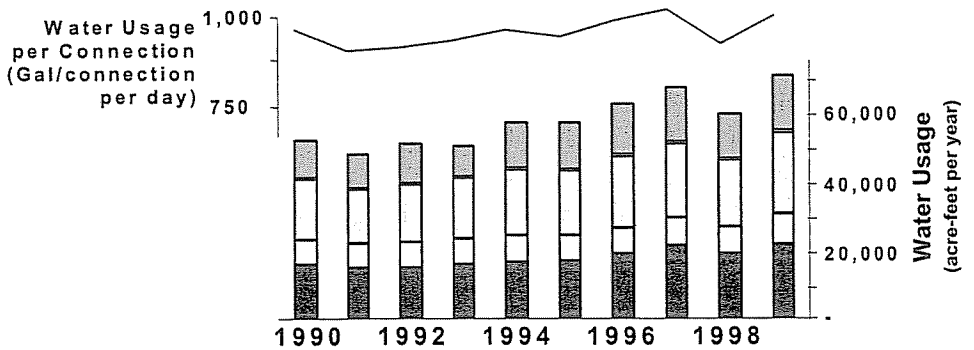
To determine the future number of service connections within the Agency's service area, two different projection techniques were undertaken. Using the simplified (average rate) regression technique, the number of connections is projected to be about 70,000 in 2020. Under the second technique (accelerated rate projection), the number of service connection is projected to be about 96,000 by the year 2020, Figure 3-1.

Figure 3-1
Historical and Projected
Number of Service Connection



As shown on Figure 3-2, the total water demand during that same period (1990 through 1999), increased from 54,350 acre-feet per year to 74,400 acre-feet per year for the Agency's service area. The graph at the top of Figure 3-2 indicates that the water usage varied between 900 gallons per day per connection to 1,030 gallons per day per connection.

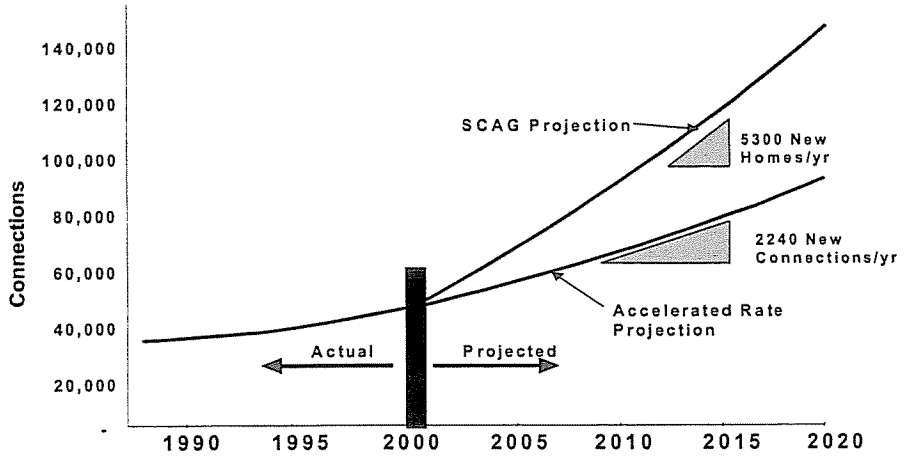
Figure 3-2
Historical Water Usage for each Water Per Year



C. Comparison of SCAG Data and Extrapolation Projection

Occupied households or new service connections are crucial indicators of growth for urban areas. For growth to occur, jobs will need to be created and homes need to be constructed. Historically, as shown in Table 3-2 above, SCAG predicted that the number of occupied households in the Agency's service area would increase from 38,474 to 58,526 in the 1990s, representing an average annual increase of 2,240 per year. However, Table 3-3 shows that, during that same period, the number of new service connections had increased from 39,299 to 49,550 representing an average increase of 1,139.

Figure 3-3
Comparison of SCAG vs. Projected Historical Data



Projecting the SCAG data into the future, according to SCAG's 1998 Regional Transportation Plan, the total number of occupied households in the Agency's service area are projected to increase from 58,526 to 96,262 in 2010, representing an annual increase of about 3,775 new households per year. By 2020, the number of occupied households in the Agency's service area, according to SCAG, will increase from 96,262 in 2010 to 149,215 in 2020, reflecting an average annual increase of about 5,300 new households per year. However, using the extrapolation method (Figure 3-1), recognizing that the extrapolation method includes household as well as other types of connections, the number of new connections will increase from 49,550 in 1999 to 96,000 in 2020. This represents an annualized average increase of about 2,240 new connections.

A comparison of the data prepared by SCAG with historical trends indicates that the number of households are going to dramatically increase. According to SCAG information, from 1999 to 2010, the Agency's service area will realize an average annual increase of 3,725 new households per year representing a 170 percent increase over historical trends. In addition, by 2020, according to SGAG data, the Agency's service area will realize an average annual increase of 5,300 new households, representing an annual increase of 240 percent. As stated above (Table 3-1), and due to the projections provided by SCAG, which are different from actual historical experience (Figure 3-3), it has been determined that the extrapolation method (accelerated rate projection technique) approximately represents the projected growth of the Agency's service area.

D. Econometric Method – Land-use Analysis

Another way of determining the water usage for the Agency's service area is by undertaking an econometric analysis. This method, which has been used by the Agency in the past, evaluates projected land-use and demographic trends within its service area. As part of this analysis, Reiter-Lowery Consultants was commissioned to undertake an evaluation of: 1) existing land-uses and 2) projected land-uses, taking into account land-use plans prepared by the Los Angeles County Department of Regional Planning, the City of Santa Clarita, and the County of Ventura.

Presented in Table 3-4 is a summary of the 245 land-use classifications monitored for the Agency's service area by Reiter-Lowry.

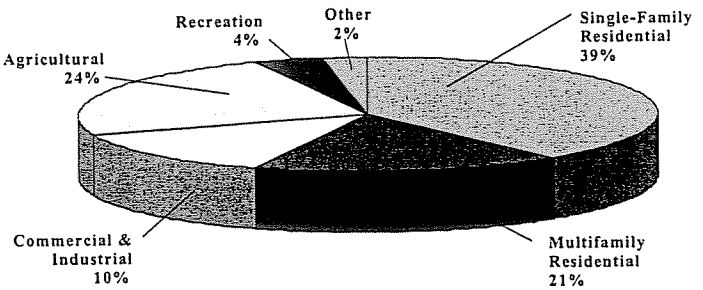
Table 3-4
Historical Land-Use Acres
& Water Usage Factors

Urban	1999[6] Acres	Water Usage Factors: Land-Use Usage (acre-feet/acre)		Water Usage Factors: Connection Usage (gallons/connection per day)	
Residential					
Low Density Residential	15,585	1.84	2.3[(7)]	665	650[(7)]
Medium Density Residential	888	2.08		645	
High Density Residential[1]	2,859	3.60		605	
Commercial	1,152	2.27		NA	
Industrial	3,374	1.46		NA	
Recreational	1,071	3.35		NA	
Miscellaneous Urban Land-Use	8,156	0.14		NA	
Melded Urban		**1.70**		**980**	
Vacant & Open Space[2]	50,668	**[4]		**[5]	
Irrigated Agricultural[3]	41,048	**1.60**		**[5]	

[1] Includes Mixed-Use Designation
[2] Includes 8,468 acres located in Ventura County.
[3] Includes government owned, vacant property, pasture and rangeland.
[4] Varies from .01 to .2 acft/ac.
[5] Usage based on acft/ac analysis.
[6] Reference: Reiter-Lowery
[7] Weighted average water usage factor for residential.

Typically, water usage consists of residential, commercial, industrial, recreational, agricultural, public infrastructure, and other purposes, which include environmental, fire fighting, line cleaning, and system losses. Presently, the largest sector water use in the Agency's service area is residential, accounting for approximately 60 percent of the total, with commercial/industrial and community landscaping making up 10 percent of the total, and agricultural accounting for 24 percent, Figure 3-4.

Figure 3-4
Water Use
Castaic Lake Water Agency's Service Area



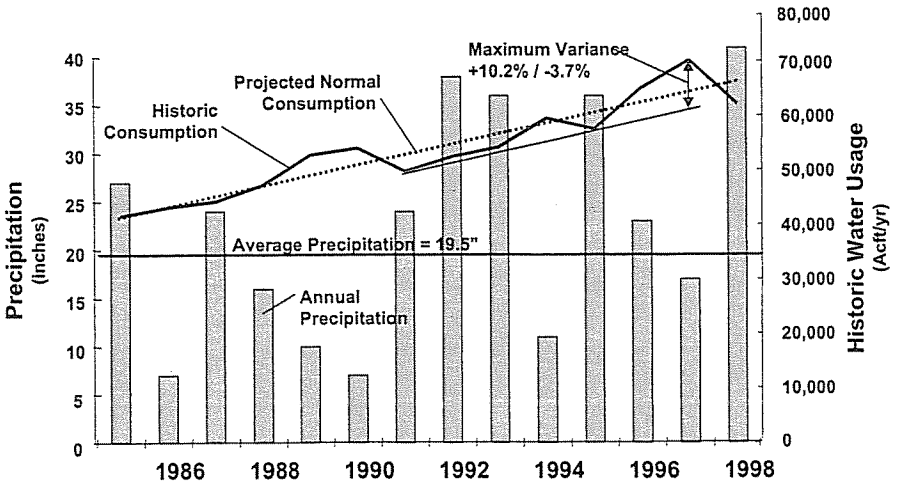
3.2 OTHER FACTORS AFFECTING WATER USAGE

Two major factors that affect water usage are weather and water conservation. Historically, when the weather is hot and dry, water usage increases. The amount of increase varies according to the number of consecutive years of hot dry weather and the conservation activities imposed. During cool-wet years, historical water usage has decreased to reflect less water usage for external landscaping. Water conservation measures employed within the Agency's service area have a direct long-term effect on water usage. Both of these factors are discussed below in detail.

A. Weather Effects on Historical Water Usage

Historically, about 605 to 1,110 gallons of water is consumed daily for urban uses for every household in the Agency's service area. Most of this range in per capita water-use is due to yearly weather variations. As presented on Figure 3-5, the historical water use from 1985 to 1998 fluctuated significantly, depending on weather, with the maximum variance around the projected normal of +10.2 percent in hot-dry-years, to -3.7 percent in cool-wet-years.

Figure 3-5
Weather Effects on Water Usage



B. Conservation Effects on Water Usage

In recent years, water conservation has become an increasingly important factor in water supply planning in California. The California plumbing code has instituted requirements for new construction that mandate the installation of ultra low-flow toilets and low-flow showerheads. The Agency has developed water conservation measures that include public information and education programs and the implementation of water efficient operations and maintenance practices. In addition, the Agency has provided financial incentives to developers for good water management practices.

During the 1987-1992 drought period, overall water requirements due to the effects of hot, dry weather were projected to increase by approximately 10 percent. As a result of extraordinary conservation measures enacted during the period, the overall water requirement actually decreased by approximately 20 percent.

Residential, commercial, and industrial usage can be expected to decrease through the implementation of future water conservation practices in the Agency's service area (see Chapter 5). Depending on the aggressiveness of the program, it is assumed that water conservation will decrease water usage by at least 10 percent.

3.3 PROJECTED WATER USAGE

Verification of Water Usage Factors. In order to verify the reasonableness of calculated water usage factors, two separate analyses were undertaken: (1) an extensive sampling of the Agency's service area and (2) verification of water usage per service connection. Sampling evaluated the historic water usage on a per monthly basis for over 1,000 individual households throughout the Agency's service area, taking into account seasonal fluctuations, lot size, household size, and number of dwellings per acre. As a result of this analysis, it was determined that the actual (sample data) average residential water usage factor (melded high, medium, and low densities) is 2.38 acre-foot per acre vs. the calculated average residential water usage factor (melded high, medium, and low densities) of 2.3 acre-foot per acre (see Table 3-4). Taking into account weather effects, it was determined that the water usage factors presented in Table 3-4 reasonably represent the historical water usage throughout the Agency's service area.

The second verification analysis evaluated historic water usage per service connection for the Agency's service area. This analysis evaluated the historic water usage on an annual basis for each service connection within the Agency's service area. As a result of this analysis, it was determined that the average urban water usage factor (residential, commercial/industrial, recreational and other) ranged from 890 to 1,060 gallons per connection per day, depending on the effects of weather, from 1990 to 1999, with an average of 970 gallons per connection per day vs. the average urban water usage factor of 980 gallons per connection per day. Again, taking into account weather effects, it was determined that the water usage factors presented in Table 3-4 reasonably represent the historical water usage throughout the Agency's service area.

Future Water Usage Requirements. As discussed above, the extrapolation method takes into account the effect of local regulatory influence, permitting process, and land-use zoning changes on development trends. As a result, it can be expected that the number of connections will increase from 49,550 to 96,000 (see Table 3-3 and Figure 3-1). During the 1990s, based upon water use sales and records, it was verified that a typical average municipal/industrial connection used an average of 980 gallons per connection per day. Since the extrapolation projection along with the land use method is believed to be the most accurate, and shows both the amount and timing of water use, that methodology was chosen to forecast future demands.

The following are the projected water uses:

?? Agricultural water usage is expected to decrease from the 17,800 acre-feet per year observed in 1999 to about 7,100 acre-feet per year by 2020.

?? Projected total water usage, under the extrapolation analysis method will increase from the current 74,400 acre-feet per year observed in 1999 to about 102,500 acre-feet per year by 2020, Table 3-5, Figure 3-6 (including conservation).

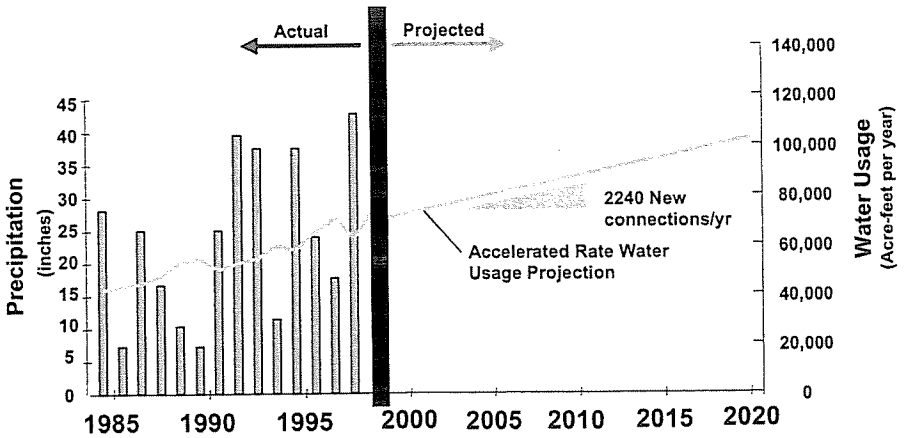
?? Thus, taking into account weather effects (dry vs. wet), it has been determined that the projected water usage for the Agency's service area could vary from 98,700 to 113,000 acre-feet per year in the year 2020.

Table 3-5
Projected Normal/Average Year Water Usage
(acre-feet per year)

	2005	2010	2015	2020
Urban				
Residential				
Low Density	32,500	35,400	39,300	41,000
Medium to High Density	18,200	24,400	32,300	42,100
Commercial	3,100	3,500	4,000	4,500
Industrial	5,100	5,700	6,400	7,100
Recreational	3,600	3,800	4,200	4,500
Institutional	3,100	3,400	3,600	3,900
Miscellaneous urban water use	1,000	1,500	2,100	2,900
Subtotal urban water usage	66,600	77,700	90,900	106,000
Irrigated Agricultural	15,100	12,400	9,800	7,100
Increase Conservation Savings	6,600	7,700	9,100	10,600
Total Projected Water Usage	**75,100**	**82,400**	**91,600**	**102,500**

As part of the econometric method, a future water usage requirements was evaluated for the near-term "planned development," as determined by the Los Angeles County Department of Regional Planning through with its Development Management System (DMS), total water usage within the Agency's service area is expected to reach 87,000 acre-feet per year in approximately 10 to 12 years.

Figure 3-6
Historic and Projected Water Usage



Chapter 4 RELIABILITY PLANNING

Chapter 4.0
RELIABILITY PLANNING

The Urban Water Management Planning Act requires urban water suppliers to assess water supply reliability that compares the total projected water use with the expected water supply over the next 20 years in 5-year increments. The Act also requires an assessment for a single dry water year and multiple dry water years. This chapter presents the reliability assessment for the Agency's service area.

4.1 RELIABILITY

To help meet the projected usage within its service area, the Agency and the local water purveyors have an entitlement of 95,200 acre-feet per year of SWP water, in addition to the local supplies. The variability of SWP deliveries affects the ability of the agencies to meet the overall water supply reliability for the service area. As discussed in Chapter 2, State Water Project (SWP) supplies are subject to reduction when statewide droughts occur. To improve water supply reliability, numerous programs could be undertaken involving local resources, such as: groundwater storage, local surface flows, and recycled water; plus imported resources such as: groundwater banking/conjunctive use, groundwater transfers, and desalination.

A. Reliability Criteria

Reliability criteria define the maximum acceptable level of supply shortage the agency is willing to sustain during a drought. For this study, a reliability criterion has been used to evaluate water supply plans. This criterion requires water supply to be sufficient to meet projected demands 90 percent of the time, or in 18 of 20 years. In the remaining 10 percent of the time, it is assumed that the maximum allowable supply shortage will be 10 percent of demand. This level is chosen because a 10 percent water demand reduction was readily attained in the Agency's service area by voluntary conservation and thus was shown to be feasible during a drought based on actual past experience in the area. When a shortage occurs, water customers typically increase their awareness of water usage and voluntarily reduce water demands, avoiding water rationing.

4.2 PLAN TO ASSURE RELIABLE WATER SUPPLY

As part of the Agency's long-term Capital Improvement Program, funding has been established to provide for the future purchase of additional supplies, implementation of recycled water programs, and enhancement of groundwater banking/conjunctive-use programs both inside and outside the Agency's service area. Implemented over time, these measures are expected to provide the Agency the assurance that there will be sufficient supplies to meet water demands. (Additional information concerning water supply sources, issues, and future potential programs is described more fully in Chapter 2.)

4.3 RELIABILITY COMPARISON

In order to determine the water supply reliability of the Agency's service area--that is, a comparison of existing potential supplies and projected demands--three different types of

comparisons were undertaken: (1) normal; (2) single dry-year; and (3) multi dry-year. As part of this analysis, an operational plan was developed for all water sources, given water resource information provided in Chapter 2. This section addresses the manner in which these resources will be managed operationally. This operational plan attempted to establish conservative assumptions concerning water supplies. These assumed water supplies do not reflect the capabilities of these water sources as discussed in Chapter 2.

A. Average/Normal Water Year Assessment

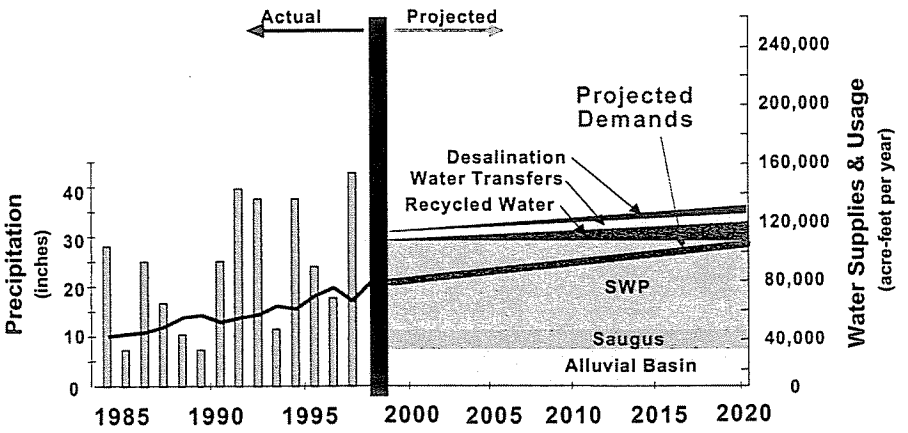
Table 4-1 and Figure 4-1 show the average/normal year assessment, summarizing the total water demands for the Agency through the year 2020 along with the supplies to meet demands. *If projected imported and local supplies are developed as indicated, no shortages are anticipated within the Agency's service area in an average year through 2020.*

Table 4-1
Operational Plan
Average/Normal Water Year
Supply and Demand Assessment
(acre-feet per year)

	Year 2005	Year 2010	Year 2015	Year 2020
Existing Water Supply Programs				
Local Supplies				
Saugus Formation	11,000	11,000	11,000	11,000
Alluvial Basin	35,000	35,000	35,000	35,000
Imported Supplies				
SWP Entitlement (95,200 afy)	56,800	56,800	56,800	56,800
Total Existing Supplies	102,800	102,800	102,800	102,800
Planned Water Supply Programs				
Local Supplies				
Stormwater[1]	-	-	-	-
Water Recycling	5,000	9,000	14,000	17,000
Imported Suppliers				
Water Transfers	5,200	5,200	5,200	5,200
Water Banking/conjunction-use [2]	-	-	-	-
Kern Water Bank/Transfer	-	-	-	-
Semitropic Water Bank/Transfer	-	-	-	-
Kern Delta Water Bank	-	-	-	-
North Las Posas Water Bank/Exchange	-	-	-	-
Saugus (ASR)				
Desalination	2,000	3,000	4,000	5,000
Total Supplies	115,000	120,000	126,000	130,000
Total Estimated Demands	75,100	82,400	91,600	102,500
Difference surplus/(deficit)	**39,900**	**37,600**	**34,400**	**27,500**

(1) Pending modification of current agreements.
(2) Programs to be implemented in dry years.

Figure 4-1
Projected Average/Normal-Year
Water Supplies & Demands



B. Single Dry-Year Water Assessment

The Act requires an estimate of the minimum water supply available during single- and multi-dry-year conditions.

The dry-year assessment, shown in Table 4-2, includes water requirements and supplies during both conditions. To determine the projected water requirement, as discussed in Chapter 3, studies have shown that hot-dry weather may generate a 10 percent increase above normal, in both urban and agricultural water usage. This percentage was used to generate the dry-year demands shown in Table 4-2. Although conservation efforts yielded approximately a 20 percent decrease in demands during the last drought, it was assumed that only a 10 percent decrease will be realized in the future, as discussed in Chapter 3. Therefore, no extraordinary conservation measures, beyond BMP implementation, are reflected in the demand projections.

Consequently, the estimated dry-year demands and projected supplies for 2010 were analyzed for the single dry-year analysis. This year was selected in order to show the results of local and imported water supply development over the next 10 years. *If projected imported and local supplies are developed as indicated, no shortages are anticipated within the Agency's service area for the dry-year scenarios analyzed.*

Table 4-2
Operational Plan
Dry-Year and Multi-Dry-Year
Water Supply and Demand Assessment
(acre-feet per year)

	Single Dry-year Year (2010)	Multiple Dry Years		
		Year 1 (2001)	Year 2 (2002)	Year 3 (2003)
Existing Water Supply Programs				
Local Supplies				
Saugus Formation	13,000	13,000	13,000	13,000
Alluvial Basin	32,500	32,500	32,500	32,500
Imported Supplies				
SWP Entitlement	37,900	37,900	37,900	37,900
Total Existing Supplies	83,400	83,400	83,400	83,400
Planned Water Supply Programs				
Local Supplies				
Stormwater	-	-	-	-
Water Recycling	9,000	-	3,000	3,000
Saugus (New Wells)	20,000	-	10,000	15,000
Imported Supplies				
Water Transfers	3,500	3,500	3,500	3,500
Water Banking/conjunctive-use[1]				
Kern Water Bank/Transfer[2]	25,000	10,000	10,000	10,000
Semitropic Water Bank/Transfer[2]	30,000	8,000	16,000	-
Kern Delta Water Bank	40,000	-	-	-
North Las Posas Water Bank/Exchange	10,000	-	-	-
Saugus (ASR)	-	-	-	-
Desalination	3,000	-	-	3,000
Total Supplies	223,900	104,900	125,900	117,900
Total Estimated Demands	90,900	77,300	78,500	79,900
Difference surplus/(deficit)	**133,000**	**27,600**	**47,400**	**38,000**

(1) Assumes conservative build up of groundwater conjunctive use.

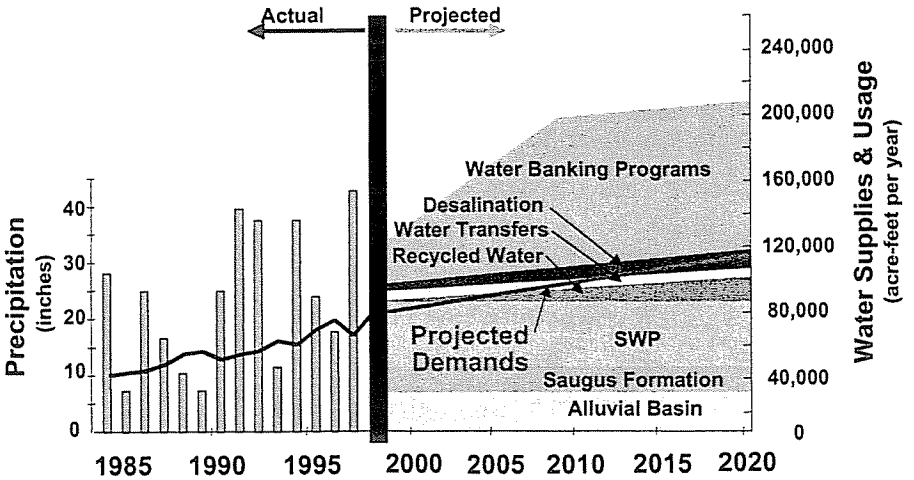
(2) Assumes acquisition of water from others already in storage and available for purchase.

C. Multi Dry-Year Water Assessment

In addition, the Act requires an estimate of the minimum water supply available during each of the next three water years, 2001, 2002, and 2003. The surface and groundwater supplies shown in Table 4-2 are reflective of supplies available during the 1987-92 drought years, and in particular, 1990, 1991, and 1992. The supplies available from recycling projects are assumed to experience no reduction in a dry-year but are also assumed not to be fully on-line at this early stage along with desalination. If projected imported and local supplies are developed as

indicated, no shortages are anticipated within the Agency's service area in the dry-year scenarios analyzed (Figure 4-2).

Figure 4-2
Projected Dry-Year
Water Supplies & Demands



Chapter 5 WATER DEMAND MANAGEMENT MEASURES

Chapter 5.0
WATER DEMAND MANAGEMENT MEASURES

5.1 WATER DEMAND MANAGEMENT MEASURES AND BEST MANAGEMENT PRACTICES

Establishing goals and choosing water conservation measures is a continuing planning process. Goals are developed, adopted, and then evaluated periodically. Specific conservation measures are phased in and then evaluated for their effectiveness, achievement of desired results, and customer satisfaction. Water conservation can achieve a number of goals such as:

- ?? Meeting legal mandates
- ?? Reducing average annual potable water demands
- ?? Reducing sewer flows
- ?? Reducing demands during peak seasons
- ?? Meeting drought restrictions

Fourteen Water Demand Management Measures (DMMs) are specified in the latest revision of the Urban Water Management Planning Act. The Act was revised in 2000 to allow the DMMs to correspond with the 14 Urban BMPs.

The California Urban Water Conservation Council (CUWCC) was formed in 1991 through the "Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California." The urban water conservation BMPs included in the MOU are intended to reduce California's long-term urban water demands. The BMPs are currently implemented by the signatories to the MOU on a voluntary basis. However, the CalFed Bay-Delta Program has included mandatory implementation of the BMPs and certification of water use efficiency programs in its final Environmental Impact Statement/Report and Record of Decision. This certification requirement would take effect by December 2002 and would apply to any agency subject to the Urban Water Management Planning Act that is located in the CalFed solution area.

The local water agencies are not currently signatories to the Urban MOU and are therefore not members of the CUWCC. While not required to implement the BMPs, local agencies have voluntarily complied with many of them, as discussed in this chapter. As a recommendation of this Plan, the water agencies will sign the MOU and implement all cost-effective BMPs.

5.2 IMPLEMENTATION LEVELS OF DMM's/BMP's

The CUWCC is composed of approximately 150 urban water suppliers and 20 environmental organizations. It has spent much of the ten years it has been in existence determining the methodology by which savings from various water conservation measures (BMPs) can be quantified. The CUWCC recently published a "BMP Cost and Savings Study," which assigns the water savings that can be ascribed to specific devices and activities. The study was complied by consultants with extensive expertise in all aspects of water conservation economics and technology, and was overseen by a committee of statewide water supplier and environmental organization representatives (Agency staff served on this committee).

The BMP Cost and Savings Study recognizes two categories of BMPs: device-based and activity-based. Device-based BMPs, such as showerhead and toilet replacement programs, are intended to alter water use patterns via the actual installation of water-saving appliances. Activity-based BPMs, such as residential water use surveys, school education programs and public information, are intended to modify social behaviors to encourage people to save water. The savings from device-based BMPs can be directly qualified and attributed, whereas savings from activity-based BMP are usually not possible to quantify. Device-based BMPs, when the Agency and the purveyors begin large-scale implementation, will result in quantifiable water savings for the Santa Clarita Valley.

The Agency as been implementing the following BMPs (which pertain to wholesalers) for the past several years:

BMP 3	System Water Audits, Leak Detection and Repair
BMP 7	Public Information
BMP 8	School Education
BMP 10	Wholesale Agency Assistance
BMP 11	Conservation Pricing
BMP 12	Conservation Coordinator

DMM 1: Water Survey Programs for Single-family Residential and Multi-family Residential Customers:

Implementation Description: Retail agencies are required to develop a strategy for targeting and marketing water use surveys to single-family and multi-family residential customers.

Implementation Schedule: As a recommendation of this plan, the local water agencies will sign the urban MOU and implement this BMP according to its schedule. The member agencies will continue to implement this DMM at current levels until that time.

Methods to Evaluate Effectiveness: Numbers of water savings devices assessed from surveys will be utilized in making savings assumptions

Conservation Savings: Savings levels are assumed per the terms of the urban MOU for each device.

DMM 2: Residential Plumbing Retrofit

Implementation Description: Agencies are required to identify residences constructed before 1992 and develop a direct-distribution, targeting and marketing strategy for water saving plumbing devices, including showerheads, toilet displacement devices and toilet flappers, and faucet aerators, as practical. The water agencies participate in the distribution of water savers for showerheads, toilet displacement bags, toilet leak detection tablets, as well as information on water saving techniques. Water conservation kits are available in the office lobby of Valencia Water Company, and kits are also distributed through the mail upon customer request.

Implementation Schedule: As a recommendation of this plan, the Agency and the retailers will sign the urban MOU and implement this BMP according to its schedule. The member agencies will continue to implement this DMM at current levels until that time.

Methods to Evaluate Effectiveness: A database of the numbers of devices distributed will be maintained.

Conservation Savings: Savings levels are assumed per the terms of the urban MOU for each device.

DMM 3: System Water Audits, Leak Detection, and Repair

Implementation Description: The water agencies conduct leak detection and repairs of their water distribution systems, if unaccounted-for losses are 10 percent or greater. The agencies also have a program of calibrating their water meters and exercising valves.

Implementation Schedule: The Agency monitors all flows into and out of its distribution system. Inflows consist of two treatment plant effluent streams, and outflows consist of retail turnouts. Each of these sites is equipped with a flow meter that registers instantaneous flow rate and totalizes flow. Each month, each of these meters is read, and the field readings are entered into a computer database. The percentage of outflows (metered sales) versus treatment plant inflows (supply) is calculated each month. Over the past two years, monthly "losses" calculated in this fashion have averaged less than 3 percent, and have never exceeded 6 percent. Individual purveyors also have leak detection and repair programs on their side of metered connections.

Methods to Evaluate Effectiveness: The agencies annually review the data records to confirm that unaccounted-for water losses stay under the required 10 percent.

DMM 4: Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

Implementation Description: Agencies are required to place water meters on all new service connections per California state law. The DMM also requires retrofitting of existing unmetered connections, and charging a commodity rate for water.

Implementation Schedule: The agencies have incorporated this DMM into their operations and maintenance procedures.

Methods to Evaluate Effectiveness: Agencies utilize customer water bills to analyze water use consumption patterns.

DMM 5: Large Landscape Conservation Programs and Incentives

Implementation Description: The DMM requires agencies to contact non-residential customers with large landscape areas and offer water use surveys. For those customers with dedicated irrigation meters, agencies must assign ET-based water use budgets.

Implementation Schedule: Agencies are currently implementing portions of this DMM/BMP. As a recommendation of this plan, CLWA and the purveyors will sign the urban MOU and implement this BMP according to its schedule.

Methods to Evaluate Effectiveness: Surveys, landscape information training, water bill historical water use and other programs will assess effectiveness.

DMM 6: High-Efficiency Washing Machine Rebate Programs

Implementation Description: The DMM requires agencies to offer customer rebates for the purchase of high-efficiency (horizontal-axis) clothes washers, if local energy providers or wastewater utilities also offer rebates.

Implementation Schedule: Neither local energy providers nor wastewater utilities currently offer rebates, and thus the agencies are exempt from implementation.

DMM 7: Public Information Programs

The following program is administered by the Agency on behalf of, and supported by, the retail water purveyors. Public information programs are an important element of the water agencies overall water plan to meet future water demands.

Implementation Description: The water agencies implement a public information program to promote water conservation and other resource efficiencies. The agencies distribute public information through bill inserts, brochures, community speakers, paid advertising, and special events every year.

Implementation Schedule: The agencies will continue to provide public information services and materials to remind the public about water conservation and other resource issues.

Methods to Evaluate Effectiveness: The water agencies will track public response regarding the information provided.

Conservation Savings: There is no method to quantify the savings of this DMM. It appears clear that this program is in the public interest.

Specific programs are discussed below.

Water Conservatory Garden and Learning Center

> Approximately 100 people per week visit the Agency's Conservatory Garden and Learning Center to learn more about water-wise landscaping. The seven-acre garden in the heart of Santa Clarita Valley features educational signage and hundreds of varieties of plants that are best suited for the extreme climate of the valley. The Agency has developed a touch screen computer kiosk that contains detailed information on plant material, which can be printed out for interested users. This allows the public to not only see plant material growing in typical Santa Clarita Valley conditions, but allows them to carry out pertinent information about the species that interest them. The Conservatory Garden Docent Program provides an

opportunity for community volunteers to become involved in the maintenance and public possession of the garden. Docents are in the garden most days during business hours and during special events. In 1999, local residents and community groups contributed a total of 2,661 volunteer docent hours.

Adult Landscape Education Program

A total of 564 adults participated in the 2000 Landscape Education Program, which offered 11 monthly workshops on different aspects of water-wise landscaping. The workshops are held each year from January through November at the Conservatory Garden and Learning Center. Topics include Irrigation Basics, Soils and Landscaping Design.

Speaker's Bureau

As another public service to the community, Agency directors and staff serve as speakers at local events and civic organization meetings. Since the program's inception in November 1997, over 300 people have attended the Speaker's Bureau presentations on topics including: the Conservatory Garden and Learning Center, the History of Water in California and Santa Clarita Valley, the State Water Project and Agency Facilities, Water Quality, and the Elementary Education Program. Each presentation begins and ends with a discussion of the value of water in our State and in our Southern California desert region.

Public Information - Print and Broadcast Media, Direct Mail, and the Internet

The Agency disseminates water conservation information in many of its public materials and notifications:

Newspapers/Magazines/Directories: Press releases and advertisements promoting water conservation and Agency programs are submitted and appear throughout the year in the local press (The Signal and the Daily News), the Magazine of Santa Clarita, and the Santa Clarita Valley Chamber Business Directory.

Agency Newsletter, "Water Currents": A newsletter was mailed in the same envelope with the Water Quality Report (for 1999). The message on the front of the envelope was "Use Water Wisely. Every Drop Counts." A subsequent envelope was printed with the message "Summer is Here. Use Water Wisely." Quarterly newsletters have featured a column called "Use Your Fair Share," which offers practical ideas that people can do to save water. A feature of Water Currents has been a column called "Talking Purely About Water," which provides information on how people can preserve water resources.

Brochures: Throughout the year, the Agency distributes a series of brochures entitled, "The Value of Water," "Castaic Lake Water Agency," "The Conservatory Garden and Learning Center," and the "CLWA Speakers Bureau." The "Value of Water" brochures show tables and graphs of how much water is used for agriculture, business, the environment, and residential purposes. The other full-color brochures in the series stress the importance of wise water use.

Bill Stuffers: The Agency and its retailers conducted a bill-stuffer campaign for distribution featuring pre-printed American Water Works Association stuffers. Additionally, Valencia Water Company's monthly bills include brief messages promoting conservation, such as "Use Water Wisely." This program has been very effective because it reaches a large percentage of customers, and because customers are reminded, on a monthly basis, about their usage and about the importance of conservation.

Internet: The Agency web site http://www/clwa/org presents extensive up-to-date information on many aspects of the Agency, its activities, and its facilities. The web site features a variety of high resolution, color photos that the browsers can select for viewing. Since its inception, the web site has received over 17,400 hits.

Direct Mail: Approximately, 50,000 Water Quality Reports (for 1999) were mailed to businesses and residences in accordance with State and Federal laws. The Agency and its retail purveyors used the eight-page report to feature a series of main headline statements on water conservation and preservation. One page of the report was devoted to water conservation tips and information. On the back cover of the report was a popular multiple-choice "Water IQ" test.

Public Tours of Rio Vista Water Treatment Plant

To help people better understand and appreciate the treatment and transmission of imported SWP water, public tours of the Rio Vista Plant are provided every Thursday and on the third Saturday of each month at 1:00 p.m. A total of 702 people toured the plant in 1999.

Public Events and Activities

To help people better understand and appreciate the water resources of the State of California, the Agency conducted two SWP tours, a Water Issues Committee Program, a Los Angeles County Public Library Program, and a California Water Awareness Month Open House. The Agency also participated as an exhibitor in the Santa Clarita Valley Chamber of Commerce Business Mixer, and in the City of Santa Clarita 's River Rally. The Agency also participated in the October 2000 Business Expo, which was attended by approximately 13,000 to 15,000 people. Thousands of individuals participated in the other Agency and community public events.

California Water Awareness Campaign

About 500 guests attended the Agency's annual Open House, which celebrates California Water Awareness Month in May of each year. At the Open House, participants were asked to provide a water saving tip to share with others; the tips are printed in subsequent newsletters.

Civic/Private Special Events

In 2000, the public facilities of the Agency were used by dozens of community clubs and organizations for meetings and receptions. The Agency administrative building and its

adjacent Conservatory Gardens were also used for a variety of private celebrations throughout the year.

The objective in opening its doors for the public was to provide widespread exposure to the practice of water-wise landscaping and the basic practices of water treatment and transmission. A total of 2,719 guests attended civic and private special events held at the Agency. It is believed that the vast majority of these individuals would not have visited the water treatment plant and conservation garden otherwise. Many of the special events also raised money for non-profit service organizations in the community.

Water Conservation Giveaway Items

Thousands of water conservation items were distributed at the public events and activities described above. Some of the items were:

?? Notepads - printed with headlines "Water is Precious. Use Water Wisely."
?? Toothbrushes - imprinted with the headline "Save Water. Turn Off Your Tap."
?? Magnets - imprinted with public visiting hours for the Garden and the Rio Vista tours.
?? Water Bottles - imprinted with "It's Cool to be Water-Wise."
?? Tote Bags - imprinted with "Help Conserve and Preserve All Natural Resources."
?? Poppy Seeds - with text on planting this drought-resistant California State Flower.
?? Rio Vista Bottles - thousands of bottles of water treated at Rio Vista were distributed to help local residents understand that their tap water is safe to drink.

Theater On-Screen Advertising

In 1998 a theater on-screen advertising campaign by the Agency was conducted on 24 movie screens in two theaters in the Valley. The Disney Productions feature film "Mighty Joe Young," was filmed at the Conservatory Garden. While this hit movie was appearing in local theaters, water conservation messages presented by the Agency appeared prior to the movies.

Stevenson Ranch Family Festival

Valencia Water Company has participated in the Stevenson Ranch Family Festival for the last two years. Stevenson Ranch is one of the communities within Valencia's service area. At the festival, the Company has a booth where representatives answer questions from the public and distribute information on conservation and water savings techniques.

City of Santa Clarita Emergency Preparedness Expo

Valencia Water Company also participates in the City of Santa Clarita Emergency Preparedness Expo which is a City-sponsored event featuring local businesses providing services and information related to emergency preparedness. At this event, the Company has a booth where representatives answer questions from the public and distribute information on conversation and water saving techniques.

Water Conservation Awards

In 1998, the Agency was awarded the Association of California Water Agencies (ACWA) Theodore Roosevelt Environmental Award. It was also one of the three finalists in the Claire A. Hill Award for Excellence; and received three of nine first place awards in the ACWA Water Management Awareness Program. In 1998, the Agency received certification in the ACWA Water Management Program and was honored for its achievement at the ACWA Fall Conference.

DMM 8: School Education

The following program is administered by the Agency on behalf of, and supported by, the retail water purveyors. School education programs are an important element of the Agency and the purveyors' overall water plan to meet future water demands

Implementation Description: The member agencies work with local schools to promote water conservation and other resource efficiencies at school facilities and to educate students about these issues. Valencia Water Company has participated in the local Adopt-a-School program since 1998. In this program, a Valencia representative visits local elementary schools and teaches students about water conservation and water savings techniques. Water education materials are also distributed.

Implementation Schedule: Agencies will continue to implement this DMM.

Methods to Evaluate Effectiveness: The water agencies will track response, particularly from teachers, regarding the information provided.

Conservation Savings: There is no method to quantify the savings of this DMM, but it is believed that this program is in the public interest.

Youth Elementary Education Program

During the 1999/2000 school year, a total of 6,153 students and 280 teachers participated in the Agency's Elementary Education Program, provided as a community service to grades K through 6. Conducted in partnership with the Santa Clarita Valley Elementary Schools, children in the program learn different facts about water and its importance to life. The programs developed for each grade were modeled after the California Education Framework for math, science, history – social science, and language arts.

Thousands of educational packets and materials featuring water conservation messages were distributed through the Elementary Education Program and to children attending public events. Examples of youth education item giveaways are water conservation rulers and water bottles. The rulers graphically show that only 1/3 of 1 percent of the Earth's water is available for consumption, while the bottles display a penguin and the slogan "It's cool to be water-wise."

DMM 9: Conservation Programs for Commercial, Industrial and Institutional (CII) Accounts

Implementation Description: The DMM calls for identification of all commercial, industrial and institutional accounts and ranking them according to water use. All CII accounts are to be contacted on a regular basis and offered either a) a water use survey and customer incentives program, or b) agencies may attempt to achieve a water use reduction target in the CII customer sector.

Implementation Schedule: Local water agencies are not yet implementing this DMM/BMP. As a recommendation of this Plan, local water agencies will sign the urban MOU and implement this BMP according to its schedule.

DMM 10: Wholesale Agency Programs

Implementation Description: Wholesale water suppliers are to provide financial incentives or equivalent resources as appropriate and beneficial to their retail water suppliers to advance water conservation efforts and effectiveness. All DMMs/BMPs implemented by retailers that can be shown to be cost-effective in terms of the wholesaler's avoided cost of water will be supported. Wholesalers shall also provide conservation-related technical support and information to all retail agencies for whom they serve as a wholesaler. The Agency implements several elements of the Public Information, School Education and other DMMs on behalf of the retail water utilities throughout its entire service area.

Implementation Schedule: The water agencies will continue to implement this DMM and will augment support of the purveyors after signing the urban MOU as a recommendation of this plan.

Methods to Evaluate Effectiveness: The Agency will monitor financial and technical assistance provided and assess verifiable savings from implemented DMMs/BMPs.

Conservation Savings: There is no method to quantify the savings of this DMM, per the terms of the urban MOU.

DMM 11: Conservation Pricing

Implementation Description: Water agencies must eliminate non-conserving pricing structures and adopt conserving pricing. There are a variety of acceptable pricing structures that meet the terms of this DMM which are used by Santa Clarita area suppliers.

Implementation Schedule: Agencies will continue to implement this DMM.

Methods to Evaluate Effectiveness: Water bills show gallons used per day for the last billing period compared to the same period the previous year. This program, by the Valencia Water Company, has been reaching all metered customers on a monthly basis, which represents more than 95 percent of Valencia's customers. All metered customers are provided with historical usage on their monthly billing statements. This allows customers to compare their water usage with the same period of the prior year, and to monitor their water usage over time.

Conservation Savings: Assumptions for this DMM are not quantified, per the terms of the urban MOU.

DMM 12: Water Conservation Coordinator

Implementation Description: The Agency and its purveyors have designated existing staff to oversee water conservation program implementation.

Implementation Schedule: The agencies will continue to implement this DMM.

Methods to Evaluate Effectiveness: The agencies will track responses regarding the information provided.

Conservation Savings: Assumptions for this DMM are not quantified, per the terms of the urban MOU. Agencies have no method to quantify the savings of this DMM, but believe that this program is in the public interest.

DMM 13: Water Waste Prohibition

Implementation Description: Those agencies with the police powers to enforce ordinances shall enact and enforce measures prohibiting water waste.

Implementation Schedule: Ongoing.

Methods to Evaluate Effectiveness: The Agency does not have police powers and thus cannot implement this DMM/BMP. Valencia Water Company and Santa Clarita Water Company have water waste prohibition per the rules of the California Public Utilities Commission.

Conservation Savings: Assumptions for this DMM are not quantified, per the terms of the urban MOU.

DMM 14: Residential Ultra-Low-Flow Toilet Replacement Program

Implementation Schedule: Agencies shall assess the number of residential service connections constructed before 1992 and offer ultra low flush toilet replacement or rebate programs to such customers. Program shall be at least as effective as a "Retrofit on Resale" requirement.

Implementation Schedule: As a recommendation of this plan, the water agencies will sign the urban MOU and implement this BMP according to its schedule.

Methods to Evaluate Effectiveness: Method set according to the terms of the urban MOU.

Conservation Savings: Assumptions according to the terms of the urban MOU.

5.3 SUMMARY OF CONSERVATION

The Agency will continue to implement (or schedule for implementation) the BMPs/DMMs applicable to a wholesale water agency (BMPs 3, 7, 8, 10, 11, 12).

The Agency is considering the development and implementation of a comprehensive water conservation program in conjunction with the four retail purveyors. The program would expand on existing water conservation activities being implemented by the Agency and the purveyors by signing the urban MOU and agreeing to implement BMPs. These new efforts would be tied to water conservation programs in adjoining urban areas making appropriate improvements to meet the unique conditions of the Agency's service area.

As part of the recommendations contained in this Plan, the Agency Board of Directors will approve the Agency becoming a wholesaler signatory to the urban MOU in 2001. The Agency will thus become a member of the California Urban Water Conservation Council and will agree to make a good faith effort to implement all cost-effective BMPs. The MOU's ten-year implementation schedule will apply to all the Agency's water conservation programs.

Chapter 6 WATER SHORTAGE CONTINGENCY ANALYSIS

Chapter 6.0
WATER SHORTAGE CONTINGENCY ANALYSIS

6.1 COORDINATED PLANNING

Water supplies may be interrupted or reduced significantly in a number of ways – drought, an earthquake which damages water delivery or storage facilities, a toxic spill that affects water quality. This chapter of the Plan describes how the Agency and its water purveyors plan to respond to such emergencies so that emergency needs are met promptly and equitably.

Castaic Lake Water Agency and the purveyors have coordinated efforts in the past to meet water shortages. During 1991 (the fifth year of a six-year drought), the purveyors and the Agency prepared a Water Shortage Contingency Plan. Since this plan was first prepared, the Santa Clarita Valley has experienced two water shortages: in 1991 due to the continuation of the 1987-1992 drought and in 1994 due to the January 17, 1994 Northridge earthquake. The plan worked extremely well in both instances, and minor updates were made to incorporate what was actually experienced during these two periods. It is envisioned that the plan will be implemented whenever needed on a contingency basis.

A. Castaic Lake Water Agency and Water Purveyors

During times of normal supply, the water agencies meet periodically to review total water supply and demand in the Santa Clarita Valley and any new regulations affecting the water industry.

During 1991, the local agencies met about once a month. Monthly water production and demand reports were produced and shared with the City of Santa Clarita Drought Committee.

The local water community signed a Drought Emergency Water Sharing Agreement, agreeing to cooperate in sharing available water from all sources without regard to contractual or other water rights for the duration of the emergency, and to facilitate among themselves water transfers, exchanges, and wheeling arrangements.

B. City of Santa Clarita Drought Committee

The City of Santa Clarita Drought Committee was created by the City's Ordinance No. 91-16, adopted on March 13, 1991. The committee was made up of five appointees representing the public, a representative of the City Staff, members of the water community, and a representative from the Castaic Lake Water Agency. The function was to:

1. Review all available data on water consumption, water supply and groundwater conditions

2. Evaluate the level of compliance with the terms of the ordinance

3. Evaluate the level of achievement of the stated water consumption reductions

4. Make recommendations to the City Council concerning the timing of and need for implementation of future additional water restrictions as may be developed

5. Make recommendations to the water purveyors in the City of Santa Clarita concerning additional measures to encourage water conservation

From its inception and through the crucial summer months of 1991, the group met twice monthly. In the event of another drought or water shortage crisis, such a committee could be re-instituted.

6.2 DROUGHT CONDITIONS

Historically, the SWP has been able to deliver to the Agency at least 40 percent of the water requested. For planning purposes, it is assumed that in the worst case the SWP will deliver at least 30 percent of the amount requested.

The Saugus Aquifer has underground storage of approximately one million acre feet. In times of continued drought, the Saugus Aquifer can be pumped for temporary periods beyond the average normal pumpage.

The Alluvium Aquifer would be most affected by continued drought. During an extended drought, the retail purveyors would consider drilling additional wells in the Alluvium Aquifer on the north and west sides of the Santa Clarita Valley to increase production. Additionally, they would consider upgrading the pumping capacity of their wells in the Saugus Formation and possibly drilling additional wells.

6.3 EARTHQUAKE OR OTHER NATURAL DISASTER

The Santa Clarita Valley is located just southwest of the San Andreas Fault. If a major earthquake were to hit along the southern portion of the San Andreas Fault, it would affect the Valley. Among the specific effects described by the California Division of Mines and Geology is that two of the aqueduct systems that import water to Southern California could be ruptured by displacement on the San Andreas Fault, and supply may not be restored for a three- to six-week period. The situation would be further complicated by physical damage to the pumping equipment and local loss of electrical power. The DWR has a contingency Aqueduct Outage Plan for bringing the California Aqueduct back on-line should a major break occur, which they estimate would take approximately four months to repair.

Experts agree it may be at least 72 hours after the earthquake before outside help could get into the Santa Clarita area. Extended supply shortages of both groundwater and imported water, due to power outages and/or equipment damage resulting from a natural disaster, would be severe until the water supply could be restored.

Combined water storage of the local agencies totals about 168 million gallons of water in storage tanks, which can be gravity fed to area homes, even if there is a power outage. In addition, since the 1994 Northridge earthquake, storage tanks have been fitted with flexible couplings, which should reduce the damage to local storage. The public would be asked to reduce consumption to minimum health and safety levels, extending the supply to seven days. This would provide sufficient time to restore a significant amount of groundwater production. Once the groundwater supply was restored, the pumping capacity of the four retail purveyors could meet the reduced

demand until such time that the imported water supply was reestablished. Updates on the water situation would be made as often as necessary.

6.4 CONTAMINATION

The Valley's water sources are generally of good quality, and no insurmountable problems resulting from industrial or agricultural contamination are foreseen. If contamination did result from a toxic spill or similar accident, the contamination would be isolated and should not significantly impact the total water supply, and such an event would be covered by the terms of the Agency's Emergency Response Plan. The recent detection of perchlorate in the Saugus Formation is an example of prior contamination due to industrial chemical processes. The few wells affected have been shut down, effective treatment technologies have been developed, and a plan is being worked out to remove the contamination from the groundwater.

6.5 STAGES OF ACTION

The four retail purveyors have agreed on a four-stage demand reduction plan. The plan includes voluntary and mandatory stages, as shown in Table 6-1.

Table 6-1
Rationing Stages and Reduction Goals

Deficiency	Stage	Demand Reduction Goal	Type Program
Up to 15%	Stage 1	15% reduction	Voluntary
15-25%	Stage 2	25% reduction	Mandatory
25-35%	Stage 3	35% reduction	Mandatory
35-50%	Stage 4	50%+ reduction	Mandatory

Priorities for use of available water, based on Chapter 3 of the California Water Code, are:

?? HEALTH & SAFETY – Interior residential, sanitation and fire protection.

?? COMMERCIAL, INDUSTRIAL & GOVERNMENTAL – Maintain jobs & economic base.

?? EXISTING LANDSCAPING – Especially trees and shrubs.

?? NEW DEMAND – Projects with permits when shortage declared.

Water quantity calculations used to determine the interior household gallons per capita per day (gpcd) requirements for health and safety are provided in Table 6-2.

Table 6-2
Per Capita Health & Safety Water Quantity Calculations

	Non-Conserving Fixtures		Habit Changes		Conserving Fixtures	
Toilets	5 flushes x 5.5 gpf =27.5		3 flushes x 5.5 gpf = 16.5		5 flushes x 1.6 gpf = 8.0	
Shower	5 min x 4.0 gpm = 20.0		4 min x 3.0 gpm = 12.0		5 min x 2.0 gpm = 10.0	
Washer	12.5 gpcd(1/3 load) =12.5		11.5 gpcd(1/3 load) =11.5		11.5 gpcd(1/3 load) =11.5	
Kitchen	4 gpcd	4.0	4 gpcd =	4.0	4 gpcd =	4.0
Other	4 gpcd	4.0	4 gpcd =	4.0	4 gpcd =	4.0
Total	gpcd	68.0	Total gpcd	48.0	Total gpcd	37.5
CCF per capita per year		33		23		18

The Stage 2, 3, and 4 health & safety allotments are 68 gpcd (33 CCF per person per year, equaling 11,043 AFY) (per the Water Code).

A. Supply Shortage Triggering Levels

To minimize the social and economic impact of water shortages, the agencies will manage water supplies prudently. The Plan is designed to provide a minimum 50 percent of normal supply during a severe or extended water shortage.

Demand reduction stages may be triggered by a shortage in any one of the water sources in the Santa Clarita Valley or by shortages in a combination of supplies. The guidelines for triggering the stages are listed in Table 6-3. However, circumstances may arise where the purveyors may deviate from these guidelines, such as in a case where the Governor instituted a statewide rationing program.

Table 6-3
Water Deficiency Triggering Levels

Stage	Percent Shortage
Stage 1	Up to 15 percent water deficiency
Stage 2	15 to 25 percent water deficiency
Stage 3	25 to 35 percent water deficiency
Stage 4	35 to 50+ percent water deficiency

B. Consumption Limits

The local water agencies have agreed on the following allocation method for each customer type:

Single Family	Hybrid of Per-capita and Percentage Reduction
Multi Family	Hybrid of Per-capita and Percentage Reduction
Commercial	Percentage Reduction
Industrial	Percentage Reduction
Governmental	Percentage Reduction
Recreational	Percentage Reduction
Irrigation	Percentage Reduction

The specific percentage reductions at each stage and for each customer class correspond to the figures listed in Table 6-3. In a drought situation, individual customer allotments will be based on a normal year consumption table. The water agencies will classify each customer and calculate each customer's allotment according to Table 6-3. Each customer will be notified of its classification and allotment by mail before the implementation of a mandatory program. New customers and connections will be notified at the time service commences if a mandatory program is in effect. Any customer may appeal its classification on the basis of use or the allotment on the basis of incorrect calculation.

In a disaster, prior notice of allotment may not be possible. Notice will be provided by the most efficient means available, if necessary, through the terms of the Agency's Emergency Response Plan.

C. New Demand

During any declared water shortage emergency requiring mandatory rationing, the purveyors recommend that the City and County Building Departments continue to process applications for grading and building permits, but not issue the actual permits until mandatory rationing is rescinded. In Stages 3 and 4, it may be necessary to discontinue all use of grading water, even if a permit has been issued, and consider banning all use of water for non-essential uses, such as new landscaping and pools.

D. Mandatory Prohibitions on Water Use

All the residents of the Santa Clarita Valley fall within the boundaries of the City of Santa Clarita or Los Angeles County. Several ordinances were passed in 1991 by the various governmental entities in the Santa Clarita Valley outlawing wasteful water practices.

On February 11, 1991, the Castaic Lake Water Agency Board of Directors adopted Resolution No. 804 mandating a program of water conservation in the Santa Clarita Valley.

On February 14, 1991, the Newhall County Water District Board of Directors adopted Resolution No. 101 outlawing wasteful water practices. The ordinance was further amended on October 15, 1991, with the adoption of Ordinance No. 102.

On March 13, 1991, the City of Santa Clarita adopted Ordinance No. 91-16 outlawing wasteful water practices and calling for voluntary water conservation. The ordinance was amended on October 8, 1991 by the adoption of Ordinance No. 91-48.

On March 21, 1991, the Los Angeles County Board of Supervisors adopted Ordinance No. 91-0046U, which prohibits wasteful water practices.

Most of the ordinances mentioned above were scheduled to sunset January 1, 1992, but could be reinstituted as needed.

E. Implementation of the Plan

If a water shortage crisis reoccurs, the water agencies will call a public hearing to declare a water shortage pursuant to Sections 351 and 352 of the California Water Code.

Los Angeles County Waterworks District 36, Newhall County Water District, and Castaic Lake Water Agency's respective Boards of Directors would adopt ordinances, similar to those adopted in 1991, implementing this plan.

Valencia Water Company would file an advice letter with the California Public Utilities Commission implementing this plan.

F. Water Use Monitoring Procedures

Demand. Santa Clarita Water Company, Valencia Water Company, and Newhall County Water District bill their customers on a monthly basis. The prior year's consumption is included on most customer bills. This allows comparison of the total consumption from each billing period to the same billing period from the prior year.

Production. Santa Clarita Water Company, Valencia Water Company and the Castaic Lake Water Agency have the ability to prepare daily production reports. Under normal conditions, monthly production reports are reviewed and compared to production reports and pumping statistics from the same period of the prior year.

Stage 1 and 2 Water Shortages. During Stage 1 and 2 Water Shortages, purveyors will review selected production reports on a daily basis and the Agency will provide each purveyor with a copy of its daily production report. The water agencies will meet on a more frequent basis to review water supply and demand in the Santa Clarita Valley. Billing reports will be reviewed to identify users who are not abiding by the plan.

Stage 3 and 4 Water Shortages. During Stage 3 and 4 Water Shortages, purveyors will review all production reports and pumping statistics on a daily basis. The water agencies will continue to monitor the supply and demand in the Santa Clarita Valley. Water transfers and wheeling arrangements will be implemented as needed. Management will continue to review billing reports to identify users who are not abiding by the plan.

Disaster Shortage. During a disaster shortage, management will continually monitor production figures. The water agencies will work to transfer and wheel water where feasible.

Chapter 7 WATER RECYCLING

Chapter 7.0
WATER RECYCLING

7.1 WASTEWATER SYSTEM DESCRIPTION

Recycled water is available from two existing water reclamation plants, the Saugus and Valencia plants operated by the County Sanitation Districts of Los Angeles County. In 1993, the Agency prepared a Reclaimed Water System Master Plan that outlined a multi-phase program to deliver recycled water in the Valley. The Agency has completed environmental review and is constructing Phase 1 of the project which will deliver approximately 1,700 acre-feet of water.

Surveys conducted by the Agency indicate a high interest in using recycled water among existing users as well as future developments, replacing non-potable demands with recycled water instead of potable water. The local water agencies encourage and support the use of recycled water to help augment and "drought proof" existing supplies. Overall, the 1993 program expected to reclaim up to 10,000 acre-feet of highly (tertiary) treated wastewater suitable for use on golf courses, landscaping, and other non-potable uses. An updated Plan is in preparation that is planned to provide up to 17,000 acre-feet to meet a larger demand.

7.2 STUDY AND PLANNING

The purpose of the Master Plan was to evaluate and plan for the use of recycled water as a reliable water source to meet a portion of the non-potable water demand within the Santa Clarita Valley. Currently, the planned recycled water system Phase I is under development with a planned output of 1,700 acre-feet. There are two existing plants and one proposed water reclamation plant within the Agency's service area. Development and implementation of the recycled water system to utilize these recycled water sources can augment the groundwater and imported water sources and increase overall water supply reliability for the area.

7.3 RECYCLED WATER DEMAND

The Reclaimed Water System Master Plan identified potential recycled water users with existing and future demands totaling 10,361 acre-feet per year. Of the total demand, 1,215 acre-feet per year of demand is outside the Agency's service area. The potential annual demands were derived from historical water use records and existing and future land use data. Existing potential recycled water users include golf courses, parks, schools, freeway landscaping, a hospital, a cemetery, a co-generation plant, the Santa Clarita Civic Center, and Magic Mountain Amusement Park. Future potential users include planned residential developments, industrial development, and golf courses.

Since recycled water is used for non-potable purposes such as landscape irrigation, demand for recycled water follows a highly seasonal pattern. Recycled water demand is generally low during wet winter months and increases dramatically during hot, dry summer months to meet greater irrigation requirements. For the annual demand of 10,361 acre-feet per year identified in the Master Plan, the total peak monthly demand is 1,922 acre-feet and the total peak daily demand is 20.5 mgd.

In addition to the recycled water demand identified in the Master Plan, if the proposed Newhall Ranch development is approved, the non-potable water demand in the Agency service area could increase by 9,251 acre-feet per year (Impact Sciences, 1996). Of this demand, approximately 6 percent is associated with non-residential development, 23 percent with residential developments, and 71 percent with open space and parks within the proposed Newhall Ranch development. The peak monthly non-potable demand has been estimated to be 1,305 acre-feet (14 mgd).

Assuming approval of the Newhall Ranch project, the total non-potable water demand within the Agency's service area is expected to reach approximately 19,600 acre-feet per year. This demand will be highly seasonal, with peak demands during summer months when the weather is hot and dry and irrigation needs are greatest.

Table 7-1 summarizes the recycled water demands.

Table 7-1
Recycled Water Demand

Item	Annual Demand (acre-feet per year)	Peak Monthly Demand (acre-feet)	Peak Daily Demand	
			acre-feet	mgd
Within the Agency Service Area[a]	9,146	1,690	55.6	18.00
Outside the Agency Service Area[a]	1,215	233	7.5	2.45
Newhall Ranch[b]	9,251	1,305	43.0	14.00
Total	19,612	3,228	106.1	34.48

(a) From the Agency's Reclaimed Water Master Plan, September 1993.
(b) From the Agency's Integrated Water Resources Plan. Water Demand and Supply Evaluation, February 1998.

7.4 RECYCLED WATER SUPPLIES

There are two existing water reclamation plants within the Santa Clarita Valley that can potentially supply recycled water to meet the identified non-potable water demands in the service area. Wastewater treatment is provided by the Los Angeles County Sanitation Districts Nos. 26 and 32.

The Saugus Water Reclamation Plant (Saugus WRP), located at 26200 Springbrook Avenue in Saugus, was completed in 1962. Additional flow equalization facilities completed in 1991 brought the plant's design capacity to 6.5 mgd. Due to site space constraints, there will not be further expansion to this reclamation plant. During 1999, Saugus WRP had an average effluent flow of 5.62 mgd (6,294 acre-feet per year), approximately 86 percent of its design capacity. Effluent from this treatment plant contain about 723 mg/l TDS and is discharged to the Santa Clara River west of Bouquet Canyon Road.

The Valencia Water Reclamation Plant (Valencia WRP), located at 28185 The Old Road in Valencia, was completed in 1967. With the 4.4 MG equalization tank constructed in February

1995 and the Stage 4 expansion completed in June 1996, the current design capacity of the plant is 13.5 mgd. The planned ultimate capacity for this facility is 22 mgd. In 1999, the average effluent flow for Valencia WRP was 10.44 mgd (11,693 acre-feet per year), approximately 77 percent of its current design capacity. Effluent from this facility contains approximately 753 mg/l TDS and is discharged to the Santa Clara River west of The Old Road.

Table 7-2 summarizes the recycled water supplies.

Table 7-2
Recycled Water Supplies[a]

	Current Capacity (mgd)	Ultimate Capacity (mgd)	Flow (1999)		TDS (mg/l)
			mgd	acre-feet per year	
Saugus WRP	6.5	6.5	5.62	6,294	723
Valencia WRP	13.5	22.0	10.44	11,093	753
Total	20.0	28.5	16.06	17,987	--

(a) From County Sanitation Districts of Los Angeles County

A third water reclamation plant for the Santa Clarita Valley is proposed as part of the proposed Newhall Ranch project. This proposed facility would be located near the western edge of the development project along the south side of State Route 126. The plant would be constructed in stages, with an ultimate capacity planned for 7.7 mgd. Effluent from the proposed water reclamation plant would be used to meet non-potable water demand within the development area. According to the Newhall Ranch Specific Plan EIR, this plant is projected to produce 6,547 acre-feet per year on average. Of this total, 6,025 acre-feet per year would be used for irrigation with the remaining 522 acre-feet per year discharged to the Santa Clara River during winter months when demands are low. This supply can meet 65 percent of the 9,251 acre-feet per year of potential non-potable water demand. The remainder of the non-potable demand is expected to be met by potable water.

Effluent from both the Saugus and Valencia WRPs can potentially be used to meet the recycled water demand as identified in the Agency's Reclaimed Water System Master Plan. The current total effluent from the plants averages 17,987 acre-feet per year. LACSD projects wastewater flows to increase to about 38,000 acre-feet per year by the year 2015. Since the existing and future non-potable water demands (excluding Newhall Ranch) are estimated to be 10,361 acre-feet per year, there appears to be sufficient recycled water supply to meet the existing and identified future demands on an annual basis. However, there are several considerations that may affect the full use of the reclamation plant effluents.

A. Recycled Water Use Considerations

Recycled water from the Saugus and Valencia WRPs can meet a significant portion of existing and identified future demands (excluding Newhall Ranch). However, there are some operational and environmental concerns that merit consideration since both WRPs currently discharge effluent into the Santa Clara River.

Differences in the monthly production and use of recycled water affect total annual use. The WRPs produce recycled water at a more or less uniform rate throughout the year. However, since most recycled water is used for irrigation, demand peaks during the summer months and is minimal in winter months. As a result, recycled water production may not be adequate to meet demands in summer months, while in winter months surplus effluent may exist. To meet peak summer demands, either potable water must be used to supplement the non-potable supply or seasonal storage for recycled water must be provided. Analysis indicates that current supplies can meet about 74 percent of the projected non-potable water demand (excluding Newhall Ranch). As wastewater flows increase, there will be additional recycled water available to meet peak non-potable demands. However, maintenance of flows in the Santa Clara River may further reduce the available supply.

The Santa Clara River is one of the few major drainage systems within the greater Los Angeles area that remains in its natural state. This unlined stream has natural flow during the winter months; however, from July through November, effluent from the WRPs comprises greater than 90 percent of the total stream flow. Discharge from the WRPs averaged 19.1 mgd in 1999. In the future, discharges have been projected to increase to about 34 mgd if a recycled water program is not implemented.

The 1993 Master Plan considered seasonal storage of recycled water as one option for minimizing potential impacts on endangered species. Two potential reservoir sites were identified in the Master Plan.

B. Recycled Water System Projects

Implementation of recycled water projects (as well as those planned for Newhall Ranch) could result in the use of 19,612 acre-feet per year of recycled water by the year 2010 if no seasonal storage is provided. Future recycled water use could potentially increase to about 24,000 acre-feet per year as additional effluent is produced. Utilization of recycled water can thus relieve demand on potable water supplies of 19,612 acre-feet per year, thus increasing the total water supply and water reliability for the Santa Clarita Valley.

7.5 POTENTIAL USES OF RECYCLED WATER

The total demand for recycled water will be 19,612 acre-feet of water per year as indicated in Table 7-3.

Table 7-3
Potential Recycled Water Users

User	Demand (acre-feet per year)
Golf Courses (8)	4,632
Parks	1,836
Schools	1,000
Residential Landscaping	3,204
Commercial/Industrial Landscaping	1,030
Cogeneration Plant	700
Six Flags Magic Mountain Amusement Park	500
Other Uses including cemetery landscaping, freeway landscaping, and Christmas tree farms	6,710
Total	**19,612**

Peak day demand is estimated to be 34.5 mgd. Most of the uses for the landscape irrigation, although Six Flags Magic Mountain will use the water for filling the lakes and ponds that feed the water rides and for washing down patios and walkways. Other uses include irrigation of Christmas tree farms and use at a cogeneration plant.

APPENDIX A

Urban Water Management Planning Act

Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AB 11X, Filante, 1991
AB 1869, Speier, 1991
AB 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AB 2853, Cortese, 1994
AB 1845, Cortese, 1995
SB 1011, Polanco, 1995
SB 553, Kelley, 2000

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING
CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. The Legislature finds and declares as follows:

(a) The waters of the state are a limited and renewable resource subject to ever increasing demands.

(b) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(c) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(d) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(e) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet the needs of both existing customers and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 7 (commencing with Section 4010) of Part 1 of Division 5 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS
Article 1. General Provisions

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier after December 31, 1984, shall adopt an urban water management plan within one year after it has become an urban water supplier.

c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that

would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)

(1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments as described in subdivision (a).

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments as described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.
(B) Residential plumbing retrofit.
(C) System water audits, leak detection, and repair.
(D) Metering with commodity rates for all new connections and retrofit of existing connections.
(E) Large landscape conservation programs and incentives.
(F) High-efficiency washing machine rebate programs.
(G) Public information programs.
(H) School education programs.
(I) Conservation programs for commercial, industrial, and institutional accounts.
(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of such savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, which offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to the council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions

(a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.
(h) A draft water shortage contingency resolution or ordinance.
(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.
(c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
(d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.
(e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.
(f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems and to promote recirculating uses.

Article 2.5 Water Service Reliability

10635.

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from the state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies within 60 days of the submission of its urban water management plan.
(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.
(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any future, potential customers.

Article 3. Adoption and Implementation of Plans

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).
The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.
10644.
(a) An urban water supplier shall file with the department a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department within 30 days after adoption.
(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. MISCELLANEOUS PROVISIONS

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.
(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive drought assistance from the state until the urban water management plan is submitted pursuant to Article 3 (commencing with Section 10640) of Chapter 3.

SEC. 2. No appropriation is made and no reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution or Section 2231 or 2234 of the Revenue and Taxation Code because the local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for the program or level of service mandated by this act.

uwmp act of 1995.doc -- revised 10/96

APPENDIX B

2000 URBAN WATER MANAGEMENT PLAN CHECKLIST

Checklist Organized According to Subject

Page # In Plan	Section of Law	Items to Address
1-3	10642	Make plan available for public inspection before its adoption.
1-3		Adopt a plan as prepared or as modified after the public hearing.
1-3	10620 (d) (2)	Coordinate the preparation of its plan with other appropriate agencies, including direct and indirect suppliers, wastewater, groundwater, and planning agencies (refer to section 10633).
3-3	10631 (a)	Provide current and projected population in 5-year increments to 20 years.
3-3		Describe the climate and other demographic factors.
4-2	10631 (b)	Identify and quantify the existing and planned sources of water available in 5-year increments to 20 years.
2-8	10631 (d)	Describe opportunities for exchanges or transfers of water on short-term or long-term basis.
3-9	10631 (e) (1)	Quantify current and past water use in 5-year increments to 20 years.
3-9	10631 (e) (2)	Identify projected water uses among water use sectors in 5-year increments to 20 years.
4-2	10631 (c)	Describe average, single dry and multiple dry water year data.
		Describe any plans to replace inconsistent water sources.
4-4	10632 (b)	Provide minimum water supply estimates based on driest three-year historic sequence.
2-8	10631 (c)	Describe the reliability of water supply.
2-8		Describe the vulnerability of water supply to seasonal or climatic shortage.
7-1	10633 (a)	Describe the wastewater collection and treatment systems in the supplier's service area.
7-2		Quantify the amount of wastewater collected and treated in the supplier's service area.
7-3		Describe the methods of wastewater disposal in the supplier's service area.
7-1	10633 (b)	Describe the type, place, and quantity of recycled water currently used in the supplier's service area.
4-2	10633 (c) (d)	Describe and quantify potential uses of recycled water in 5-year increments to 20 years.
7-4		Describe the technical and economic feasibility of serving the potential users of recycled water.
7-4	10633 (e)	Describe the actions that may be taken to encourage recycled water use.
4-4	10633 (e)	Provide the projected acre-feet results of recycled water used per year.
7-4	10633 (f)	Provide a plan for optimizing the use of recycled water in the supplier's service area.

2000 URBAN WATER MANAGEMENT PLAN CHECKLIST

Checklist Organized According to Subject

Page # In Plan	Section of Law	Items to Address
7-3		Provide actions to facilitate the installation of dual distribution systems and to promote recirculating uses.
4-5	10635 (a)	Provide an assessment of the reliability of the water supplier's water service to its customers during normal, single dry, and multiple dry water years.
4-2		Compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in 5-year increments. (Refer to 10631 (c).
4-4		Compare normal, single dry, and multiple dry water year projected water supply sources available to water supplier with the normal, single dry, multiple dry water year projected water used (refer to 10631 (c).
6-3	10632 (c)	Provide actions a water supplier will take to prepare for a catastrophe.
6-7	10632 (h)	Provide a copy of a draft water shortage contingency resolution or ordinance.
6-3	10632 (a)	Provide water shortage stages of action, including up to a 50 percent reduction specific water supply conditions at each stage.
6-7	10632 (d)	Provide mandatory prohibitions.
6-8	10632 (f)	Provide penalties or charges.
6-4	10632 (e)	Provide consumption reduction methods.
--	10632 (g)	Provide an analysis of the impacts on the water supplier revenues and expenditures.
--		Provide measures to overcome revenue and expenditure impacts.
6-4	10632 (I)	Provide a mechanism for determining actual reductions in water use.

APPENDIX C

RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

MEMORANDUM

November 16, 2000

To: Mr. Robert Sagehorn
General Manager
Castaic Lake Water Agency
27234 Bouquet Canyon Rd
Santa Clarita 91350-2175

From: Richard C. Slade, Principal Groundwater Geologist
Richard C. Slade & Associates, LLC Job S2052

Re: Groundwater Extractions,
Alluvial and Saugus Formation Aquifer Systems
Santa Clarita Valley

In resonse to your request to support Black and Veatch in their preparation of the Urban Water Management Plan, we submit the following work on the alluvial and Saugus Formation aquifer systems in the Santa Clarita Valley:

1. **Well Locations**

Figure 1 – Map of Wells and Aquifer Systems – illustrates the locations of key municipal-supply water wells and the geologic contacts for the alluvial and Saugus Formation aquifer systems in the Santa Clarita Valley. Specifically denoted on Figure 1 are the locations, municipal-supply ownerships, and well numbers/names for each alluvial-supply well and for each Saugus Formation water well.

2. **Rainfall**

Long-term rainfall data are available from the Saugus rainfall gage for a period of record of 1883 through 1998. Figure 2 – Total Annual Rainfall – presents a bar chart of the annual rainfall versus time over the period of record. Average annual rainfall over the period of record has been approximately 18 inches as shown on Figure 2.

Historic high rainfall over the period of record was 42.11 inches in 1884, although annual totals in excess of 35 inches were also recorded in 1890, 1978, 1983, and 1998. Historic low rainfall over the period of record was 3.32

inches in 1898, although annual totals less than 8 inches were also recorded in 1885, 1894, 1899, 1900, 1925, 1948, 1950, 1961, 1987, 1990, and 1997.

From these data accumulated rainfall departure values were calculated for each year of rainfall relative to the long-term average and plotted to determine long-term historic trends in rainfall for the region.

Figure 3 – Cumulative Departure Curve – presents a graph of the accumulated departure from the average annual precipitation (rainfall) data shown on Figure 2. These accumulated departure values are plotted relative to the long-term rainfall of approximately 18 inches over the period of rain gage data (1883–1998). The purpose of Figure 3 is to illustrate temporal trends in the rainfall data. For example, the slopes of the curves declining to the right-hand side of the graph (negative slopes) indicate those years where accumulated rainfall departure totals are declining, relative to the long-term average. These declining trends represent general periods of deficient rainfall, wherein each yearly rainfall total was generally at or below the long-term average. Conversely, those portions of the Figure 3 curve that are ascending towards the right-hand side of the graph (positive slopes) indicate years where accumulated rainfall totals are increasing, relative to the long-term average; in essence, these rising trends represent periods of generally excess rainfall wherein each yearly rainfall total was generally at or above the long-term average.

Figure 3 shows a few periods for which rainfall was in a state of general decline relative to the long-term average. Examples of these period include 1890 through 1904 and 1944 through 1966. These time periods are considered to be relatively "dry" hydrologic periods, and are characterized by a series of years in which most of the years had annual rainfall totals that were at or below the long-term average rainfall in the area. In contrast, the Figure 3 curve shows a general state of increasing rainfall relative to the long-term average rainfall. Examples of these periods include 1904 through 1922 and 1966 through 1983. These periods are considered to be relatively "wet" hydrologic periods and are characterized by a series of years in which most of the years had annual rainfall totals that were at or above the long-term average annual rainfall in the area.

3. Groundwater Extractions

Figures 4 and 5 have been prepared to depict the historic variations in the total groundwater extractions by the municipal-supply and main agricultural-supply purveyors from their water-supply wells in the alluvium, and in the Saugus Formation, respectively. Specifically, those graphs show the changes in groundwater extrac-

tions in acre-feet (AF) versus time between 1947 and 1999 for the alluvial aquifer system and between 1954 and 2000 for the Saugus Formation.

a. *Alluvial Aquifer Extractions*

For the alluvial aquifer system, municipal-supply purveyors have included: Newhall County Water District (NCWD); Santa Clarita Water Company (SCWC); Valencia Water Company (VWC); and the Wayside Honor Rancho (WHR). The only agricultural-supply purveyor included in the groundwater production database is the Newhall Land and Farming Company (NLF).

Not included in the data graphed on Figure 4 for the alluvium is any additional historic or current groundwater pumpage by any other privately-owned industrial, agricultural, ranch or domestic-supply well. Hence, data graphed on Figure 4 do not include an estimated 500 AF per year of additional historic pumpage by those other types of privately-owned pumpers.

As seen on Figure 4, historic groundwater extractions have ranged approximately between a high of 42,589 AF in 1999 and a low of 19,380 AF in 1983. The average long-term extraction from the alluvium during the period of available data record has been approximately 32,400 AF/yr. As stated previously, these production totals do not include any alluvial pumpage by privately-owned wells except for that owned by NLF.

During the period of available data, maximum annual groundwater production from the alluvial aquifer system has exceeded 40,000 AF/yr a total of 5 times: 1951 (41,315 AF); 1955 (41,478 AF); 1960 (42,003 AF); 1964 (40,314 AF); and 1999 (42,589 AF). Four of these five dates lie within a long-term period of generally deficient rainfall that occurred in the area between approximately 1944 and 1966 (as evidenced by the trends on Figure 3 of cumulative departure from the average rainfall for the period of historic record; a portion of that cumulative rainfall departure curve is shown on each of the water level hydrographs on Figures 6.1 through 6.7 and 7.1 through 7.4, discussed below in Section 4.

b. *Saugus Formation Extractions*

For the Saugus Formation aquifer system, municipal-supply purveyors have included NCWD, SCWC, VWC and WHR. NLF represents the only agricultural-supply purveyor whose data are included on Figure 5. Not included on the Figure 5 graph is any additional historic or current pumpage by any other privately-owned Saugus Formation water wells in the region.

Hence, Figure 5 data do not include an estimated 100 AF per year, or less, of additional historic Saugus Formation pumpage by such private pumpers. The period of record for available Saugus Formation production data is from 1954 through 1999.

During this period of record, maximum Saugus Formation production was 14,915 AF in 1991, a time period that was near the end of the 1986 through 1991 drought. In the past 20 years (1980 – 1999, inclusive), which would include a period of time of more development in the region, the average Saugus Formation production has been approximately 7145 AF/yr.

4. Water Levels

Graphs of water levels versus time (hydrographs) have been prepared for selected municipal-supply wells constructed in the alluvium and in the Saugus Formation (refer to Figures 6.1 through 6.7 and 7.1 through 7.4, respectively). Also illustrated on Figures 6 and 7 for comparative purposes are: the 1950 through 1998 portion of the long-term accumulated rainfall departure curve as adapted from Figure 3; and the depths to the top (uppermost section) of the perforated interval and to the base (lowermost section) of the perforated interval in each respective well.

These well locations are shown on Figure 1 and include:

- *Alluvial Aquifer Wells*

  SCWC Lost Canyon 2, North Oaks, and Honby.
  VWC L2, Q2, S2, and T2.

- *Saugus Formation Wells*

  NCWD Nos. 9 and 10, and
  VWC Nos. 157 and 160.

a. *Alluvial Aquifer Hydrographs*

As shown by the alluvial hydrographs (Figures 6.1 through 6.7), water levels clearly fluctuate on a seasonal basis each year, with spring months and fall months representing the annual high and annual low water level periods, respectively. Superposed on this annual water level cycle are the long-term trends; these trends for the alluvium tend to closely follow long-term trends in annual rainfall, surface water runoff and resulting recharge. Periods of recent long-term water level trends include: declining water

levels during extended droughts (such as 1944 through 1966 and 1983 through 1991); refer also to the long-term cumulative rainfall departure curve on Figure 3; and rising water levels during periods of excess rainfall (such as 1966 through 1971, and 1978 through 1983).

Noteworthy on the alluvial aquifer hydrographs is that high rainfall totals in only one or two years generally will cause water levels to rise quickly and by a relatively large amount. Such water level response to rainfall is a significant characteristic of permeable, porous, alluvial aquifer systems that occur within large watersheds.

It is notable also that the annually large extractions from the alluvium between 1953 and 1966 (a 14-year period during which 531,266 AF of pumping occurred, for an average alluvial production of 37,948 AF/yr) was concurrent with the latter portion of the long-term drought of approximately 1944 through 1966 in which there was deficient rainfall and recharge (see also long-term departure curve on Figure 3). Yet, Figures 6.1 through 6.7 hydrographs for wells having lengthy periods of record clearly reveal four conditions: 1) water levels in the alluvial wells were declining through the drought, but; 2) water levels recovered quickly and completely to pre-drought levels as soon as normal or above-average rainfall occurred; 3) none of the historic water levels in any of the alluvial wells declined to the base of the respective casing perforations; and 4) no permanent dewatering or overdraft in water levels in the alluvial aquifer system has occurred.

Current water levels in the alluvium, as seen on Figures 6.1 through 6.7, are at or near their historic high regardless of either historic amounts of alluvial production and/or very long periods of drought (like 1945 through 1966).

b. *Saugus Formation Hydrographs*

Figures 7.1 through 7.4 hydrographs for Saugus Formation wells reveal that water levels in those wells are at or near their historic highs. The graphs also reveal a direct relationship between excess or deficient rainfall/recharge and water levels in the Saugus Formation, although the relationship is not as strong as it is for the alluvial wells.

Typical Saugus Formation wells range in total depth from 1100 ft to 1900 ft; most of the newer wells have uppermost perforations that begin at depths on the order of 500 ft. Typical historic depths to the non-pumping piezometric water levels in Saugus Formation wells have been in the range

of 40 ft to a maximum of 250 ft below ground surface, depending on the well. The total amplitude of these long-term water level fluctuations in these Saugus Formation wells has typically been in the range of only 40 to 100 ft, depending on the well.

None of the water levels in any of the Saugus Formation wells has ever declined to the top (uppermost) perforated zones in any of these wells. Moreover, no permanent dewatering or overdraft in water levels in the Saugus Formation aquifer system has occurred.

5. Water Levels vs. Total Groundwater Production

Figures 8 and 9 have been prepared to illustrate historic fluctuations in water levels (hydrographs) relative to total annual pumpage from the alluvial aquifer system and the Saugus Formation aquifer system, respectively. The wells for which hydrographs are presented include the same alluvial and Saugus Formation wells as were discussed previously in Section 4 of this Memorandum.

a. *Alluvial Aquifer Graphs (Figures 8.1 through 8.7)*

These graphs present historic water level fluctuations in the selected alluvial aquifer system wells relative to total annual groundwater extractions by all municipal-supply and agricultural-supply alluvial wells over time in the area. Also illustrated on Figure 8 are the depths to the top (uppermost) and base (lowermost) of the perforated intervals in each respective well.

The graphed data reveal that historic water level fluctuations in the alluvial aquifer system are not related to the historic annual volumes of groundwater production from the alluvium.

b. *Saugus Formation Graphs (Figures 9.1 through 9.4)*

These graphs show historic water level fluctuations in the selected Saugus Formation aquifer system wells relative to total groundwater extractions by all known Saugus Formation wells over time in the area. Also illustrated on Figure 9 are the depths to the top (uppermost) and base (lowermost) of the perforated intervals in each respective well.

The graphed data reveal that historic water level fluctuations in the Saugus Formation aquifer system are not related to the historic annual volumes of groundwater production from the formation.

6. Conclusions

a. Alluvial water levels have repeatedly recovered over time following droughts of various durations (including the very long-term drought of approximately 1945 through 1966), and there is no evidence for permanent overdraft or dewatering of this aquifer system.

b. Even with groundwater production at or above 40,000 AF/yr (such as 1951, 1955, 1960 and 1964), all of which occurred during the very long-term drought of 1945 through 1966), groundwater levels in alluvial wells have recovered regardless of the timing (date) of this amount of production relative to the accumulated rainfall departure curve.

c. As a result of the above, it is considered to be hydrogeologically feasible to utilize groundwater extractions from the alluvial aquifer system at the rate of 30,000 AF/yr to 40,000 AF/yr in normal (average) rainfall conditions. During dry periods, alluvial aquifer production should be reduced to the range of 30,000 AF/yr to 35,000 AF/yr.

d. For the historic annual amounts of groundwater production from the Saugus Formation (to date, up to 15,000 AF/yr), there is no relationship between non-pumping (static) water levels in individual Saugus Formation wells and total groundwater extraction by those wells.

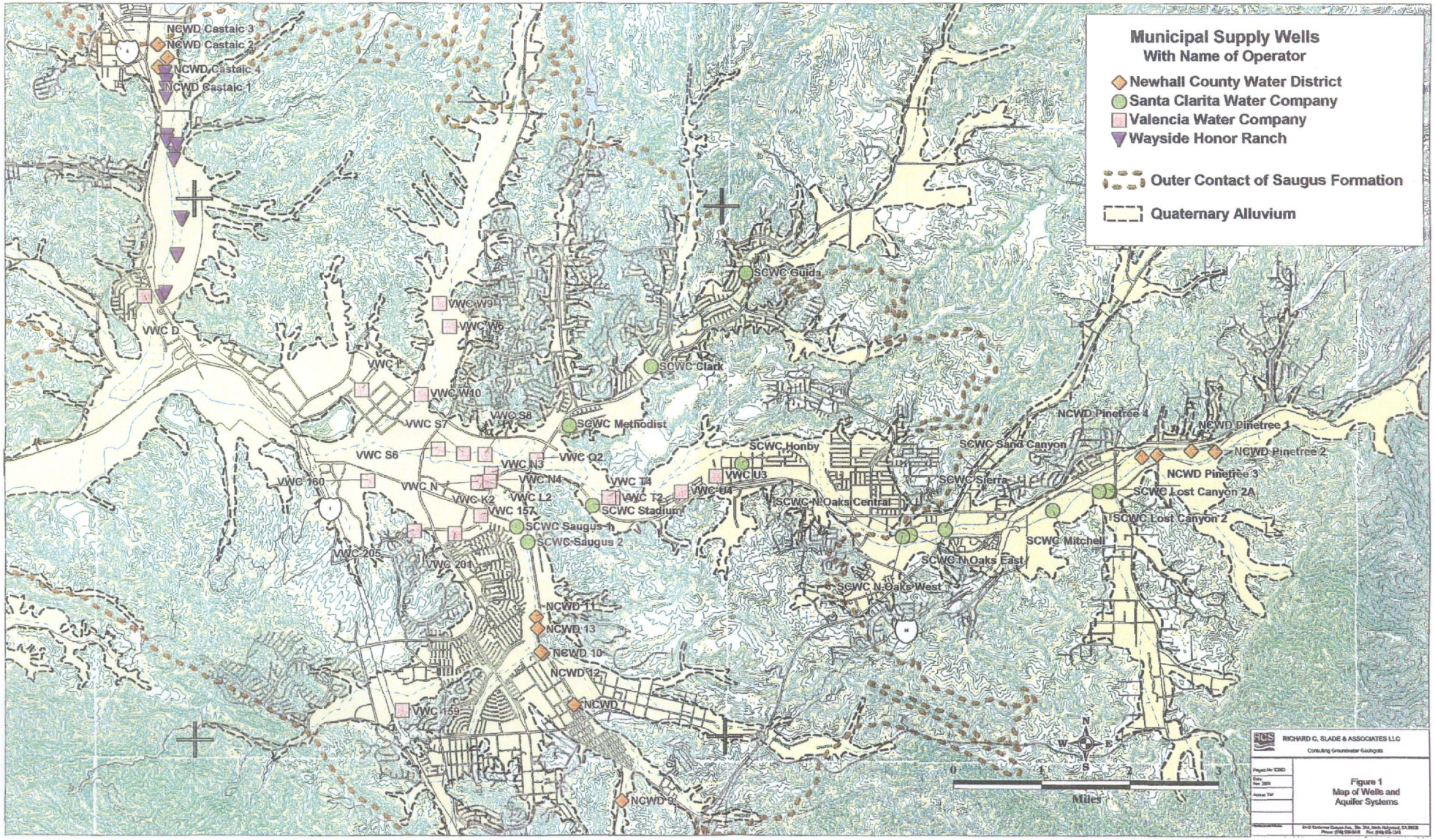
e. Saugus Formation hydrographs, which in some cases date to the early-1960s, reveal both seasonal and long-term fluctuations in water levels over time; these water levels respond to changes in rainfall/recharge conditions in the region. Current water levels in Saugus Formation wells are at or near their historic highs. There is no evidence for permanent overdraft or dewatering of the Saugus Formation aquifer system.

f. Because of its relatively large areal extent and substantial vertical depth, the Saugus Formation conservatively contains on the order of 1 million AF of groundwater in storage in the depth zone of 500 ft to 2500 ft and/or the base of fresh water within the formation.

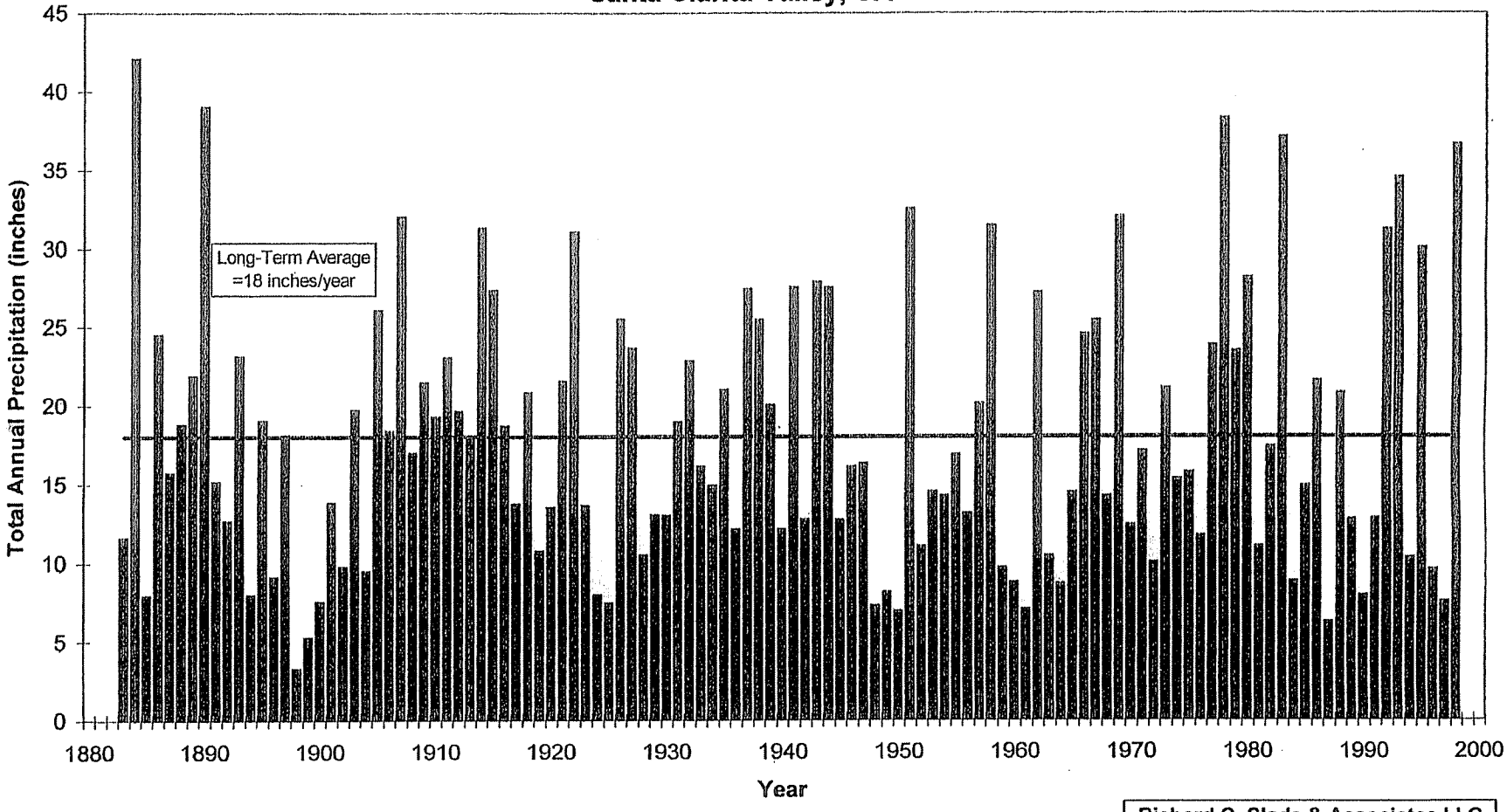
g. Historic and current depths to water and the known amount of historic water level fluctuations in Saugus Formation wells, even recognizing the resulting pumping rates and specific capacities of the wells, are considered small compared to the depths of these wells and to the future amount of available drawdown in each well.

h. As a result of all the above conditions, it is considered to be hydrogeologically feasible to increase production from Saugus Formation aquifers for short-term periods (e.g., for a few years) even during drought conditions. At this time, increasing maximum production in a staged or ramped process from 15,000 AF/yr to 25,000 and then to 40,000 AF/yr for such short-term periods is considered to be hydrogeologically feasible. This staged increase in Saugus Formation production to 40,000 AF/yr for short-term periods amounts to a maximum increase of 25,000 AF/yr over the known historic maximum groundwater extractions from this formation. This 25,000 AF/yr increase represents only a very small percentage of the total amount of groundwater calculated to be present in storage in the depth range of 500 ft to either 2500 ft or the base of fresh water within the Saugus Formation.

c.c. Mr. Dirk Reed, Black and Veatch

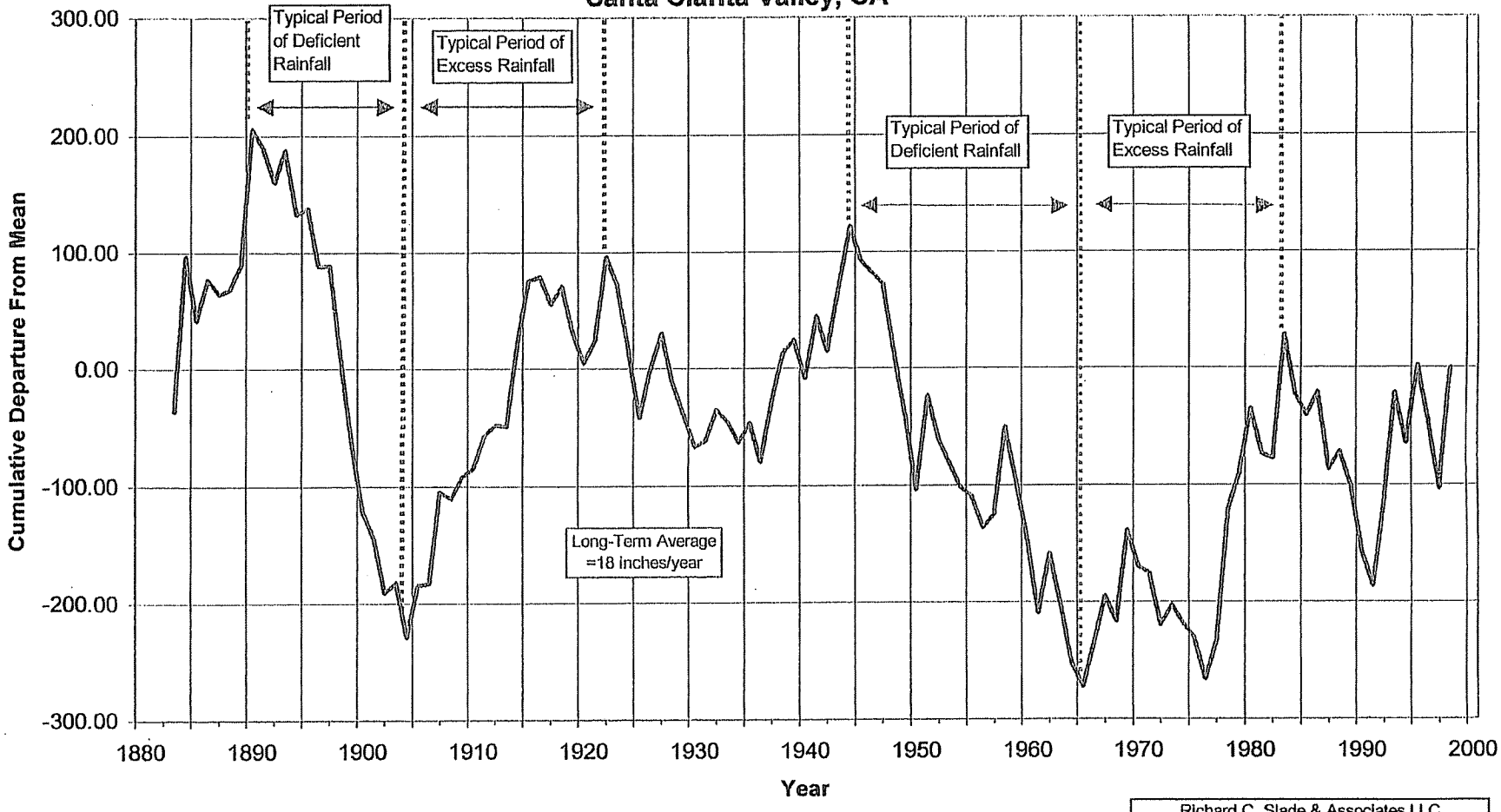

Municipal Supply Wells
With Name of Operator
Newhall County Water District
Santa Clarita Water Company
Valencia Water Company
Wayside Honor Ranch
Outer Contact of Saugus Formation
Quaternary Alluvium
NCWD Castaic 3
NCWD Castaic 2
NCWD Castaic 4
NCWD Castaic 1
VWC D
VWC W9
VWC W6
VWC E
VWC W10
VWC S7
VWC S8
VWC S6
VWC 160
VWC N
VWC K2
VWC N3
VWC N4
VWC L2
VWC 157
VWC 205
VWC 201
VWC 159
SCWC Saugus 1
SCWC Saugus 2
SCWC Methodist
VWC Q2
VWC T4
VWC T2
SCWC Stadium
SCWC Clark
SCWC Guida
SCWC Honby
VWC U3
VWC U4
SCWC N Oaks Central
SCWC Sand Canyon
SCWC Sierra
NCWD Pinetree 4
NCWD Pinetree 1
NCWD Pinetree 2
NCWD Pinetree 3
SCWC Lost Canyon 2A
SCWC Lost Canyon 2
SCWC Mitchell
SCWC N Oaks East
SCWC N Oaks West
NCWD 11
NCWD 13
NCWD 10
NCWD 12
NCWD 1
NCWD 9
N
W
E
S
0
1
2
3
Miles
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Consulting Groundwater Geologists
Figure 1
Map of Wells and
Aquifer Systems

Total Annual Rainfall
Newhall - Soledad Gage
Santa Clarita Valley, CA



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Figure 2
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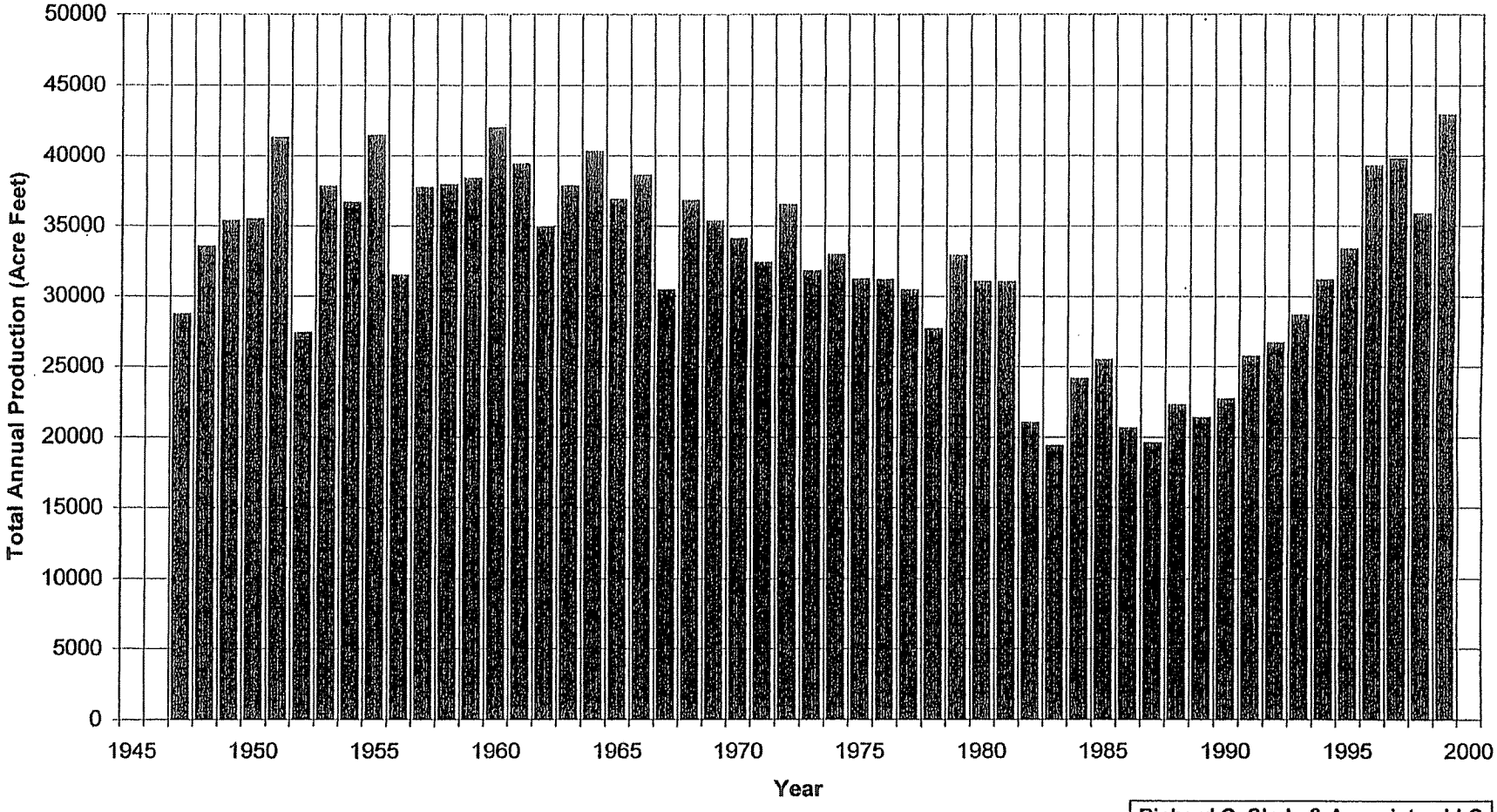
Cumulative Rainfall Departure Curve
Newhall - Soledad Gage
Santa Clarita Valley, CA



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Figure 3

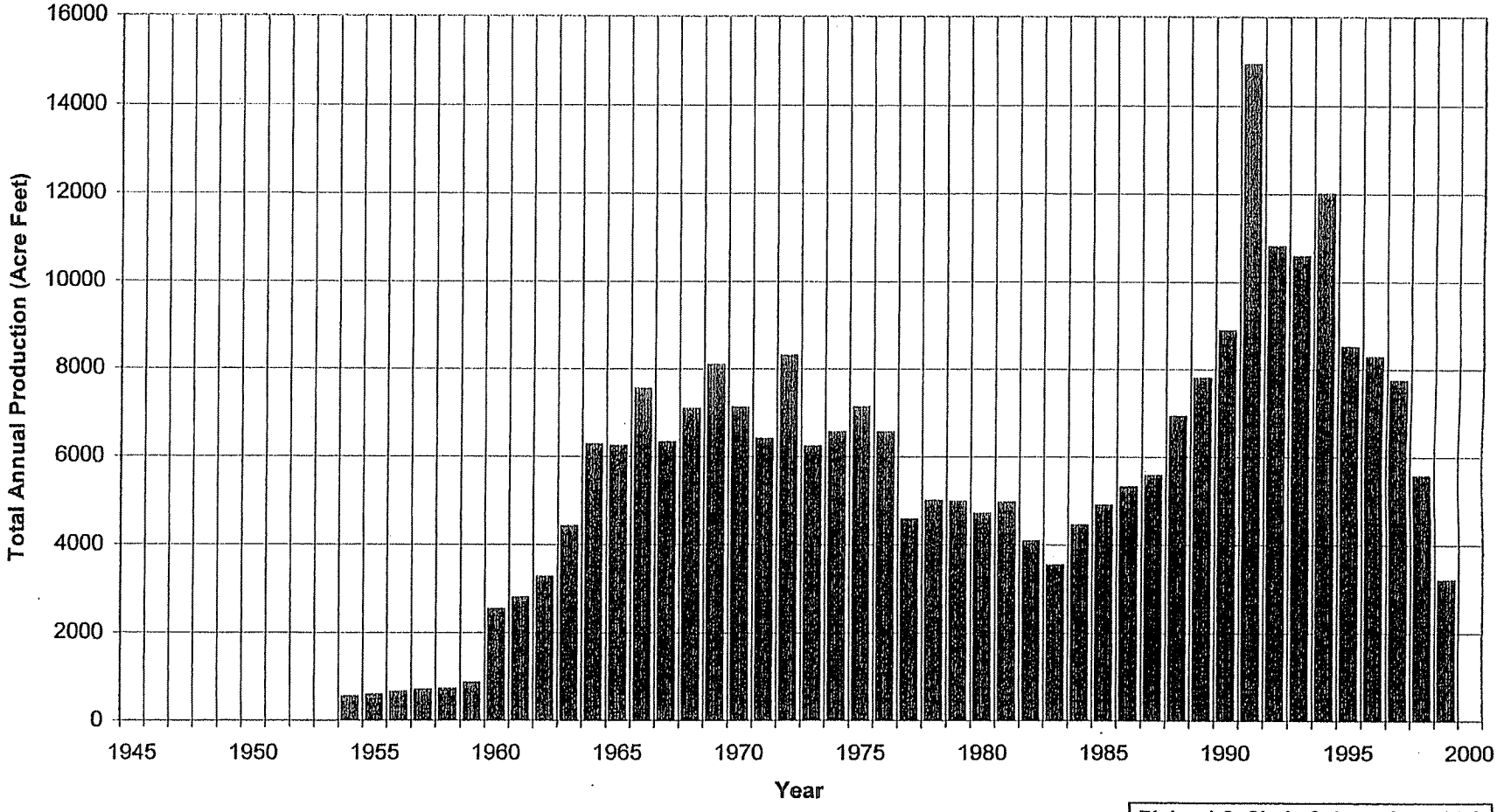
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Total Alluvial Aquifer System Production

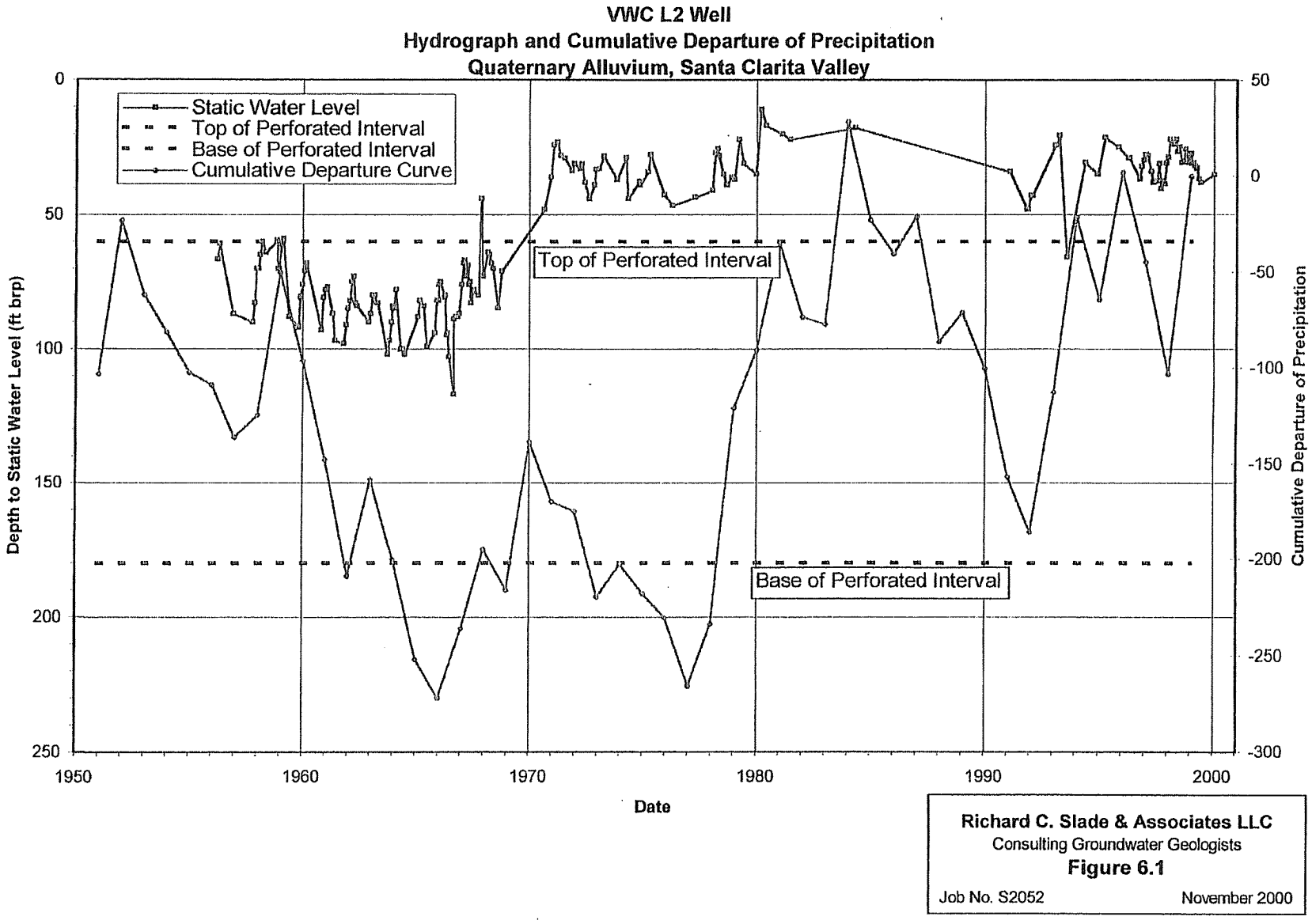


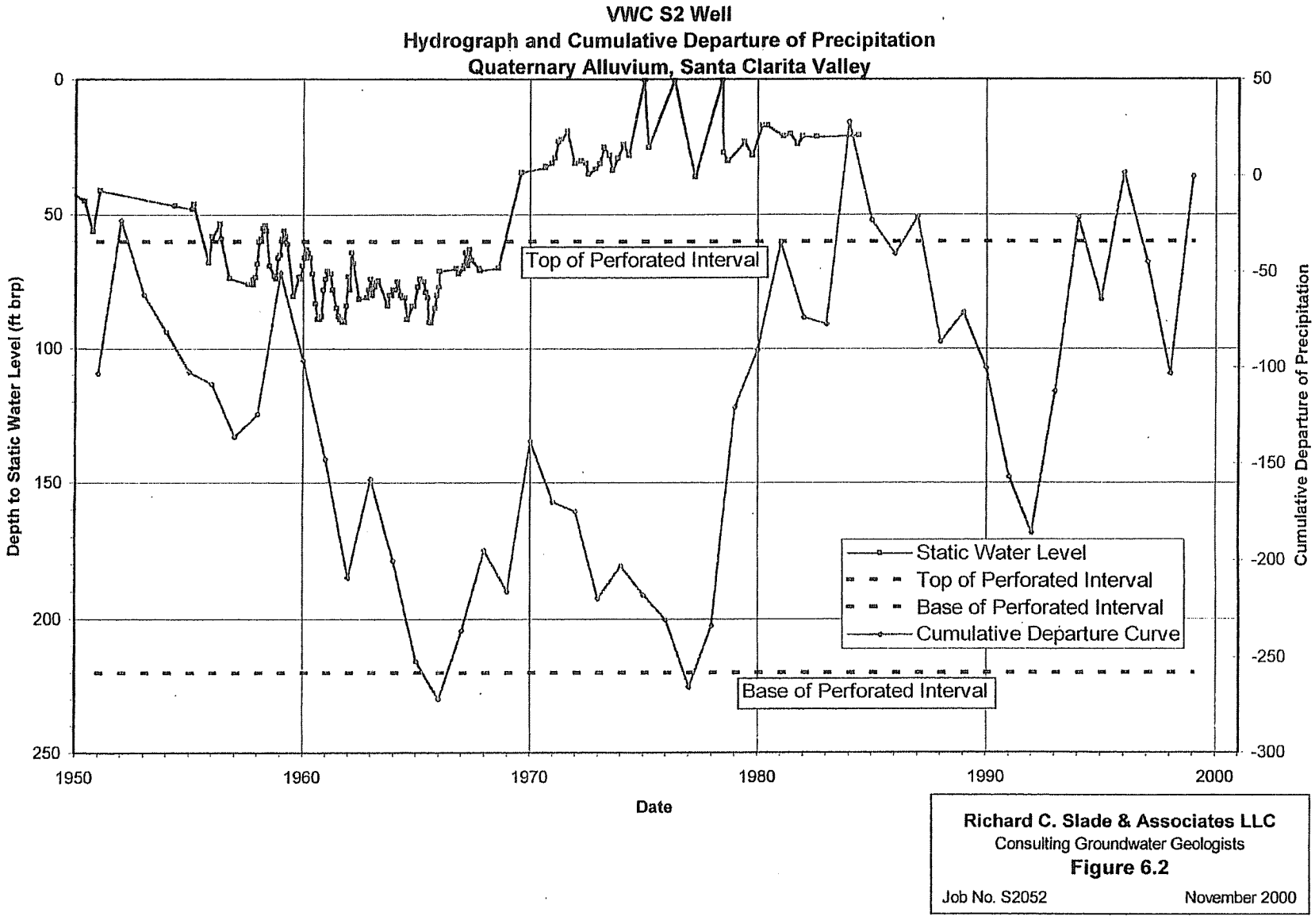
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Figure 4
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Total Saugus Formation Aquifer System Production



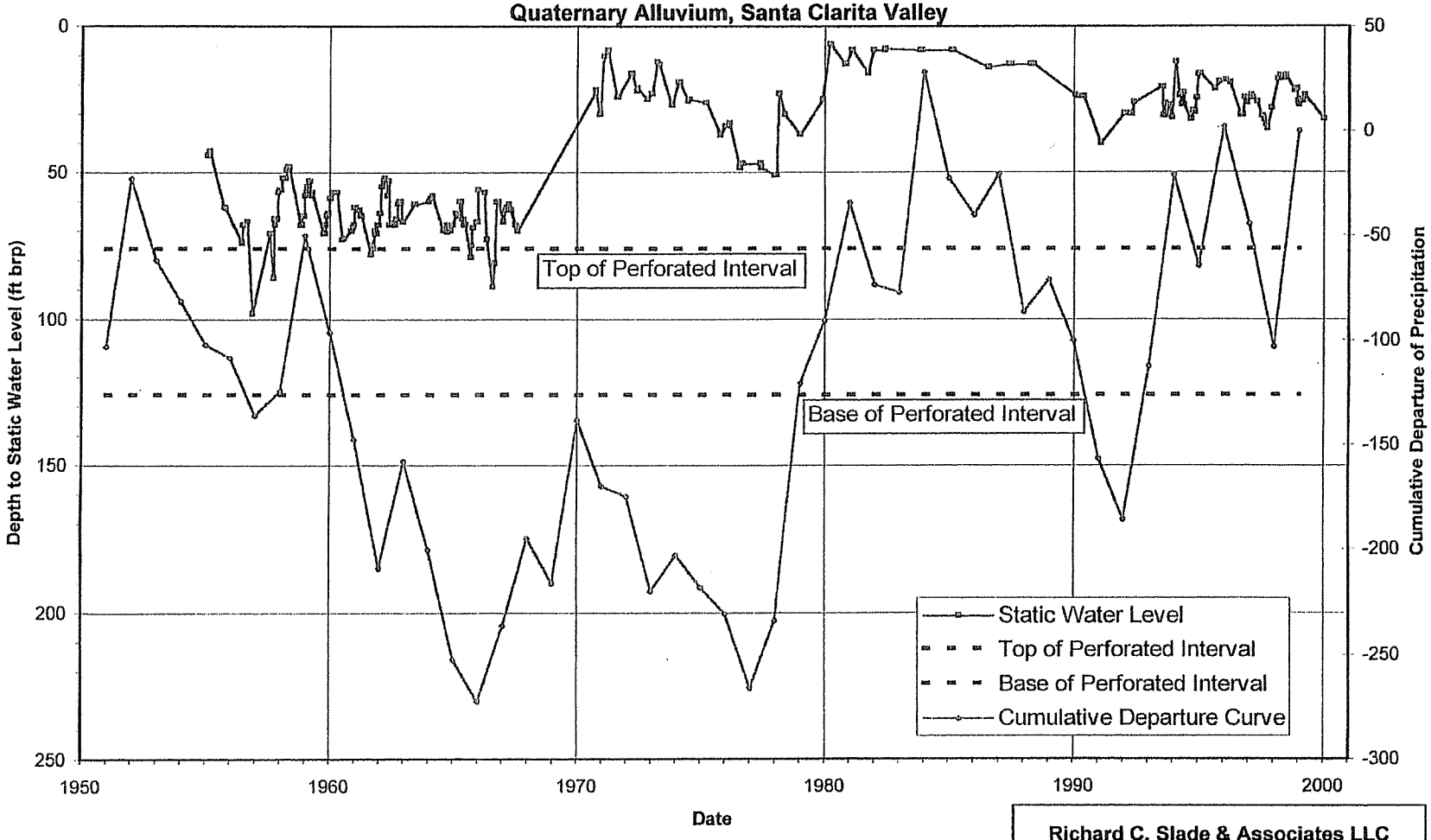
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Figure 5
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VWC L2 Well
Hydrograph and Cumulative Departure of Precipitation
Quaternary Alluvium, Santa Clarita Valley
Static Water Level
Top of Perforated Interval
Base of Perforated Interval
Cumulative Departure Curve
Top of Perforated Interval
Base of Perforated Interval
Depth to Static Water Level (ft brp)
Cumulative Departure of Precipitation
Date
0
50
100
150
200
250
50
0
-50
-100
-150
-200
-250
-300
1950
1960
1970
1980
1990
2000
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Figure 6.1
Job No. S2052
November 2000



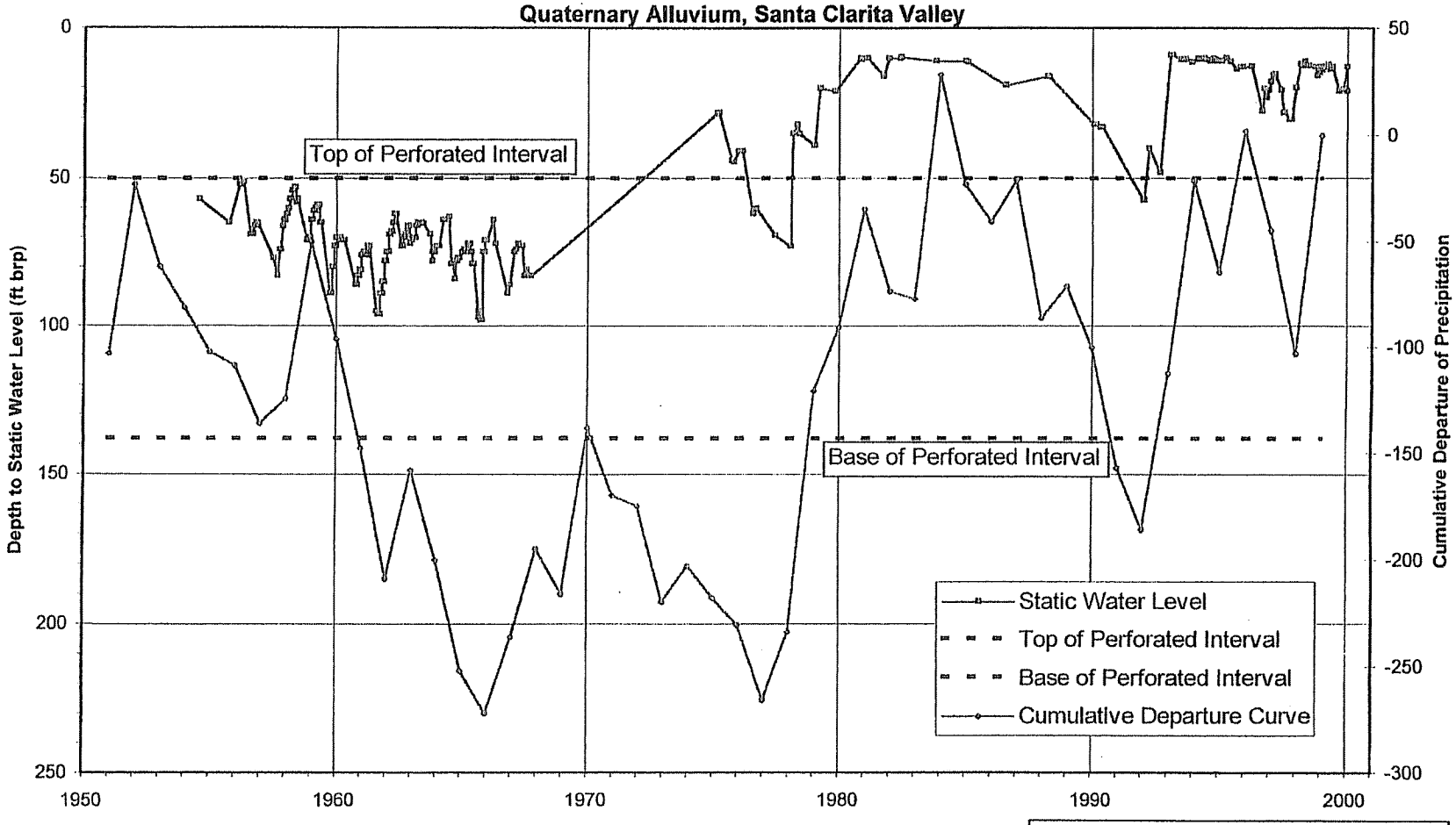
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Figure 6.2
Job No. S2052 November 2000

VWC Well Q2
Hydrograph and Cumulative Departure of Precipitation
Quaternary Alluvium, Santa Clarita Valley

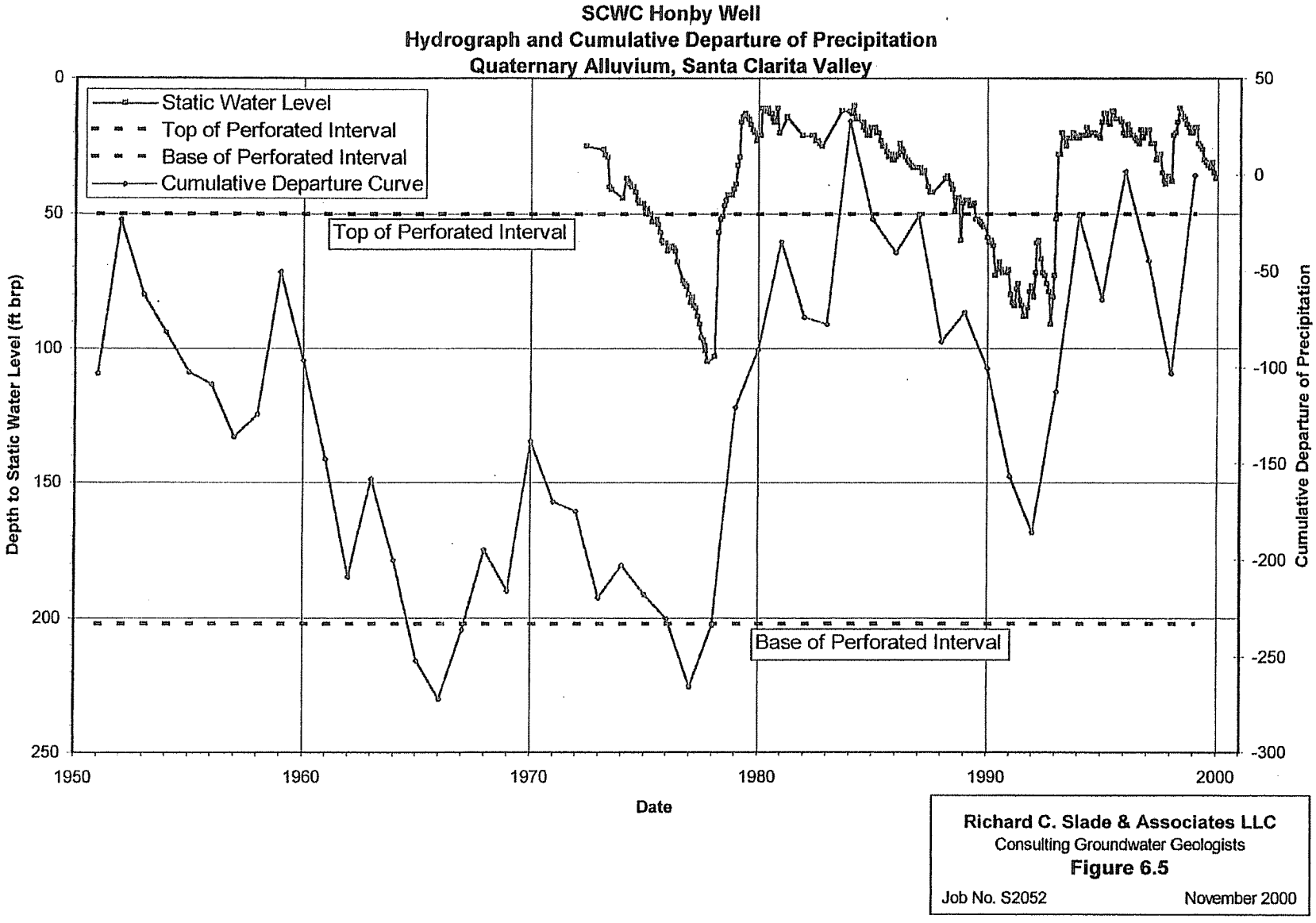


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Figure 6.3
Job No. S2052 November 2000

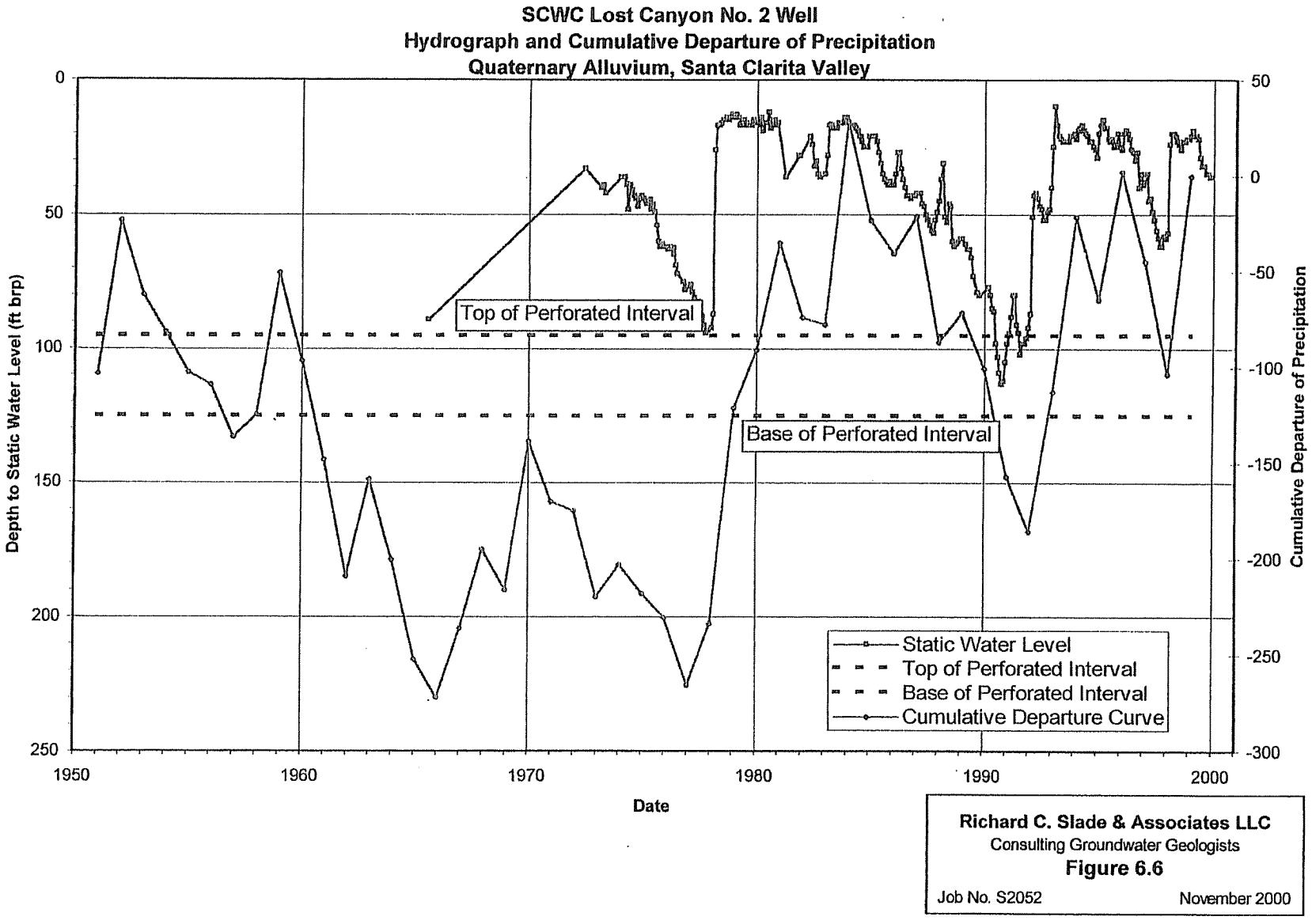
VWC Well T2
Hydrograph and Cumulative Departure of Precipitation
Quaternary Alluvium, Santa Clarita Valley



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Figure 6.4
Job No. S2052 November 2000

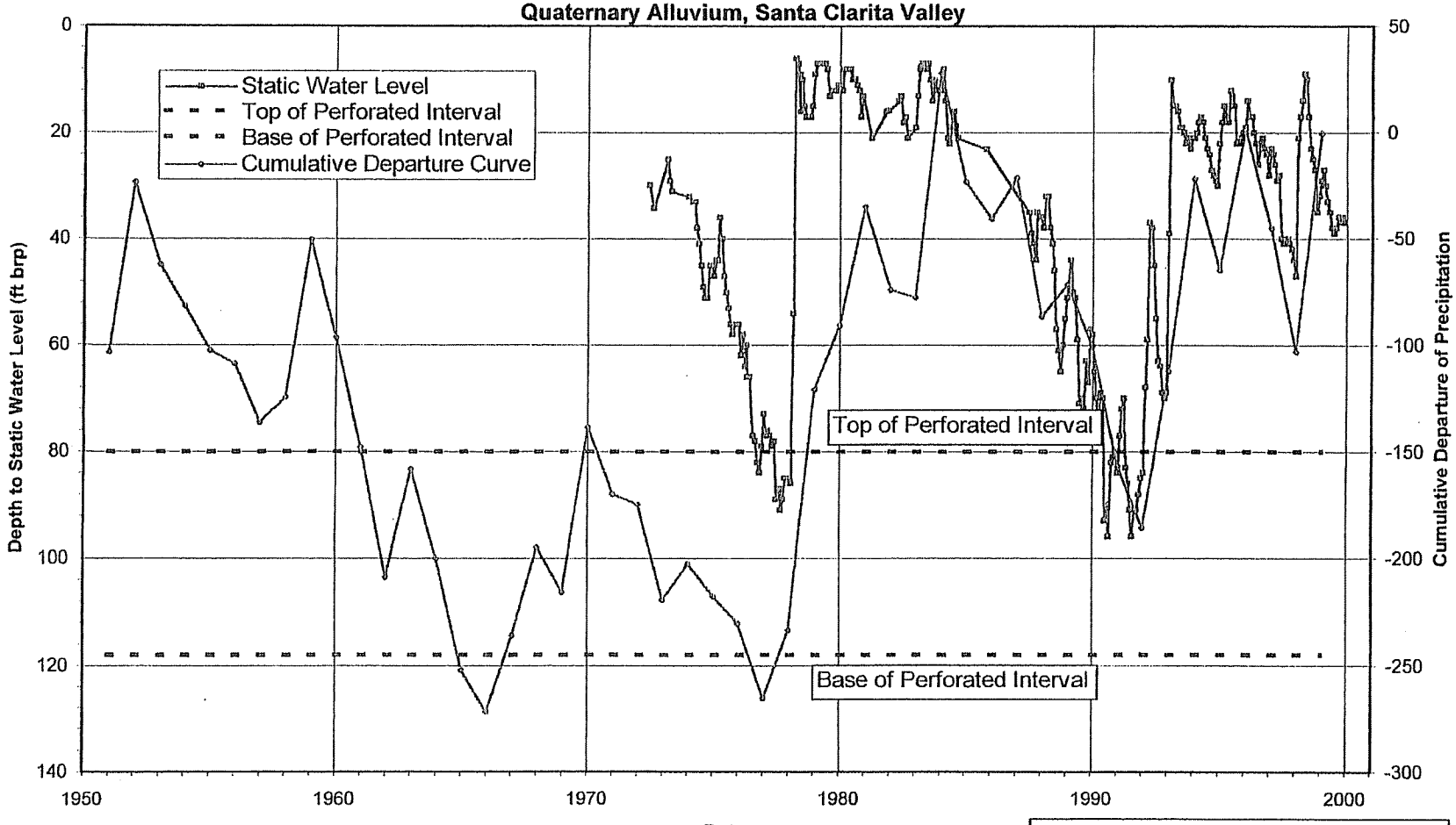


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Figure 6.5
Job No. S2052 November 2000

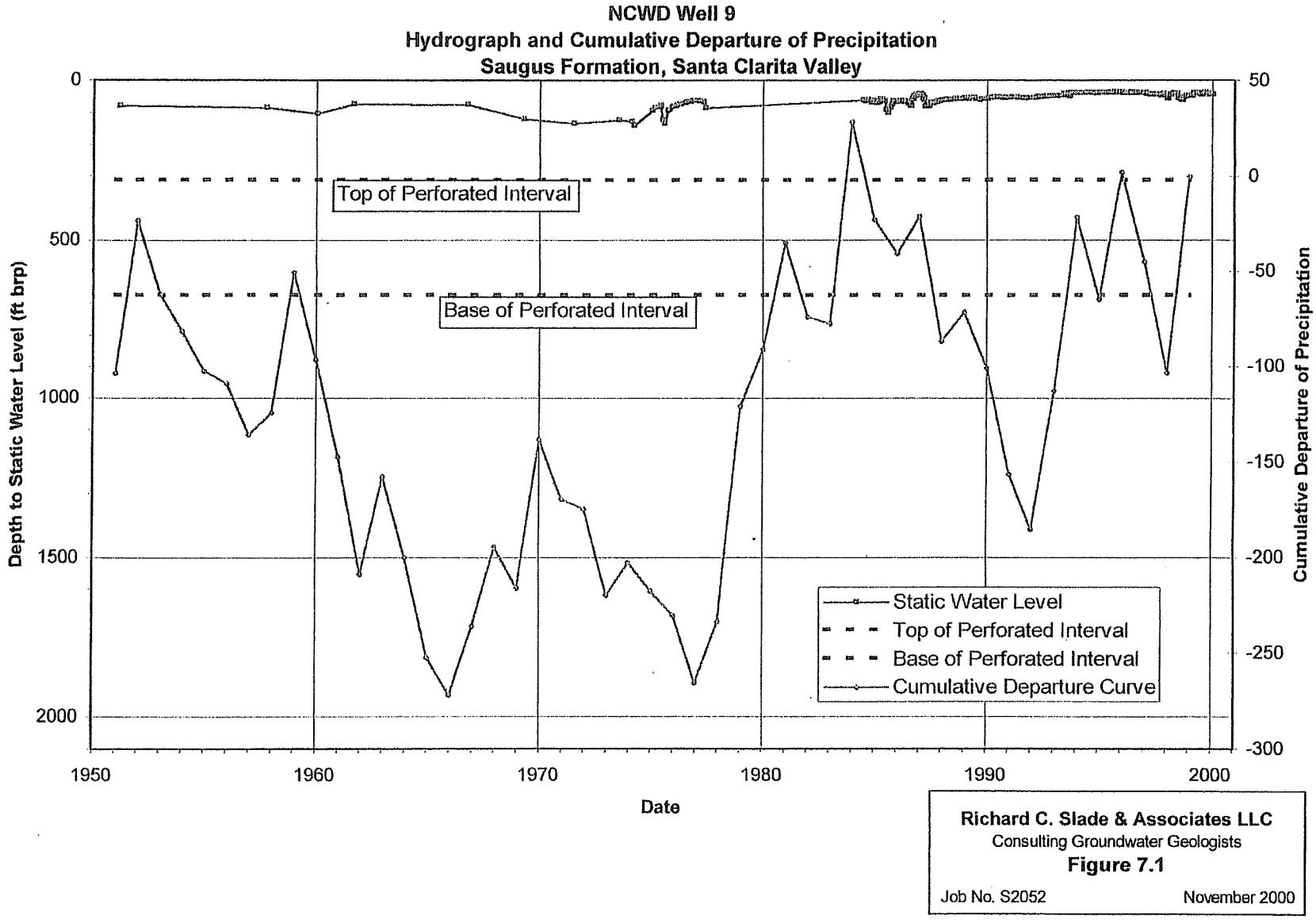


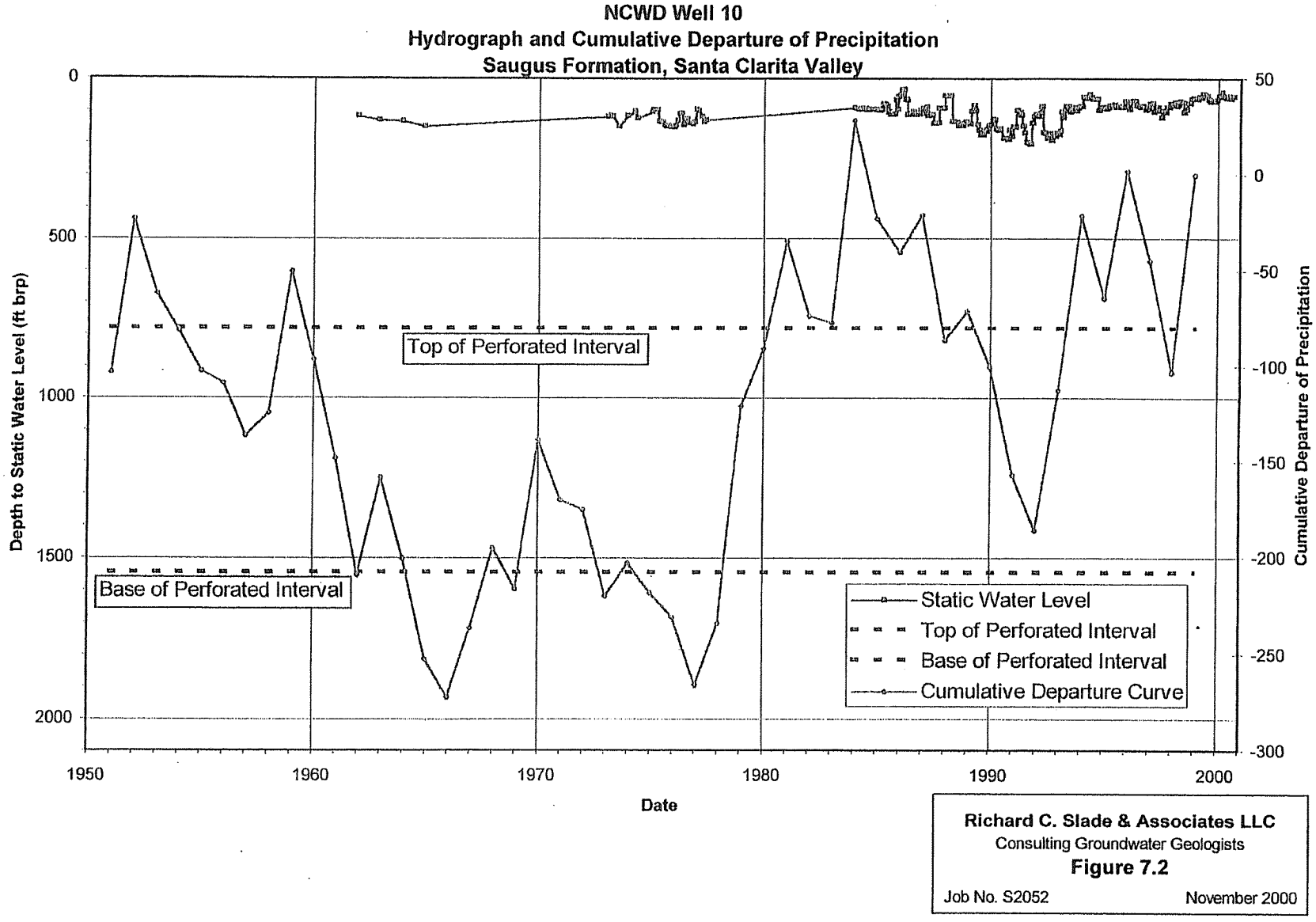
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Figure 6.6
Job No. S2052 November 2000

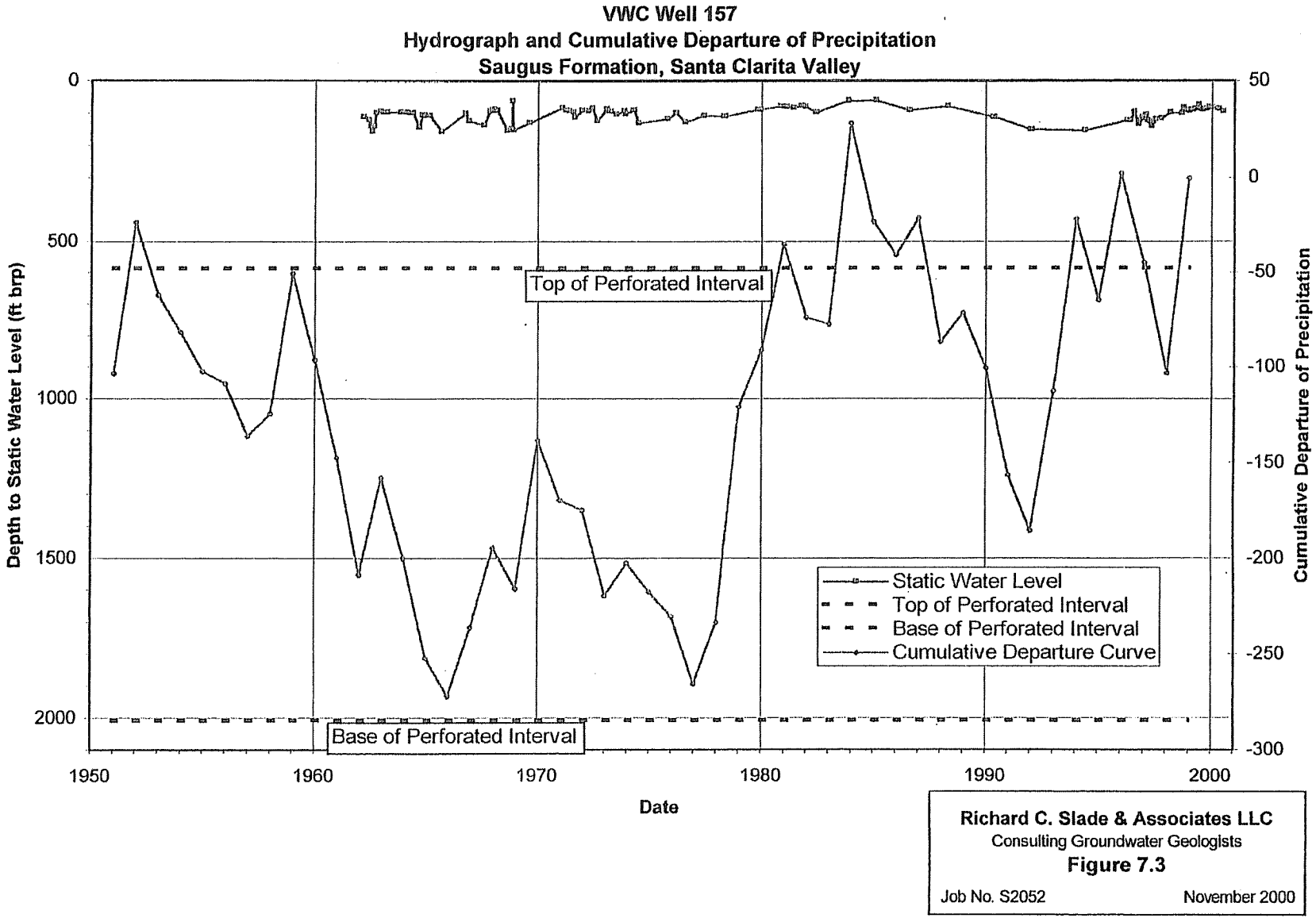
SCWC North Oaks West Well
Hydrograph and Cumulative Departure of Precipitation
Quaternary Alluvium, Santa Clarita Valley



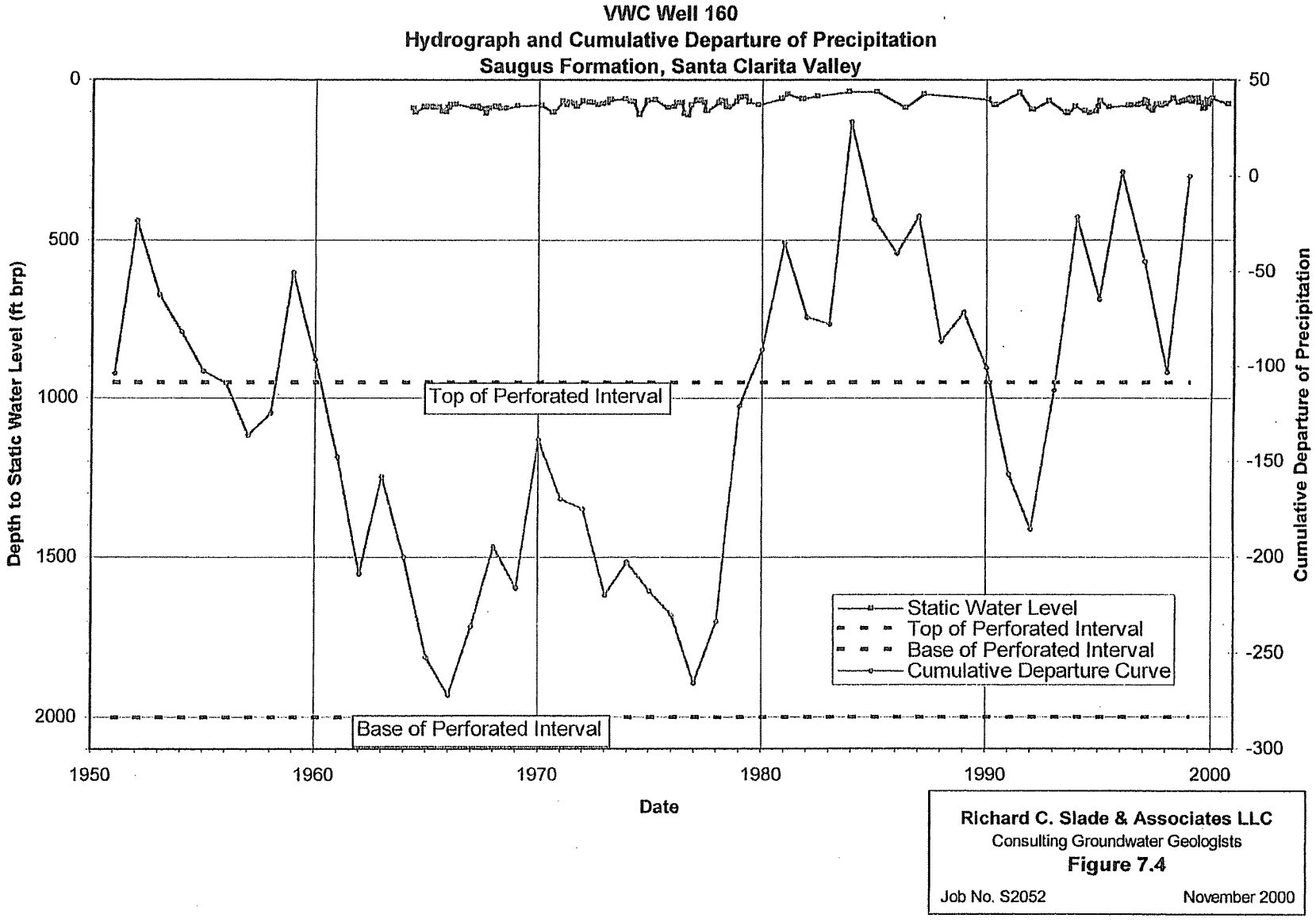
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Figure 6.7
Job No. S2052 November 2000

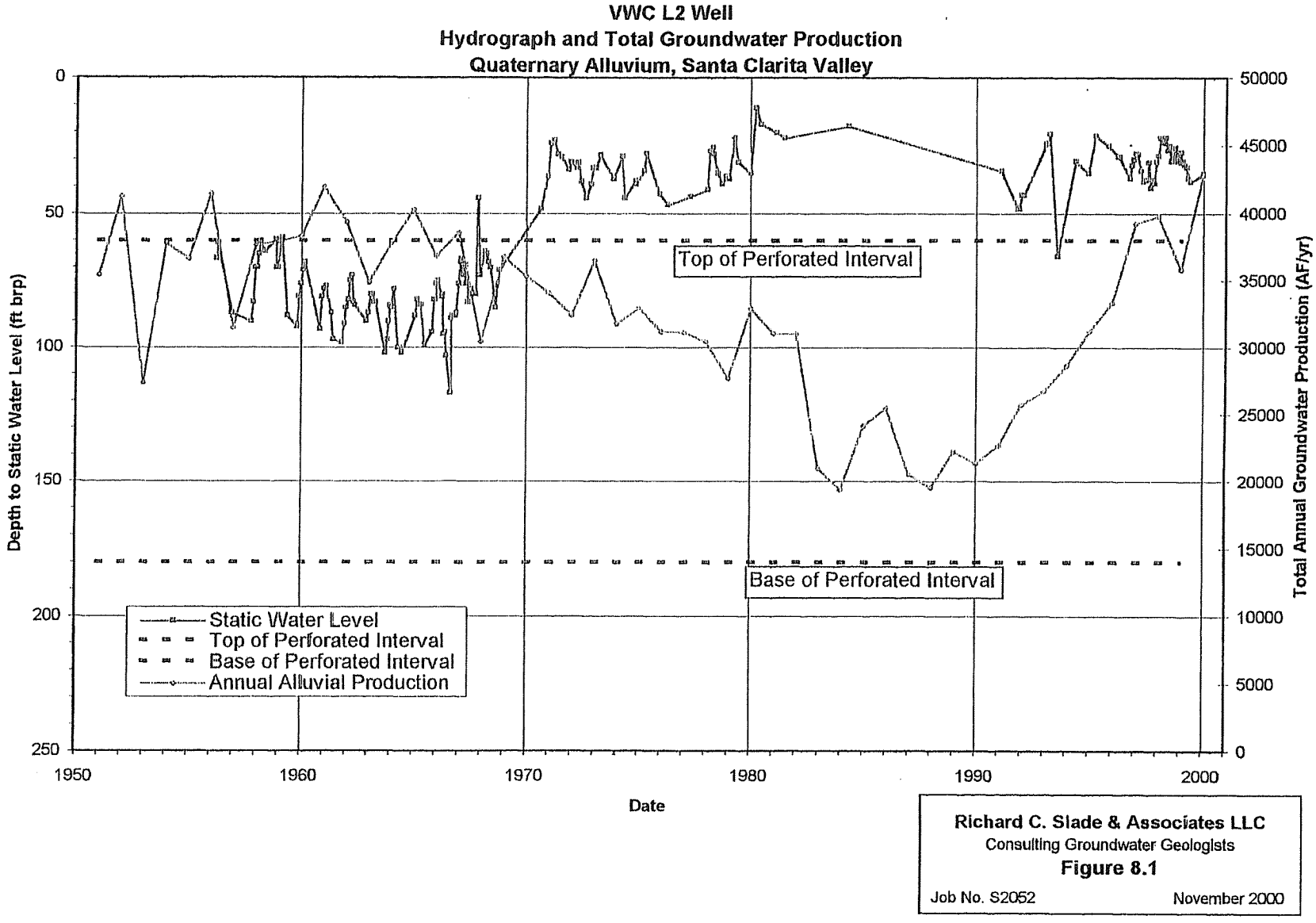

NCWD Well 9
Hydrograph and Cumulative Departure of Precipitation
Saugus Formation, Santa Clarita Valley
Depth to Static Water Level (ft brp)
Cumulative Departure of Precipitation
Date
Top of Perforated Interval
Base of Perforated Interval
Static Water Level
Top of Perforated Interval
Base of Perforated Interval
Cumulative Departure Curve
0
500
1000
1500
2000
50
0
-50
-100
-150
-200
-250
-300
1950
1960
1970
1980
1990
2000
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Figure 7.1
Job No. S2052
November 2000


NCWD Well 10
Hydrograph and Cumulative Departure of Precipitation
Saugus Formation, Santa Clarita Valley
Depth to Static Water Level (ft brp)
Cumulative Departure of Precipitation
Date
0
500
1000
1500
2000
50
0
-50
-100
-150
-200
-250
-300
1950
1960
1970
1980
1990
2000
Top of Perforated Interval
Base of Perforated Interval
Static Water Level
Top of Perforated Interval
Base of Perforated Interval
Cumulative Departure Curve
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Consulting Groundwater Geologists
Figure 7.2
Job No. S2052
November 2000

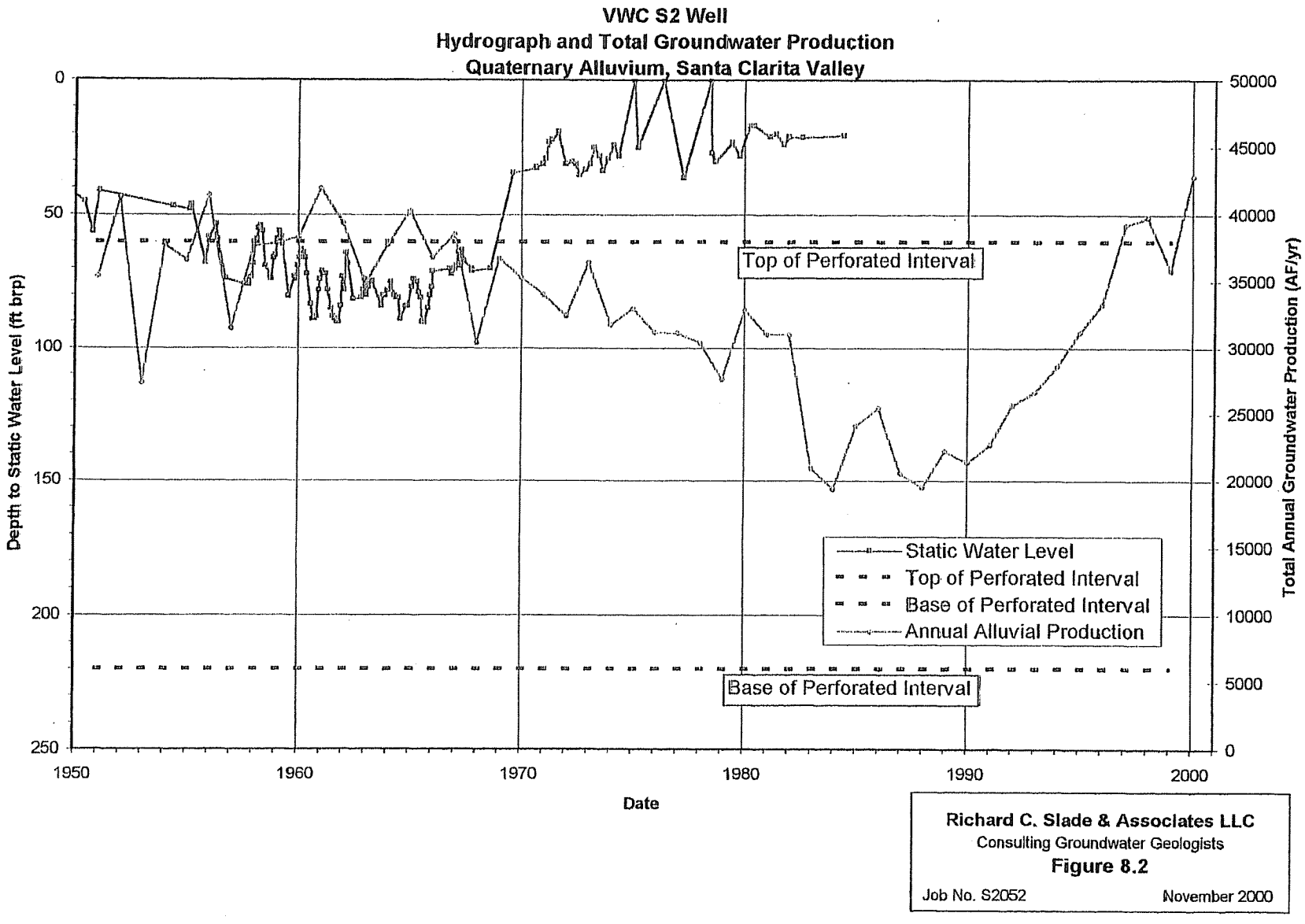


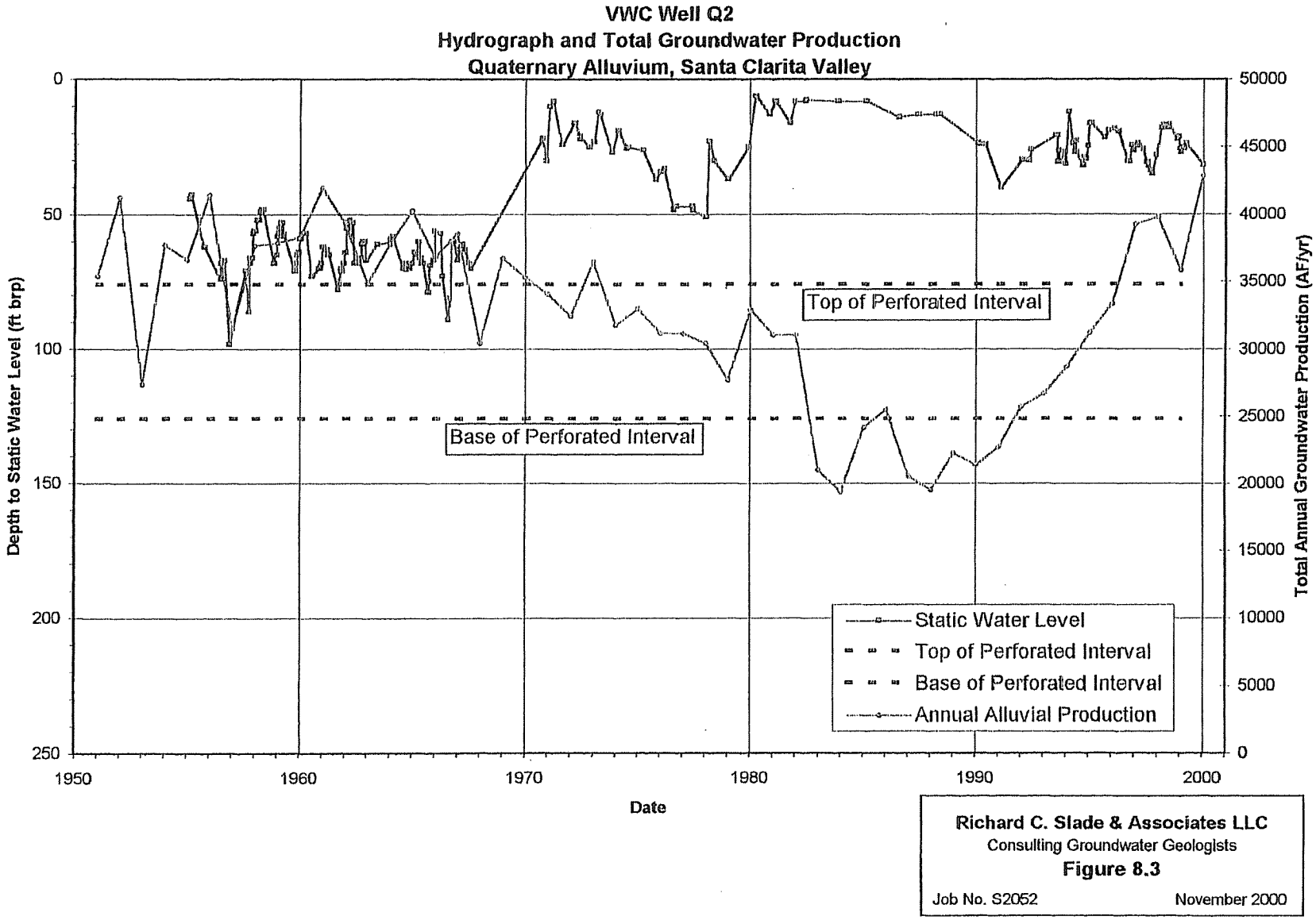
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Consulting Groundwater Geologists
Figure 7.3
Job No. S2052 November 2000


VWC Well 160
Hydrograph and Cumulative Departure of Precipitation
Saugus Formation, Santa Clarita Valley
Depth to Static Water Level (ft brp)
Cumulative Departure of Precipitation
Date
0
500
1000
1500
2000
50
0
-50
-100
-150
-200
-250
-300
1950
1960
1970
1980
1990
2000
Top of Perforated Interval
Base of Perforated Interval
Static Water Level
Top of Perforated Interval
Base of Perforated Interval
Cumulative Departure Curve
Richard C. Slade & Associates LLC
Consulting Groundwater Geologists
Figure 7.4
Job No. S2052
November 2000

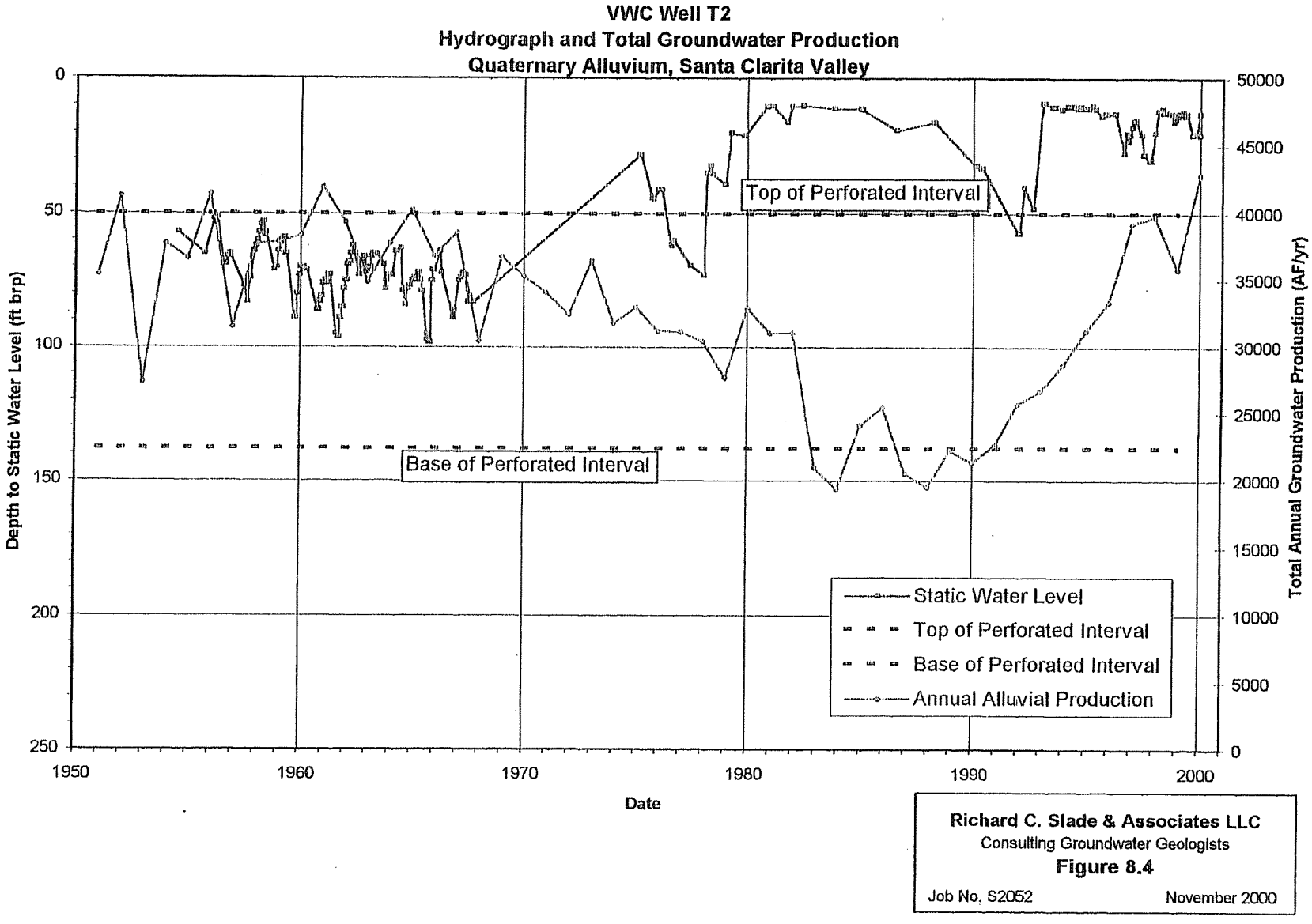


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Consulting Groundwater Geologists
Figure 8.1
Job No. S2052 November 2000


VWC S2 Well
Hydrograph and Total Groundwater Production
Quaternary Alluvium, Santa Clarita Valley
Depth to Static Water Level (ft brp)
Total Annual Groundwater Production (AF/yr)
Date
0
50
100
150
200
250
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
1950
1960
1970
1980
1990
2000
Top of Perforated Interval
Base of Perforated Interval
Static Water Level
Top of Perforated Interval
Base of Perforated Interval
Annual Alluvial Production
Richard C. Slade & Associates LLC
Consulting Groundwater Geologists
Figure 8.2
Job No. S2052
November 2000



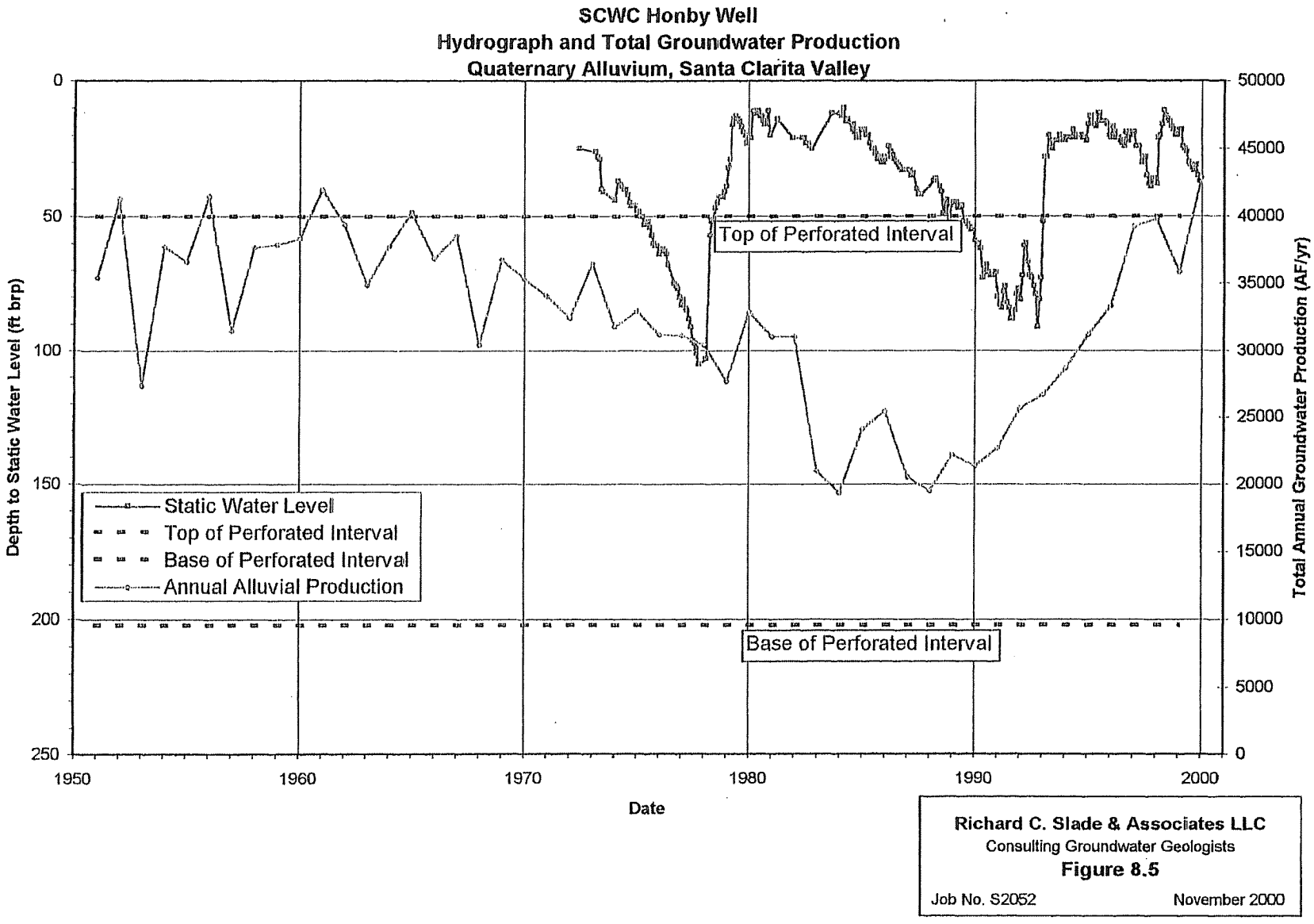
Richard C. Slade & Associates LLC
Consulting Groundwater Geologists
Figure 8.3
Job No. S2052 November 2000

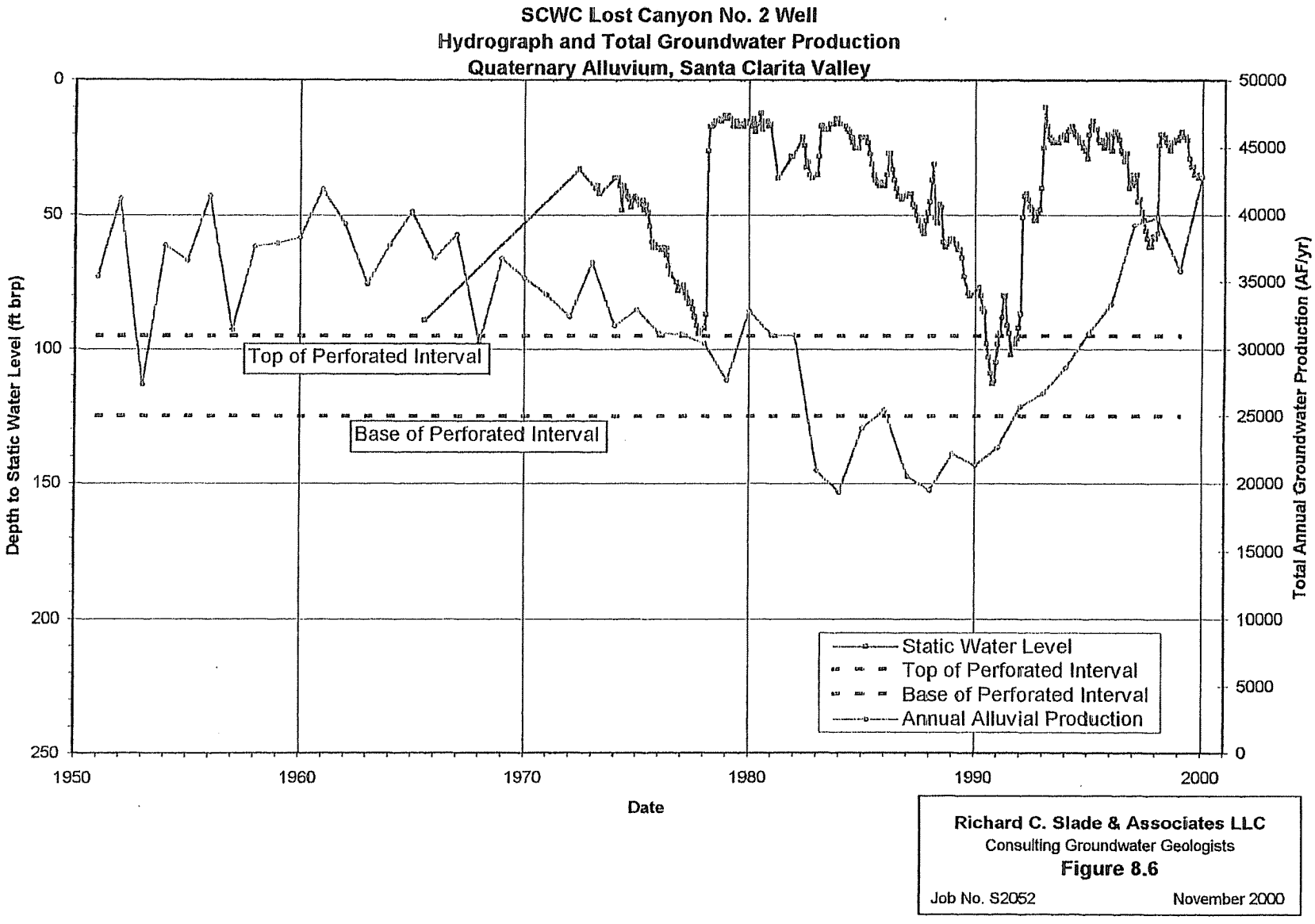


Richard C. Slade & Associates LLC
Consulting Groundwater Geologists

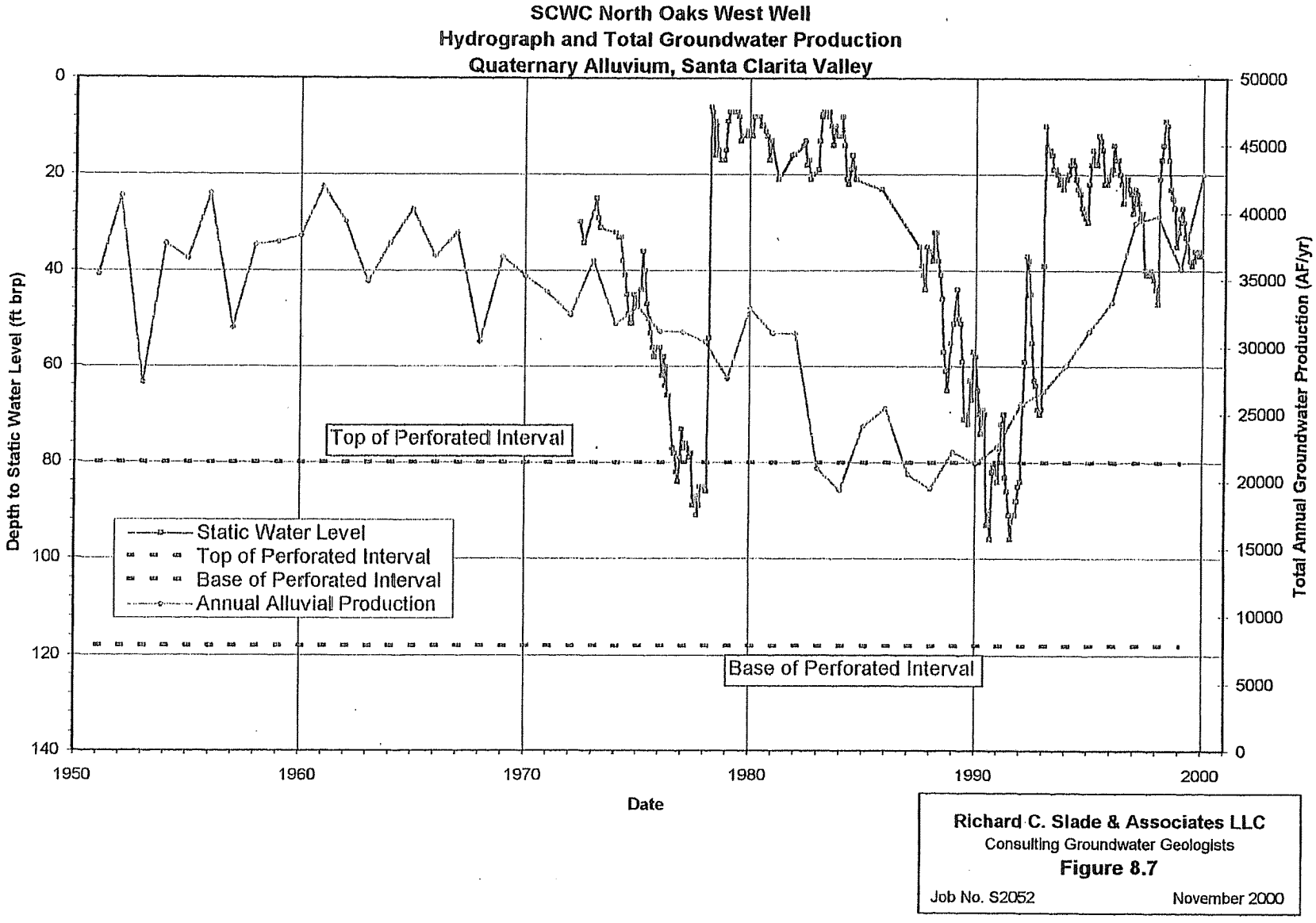
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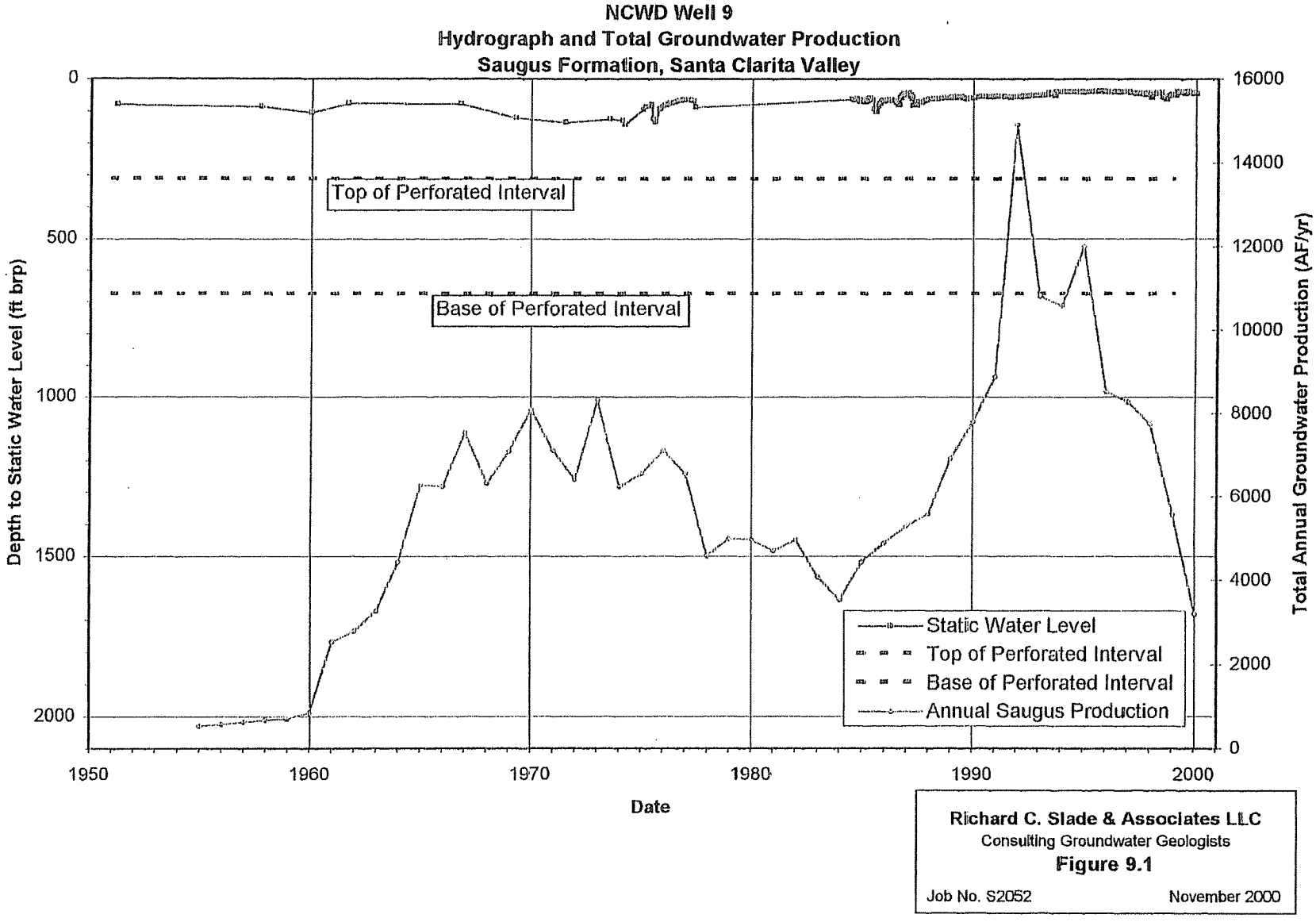
Job No. S2052 November 2000


SCWC Honby Well
Hydrograph and Total Groundwater Production
Quaternary Alluvium, Santa Clarita Valley
Depth to Static Water Level (ft brp)
Total Annual Groundwater Production (AF/yr)
Date
0
50
100
150
200
250
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
1950
1960
1970
1980
1990
2000
Top of Perforated Interval
Base of Perforated Interval
Static Water Level
Top of Perforated Interval
Base of Perforated Interval
Annual Alluvial Production
Richard C. Slade & Associates LLC
Consulting Groundwater Geologists
Figure 8.5
Job No. S2052
November 2000

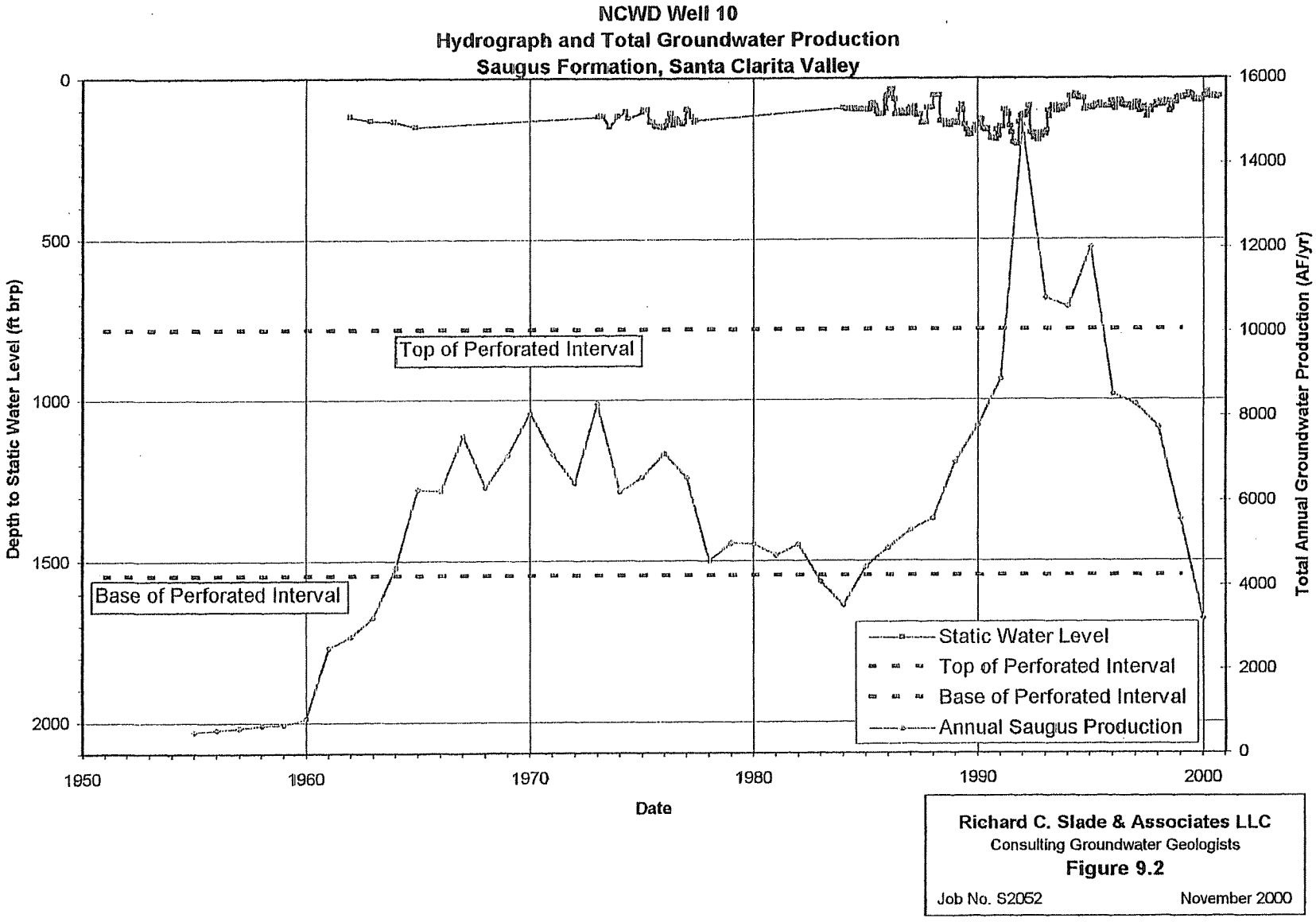


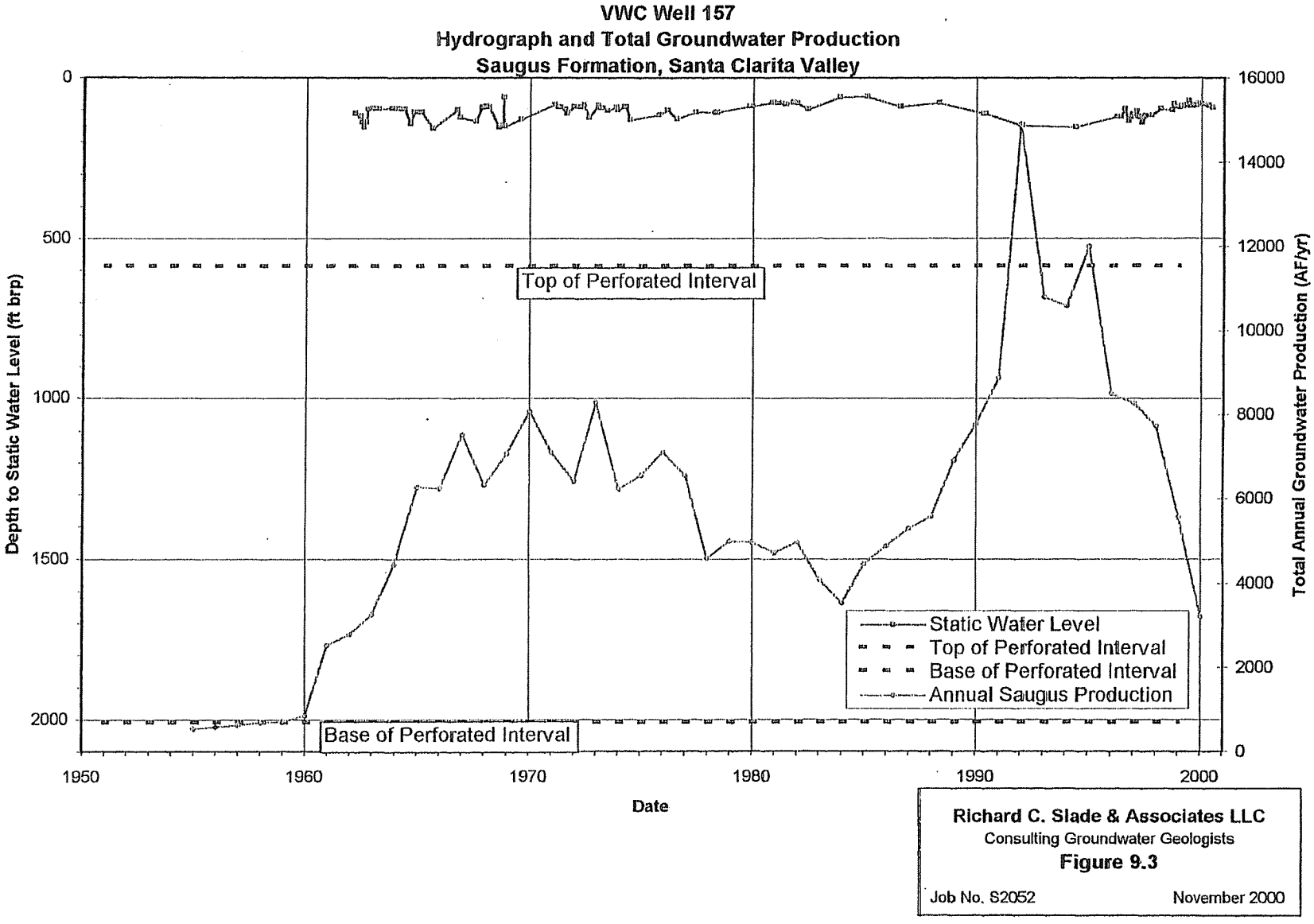
Richard C. Slade & Associates LLC
Consulting Groundwater Geologists
Figure 8.6
Job No. S2052 November 2000

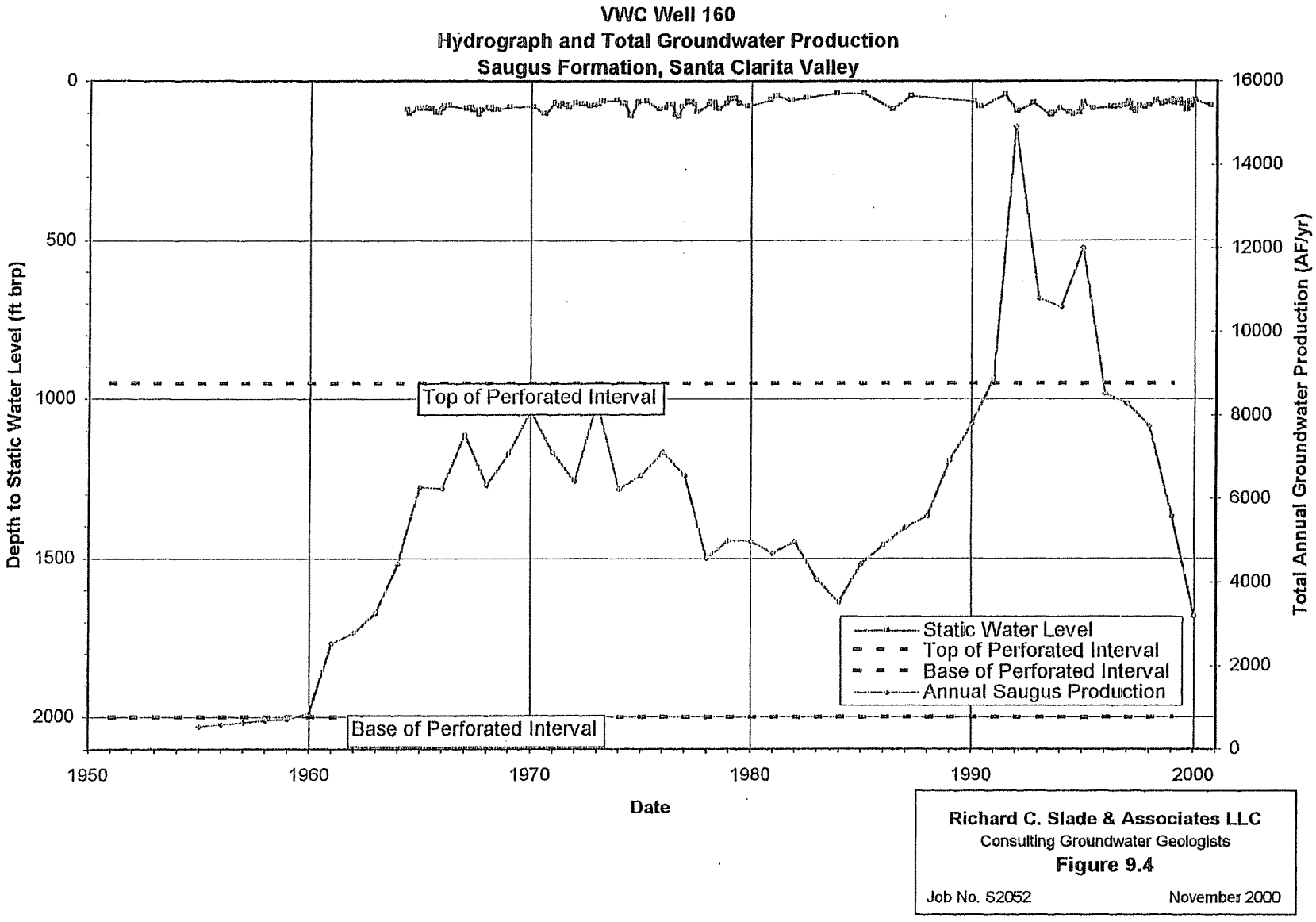

SCWC North Oaks West Well
Hydrograph and Total Groundwater Production
Quaternary Alluvium, Santa Clarita Valley
Depth to Static Water Level (ft brp)
Total Annual Groundwater Production (AF/yr)
Date
0
20
40
60
80
100
120
140
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
1950
1960
1970
1980
1990
2000
Top of Perforated Interval
Base of Perforated Interval
Static Water Level
Top of Perforated Interval
Base of Perforated Interval
Annual Alluvial Production
Richard C. Slade & Associates LLC
Consulting Groundwater Geologists
Figure 8.7
Job No. S2052
November 2000



Richard C. Slade & Associates LLC
Consulting Groundwater Geologists
Figure 9.1
Job No. S2052 November 2000


NCWD Well 10
Hydrograph and Total Groundwater Production
Saugus Formation, Santa Clarita Valley
Depth to Static Water Level (ft brp)
Total Annual Groundwater Production (AF/yr)
Date
0
500
1000
1500
2000
16000
14000
12000
10000
8000
6000
4000
2000
0
1950
1960
1970
1980
1990
2000
Top of Perforated Interval
Base of Perforated Interval
Static Water Level
Top of Perforated Interval
Base of Perforated Interval
Annual Saugus Production
Richard C. Slade & Associates LLC
Consulting Groundwater Geologists
Figure 9.2
Job No. S2052
November 2000


VWC Well 157
Hydrograph and Total Groundwater Production
Saugus Formation, Santa Clarita Valley
Depth to Static Water Level (ft brp)
Total Annual Groundwater Production (AF/yr)
Date
0
500
1000
1500
2000
16000
14000
12000
10000
8000
6000
4000
2000
0
1950
1960
1970
1980
1990
2000
Top of Perforated Interval
Base of Perforated Interval
Static Water Level
Top of Perforated Interval
Base of Perforated Interval
Annual Saugus Production
Richard C. Slade & Associates LLC
Consulting Groundwater Geologists
Figure 9.3
Job No. S2052
November 2000


VWC Well 160
Hydrograph and Total Groundwater Production
Saugus Formation, Santa Clarita Valley
Depth to Static Water Level (ft brp)
Total Annual Groundwater Production (AF/yr)
Date
0
500
1000
1500
2000
16000
14000
12000
10000
8000
6000
4000
2000
0
1950
1960
1970
1980
1990
2000
Top of Perforated Interval
Base of Perforated Interval
Static Water Level
Top of Perforated Interval
Base of Perforated Interval
Annual Saugus Production
Richard C. Slade & Associates LLC
Consulting Groundwater Geologists
Figure 9.4
Job No. S2052
November 2000

APPENDIX D

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

GROUND-WATER RESOURCES
HYDROLOGY • DEVELOPMENT • MANAGEMENT

December 15, 2000
File 00-1-128

Mr. Dave Argo
Mr. Dirk Reed
Black and Veatch
6 Venture, Suite 315
Irvine, CA 92618

SUBJECT: REVIEW OF GROUND-WATER COMPONENTS
2000 URBAN WATER MANAGEMENT PLAN
CLWA, NCWD, SCWC, and VWC

Dear Mr. Argo and Mr. Reed:

In response to your request, we have reviewed the Draft Urban Water Management Plan (UWMP) prepared for Castaic Lake Water Agency, Newhall County Water District, Santa Clarita Water Company, and Valencia Water Company (dated November 21, 2000). The focus of our review was on the ground-water components of that plan and on the memorandum from Richard C. Slade & Associates, which is included as Appendix C of the UWMP, on the subject "Groundwater Extractions, Alluvial and Saugus Formation Aquifer Systems, Santa Clarita Valley". In reviewing the UWMP, our primary consideration was to respond to certain comments which you asked us to address about the availability of ground water at the yields reported in the UWMP. Specifically, our understanding of those comments is that they claim that ground-water availability is overstated in the UWMP, that the projected ground-water supplies as summarized in Table 2-1 and embedded in other tables will deplete or "dry up" the ground-water basin, and that the ground-water supplies in the UWMP should consequently be smaller. In general summary, based on our review of the UWMP and also based on other work which we have done on ground water in the area, we would disagree with the comments that claim that ground-water availability is overstated or, if utilized at the yields reported in the UWMP, will deplete or "dry up" the ground-water basin.

In conducting our review, we relied primarily on the information presented in the Plan, complemented by other previously prepared reports, most notably those prepared by Slade on the Alluvial and Saugus aquifer systems in the late 1980's, as well as the 1999 Water Report and all the supporting hydrologic data which is either part of that report or related to it. As reviewers of the UWMP, we did not undertake any independent numerical or other analyses, nor did we perform any substantive new work in analyzing ground-water conditions in the Santa Clarita

area. We did, however, prepare a series of water balances to generally assess whether the Saugus Formation is likely to be in or out of overall balance if it were to be developed as indicated in the Plan: in the range of 7,500 to 15,000 acre-feet per year (afy) in average/normal years, and up to 35,000 afy in dry years. Those water balances are partial bases for our conclusions and general support for the Alluvial and Saugus yields expressed in the UWMP, particularly in light of the fact that those yields are for planning purposes.

As part of the overall water supply for the Santa Clarita Valley area, the UWMP includes ground-water supplies from the two aquifer systems beneath the Valley as follows: from the Alluvium - 30,000 to 40,000 afy in average/normal years, and 30,000 to 35,000 afy in dry years; and from the Saugus - 7,500 to 15,000 afy in average/normal years, and 21,000 to 35,000 afy in dry years. Based on a combination of historical operating experience with the Alluvium and a general assessment of pumping and recharge in the Saugus Formation, we would expect that those ranges of pumping will likely be within the perennial yields of the two aquifer systems, and will not result in any obvious overdraft or depletion of ground-water resources in the area.

The Alluvial aquifer system is the easier of the two to address since it has historically (over the last 50 years) been pumped in numerous years and for extended periods in the ranges cited in the UWMP without undesirable results, i.e. without any evidence of overdraft. In other words, the Alluvium has been managed within its perennial yield, while pumping in the broad range of nearly 20,000 afy to more than 42,000 afy. Although there have been seasonal and longer term intermittent lowering of ground-water levels in response to both variations in pumping and variations in precipitation (and associated recharge), the long-term trend in Alluvial ground-water levels has been stable, with no persistent trend toward lower water levels and associated depletion of ground-water storage. While the cited ranges for Alluvial pumpage in various year-types suggest that, overall, the average extraction will be greater than the perennial yield reported by Slade in 1986, recent high Alluvial pumping and sustained high ground-water levels suggest that an updated perennial yield analysis would result in a higher value of perennial yield than that reported by Slade nearly 15 years ago. Ultimately, however, the exact number is not as important as operating in a range of production that does not cause undesirable results such as chronic ground-water level decline; the ranges cited in the UWMP would certainly fit that criterion. In any case, in light of the range of historical pumping from the Alluvium and the lack of any chronic ground-water level depression as a result of that pumping, it appears sound to plan on long-term ground-water supplies from the Alluvium in the general ranges of pumping included in the UWMP, which are consistent with what has been successfully practiced over the last 50 years.

The Saugus Formation is the more difficult of the two aquifers in the area to assess, both in terms of dry period water supply and long-time dependability, primarily because there is no historical operating experience in the range of dry-year Saugus pumping cited in the UWMP. The

memorandum in Appendix C includes a brief discussion of historical pumpage (up to a maximum of nearly 15,000 afy, and an average of slightly more than 7,000 afy over the last 20 years), limited historical water levels (no long-term change or other evidence of overdraft, with current levels comparable to pre-development levels), and ground-water storage (on the order of one million af in storage in the depth zone of 500 to 2,500 feet). Based on these conditions and a couple of other considerations (large areal extent and substantial vertical depth of the Saugus, and typically deep well completions with sufficient available drawdown in wells), it is concluded that it is hydrogeologically feasible to increase pumpage from the Saugus for short-term periods in a ramped manner from 15,000 to 25,000 to 40,000 afy. The memorandum is not specific with regard to pumping outside the "short-term" periods when pumpage might be increased; however, it implies that increased pumpage would occur only during dry periods, and that pumpage would decline to lower values in wet and normal periods such that the long-term stability in water levels and storage discussed in the memorandum would be maintained.

Our impression of the concerns expressed about the UWMP overstating the availability of ground water and the potential for pumpage at the yields in the UWMP to deplete or "dry up" the aquifer is that they are primarily concerned with the preceding increase in short-term, i.e. dry period, pumpage from the Saugus. While we agree that it is likely, based on the various considerations discussed in the Appendix, that the Saugus can support such an increase in pumpage without substantially affecting the significant storage in the aquifer and without any significant constraints by such factors as well completion depths and screen intervals, the key question not discussed in the Appendix is whether the Saugus can be expected to recover (recharge) from the short-term dry-period increases in pumpage. To generally address the latter concern as part of our review, we prepared several general water balances of the Saugus based on the ranges of pumping included in the UWMP and the recharge potential previously reported for the Saugus (Slade, 1988). While our water balance approach was very general in nature, it provides a useful indication that the Saugus should be in general balance and, more importantly, that the short-term dry-period increases in Saugus pumpage will not be permanent reductions in ground-water storage. In summary, we examined a range of pumping scenarios for the Saugus as follows, all based on the water supply summaries in Tables 1-4, 2-1, and 4-2 in the UWMP:

- pumpage in the middle of the 7,500 - 15,000 afy range (11,250 afy) in all average/normal years, and dry year pumpage in the middle of the 21,000 - 35,000 afy range (28,000 afy).

- historical average pumpage (7,500 afy) in average/normal years, and ramped increase in dry year pumpage as indicated in Table 4-2.

- historical average pumpage (7,500 afy) in average/normal years, and maximum Saugus pumpage (35,000 afy) in all dry years.

- historical maximum pumpage (15,000 afy) in all average/normal years, and ramped increase in dry year pumpage as indicated in Table 4-2.

All the preceding scenarios show general long-term balances, with the reductions to historical average pumpage or even to historical maximum pumpage in average/normal years sufficient to allow ground-water storage to recover such that the short-term dry period increases in pumpage do not represent permanent reductions in ground-water storage. Based on the information included in the UWMP, complemented by the general water balance assessment described above, we would conclude that the Saugus ground-water supply component in the UWMP is a reasonable plan for use of that aquifer system for a small part of the overall water supply, while also utilizing it on a renewable (recharged) basis to meet short-term dry period reductions in other water supplies.

In conclusion, as introduced above, our assessment of the ground-water supply components in the UWMP is that both the Alluvium and the Saugus are reasonable and sustainable sources at the yields represented in the Plan.. As such, those yields are not overstated and will not deplete or "dry up" the ground-water basin; and there is no need to "reduce" them for purposes of planning within the context of an Urban Water Management Plan.

We appreciate the opportunity to review the subject Urban Water Management Plan, and to provide the preceding comments on it. We trust that they will be useful in your completion of the Plan. If we can provide further detail or respond to questions regarding any of the above, we would be pleased to respond.

Sincerely,

LUHDORFF AND SCALMANINI
CONSULTING ENGINEERS

Joseph C. Scalmanini

JCS

JOINT STATEMENT ON THE MONTEREY AMENDMENTS LITIGATION
February 27, 2003

By the Department of Water Resources, the Central Coast Water Authority, the State Water Contractors, the Planning and Conservation League, the Plumas County Flood Control and Water Conservation District, and the Citizens' Planning Association of Santa Barbara County

In 1996, the "Monterey Amendment litigation" was filed against the Department of Water Resources. (*Planning and Conservation League vs. Department of Water Resources and Central Coast Water Authority*) During 2001 and 2002 mediation discussions were conducted under the auspices of Judge Daniel Weinstein (Ret.). In July 2002, the discussions resulted in a statement of principles for the settlement of the litigation. The negotiators have now completed work on a detailed set of papers that embodies those principles. Those settlement papers are being reviewed by the plaintiffs (Planning and Conservation League, the Plumas County Flood Control and Water Conservation District, and the Citizens' Planning Association of Santa Barbara County and defendants (DWR and the Central Coast Water Authority). (State Water Project contractors who were not parties to the Monterey Amendment litigation also participated in the negotiations.)

The Monterey Amendments are amendments to the long-term water supply contracts for the SWP executed by the DWR and most of the State Water contractors in 1995 and 1996. In a 2000 ruling in this lawsuit, the Third District Court of Appeal in Sacramento held that the environmental impact report for the Monterey Amendments ("1995 EIR") did not comply with the California Environmental Quality Act.

DWR has commenced preparing a new Environmental Impact Report (the "new EIR") and published the Notice of Preparation for the new EIR on January 24, 2003.

This is a complex agreement. Selected key components of the settlement are summarized below:

- DWR and the SWP contractors will take actions, including adoption of new amendments to the SWP contracts, to improve and clarify disclosure of information about the delivery capability of the SWP. Contract amendments will delete the term "entitlement" and replace that term with "Table A Amount." The amendment will not change DWR's water delivery obligations under the SWP contracts. The amendment will also require DWR to distribute a biennial report to SWP contractors and all city, county, and regional planning agencies within the SWP project area, providing

information as to SWP delivery capabilities, historic deliveries, and estimated deliveries under a range of hydrologic conditions.

- The parties reached agreement on the content, scope and process for the new EIR.
- DWR will act as lead agency in preparing the new EIR.
- Future negotiations for certain amendments to SWP water contracts between DWR and the SWP contractors will be conducted in public.
- DWR will issue guidelines for its review and approval of permanent water transfers.
- The Kern Water Bank will remain in local ownership and will operate as it has, but will be subject to additional restrictions on use.
- $8 million will be paid to Plumas, primarily for watershed improvements in the Feather River watershed, and for other district-related purposes, to be disbursed with input from a watershed forum composed of representatives of Plumas, local community groups, DWR, and SWP contractors.
- $5.5 million will be paid in installments to plaintiffs to implement the settlement, including watershed restoration projects, follow-up actions arising from the settlement, and technical studies.
- The State Water Project will be operated pursuant to the Monterey Amendments and new amendments pending completion of the new EIR and termination of the litigation.
- Procedural provisions of the Settlement Agreement address the relations of the parties, a process for resolving disputes, and the status of the litigation while the new EIR is being prepared and thereafter.

The Settlement Agreement and Notice of Preparation can be viewed from the DWR website links listed below:

Settlement Agreement –Without Attachments and Exhibits

Settlement Agreement -Attachments and Exhibits

Settlement Agreement -Complete Document

Notice of Preparation of EIR

ATTACHMENT A

AMENDMENT TO STATE WATER PROJECT CONTRACT

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

AMENDMENT NO. ____ TO THE WATER SUPPLY CONTRACT BETWEEN THE STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES AND _____

This amendment is made this ____ day of _____, 2003, pursuant to the provisions of the California Water Resources Development Bond Act, the Central Valley Project Act, and other applicable laws of the State of California, between the State of California, acting by and through its Department of Water Resources, hereinafter referred to as the "State", and _____, hereinafter referred to as the "District" [or "Agency"].

RECITALS

WHEREAS, the State and the District entered into and subsequently amended a water supply contract (the "contract") providing that the State shall supply certain quantities of water to the District and providing that the District shall make certain payments to the State, and setting forth the terms and conditions of such supply and such payments; and

WHEREAS, on December 1, 1994, the State and representatives of certain State Water Project contractors executed a document entitled "Monterey Agreement – Statement of Principles – By The State Water Contractors And The State Of California Department Of Water Resources For Potential Amendments To The State Water Supply Contracts" (the "Monterey Agreement"); and

WHEREAS, the State, the Central Coast Water Authority ("CCWA") and those contractors intending to be subject to the Monterey Agreement subsequently negotiated an amendment to their contracts to implement provisions of the Monterey Agreement, and such amendment was named the "Monterey Amendment"; and

WHEREAS, in October 1995, an environmental impact report ("EIR") for the Monterey Amendment was completed and certified by CCWA as the lead agency, and thereafter the District and the State executed the Monterey Amendment; and

WHEREAS, the EIR certified by the CCWA was challenged by several parties (the "Plaintiffs") in the Sacramento County Superior Court and thereafter in the Third District Court of Appeal, resulting in a decision in *Planning and Conservation League, et al. v. Department of*

Water Resources, 83 Cal.App.4th 892 (2000), which case is hereinafter referred to as "PCL v. DWR"; and

WHEREAS, in its decision, the Court of Appeal held that (i) the Department of Water Resources ("DWR"), not CCWA, had the statutory duty to serve as lead agency, (ii) the trial court erred by finding CCWA's EIR sufficient despite its failure to discuss implementation of Article 18, subdivision (b) of the State Water Project contracts, as a no-project alternative, (iii) said errors mandate preparation of a new EIR under the direction of DWR, and (iv) the trial court erroneously dismissed the challenge to DWR's transfer of title to certain lands to Kern County Water Agency (the "Validation Cause of Action") and execution of amended State Water Project contracts for failure to name and serve indispensable parties. The Court of Appeal remanded the case to the trial court, ordering it to take the following five actions: (1) vacate the trial court's grant of the motion for summary adjudication of the Validation Cause of Action; (2) issue a writ of mandate vacating the certification of the EIR; (3) determine the amount of attorney fees to be awarded Plaintiffs; (4) consider such orders it deems appropriate under Public Resources Code Section 21168.9(a) consistent with the views expressed in the Appellate Court's opinion; and (5) retain jurisdiction over the action until DWR, as lead agency, certifies an environmental impact report in accordance with CEQA standards and procedures, and the Superior Court determines that such environmental impact report meets the substantive requirements of CEQA; and

WHEREAS, the State, the contractors, and the Plaintiffs in *PCL v. DWR* reached an agreement to settle *PCL v. DWR*, as documented by that certain Settlement Agreement dated _____, 2003 (the "Settlement Agreement"), and in such Settlement Agreement have agreed that the contracts should be amended, for clarification purposes, to delete terms such as "annual entitlement" and "maximum annual entitlement" so that the public, and particularly land use planning agencies, will better understand the contracts; and

WHEREAS, pursuant to the Settlement Agreement, the State and the District desire to so amend the District's contract, with the understanding and intent that the amendments herein with respect to subsections (m), (n), and (o) of Article 1, subsection (b) of Article 6, and subsection (a) of Article 16, and to Table A of the District's contract are solely for clarification purposes and that such amendments are not intended to and do not in any way change the rights, obligations or limitations on liability of the State or the District established by or set forth in the contract; and

WHEREAS, pursuant to the Settlement Agreement, the State, the contractors and the Plaintiffs in *PCL v. DWR* also agreed that the contracts should be amended to include a new Article 58 addressing the determination of dependable annual supply of State Water Project water to be made available by existing Project facilities, and the State and District desire to so amend the District's contract.

NOW THEREFORE, IT IS MUTUALLY AGREED, as follows:

1. Article 1(n) is amended to read:[1]

(n) **Annual Table A Amount**

"Annual Table A Amount" shall mean the amount of project water set forth in Table A of this contract that the State, pursuant to the obligations of this contract and applicable law, makes available for delivery to the District at the delivery structures provided for the District. The term Annual Table A Amount shall not be interpreted to mean that in each year the State will be able to make that quantity of project water available to the District. The Annual Table A Amounts and the terms of this contract reflect an expectation that under certain conditions the District will receive its full Annual Table A Amount; but that under other conditions only a lesser amount, allocated in accordance with this contract, may be made available to the District. This recognition that full Annual Table A Amounts will not be deliverable under all conditions does not change the obligations of the State under this contract, including but not limited to, the obligations to make all reasonable efforts to complete the project facilities, to perfect and protect water rights, and to allocate among contractors the supply available in any year, as set forth in Articles 6(b), 6(c), 16(b) and 18, in the manner and subject to the terms and conditions of those articles and this contract. Where the term "annual entitlement" appears elsewhere in this contract, it shall mean "Annual Table A Amount." The State agrees that in future amendments to this and other contractor's contracts, in lieu of the term "annual entitlement," the term "Annual Table A Amount" will be used and will have the same meaning as "annual entitlement" wherever that term is used.

2. Article 1(o) is amended to read:

(o) **Maximum Annual Table A Amount**

"Maximum annual entitlement" shall mean the maximum annual amounts set forth in Table A of this contract, and where the term "maximum annual entitlement" appears elsewhere in this contract it shall mean "Maximum Annual Table A Amounts."

3. Article 1(m) is amended to read:

(m) Minimum Project Yield

"Minimum project yield" shall mean the dependable annual supply of project water to be made available assuming completion of the initial project conservation facilities and additional project conservation facilities. The project's capability of providing the minimum project yield shall be determined by the State on the basis of coordinated operations studies of initial project conservation facilities and additional project conservation facilities, which studies shall be based upon factors including but not limited to: (1) the estimated relative proportion of deliveries for agricultural use to deliveries for municipal use assuming Maximum Annual Table A Amounts

[1] The number of the articles is not the same for all the Water Supply Contractors. Article 1(n) is intended to be the article presently entitled "Annual Entitlement", whatever its number may be in each District's contract. The article numbers may have to be changed for each contractor to reflect the numbers in its contract.

for all contractors and the characteristic distributions of demands for these two uses throughout the year; and (2) agreements now in effect or as hereafter amended or supplemented between the State and the United States and others regarding the division of utilization of waters of the Delta or streams tributary thereto.

4. Article 6(b) is amended to read:

(b) District's Annual Table A Amounts

Commencing with the year of initial water delivery to the District, the State each year shall make available for delivery to the District the amounts of project water designated in Table A of this contract, which amounts shall be subject to change as provided for in Article 7(a) and are referred to in this contract as the District's Annual Table A Amounts.

5. Article 16(a) is amended to read:

(a) Limit on Total of all Maximum Annual Table A Amounts

The District's Maximum Annual Table A Amount hereunder, together with the maximum Table A amounts of all other contractors, shall aggregate no more than 4,185,000 acre-feet of project water.

6 Article 58 is added to read:

58. **Determination of Dependable Annual Supply of Project Water to be Made Available by Existing Project Facilities.**

In order to provide current information regarding the delivery capability of existing project conservation facilities, commencing in 2003 and every two years thereafter the State shall prepare and mail a report to all contractors, and all California city, county, and regional planning departments and agencies within the contractors' project service areas. This report will set forth, under a range of hydrologic conditions, estimates of overall delivery capability of the existing project facilities and of supply availability to each contractor in accordance with other provisions of the contractors' contracts. The range of hydrologic conditions shall include the delivery capability in the driest year of record, the average over the historic extended dry cycle and the average over the long-term. The biennial report will also include, for each of the ten years immediately preceding the report, the total amount of project water delivered to all contractors and the amount of project water delivered to each contractor.

7. Add the following language at the bottom of Table A:

In any year, the amounts designated in this Table A shall not be interpreted to mean that the State is able to deliver those amounts in all years. Article 58 describes the State's process for providing current information for project delivery capability.

8. Except for Article 58, the changes made by this amendment are solely for clarification purposes, and are not intended to nor do they in any way change the rights, obligations or

limitations on liability of the State or the District established by or set forth in the contract, and this amendment shall be interpreted in accordance with this intent.

9. At the time of execution of this Agreement and thereafter, the effectiveness of this Amendment is dependent upon the effectiveness of the District's Monterey Amendment (all provisions therein) and the Kern Fan Element Transaction.

IN WITNESS WHEREOF, the parties hereto have executed this amendment on the date first above written.

STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES

By: _____
Name: _____
Title: Director

Approved as to legal form and sufficiency:

By: _____
Name: _____
Title: Chief Counsel

Attest:

_____ **DISTRICT**

By: _____
Name: _____
Title: _____

ATTACHMENT B

PRINCIPLES REGARDING STATE WATER PROJECT AVAILABILITY

Note: These principles are prepared in connection with the settlement agreement between PCL and DWR and are only effective pursuant to the terms therein.

1. Commencing in 2003, and every two years thereafter, the Department of Water Resources (DWR) shall prepare and deliver to all State Water Project (SWP) contractors, all city and county planning departments, and all regional and metropolitan planning departments within the project service area a report which accurately sets forth, under a range of hydrologic conditions, the then existing overall delivery capability of the project facilities and the allocation of that capacity to each contractor. The range of hydrologic conditions shall include the historic extended dry cycle and long-term average. The biennial report shall also disclose, for each of the ten years immediately preceding the report, the total amount of project water delivered and the amount of project water delivered to each contractor. The information presented in each report shall be presented in a manner readily understandable by the public.

2. DWR shall develop and, by January 1, 2004, publish guidelines to assist Municipal and Industrial Contractors in providing accurate information to land-use planning agencies with jurisdiction within the Contractors' respective service areas regarding local and regional programs to manage or supplement SWP supplies. DWR shall consult with the plaintiffs and contractors in developing the guidelines.

3. DWR shall provide assistance to enable all Municipal and Industrial Contractors to provide complete and accurate information to relevant land-use planning agencies to assure that local land-use decisions reflect accurate information on the availability of water from state, local, and other sources.

ATTACHMENT C

DWR GUIDELINES FOR REVIEW OF PROPOSED PERMANENT TRANSFERS OF STATE WATER PROJECT ANNUAL TABLE A AMOUNTS

Note: These guidelines are prepared in connection with the settlement agreement between PCL and DWR and are only effective pursuant to the terms therein.

1. Purpose: The purpose of these guidelines is to describe the process for DWR's review of proposed permanent transfers of SWP Annual Table A Amounts and by so doing, provide disclosure to SWP Contractors and to the public of DWR's process and policy on approving permanent transfer of SWP Annual Table A Amounts. Such disclosure should assist contractors in developing their transfer proposals and obtaining DWR review expeditiously, and assist the public in participating in that review.

2. Coverage: These guidelines will apply to DWR's approval of permanent transfers of water among existing SWP Contractors and, if and when appropriate, to permanent transfers of water from an existing SWP Contractor to a new SWP Contractor.

3. Interpretation: These guidelines are in furtherance of the state policy in favor of voluntary water transfers and shall be interpreted consistent with the law, including but not limited to Water Code Section 109, the Burns-Porter Act, the Central Valley Project Act, the California Environmental Quality Act, area of origin laws, the public trust doctrine, and with existing contracts and bond covenants. These guidelines are not intended to change or augment existing law.

4. Format: The guidelines shall be issued by DWR as a "Notice to State Water Contractors."

5. Revisions: Revisions may be made to these guidelines as necessary to meet changed circumstances, changes in the law or long-term water supply contracts, or to address conditions unanticipated when the guidelines are adopted. Revisions shall be in accordance with the settlement agreement reached in *Planning and Conservation League vs. Department of Water Resources*.

6. Distribution: The transfer guidelines shall be published by DWR in the next available edition of Bulletin 132, and also as part of the biennial disclosure of SWP reliability as described in the PCL v. DWR Settlement Agreement.

7. Contract Amendment: Permanent transfers of SWP water are accomplished by amendment of each participating contractor's long-term water supply contract. The amendment consists of amending the Table A upwards for a buying contractor and downwards for a selling contractor. The amendment shall be in conformity with all provisions of the long-term water supply contracts, applicable laws, and bond covenants. Other issues to be addressed in the contract amendment will be subject to negotiation among DWR and the two participating contractors. The negotiations will be conducted in public, pursuant to the settlement agreement in PCL vs. DWR.

8. Financial issues: The purchasing contractor must demonstrate to the DWR's satisfaction that it has the financial ability to assume payments associated with the transferred water. If the purchasing entity was not a SWP Contractor as of 2001, special financial requirements pertain as described below, as well as additional qualifications.

9. Compliance with CEQA: Consistent with CEQA, the State's policy to preserve and enhance environmental quality will guide DWR's consideration of transfer proposals (Public Resources Code Section 21000). Identification of the appropriate lead agency will be based on CEQA, the CEQA Guidelines, and applicable caselaw, including *Planning and Conservation League vs. Department of Water Resources, 83 Cal. App. 4th 892 (2000).* CEQA requires the lead agency at a minimum to address the feasible alternatives to the proposed transfer and its potentially significant environmental impacts (1) in the selling contractor's service area; (2) in the buying contractor's service area; (3) on SWP facilities and operations; and (4) on the Delta and areas of origin and other regions as appropriate. Impacts that may occur outside of the transferring SWP Contractors' service areas and on fish and wildlife shall be included in the environmental analysis. DWR will not approve a transfer proposal until CEQA compliance is completed. The lead agency shall consult with responsible and trustee agencies and affected cities and counties; and when DWR is not the lead agency, shall provide an administrative draft of the draft EIR or Initial Study/Negative Declaration to DWR prior to the public review period. A descriptive narrative must accompany a checklist, if a checklist is used. The lead agency shall conduct a public hearing on the EIR during the public comment period and notify DWR's State Water Project Analysis Office of the time and place of such hearing in addition to other notice required by law.

10. Place of Use: The purchasing contractor must identify the place and purpose of use of the purchased water, including the reasonable and beneficial use of the water. Typically this information would be included in the environmental documentation. If a specific transfer proposal does not fit precisely into any of the alternatives listed below, DWR will use the principles described in these Guidelines to define the process to be followed. The information to be provided under this paragraph is in addition to the CEQA information described in paragraph 9 of these guidelines.

a) If the place of use is within the contractor's service area, the contractor should disclose the purpose of the transferred water, such as whether the water is being acquired for a specific development project, to enhance overall water supply reliability in the contractor's service area, or some other purpose. If the transferred water is for a municipal purpose, the contractor should state whether the transfer is consistent with its own Urban Water Management Plan or that of its member unit(s) receiving the water.

b) If the place of use is outside the contractor's service area, but within the SWP authorized place of use, and service is to be provided by an existing SWP Contractor: In addition to Paragraph 10(a) above, the contractor should provide DWR with copies of LAFCO approval and consent of the water agency with authority to serve that area, if any. In some instances, DWR's separate consent is required for annexations in addition to the approval for the transfer.

c) If the place of use is outside the SWP authorized place of use and service is to be provided by an existing SWP Contractor, the contractor should provide information in Paragraph 10(a) and 10(b). Prior to approving the transfer, DWR will consider project delivery capability, demands for water supply from the SWP, and the impact, if any, of the proposed transfer on such demand. If DWR approves the transfer, DWR will petition State Water Resources Control Board for approval of expansion of authorized place of use. Water will not be delivered until the place of use has been approved by the SWRCB and will be delivered in compliance with any terms imposed by the SWRCB.

d) If the place of use is outside the SWP authorized place of use and service is not to be provided by an existing SWP contractor, DWR will consider the transfer proposal as a proposal to become a new state water contractor. Prior to adding a new SWP Contractor, DWR will consider project delivery capability, demands for water supply from the SWP, and the impact, if any, of the proposed transfer on such demand. DWR will consult with existing SWP Contractors regarding their water supply needs and the proposed transfer. In addition to the information in Paragraph 10(a), 10(b), and 10(c), the new contractor should provide information similar to that provided by the original SWP contractors in the 1960's Bulletin 119 feasibility report addressing hydrology, demand for water supply, population growth, financial feasibility, etc. DWR will evaluate these issues independently and ordinarily will act as lead agency for CEQA purposes. In addition, issues such as area of origin claims, priorities, environmental impacts and use of water will be addressed. The selling contractor may not be released from financial obligations. The contract will be subject to a CCP 860 validation action initiated by the new contractor. If DWR approves the transfer, DWR will petition State Water Resources Control Board for approval of expansion of authorized place of use. Water will not be delivered until the place of use has been approved by the SWRCB and will be delivered in compliance with any terms imposed by the SWRCB.

11, DWR Discretion. Consistent with the long-term water supply contract provisions, CEQA, and other provisions of law, DWR has discretion to approve or deny transfers. DWR's exercise of discretion will incorporate the following principles:

(a) As required by CEQA, DWR as an agency with statewide authority will implement feasible mitigation measures for any significant environmental impacts resulting from a transfer, if such impacts and their mitigation are not addressed by other public agencies and are within DWR's jurisdiction.

(b) DWR will invoke "overriding considerations" in approving a transfer only as authorized by law, including but not limited to CEQA, and, to the extent applicable, the public trust doctrine and area of origin laws.

ATTACHMENT D

PRINCIPLES REGARDING PUBLIC PARTICIPATION PROCESS IN SWP CONTRACT NEGOTIATIONS

Note: These principles are prepared in connection with the settlement agreement between PCL and DWR and are only effective pursuant to the terms therein.

1. **Policy:** Given the importance of the State Water Project to the State of California, and the key role that the long-term water supply contracts play in the administration of the State Water Project, DWR agrees that public review of significant changes to these contracts is beneficial and in the public interest.

2. **Types of activities to be covered:** Project-wide contract amendments (i.e., contracts with substantially similar terms intended to be offered to all long-term SWP Contractors) and contract amendments to transfer entitlements between existing SWP Contractors will not be offered to the contractors for execution unless DWR has first complied with the public participation process as described in paragraphs (3), (4), (5) and (6).

3. **The Public Participation Process.**

   1) Negotiations will be conducted in public;

   2) The public will be provided with advance notice of the time and place of the negotiations; and

   3) The public will be provided the opportunity to observe negotiations and comment in each negotiating session

4. **Timing of Public Participation:** Public participation ordinarily will precede the formulation of the project description in the CEQA process in order to assure that the public participation is meaningful. When DWR is a responsible agency, (e.g., when existing SWP Contractors agree to transfer entitlement between themselves), the public participation will be scheduled to facilitate coordination with the lead agency's CEQA process.

5. **Activities that will not be subject to public participation:** Informal discussions prior to exchange of formal drafts and discussion of topics that are authorized to be kept confidential by law will not be subject to the public participation process.

6. **Contract amendments resulting from litigation:** If litigation has been formally initiated, and settlement negotiations result in a proposal to adopt project-wide amendments to settle the litigation, all proposed contract amendments shall be subject to the public participation process before they are approved by DWR.

ATTACHMENT E

FINAL PERMANENT TABLE A AMOUNT TRANSFERS FROM KERN COUNTY WATER AGENCY SUBSEQUENT TO MONTEREY AMENDMENTS (January 1, 2003)

Note: This Exhibit is prepared in connection with the settlement agreement between PCL and DWR.

From (Kern County Water Agency Member Unit)	To	Amount (afy)	Year Effective
Berrenda Mesa Water District	Mojave Water Agency	25,000	1998
Belridge Water Storage District	Palmdale Water Agency	4,000	2000
Berrenda Mesa Water District	Alameda County Flood Control and Water Conservation District Zone 7	7,000	2000
Lost Hills Water District	Alameda County Flood Control and Water Conservation District Zone 7	15,000	2000
Belridge Water Storage District	Alameda County Flood Control and Water Conservation District Zone 7	10,000	2001
Belridge Water Storage District and Berrenda Mesa Water District	Solano County Water Agency	5,756	2001
Belridge Water Storage District and Berrenda Mesa Water District	Napa County Flood Control and Water Conservation District	4,025	2001

EXHIBIT 1

PLAINTIFFS' EXPENSES TRUST ACCOUNT AGREEMENT

This Agreement is entered into this fifteenth day of August 2002, by JAMS and DWR, for the purpose of transferring $300,000 in trust to JAMS for use in accordance with Principles of Settlement in PCL vs. DWR.

WHEREAS, JAMS has acted as mediator between the Department and other parties to the litigation in PCL v. DWR (Superior Court No. 95CS03216).

WHEREAS, the Principles of Settlement as agreed to by the parties on July 22, 2002, provides for the placement of $300,000 in trust with JAMS.

WHEREAS, the money placed in the trust is to be provided to plaintiffs for expenses actually incurred as needed to support plaintiffs' participation in developing the new EIR to be filed as a return to the writ.

WHEREAS, the Principles of Settlement also provides that the funds will be provided based on a budget and participation plan to be submitted by plaintiffs to the mediator specifying the purposes for which the funds will be expended.

The parties agree as follows:

1. JAMS agrees to accept $300,000 in trust in accordance with the Principles of Settlement.

2. JAMS agrees to maintain the monies in trust, and following receipt of a budget and participation plan from plaintiffs, to disburse funds to plaintiffs for actual expenditures incurred for such purpose and pursuant to such schedule, budget, and participation plan, all in conformance with the Principles of Settlement. The funds will be disbursed to the plaintiffs' attorney, Antonio Rossmann, Law Offices of Antonio Rossmann.

3. Costs incurred by JAMS in providing this service will be paid as part of the mediator services as part of the existing contract between JAMS and the California Department of Justice, Office of the Attorney General.

4. This agreement may be amended in writing by agreement of both parties.

5. Funds not disbursed upon termination of the trust shall be returned to DWR.

6. The trust shall terminate upon notice to JAMS by DWR of termination based on the earlier of (a) failure of the parties to the mediation to execute a settlement agreement by January 1, 2003; (b) notice of termination given by the Director of DWR to JAMS and plaintiffs that this trust is terminated, which notice shall not be given without

defendants' consultation with plaintiffs and the mediator; or c) filing of the Notice of Determination on the new EIR.

7. JAMS will incur no liability to DWR arising from any disbursement made pursuant to this agreement.

8. This agreement is not intended to and shall not create any rights in any third party.

APPROVED:

/s/ Steve Macaulay for	8/10/02	/s/ Julie Sager	8/15/02
Thomas M. Hannigan	Date	Vice President & CFO	Date
Director		JAMS	

EXHIBIT 1

AMENDMENT NO. 1

PLAINTIFFS' EXPENSES TRUST ACCOUNT AGREEMENT

Paragraph 6 of this Agreement is amended to read as follows:

6. The trust shall terminate upon notice to JAMS by DWR of termination based on the earlier of (a) failure of the parties to the mediation to execute a settlement agreement by May 1, 2003, (b) notice of termination given by the Director of DWR to JAMS and plaintiffs that this trust is terminated, which notice shall not be given without defendants' consultation with plaintiffs and the mediator; or (c) filing of the Notice of Determination on the new EIR.

APPROVED:

Thomas M. Hannigan Director	Date	JAMS	Date

EXHIBIT 2

KERN WATER BANK AUTHORITY
AGREEMENTS AND PERMITS
WHICH MAY HAVE RELIED ON THE KWBA ADDENDUM

AGREEMENT/PERMIT	DATE	OTHER PARTIES
Incidental Take Permit - PRT-828086	2-Oct-97	Department of Interior, U.S. Fish & Wildlife Service
Approval/Management Authorization pursuant to California Endangered Species Act for Implementation of Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan	2-Oct-97	Calif. Department of Fish & Game
Natural Community Conservation Plan/Habitat Conservation Plan Implementation Agreement	2-Oct-97	U.S. Fish & Wildlife Service; Calif Dept of Fish & Game; Kern Water Bank Authority
Approval, Cultural Resources Assessment and Plan for the KWBA Project	January, 1997	N/A
Memorandum of Understanding Regarding Operation and Monitoring of the Kern Water Bank Groundwater Banking Program	26-Oct-95	Numerous
Approval of Kern Water Bank Authority Mosquito Abatement Program	26-Oct-95	Mosquito Abatement Districts
Service Contracts for Operations and Maintenance	1996 - current	Numerous Vendors
Grazing Leases (Sheep and Cattle)	1997- current	Various Stockmen
Minor Amendment No. 1: Hunting/Research to the KWBA HCP/NCCP and Implementation Agreement	6/30/1998	California Department of Fish and Game and U.S. Fish and Wildlife Service
State of California Standard Agreement for "Improving Wildlife Habitat for Doves" (annual contract)	1998 - current	Calif. Department of Fish and Game
Conservation Credit Certificates	1998 - current	Conservation Credit Buyers
Construction and Service Contracts for Master Plan Construction Project - KWB Canal, Head-works, Aqueduct Turnout, New Wells, Well Rehabilitation, Pipelines	7/1999 - 8/2002	Numerous Contractors and Vendors
KWB Canal and Buena Vista Main Canal Joint Use Agreement	7/20/1999	Buena Vista Water Storage District

AGREEMENT/PERMIT	DATE	OTHER PARTIES
Business Loan Agreement ($21,000,000)	7/23/1999	Bank of America, N.A.
Agreement for Grant of Easement	September 1999	State of California Acting Through the Department of Parks and Recreation
Agreement for Construction, Operation, and Maintenance of the Kern Water Bank Turnout, a Permanent Turnout Within the California Aqueduct Right of Way	11/9/1999	Department of Water Resources
License Agreement for Kern River Canal Crossing	11/17/1999	City of Bakersfield
Loan Contract No. E75002 Under the "Safe, Clean, Reliable Water Supply Act Water Conservation and Ground Water Recharge Sub account ($5,000,000)	March 2000	State of California, Department of Water Resources, Division of Planning and Local Assistance
Reclamation Board Permit No. 17147-A GM Authorizing Construction of Pedestrian Bridge Across the Outlet Canal within the Kern River Designated Floodway	10/16/2000	State of California - The Resources Agency, Department of Water Resources
Reclamation Board Permit No. 16821 GM (Revised) Authorizing Construction of a 20-foot Wide Unlined Canal and Reinforced Concrete Gated Turnout Structure on the Right (North) Bank of the Designated Floodway and Install a 108-Inch Diameter, 700-foot long, Reinforced Concrete Pipe Across (Under the Kern River	2/26/2001	State of California - The Resources Agency, Department of Water Resources
Grant Awarded Under the "Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection Act (Proposition 13) - Groundwater Storage Program ($3,375,000)	Jun-02	State of California, Department of Water Resources, Division of Planning and Local Assistance
Service Contracts for Well Testing and Rehabilitation Under the SB5X Program	2002	Various Vendors

EXHIBIT 3-A

PROPOSED 21168.9 ORDER

IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SACRAMENTO

PLANNING AND CONSERVATION LEAGUE, a California not for profit corporation, PLUMAS COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, a California public agency; CITIZENS PLANNING ASSOCIATION OF SANTA BARBARA COUNTY, INC., a California not for profit corporation, Plaintiffs and Petitioners, v. DEPARTMENT OF WATER RESOURCES, a California State Agency, et al., Defendants and Respondents,	Case No: 95CS03216 [PROPOSED] ORDER PURSUANT TO PUBLIC RESOURCES CODE SECTION 21168.9

On remand from the Third District Court of Appeal on January ___, 2003, in Department 53 of the Sacramento Superior Court, the Honorable Loren E. McMaster, presiding, this proceeding came on for a status report and joint motion. Petitioners and Plaintiffs, Planning and Conservation League, Plumas County Flood Control and Water Conservation District, and Citizens Planning Association of Santa Barbara County ("Petitioners"), appeared through Antonio Rossmann and Roger B. Moore. Respondent and Defendant, Central Coast Water Authority (CCWA), appeared through Susan F. Petrovich of the Law Firm of Hatch & Parent. Respondent and Defendant, Department of Water Resources (DWR), appeared through Deputy Attorney General Marian E. Moe. Robert S. Draper of O'Melveny and Myers, LLP and Clifford W. Schulz appeared, respectively, on behalf of the Metropolitan Water District of Southern California and Dudley Ridge Water District, entities that submitted answers to the First

Amended Complaint subsequent to the Court of Appeal's final determination in this action and prior to any further order of this Court on remand.

In light of the direction from the Third District Court of Appeal on remand in Planning and Conservation League v. Department of Water Resources (2000) 83 Cal.App.4th 892, this Court hereby makes the following findings:

1. The parties to this lawsuit and other public agencies have engaged in extensive settlement negotiations, mediated by retired Judge Daniel Weinstein of JAMS Dispute Resolution, with the intent to avoid further litigation and associated expenses, to provide for an effective way to cooperate in the preparation of a new environmental impact report (EIR), and to make other specified improvements in the administration and operation of the State Water Project.

2. The mediation has resulted in an executed Settlement Agreement for approval by this Court, attached to this Order as Exhibit A.

3. DWR as lead agency has commenced the preparation of the new EIR.

4. As part of the Settlement Agreement, DWR and the State Water Project (SWP) contractors who are signatories to the Settlement Agreement have agreed that, pending DWR's filing of a return in satisfaction of the Writ of Mandate and this Court's dismissal of the Writ of Mandate, they will not approve any new project or activity (as defined in section VII.A of the Settlement Agreement) in reliance on the 1995 Environmental Impact Report for the Implementation of the Monterey Agreement.

5. This Order is made pursuant to the provisions of Public Resources Code section 21168.9 and pursuant to this Court's equitable powers. This Court finds that the actions described in this Order, including actions taken in compliance with the Writ of Mandate, comprise the actions necessary to assure DWR's compliance with Division 13 of the Public Resources Code. This Court further finds that this Order includes only those mandates necessary to achieve compliance with Division 13.

THEREFORE, IT IS HEREBY ORDERED as follows:

1. This Court's Final Judgment denying the petition for writ of mandate, entered August 15, 1996, is reversed in accordance with the directive of the Third District Court of Appeal's decision in Planning and Conservation League v. Department of Water Resources (2000) 83 Cal.App.4th 892.

2. This Court's order granting the summary adjudication on the fifth cause of action, entered June 10, 1996, is vacated.

3. The Settlement Agreement attached as Exhibit A is hereby approved.

4. A Peremptory Writ of Mandate directed to Respondents Central Coast Water Authority and DWR shall issue under seal of this Court in the form attached hereto as Exhibit B.

5. In accordance with the Settlement Agreement and this Order, pending DWR's filing of the return in compliance with the Peremptory Writ of Mandate and this Court's Order discharging the Writ of Mandate, DWR and CCWA shall not approve any new project or activity (as defined section VII.A of the Settlement Agreement) in reliance on the 1995 EIR for the Implementation of the Monterey Agreement.

6. In the interim, until DWR files its return in compliance with the Peremptory Writ of Mandate and this Court orders discharge of the Writ of Mandate, the administration and operation of the State Water Project and Kern Water Bank Lands shall be conducted pursuant to the Monterey Amendments to the State Water Contracts, as supplemented by the Attachment A Amendments to the State Water Contracts (as defined in the Settlement Agreement) and the other terms and conditions of the Settlement Agreement.

7. Plaintiffs and petitioners shall recover such costs and attorney's fees as provided in prior court orders and in an amount as determined in the arbitration procedures agreed to in the Settlement Agreement, or as otherwise agreed to by the parties.

8. Except as provided, the Peremptory Writ of Mandate shall not limit or constrain the lawful jurisdiction and discretion of DWR. This Court retains jurisdiction until DWR files a

return that complies with the terms of the Writ of Mandate, and this Court issues an order discharging the Writ of Mandate.

IT IS SO ORDERED.

Dated: _____, 2003 _____ _____

Judge of the Superior Court

EXHIBIT 3-B

PROPOSED WRIT OF MANDATE

IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SACRAMENTO

PLANNING AND CONSERVATION LEAGUE, a California not for profit corporation, PLUMAS COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, a California public agency; CITIZENS PLANNING ASSOCIATION OF SANTA BARBARA COUNTY, INC., a California not for profit corporation, Petitioners, v. DEPARTMENT OF WATER RESOURCES, a California State Agency, and CENTRAL COAST WATER AUTHORITY, A Joint Powers Agency Respondents.	Case No: 95CS03216 PROPOSED PEREMPTORY WRIT OF MANDATE (Public Resources Code § 21168.9)

TO: Respondents California Department of Water Resources and Central Coast Water Authority:

The Third District Court of Appeal, in its decision in Planning and Conservation League v. Department of Water Resources (2000) 83 Cal.App.4th 892, having directed this Court to issue a Peremptory Writ of Mandate,

YOU ARE HEREBY COMMANDED to comply with the following:

1. Respondent Central Coast Water Authority shall set aside its October 26, 1995 certification that the Final Programmatic Environmental Impact Report for Implementation of

the Monterey Agreement (the 1995 Monterey Agreement EIR) was completed in compliance with the California Environmental Quality Act [AR 2183].

2. Respondent Department of Water Resources (DWR) shall:

(a) set aside its December 13, 1995 certification, as responsible agency, that the 1995 Monterey Amendment EIR is adequate under the California Environmental Quality Act [AR 1875]; and

(b) as lead agency, prepare and certify a new EIR. in compliance with the Court of Appeal's decision, the California Environmental Quality Act, and the Settlement Agreement.

3. Upon completion and certification of the new EIR, Respondent DWR shall make written findings and decisions and file a notice of determination identifying the components of the project analyzed in the new EIR, all in the manner prescribed by sections 15091 – 15094 of the CEQA Guidelines.

4. Respondent DWR shall, upon the filing of a Notice of Determination, submit the new EIR, the written findings, the Notice of Determination, and such additional documents as this Court may order by way of return to this writ of mandate.

5. This Court shall retain jurisdiction over this proceeding until DWR files a return that complies with this Writ of Mandate, and this Court issues an order discharging this Writ of Mandate. Except as provided, this Writ of Mandate shall not limit or constrain the lawful jurisdiction and discretion of the Department of Water Resources.

Dated: _____, 2003

_____

Clerk of the Superior Court

Let the foregoing writ issue:

_____

Judge of the Superior Court

EXHIBIT 4

SECTION VI TRUST ACCOUNT AGREEMENT

This Section VI Trust Account Agreement (this "Trust Agreement") is entered into this _____ day of _____ 2003, by JAMS and the State of California Department of Water Resources (the "Department"), for the purposes of establishing and describing the trust account in accordance with that certain Settlement Agreement entered into in *Planning & Conservation League v. Department of Water Resources* ("PCL v. DWR").

WHEREAS, Judge Daniel Weinstein (ret.) of JAMS has acted as mediator between the Department and other parties to the litigation in *PCL v. DWR* (Sacramento Superior Court No. 95CS03216).

WHEREAS, the Settlement Agreement provides for the placement over time of $5,500,000 in trust with JAMS at the specific times and under the conditions in the Settlement Agreement.

The parties agree as follows:

1. JAMS will establish a trust account for receipt and disbursal of funds received from the Department for payment pursuant to the Settlement Agreement.

2. All funds deposited with JAMS pursuant to this agreement shall be placed into a trust account and shall be disbursed only in accordance with this Trust Agreement and the Settlement Agreement. Section VI of the Settlement Agreement provides that the funds shall be used to implement the Settlement Agreement, as determined by Plaintiffs in their reasonable judgment, including watershed restoration projects, follow-up actions arising from the Settlement Agreement, and technical studies.

3. JAMS agrees to maintain the monies in trust, and after receipt of a written statement executed by all Plaintiffs (as defined in the Settlement Agreement), to disburse funds to Plaintiffs in conformance with such statement. JAMS will provide a copy of the written statement to: Chief Counsel, The Office of the Chief Counsel, Department of Water Resources, P.O. Box 942836, Sacramento, CA 95814.

4. Costs incurred by JAMS in providing this service will be paid as part of the mediator services as part of the existing contract between JAMS and the California Department of Justice, Office of the Attorney General, or any successor contract.

5. This agreement may be amended only in writing by agreement of both parties.

6. Funds not disbursed before termination of this Trust Agreement shall be returned to DWR immediately upon termination of this Trust Agreement.

7. This Trust Agreement shall terminate if and when DWR notifies JAMS that the agreement is terminated, which notice shall not be given without DWR's consultation with Plaintiffs and the mediator.

8. JAMS will incur no liability to DWR arising from any disbursement made pursuant to this agreement.

9. This Trust Agreement is intended solely for the purposes of establishing and describing the trust account at JAMS and is not intended to and shall not create any rights in any third party.

APPROVED:

Thomas M. Hannigan Director	Date	JAMS	Date

Effect of Urbanization on Aquifer Recharge in the Santa Clarita Valley

TO: Tom Worthington/Impact Sciences, Inc.

FROM: John Porcello/CH2M HILL

DATE: February 22, 2004

Introduction

In a groundwater basin, the effect of urbanization on recharge to underlying groundwater is dependent on land uses, water uses, vegetative cover, and geologic conditions. Groundwater recharge from undeveloped lands occurs from precipitation alone, whereas areas that are developed for agricultural or urban land uses receive both precipitation and irrigation of vegetative cover. In an urban area, groundwater recharge occurs directly beneath irrigated lands and in drainages whose bottoms are not paved or cemented. This memorandum discusses the general effects of urbanization on groundwater recharge and the specific effects in the Santa Clarita Valley.

Summary of Findings

In the Santa Clarita Valley, stormwater runoff finds its way to the Santa Clara River and its tributaries, whose channels are predominantly natural and consist of vegetation and coarse-grained sediments (rather than concrete). The stormwater that flows across paved lands in the Santa Clarita Valley is routed to stormwater detention basins and to the river channels, where the porous nature of the sands and gravels forming the streambeds allow for significant infiltration to occur to the underlying groundwater.

Increased urbanization in the Valley has resulted in the irrigation of previously undeveloped lands. The effect of irrigation is to maintain higher soil moisture levels during the summer than would exist if no irrigation were occurring. Consequently, a greater percentage of the fall/winter precipitation recharges groundwater beneath irrigated land parcels than beneath undeveloped land parcels. In addition, urbanization in the Santa Clarita Valley has occurred in part because of the importation of State Water Project (SWP) water, which began in 1980. SWP water use has increased steadily, reaching nearly 44,500 acre-feet (AF) in 2003. Two-thirds of this water is used outdoors, and a portion of this water eventually infiltrates to groundwater. The other one-third is used indoors and is subsequently routed to local water reclamation plants (WRPs) and then to the Santa Clara River (after treatment). A portion of this water flows downstream out of the basin, and a portion infiltrates to groundwater.

Records show that groundwater levels and the amount of groundwater in storage were similar in both the late 1990s and the early 1980s, despite a significant increase in the

urbanized area during these two decades. This long-term stability of groundwater levels is attributed in part to the significant volume of natural recharge that occurs in the streambeds, which do not contain paved, urban land areas. On a long-term historical basis, groundwater pumping volumes have not increased due to urbanization, compared with pumping volumes during the 1950s and 1960s when water was used primarily for agriculture. Also, the importation of SWP water is another process that contributes to recharge in the Valley. In summary, urbanization has been accompanied by long-term stability in pumping and groundwater levels, plus the addition of imported SWP water to the Valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater that is in storage within the Valley.

Effect of Pavement on Recharge Beneath Specific Land Parcels

The amount of paved cover on the ground affects the degree to which rainfall and outdoor-applied urban water will be able to infiltrate to groundwater. In heavily industrialized areas with high percentages of paved cover, such as exist in portions of the Los Angeles Basin, less rainfall recharge will occur than if the land is in an undeveloped condition. Furthermore, if the bottoms of rivers and other drainages are paved, then the majority of stormwater generated during a rainfall event will be unable to infiltrate to groundwater. In contrast, the amount of recharge to groundwater will be greater in urbanized areas, such as the Santa Clarita Valley, that have natural soils in the bottoms of rivers and local drainages or that have lower percentages of paved cover on the developed areas lying outside the principal drainages. In these areas, the outdoor use of water for irrigation landscape vegetation or agricultural lands can notably increase the amount of groundwater recharge, particularly if the outdoor water is imported from outside the local groundwater basin. This is discussed further below.

Effect of Vegetative Cover and Water Use

From the 1930s through the 1960s, H.F. Blaney and other researchers at the U.S. Department of Agriculture performed numerous studies to measure the amount of infiltration to groundwater that occurs beneath undeveloped lands and irrigated farmlands, and the differences in recharge rates for different types of native vegetation and crops. In California, these studies included a 1933 study by Blaney in Ventura County, a 1963 study by Blaney and others in the Lompoc Uplands, studies by the U.S. Geological Survey and various consultants in the Montecito and Carpenteria groundwater basins, and a groundwater basin study by Santa Barbara County[1] that incorporated the results of these earlier studies.

Together, these studies concluded that deep percolation to groundwater from undeveloped lands occurs only during years of average or above-average precipitation. This occurs because:

1. Southern California's rainfall is highly seasonal in nature, whereupon most rainfall occurs during the relatively cool period November through March, when plant water

[1] See Santa Barbara County Water Agency, December 15, 1977. *Report on Adequacy of the Groundwater Basins of Santa Barbara County.*

requirements are low, and little, if any, rainfall occurs during the remaining (and warmer months) when plant water requirements increase.

2. During the summer, when little or no rainfall occurs, the native vegetation extracts the residual moisture that is present in the soil, which substantially decreases the soil moisture within the root zone of the vegetation. At the end of the dry season, soil moisture levels on undeveloped lands are below the soil's field capacity, which is the amount of moisture that must be present in the soil before free drainage of water can occur below the rooting zone of the native vegetation.

3. When the seasonal rains arrive, the incident rainfall that is not consumed by plants and does not become stormwater runoff must first raise the soil moisture level to the soil's field capacity before any groundwater recharge will occur. The various studies indicate that about 17 inches/year of rainfall is necessary to raise the soil moisture to the field capacity on an undeveloped parcel of land. This is similar to the average annual rainfall in the Santa Clarita Valley and in other lowland coastal and near-coastal valleys in southern California.

On irrigated lands, irrigation occurs during several months of the year, with the exact duration depending on the amount and timing of rainfall and also the crops or type of urban landscaping being irrigated. The principal effect of converting undeveloped land to land that receives agricultural or urban irrigation is to increase the amount of water that is applied to the land during the low-rainfall months. This application of water to the vegetative cover on the surface of the developed land parcel results in the maintenance of higher soil moisture levels during the warm, dry months than would occur without development. This has three effects:

1. Because irrigation will generally be performed in a manner that maintains the health of the vegetative cover, enough water will be applied to maintain the soil moisture at, or close to, the field capacity of the soil. This in turn will allow some deep percolation to occur from the irrigation water itself.

2. When the rainy season begins, because irrigation has maintained soil moisture at or near field capacity, less of the initial rainfall entering the root zone needs to be stored in the soil (to meet soil moisture deficits) beneath an irrigated parcel than in the case of an undeveloped parcel. Therefore, a greater percentage of the initial rainfall and annual rainfall will be able to infiltrate to groundwater. The southern California studies estimated that irrigated land parcels would allow rainfall infiltration to occur in years when annual rainfall is at least 10.5 inches/year. This threshold rainfall value is 6.5 inches less than the threshold rainfall value that the studies estimated to be necessary for generating groundwater recharge beneath undeveloped land parcels.

3. Because the majority of irrigation occurs during the dry (low-rainfall) months, the total annual recharge to groundwater from irrigated developed lands is the sum of: (a) the deep percolation arising from irrigation (during the low-rainfall months); and (b) rainfall (during the months when less irrigation is occurring). Therefore, groundwater recharge beneath developed lands is greater and occurs for a longer period of time each year than in the case of undeveloped lands where no irrigation is occurring.

Historical Observations of Groundwater Conditions in the Santa Clarita Valley

The findings of the studies described above for other groundwater basins in southern California are consistent with observations that have been made in the Santa Clarita Valley, which are based on long-term water level records, water budget analyses, and groundwater modeling. Based on a month-by-month calibration to a 20-year record of historical water level records (throughout the Valley) and stream gaging records (at the Los Angeles – Ventura County line), the model simulates 10 percent of the applied outdoor water as being available for recharge to groundwater in retail and residential areas, with greater percentages infiltrating beneath golf courses and agricultural lands. This is consistent with a 1980 study by DWR of the groundwater resources of the Santee and El Monte hydrologic subareas of San Diego County. In that study, which was performed to evaluate reclaimed water use plans, DWR concluded that approximately 20 percent of the applied outdoor water in municipal areas infiltrates to the water table, with the remaining 80 percent going to evapotranspiration and direct evaporation. DWR also concluded that there would likely be no significant change in these percentages as urbanization continues.[2]

In the Santa Clarita Valley, as in any urbanized area, urbanization increases the paved area and can increase the magnitude and intensity of stormwater runoff from paved land areas. In the Santa Clarita Valley, this stormwater runoff will find its way to the Santa Clara River and its tributaries, whose channels are predominantly natural and consist of vegetation and coarse-grained sediments (rather than concrete). The stormwater that flows across paved lands in the Santa Clarita Valley is routed to stormwater detention basins and to the river channels, where the porous nature of the sands and gravels forming the streambeds allow for significant infiltration to occur to the underlying groundwater. Consequently, for a developed land parcel, the water that runs off of the paved portion of the land parcel will infiltrate to groundwater from a detention basin or a riverbed, rather than infiltrating onsite.

Riverbed infiltration is a significant percentage of total recharge in the Santa Clarita Valley in any given year. Streamflow records and the model calibration process together demonstrate that year-to-year fluctuations in total recharge in the Valley arise not just from year-to-year variations in incident rainfall within the Valley, but also from year-to-year variations in streamflows in the Santa Clara River and its tributaries. Because the areas contributing flow to the rivers are located both within and outside of the Valley, the recharge that occurs from riverbeds is a significant source of groundwater recharge within the Valley.

Evidence that stormwater infiltration to groundwater is not significantly decreased by urbanization comes from long-term water level records at wells completed in the Alluvial aquifer. These records show that groundwater levels and the amount of groundwater in storage were similar in both the late 1990s and the early 1980s, despite a significant increase in the urbanized area during these two decades. This long-term stability is attributed in part to the significant volume of natural recharge that occurs in the streambeds, which do not contain paved, urban land areas. Also, groundwater pumping volumes have not increased

[2] See State of California, Department of Water Resources, Southern District. August 1984, *San Diego County Cooperative Ground Water Studies: Reclaimed Water Use, Phase II.* Pages 40-41.

due to urbanization, compared with pumping volumes during the 1950s and 1960s when water was used primarily for agriculture. Additionally, beginning in 1980, water was imported into the Santa Clarita Valley from the State Water Project (SWP) for urban use, with SWP water use reaching nearly 30,000 acre-feet per year (AF/yr) by the end of the 1990s, and progressively increasing from about 32,500 AF in 2000 to nearly 44,500 AF in 2003. Because two-thirds of the total urban water demand is used outdoors, a substantial portion of the imported SWP water has been and continues to be applied to urban landscaping, thereby increasing the amount of recharge to groundwater. The remaining urban water is used indoors, and is subsequently routed to local water reclamation plants (WRPs) and then to the Santa Clara River (after treatment). A portion of this water flows downstream out of the basin, and a portion infiltrates to groundwater.

In summary, urbanization has been accompanied by long-term stability in pumping and groundwater levels, plus the addition of imported SWP water to the Valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater that is in storage within the Valley.



Appendix I
CORRESPONDENCE

Saugus Union School District

24930 Avenue Stanford, Valencia, CA 91355
(661) 294-7500; FAX (661) 294-7525

FAX COVER SHEET

to: Lindsey

from: Bob Cuthup Office

company:

date:

949-837-4122

fax number:

total no. of pages including cover: 2

☐ Urgent For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Per Your Request

SAUGUS UNION SCHOOL DISTRICT

SITE	ENROLLMENT	CAPACITY	
	As of 09/09/05		
BOUQUET CANYON	561	575	
BRIDGEPORT	906	900	
CEDARCREEK	700	725	
EMBLEM	254	800	
FOSTER	678	775	
HELMERS	977	1075	
HIGHLANDS	684	775	
MOUNTAINVIEW	1070	1175	
NORTH PARK	919	900	
PLUM CANYON	751	775	
RIO VISTA	973	1050	
ROSEDELL	731	800	
SANTA CLARITA	610	725	
SKYBLUE MESA	487	575	
TESORO DEL VALLE	440	720	
TOTAL	10741	12345	

NOTE: Highlands campus closed 2005/2006. Temporary District Capacity: 11,570
Emblem campus closed 2006/2007.Temporary District Capacity: 11,545
Total capacity includes permanent school buildings and temporary portables.

Saugus Union School District
Business Office
24930 Avenue Stanford
Valencia, CA 91355
(661) 294-5300

SAUGUS UNION SCHOOL DISTRICT

24930 Avenue Stanford, Santa Clarita, California 91355 661-294-5300 Fax 661-294-7560

June 8, 2005

RECEIVED

JUN 13 2005

RBF CONSULTING

RBF Consulting
14725 Alton Parkway
Irvine, CA 92618-2027

RE: Soledad Townhomes Environmental Impact Report

1.01 .10/sf
2.55
5.10

Dear Ms. Anderson:

In reply to your letter dated May 19, 2005 the above referenced property is within the Saugus District boundaries.

The school to serve this project would be:

Emblem Elementary School
22635 Espuella Drive
Saugus, Ca 91350

Emblem Elementary Schools current capacity is 880. As of August 2005 the projected enrollment for Emblem is 285.

Any assessment fees are included in the existing Newhall Land and Farming Company's Mitigation Agreement.

Current Student Generation Rates are as follows:

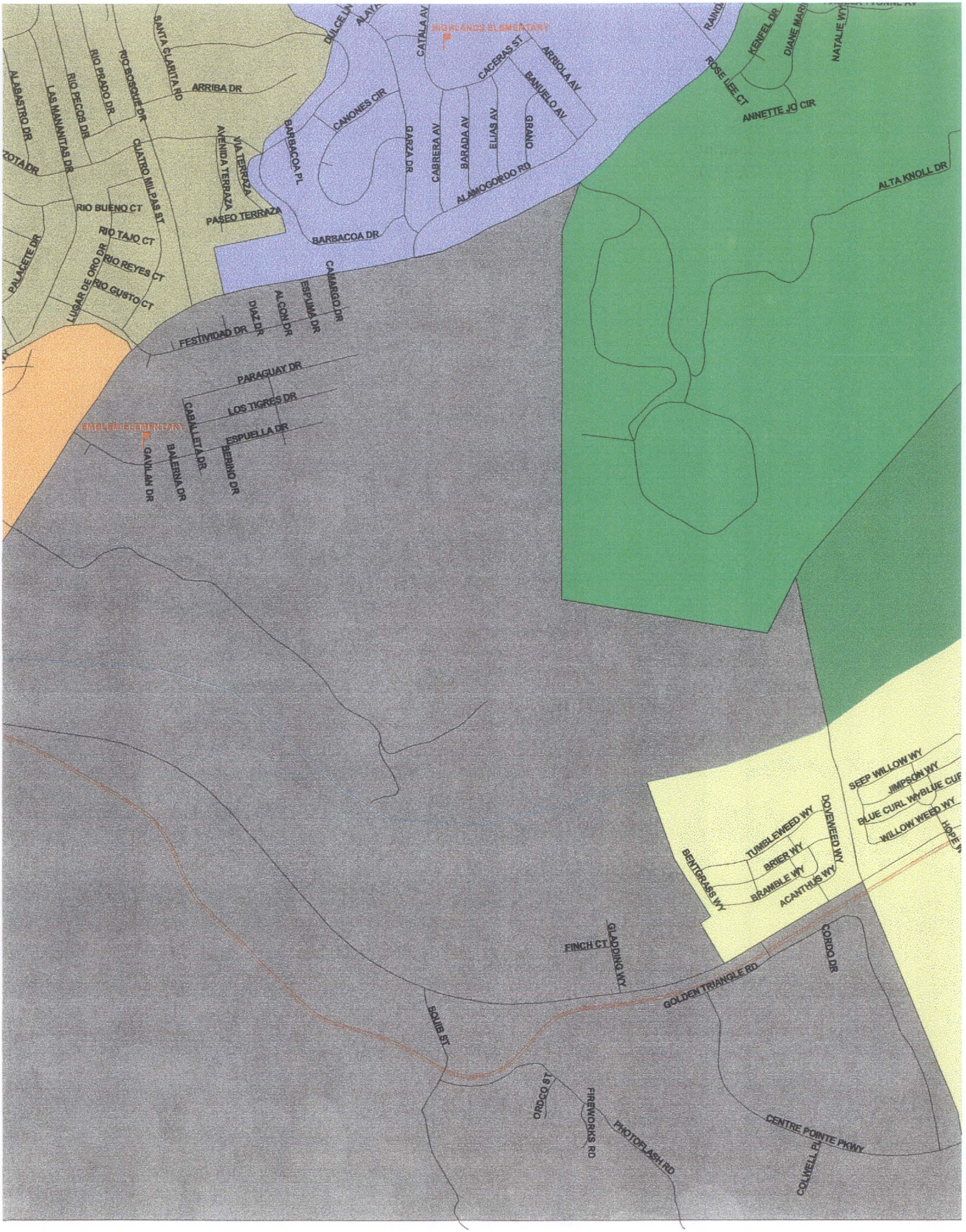
Single Family Detached Units – 0.4790
Single Family Attached Units – 0.1455
Multifamily Units – 0.1120

Sincerely,

Sue Gordon

Sue Gordon
Planning/Enrollment Technician
661-294-5300 x 174

BOARD OF TRUSTEES • Rose S. Diaz • Rose Koscielny • Gary G. Murr • Jonathan L. Myl • Judy Umeck •
SUPERINTENDENT • Judy Fish, Ph.D.
"EXCELLENCE IN ELEMENTARY EDUCATION"


HIGHLANDS ELEMENTARY
EMBLEM ELEMENTARY
SANTA CLARITA RD
ARRIBA DR
ALABASTRO DR
LAS MANANITAS DR
RIO PECOS DR
RIO PRADO DR
RIO BOSQUE DR
CUATRO MILPAS ST
RIO BUENO CT
RIO TAJO CT
RIO REYES CT
RIO GUSTO CT
LUGAR DE ORO DR
PALACETE DR
ZOTA DR
AVENIDA TERRAZA
VIA TERRAZA
PASEO TERRAZA
BARBACOA PL
BARBACOA DR
CANONES CIR
CATALA AV
CACERAS ST
ARRIOLA AV
BANUELO AV
GRANO
ALAMOGORDO RD
ELIAS AV
BARADA AV
CABRERA AV
GARZA DR
ROSE LEE CT
KENFEL DR
DIANE MARIE
NATALIE WY
ANNETTE JO CIR
ALTA KNOLL DR
CAMARGO DR
ESPUMA DR
ALCON DR
DIAZ DR
FESTIVIDAD DR
PARAGUAY DR
LOS TIGRES DR
ESPUELLA DR
BERINO DR
BALERNA DR
CABALLETA DR
GAVILAN DR
SEEP WILLOW WY
JIMPSON WY
BLUE CURL WY
WILLOW WEED WY
DOVEWEED WY
TUMBLEWEED WY
BRIER WY
BRAMBLE WY
ACANTHUS WY
BENTGRASS WY
FINCH CT
GLADDING WY
GOLDEN TRIANGLE RD
CORDO DR
SQUIB ST
CORDCO ST
FIREWORKS RD
PHOTOFLASH RD
CENTRE POINTE PKWY
COLWELL PL

24930 Avenue Stanford, Santa Clarita, CA 91355
(661) 294-7500, FAX (661) 294-7525

SAUGUS UNION SCHOOL DISTRICT

Fax

To:	Lindsay Anderson	**From:**	Harold Pierre
Fax:	(949) 837-4122	**Pages:**	3
Phone:		**Date:**	6/17/2005
Re:	Soledad Townhomes	**CC:**	

☑ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:**

Here's the info you requested.

Thanks,

Harold

SAUGUS UNION SCHOOL DISTRICT

24930 AVENUE STANFORD, SANTA CLARITA, CALIFORNIA 91355 661-294-5300 FAX 661-294-7560

June 17, 2005

Lindsay Anderson
Environmental Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618-2027

Re: Soledad Townhomes Environmental Impact Report

Dear Ms. Lindsay:

The following information is provided in response to your request dated May 19, 2005:

1. Your project would be served by Emblem Elementary School.
2. Current capacity and enrollment of the schools are included on the attached spreadsheet.
3. The developer would be required to pay to the school district the Developer Fees in effect at the time he is ready to pull building permits.
4. Student Generation Rates:
    a. SFD – 0.395
    b. MFA – 0.150
    c. APT – 0.202

If you have any questions, please feel free to contact me or Robert Cutting at (661) 294-5300.

Yours truly,

Harold Pierre, P.E.
Director of Facilities

Enc.

BOARD OF TRUSTEES • Rose S. Diaz • Rose Koscielny • Gary G. Murr • Jonathan L. Myl • Judy Umeck •
SUPERINTENDENT • Judy Fish, Ph.D. "EXCELLENCE IN ELEMENTARY EDUCATION"

SAUGUS UNION SCHOOL DISTRICT
JUNE 2005

K-6 School	Location	Number of Classrooms					Percentage of classrooms in Temp portables	Design Capacity	Total Capacity w/Temp portables	2004-05 Student Enrollment	Any Expansion Plans?
		Number of Permanent Classrooms	Number of Temp Portable Classrooms	No. Reduced Size Classrooms	State Leased Portables	Year Built					
Bouquet Canyon	28110 N.Wellston Dr. Saugus 91350	0	24	6		1989	100%	480	600	423	No
Bridgeport	23670 Newhall Ranch Rd Santa Clarita 91355	35	0	0		2002	0%	930	930	923	No
Cedarcreek	27792 Camp Plenty Road Canyon Country 91351	17	14	4	1	1966	45%	495	775	687	No
Emblem	22635 Espuella Drive Saugus 91350	16	16	4	3	1966	50%	535	800	723	No
James Foster	22500 Pamplico Drive Saugus 91350	18	13	6		1989	42%	600	775	673	No
Charles Helmers	27300 Grandview Avenue Valencia 91355	14	32	16		1990	70%	860	1150	1080	No
Highlands	27332 Catala Avenue Saugus 91350	18	11	4	3	1970	38%	590	725	646	No
Mountainview	22201 W. Cypress Place Saugus 91350	43	4	2		1994	9%	650	1175	1085	No
North Park	23335 W. Sunset Hills Dr. Valencia 91355	25	14	14		1999	36%	930	930	944	No
Plum Canyon	28360 N. Alfred Way Saugus 91350	18	15	0	5	1998	46%	600	775	685	No
Rio Vista	20417 Cedarcreek Street Canyon Country 91351	27	20	8		1969	43%	480	1175	973	No
Rosedell	27853 Urbandale Avenue Saugus 91350	18	12	4	2	1967	40%	480	750	723	No
Santa Clarita	27177 Seco Canyon Road Saugus 91350	15	14	8	5	1959	48%	535	725	608	No
Skyblue Mesa	28040 Hardesty Street Canyon Country 91351	16	7	4	4	1968	30%	476	575	522	Yes
Total		278	196	82	23		41%	8440	11860	10695	

06/17/2005 15:03 FAX 661 294 7525 SAUGUS UNION 003

WATER SERVICE
QUESTIONNAIRE

Please respond to the following questions on your agency/company letterhead and provide maps to illustrate facility locations.

1. What is the current and projected water capacity for the District; annual use in acre-feet, daily flow in cfs and peak demand in MGD?

33,000 gpm
future 54,000 gpm-completion of pipeline project

annual use 29,000 af
daily flow 40 cfs
peak 50 cfs - average

2. What is the projected water demand for the project based on the information provided?

160-200 af / year – conservative

3. Please indicate any existing facilities on/near the project site.

16" diameter watermain along front of property to main entrance and east end

4. What is the current rate of local groundwater extraction and existing groundwater quality? Will the proposed project have an impact on groundwater quality?

NA – No impact on groundwater quality with supplying water

5. Will the proposal require new facilities or additions to existing facilities? If so, please list/summarize any changes.

Storage for maximum day flow – based on water use and final design, water co. will require $ production storage facilities

6. Do you have any required assessment fees or other required or recommended mitigation measures for project impacts?

No-not really – cost of building intract (fire hydrant, etc.) and storage production

7. According to SB 901 requires a "water supply assessment" be provided by the affected water agency for incorporation into the EIR? As such, please identify whether the demand created by the proposed project has been considered in your agency's most recently adopted water management plan. The assessment should indicate whether the water demand associated with the proposed project can be served by your agency's supplies available during "normal, single-dry, and multiple-dry water years", in addition to the demand for water from existing and other planned uses.

NA – not necessary

8. Does your agency have sufficient water supplies available to serve the project from existing entitlement and resources, or are new or expanded entitlement needed?

YES!

9. Is there any other relevant information regarding potential significant effects of the project?

No!

Per conversation with Bill Manetta on June 3, 2005 at 11:15 a.m.

23920 Valencia Blvd.
Suite 120
Santa Clarita
California 91355-2196
Website: www.santa-clarita.com

Phone
(661) 255-4910
Fax
(661) 255-1996

City of
Santa Clarita

June 7, 2005

RECEIVED
JUN 8 2005
RBF CONSULTING

Ms. Lindsay Anderson
Environmental Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618-2027

SUBJECT: SOLEDAD TOWNHOMES - PARK AND RECREATION FACILITIES QUESTIONNAIRE

Dear Ms. Anderson:

Below are responses to your questionnaire dated May 19, 2005:

1) Location of facilities which serve project. (see attached map)
   A. George A. Carvalho Sports Complex
   B. Bridgeport Community Park
   C. Central Park
   D. Commuter Rail Trail

2) Generation factors for the proposed land use

   Given the average of 3.08 persons/unit within the development and a dwelling count of 437, the project will generate 1364 persons. This number results in a park land requirement of approximately 4 acres of usable flat land.

3) Impact to Park and Recreational Facilities

   Due to the influx of approximately 1346 residents looking to use both passive "open space" and active park lands the project will have an impact on the City's recreational facilities. The City's goal is to have five acres of active parkland for every 1000 residents.

4) Fees required to help mitigate potential impacts to the City's park and recreation facilities

   The project will be subject to the City's park dedication ordinance. The developer will be required to provide park land or a combination of land and fees often referred to as Quimby Fees. These fees are based on a

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minimum requirement for developers to provide three acres per 1,000 population. Other land or fees may be required to bring the project into compliance with the City's General Plan, which sets the goal of five acres of park land per 1,000 residents.

5) Park Dedication requirement.

   The City's Park dedication requirements will be applied to the project (CHAPTER 16.15 SCMC).

6) Required or recommended mitigation measures for significant impacts.

   Any required or recommended mitigation measures for significant impacts are to be determined upon review of the environmental document.

7) Other relevant information regarding potential impacts of this project.

   Other impacts will include:
   a. Increased demand for recreational programs will result in an incremental need for additional facilities and staff.
   b. Any increase in park land acreage will result in an increase in maintenance equipment and staffing.

8) Need for physical additions to this agency.

   The City of Santa Clarita Park, Recreation, and Community Services Department would require some physical improvements on or off site to accommodate the demand created by this development.

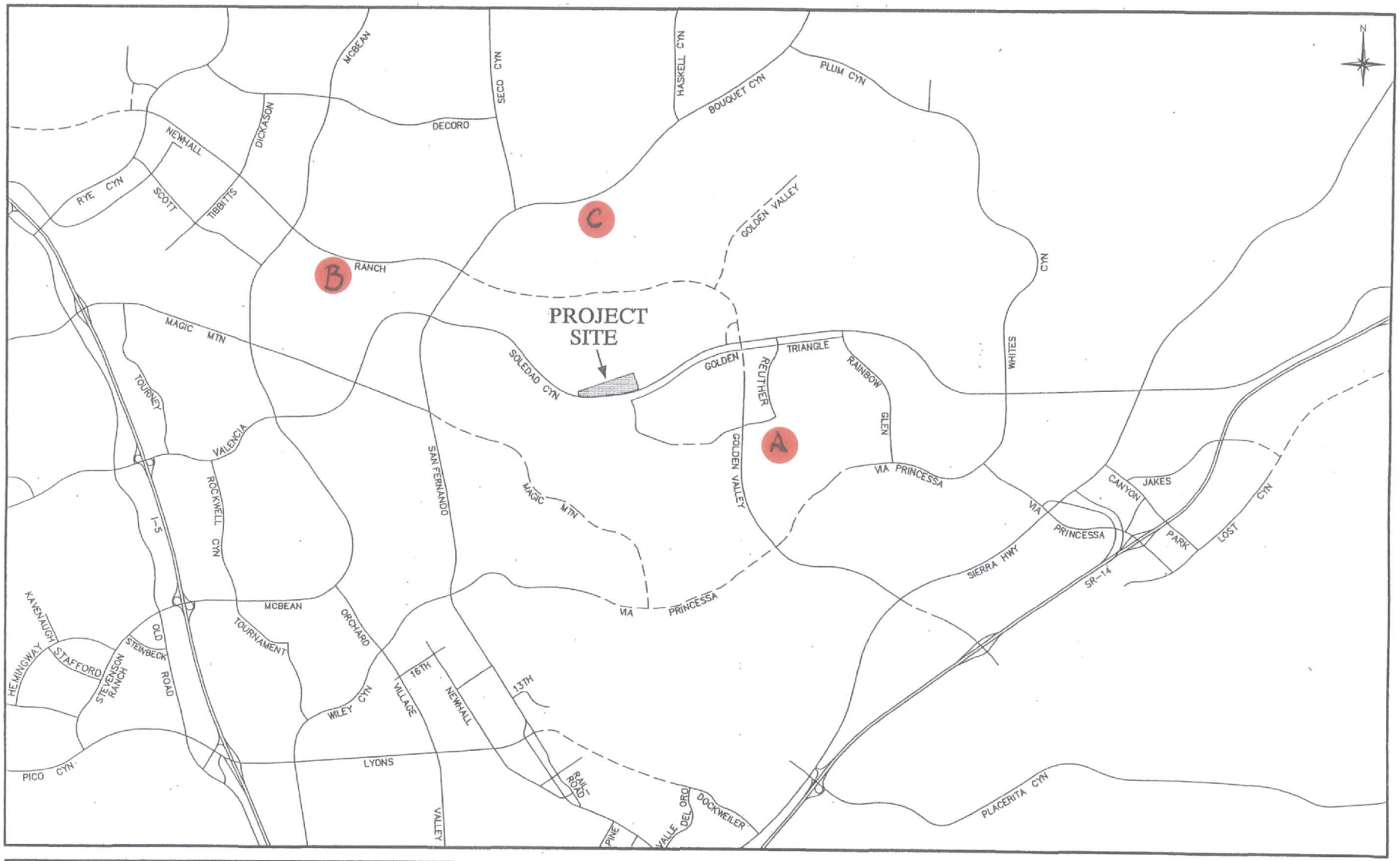
I hope the information will be helpful to you in preparation of the environmental document. Please feel free to contact me at (661) 255-4394 if you have any questions.

Sincerely,

Tom Reilly
Park Development Administrator

TR:mpl
Plandev/Reilly/soledadtownhomes.doc

Enclosures

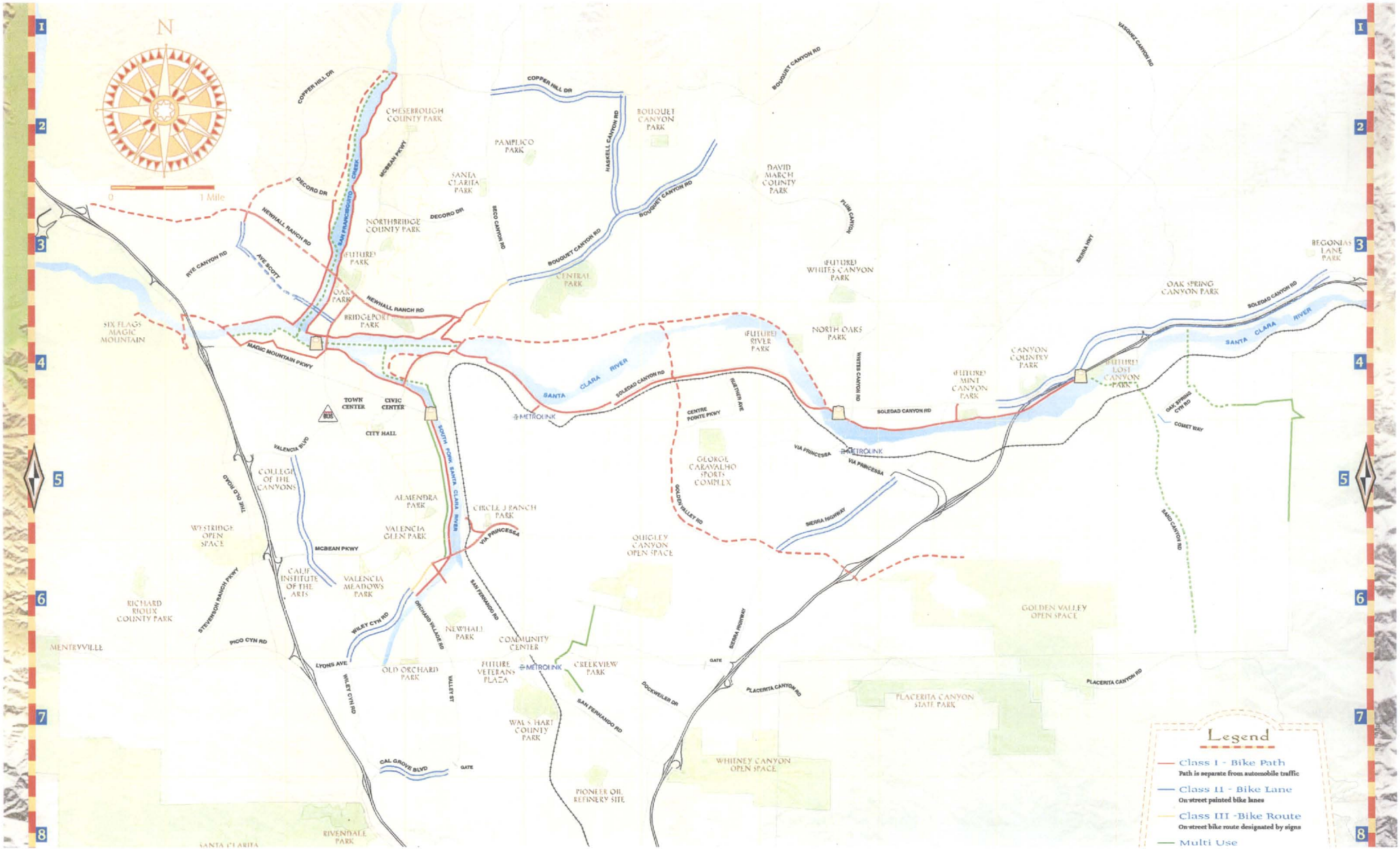


Legend

Planned Roadway

PARK LOCATIONS

PROJECT SITE LOCATION


N
0
1 Mile
COPPER HILL DR
CHESEBROUGH COUNTY PARK
PAMPICO PARK
SANTA CLARITA PARK
NORTHBRIDGE COUNTY PARK
DECORO DR
MCBEAN PKWY
SAN FRANCISQUITO CREEK
NEWHALL RANCH RD
RYE CANYON RD
AVE SCOTT
OAK PARK
(FUTURE) PARK
BRIDGEPORT PARK
SIX FLAGS MAGIC MOUNTAIN
MAGIC MOUNTAIN PKWY
REED CANYON RD
HASKELL CANYON RD
BOUQUET CANYON PARK
BOUQUET CANYON RD
DAVID MARCH COUNTY PARK
PLUM CANYON
(FUTURE) WHITES CANYON PARK
CENTRAL PARK
SIERRA HWY
BEGONIAS LANE PARK
OAK SPRING CANYON PARK
SOLEDAD CANYON RD
SANTA CLARA RIVER
(FUTURE) RIVER PARK
NORTH OAKS PARK
WHITES CANYON RD
CANYON COUNTRY PARK
(FUTURE) MINT CANYON PARK
(FUTURE) LOST CANYON PARK
OAK SPRING CYN RD
COMET WAY
TOWN CENTER
CIVIC CENTER
CITY HALL
METROLINK
CENTRE POINTE PKWY
RUETHER AVE
VIA PRINCESSA
GEORGE CARAVALHO SPORTS COMPLEX
GOLDEN VALLEY RD
SAND CANYON RD
VALENCIA BLVD
COLLEGE OF THE CANYONS
THE OLD ROAD
ALMENDRA PARK
CIRCLE J RANCH PARK
SOUTH FORK SANTA CLARA RIVER
WESTRIDGE OPEN SPACE
VALENCIA GLEN PARK
QUIGLEY CANYON OPEN SPACE
CALIF INSTITUTE OF THE ARTS
VALENCIA MEADOWS PARK
STEVENSON RANCH PKWY
RICHARD SIOUX COUNTY PARK
SAN FERNANDO RD
ORCHARD VILLAGE RD
WILEY CYN RD
NEWHALL PARK
COMMUNITY CENTER
GOLDEN VALLEY OPEN SPACE
MENTRYVILLE
PICO CYN RD
LYONS AVE
OLD ORCHARD PARK
FUTURE VETERANS PLAZA
CREEKVIEW PARK
WALLEY ST
GATE
DOCKWEILER DR
PLACERITA CANYON RD
PLACERITA CANYON STATE PARK
WALNUT HART COUNTY PARK
CAL GROVE BLVD
WHITNEY CANYON OPEN SPACE
PIONEER OIL REFINERY SITE
RIVENDALE PARK
SANTA CLARITA
Legend
Class I - Bike Path
Path is separate from automobile traffic
Class II - Bike Lane
On-street painted bike lanes
Class III -Bike Route
On-street bike route designated by signs
Multi Use

TRAILS MAP

23920 Valencia Blvd.
Santa Clarita, CA 91355
Phone: (661) 255-4317

City of Santa Clarita

Fax

To:	RBF Consulting	**From:**	Tom Reilly
Fax:	949-472-8373	**Date:**	June 7, 2005
Phone:	949-472-3505	**Pages:**	# (3)
Re:	Park and Recreation Facilities	**CC:**	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Comments:

Attached is the City of Santa Clarita's response to your Park and Recreation Facility Questionnaire.

Please review and inform me via e mail ~~fax or phone~~ if you have any comments or questions.

Thank you.

Tom Reilly (661-255-4394)

treilly@santa-clarita.com

23920 Valencia Blvd.
Suite 120
Santa Clarita
California 91355-2196
Website: www.santa-clarita.com

Phone
(661) 255-4910
Fax
(661) 255-1996

City of
Santa Clarita

June 7, 2005

Ms. Lindsay Anderson
Environmental Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618-2027

SUBJECT: SOLEDAD TOWNHOMES - PARK AND RECREATION FACILITIES QUESTIONNAIRE

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Any required or recommended mitigation measures for significant impacts are to be determined upon review of the environmental document.

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Other impacts will include:

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8) Need for physical additions to this agency.

The City of Santa Clarita Park, Recreation, and Community Services Department would require some physical improvements on or off site to accommodate the demand created by this development.

I hope the information will be helpful to you in preparation of the environmental document. Please feel free to contact me at (661) 255-4394 if you have any questions.

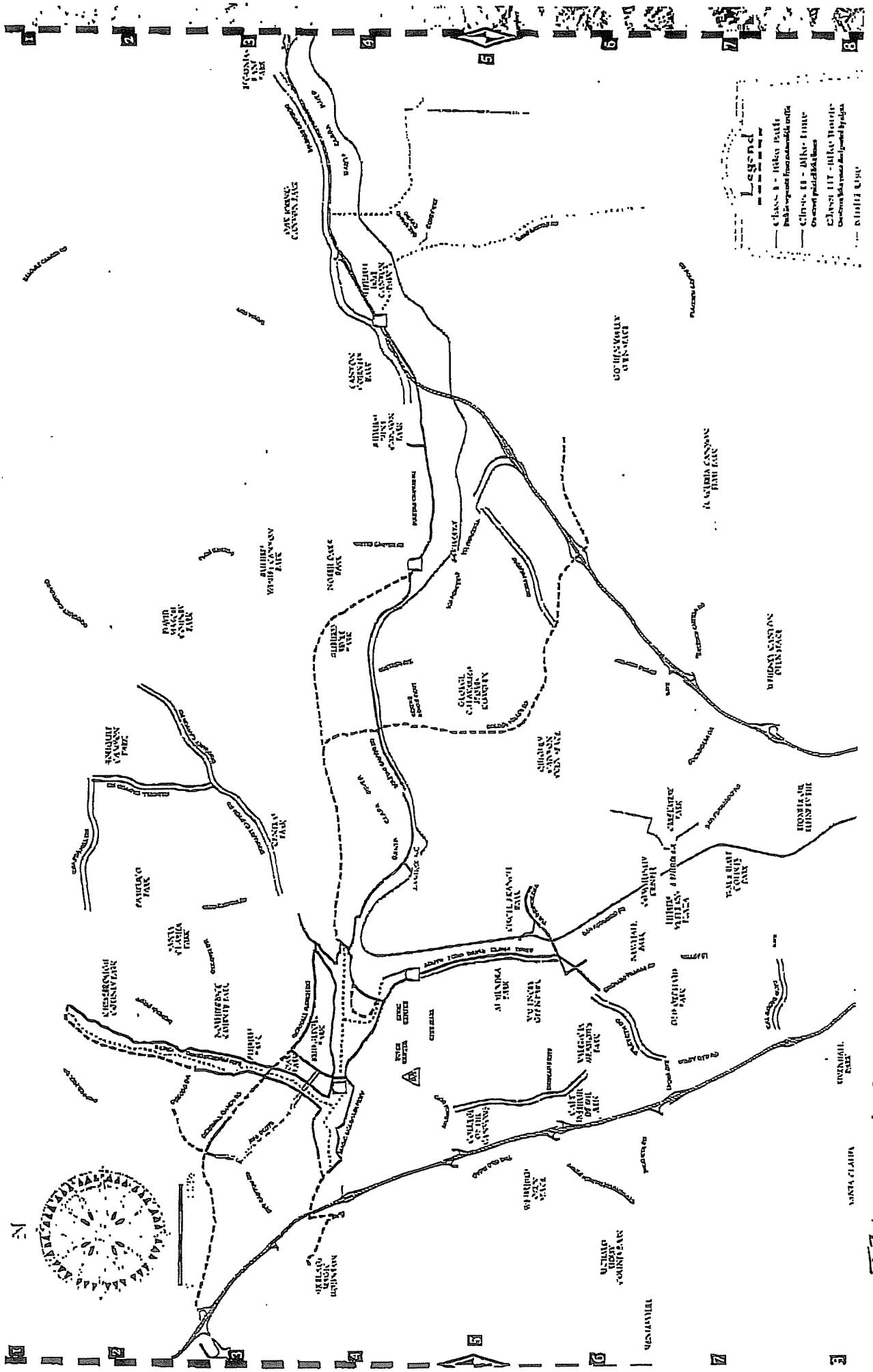
Sincerely,

Tom Reilly
Park Development Administrator

TR:mpl
Plandev/Reilly/soledadtownhomes.doc

Enclosures

PROJECT SITE
PROJECT SITE LOCATION
Legend
Planned Roadway
Park Locations
GOLDEN VALLEY
SAN FERNANDO
VALLEY
RESEDA
ROSCOE
SCHOOL
PARK
ROAD


Legend
Class I - Bike Path
Class II - Bike Lane
Class III - Bike Route
Bridge
N

TRAILS MAP

BLUE BARREL DISPOSAL

A WASTE MANAGEMENT COMPANY

FACSIMILE TRANSMITTAL SHEET

TO: Lindsay Anderson
FROM: Kevin Burke
COMPANY: RBF
DATE: 5/20/05
FAX NUMBER: 949-837-4122
TOTAL NO. OF PAGES INCLUDING COVER: 4
PHONE NUMBER:
SENDER'S REFERENCE NUMBER:
RE:
YOUR REFERENCE NUMBER:

☐ URGENT FOR REVIEW ☐ PLEASE COMMENT PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

25772 SPRINGBROOK ROAD
SAUGUS, CA 91350
PHONE: 661-259-2398 * FAX: 661-286-2112



Blue Barrel Disposal
A Waste Management Company

1. Chiquita Canyon Landfill is the facility with sufficient capacity for your project's needs.

2. Estimated monthly solid waste generation 875 to 1200 cubic yards per month.

3. We can provide service for this project. We currently have the City of Santa Clarita franchise for Multi-family projects.

4. Impacts – The streets need to be wide enough to handle our trucks. We cannot drive into cul-de-sacs and then back our trucks out. This is a safety issue. Will trash barrels be set out on the street or will the project use dumpsters placed in enclosures? If each home has trash, recycling and greenwaste barrels, there will be three different trucks in the project each week. If you use dumpsters, there will only be one truck in the project on service days.

5. Again, the streets must be wide enough for our trucks so that we can keep backing to an absolute minimum. Individual yards vs landscape maintenance will increase the amount of green waste generated.

6. N/A

7. City of Santa Clarita requires recycling.

25772 Springbrook Road, Saugus, California . 91350 ◦ (661) 259-2398 . (661) 259-4253 Fax

SOLID WASTE DISPOSAL QUESTIONNAIRE

Please respond to the following questions on your agency/company letterhead and provide maps to illustrate facility locations.

1. Which landfills are presently used in disposal of solid waste from the project area vicinity? Does the landfill(s) have sufficient permitted capacity to accommodate the project's solid waste disposal needs?

2. What is the estimated solid waste generation based upon information provided?

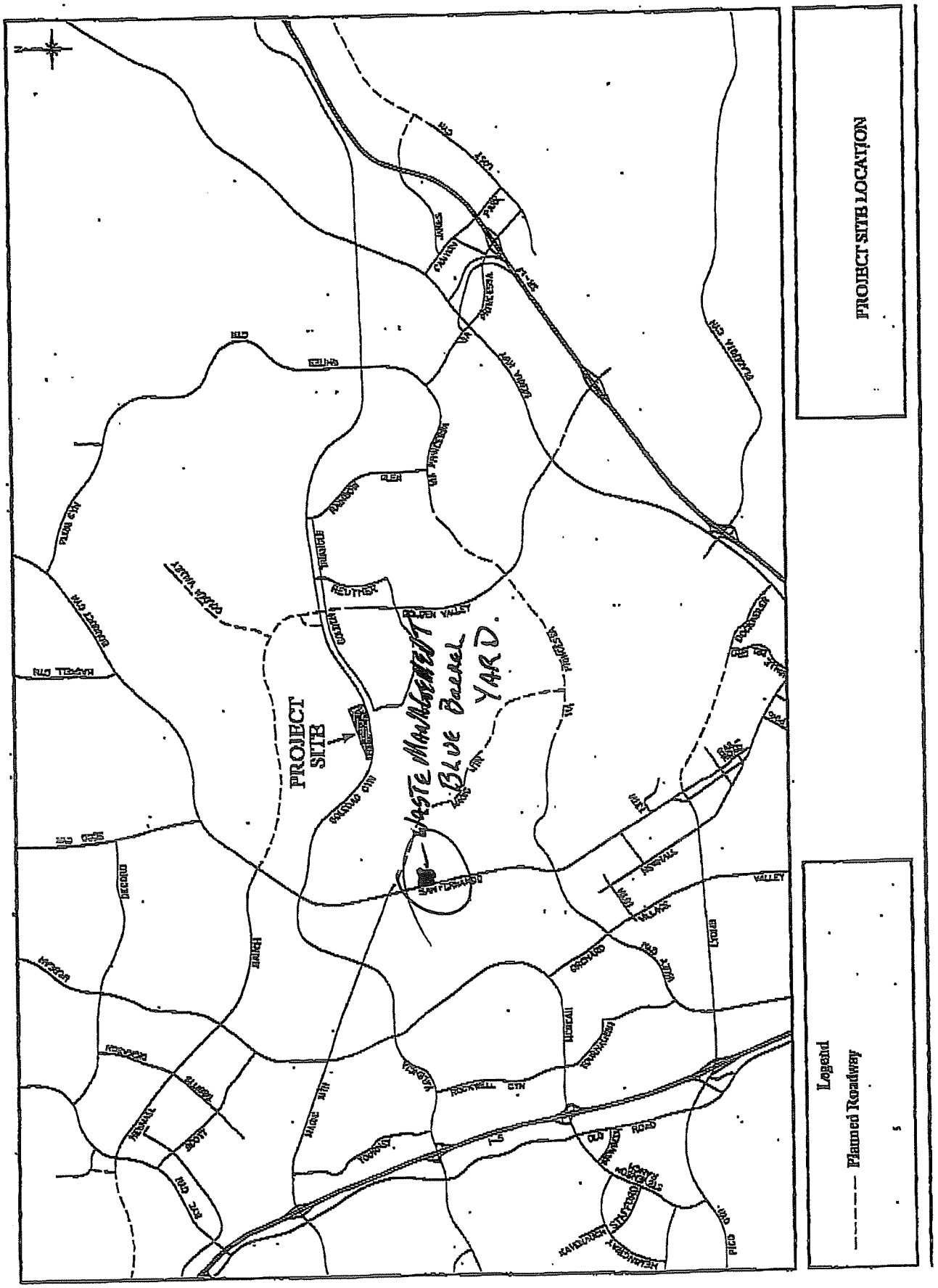
3. Will solid waste pickup service be available for the project?

4. Do you anticipate any impacts of the project with respect to solid waste service?

5. Do you have any required or recommended mitigation measures for any significant impacts?

6. Is there any other relevant information regarding significant projects impacts?

7. What federal, state, and local statues and regulations would the proposed project be required to comply with?


PROJECT SITE LOCATION
PROJECT SITE
Waste Management
Blue Barrel
YARD
Legend
Planned Roadway

RBF CONSULTING

RECEIVED
MAY 25 2005
RBF CONSULTING

May 19, 2005
Attn: Chris Fall
Attn: ~~Karen~~ Erstad = Antelope Valley
BLUE BARREL DISPOSAL
25772 Springbrook Avenue
Santa Clarita, CA 91350

JN 10-104142

Subject: Soledad Townhomes Environmental Impact Report

Dear Ms. Erstad:

RBF Consulting (RBF) is in the process of preparing an Environmental Impact Report (EIR) for the Soledad Townhomes project. RBF is seeking a response from your agency, to be incorporated into the EIR, with regard to the services provided by your agency. A questionnaire (attached) identifies the relevant issues to be addressed in the EIR document.

The Soledad Townhomes project (Project) site encompasses approximately 30 acres of land located along the north side of Soledad Canyon Road, between Bouquet Canyon Road and Golden Valley Road, in the City of Santa Clarita (refer to the *Project Site Location* exhibit). The Project would construct a residential community with 437 for-sale multiple-family dwelling units (162 two-story triplex units and 275 two-story townhome units), a maximum of 8,000 square feet of commercial uses, associated recreation uses (common and private open space areas) and on-site private roads. The residential units would range in size from approximately 1,400 square feet to 2,200 square feet. (refer to the *Proposed Project Site Plan* exhibit).

We would greatly appreciate your assistance and cooperation in providing the requested information to our attached questionnaire. Please provide your written response on agency letterhead. In order for the consultant team to maintain our projected schedule, we would appreciate your written response as soon as information is available. For your convenience, you may FAX your response to 949/837-4122.

If you have any questions or require additional information, please do not hesitate to contact me at 949/855-5772 or Collette Morse, Project Manager, at 949/855-3653. Again, thank you for your cooperation.

Sincerely,

L Anderson

Lindsay Anderson
Environmental Planner

Attachments

SOLID WASTE DISPOSAL
QUESTIONNAIRE

Please respond to the following questions on your agency/company letterhead and provide maps to illustrate facility locations.

1. Which landfills are presently used in disposal of solid waste from the project area vicinity? Does the landfill(s) have sufficient permitted capacity to accommodate the project's solid waste disposal needs?
   Chiquita Cyn -
   Pathdale Landfill - yes

2. What is the estimated solid waste generation based upon information provided?
   Approx. 85 to 100 tons [redacted] per year.

3. Will solid waste pickup service be available for the project?
   yes

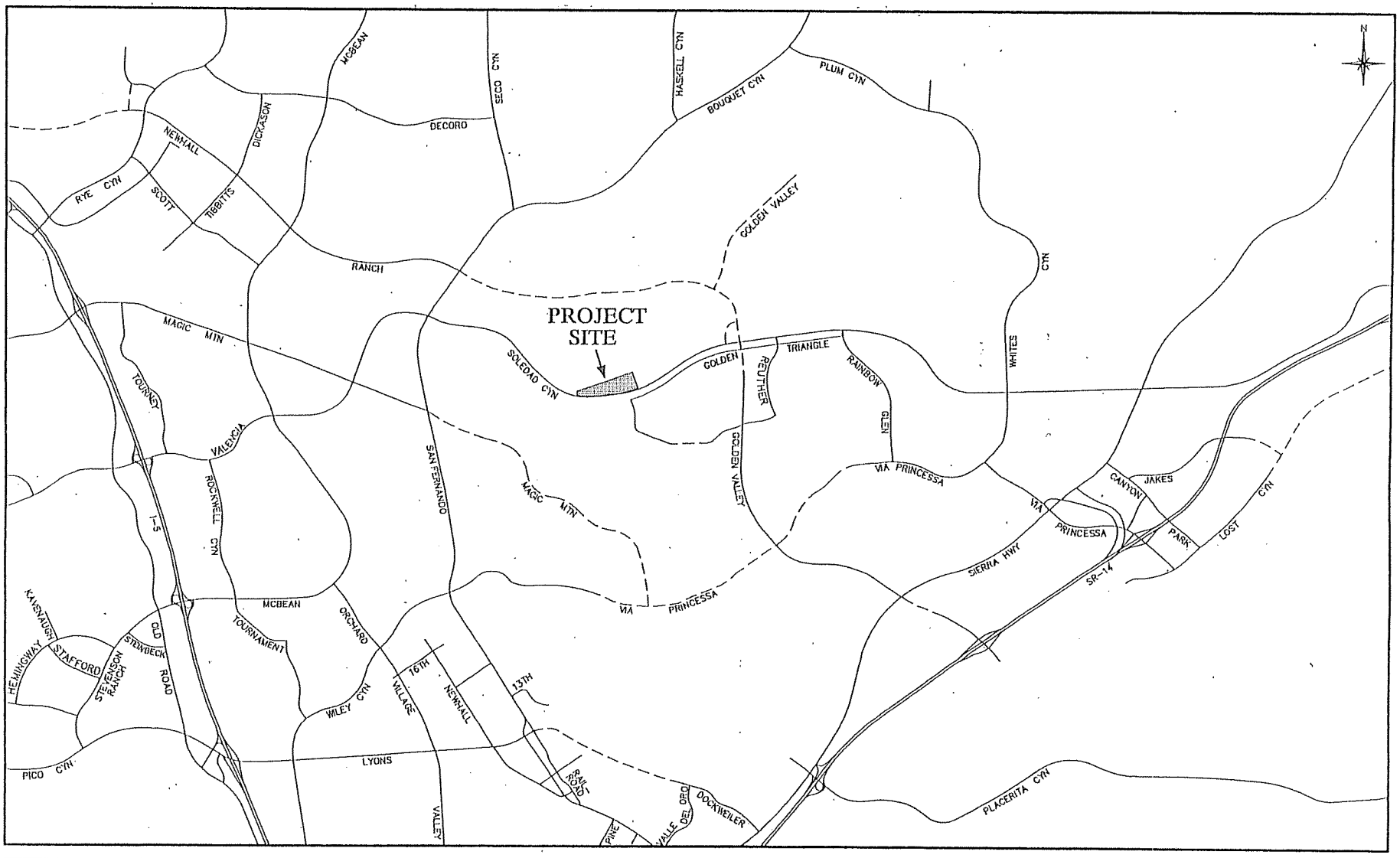
4. Do you anticipate any impacts of the project with respect to solid waste service?
   No

5. Do you have any required or recommended mitigation measures for any significant impacts? We recommend that all trash enclousures include enough room for a recycling bin

6. Is there any other relevant information regarding significant projects impacts?
   No

7. What federal, state, and local statues and regulations would the proposed project be required to comply with?
   AB939 - 50% recycling.

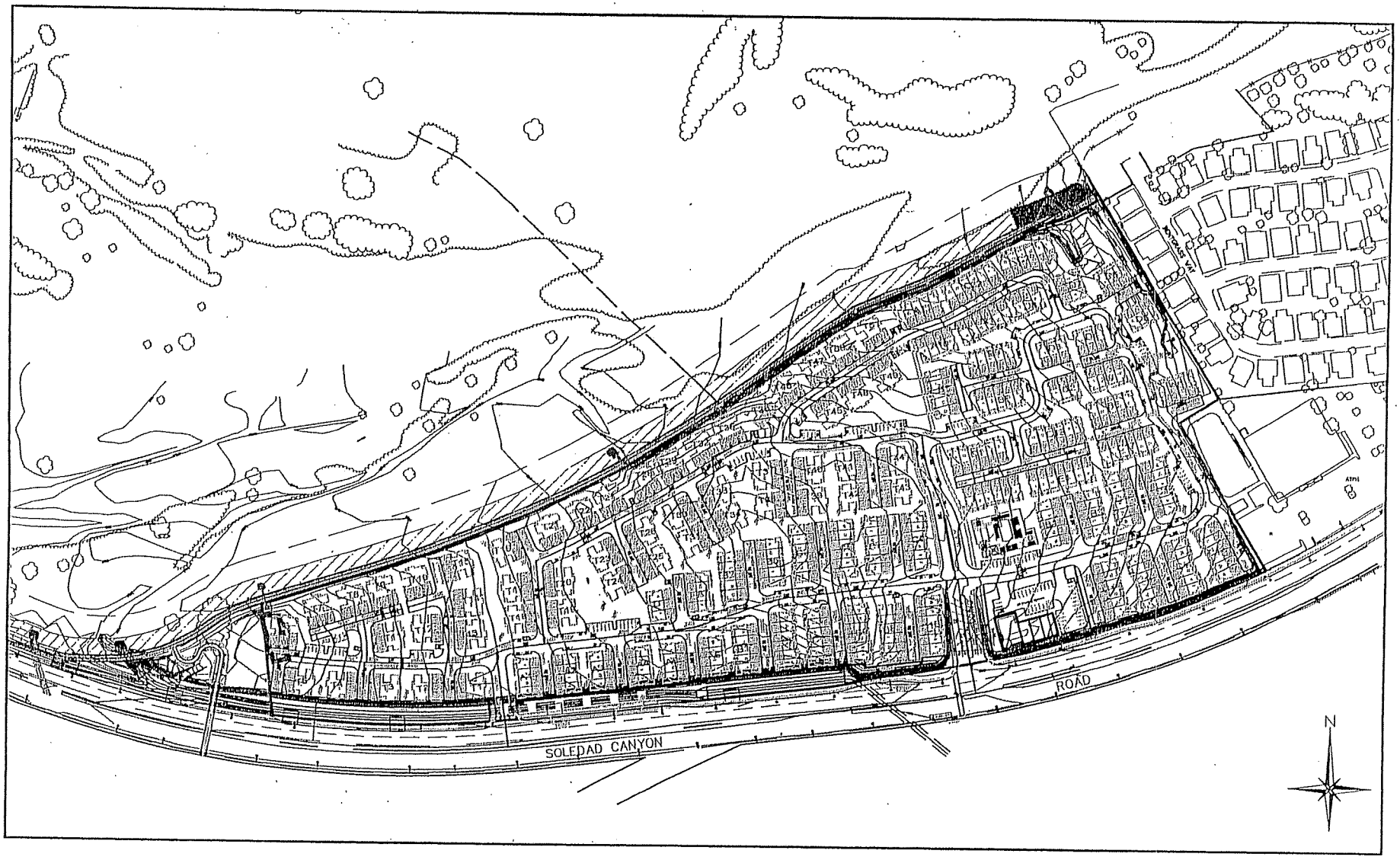
5/23/05
Chris Hall



Legend

Planned Roadway

PROJECT SITE LOCATION



PROPOSED PROJECT SITE PLAN

FAX

Date 5/19/05

Number of pages including cover sheet 1

TO:	Lindsay Anderson RBF Consulting	**FROM:**	Keith Abercrombie Vice President/Operations Valencia Water Company 24631 Avenue Rockefeller Valencia, CA 91355
Phone	949-855-5772	**Phone**	661-295-6504
Fax Phone	949-837-4122	**Fax Phone**	661-294-3806

LM -

CC:

REMARKS: ☒ Urgent ☐ For your review ☐ Reply ASAP ☐ Please Comment

Regarding your fax to me today requesting supporting info for the EIR being prepared for the Soledad Townhomes project – Valencia Water Company is not the water purveyor for this project. This project will be served by Santa Clarita Water Company, and you should be contacting them concerning any information you may need.

Give me a call if you have any questions for me.

KY

PRIVILEGED AND CONFIDENTIAL

All the information transmitted hereby is intended only for the use of the addressee(s) named above. If the reader of this message is not the intended recipient or the employee or agent responsible for delivering the message to the intended recipient(s), please note that any distribution or copying of this communication is strictly prohibited.

Anyone who receives this communications in error should notify us immediately by telephone and return the original message to us at the above address via the US Mail.

VALENCIA WATER CO Fax:6612943806 May 19 2005 12:06 P.01



Appendix J
SCHOOL FUNDING AGREEMENTS

SCHOOL FACILITIES FUNDING AGREEMENT BETWEEN THE SAUGUS UNION SCHOOL DISTRICT AND THE NEWHALL LAND AND FARMING COMPANY

This School Facilities Funding Agreement ("Agreement") is made at Valencia, California, as of February 18, 1997, between the **SAUGUS UNION SCHOOL DISTRICT** ("District"), a school district organized and existing under the laws of the State of California, on the one hand, and **THE NEWHALL LAND AND FARMING COMPANY** ("NLF"), a California limited partnership, on the other hand, with respect to the following facts:

A. NLF, the owner, has been developing and continues to develop the master planned Valencia Community ("Valencia"), which is located in part within the District's boundaries, a portion of which is subject to the provisions of this Agreement ("NLF Property"). The NLF Property, which is described in Exhibit"A," attached and herein incorporated to this Agreement, excluding those areas depicted as exclusions ("Excluded Areas") as described in Exhibit "A," attached and herein incorporated to this Agreement. The Excluded Areas are further identified and described in Exhibit "B" which is attached and herein incorporated to this Agreement.

B. NLF Property is a mixed use development which will include approximately fifteen thousand (15,000) dwelling units in addition to commercial facilities. Total buildout of the NLF Property will take approximately ten (10) more years and the final details of development of the NLF Property, including the location and extent of land uses, the number and product mix of dwelling units is expected to change over time to meet the needs of the market. Corresponding changes in governmental approvals are also expected.

C. Historically, the State of California has provided a substantial portion of the money necessary to build new School Facilities ("State Funding"). However, over the last several years sufficient funds have not been available from the State for this purpose and the District does not believe that sufficient funds will be available from the State for this purpose in the near future.

D. The District and NLF have estimated the amount of money which would be necessary to completely mitigate the impacts of the development of the NLF Property on the District's educational facilities in the absence of State funding ("Mitigation Payments").

E. Both the District and NLF desire to provide a financing schedule ("Financing Schedule") and a financing plan ("Financing Plan"), as set out in this Agreement, in lieu of Mitigation Payments, which will provide permanent School Facilities, including land, buildings, furnishings and equipment ("School Facilities"), to house the NLF K-6 Students who will be generated by the development of the NLF Property, including those students from NLF Property which may attend District School Facilities pursuant to paragraph 1 of this Agreement ("NLF Students"), and which will completely mitigate the direct and cumulative impacts on the District's educational facilities. Temporary facilities to house NLF Students inclusive of Castaic

NLF Students as hereinafter defined, while new School Facilities are being constructed, will be provided, and paid for, by the District. School Facilities will be constructed in accordance with the requirements and specifications contained in the Education Code and the Applicant Handbook for State School Building Lease-Purchase Program put out by the Office of Public School Construction as those requirements and specifications exist at any given time ("State Requirements and Specifications"). A copy of the State Requirements and Specifications as they exist on the date of this Agreement is attached as Exhibit "C" and herein incorporated to this Agreement.

F. The construction of School Facilities will be accomplished through the use of funds advanced by NLF in response to requests from the District, hereinafter defined as Construction Draws. The Financing Schedule will ensure that the District will always have sufficient capacity to house every NLF student. The Financing Plan is intended to minimize the financial impacts on NLF while at the same time maximizing the opportunity to obtain State Funding for School Facilities or the repayment, without interest, from State Funding of the funds advanced by NLF for the cost of School Facilities necessary to house NLF Students.

G. The Financing Schedule and the Financing Plan will ensure that the development of the NLF Property, either individually or cumulatively with other projects within the District's boundaries, will have no adverse impacts on the District's ability to provide adequate educational opportunities to every student in the District. In particular, the Financing Schedule and the Financing Plan guarantee to the District that there will be adequate School Facilities available to house every NLF Student.

H. The District has determined that the development of the NLF Property, as a part of the planned community of Valencia, presents a unique opportunity for the District to provide for complete mitigation of the impact that this development is likely to have on the District's educational facilities, that the Financing Schedule and the Financing Plan will provide all of the land and money necessary to provide all needed School Facilities without the need to collect any fees which might otherwise be available to the District in connection with the construction of commercial or industrial buildings within the NLF Property. The District has also determined that the number of additional students who might be entitled to attend the District's schools because of their parents' or guardians' employment in those buildings is less than, or equal to, the number of NLF Students who will not attend the District's schools because they will be attending schools in other districts or private schools. The District's determination is limited to the NLF Property and does not represent a precedent applicable to any other property within the District.

I. Each future permanent elementary school to house NLF Students will be built to the State Requirements and Specifications and will contain at least 30% relocatable classrooms, which, together with permanent School Facilities, will house seven hundred seventy-five (775) students on a traditional, single track, nine month school schedule and that each represents the appropriate size elementary school to house NLF Students ("New Elementary School"). The

District will operate each New Elementary School to house nine hundred thirty (930) NLF Students by housing the additional one hundred fifty-five (155) NLF Students at any New Elementary School or at any other District school by either, in its sole discretion, adding relocatable classrooms or, without adding relocatable classrooms, by operating any New Elementary School on a multi-track, year-round schedule.

J. Each New Elementary School will be built on a net (10) ten acre school site exclusive of slope areas in excess of two percent (2%) ("Slope Areas") or, in NLF's sole discretion, on a net six and one-half (6.5) acre school site exclusive of Slope Areas for joint use with an adjoining local public park containing at least a net of five (5) acres exclusive of Slope Areas ("New Elementary School Site"), provided the District has entered into a joint use agreement ("JUA") acceptable to the District. The operation and relationship of the joint use school and park shall be contained in such JUA. Any adjoining local park shall be improved and available as provided in the JUA for use by the District at the time the adjoining New Elementary School is open for operation and for as long afterwards as the New Elementary School remains in operation.

IN LIGHT OF THE FOREGOING FACTS, IT IS MUTUALLY AGREED THAT:

1. The District shall use its best efforts to enter into an agreement with the Castaic Union School District ("Castaic") whereby District can provide classrooms and educational services to the students from that portion of the NLF Property anticipated to be developed, consisting of approximately 200 dwelling units which presently are within the boundaries of Castaic. This area, hereinafter defined as the Castaic Area ("Castaic Area"), is depicted in Exhibit "A" to this Agreement. This shall occur, if at all, through an interdistrict transfer agreement or some similar agreement to the mutual satisfaction of the District and Castaic. The District also shall not withhold its reasonable cooperation and consent to a reorganization and transfer of that portion of the District's boundaries that are currently in NLF's Westridge project so that the Westridge portion of District will become part of the Newhall School District ("Newhall") and within Newhall's boundaries. The terms of this Agreement shall apply to those portions of the NLF Property which are within the District's boundaries regardless of the outcome of District's best efforts to successfully complete the annexation or reorganization set forth in this Paragraph 1.

2. NLF shall advance all of the funds needed by the District to build the New Elementary Schools pursuant to the terms of this Agreement and the District shall build the New Elementary Schools necessary to house all NLF Students pursuant to the terms of this Agreement.

3. The District shall provide NLF with written notice ("District Notice") for the first New Elementary School when the District reasonably determines that at least three hundred (300) NLF Students, including any NLF students from the Castaic Area ("Castaic NLF Students"), are estimated to exist for the next succeeding school year and that a New Elementary School is

reasonably required to house NLF Students, including any Castaic NLF Students. Thereafter the District shall provide NLF with a District Notice whenever it reasonably determines that all existing New Elementary Schools will house at least nine hundred thirty (930) NLF Students, including Castaic NLF Students, except when the last constructed new elementary school which will house at least seven hundred seventy-five (775) NLF students, including Castaic NLF Students, in the next succeeding school year and when at least three hundred ninety (390) additional NLF Students including Castaic NLF Students are reasonably estimated by the District to exist for the next two succeeding school years. The District Notice shall contain a description of the New Elementary School and a schematic footprint showing the location of all proposed buildings, parking lots, and other improved areas ("Project Layout") and shall state the District's estimated cost to construct the New Elementary School and the amount needed for the first Construction Draw.

4. The District shall use its best efforts to provide each New Elementary School, open for operation, at the time when four hundred fifty (450) additional NLF Students including any Castaic NLF Students are available to be housed in the New Elementary School. NLF shall advance to the District the funds required to construct each New Elementary School to a maximum of Six Million Nine Hundred Sixty-Seven Thousand Two Hundred Ninety Dollars ($6,967,290.00) (as shown on Exhibit D) adjusted beginning on January 1, 1998 and annually thereafter on January 1st to account for inflation based on the statewide cost index for Class D construction as determined by the State Allocation Board at its quarterly meetings ("Index"), which adjustment shall be effective as of the date of each meeting ("Maximum Construction Cost"). If the State Allocation Board stops determining the adjustments, the adjustments shall be made using the Marshall & Swift Class D Wood Frame Cost Index for the Western United States, or another mutually agreed upon index. NLF may, in its sole discretion, post an improvement bond, or a letter of credit in favor of the District in a form and from a source reasonably acceptable to the District, in the lesser of the amount of the cost of construction set forth in the District Notice or the Maximum Construction Cost and shall advance the funds required for the first Construction Draw to the District within sixty (60) calendar days of receipt of the District Notice. Thereafter, the District shall submit subsequent written Construction Draw requests to NLF and NLF shall advance the funds required by each subsequent Construction Draw request to the District within thirty (30) calendar days of receipt of the Construction Draw request up to the lesser of the amount of the Construction Draw or Maximum Construction Cost set forth in the District Notice, plus any change orders or actual reasonable extra costs. The District shall confer with NLF as to any change orders involving extra costs in excess of five percent (5%) of the Maximum Construction Cost.

5. The District shall be responsible for obtaining, paying for, and installing any permanent or temporary relocatable classrooms which are to be used to house NLF Students inclusive of any Castaic NLF Students while a New Elementary School is being built.

6. The District and NLF shall consult with each other on the planning, design, layout, and grading of each New Elementary School and each New Elementary School Site to maximize architectural compatibility with surrounding development and to minimize construction and maintenance costs to the District to the greatest extent possible while still conforming to the State Requirements and Specifications. All decisions regarding the planning, design, layout, and grading of New Elementary Schools and New Elementary School Sites shall be in the District's sole discretion and it is not intended that the District be required to do anything that will increase its current or future costs of operation or maintenance.

7. NLF shall provide each New Elementary School Site to the District in a construction ready condition within one hundred eighty (180) calendar days of receipt of the District Notice. It is the intent of the District and NLF that plans, drawings, and construction documents will have been prepared and approved by the Office of the State Architect and the State Allocation Board and that a construction contract will be concurrently awarded upon completion of a New Elementary School Site by NLF in the herein described construction ready condition, so that construction of each New Elementary School can begin at the time each New Elementary School Site is provided to the District.

8. Each New Elementary School Site shall be provided to the District in a construction ready condition with all-weather access to public roads and utilities, including storm water and drainage facilities. This shall consist of one (1) potable water line, one (1) fire water line, one (1) electrical line, one (1) natural gas line, one (1) telephone line, and up to two (2) sewer lines, stubbed to the hook-up location indicated for each utility on pages 3-B-40-41 of The State Requirements and Specifications attached as Exhibit "C", and shown on the Project Layout, sufficient to service a New Elementary School, in place. Each New Elementary School Site shall have no more than two (2) pads with no more than a two percent (2%) grade as to each pad. The Maximum Construction Cost shall be increased by any additional costs of service-site development over that which would otherwise be incurred if the difference in elevation of two pads on a New Elementary School Site exceeds four (4) feet. Every pad shall be compacted to the degree required by a geotechnical engineer to support the uses shown on the Project Layout without additional cost to the District.

9. NLF shall provide, a maximum of four (4) New Elementary Schools and four (4) New Elementary School Sites, pursuant to paragraph 13 below, which shall be funded by NLF pursuant to this Agreement. The location of each New Elementary School Site is to be reasonably determined by NLF subject to the consent of the District, which consent shall not be unreasonably withheld, the concurrence of the State Department of Education and, if required, the County of Los Angeles or a successor City.

10. NLF shall lease New Elementary School Sites to the District as needed by the District on the terms and conditions of this Agreement. Each lease shall commence sixty (60) calendar days after receipt of the District Notice. Each net five (5) acre local public park,

exclusive of Slope Areas, adjacent to a net six and one half (6.5) acre, exclusive of Slope Areas, New Elementary School Site, shall be improved and available for joint use in connection with the operation of the New Elementary School at the time that it opens for operation and shall remain available for as long afterwards as it remains in operation. NLF shall make all reasonable efforts to place the landscaped area, if any, on the frontage of the New Elementary School Sites within the boundary of a landscaping and lighting maintenance district. Each lease for a New Elementary School Site shall be for a period of thirty (30) years ("Lease Term") at a rental of One Dollar ($1) per year. Each lease shall terminate if the New Elementary School is not open for operation within five (5) years of the commencement of the lease, provided that NLF has advanced all required funds for the New Elementary School to the District, or if, after the New Elementary School has opened for operation, it fails to operate as an elementary school for five (5) years in any seven (7) year period. The District, upon termination of any lease, shall, at the District's sole expense, demolish all improvements constructed by it on the New Elementary School Site and return it to the condition it was in at the commencement of the lease and shall refund to NLF any funds advanced to the District, together with interest actually earned by the District, for the construction of the New Elementary School which have not been paid, irrevocably committed, or required to terminate any applicable contract.

11. Each lease shall contain an option which allows the District to purchase the New Elementary School Site and which the District shall exercise immediately if the District is able to obtain money for construction or land acquisition from any State or federal agency. The purchase price shall be the appraised value at the time of the exercise of the option or at such other time as required by applicable State or federal law and shall be determined in accordance with applicable policies and regulations of the office of Public School Construction and the State Allocation Board. If the money received from any State or federal agency is less than the purchase price, then the District shall pay NLF the amount received and any additional amounts received for the New Elementary School Site from any State or federal agency thereafter. If the District is unable to exercise the purchase option during Lease Term, the District shall purchase the New Elementary School Site for One Dollar ($1) at the end of the Lease Term. Any purchase of a New Elementary School Site which does not include the payment of the full amount of the appraised value shall be subject to a power of termination, as that term is defined in Civil Code 885.010, in favor of NLF which will require the District to deed all improvements constructed by it on the New Elementary School Site, and to return it to the condition it was in at the commencement of the lease if the New Elementary School fails to operate as an elementary school for five (5) years in any seven (7) year period. Upon exercise of the power of termination, NLF shall pay the District the amount of the purchase price, without interest, paid to NLF. The power of termination shall become ineffective at such time as NLF receives the full amount of the appraised value of a New Elementary School Site.

12. If the District determines that a fourth New Elementary School Site and a New Elementary School is needed by District, then NLF shall provide the fourth New Elementary School Site pursuant to the provisions set out in Paragraphs 10 and 11 above.

13. The District shall state in the District Notice for the last school needed to house NLF Students including Castaic NLF Students ("Last School") the number of NLF Students that exceed two thousand seven hundred ninety (2,790) that will be housed in the Last School.

a. If the District reasonably determines that the Last School will house less than nine hundred thirty (930) NLF Students, including Castaic NLF Students, but more than four hundred sixty-five (465) NLF Students, including Castaic NLF Students, then the District shall build the Last School on a New Elementary School Site to be provided by NLF. The Last School shall be built to the State Requirements and Specifications and shall be large enough to house the number of NLF Students, including Castaic NLF Students, if the school were operated on a multi-track, year round schedule. NLF shall only be required to advance funds to the District equal to the construction cost of the Last School up to the Maximum Construction Cost. Alternatively, the District, in its sole discretion, may build a New Elementary School in which case NLF shall be required to advance funds to the District equal to the lesser of the construction cost of the New Elementary School multiplied by the ratio of the number of NLF Students and Castaic NLF Students to be housed to the nine hundred thirty (930) or the Maximum Construction Cost multiplied by the ratio of the number of NLF Students and Castaic NLF Students to be housed to nine hundred thirty (930).

b. If the District determines that the Last School will house four hundred sixty-five (465) NLF Students, including Castaic NLF Students, or less, then the District shall not be required to build the Last School and NLF shall only be required to advance funds to the District equal to the construction cost of a school large enough to house such number of NLF Students, including Castaic Students. This amount, shall be equal to the construction cost of a New Elementary School, up to the Maximum Construction Cost, to be adjusted by the Index, multiplied by the ratio of the number of NLF Students, including Castaic NLF Students, to be housed to nine hundred thirty (930). Alternatively, the District, in its sole discretion, may build the Last School in which case it shall be large enough to house a minimum of seven hundred seventy-five (775) students if operated on a traditional, single track, nine month school schedule and shall be built to the State Requirements and Specifications. If the District constructs the Last School and if it becomes obligated to purchase land for the Last School within five (5) years of the time that NLF advances the funds called for under this subparagraph, then NLF shall advance additional funds to the District equal to the construction cost of the Last School plus the District's actual out-of-pocket purchase price of the land . This amount shall be multiplied by the ratio determined by dividing the number of NLF Students, including Castaic NLF Students to be housed, by the number of students that the Last School will be able to house if the Last School were to operate on a multi-track, year round schedule. This amount shall not exceed the Maximum Construction Cost, less the amount of funds previously advanced for the Last School. The District shall reimburse NLF for the funds advanced for the purchase of the land for the Last School if the District later receives funds for the purchase of the land from any State or federal agency. NLF shall have no obligation to advance additional funds for the construction cost or the purchase of the land for the Last School if the District does not become obligated to purchase the

land within five (5) years of the time that NLF advances the funds called for under this subparagraph.

c. If the District determines that the total number of NLF Students, including Castaic NLF Students, generated by the NLF Property will be greater than three thousand seven hundred twenty (3,720), i.e. the number of students that would be in four (4) New Elementary Schools, then District shall notify NLF at such time. Beginning at such time that there are three thousand seven hundred twenty-one (3,721) NLF Students, including Castaic NLF Students, in four (4) New Elementary Schools, then NLF shall be required to pay a mitigation fee to District for each single family and multi-family dwelling unit at the time of issuance of a building permit for each such unit. The mitigation fee shall be calculated by multiplying the student generation rate ("SGR") of a single family and/or multi-family dwelling unit times the Maximum Construction cost of a New Elementary School and the cost of land acquisition of ten (10) net acres, at the then appraised value and dividing that amount by nine hundred thirty (930) students. The SGRs shall be calculated by dividing the actual total number of District students from each of the two types of dwelling units by the actual total number of the respective type of dwelling units within the District.

14. The District shall use its best efforts to maximize its eligibility to obtain funding for each New Elementary School and each New Elementary School Site from any State or federal agency and shall take all reasonable efforts to obtain such funding. Toward this end, the District and NLF may, upon NLF's request, revise this Agreement to provide a different procedure, including design/build and Public/Private Partnership concepts which will increase the opportunity to obtain funding from any State or federal agency as long as there is no increased cost to either the District or NLF. The District shall, in any event, use its best efforts to ensure that NLF receives any funds received from any State or federal agency in connection with the acquisition of a New Elementary School Site or the construction of a New Elementary School. The District shall be entitled to retain funds received from any State or federal agency up to the cost of five (5) permanent relocatable classrooms for each New Elementary School. If the law is changed to allow local bond issues to be approved by a majority of the voters, the District shall use its best efforts to put a local bond issue on the ballot and have it approved. District shall not be obligated to put a local bond issue on the ballot in those areas of the District in which a Community Facilities District (Mello-Roos) has been or will be established to fund School Facilities. If such a local bond issue passes, then NLF shall be reimbursed for the appraised value of the New Elementary School Sites before the District retains funds received from the State or any federal agency for permanent relocatable classrooms.

15. The District shall provide the County of Los Angeles with information for the County's Development Monitoring System based on a capacity of nine hundred thirty (930) students for each New Elementary School.

16. To the extent that the dwelling units in Tentative Tract Maps of the County of Los Angeles designated as Tentative Tract Map Nos. 46389-07, 46389-08, 46389-09, 46389-10, 46389-11, 46389-12, 46389-13 and 52206, designated in Exhibit "A" to this Agreement, are constructed and pay school fees or other amounts pursuant to the Joint Valley-Wide Agreement to District for School Facilities, the District shall credit against the first Construction Draw for any New Elementary School such school fees or other amounts received by District pursuant to any Joint Valley-Wide Agreement entered into within the District. Such amounts may be used for architectural and additional costs preliminary to commencement of construction of the First New Elementary School.

17. Provided, NLF is not in default hereunder, the District shall not, under any circumstances:

a. Exercise any power or authority under current or future law without the consent of NLF to levy or impose an exaction of land, goods, money or services, whether denominated a fee, charge, dedication, or tax, against any development of the NLF Property except as to any District-wide general tax, special tax, or assessment for School Facilities;

b. Require, request, or cooperate with the County of Los Angeles, the City of Santa Clarita, or any other governmental entity to exercise its power or authority to levy or impose an exaction of land, goods, money, or services, whether denominated a fee, charge, dedication, or tax as to the NLF Property, for the benefit of the District;

c. Oppose the development of the NLF Property, any governmental approval, whether legislative or administrative, of these projects, or any change in any governmental approval of these projects on any basis whatsoever; or

d. Sponsor, or require the formation of, a Communities Facilities District which includes the NLF Property, except on a District-wide basis, without the express, written consent of NLF which consent may be given or withheld in NLF's sole discretion. The District shall not unreasonably refuse to act as sponsor for a Community Facilities District if requested to do so by NLF.

18. The funds and land to be provided to the District by NLF pursuant to the terms of this Agreement constitute the entire extent of NLF's obligation to provide School Facilities for development of the NLF Property. The District shall not require or accept any fees, except as provided for in Paragraph 16 above, in connection with the development of the NLF Property which might otherwise be available to it under current or future State law, the Valley-Wide ~~Joint School Fee Resolution~~ AGREEMENT (which the District is no longer a party to), or by any other means. The District shall inform the William S. Hart Union High School District that the amount of any such fees that would be otherwise available to the District shall not be collected.

19. The District shall provide written certification upon written request from NLF that adequate School Facilities for the District's K-6 needs either exist, or that the Financing Schedule and the Financing Plan provided by this Agreement guarantee their availability as needed, to house NLF Students from the NLF Property. This written certification shall be given to the County of Los Angeles, the City of Santa Clarita, or any other governmental entity which may have development approval authority over the NLF Property as requested by NLF.

20. Provided NLF is not in default under this Agreement, no development, change of development, governmental approval, nor change in any governmental approval of the NLF Property shall constitute the basis for any change or termination of this Agreement because this Agreement provides for the complete mitigation of all impacts, direct and cumulative, of the NLF Property on the District's ability to provide adequate educational opportunities to every student in the District.

21. The District, immediately upon request by NLF, shall provide any written certification required to obtain building permits or other development approvals for development of the NLF Property. The written certifications shall be provided for whatever number of residential dwelling units or commercial or industrial buildings are requested by NLF at any time.

22. NLF shall have the right, in its sole discretion, to sell or encumber the NLF Property, improved or unimproved and in whole or in part, by any deed, mortgage, deed of trust, or other security device. No sale, transfer, or encumbrance of the NLF Property shall affect NLF's obligations under this Agreement. Neither this Agreement nor any breach of this Agreement shall defeat, invalidate, diminish, or impair the lien or priority of any deed, mortgage, deed of trust, or other security device.

23. The District and NLF, within thirty (30) calendar days of the written request, shall perform any acts and prepare, sign, deliver, file, and record any documents reasonably required to obtain the goals, and to satisfy the conditions, contained in this Agreement. This includes, but is not limited to, providing the requesting party with a written statement certifying that:

a. This Agreement is unmodified and in full force and effect or, if there have been modifications, that this Agreement, as modified, is in full force and effect, stating the date and nature of any modifications; and

b. There are no current uncured defaults under this Agreement or, if there are any, the dates and natures of the defaults.

24. Any District Notice, request for a Construction Draw or other document which would impose a duty on NLF or change the extent of NLF's obligations under this Agreement shall be accompanied by reasonable supporting documentation at the time that it is provided to NLF by the District.

25. This Agreement is entered into solely for the benefit of the District and NLF and their successors, transferees, and assigns. Other than the District and NLF and their successors, transferees and assigns, no third person shall be entitled, directly or indirectly, to base any claim or to have any right arising from, or related to, this Agreement.

26. This Agreement contains the entire agreement and understanding concerning the funding of School Facilities to house NLF Students and except as to the portion of the NLF Property described in Paragraph 16 of this Agreement supersedes and replaces all prior negotiations and reposed agreements, written or oral. The District and NLF acknowledge that neither the other party nor its agents or attorneys have made any promise, representation, or warranty whatsoever, express or implied, not contained herein to induce the execution of this Agreement and acknowledges that this Agreement has not been executed in reliance upon any promise, representation, or warranty not contained herein.

27. This Agreement may not be amended except in writing and signed by the District and NLF.

28. The District and NLF acknowledge that each has conducted an independent investigation of the facts concerning the development of the NLF Property, the impact that NLF Students will have on the District's educational facilities, and the costs of housing NLF Students.

29. The District and NLF desire to resolve any disputes as to the meaning of any portion of this Agreement or the rights or obligations of the District or NLF under it as quickly as possible. Therefore any such disputes shall be resolved by binding arbitration conducted by a mutually agreed upon retired judge of the Los Angeles Superior Court. If the District and NLF are unable to agree on the arbitrator within thirty (30) calendar days of the receipt of a request for arbitration, they shall request that the presiding judge of the Los Angeles Superior Court designate one. The District and NLF shall each pay half of the cost of the arbitration and each shall be responsible for its own costs as to any such arbitration.

30. Except as provided in paragraph 29, if it becomes necessary to enforce any of the terms of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees and other costs of litigation in addition to any other relief to which it may be entitled.

31. In interpreting this Agreement, it shall be deemed that it was prepared by the parties jointly and no ambiguity shall be resolved against either party on the premise that it or its attorneys was responsible for drafting this Agreement or any provision hereof.

32. Each individual signing this Agreement warrants and represents that he or she has been authorized by appropriate action of the party which he or she represents to enter into this Agreement on behalf of the party.

33. All notices, demands, and communications between the District and NLF shall be given by personal delivery, registered or certified mail, postage prepaid, return receipt requested, Federal Express or other reliable private express delivery, or by facsimile transmission. Such notices, demands, or communications shall be deemed received upon delivery if personally served or sent by facsimile or after three business days if given by other approved means as specified above. Notices, demands, and communications shall be sent:

To the District:

Saugus Union School District
24930 Avenue Stanford
Santa Clarita, CA 91355
Fax No.: (805) 295-7525

With a copy to:

Alexander Bowie, Esq.
BOWIE, ARNESON, KADI, WILES & GIANNONE
4920 Campus Drive, Suite A
Newport Beach, CA 92660
Fax No.: (714) 851-2014

To NLF:

The Newhall Land and Farming Company
Attention: President
23823 Valencia Blvd.
Valencia, CA 91355
Fax No.: (805) 255-3960

With a copy to:

Steven D. Zimmer
RUPP, HOLMBERG & ZIMMER
P. O. Box 1426
Oxnard, CA 93032
Fax No.: (805) 385-8891

The foregoing names, addresses and fax numbers may be changed at any time by a written notice given as provided above.

34. This Agreement and all rights and obligations arising out of it shall be construed in accordance with the laws of the State of California.

35. Any litigation arising out of this Agreement shall be conducted only in Los Angeles County, California.

36. This Agreement may be signed in one or more counterparts at which, taken together, shall constitute one original documents.

37. Recitals A through J are true and correct and are hereby incorporated.

38. The terms and conditions of this Agreement shall be incorporated in every environmental impact report, environmental monitoring program, general plan amendment, specific plan, and tentative subdivision map approval given by Los Angeles County for NLF Property .

DATED: February 18, 1997

BOARD OF TRUSTEES OF THE SAUGUS UNION SCHOOL DISTRICT

By: _____
PRESIDENT OF THE BOARD OF TRUSTEES OF THE SAUGUS UNION SCHOOL DISTRICT

ATTEST:

_____
CLERK OF THE BOARD OF TRUSTEES OF THE SAUGUS UNION SCHOOL DISTRICT

Newhall/Saugus Union School District

DATED: February 18, 1997

THE NEWHALL LAND AND FARMING COMPANY (A California Limited Partnership)

By: NEWHALL MANAGEMENT LIMITED PARTNERSHIP

Managing Partner

By: NEWHALL MANAGEMENT CORPORATION

Managing General Partner

By: _____
Its: President

By: _____
Its: SR V.P.

APPROVED AS TO FORM: BOWIE, ARNESON, KADI, WILES & GIANNONE

By: _____
Alexander Bowie
Attorneys for THE SAUGUS UNION SCHOOL DISTRICT

RUPP, HOLMBERG& ZIMMER

By: _____
Steven D. Zimmer
Attorneys for THE NEWHALL LAND AND FARMING COMPANY

Exhibit B

Excluded Areas

Northbridge

MAP 1		MAP 2	MAP 3
TM44481	TM44488	TM44689	TM44695
TM44482	TM44489	TM44690	TM44696
TM44483	TM44490	TM44691	TM44697
TM44484	TM44491	TM44692	TM44698
TM44485	TM44687	TM44693	TM44699
TM44486	TM44688	TM44694	TM44821
TM44487			TM44823
			TM44823-01
			TM44848
			TM44849
			TM44850
			TM44851

Northpark I and II

TM45440
TM45440-02
TM46389-01
TM46389-02
TM46389-03
TM46389-04
TM46389-05
TM46389-06
TM51874
TM51875

SCHOOL FACILITIES FUNDING AGREEMENT BETWEEN

THE WILLIAM S. HART UNION HIGH SCHOOL DISTRICT AND

THE NEWHALL LAND AND FARMING COMPANY

This School Facilities Funding Agreement ("Agreement") is made as of Dec. 16, 1997, between the WILLIAM S. HART UNION HIGH SCHOOL DISTRICT ("Hart"), a school district organized and existing under the laws of the State of California, on the one hand, and THE NEWHALL LAND AND FARMING COMPANY ("Newhall"), a California limited partnership, on the other hand, with respect to the following facts:

RECITALS:

A. Newhall is the owner of the following projects located within Hart's district boundaries:

1. Vesting Tentative Tract Map No. 51931, currently pending before the City of Santa Clarita ("City") ("North Valencia Annexation Project");

2. Vesting Tentative Tract Map No. 48202, currently pending before the County of Los Angeles ("County") ("Decoro Highlands Project");

3. Tentative Tract Map Nos. 46389-07 through -16 inclusive, pursuant to a parent map approved by the County on January 3, 1996 ("North Park Project"); and

4. Tentative Tract Map No. 44374, approved by the City on February 4, 1997 ("Woodlands Project");

collectively referred to herein as the "Projects" or, individually, a "Project".

The Projects are being developed or are planned for development by Newhall or, after sale, by one or more merchant builders.

B. Newhall is the owner also of an approximately thirty-four and two-tenths (34.2) acre unimproved site, located at the northwest corner of Newhall Ranch Road and McBean

Parkway, as generally described in Exhibit "A" attached hereto and incorporated herein ("Newhall Ranch Road/McBean Site"). For purposes of this Agreement, the Newhall Ranch Road/McBean Site is divided for reference into two (2) separate parcels which are: a portion of a proposed junior high school site of twenty (20) acres ("Parcel A"); and an approximately fourteen and two-tenths (14.2) acre park site ("Parcel B") to be dedicated to the City, subject to a deed restriction providing that the conveyance of Parcel B is conditioned upon the City concurrently conveying five (5) acres of Parcel B ("Parcel C") to Hart, reserving to the City a perpetual easement for purposes of park and recreation, all as generally described in Exhibit "A." Exhibit "A" is intended only to generally describe such property. The exact locations, boundaries, and sizes of Parcel A, Parcel B and Parcel C shall be formally depicted on a separate Exhibit "B" which will be incorporated into the Agreement by amendment subsequent to execution of this Agreement. Newhall is willing to consent to annex the Newhall Ranch Road/McBean Site to the City.

C. Newhall and the County are party to the North River Park and Trail Agreement, entered into on June 2, 1992, providing a master plan for parks in the approximately two thousand three hundred (2,300) acre North River Community as defined in that agreement ("County Parks Agreement"). Pursuant to Section 1.B of the County Parks Agreement, Newhall is obligated to dedicate approximately twenty (20) acres of park area within Tentative Tract No. 44831 and Tentative Tract 45440, respectively, in some instances referred to as Duplex I and Duplex II. Newhall desires to satisfy a portion of its obligations to the County as set forth in the County Parks Agreement, by conveying Parcel B to the City.

D. Hart and Newhall recognize that the planned development of residential units of the Projects will generate additional grades 7 through 12 students ("Project Students") within Hart which will, in turn, require additional junior high and senior high school capacity. Newhall and Hart desire to enter into this Agreement for the purpose of setting forth Newhall's obligations to mitigate the impact of the development of the Projects on the school facilities of Hart, and the obligations of Hart relative to school facilities for the Project Students.

E. Performance by Newhall of the provisions set forth in this Agreement satisfy all of Newhall's obligations to Hart with respect to the impacts of the development of the Projects, and insure that, either individually or cumulatively with other development projects within Hart, the Projects will have no adverse impacts on Hart's ability to provide adequate school facilities for Project Students.

IN LIGHT OF THE FOREGOING FACTS, IT IS MUTUALLY AGREED THAT:

NEWHALL OBLIGATIONS

1. Newhall, on or before February 1, 1998, or such later date as the parties may agree, shall convey Parcel A to Hart in fee and Hart shall accept the conveyance of Parcel A from Newhall. Concurrent with the conveyance of Parcel A from Newhall to Hart, Newhall shall convey Parcel B to the City in fee, subject to a deed restriction providing that the conveyance is conditioned upon the City concurrently conveying in fee five (5) acres of Parcel B, previously defined herein as Parcel C, to Hart, reserving to the City a perpetual easement for purposes of park and recreation use which will be operated pursuant to a duly executed joint use agreement between Hart and the City. The form of the deeds for Parcel A to Hart, and Parcel B to the City are as set forth on Exhibits "C" and "D."

2. Newhall further, at its own expense, shall grade and improve Parcel A and Parcel C (collectively referred to as the "Proposed Junior High School Site"), to a construction ready condition consisting of a graded pad with dedicated and improved public roads and utilities, including storm drainage facilities, stubbed into the Proposed Junior High School Site, and with a cross-fall of no more than two percent (2%) and within one (1) foot of the elevation shown on grading plans to be approved by both parties ("Site Improvements"), all as generally provided for in the Applicant Handbook for the State School Building Lease Purchase Program promulgated by the Office of Public School Construction ("OPSC"). Newhall, subsequent to conveyance of Parcel A to Hart and the concurrent conveyance of Parcel C by the City to Hart, shall initiate and diligently pursue to completion the Site Improvements and shall make all reasonable efforts necessary to complete the Site Improvements by September 30, 1998, subject, however, to the provisions of Section 4, below.

3. If any one of the following events occurs prior to Newhall's conveyance of Parcel A to Hart and the conveyance of Parcel C by the City to Hart, Newhall shall, subject to the terms of this Agreement, identify and dedicate to Hart another mutually acceptable junior high school site, in the same general vicinity and of equivalent value, consisting of twenty (20) net usable acres, and identify and dedicate to the City a contiguous parcel consisting of a minimum of five (5) net usable acres, subject to a deed restriction as provided in Section 1 of this Agreement, instead of the dedication of Parcel A and Parcel B:

a. The State Department of Education fails to approve Parcel A for use as a junior high school site or to approve Parcel C for recreational, athletic field, open space, park, landscaping, parking, and like uses in conjunction with a school on the adjacent Parcel A;

b. After an environmental analysis conducted pursuant to the California Environmental Quality Act, Public Resources Code Section 21000 et seq., the Proposed Junior High School Site is deemed infeasible for purposes of school facilities;

c. After an environmental analysis conducted pursuant to Education Code Section 39001 et seq., Education Code Section 39101 et seq. and Title 5 of the California Code of Regulations, the Proposed Junior High School Site is deemed infeasible for purposes of school facilities; or

d. Hart fails to obtain the requisite local land use approvals or concurrence from the City or County pursuant to Government Code Section 65402 and Public Resources Code Section 21151.2 or the City or County disputes any action taken by Hart pursuant to Section 53094 of the Government Code.

4. Newhall shall deliver to Hart and its legal counsel, Bowie, Arneson, Kadi, Wiles & Giannone ("Legal Counsel") within twenty (20) calendar days after the opening of an escrow to consummate the transfer of Parcel A to Hart and Parcel B to the City, subject to the terms of this Agreement, a Preliminary Title Report covering Parcel A and Parcel B issued by Chicago

Title Insurance Company ("Title Insurer"), together with complete and legible copies of all underlying documents referred to in the Title Report as evidencing exceptions to title, and a complete map plotting all such exceptions and easements disclosed in the Title Report (collectively "PTR").

Hart shall have twenty (20) calendar days following receipt of the PTR within which to notify Newhall in writing of Hart's approval or disapproval of any exception to title disclosed in the PTR. In the event the PTR is supplemented ("Supplemental PTR"), Hart shall have twenty (20) calendar days after its receipt by Hart and Legal Counsel of such Supplemental PTR, and complete and legible copies of all additional documents described therein, and a plotting thereof, within which to approve or disapprove of any new matters disclosed in such Supplemental PTR.

Hart's failure to approve or disapprove of a matter by a writing delivered to Newhall within the time periods specified above shall be deemed to be Hart's disapproval of the PTR or Supplemental PTR, in which case all dates for performance of Newhall's obligations and duties under this Agreement shall be suspended and tolled for a period of time equal to the number of calendar days between the date that is twenty (20) days after the PTR or Supplemental PTR, as the case may be, is delivered to Hart and the date that Hart delivers to Newhall in writing specific disapproval or approval of title exceptions.

In the event Hart specifically disapproves a matter disclosed in the PTR or any Supplemental PTR, Newhall shall have twenty (20) calendar days from receipt of Hart's written notice of disapproval to inform Hart in writing whether Newhall will use its best efforts to remove such disapproved exception. In the event Newhall agrees that it shall use its best efforts to remove a disapproved exception prior to the conveyance of Parcel A to Hart and Parcel B to the City, such removal shall be a condition to the "Closing," as that term is defined in the escrow agreement, and the condition of title as disclosed in the PTR and Supplemental PTR otherwise shall be deemed to be approved by Hart. In the event Newhall gives notice that it will not cause the removal of a disapproved matter or fails to give timely notice of its election to correct a disapproved matter, and if Hart thereupon shall fail to waive its disapproval of the matter within twenty (20) calendar days after receipt of Newhall's written notice that it will not correct the

disapproved matter (or the expiration of Newhall's twenty (20) calendar day period for response to Hart's disapproval in the event Newhall has failed to make a timely response), then either Hart or Newhall may terminate this Agreement.

All matters shown in the PTR and any Supplemental PTR which are not disapproved by Hart (or as to which Hart waives its disapproval) or are otherwise approved by Hart prior to the conveyances of Parcel A and Parcel B shall be deemed to be "Permitted Exceptions." Newhall shall convey Parcel A to Hart in fee simple and Parcel B to the City in fee simple subject to a deed restriction providing that the conveyance is conditioned upon the City concurrently conveying Parcel C to Hart, excepting mineral and water rights, free and clear of all mortgages, liens, charges, encumbrances, encroachments, easements, conditions, exceptions and other defects of title, except for the Permitted Exceptions.

5. Newhall agrees to consent to and support annexation of Parcel A and Parcel B to the City. If the annexation is not completed, it shall not affect the terms of this Agreement. Hart as the owner of Parcel A and (when subsequently conveyed by the City) Parcel C agrees to affirmatively support the annexation of Parcel A and Parcel B to the City. All out-of-pocket costs of the annexation of Parcel A and Parcel B, if any, shall be borne or satisfied by Newhall and Hart in equal shares.

6. Newhall and Hart shall equally share in all costs of escrow; provided, however, that Hart's share of such closing costs shall not exceed one thousand five hundred dollars ($1,500.00) and any escrow costs in excess of three thousand dollars ($3,000.00) shall be the sole responsibility of Newhall.

HART OBLIGATIONS

7. In consideration of the dedications and other obligations of Newhall in the Agreement, Hart agrees that the Projects shall be deemed to have fully mitigated their impacts or to have fully satisfied their obligations or requirements for development, as to school facility construction pursuant to State School Facilities Act (Government Code sections 53080 et seq. and 65995 et seq.), the California Environmental Quality Act (Public Resources Code

section 21000 et seq.), the Planning and Zoning Law (Government Code sections 65000 et seq.), the Subdivision Map Act [Government Code section 66410], the County general plan (including without limitation the County Development Monitoring System ("DMS")) and any other applicable County plans, ordinances, or regulations, as well as the City general plan and any other applicable City plans, ordinances, or regulations, and any other law or policy which would otherwise require Newhall to pay fees or incur obligations with respect to Hart concerning the following specified dwelling units ("Dwelling Units") in the Projects, specifically as follows:

	Total	Single Family	Multi-Family
North Valencia Annexation (Lago de Valencia and South River)	2,000	750	1,250
Decoro Highlands	460	301	159
Woodlands	335	265	70
North Park III & IV/ (Tentative Tract 46389-07 through -16, inclusive)	240	240	———
	3,035	1,556	1,479

a. The location, number and types of units in each individual Project and the timing of development in the Projects are subject to change. In the event that one (1) or more of the Projects, as actually built, consists of more residential units in a given category (single family ("SF") or multi-family ("MF")) than specified above ("Additional Units"), Newhall may reallocate the herein specified Dwelling Unit credits among the above-described individual Projects as set forth in subsection 7(b) below. If the total number of Dwelling Units in the Projects exceeds the total credits provided under this Agreement ("Excess Units"), then Newhall shall pay mitigation payments to Hart in an amount to be determined by Newhall and Hart to reasonably mitigate the impacts of the Excess Units. If the parties cannot agree on the amount of reasonable mitigation, the dispute will be resolved pursuant to the provisions of Section 24 below.

b. In the event one (1) or more of the Projects as actually built consists of fewer Dwelling Units in a given category (i.e., SF or MF) than specified in this section, Newhall shall have the right to transfer credits for such unbuilt Dwelling Units to another

category (i.e., SF or MF) for that individual Project, to other Projects as specified in this Agreement or to other future residential developments of Newhall within the boundaries of Hart. The number of unbuilt Dwelling Units for which such credit will be given shall be based upon the difference between the total number of Dwelling Units per category (i.e., SF or MF) as specified in this section and the number of Dwelling Units actually built in the Projects. For purposes of such transfers of credits, each credit given for a SF Dwelling Unit shall be considered equivalent to 2.745 credit for MF Dwelling Units and each MF Dwelling Unit credit shall be equivalent to 0.364 SF Dwelling Unit credits.

8. Upon performance of Newhall's obligations as set forth in Sections 1-6 of this Agreement, Hart, for each residential unit in the Projects, shall provide any written certification required to obtain building permits or other development approvals from the County, the City, or any other governmental entity which requires such certification. The certification shall be in writing and shall be provided for whatever number of residential units are requested, as provided in this Agreement, by Newhall or any assignee of Newhall at any time.

9. Upon performance of Newhall's obligations as set forth in Sections 1-6, Hart shall, immediately upon request by Newhall or any of its assignees and without the payment of any fees whatsoever, provide any written certification required to obtain building permits or other development approvals for the construction of commercial/retail or industrial/business park buildings in the Projects to the County, the City, or any other governmental entity which requires such certification. The certification shall be in writing and shall be provided for whatever number of commercial or industrial buildings within the Projects are requested by Newhall or any of its assignees at any time.

STATE FUNDING PROVISIONS

10. Hart, if it has not already done so, shall submit to OPSC, within thirty (30) days of the signing of this Agreement, applications for State funding for the new junior high school to be constructed on the Proposed Junior High School Site ("New Junior High School"). In consideration of Newhall's obligations provided for in the Agreement, Hart shall take all reasonable steps to maximize its priorities for obtaining State and federal funding for school

facility construction necessary to accommodate Project Students. In particular, Hart under existing applicable law and procedures, shall maintain an active, up-to-date "Priority One" application with OPSC for the New Junior High School pursuant to the Leroy F. Greene State School Building Lease - Purchase law (Education Code Section 17700 et. seq.). Further, Hart shall obtain any interim or temporary school facilities, including, but not limited to, relocatable and portable classrooms in such manner so as not to jeopardize or reduce its State funding priority at any time. The costs of interim or temporary school facilities to house Project Students will be funded from Hart's new capital facilities construction account.

11. In the event Hart qualifies for and receives State funding for all or any portion of the construction costs of the New Junior High School and the first new senior high school, Hart shall credit Newhall for Newhall's pro-rata share of such State funding, which shall be 17.3% for the New Junior High School and 14.8% for the first new senior high school ("State Funding Credit"). Upon receipt of State funding by Hart, the amount of such State Funding Credit due to Newhall shall be increased annually on the anniversary date of the receipt of such funds by an amount equal to the annual percentage increase in the Marshall and Swift Class D Wood Frame Index. Newhall may apply such State Funding Credit to any future school facilities mitigation obligation owed to Hart.

12. If an agreement is reached by Newhall and Hart prior to July 1, 1999 concerning the mitigation of school facilities impacts on Hart for those residential development projects proposed by Newhall and which are the subject of current negotiation between Newhall and Hart, as described on Exhibit "E" attached hereto and incorporated herein, such agreement shall provide that Newhall, notwithstanding any other provision of the Agreement, shall not receive State Funding Credits for its pro-rata share of State funding for the New Junior High School and the first new senior high school.

HART COOPERATION

13. Upon performance of Newhall's obligations as set forth in Sections 1-6, Hart shall, within twenty (20) days of receipt of written request from Newhall, support, orally and in writing, any request for a land use approval, whether legislative or administrative, sought for the

development of any portion of the Projects from the County, the City, or any other governmental entity which has the right to grant such an approval.

14. Upon performance of Newhall's obligations as set forth in Sections 1-6, Hart shall thereafter, for purposes of state reporting or funding applications, reporting under the County DMS, comments on future Environmental Impact Reports, or any calculation of school capacity in any context, designate the capacity of the New Junior High School as one thousand two hundred (1200) students and designate the capacity of the first new senior high school as two thousand four hundred students (2400).

15. Upon satisfaction of Newhall's obligations herein, Hart shall not, under any circumstances:

a. Exercise any power or authority under current or future law to levy or impose an exaction of land, goods, money, or services, whether denominated a fee, charge, dedication, or tax, against any Project except for any general tax, special tax, or assessment for educational facilities levied against all of the land within Hart's boundaries or a school facilities improvement district ("SFID") to finance additional facilities at the New Junior High School provided that such SFID does not affect Hart's "Priority One" status;

b. Require, request, or cooperate with the County, the City, or any other governmental entity to exercise any power or authority to levy or impose an exaction of land, goods, money, or services, whether denominated a fee, charge, dedication, or tax, for Hart's benefit;

c. Oppose the development of any portion of the Projects or any governmental approval, whether legislative or administrative, or any change in any governmental approval on any basis whatsoever; or

d. Sponsor, or require the formation of, a Community Facilities District, except for one which includes all of the land within the boundaries of Hart, for any of the Projects without the express, written consent of Newhall which consent may be given or

withheld in Newhall's sole discretion. Hart shall not unreasonably refuse to act as a sponsor for a Community Facilities District or similar public financing procedure if requested to do so by Newhall.

e. Initiate, participate, cooperate with, or support any legal action brought to challenge governmental approvals of the Projects.

GENERAL PROVISIONS

16. No development, change of development, governmental approval, nor change in any governmental approval of any portion the Projects shall constitute the basis for any change or termination of this Agreement.

17. Newhall shall have the right, in its sole discretion, to sell or encumber the Projects, improved or unimproved and in whole or in part, by any deed, mortgage, deed of trust, or other security device. No sale, transfer, or encumbrance of any portion of the Projects shall affect Newhall's obligations under this Agreement. Neither this Agreement nor any breach of this Agreement shall defeat, invalidate, diminish, or impair the lien or priority of any deed, mortgage, deed of trust, or other security device.

18. Unless this Agreement provides to the contrary, Hart and Newhall shall, within twenty (20) days of receipt of a written request from the other party, perform any acts and prepare, sign, deliver, file and record any documents reasonably required to obtain the goals, and to satisfy the conditions, contained in this Agreement. This includes, but is not limited to, providing the requesting party with a written statement certifying that:

a. This Agreement is unmodified and in full force and effect, or, if there have been modifications, this Agreement, as modified, is in full force and effect, stating the date and nature of any modification; and

b. There are no current uncured defaults under this Agreement or, if there are any, the dates and nature of the defaults.

19. Newhall is acting as the master developer of the Projects and intends to sell portions of the Projects to builders who will construct and sell residential, commercial, and industrial buildings to the public. Newhall shall have the unconditional right to assign any right or obligation under this Agreement to anyone at any time. Whenever this Agreement provides Newhall with a right, that right may be exercised by an assignee of that right to the same extent that Newhall could have exercised that right. Newhall shall determine and advise Hart in writing as to the number of credits by housing product type assigned to any such assignee and the resulting remaining credits existing under this Agreement after such assignment. This shall occur prior to each assignment by Newhall under this Agreement. The assignment of any right or obligation under this Agreement shall be in writing and a copy of the assignment shall be provided to Hart. No such assignments shall relieve Newhall of any of its obligations under this Agreement without Hart's written consent which consent shall not unreasonably be withheld.

20. This Agreement is entered into solely for the benefit of Hart and Newhall and their successors, transferees, and assigns. Other than Hart and Newhall and their successors, transferees, and assigns, no third person shall be entitled, directly or indirectly, to base any claim or to have any right arising from, or related to, this Agreement.

21. This Agreement contains the entire agreement and understanding concerning the funding of school facilities to house Project Students and supersedes and replaces all prior negotiations and proposed agreements, written or oral with respect to the Projects. Hart and Newhall acknowledge that neither the other party nor its agents nor attorneys has made any promise, representation, or warranty whatsoever, express or implied, not contained herein to induce the execution of this Agreement and acknowledge that this Agreement has not been executed in reliance upon any promise, representation, or warranty not contained herein.

22. This Agreement may not be amended except by a writing signed by Hart and Newhall.

23. Hart and Newhall acknowledge that each has conducted an independent investigation of the facts concerning the development of the Projects, the impacts that Projects Students will have on Hart's educational facilities, and the costs of housing Project Students.

24. Hart and Newhall desire to resolve any disputes as to the meaning of any portion of this Agreement, the validity of any determination or calculation, or the rights or obligations of Hart or Newhall under it as quickly as possible. Therefore, except as provided in Section 25, any such disputes shall be resolved by binding arbitration conducted by a mutually agreed upon retired judge of the Los Angeles Superior Court. If Hart and Newhall are unable to agree on the arbitrator within twenty (20) days of the receipt of a request for arbitration, they shall request that the presiding judge of the Los Angeles Superior Court designate one. Hart and Newhall shall each pay one-half (½) the cost of the arbitration and each shall be responsible for its own attorneys' fees and costs as to any such arbitration.

25. Notwithstanding any other provision of this Agreement, either party shall be entitled to seek declaratory and injunctive relief in any court of jurisdiction to enforce the terms of this Agreement, or to enjoin the other party from an asserted breach thereof, pending arbitration as provided in Section 24, on a showing that the moving party would otherwise suffer irreparable harm.

26. If it becomes necessary to enforce any of the terms of this Agreement by actions as provided in Section 25, the prevailing party shall be entitled to reasonable attorneys' fees and other costs of litigation in addition to any other relief to which it may be entitled.

27. In interpreting this Agreement, it shall be deemed that it was prepared by the parties jointly and no ambiguity shall be resolved against either party on the premise that it or its attorneys was responsible for drafting this Agreement or any provision hereof.

28. Each individual signing this Agreement warrants and represents that he or she has been authorized by appropriate action of the party which he or she represents to enter into this Agreement on behalf of the party.

29. All notices, demands, and communications between Hart and Newhall shall be given by personal delivery; registered or certified mail, postage prepaid, return receipt requested; Federal Express or other reliable private express delivery; or by facsimile transmission. Such notices, demands, or communications shall be deemed received upon delivery if personally

served or sent by facsimile or after three (3) business days if given by other approved means as specified above. Notices, demands, and communications shall be sent:

To Hart:	William S. Hart Union High School District Attn: Superintendent 21515 Redview Drive Santa Clarita, CA 91350 Fax No.: (805) 254-8635
With a copy to:	Alexander Bowie, Esq. Bowie, Arneson, Kadi, Wiles & Giannone 4920 Campus Drive, Suite A Newport Beach, CA 92660 Fax No.: (714) 851-2014
To Newhall:	The Newhall Land and Farming Company Attn: President 23823 Valencia Boulevard Valencia, CA 91355 Fax No.: (805) 255-3960
With a copy to:	Robert I. McMurry, Esq. Nossaman, Guthner, Knox & Elliott, LLP 18101 Von Karman Avenue, Suite 1800 Irvine, CA 92612 Fax No.: (714) 833-7878

The foregoing names, addresses, and fax numbers may be changed at any time by a written notice given as provided above.

30. This Agreement and all rights and obligations arising out of it shall be construed in accordance with the laws of the State of California.

31. Any arbitration or litigation arising out of this Agreement shall be conducted only in Los Angeles County, California.

32. This Agreement may be signed in one or more counterparts which, taken together, shall constitute one original document.

33. Recitals A through E are true and correct and are hereby incorporated.

34. All Exhibits attached hereto are incorporated into this Agreement.

35. The terms of this Agreement shall be incorporated in every environmental impact report, environmental monitoring program, report provided to the County for inclusion in its DMS, general plan amendment, specific plan, and tentative subdivision map approval given by the County, the City, or any other governmental entity responsible for the approval of the development of the Projects.

DATED: Dec. 17, 1997

BOARD OF TRUSTEES OF THE
WILLIAM S. HART UNION HIGH
SCHOOL DISTRICT

By: _____

President of the Board of Trustees of the
WILLIAM S. HART UNION HIGH
SCHOOL DISTRICT

Attest:

_____

Superintendent
WILLIAM S. HART UNION HIGH
SCHOOL DISTRICT

DATED: Dec 16, 1997

THE NEWHALL LAND AND FARMING COMPANY (A California Limited Partnership)

By: NEWHALL MANAGEMENT LIMITED PARTNERSHIP
Managing General Partner

By: NEWHALL MANAGEMENT CORPORATION
Managing General Partner

By: _____
Its: President

By: _____
Its: Senior Vice President

APPROVED AS TO FORM:

BOWIE, ARNESON, KADI, WILES & GIANNONE

By: _____
ALEXANDER BOWIE, ESQ.
Attorneys for the WILLIAM S. HART UNION HIGH SCHOOL DISTRICT

NOSSAMAN, GUTHNER, KNOX & ELLIOTT, LLP

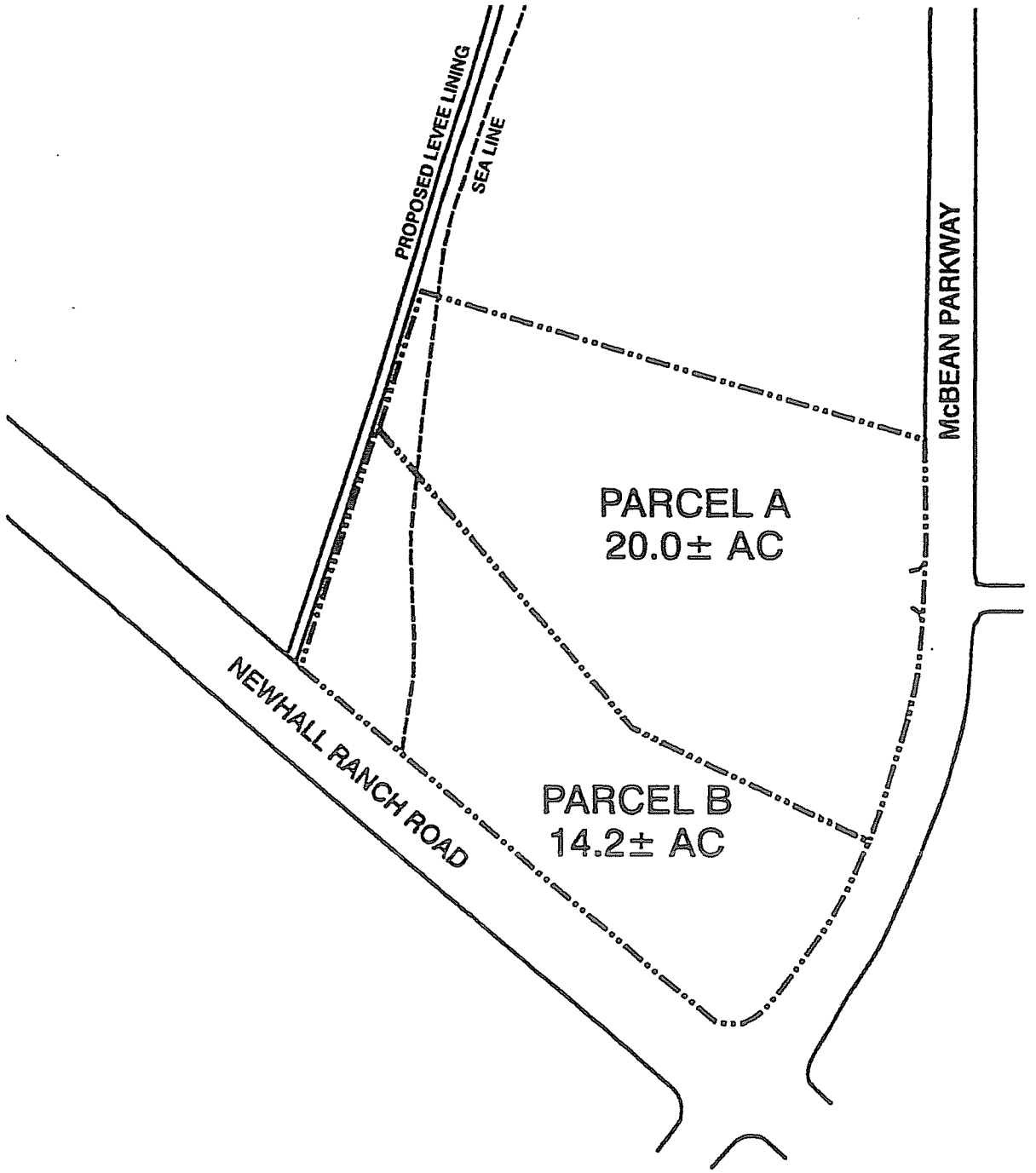
By: _____
ROBERT I. McMURRY
Attorneys for THE NEWHALL LAND AND FARMING COMPANY

Definitions

Term	Page
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City	1
Closing	5
County	1
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DMS	7
Dwelling Units	7
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Hart	1
Legal Counsel	4
MF	7
New Junior High School	8
Newhall	1
Newhall Ranch Road/McBean Site	2
North Park Project	1
North Valencia Annexation Project	1
OPSC	3
Parcel A	2
Parcel B	2
Parcel C	2
Permitted Exceptions	6
Project Students	2
Project(s)	1
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SF 7
SFID 10
Site Improvements 3
State Funding Credit 9
Supplemental PTR 5
Title Insurer 5
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EXHIBIT A



Note: Exhibit A is intended only to generally describe such property.

Exhibit A

EXHIBIT B

EXHIBIT B
TO BE SUPPLIED LATER PURSUANT TO THE AGREEMENT.

EXHIBIT C

RECORDING REQUESTED BY AND
RETURN TO:

WILLIAM S. HART UNION HIGH SCHOOL
DISTRICT
21515 Redview Drive
Santa Clarita, CA 91350
Attn: Superintendent

(Space Above for Recorder's Use)

NO RECORDING FEE AND NO DOCUMENTARY
TRANSFER TAX DUE PURSUANT TO GOVERNMENT CODE
SECTION 6103 AND REVENUE AND TAX CODE SECTION 11922.

PARTNERSHIP GRANT DEED

FOR GOOD AND VALUABLE CONSIDERATION, the receipt and sufficiency of which is hereby acknowledged, THE NEWHALL LAND AND FARMING COMPANY (A CALIFORNIA LIMITED PARTNERSHIP), a limited partnership ("Grantor"), hereby grants to WILLIAM S. HART UNION HIGH SCHOOL DISTRICT, a school district organized and existing under the laws of the State of California ("Grantee"), that certain real property in the County of Los Angeles, State of California, more particularly described in Exhibit "A" attached hereto and incorporated herein by this reference ("Property").

EXCEPTING AND RESERVING UNTO GRANTOR, its successors and assigns, together with the right to grant and transfer all or a portion of the same, as follows:

A. All oil, oil rights, minerals, mineral rights, natural gas rights and other hydrocarbons by whatsoever name known, geothermal steam and all products derived from any of the foregoing, that may be within or under the parcel of Property hereinabove described, together with the perpetual right of drilling, mining, exploring and operating therefor and storing in and removing the same from said Property or any other property, including the right to whipstock or directionally drill and mine from properties other than those hereinabove described, oil or gas wells, tunnels and shafts into, through or across the subsurface of the Property hereinabove described, and to bottom such whipstocked or directionally drilled wells, tunnels and shafts under and beneath or beyond the exterior limits thereof, and to redrill, retunnel, equip, maintain, repair, deepen and operate any such wells or mines without, however, the right to drill, mine, store, explore or operate through the surface or the upper 500 feet of the subsurface of the Property hereinabove described.

B. The right to place on, under or across the Property conveyed hereby, transmission lines and other facilities for a community antenna television system and thereafter

to own and convey such lines and facilities and the right to enter upon said Property to service, maintain, repair, reconstruct and replace said lines and facilities; provided, however, that the exercise of such rights shall be as least intrusive upon Grantee's proposed development and use of the Property for school facilities purposes as practicable and not unreasonably interfere with Grantee's reasonable use and enjoyment of said Property conveyed hereby for school facilities purposes.

C. Any and all water, water rights or interests therein appurtenant or relating to the Property hereinabove described or owned or used by Grantor in connection with or with respect to said Property (no matter how acquired by Grantor), whether such water rights shall he riparian, overlying appropriative, littoral, percolating, prescriptive, adjudicated, statutory or contractual, together with the right and power to explore, drill, redrill, remove and store the same from or in the Property hereinabove described or to divert or otherwise utilize such water, rights or interests on any other property owned or leased by Grantor; but without, however, any right to enter upon the surface or upper fifty (50) feet of the subsurface of the Property described herein in the exercise of such rights.

D. Easements over the Property conveyed hereby for the construction, installation and maintenance of electric, gas, telephone, water, sewer and drainage facilities, provided that the construction and installation of such facilities shall not unreasonably interfere with Grantee's development and use of the Property conveyed hereby for school facilities purposes.

SUBJECT TO:

1. Nondelinquent general, special and supplemental real property taxes and assessments, if any, for the current fiscal year.

2. All other covenants, conditions, restrictions, reservations, rights, rights-of-way, dedications, offers of dedication, easements and other matters of record or otherwise known to Grantee as of the date hereof.

[signature page follows]

IN WITNESS WHEREOF, the Grantor has executed this Partnership Grant Deed as of the date written below.

Dated: _____

GRANTOR:

THE NEWHALL LAND AND FARMING COMPANY (A CALIFORNIA LIMITED PARTNERSHIP), a limited partnership

By: NEWHALL MANAGEMENT LIMITED PARTNERSHIP, a California limited partnership
Its managing general partner

By: NEWHALL MANAGEMENT CORPORATION, a California corporation
Its managing general partner

By: _____
Its: _____
By: _____
Its; _____

STATE OF CALIFORNIA)
) ss.
COUNTY OF _____)

On _____ before me, _____, a Notary Public, personally appeared _____ personally known to me or proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

_____
Signature of Notary

[Seal]

EXHIBIT D

RECORDING REQUESTED BY AND
RETURN TO:

CITY OF SANTA CLARITA

Santa Clarita, CA 91350
Attn: _____

(Space Above for Recorder's Use)

NO RECORDING FEE AND NO DOCUMENTARY
TRANSFER TAX DUE PURSUANT TO GOVERNMENT CODE
SECTION 6103 AND REVENUE AND TAX CODE SECTION 11922.

PARTNERSHIP GRANT DEED

FOR GOOD AND VALUABLE CONSIDERATION, the receipt and sufficiency of which is hereby acknowledged, THE NEWHALL LAND AND FARMING COMPANY (A CALIFORNIA LIMITED PARTNERSHIP), a limited partnership ("Grantor"), hereby grants to THE CITY OF SANTA CLARITA, a municipal corporation ("Grantee"), that certain real property in the County of Los Angeles, State of California, more particularly described in Exhibit "A" attached hereto and incorporated herein by this reference ("Property").

EXCEPTING AND RESERVING UNTO GRANTOR, its successors and assigns, together with the right to grant and transfer all or a portion of the same, as follows:

A. All oil, oil rights, minerals, mineral rights, natural gas rights and other hydrocarbons by whatsoever name known, geothermal steam and all products derived from any of the foregoing, that may be within or under the parcel of Property hereinabove described, together with the perpetual right of drilling, mining, exploring and operating therefor and storing in and removing the same from said Property or any other property, including the right to whipstock or directionally drill and mine from properties other than those hereinabove described, oil or gas wells, tunnels and shafts into, through or across the subsurface of the Property hereinabove described, and to bottom such whipstocked or directionally drilled wells, tunnels and shafts under and beneath or beyond the exterior limits thereof, and to redrill, retunnel, equip, maintain, repair, deepen and operate any such wells or mines without, however, the right to drill, mine, store, explore or operate through the surface or the upper 500 feet of the subsurface of the Property hereinabove described.

B. The right to place on, under or across the Property conveyed hereby, transmission lines and other facilities for a community antenna television system and thereafter to own and convey such lines and facilities and the right to enter upon said Property to service, maintain, repair, reconstruct and replace said lines and facilities; provided, however, that the

exercise of such rights shall be as least intrusive upon Grantee's proposed development and use of the Property for park and recreation and school facility purposes as practicable and not unreasonably interfere with Grantee's reasonable use and enjoyment of said Property conveyed hereby for park and recreation and school facility purposes.

C. Any and all water, water rights or interests therein appurtenant or relating to the Property hereinabove described or owned or used by Grantor in connection with or with respect to said Property (no matter how acquired by Grantor), whether such water rights shall he riparian, overlying appropriative, littoral, percolating, prescriptive, adjudicated, statutory or contractual, together with the right and power to explore, drill, redrill, remove and store the same from or in the Property hereinabove described or to divert or otherwise utilize such water, rights or interests on any other property owned or leased by Grantor; but without, however, any right to enter upon the surface or upper fifty (50) feet of the subsurface of the Property described herein in the exercise of such rights.

D. Easements over the Property conveyed hereby for the construction, installation and maintenance of electric, gas, telephone, water, sewer and drainage facilities, provided that the construction and installation of such facilities shall not unreasonably interfere with Grantee's development and use of the Property conveyed hereby for park and recreation and school facility purposes.

E. A power of termination and right of re-entry in favor of the County of Los Angeles, should the Property ever cease to be used for park and recreation purposes as further provided herein.

SUBJECT TO:

1. Nondelinquent general, special and supplemental real property taxes and assessments, if any, for the current fiscal year.

2. All other covenants, conditions, restrictions, reservations, rights, rights-of-way, dedications, offers of dedication, easements and other matters of record or otherwise known to Grantee as of the date hereof.

The grant of the Property by Grantor to Grantee is further subject to the following express covenants, conditions and restrictions:

a. By acceptance of the grant of the Property pursuant to this Partnership Grant Deed, City covenants and agrees, on behalf of itself and its successive owners and assigns, that the Property is being granted to the City pursuant to the dedication requirements of Government Code section 66477 of the Subdivision Map Act, and shall be operated consistent with such dedication requirements and only for park and recreation purposes ("Conditions"), which Conditions shall inure to the benefit of and be enforceful by the County of Los Angeles and Grantor as against the City or any successive owners and assigns, the covenants and the Conditions as set forth herein being for the benefit of the County of Los Angeles and Grantor and all property owned by the County of Los Angeles and Grantor within the County of Los Angeles.

The Property shall only be used for park and recreation purposes, and shall be open and available without discrimination as to all residents of the incorporated and unincorporated territory of the County of Los Angeles without discrimination against, or preference, gratuity or bonus or other benefit given to residents of incorporated areas not equally given to residents of unincorporated territory ("Non-Discrimination Covenant"). If for any reason Grantee fails to operate the Property for park and recreational purposes pursuant to the Conditions and other restrictions set forth herein, then the County of Los Angeles shall have the power to terminate the interests of Grantee or any successor in interest thereto and a right to re-enter and take possession of the Property.

b. Concurrent with the recordation of this Partnership Grant Deed, Grantee shall convey to the William S. Hart Union High School District ("Hart") by Grant Deed an approximate five (5) acre parcel as more particularly shown and described on Exhibit "B", attached hereto and incorporated herein by this reference ("Five Acre Parcel"), but reserving therefrom unto Grantee a nonexclusive perpetual easement for park and recreation purposes, and to be operated pursuant to that certain Joint Use Agreement between Grantee and Hart dated _____, 199__ ("Joint Use Agreement"). The Grant Deed conveying the Five Acre Parcel shall also incorporate the Non-Discrimination Covenant set forth above, shall acknowledge that the Conditions are for the benefit of Grantee, Grantor and the County of Los Angeles, shall acknowledge the power of termination and right of re-entry in favor of the County of Los Angeles, and shall separately provide for a power of termination and right of re-entry by City if Hart ceases to use the Five Acre Parcel for park and recreation and school facility purposes.

[signature page follows]

IN WITNESS WHEREOF, the Grantor and Grantee have executed this Partnership Grant Deed as of the date written below.

Dated: _____ GRANTOR:

THE NEWHALL LAND AND FARMING COMPANY (A CALIFORNIA LIMITED PARTNERSHIP), a limited partnership

By: NEWHALL MANAGEMENT LIMITED PARTNERSHIP, a California limited partnership
Its managing general partner

By: NEWHALL MANAGEMENT CORPORATION, a California corporation
Its managing general partner

By: _____
Its: _____
By: _____
Its; _____

Dated: _____ GRANTEE:

CITY OF SANTA CLARITA, a California municipal corporation

By: _____
Mayor

ATTEST:

By: _____

APPROVED AS TO FORM:

By: _____

EXHIBIT "A"

LEGAL DESCRIPTION

ON FILE AT NEWHALL LAND AND FARMING COMPANY
LOCATED AT: 23823 VALENCIA BOULEVARD, VALENCIA, CA 91355

EXHIBIT "B"

FIVE ACRE PARCEL

STATE OF CALIFORNIA)
) ss.
COUNTY OF _____)

On _____ before me, _____, a Notary Public, personally appeared _____ personally known to me or proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

_____
Signature of Notary

[Seal]

STATE OF CALIFORNIA)
) ss.
COUNTY OF _____)

On _____ before me, _____, a Notary Public, personally appeared _____ personally known to me or proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

_____
Signature of Notary

[Seal]

EXHIBIT E

Exhibit E

Residential development projects which are the subject of current negotiation and which are referred to in Paragraph 11 of the Agreement are those properties owned by The Newhall Land and Farming Company shown on the attached Exhibits E-1 (Valencia), E-2 (Newhall Ranch Specific Plan) and E-3 (Castaic area), not including the Projects as defined in the Agreement and the following excluded areas:

Excluded Areas:

Northbridge

TM44481
TM44482
TM44483
TM44484
TM44485
TM44486
TM44487
TM44488
TM44489
TM33390
TM44491
TM44687
TM44688
TM44689
TM44690
TM44691
TM44692
TM44693
TM44694
TM44695
TM44696
TM44697
TM44698
TM44699
TM44821
TM44823
TM44823-01
TM44848
TM44849
TM44850
TM44851

Northpark I and II

TM45440
TM45440-02
TM46389-01
TM46389-02
TM46389-03
TM46389-04
TM46389-05
TM46389-06
TM51874
TM51875

Other

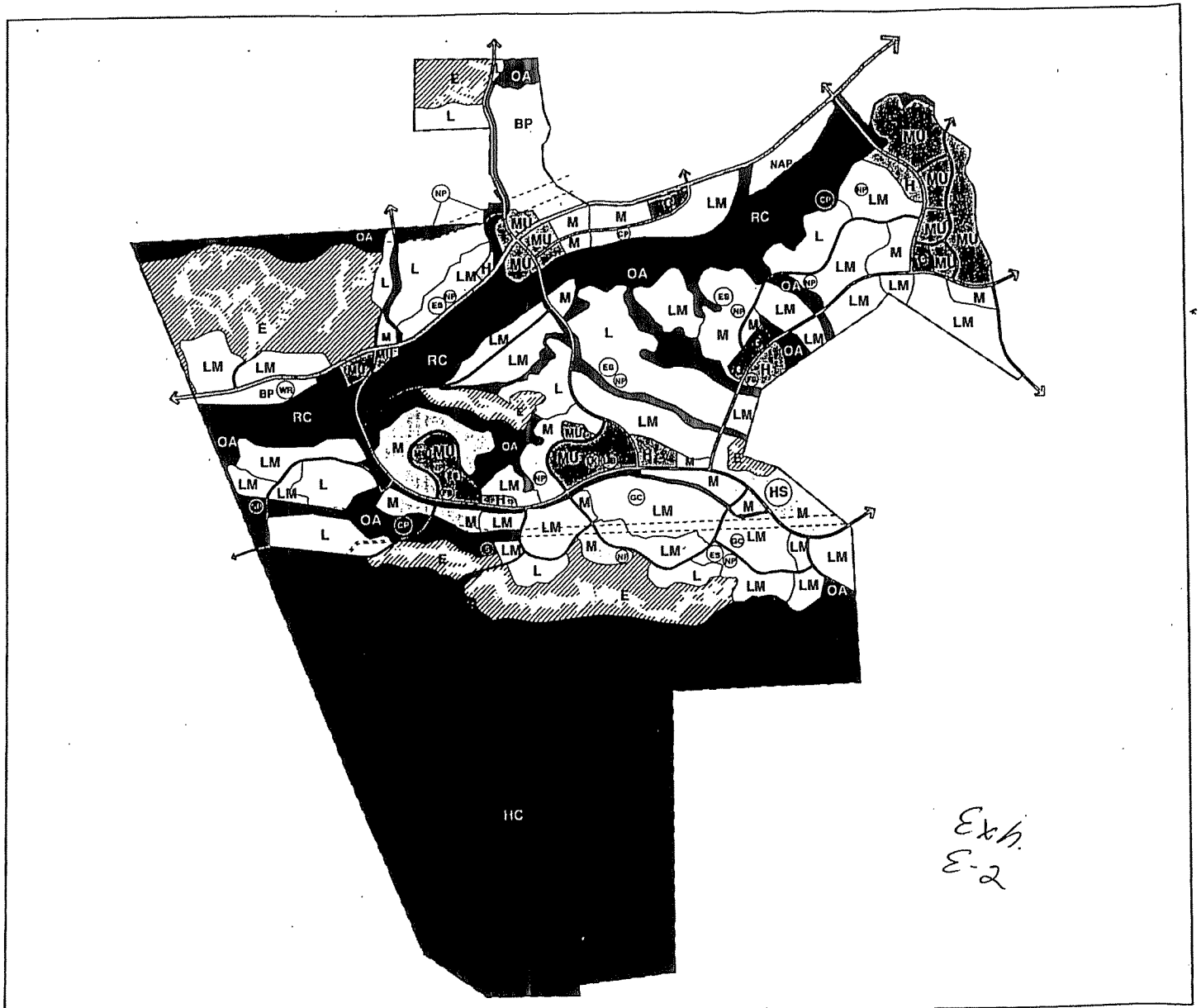
TM36668 (Hasley)
TM44800 (Hasley)
TM44800-01 (Hasley)
TM44800-02 (Hasley)
TM44800-03 (Hasley)
TM45084 (Hasley)
TM52206 (Avignon)

EXHIBIT E-3

"Castaic area"

NLF Common Name	APN
Teardrop parcel	2865-17-1
Van Gorder	2865-3-23
	2865-3-27
Castaic Lagoon	2865-3-11
Mesa	2865-4-1
	2865-5-12
	2865-5-13
	2865-5-14
	2865-7-8
	2865-7-9
	2865-11-15
Lelles	2865-5-23
	2865-4-14
	2865-4-15
	2865-4-16
	2865-4-17
Castaic Commercial	2865-36-29
	2865-36-33
	2865-36-34
	2865-36-35
	2865-36-36
	2865-36-37
	2865-36-38

The attached map shows their approximate locations.



NEWHALL RANCH™
SPECIFIC PLAN
Prepared For: Newhall Ranch Company

- E — ESTATE RESIDENTIAL
- L — LOW RESIDENTIAL
- LM — LOW-MEDIUM RESIDENTIAL
- M — MEDIUM RESIDENTIAL
- H — HIGH RESIDENTIAL
- MU — MIXED USE
- C — COMMERCIAL (RETAIL/OFFICE)
- BP — BUSINESS PARK
- VS — VISITOR SERVING
- OA — OPEN AREA
- RC — RIVER CORRIDOR SPECIAL MANAGEMENT AREA (SEA #23)
- HC — HIGH COUNTRY SPECIAL MANAGEMENT AREA (SEA #20)
- ROADS
- SCE/UTILITY EASEMENTS

LAND USE OVERLAYS (POTENTIAL LOCATIONS):

- CP — COMMUNITY PARK
- NP — NEIGHBORHOOD PARK
- ES — ELEMENTARY SCHOOL
- MS — MIDDLE SCHOOL
- HS — HIGH SCHOOL
- GC — GOLF COURSE
- LK — COMMUNITY LAKE
- FS — FIRE STATION
- S — ELECTRICAL SUBSTATION
- LIB — LIBRARY
- WR — WATER RECLAMATION PLANT

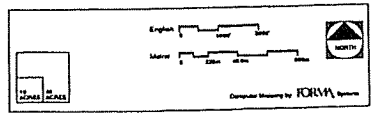
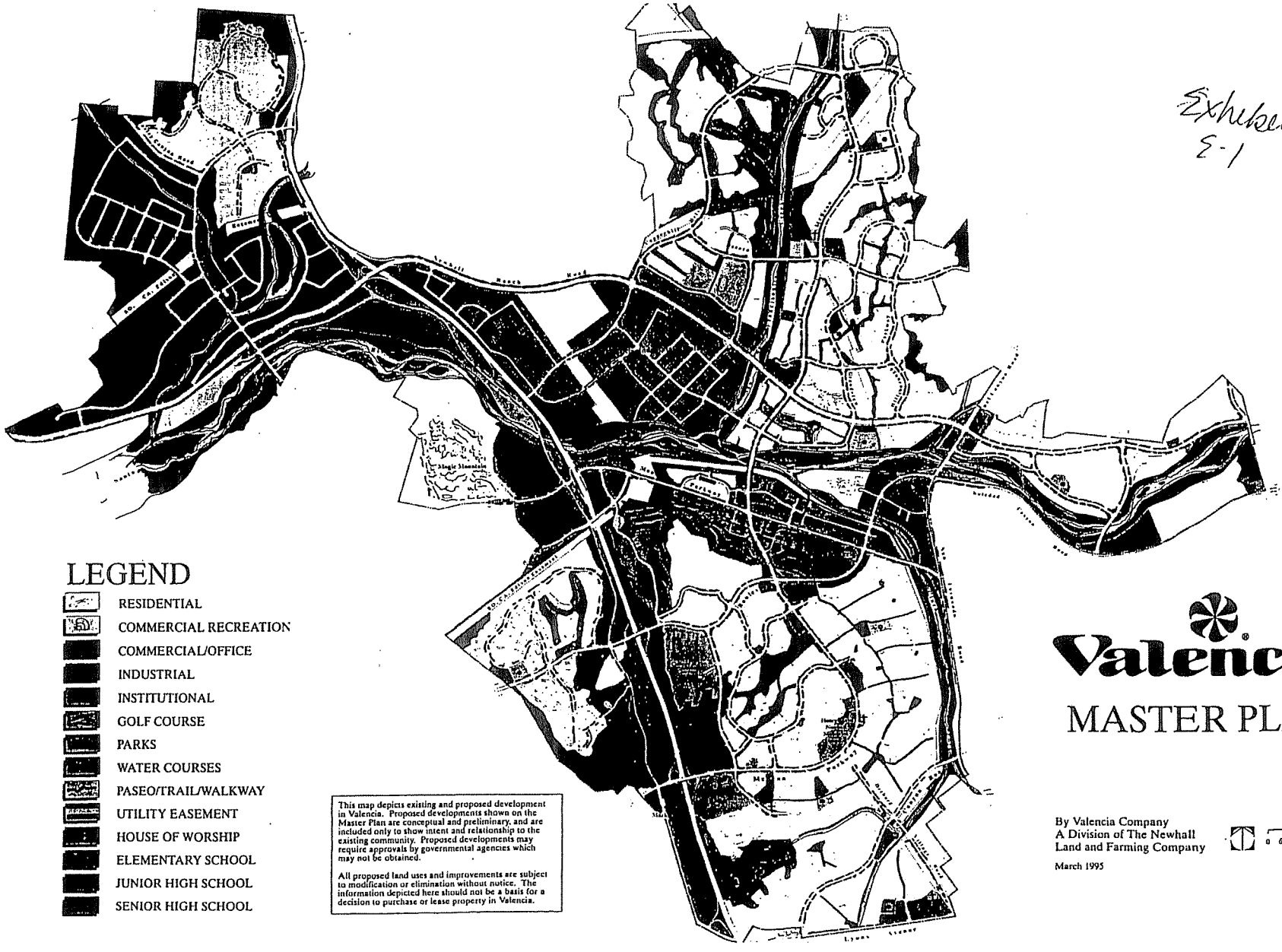


EXHIBIT 2.3-1
LAND USE PLAN

7/97

Exhibit E-1



LEGEND

- RESIDENTIAL
- COMMERCIAL RECREATION
- COMMERCIAL/OFFICE
- INDUSTRIAL
- INSTITUTIONAL
- GOLF COURSE
- PARKS
- WATER COURSES
- PASEO/TRAIL/WALKWAY
- UTILITY EASEMENT
- HOUSE OF WORSHIP
- ELEMENTARY SCHOOL
- JUNIOR HIGH SCHOOL
- SENIOR HIGH SCHOOL

This map depicts existing and proposed development in Valencia. Proposed developments shown on the Master Plan are conceptual and preliminary, and are included only to show intent and relationship to the existing community. Proposed developments may require approvals by governmental agencies which may not be obtained.

All proposed land uses and improvements are subject to modification or elimination without notice. The information depicted here should not be a basis for a decision to purchase or lease property in Valencia.

Valencia

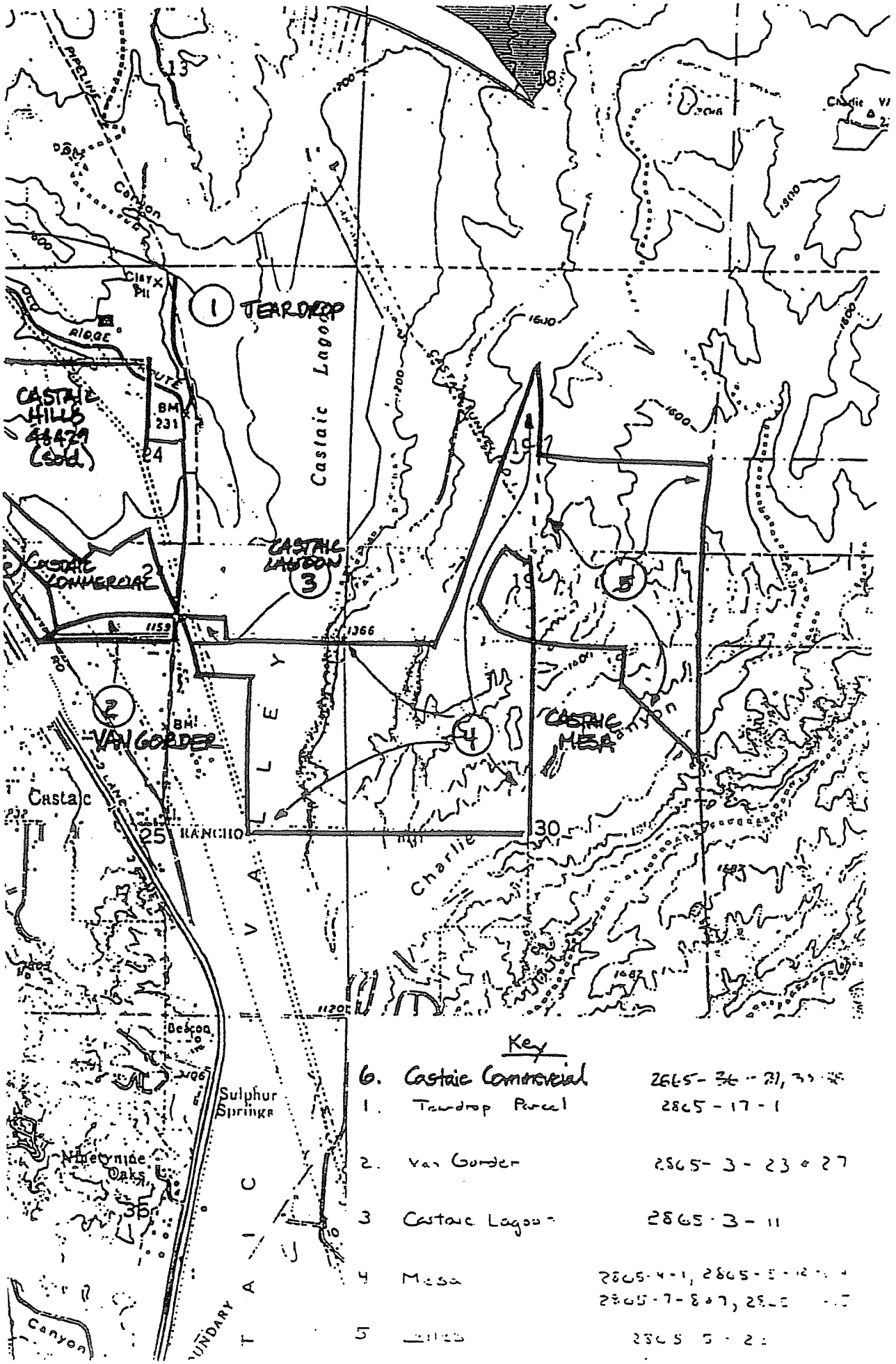
MASTER PLAN

By Valencia Company
A Division of The Newhall
Land and Farming Company

0 600 1200 2400

March 1995

EXHIBIT E-4



Key

6.	Castaic Commercial	2865-36-21, 33
1.	Teardrop Parcel	2865-17-1
2.	Van Gorder	2865-3-23 & 27
3	Castaic Lagoon	2865-3-11
4	Mesa	2865-4-1, 2865-[illegible] 2865-7-8 & 7, 2[illegible]
5	[illegible]	2865-5-2[illegible]

23920 Valencia Blvd.
Suite 300
Santa Clarita
California 91355-2196

Phone
(805) 259-2489
Fax
(805) 259-8125

City of
Santa Clarita

December 10, 1997

Mr. Robert Lee
Superintendent
William S. Hart Union High School District
21515 Redview Drive
Santa Clarita, CA 91350-2948

Re: North Valencia Annexation Project

Dear Mr. Lee:

As you know, the City is processing development approvals, including a General Plan Amendment, a Specific Plan, an Annexation and Development Agreement, a tentative tract map and oak tree permit for a proposed development known as the North Valencia Annexation Project ("Project"). The developer of the Project, the Newhall Land and Farming Company ("Newhall") has negotiated with the William S. Hart Union High School District ("Hart"), with the assistance of the City, a School Facilities Funding Agreement ("Agreement"). The Agreement has been negotiated between Newhall and Hart, with the assistance of the City, based upon certain understandings with respect to the intentions of the City to convey certain property to Hart after it has been dedicated to the City by Newhall in partial satisfaction of Newhall's park dedication requirements in connection with the Project, together with a portion of Newhall's park dedication requirements under the North River Park and Trail Agreement, a master plan for parks in the entire North River community.

The property proposed for conveyance by the City to Hart consists of a five (5) acre parcel, which is identified in the Agreement as "Parcel C" and is a portion of the fourteen and two-tenths (14.2) acre park site to be dedicated to the City, identified in the Agreement as "Parcel B," which is adjacent to the proposed junior high school site of twenty (20) acres, identified in the Agreement as "Parcel A."

It is the City's understanding that in the partial discharge of Newhall's obligations under the Agreement, Newhall will dedicate to the City for park purposes the fourteen and two-tenths (14.2) acre property, identified in the Agreement as "Parcel B," which will include the five (5) acre parcel, identified in the Agreement as "Parcel C." The dedication by Newhall to

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the City of "Parcel B" in fee will be subject to a deed restriction providing that the conveyance is conditioned upon the City concurrently conveying the five (5) acre parcel, "Parcel C," to Hart in fee, reserving to the City a perpetual easement for park and recreation purposes, and that said "Parcel C" will be operated pursuant to a joint use agreement to be entered into between Hart and the City.

The foregoing conveyance by the City to Hart of the five (5) acre parcel, "Parcel C," in fee, reserving a perpetual easement for park and recreation purposes is consistent with the City's understanding and intention in connection with the proposed processing and approval of the Project and the implementation of the Agreement between Newhall and Hart. It is further the City's understanding that said "Parcel C" will be the subject matter of a joint use agreement to be entered into between the City and Hart subsequent to the conveyances mentioned above.

If the foregoing intentions and understandings of the City confirmed in this letter are consistent with the intentions and understandings of Hart, please confirm that by signing a copy of this letter and returning a copy to me.

If you have any further questions relative to this matter, please don't hesitate to contact me.

Sincerely,

George A. Caravalho
City Manager

cc: Carl K. Newton, Esq., City Attorney
Robert I. McMurry, Esq., of Nossaman, Guthner, Knox & Elliot, LLP
Alexander Bowie, Esq., of Bowie, Arneson, Kadi, Wiles & Giannone

Confirmed and Approved:

By_____
Robert Lee
Superintendent, William S. Hart Union High School District

GAC/carrelpro.doc

APPROVED AS TO FORM:

NOSSAMAN, GUTHNER, KNOX & ELLIOT, LLP

By:_____
Robert I. McMurry
Attorneys for THE NEWHALL LAND AND FARMING COMPANY

BOWIE, ARNESON, KADI, WILES & GIANNONE

By:_____
Alexander Bowie
Attorneys for WILLIAM S. HART UNION HIGH SCHOOL DISTRICT

SCHOOL FACILITIES FUNDING AGREEMENT BETWEEN THE WILLIAM S. HART UNION HIGH SCHOOL DISTRICT AND THE NEWHALL LAND AND FARMING COMPANY

This School Facilities Funding Agreement ("Agreement") is made as of October ____, 1998, between the WILLIAM S. HART UNION HIGH SCHOOL DISTRICT ("Hart"), a school district organized and existing under the laws of the State of California, on the one hand, and THE NEWHALL LAND AND FARMING COMPANY ("Newhall"), a California limited partnership, on the other hand, with respect to the following facts:

RECITALS

A. Newhall is the owner of approximately seventeen thousand (17,000) acres of land, as shown on Exhibit "A", ("Newhall Land") located within Hart's boundaries some of which is located in the City of Santa Clarita ("City") and all of which is in the County of Los Angeles ("County"), which Newhall currently is in the process of master planning for development and obtaining land use Entitlements either by itself or by others.

B. The current plans for development of Newhall Land envision the construction of an estimated thirty five thousand (35,000) residential dwelling units ("DU") and an estimated twenty seven million (27,000,000) square feet of commercial and industrial development ("Commercial/Industrial Development") over approximately thirty (30) years.

C. The provisions herein are applicable to whatever development occurs on Newhall Land, including the proposed Westridge Project (Tentative Map 45433) of County and the Newhall Ranch Project as described in the Specific Plan ("Newhall Ranch Project Specific Plan") now being considered therefor by the County. Subject to the provisions of Section 15 of this Agreement, development which occurs on the Newhall Land in the projects listed on Exhibit "B" ("Excluded Development") are subject to the agreements or conditions of approval or

mitigation measures applicable thereto and are excluded from the obligations herein provided as to Fair Share School Impact Mitigation Payments as hereinafter defined.

D. Hart and Newhall recognize that the planned development of DU on Newhall Land will generate additional junior high and senior high school students (collectively, "Newhall Students") which in turn, will require the construction of new junior high schools ("JHS") and senior high schools ("SHS").

E. Historically, the State of California ("State") has provided a substantial portion of the funds necessary to build additional school facilities needed by school districts. However, over the last several years the amount of funds available from the State for the construction of new school facilities has been limited. The method of apportioning such funds to Hart and other school districts has been varied and uncertain, and it is unclear what amount of funds, if any, will be available to Hart in the future from the State for such purposes.

F. Hart does not have school facility capacity to accommodate the Newhall Students. Accordingly, Hart will require, as applicable, substantial additional grade 7-12 interim and permanent school facilities, including land, buildings, furnishings and equipment, as well as interim classrooms, permanent classrooms, central and administration facilities, including such facilities to accommodate students considered as being accommodated in lieu of using the school facilities of Hart on a year-round multi-track ("YRE") basis which presently is required to obtain funding for school facilities from the State ("School Facilities"). Newhall and Hart desire to enter into this Agreement to set forth Newhall's obligations to mitigate the development of Newhall Land as to Hart, and the respective obligations of Hart relating to the provision of additional School Facilities for Newhall Students.

G. Hart and Newhall agree that the present anticipated development of the Newhall Land will result in a need for an estimated three (3) additional JHS and two (2) additional SHS. If, and only if, funding from the State ("State Funding") is received by Hart for the cost of the additional School Facilities to accommodate Newhall Students, the parties intend that Newhall, as herein provided, shall receive reimbursement without interest to the extent provided in this Agreement to be paid only from the herein specified portion of State Funding for a portion of

Newhall's herein specified payment to Hart per DU ("Fair Share School Impact Mitigation Payments") as defined in Section 3 of this Agreement. Newhall hereby assumes the risk that State Funding will not be available to assist in funding School Facilities necessary to mitigate the impact of development of Newhall Land. In such case, Newhall will have contributed one hundred percent (100%) of the cost to mitigate the impact of development of the Newhall Land on the School Facilities of Hart. In consideration of Newhall's obligations provided for in this Agreement, to the extent herein specified, Hart will take all reasonable actions to seek to maximize its priorities for obtaining State Funding for needed School Facilities. If Hart determines that it would be advantageous to do so in order to obtain State Funding for additional School Facilities, Hart may request that Newhall advance funds to Hart but Newhall shall have no obligation to advance such funds.

H. Hart has determined that the Fair Share School Impact Mitigation Payments which Newhall will pay to Hart pursuant to this Agreement will allow Hart to fully mitigate any adverse impacts which might otherwise result from the development of Newhall Land. Hence, except as to Excluded Development, there will be no need to collect any fees from development of the Newhall Land which might otherwise be collected by Hart in connection with the construction of DU which meet the requirements of Government Code §65995.1 ("Age-Restricted DU") or Commercial/Industrial Development.

I. The procedure set forth in this Agreement will ensure that the development of Newhall Land, either individually or cumulatively with other projects within Hart's boundaries, will have no adverse impacts on Hart's ability to provide adequate School Facilities to all students of Hart.

IN LIGHT OF THE FOREGOING FACTS, IT IS MUTUALLY AGREED THAT:

1. ***Incorporation of Recitals.*** Recitals A through I are hereby incorporated in this Agreement.

2. ***Mitigation Requirements.*** The cost of Hart's School Facilities as of January 1, 1997, calculated on a per student basis, is estimated to be as set forth in Exhibit "C". The cost of Hart's School Facilities as of January 1, 1997, through December 31, 1998, as calculated on per DU basis, is set forth in Exhibit "D".

3. ***Mitigation Obligation.*** The Fair Share School Impact Mitigation Payment determined by the impact of future development on the School Facilities of Hart, calculated on a per DU basis as shown on Exhibit "D" as of January 1, 1997, in current dollars, are $5,600 for each such single-family detached DU, ("SFDU") and $2,100 for each multi-family attached DU ("MFDU") located within the boundaries of Hart but outside of the boundaries of the Castaic Union School District ("CUSD"). A SFDU is any DU which is a single family residence with no common walls. A MFDU (including apartments) is a DU in a building or buildings in which all of the DU have one or more supporting, above-ground vertical common walls establishing a substantial connectivity between two (2) or more DU, or a second unit ("Second Unit"). A Second Unit may be either detached or attached construction but shall be only those DUs specified and defined in the Newhall Ranch Project Specific Plan, as the proposed terms thereof exist on the date of this Agreement. All Second Units shall be located within the Newhall Ranch Project portion of the Newhall Land as shown in Exhibit "A." A Second Unit constructed on an attached basis to what otherwise would be a SFDU does not recategorize the basic SFDU as a MFDU by reason of a Second Unit being constructed on an attached basis as to what otherwise would be a SFDU. As to SFDU and MFDU, or a Second Unit, located in the CUSD portion of Hart where Hart provides educational facilities for grades 9-12, the Fair Share School Impact Mitigation Payment as of January 1, 1997, through December 31, 1998, shall be $3,640 for each SFDU and $1,360 for each MFDU and Second Unit.

As previously described herein, Hart intends to seek State Funding for future School Facilities that, prospectively, may allow repayment as a special fund obligation of Hart to Newhall only from such funding as is received by Hart and allocated to Newhall as herein provided as to a portion of the Fair Share School Impact Mitigation Payments required by reason of the residential development of Newhall Land. Newhall acknowledges that Hart has entered,

and will enter, into similar agreements with others ("Fair Share Mitigation Payment Participants"). Newhall acknowledges that there is no assurance that such State Funding will be received by Hart and available for allocation to Newhall and other Fair Share Mitigation Payment Participants as provided for in this Agreement. Accordingly, Newhall will be responsible for paying to Hart the entire amount of the Fair Share School Impact Mitigation Payment relative to development of the Newhall Land on the basis provided for in this Agreement. The Fair Share School Impact Mitigation Payment shall be paid to Hart prior to the time that an application for a building permit for the construction of a DU, other than an Age-Restricted DU, a DU in an Excluded Development or a DU subject to the provisions of the Annexation Agreement, as that term is defined in Section 6.c of this Agreement, is submitted to the County, the City, or any other governmental entity which has the authority to issue building permits for the development of Newhall Land.

4. ***Adjustments To Mitigation Obligation.*** The Fair Share School Impact Mitigation Payment shall be reviewed and, if appropriate, increased or decreased by Hart, from the base date, at the times, and in accordance with the methodologies set forth in this Section 4. The adjustments shall be based on variations in student generation factors ("SGF"), land value of school sites ("Land Value Component") and costs of construction, furnishings, equipment and related costs ("Non-Land Value Component") as follows:

a. *Student Generation Factors.* As set forth in Exhibit "E", certain initial SGF have been used in determining the initial amounts of the Fair Share School Impact Mitigation Payment. The SGF to be used until January 1, 1999, shall be: 0.171 SHS students for each SFDU, 0.064 SHS students for each MFDU or Second Unit, 0.098 JHS students for each SFDU, and 0.037 JHS students for each MFDU or Second Unit. Effective each January 1, commencing January 1, 1999, as provided in this Section 4, the amount of Fair Share School Impact Mitigation Payments shall be increased or decreased based upon the recalculation of the SGF for Hart determined in accordance with the methodology set forth in Exhibit "E" and the other provisions of this Section 4 of this Agreement, all as set forth in Exhibit "F".

b. *Land Value Component.* A Land Value Component of Three Hundred Seventy-five Thousand Dollars ($375,000) per net usable acre, as of January 1, 1997, assuming a construction-ready condition, with dedicated and improved public roads and utilities, including storm drainage facilities, has been used in calculating the initial Fair Share School Impact Mitigation Payment as of January 1, 1997. The parties acknowledge this value per acre may vary as the Newhall Land is developed. Consequently, effective each January 1st, commencing January 1, 1999, the Fair Share School Impact Mitigation Payment shall be increased or decreased based upon the Land Value Component determined as of a valuation date of the preceding October 15th. This adjustment shall be determined by the appraised per acre value of the sites then under consideration by Hart for the next JHS site and the next SHS site ("Proposed Sites"). If Hart identifies more than one (1) JHS Proposed Site or more than one (1) SHS Proposed Site, the Land Value Components for the JHS and for the SHS shall be based on the average of the appraised per acre values of all JHS Proposed Sites and the average of the appraised per acre values of all SHS Proposed Sites.

Appraisals at Hart's cost payable from Fair Share School Impact Mitigation Payment or interest earned thereon shall be conducted by a member of the Appraisal Institute ("AI") which person shall be selected by Hart ("Hart Appraiser"). The Proposed Sites shall be appraised on the basis that each Proposed Site satisfies the site requirements set forth in Section 7.b. of this Agreement and shall be on the basis of the highest and best use of the Proposed Sites as determined by the Hart Appraiser. If Newhall does not concur as to the Hart Appraiser, or its opinion of value, Newhall may designate, at its own expense, an appraiser that is currently a member of the AI ("Developer Appraiser") to independently appraise the Proposed Sites and prepare a report establishing and supporting the Developer Appraiser's opinion of the fair market value of each of the Proposed Sites. If the opinions of value of the Hart Appraiser and the Developer Appraiser differ by ten percent (10%) or less from each other, the appraised fair market value of the Proposed Sites shall be deemed to be the average of the two (2) appraisals as to each of the Proposed Sites. If the opinions of value of the Hart Appraiser and the Developer Appraiser differ by more than ten percent (10%), the Hart Appraiser and the Developer Appraiser

shall be instructed to agree upon a third appraiser who shall be a member of the AI ("Supplemental Appraiser"). The cost of the Supplemental Appraiser shall be shared equally by Hart and Newhall. The Supplemental Appraiser also shall independently appraise the Proposed Sites and prepare a report establishing and supporting his or her opinion of the fair market value of each of the Proposed Sites. In that event, the appraised fair market value of each of the Proposed Sites shall be deemed to be the average of the two (2) appraisals having the closest opinions of value. In the event the appraisal of each of the Proposed Sites conducted by the Supplemental Appraiser equals the average of the Hart Appraiser and the Developer Appraiser, then the appraised fair market value of each of the Proposed Sites shall be deemed to be the value determined by the Supplemental Appraiser. In the event other Fair Share Mitigation Payment Participants also desire to designate a Developer Appraiser, such appraiser shall be the appraiser designated by a majority of Newhall and the other Fair Share Mitigation Payment Participants whose mitigation agreements contain a Land Value Component adjustment substantially similar to the provisions of this Agreement. Newhall agrees to bear its pro rata share of the cost of the Developer Appraiser and the Supplemental Appraiser designated by a majority of the parties executing such mitigation agreements with Hart. If the parties are unable to agree on the Developer Appraiser, Hart shall designate the Developer Appraiser from a list of appraisers submitted by Newhall and other Fair Share Mitigation Payment Participants.

c. *Non-Land Value Component.* Effective January 1, 1999, the Non-Land Value Component shall be increased or decreased based upon the percentage change in the Marshall & Swift Class D Wood Frame Index for the Western United States ("Index"), for the period of November 1, , 1996 to October 31, 1998. Each January 1st subsequent to January 1, 1999, the Non-Land Value Component shall be increased or decreased based on the percentage change in the Index for the prior twelve (12) month period ending on the preceding October 31st. If the Index is no longer published, an equivalent index shall be reasonably determined by Hart.

d. *Adjustment Process.* The annual adjustment of the Fair Share School Impact Mitigation Payment shall be accomplished in the manner set forth in Exhibit "F" and in accordance with the procedure set forth in this Section 4.d.

Not later than November 15th of each year, Hart shall prepare and submit to Newhall an analysis of the proposed Fair Share School Impact Mitigation Payment adjustments described in Subsections (a) through (c) above ("Annual Adjustment Analysis") and Hart shall provide Newhall with all supporting documentation used for the Annual Adjustment Analysis. Hart shall therein state the proposed revised Fair Share School Impact Mitigation Payment to be applicable for the next succeeding calendar year effective on the next January 1st. Hart shall meet with Newhall to review and discuss the Annual Adjustment Analysis not later than December 10th of each year. Hart shall take into account any information provided by Newhall with respect to the Annual Adjustment Analysis, either before or after completion of the Annual Adjustment Analysis, in determining adjustment of the Fair Share School Impact Mitigation Payment. Any disputes between Newhall and Hart with respect to the Annual Adjustment Analysis not resolved to each party's satisfaction shall be resolved in accordance with Section 24 of this Agreement, but only after either Hart or Newhall determine no other alternative is feasible. Pending such resolution, any revised Fair Share School Impact Mitigation Payments that becomes due may be paid under protest and, if any amount subsequently is determined to have been improperly applied by Hart, such additional amount shall be returned by Hart to Newhall with interest at the average rate paid by the Los Angeles County Local Agency Investment Fund accruing from the date of payment to the date of repayment by Hart to Newhall.

5. *Notice of Annual Adjustment.* No later than November 15th of each year, Hart shall forward to Newhall the Annual Adjustment Analysis provided for in Section 4.d of this Agreement. The Adjustment Analysis shall serve as notice from Hart as to any determination of the Student Generation Rate, Land Value Component, Non-Land Value Component, Fair Share School Impact Mitigation Payment, or any other determination or document which would impose a duty on Newhall or change the extent of Newhall's obligations under this Agreement.

6. ***Reimbursement From State Funding.*** Prior to any allocation of State Funding to Newhall as provided for in this Agreement, Hart shall have received State Funding for a JHS and a SHS. This amount as to such JHS and SHS shall be equal to at least one hundred percent (100%) of fifty percent (50%) of the cost of site acquisition and improvement, design inspection,

construction, furnishing and equipment of a JHS and of a SHS for which State Funding is received by Hart. State Funding presently is provided, when available, for site acquisition and planning ("Phase P") and construction ("Phase C") of School Facilities. If only Phase P or Phase C, or however such funding is subsequently designated, is funded by the State, but not both, as to a given JHS or SHS, to be allocated to Hart as herein provided the unfunded portion of Phase P or Phase C, or if a JHS or SHS is designed and constructed at a lesser capacity than designated in Exhibit "C", such unfunded minimum amount as to a JHS or SHS shall carry forward as to State Funding and be reserved for Hart pursuant to this Agreement to the next JHS or SHS for which State Funding is received by Hart, prior to any allocation of State Funding to Newhall. The total amount of State Funding for a JHS and for a SHS to be allocated pursuant to the terms of this Agreement shall be determined on the basis equal to what would be apportioned and funded by the State for the actual completed total cost of such JHS or SHS based on a JHS of 1,000 students and a SHS of 2,000 students on a traditional school year calendar. This amount is not intended to include any cost for accommodating students in lieu of operating such JHS or SHS on a YRE. Subject to the foregoing, State Funding for future JHS and SHS, shall be apportioned to Newhall as follows:

a. Hart shall keep a cumulative total, which shall be adjusted as set forth herein, of JHS and SHS Newhall Students resulting from DU constructed as the result of building permits issued after Hart has received the Fair Share School Mitigation Payments provided for in this Agreement beginning on the day after this Agreement becomes effective based on the SGF in effect at the time each Fair Share School Impact Mitigation Payment for a SFDU, MFDU or Second Unit is paid to Hart ("Newhall Reimbursable Students").

i. If the total number of Newhall Reimbursable Students and students generated by DU subject to agreements with Fair Share Mitigation Payment Participants for a new JHS or SHS, as the case may be, is less than the design capacity of such JHS or SHS herein assumed to be 1,200 for a JHS or 2,400 for a SHS ("Capacity"), Hart shall divide the number of Newhall Reimbursable Students by the Capacity of that school ("Newhall Reimbursement Fraction"). Hart shall then pay an amount equal to the Newhall Reimbursement Fraction times

the amount of State Funding received by Hart to Newhall within thirty (30) days of Hart's receipt of such State Funding. Upon payment, Hart shall reduce the number of JHS or SHS Newhall Reimbursable Students, as the case may be, by a number equal to the Capacity of the applicable JHS or SHS multiplied by the Newhall Reimbursement Fraction.

ii. If the total number of Newhall Reimbursable Students and students generated by DUs subject to agreements with Fair Share Mitigation Payment Participants ("Total Number of Reimbursable Students") for a New JHS or SHS, as the case may be, is equal to or exceeds the Capacity of the school, Hart shall divide the number of Newhall Reimbursable Students by the Total Number of Reimbursable Students ("Newhall Adjustment Fraction"). Hart shall then pay an amount equal to the Newhall Adjustment Fraction times the amount of State Funding received by Hart to Newhall within thirty (30) days of Hart's receipt of such State Funding. Upon payment, Hart shall reduce in its records the number of JHS or SHS Newhall Reimbursable Students, as the case may be, by a number equal to the Capacity of that school multiplied by the Newhall Adjustment Fraction.

b. If Hart has requested and received advanced funds from Newhall, Newhall shall designate those funds as advance payment of Fair Share School Impact Mitigation Payments for SFDU, MFDU or Second Unit as it determines in its sole discretion. The number of Newhall Reimbursable Students associated with the number and type of DU specified by Newhall shall be increased immediately upon receipt by Hart of the advanced funds and Newhall shall be credited as herein provided in Section 6c with having paid the Fair Share School Impact Mitigation Payments for the number and type of DU specified.

c. Hart has entered into a school facilities funding agreement with Newhall, dated December 16, 1997, a copy of which is attached as Exhibit "G", which governs the school impact mitigation measures required for land designated therein that is to be annexed to the City ("Annexation Agreement"). At the time that the Proposed Junior High School Site, as that term is defined in the Annexation Agreement, is transferred to Hart and all required improvements completed on a lien-free basis, Newhall shall specify the number and type of DU as to which it will be deemed to have paid the Fair Share School Impact Mitigation Payments. In determining

the number of Newhall Reimbursable Students, Hart shall apply the initial SGF set forth on Exhibit "E" to this Agreement and the SFDU or MFDU designated by Newhall at the time of such payment to Hart. The number of Newhall Reimbursable Students associated with the number and type of DU specified by Newhall shall be increased immediately upon receipt by Hart of the Proposed JHS Site provided for in the Annexation Agreement and Newhall shall be credited with having paid the Fair Share School Impact Mitigation Payments for the number and type of DU specified by Newhall.

d. Attached as Exhibit "H" are examples of some possible scenarios of the foregoing which are attached only as explanatory material and are not intended to and do not affect or change any of the provisions of this Section 6 of this Agreement.

7. *New School Facilities.*

a. *School Size.* Each additional JHS will be considered to have been designed and constructed to accommodate approximately one thousand two hundred (1,200) students on a traditional, single track, nine month school schedule and each additional SHS will be considered to have been designed and constructed to accommodate approximately two thousand four hundred (2,400) students, on a traditional, single track, nine month school schedule.

b. *Site Requirements.* Each additional JHS will be built on a site containing approximately twenty five (25) net usable acres, and each additional SHS will be built on a site containing approximately forty five (45) net usable acres. Net useable acres shall be exclusive of slopes which exceed two percent (2%) assuming a construction-ready condition.

c. *Construction of New Schools.* Hart, subject to availability of funds for such purposes, will build as many additional JHS and SHS as are necessary to house Newhall Students. Hart will use its best efforts to locate only two (2) additional JHS and one (1) additional SHS on Newhall Land. Hart, on a best efforts basis, will seek to locate such additional JHS and SHS as shown on Exhibit "A." The precise location of such JHS and SHS to be built on Newhall Land will be mutually agreed upon between Hart and Newhall and acceptable to the State. In the absence of such mutual agreement, the precise location of such

JHS or SHS shall be determined by Hart subject to approval by the State. In the event Hart reasonably determines that additional JHS or SHS should be located on Newhall Land, it may acquire the sites for the additional schools either through negotiations or by means of an eminent domain action. Hart shall pay Newhall the fair market price for all school sites it acquires from Newhall except for the JHS site transferred to Hart pursuant to the Annexation Agreement as to which the fair market value has been agreed upon and the consideration therefor is as provided for in the Annexation Agreement.

8. ***Certification of Mitigation.***

a. Immediately upon receipt from Newhall or any of its assignees of the required school impact mitigation fee or mitigation payment in the required amount for each DU and Commercial/Industrial Development in an Excluded Development or the Fair Share School Impact Mitigation Payment for each DU subject to this Agreement, Hart shall provide any written certification required to obtain building permits or other approvals for the construction of DU from the County, the City, or any other governmental entity which requires such certification. The certification shall be in writing and shall be provided for whatever number of DU are requested and paid for by Newhall or by any assignee of Newhall at any time.

b. As to the Newhall Land, immediately upon request by Newhall or any of its assignees without the payment of any fees whatsoever, Hart shall provide any written certification required to obtain building permits or other development approvals for the construction of Age-Restricted DU, or Commercial/Industrial Development and the construction of DU subject to the Annexation Agreement specified by Newhall from the County, the City, or any other governmental entity which requires such certification. The certification shall be in writing and shall be provided for whatever number of Age-Restricted DU, or Commercial/Industrial Development and DU subject to the Annexation Agreement are requested by Newhall or any of its assignees at any time. The foregoing is not applicable to the Excluded Development portion of the Newhall Land which is subject to the obligations and requirements applicable thereto .

9. ***Maximization of Priorities to Receive State Funding.*** If it has not already done so, Hart shall submit applications for State Funding for a JHS and for a SHS to the Office of Public School Construction within thirty (30) days of the signing of this Agreement. Hart shall thereafter take all reasonable steps available to Hart to pursue and obtain State Funding and federal funding, if any, for a JHS and a SHS. Hart may pursue such funding on the basis of what is presently designated as Priority Two for one hundred percent (100%) funding or Priority One for fifty percent (50%) funding of State eligible area and costs of a JHS or SHS. Pending legislation may be enacted providing only for fifty percent (50%) of such funding except for greater amounts under specified circumstances. If Hart elects to not pursue the highest priority for the first JHS or the first SHS for State Funding and the greater amount based on what presently is a Priority Two or hardship basis is not received by Hart and the lesser amount, herein assumed fifty percent (50%), would have been received by Hart on the basis of a Priority One application, such amount, if not received, will be credited against and reduce the priority allocation of State Funding to Hart provided for in Section 6 of this Agreement. As to any subsequent JHS or SHS, Hart shall pursue the highest priority for State Funding unless otherwise agreed by the Parties. Neither Party shall unreasonably withhold such consent. Hart shall take no actions which would deny or delay obtaining State Funding as provided for in this Agreement. Provided Hart has the local matching funds or, as provided for herein, Newhall, in its sole discretion, has advanced the necessary funds, Hart, subject to the foregoing, shall maintain an active, up-to-date application for the first available State Funding. Hart shall pursue similar appropriate action if State law or policy changes in regard to future State Funding. Hart shall not acquire other chargeable space which substantially adversely affects its eligibility for future State Funding except as provided in this Agreement (i.e., facilities for students in lieu of YRE as referred to in Recital F). Newhall and Hart acknowledge that leases of portable classrooms for less than five (5) years prior to an application for State Funding are not existing school building capacity under Chapter 407 of the 1998 Statutes (Section 17071.30(a) of the Education Code) if existent and applicable to Hart at any point in time relevant to the Newhall Land. Further, Hart shall obtain any interim or temporary school facilities, including, but not limited to, relocatable

and portable, classrooms in such manner so as not to unreasonably reduce the number of unhoused students relative to Hart's eligibility for future State Funding. Except as set forth herein, this Agreement shall not in any manner be asserted by Newhall to interfere in any way with, or to limit, Hart's Board of Trustees in determining what educational and school facilities policies will best further the interests of Hart's students or the construction or operation of its educational facilities.

10. ***Support of Land Use Applications***. Hart shall, within ten (10) days of receipt of written request from Newhall as to adequacy of School Facilities for development of the Newhall Land, express, orally and in written form, its support for any request for a land use approval, whether legislative or administrative, sought for the development of any portion of Newhall Land from the County, the City, or any other governmental entity which has the right to grant such an approval. Such action by Hart shall relate only to the adequacy of school facilities for such development and not the desirability or undesirability of approval except as related to adequacy of School Facilities for such proposal.

11. ***Certification of Adequacy of Mitigation***. Hart shall provide written certification within ten (10) days of receipt of a written request from Newhall or any Newhall assignee that adequate educational facilities exist, or that the financing provided by this Agreement guarantees their availability as needed, to house Newhall Students. This written certification shall be given to the California Department of Real Estate, the County, the City, or any other governmental entity which may have development approval authority over any portion of Newhall Land. Each such certification shall be based on each JHS having the capacity to serve the needs of 1200 students and each SHS having the capacity to serve the needs of 2400 students.

12. ***Equal Treatment Provisions***. Not later than November 15th of each year, or upon Newhall's written request at any other time, Hart shall provide Newhall with copies of all mitigation agreements entered into with other developers or landowners that have not previously been provided to Newhall. Hart shall, at the same time, provide any analyses of such agreements prepared by Hart or its consultants and all other materials in Hart's possession reasonably

necessary for the evaluation of the economic terms of such agreements to the extent such documents are not subject to the attorney-client privilege.

If Hart enters into any such agreement which is more economically advantageous than this Agreement, as agreed upon by parties or as determined pursuant to Section 24 of this Agreement, this Agreement shall be modified to make the obligations of this Agreement consistent with, and no greater than, the obligation imposed by any such agreement. Any such modification shall not require an amendment to this Agreement but may be described in an addendum signed by Hart and Newhall. Any modification to the obligations imposed on Newhall by this Agreement shall be effective as of the date of Hart's approval of any such agreement and Newhall shall be entitled to a refund of the amount of the Fair Share School Impact Mitigation Payments in excess of the modified amount plus interest on the refunded amount at the average interest rate paid by the Los Angeles County Local Agency Investment Fund accruing from the date of each payment to the date of refund.

An agreement requiring a lesser mitigation payment per DU, but requiring other consideration of equal or greater value, such as land, shall not be considered a more economically advantageous agreement. A subsequent agreement shall not be deemed more economically advantageous if it is the result of a condition of approval imposed prior to the effective date of this Agreement which explicitly limits the amounts payable to Hart imposed by a prior action of a public agency (other than Hart) or due to a change in applicable law including but not by way of limitation Chapter 407 of the Statutes of 1998.

13. ***No Further Exactions.*** Hart shall not, under any circumstances:

a. Exercise any power or authority under current of future law to levy or impose an exaction of land, goods, money, or services, whether denominated a fee, charge, dedication, or otherwise, against any development of Newhall Land;

b. Require, request, or cooperate with the County, the City, or any other governmental entity to exercise any power or authority to levy or impose an exaction of land, goods, money, or services, whether denominated a fee, charge, dedication, or otherwise, for Hart's benefit;

c. Oppose the development of any portion of Newhall Land or any governmental approval, whether legislative or administrative, or any change in any governmental approval on any basis whatsoever; or

d. Sponsor or require the formation of a Communities Facilities District ("CFD"), except for a CFD or multiple CFDs which together include all of the land within Hart's boundaries, for any of Newhall Land without the express, written consent of Newhall which consent may be given or withheld in Newhall's sole discretion. Hart shall not unreasonably refuse to act as a sponsor for a CFD or similar public financing procedure if requested to do so by Newhall. Hart may accomplish any general obligation bond election that it desires on a District-wide basis or by one or more school facilities improvement districts.

14. ***Adequacy of Newhall's Mitigation Obligation.*** The school fees and payments as well as the Fair Share School Impact Mitigation Payments to be provided to Hart by Newhall pursuant to the terms of this Agreement constitute the entire extent of Newhall's obligation to provide the funds necessary for Hart to obtain the School Facilities needed to house Newhall Students.

15. ***Changes in Excluded Developments.*** If the number or type of DU, other than Age-Restricted DU, in an Excluded Development is changed ("Changed Project") so that the total number of Newhall Students from a Changed Project is increased, the number of JHS and SHS students generated by the Excluded Development then under consideration, without taking into consideration the Changed Project, shall be determined using the then existing SGF ("Excluded Development Students"). Thereafter, the number of JHS and SHS students from the Changed Project shall be determined by using the then existing SGF ("Changed Project Students"). The difference shall be determined between the total number of Changed Project Students and the Excluded Development Students for both JHS students and SHS students ("Additional JHS Students" and "Additional SHS Students", collectively "Additional Students"). The cost of School Facilities for the Additional Students shall be determined as provided in Exhibit "D" adjusted as provided for in this Agreement. Such cost shall be apportioned proportionately to all DU in the Changed Project in addition to whatever obligation is otherwise

applicable to each such DU. Attached as Exhibit "I" are examples of some possible scenarios of the foregoing which are attached only as explanatory material and are not intended to and do not affect or change any provisions of this Section 15 of this Agreement.

16. ***Agreement Not Terminated By Change In Law.*** No development, change of development, governmental approval, nor change in any governmental approval of any portion of Newhall Land shall constitute the basis for any change or termination of this Agreement because this Agreement provides for the complete mitigation of all impacts, direct and cumulative, to the development of Newhall Land on Hart's ability to provide adequate educational opportunities to every student within Hart's boundaries. The provisions of this Agreement shall not be affected by any existing applicable law or subsequent legislation enacted by the State of California acting through the legislative or initiative process, or any subsequent judicial decisions relating to the matters provided for in this Agreement. The Fair Share School Impact Mitigation Payments provided for in this Agreement are hereby appropriated and dedicated to the costs related to future acquisition, construction and financing of the School Facilities and other such related costs of Hart for purposes of housing Newhall Students.

17. ***Transfer and Encumbrance.*** Newhall shall have the right, in its sole discretion, to sell or encumber Newhall Land, improved or unimproved and in whole or in part, by any deed, mortgage, deed of trust, or other security device. No sale, transfer, or encumbrance of any portion of Newhall Land shall affect Newhall's obligations under this Agreement. Neither this Agreement nor any breach of this Agreement shall defeat, invalidate, diminish, or impair the lien or priority of any deed, mortgage, deed of trust, or other security device.

18. ***Mutual Cooperation.*** Unless this Agreement provides to the contrary, Hart and Newhall shall, within ten (10) days of receipt of a written request from the other party, perform any acts and prepare, sign, deliver, file, and record any documents reasonably required to obtain the goals, and to satisfy the conditions, contained in this Agreement. This includes, but is not limited to, providing the requesting party with a written statement certifying that:

a. This Agreement is unmodified and in full force and effect, or, if there have been modifications, this Agreement, as modified, is in full force and effect, stating the date and nature of any modification; and

b. There are no current uncured defaults under this Agreement or, if there are any, the dates and natures of the defaults.

19. ***Assignability of Agreement.*** Newhall is acting as the master developer of Newhall Land and intends to sell portions of Newhall Land to builders who will construct and sell residential, commercial, and industrial buildings to the public. Newhall shall have the unconditional right to assign any right or obligation under this Agreement to anyone at any time which assignee shall proportionally assume all applicable provisions of this Agreement. Whenever this Agreement provides Newhall with a right, that right may be exercised by an assignee of that right to the same extent that Newhall could have exercised that right. The assignment of any right or obligation under this Agreement shall be in writing and a copy of the assignment shall be provided to Hart. No such assignment shall relieve Newhall of any of its obligations under this Agreement without Hart's written consent which consent shall not unreasonably be withheld.

20. ***No Third Party Beneficiaries.*** This Agreement is entered into solely for the benefit of Hart and Newhall and their successors, transferees, and assigns. Other than Hart and Newhall and their successors, transferees, and assigns, no third person shall be entitled, directly or indirectly, to base any claim or to have any right arising from, or related to, this Agreement.

21. ***Entire Agreement.*** Except as to the Excluded Development this Agreement contains the entire agreement and understanding concerning the funding of School Facilities as to the Newhall Land as described on Exhibit "A" and supersedes and replaces all prior negotiations and proposed agreements, written or oral, except as they are included in this Agreement. Excluded Development, except as herein specified in Section 15 of this Agreement, shall be subject to the applicable fees or Mitigation Payments identified in Exhibit "B". Hart and Newhall acknowledge that neither the other party nor its agents nor attorneys has made any promise, representation, or warranty whatsoever, express or implied, not contained herein to

induce the execution of this Agreement and acknowledge that this Agreement has not been executed in reliance upon any promise, representation, or warranty not contained herein.

22. ***Amendments Must Be In Writing.*** This Agreement may not be amended except by a writing signed by Hart and Newhall.

23. ***Acknowledgment of Independent Investigation.*** Hart and Newhall acknowledge that each has conducted an independent investigation of the facts concerning the development of Newhall Land (including the development of the Excluded Projects), the impacts that Newhall Students will have on Hart's educational facilities, and the costs of housing Newhall Students.

24. ***Disputes To Be Arbitrated.*** Hart and Newhall desire to resolve any disputes as to the meaning of any portion of this Agreement, the validity of any determination or calculation, or the rights or obligations of Hart or Newhall under it as quickly as possible. Therefore, any such disputes shall be resolved by binding arbitration conducted by a mutually agreed upon retired judge of the Los Angeles Superior Court. If Hart and Newhall are unable to agree on the arbitrator within thirty (30) days of the receipt of a request for arbitration, they shall request that the presiding judge of the Los Angeles Superior Court designate one. Hart and Newhall shall each pay one-half the cost of the arbitration and each shall be responsible for its own attorneys' fees and costs as to any such arbitration.

25. ***Recovery Of Litigation Expenses.*** Except as provided in Section 24 above, if it becomes necessary to enforce any of the terms of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees and other costs of litigation in addition to any other relief to which it may be entitled.

26. ***Venue for Resolving Disputes.*** Any arbitration or litigation arising out of this Agreement shall be conducted only in Los Angeles County, California.

27. ***Interpretation Guides.*** In interpreting this Agreement, it shall be deemed it was prepared by the parties jointly and no ambiguity shall be resolved against either party on the premise that it or its attorneys was responsible for drafting this Agreement or any provision hereof.

28. ***Due Authority of Signatories.*** Each individual signing this Agreement warrants and represents that he or she has been authorized by appropriate action of the party which he or she represents to enter into this Agreement on behalf of the party.

29. ***Notices.*** All notices, demands, and communications between Hart and Newhall shall be given by personal delivery; registered or certified mail, postage prepaid, return receipt requested; Federal Express or other reliable private express delivery; or by facsimile transmission. Such notices, demands, or communications shall be deemed received upon delivery if personally served or sent by facsimile or after three business days if given by other approved means as specified above. Notices, demands, and communications shall be sent:

To Hart:	William S. Hart Union High School District Attn: Superintendent 21515 Redview Drive Santa Clarita, CA 91350 Fax No. (805) 254-8653
With a copy to:	Alexander Bowie, Esq. Bowie, Arneson, Wiles & Giannone 4920 Campus Drive Newport Beach, CA 92660 Fax No. (949) 851-2014
To Newhall:	The Newhall Land and Farming Company Attn: President 23823 Valencia Boulevard Valencia, CA 91355 Fax No. (805) 255-3960
With a copy to:	Kenneth B. Bley, Esq. Cox, Castle & Nicholson LLP 2049 Century Park East, 28th Floor Los Angeles, CA 90067 Fax No. (310) 277-7889

The foregoing names, addresses, and fax numbers may be changed at any time by a written notice given as provided above.

30. ***California Law Governs.*** This Agreement and all rights and obligations arising out of it shall be construed in accordance with the laws of the State of California.

31. ***Counterparts.*** This Agreement may be signed in one or more counter-parts which, taken together, shall constitute one original document.

32. ***Exhibits.*** All Exhibits attached hereto are incorporated into this Agreement.

33. ***Incorporation Into Subsequent Approvals.*** These obligations shall be deemed to be obligations that relate to the Newhall Land Development Entitlements and shall run with the land as obligations of its future development, including all provisions and requirements hereof relating to any SRDU. This Agreement shall be included in the technical appendices of the EIRs for the Westridge Project and Newhall Ranch Project, and be included in the mitigation measures and monitoring programs of the EIRs for both such projects.

34. ***Effective Date.*** This Agreement shall become effective on the date of the last signature by a party.

DATED: October 15, 1998

BOARD OF TRUSTEES OF THE WILLIAM S. HART UNION HIGH SCHOOL DISTRICT

By: Paula C. Olivares

President of the Board of Trustees of the WILLIAM S. HART UNION HIGH SCHOOL DISTRICT

[Signatures continued on following page.]

[Signatures continued from previous page.]

Attest:

_____

Clerk of the Board of Trustees of the WILLIAM S. HART UNION HIGH SCHOOL DISTRICT

DATED: October _____, 1998

THE NEWHALL LAND AND FARMING COMPANY (a California Limited Partnership)

By: NEWHALL MANAGEMENT LIMITED PARTNERSHIP Managing General Partner

By: NEWHALL MANAGEMENT CORPORATION
Managing General Partner

By: Tony M Cervantes
Its: President
By: James M Burton
Its: Sr. V.P.

[Signatures continued on following page.]

[Signatures continued from previous page.]

APPROVED AS TO FORM:

DATED: October 12, 1998

BOWIE, ARNESON, WILES & GIANNONE

By: _____
ALEXANDER BOWIE, ESQ.
Attorneys for the WILLIAM S. HART UNION HIGH SCHOOL DISTRICT

APPROVED AS TO FORM:

DATED: October 13, 1998

COX, CASTLE & NICHOLSON LLP

By: _____
KENNETH B. BLEY
Attorneys for THE NEWHALL LAND AND FARMING COMPANY

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Appendix K
SCAQMD SANTA CLARITA SUBREGIONAL ANALYSIS

SANTA CLARITA SUBREGIONAL ANALYSIS

NOVEMBER 2004

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

GOVERNING BOARD

Chair: WILLIAM A. BURKE, Ed.D.
Speaker of the Assembly Appointee

Vice Chair: S. ROY WILSON, Ed.D.

Supervisor, Fourth District
Riverside County Representative

MEMBERS:

MICHAEL D. ANTONOVICH
Supervisor, Fifth District
Los Angeles County Representative

JANE W. CARNEY
Senate Rules Committee Appointee

WILLIAM CRAYCRAFT
Councilmember, City of Mission Viejo
Cities Representative, Orange County

BEATRICE LAPISTO-KIRTLEY
Councilmember, City of Bradbury
Cities Representative, Los Angeles County, Eastern Region

RONALD O. LOVERIDGE
Mayor, City of Riverside
Cities Representative, Riverside County

JAN PERRY
Councilmember, City of Los Angeles
Cities Representative, Los Angeles County, Western Region

BILL POSTMUS
Supervisor - First District
San Bernardino County Representative

JAMES SILVA
Supervisor, Second District
Orange County Representative

CYNTHIA VERDUGO –PERALTA
Governor's Appointee

DENNIS YATES
Chino City Councilman
Cities Representative, San Bernardino County

EXECUTIVE OFFICER

BARRY R. WALLERSTEIN, D.Env.

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EXECUTIVE SUMMARY

Background on Subregional Analysis

The overall blueprint for attainment strategy in the greater South Coast basin is the Air Quality Management Plan (AQMP). The AQMP assesses and addresses regional air quality as a macrocosm. Since 2002, as part of SCAQMD's ongoing Environmental Justice program, the SCAQMD Governing Board has also asked staff to carry out one or more "subregional analyses" each year, as "mini-AQMP" microcosms.

A subregional analysis seeks to identify disproportionate air quality impacts in a specific geographic area, and if found, to address and mitigate these impacts. Thus far, the following subregional analyses have been requested by the Board, all involving potentially disproportionate exposure to unhealthful emissions: Mira Loma (concern: diesel exhaust from large clusters of truck warehouse facilities); the Alameda Corridor (concern: diesel exhaust from port operations, the freight rail expressway, associated rail yards, and on-road trucks); and in this report, the Santa Clarita Valley (concern: transported ozone and potential increases in fugitive dust and diesel exhaust emissions stemming from proposed aggregate mining and gravel hauling operations).

In 2003, SCAQMD's Santa Clarita Valley monitoring station recorded the highest official 1-hour ozone reading in Los Angeles county (a maximum concentration of 0.194 parts per million [ppm]). Ozone concentrations in Santa Clarita exceeded the federal 1- and 8-hour standards of 0.12 and 0.08 ppm on 35 and 69 days respectively.

In the spring of 2004, the SCAQMD Governing Board directed that the District provide an expanded analysis of subregional air quality, beyond that presented in the AQMP, to examine and assess several air quality issues confronting the Santa Clarita Valley. In response to this direction, an analysis has been conducted to discuss the observed air quality, the contributing factors to recent trends and to assess the roles of local emissions and pollution transport in relationship to the observations. In addition, the analysis attempts to characterize the potential impacts of development in both the residential sector and in the industrial sector as represented by the development of the Soledad Canyon Sand and Gravel Mining Project (Cemex/Transit Mixed Concrete, Inc. [Cemex/TMC]). The results of the analysis are grouped into three categories: observed ambient air quality (ozone and PM10/PM2.5), simulated ozone and PM10 impacts from future development of available land parcels in the valley, and potential toxic risk from diesel soot emissions associated with the in-situ mining and gravel hauling operations from the Cemex/TMC project.

Ozone and PM10 Air Quality (Sections 2 and 3):

- Santa Clarita does not meet the federal and California ozone air quality standards.

- The recent increase in the number of days exceeding the federal 1-hour ozone standard has been impacted mostly by weather and the movement of the monitoring station location (the old site was unsuitably impacted by local emissions);
- The city can experience a 50 part per billion (ppb) gradient of ozone concentrations from west to east on smoggy days;
- The highest PM10 concentrations in the Santa Clarita Valley are observed in the City of Santa Clarita near the Interstate 5 (I5) and State Route 14/Antelope Valley (SR-14) freeways;
- Transport from the San Fernando Valley and Los Angeles dominates both local ozone and particulate air quality;
- Santa Clarita emissions contribute about 2 percent to local ozone impact;
- Local particulate emissions contribute about 10 percent to the annual average observed PM10 concentration;
- Weekend ozone concentrations under average wind transport conditions are approximately 23 percent higher than weekdays; and
- Santa Clarita meets federal PM10 standards but exceeds the more restrictive California standard.

Impacts from Future Development (Sections 3, 4 and 5)

- Doubling of motor vehicle emissions in the city of Santa Clarita will have a nominal impact to local PM10 and no impact to local ozone;
- When simultaneous 25-year build-out of all recorded, pending and approved land parcels in the city and county portions of the valley is assumed, simulated annual PM10 concentrations are projected to increase up to 5 micrograms per cubic meter ($\mu g/m^3$);
- The maximum regional annual average PM10 impact is projected to occur near Newhall Ranch;
- The annual average regional impact due to the development of the Cemex/TMC facility is projected to result in an increase of up to 3 $\mu g/m^3$, in the immediate area surrounding the mine;
- A focus point source analysis of the Cemex/TMC mine projected an annual PM10 impact of up to 16 $\mu g/m^3$ (at the fence line of the facility); and
- Future development would not cause violations of the federal annual average PM10 standard but could cause possible violations of the state standard.

Toxic Risk Analyses (Section 6)

- The MATES II regional toxic risk study estimated an average risk of 500 in one million for the City of Santa Clarita;
- By comparison, the average toxic risk for the South Coast Air Basin (Basin) is approximately 1,400 in one million;
- In general, simulations using a Gaussian model in the Basin are conducted using the urban meteorological assumption. Due to its unique topography, the Santa Clarita Valley was simulated using both the urban and rural meteorological assumptions to bound the analysis;
- Model-simulated maximum risk to the city of Santa Clarita from diesel emissions associated with mining and hauling operations from the Cemex/TMC project ranges from 10 to 25 in one million, dependent upon the meteorological profile: urban or rural, respectively;
- The northeast portion of the city adjacent to the SR-14 and Soledad Canyon Road split would experience the greatest impact; and
- The maximum risk to a sensitive receptor (school) ranges from 7 to 20 in one million, dependent upon the meteorological profile: urban or rural, respectively.

The City of Santa Clarita through its air quality element has instituted many air pollution mitigation measures and is considering additional options. This analysis concludes by providing selected potential mitigation measures **(Section 7)** that address fugitive dust issues and emissions from diesel mobile sources.

1.0 INTRODUCTION

At its August 2003 meeting; the Governing Board of the South Coast Air Quality Management District (District) adopted the 2003 revision to the Air Quality Management Plan (AQMP) for the South Coast Air Basin (Basin). The 2003 AQMP, which has since been forwarded to the California Air Resources Board (CARB), and approved for inclusion in the California State Implementation Plan (SIP), is the region's blueprint towards clean air. The AQMP provides regional characterization of the air quality problem and proposes the development of specific emissions control measures and rule implementation schedules to meet clean air goals. While the AQMP details the road map to regional attainment of all air quality standards, it is not directly focused on the subregional or localized air quality impacts that affect individual communities.

The City of Santa Clarita has requested that the District conduct an expanded analysis of subregional air quality, beyond that presented in the AQMP, to exam and assess several air quality issues confronting both the city and its sphere of influence, the Santa Clarita Valley. The city and valley are both rapidly developing. The community is developing a subregional plan "One Valley, One Vision," which defines the goals of growth and development for the incorporated and unincorporated cities of the valley while maintaining a high quality of life. As part of this planning effort, the city has requested that the District provide answers to key issues that are intimate to the local area. These included:

- Characterizing and evaluating the observed ozone and particulate air quality

  - trends;
  - impact of local emissions; and
  - and what is termed the "weekend effect".

- Evaluating the impact of potential development growth on air quality

  - through increased mobile source emissions; and
  - by simulating the valley build-out .

- Evaluating the impact of proposed Cemex/TMC mining operations.

- Providing potential mitigation measures.

2.0 BACKGROUND

The city of Santa Clarita (Figure 2-1) is located approximately 35 miles northwest of central Los Angeles, with its southern boundary abutting the northern portion of the San Fernando Pass. The majority of the city resides between Interstate 5 and State Routes 126 and 14. The size of the city accounts for roughly 25 percent of the 200-square mile Santa Clarita Valley.

The estimated population of Santa Clarita in 2003 was approximately 163,000 with an estimated total population in the Santa Clarita Valley of 172,000. The population of the city has grown over 35 percent since 1990 with 75 percent of the population residing in single family dwellings. The population growth rate has been complemented with substantial growth in housing, within the incorporated boundaries of the city and on adjacent developed land in both Los Angeles and Ventura counties.

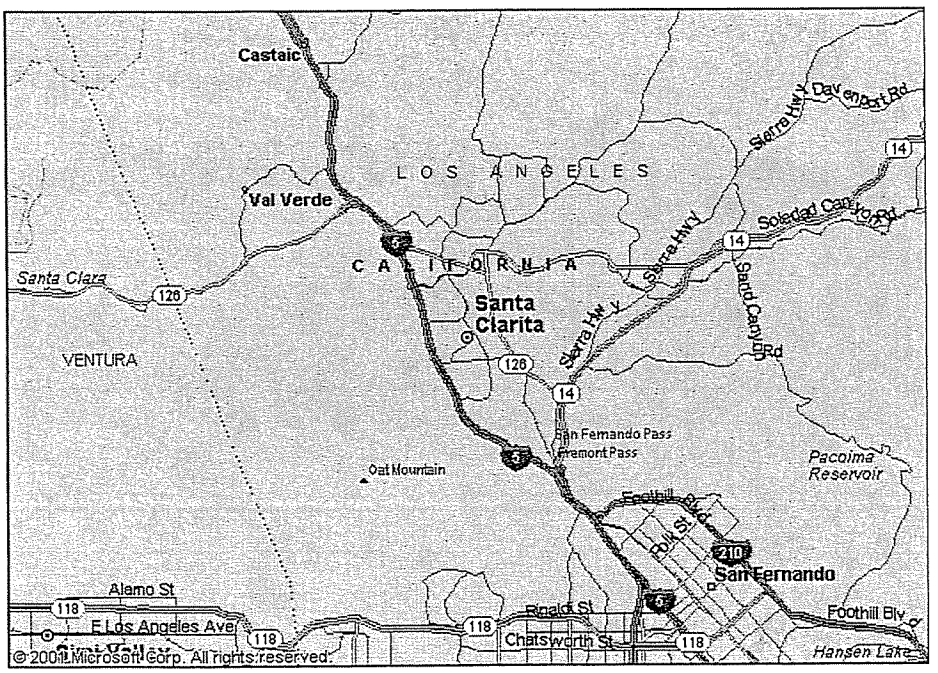


FIGURE 2-1

Santa Clarita and Neighboring Communities

While residents commuting to the San Fernando Valley and Central Los Angeles account for a large percentage of the work force, the Santa Clarita Valley retains more than 30,000 jobs. Commuting to the Santa Clarita Valley represents a growing contribution to traffic and emissions.

2.1 Meteorological Profile

During the 1997 Southern California Ozone Study (SCOS97, conducted by a partnership of air districts, CARB and U.S. EPA), extensive measurements of meteorological and air quality data were taken to help characterize the pollutant build-up and transport processes that take place in the Basin. The August 4-7, 1997 meteorological episode captured the build-up of an ozone episode and the development of a coastal eddy that resulted in transport of the polluted air mass to the Santa Clarita Valley over successive days. The episode was simulated as part of the Basin ozone attainment demonstration for the 2003 Air Quality Management Plan. In later sections of this report, these simulations are used to demonstrate the relative impact of transport to the Santa Clarita air quality problem due to emissions in the valley and in the upwind emissions source areas.

The following sections briefly describe the observed wind flow and inversion characteristics that uniquely impact the Santa Clarita Valley.

2.1.1 Wind Flow

The meteorological profile of the Santa Clarita Valley is dominated by the diurnal sea breeze wind circulation that is characteristic of Southern California. Daytime wind transport into the Santa Clarita Valley occurs along two primary routes: from the south through the Newhall pass, and from the west following the Santa Clara River (Figure 2-2). The thermally driven southwesterly wind flow exits the valley mainly through the eastern canyons on a traverse towards the Antelope Valley. A smaller percentage of the wind flow into the Santa Clarita Valley is channeled up the side canyons which are generally north-south in orientation. Average wind speeds during the afternoon range between 5 and 10 miles per hour. At night, weak drainage flow from the surrounding mountains collects along the Santa Clara River bed and is transported westward towards the coast.

Seasonally, the sea breeze is strongest during the spring and summer months. The typical flow pattern into the valley is augmented by region-wide southerly flow that accompanies the development of coastal eddies in the Southern California bight. The formation of coastal eddies occurs approximately 15 percent of the year. When the eddy is established, it promotes regional transport from the majority of the air pollution sources in the coastal plain. Less frequent, but well pronounced in the Santa Clarita Valley, are the periodic Santa Ana northerly winds which are routinely characterized by wind gusts in excess of 30 mph.

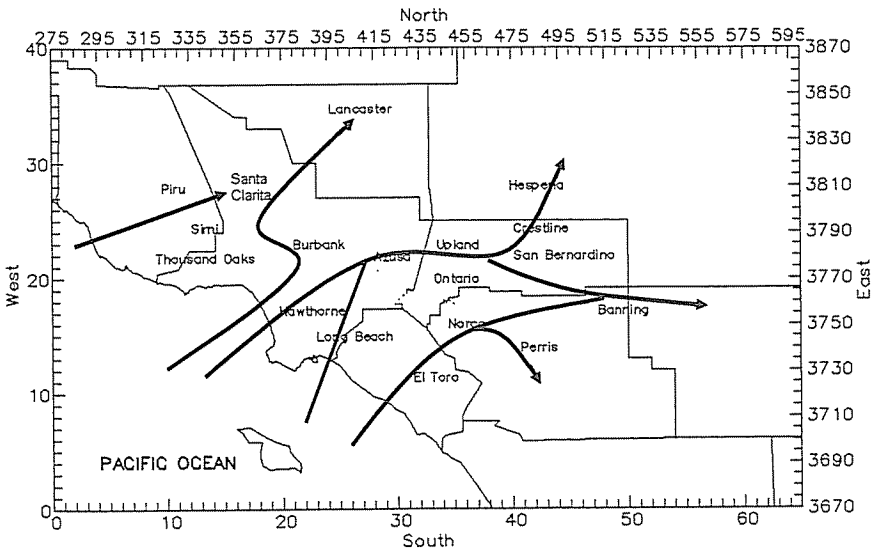


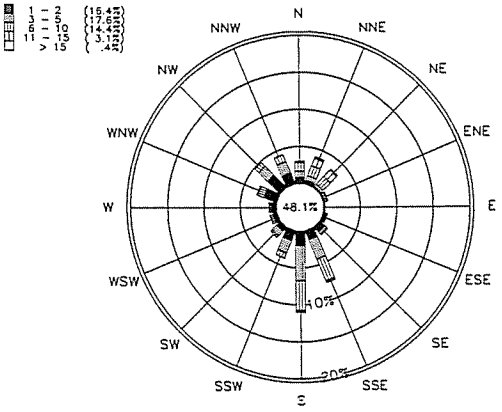
FIGURE 2-2

Prevailing Wind Transport to the Mojave Desert

The overwhelming contribution of pollution transport to the Santa Clarita Valley comes from the San Fernando Valley and metropolitan Los Angeles. Figure 2-3 depicts the seasonal-hourly wind frequency diagrams or "wind roses" for the Santa Clarita SCAQMD monitoring station for the period 1991-2000. Excluding periods of calm winds that occur as the sea breeze begins and ends (49.2 percent of all hours), the major daytime wind vectors are from the south and upwind emission source areas. This is particularly evident in the spring and summer months. In addition, several field studies have confirmed the prevalent transport route through the Newhall Pass by tracing the northward movement of inert tracer gases released in the Metropolitan Los Angeles areas.

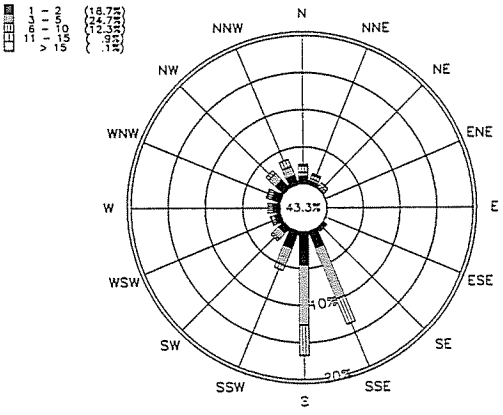
Table 2-1 summarizes the frequency of occurrence of different daytime transport regimes to Santa Clarita. In general, average transport, which is characterized by a moderate-to-strong sea breeze through the Newhall Pass, occurs two-thirds of all days. In contrast, Santa Clarita is mostly impacted from local emissions under calm winds and weak offshore flow which occurs less than ten percent of all days.

(a)



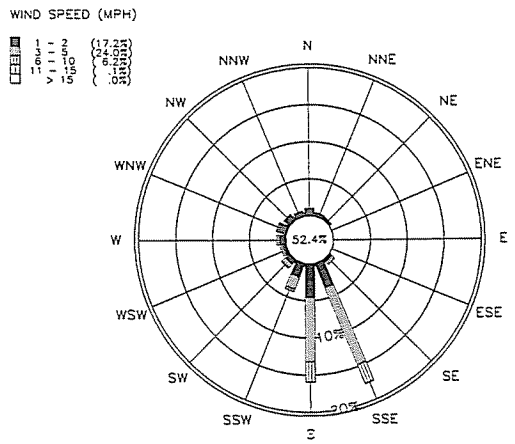
SCAQMD Santa Clarita Monitoring Station
January – March (1991–2000)

(b)



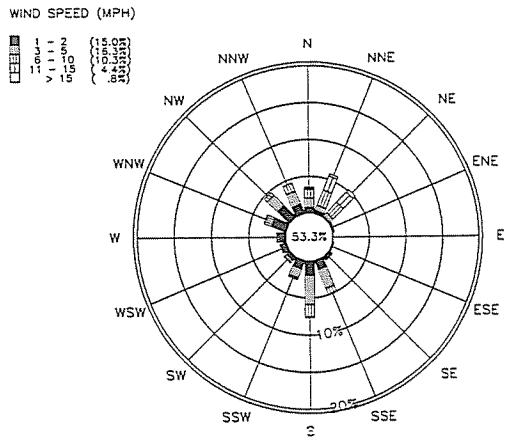
SCAQMD Santa Clarita Monitoring Station
April – June (1991–2000)

(c)



SCAQMD Santa Clarita Monitoring Station
July – September (1991–2000)

(d)



SCAQMD Santa Clarita Monitoring Station
October – December (1991–2000)

FIGURE 2-3

Hourly Wind Rose for Santa Clarita (1991-2000):
(a) Winter, (b) Spring, (c) Summer, (d) Fall

TABLE 2-1

Frequency and Strength of Daytime Wind Transport to Santa Clarita

Transport Regime	Frequency of Days	Characteristics
Local	6	Calm winds or weak offshore flow
Weak	20	Light winds onshore
Average	66	Moderate to strong sea breeze through Newhall pass and Santa Clara River Valley
Overwhelming	8	Strong Catalina eddy or an approaching storm system

2.1.2 Inversion Characteristics and Mixing

The elevation of the Santa Clarita Valley varies from just over 1000 feet to about 1700 feet above mean sea level (msl) in the eastern portion of the city. The base of the morning coastal inversion layer typically resides within a layer approximately 1000 and 3000 feet above msl with a median height of approximately 1200 feet msl. On many days, the coastal and San Fernando portions of the Basin reside in the marine layer while Santa Clarita is above the inversion base in the stable air within the inversion layer. When the inversion is lower than the elevation of the valley, Santa Clarita will take on the climatic characteristics of the high desert. These include limited cloud cover from the marine layer, low humidity and a rapid warming of daytime temperatures. Vertical mixing of the atmosphere under these conditions is limited in the pre-dawn and early morning hours due to the very stable atmosphere. Higher levels of tailpipe emissions are trapped close to the ground but the rapid heating of the atmosphere after dawn limits the amount of stagnation, acting to disperse morning pollution vertically.

On days when the height of the base of the inversion layer is approximately equal to or greater than the elevation of the valley, a modified marine air climatic profile is observed in Santa Clarita. This will often include clouds or fog, higher humidity and slower rise in daytime temperature. Vertical mixing of the atmosphere will readily disperse ground level emissions; however, the extent of mixing will be determined by the inversion base height above mean sea level relative to the terrain elevation. As a consequence, on days when the morning inversion is elevated over Santa Clarita, the mixed layer, or area of the atmosphere where pollutants readily disperse, can actually be shallower than over the San Fernando Valley and coastal plain. These conditions often accompany the development of a coastal eddy and enhanced wind transport into the valley.

As the air over Southern California heats during the day, vertical mixing in the coastal plain and San Fernando Valley will typically reach between 3000 and 5000

feet. Developing ozone and particulate air pollution caught in the mixed layer is transported with the winds towards the Santa Clarita Valley. The pollutant-laden air mass extends high enough in the atmosphere to easily move through the Newhall Pass into the valley proper. The transported pollutant air mass typically retains the marine or coastal climatic characteristics and is several degrees cooler in temperature than the air it is displacing in the Santa Clarita Valley. The cooler pollutant-laden air tends to hug the ground creating a temperature contrast between the pollutant air mass and the warmer air above in the mixed layer. As a result, the movement of the polluted air mass into Santa Clarita acts to regenerate a low-level inversion whereby the transported pollutants are concentrated in a shallow layer.

On days when Southern California experiences extreme heat, the inversion layer is broken and vertical mixing of the atmosphere becomes unlimited. Under this condition transport into the Santa Clarita Valley is limited and pollutant levels are characteristically low in the area.

2.2 Air Quality Profile

Any assessment of the Santa Clarita air quality profile must begin with an assessment of the trend of air pollution in the South Coast Air Basin. In general, the region is most greatly impacted by ground-level ozone. Particulate matter, separated into a fine mode (PM2.5 - aerodynamic diameter less than or equal to 2.5 microns) and a coarse mode (PM10 - aerodynamic diameter of 10 microns or smaller, including PM2.5), is the second major contributing pollutant to Basin air quality. To a lesser extent, and more restricted in geographical impact is carbon monoxide, a third pollutant of concern.

The federal air quality pollutant standard attainment designations characterize the Basin as a region. The Basin is classified non-attainment for ozone, PM10, and carbon monoxide. Each of these pollutants impacts the health of the Basin population through short-term acute exposure and long term chronic impacts. On a sub-regional scale, Santa Clarita exceeds only the federal standard for ozone.

Ozone is an oxidant that readily reacts with tissue in the respiratory tract; primarily the cilia in the bronchi and the alveoli in the lungs. Irritation, combined with inflammation caused by exposure leads to scarring of the alveoli cell walls and reduced pulmonary function with repeated exposure over time. Particulates, especially the fine portion, are easily inhaled and deeply penetrate the respiratory tract, causing irritation and inflammation. The particulates often serve as platforms for toxic materials and are associated with increases in mortality rates. Asthmatics, the, very young, the aged and people with pre-existing chronic respiratory ailments, are among the susceptible segments of the population who have been identified as being greatly impacted by exposure to either ozone or particulates.

Although not measured frequently in very high concentrations, carbon monoxide can cause impairment of consciousness and is especially harmful to people with emphysema or heart conditions. The Basin has met the criteria defining attainment

of the carbon monoxide since 2002. A petition to re-designate the Basin as attainment will be submitted to U.S. EPA in the near future.

2.2.1 Ozone Trend

Figure 2-4 depicts the long-term trend of days when the federal 1-hour ozone has been exceeded at one or more locations in the Basin. Also depicted in the figure is the regional peak concentration. As demonstrated by the trend, ozone air quality has significantly improved since the mid-1970's. The rate of improvement has slowed in the later 1990's and has shown a minor reversal over the past two years.

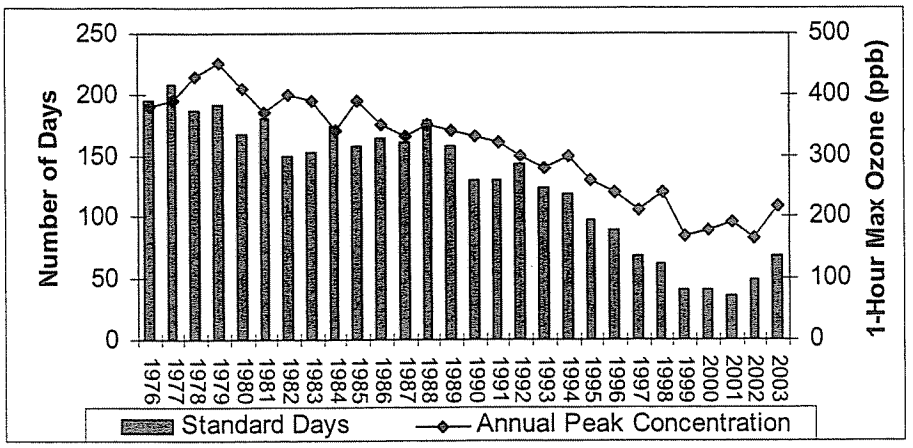


FIGURE 2-4

Trend of Days Exceeding the Federal 1-Hour Ozone Standard in the South Coast Air Basin and Annual Peak Concentration (ppb)

Figure 2-5 depicts the long-term trend of days when the federal 1-hour ozone standard was exceeded at Santa Clarita. When compared to the Basin totals, the trends are generally consistent with time. On average, Santa Clarita experiences violations of the 1-hour ozone standard on approximately fifty percent of the days each year that a basin-wide violation occurs.

Two features are very prominent in the recent ozone trend: First, no violations of the federal 1-hour average ozone standard were observed at the Santa Clarita monitoring site in 1999 and only one was observed the following year. The second characteristic of the recent trend has been the sharp increase in the number of violations observed in 2002 and 2003. A fundamental question arises when analyzing the recent trend: was the improvement in 1999-2000 real or is the 2002-2003 increase in violations a truer measure of ambient ozone in the area?

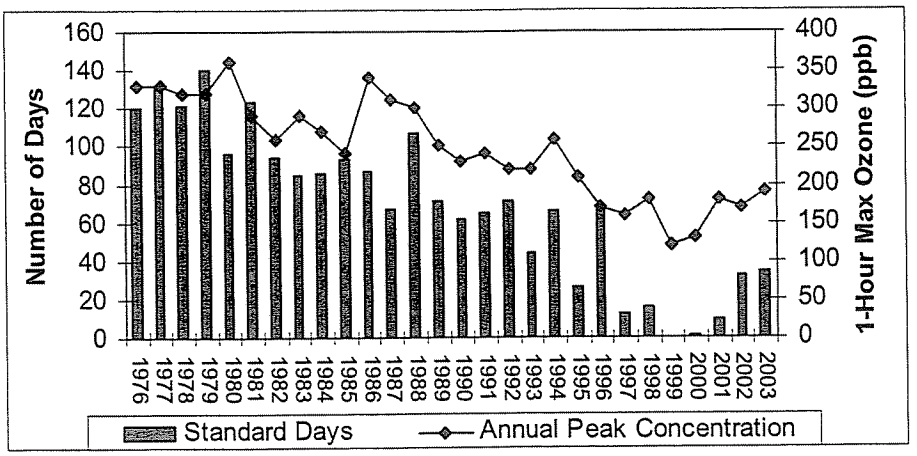


FIGURE 2-5
Trend of Days Exceeding the Federal 1-Hour Ozone Standard in Santa Clarita and Annual Peak Concentration (ppb)

2.2.1.1 Air Monitoring Station Relocation

In the spring of 2001, the Santa Clarita monitoring station was moved from its long-term location at L.A. County Fire Station #73 (24875 N. San Fernando Road, Newhall) to a site approximately one half mile to the east in a county maintenance yard. The fire station monitoring site on San Fernando Road was limited in space and had exposure interference from trees. The site was also adjacent to the fire department's diesel refueling station and was impacted from traffic emissions on San Fernando Road and from fire station activities. Diesel fire equipment, as well as routine traffic, emit high volumes of nitric oxide (NO). NO readily reacts with ambient ozone to titrate ozone concentrations nearby the NO emissions source. As a consequence, the fire station site may have been reading nominally lower ozone concentrations than the surrounding area. District staff determined that the new monitoring location receives better exposure and was less subjected to traffic influences than at the fire station.

At the time of the move, the ozone instrumentation was replaced and upgraded. The older equipment used at the fire station was found to have a problem with surface resistance on the intake manifold that scavenged ozone before reaching the analyzer. It is difficult to determine to what extent and when the equipment began to experience a loss in recorded ozone. The equipment is routinely calibrated and performance is determined to be acceptable if the results are within an acceptable range prescribed by both U.S. EPA and CARB. It is most likely that the instrument was operating at the lower bounds of acceptable performance at the fire station monitoring site during 1999 and 2000. This feature, together with favorable weather conditions, may have accounted for the unusually low number of days exceeding the

federal 1-hour average ozone standard. After the monitoring site relocation in the spring of 2001, higher ozone concentrations were observed by the new instrumentation. Concurrently, Santa Clarita experienced an upswing in the number of days exceeding the federal standard in 2001 and 2002 while leveling off in 2003. Other factors such as wildfire activity, regional changes in emissions levels and seasonal weather also may have contributed to the observed trend.

2.2.1.2 Wildfires

Due to drought conditions resulting from the record low rainfall measured over the past few years, much of the vegetation in the wildland interfacing the urban portion of the Basin has been stressed and has had dangerously low fuel moisture. Numerous wildfires have been ignited in Southern California. In particular the Santa Clarita area has been impacted each of the past three years (2002-2004). While the direct air quality impact caused by wildfires is due to fine particulates from the smoke, chemical reactions take place in the smoke plume that can elevate ozone concentrations. Experimental data captured from the Lodi Canyon controlled burns conducted in the Angeles National Forest during the late fall of 1986 indicated that on days having low ozone formation potential, a burn could generate concentrations of ozone exceeding 200 ppb with the smoke plume. The fires that occurred in the Santa Clarita valley during 2002 were very stubborn, lasting several days. Unlike the typical Santa Ana borne wildfires, the 2002 and 2004 fires fed upon the strong onshore sea breeze flow. Re-circulation of the smoke was observed throughout the Santa Clarita area and back into the San Fernando Valley. Several violations of the federal ozone standard occurred in both receptor areas as the fires burned and there existed a strong likelihood that the fires played a role in the enhanced ozone formation.

2.2.2 PM10 Trend

Figure 2-6 depicts the long-term trend of the peak annual average PM10 concentrations in the Basin. Also depicted in the figure is the regional peak 24- hour average concentration. The Basin exceeds the federal annual average PM10 standard (50 ug/m^3) and the 24-hour daily average standard (150 $\mu g/m^3$). The trend of annual average particulate has shown improvement since the late 1980's, however at a slower pace regionally than ozone. While the peak 24-hour average concentration continues to exceed the federal 24-hour average standard, it is important to note that since the mid 1990's the overwhelming number of days exceeding the standard were associated with high wind events (i.e. Santa Ana weather conditions and wildfires).

In the Santa Clarita Valley, annual average and 24-hour average concentrations of particulates are below the respective federal standards. Figure 2-7 shows the PM10 trends from 1989 through 2002. Over the last decade, the annual average concentration has been consistently about 70 percent of the federal annual standard. For the same period, the 24-hour maximum concentration has been on average less than 50 percent of the federal standard.

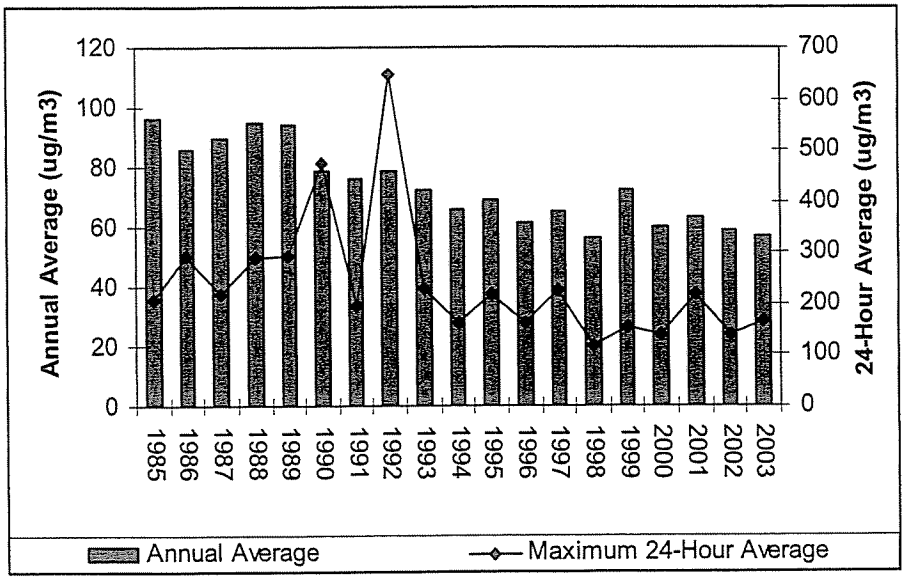


FIGURE 2-6

Basin Annual Average and Maximum 24-Hour Average PM10 Concentration

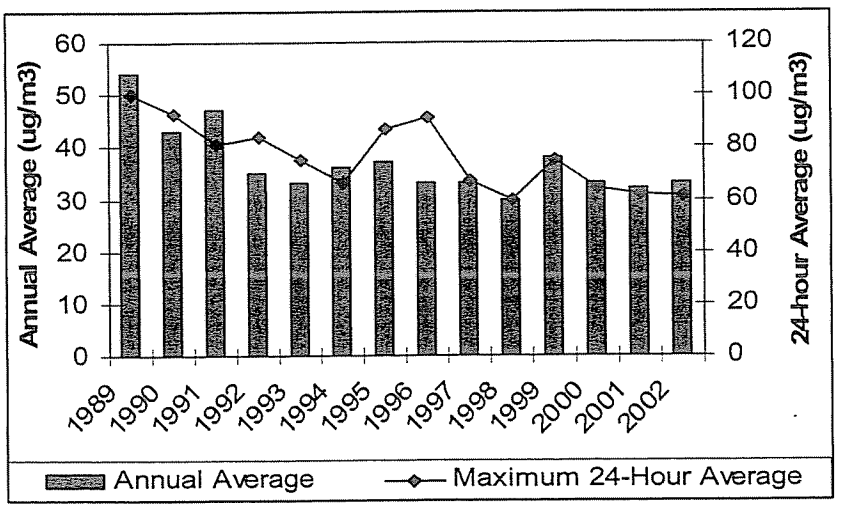


FIGURE 2-7

Santa Clarita Annual Average and Maximum 24-Hour Average PM10 Concentration

3.0 OZONE SIMULATIONS

Air quality modeling simulations were conducted to further examine the ozone impact to Santa Clarita. The modeling analyses were conducted to answer specific questions including:

- What is the subregional gradient of ozone in the Santa Clarita Valley?
- What is Santa Clarita's contribution to local smog formation?
- What is the "weekday effect" and how does it impact Santa Clarita?

3.1 Base and Future Year Simulations

The simulations were conducted for the 2003 AQMP modeling domain, using the SCOS97 meteorological episodes. The SCOS97 meteorological episode includes four days exhibiting increasing degrees of transport to the valley. August 4, 1997, the first day in the episode, was classified as a weak transport day, which occurs approximately 20 percent of the time. August 5, 1997, was classified as a local day, with little or minor transport into Santa Clarita. The local day occurs roughly 6 percent of the year. The final two days of the meteorological episode August 6, 1997, and August 7, 1997, were characteristic of the typical transport pattern which is observed on approximately 66 percent of all days.

Simulations were conducted for the full 2003 AQMP modeling domain. Figure 3-1 presents the Santa Clarita Valley subset of the full modeling domain (grids 15,25 [east-west] through 22,30 [north-south]). The hatched area includes the grids comprising the city of Santa Clarita. Interstates 5 and 210 and State Route 14 are drawn on the figure to provide reference landmarks. Each grid is 5 square kilometers in size.

3.1.3 Local vs. Regional Emissions

Ozone concentrations were simulated for three modeling inventories representing the estimated reactive emissions in the environment. The emissions inventories were developed for 2002 to reflect the conditions observed when ozone concentrations began to increase in the valley; 2007, a milestone year when the Antelope Valley must attain the federal standard; and 2010, the year the South Coast Air Basin must attain the federal 1-hour ozone standard. The emissions inventories include daily tonnages of directly emitted carbon monoxide (CO), oxides of nitrogen (NOx), volatile organic compounds (VOC) and particulate matter as PM10. VOC and NOx are the primary precursors "building blocks" of ozone. As is depicted in Table 3-1, Santa Clarita is a relatively small contributor to the total emissions of the key pollutants in both Los Angeles county and the Basin as a whole. Across the board, the emissions are typically less than three percent of the county total and two percent of the Basin total.

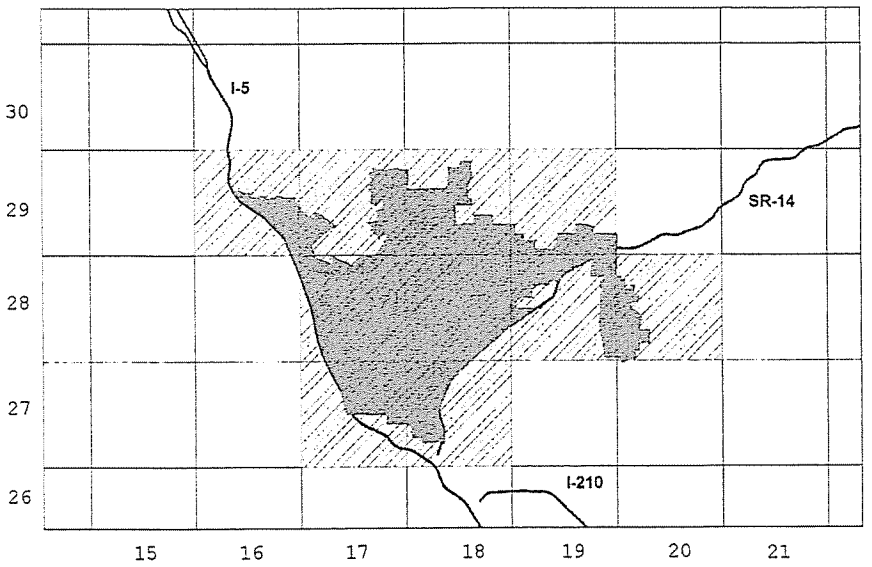


FIGURE 3-1

Santa Clarita Valley Portion of the 2003 AQMP Modeling Domain

TABLE 3-1

2002 Santa Clarita Emissions Profile

Emissions	CO	NOx	VOC	PM10
Santa Clarita (Tons Per Day)	63.9	19.3	11.2	3.4
Percentage of LA County	2.2	3.0	2.2	2.4
Percentage of Basin	1.4	1.8	1.4	1.2

3.1.2 2003 AQMP Ozone Model Simulations

The rate of progress towards achieving standard compliance is demonstrated in the 2003 AQMP ozone model simulations. Table 3-2 summarizes the results of the model simulations. In 2002, the highest observed 1-hour average ozone concentration at Santa Clarita reached 169 ppb. Model simulations for a day experiencing average transport but approximately the 95th percentile for ozone formation potential were projected to reach 146 ppb. While the weather conditions for the day simulated and the day having the observed peak are not exactly the same, the potential for ozone generation is roughly equivalent and the projection indicated that an ozone health advisory episode was likely to occur given the emissions present in the atmosphere in 2002. What is encouraging is that on weak or local transport days, Santa Clarita was simulated to attain the federal standard. Extending the analysis to 2007 predicts that Santa Clarita will marginally exceed the standard and by 2010 the city and valley will be in attainment.

TABLE 3-2

2003 AQMP Model-Predicted Santa Clarita Maximum 1-Hour Average Ozone Concentration (ppb)

Transport Regime	2002	2007	2010
Local	78	77	68
Weak	118	115	103
Average	146	135	109

3.2 Ozone Gradients

A closer grid-level examination of the model-simulated ozone concentrations for an average transport day using the 2002 emissions inventory is presented in Figure 3-2. Santa Clarita, like several communities in the Basin, experiences a gradient of ozone air pollution throughout the city. The northwestern portion of the city can be cleaner than the eastern and southeastern portions by as much as 50 ppb. While transport to Santa Clarita via the Santa Clara River valley is a factor, the bulk of the transport originates from the San Fernando Valley and the coastal plain of Los Angeles. The location of the old fire station monitoring site is in grid 17 [horizontal axis], 27 [vertical-axis]). The monitoring station relocation in 2001 shifted the analyzer location in the direction of the main pollution transport corridor and increasing ozone. Thus, on days when ozone concentrations measured at the fire station monitoring site were just below the federal standard (124 ppb) it is likely that the

projected concentration at the new location could be higher, causing the standard to be violated. Clearly, the move of the monitoring station and the equipment replacement has impacted the frequency of days reported exceeding the federal standard since 2001.

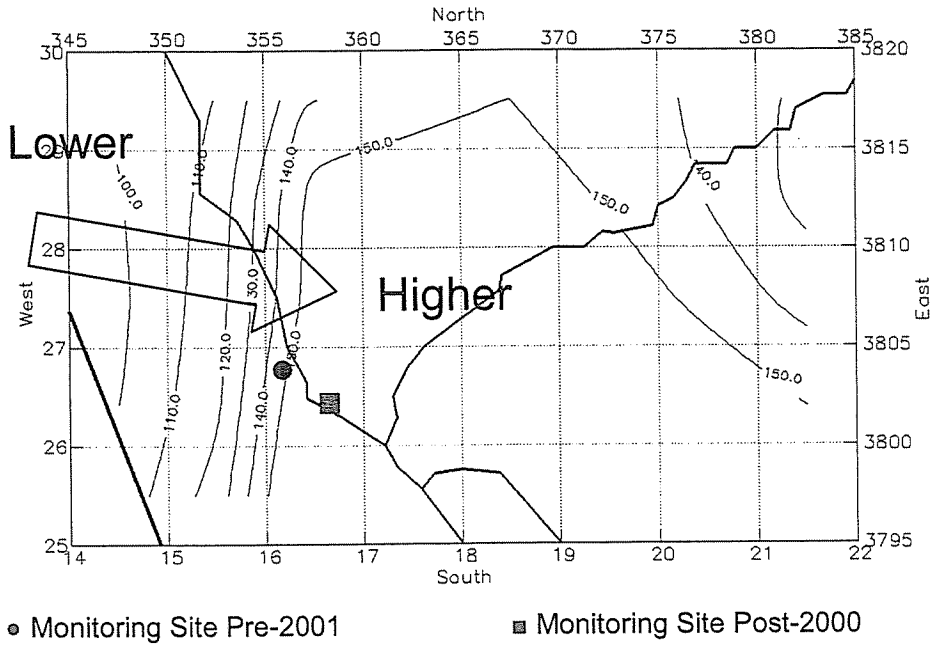


FIGURE 3-2

2002 Simulated Ozone (ppb) Gradient in Santa Clarita Valley for the Average Transport Regime

3.3 Santa Clarita's Contribution to Observed Ozone

A principal question asked by residents and city officials of Santa Clarita was "what is our contribution to the ozone problem?" Table 3-3 summarizes a series of ozone sensitivity simulations where selected segments of the emissions were withdrawn from the analysis to assess the impact of different source regions to Santa Clarita's locally observed ozone. The first simulation withdrew all of the anthropogenic (man-made) emissions from Santa Clarita. A second simulation withdrew the emissions from upwind Santa Barbara and Ventura counties. An additional simulation doubled the Santa Clarita emissions to test the impact to the community.

In general, under average transport conditions, emissions from the Santa Clarita area do not contribute significantly to ozone formation in the city. In fact, the emissions of oxides of nitrogen act to scavenge some of the ozone that is transported to the area. (This is depicted by a negative value of the percentage contribution listed in Table 3-3). Under local and weak transport conditions, emissions from Santa Clarita

have a minor contribution to the observed ozone air quality profile. In contrast, the Ventura and Santa Barbara emissions, coupled contribute as much as 10 percent to the ozone problem under average transport conditions. Ozone transport and emissions from the San Fernando Valley and the Los Angeles coastal plain are responsible for the bulk of the observed ozone in Santa Clarita. Carryover, the process where yesterday's smog provides a platform for today's smog to develop, is also a factor.

TABLE 3-3

Percentage Emissions Contribution to Santa Clarita Ozone Air Quality

Transport Regime	Santa Clarita Emissions	Doubled Santa Clarita Emissions	Santa Barbara & Ventura Emissions	Carryover & Other Basin Emissions
Local	2.8	0.7	0.7	96.5
Weak	1.2	-0.2	6.0	92.8
Average	-2.9	-2.9	9.9	93.0

3.4 Weekend Effect

A final issue that was addressed through the ozone simulations was the "weekend effect" and its impact on Santa Clarita air quality. Ozone concentrations observed on weekend days are higher than that observed on weekdays. Figure 3-3 illustrates the day-of-week smog season average ozone concentrations for 1-hour and 8-hour averaging periods measured in Santa Clarita. Over the period 2001-2003, a disproportionate percentage of the days exceeding the standard occurred on weekend days (43 percent as opposed to the expected two days out of seven or 28 percent). In general, the weekend effect reflects the change in emissions levels and emissions sources that occur from weekdays (Monday-Thursday) and Friday, Saturday and Sunday. The primary cause of the weekend effect has been postulated in several analyses as the change in motor vehicle emissions patterns both in space and time as the weekend progresses. In general the postulation is as follows: Extended commuting on Friday night coupled with a later start to the morning commute on both Saturday and Sunday gives rise to a more reactive pollution cloud; the reactive pollutant cloud generates ozone concentrations earlier in the day, reaching peak concentrations at a faster pace. In addition, the weekend effect is most notable nearby the emissions source areas.

Three scenarios were simulated to test the impact of the weekend effect on transport of ozone to Santa Clarita. First, the August SCOS97 ozone meteorological episode was simulated assuming the August 4 through 7, 1997, episode took place on a Friday through Monday rather than a Monday through Thursday as it was observed. For this simulation, August 5 was assigned the Saturday emissions profile and August 6 the Sunday emissions profile. The analysis was repeated moving the start date (August 4) to a Thursday, placing August 6 as the Saturday and August 7 as Sunday. A third simulation was conducted placing August 4 on a Wednesday so that the August 7 was treated as a Saturday.

The reasoning for this rotation was to test the weekend effect when the Friday emissions were placed in different meteorological scenarios. In the first simulation, the Friday meteorology was classified as a weak transport day. The second simulation placed Friday as a local transport day. For the third simulation the Friday was classified as an average transport scenario.

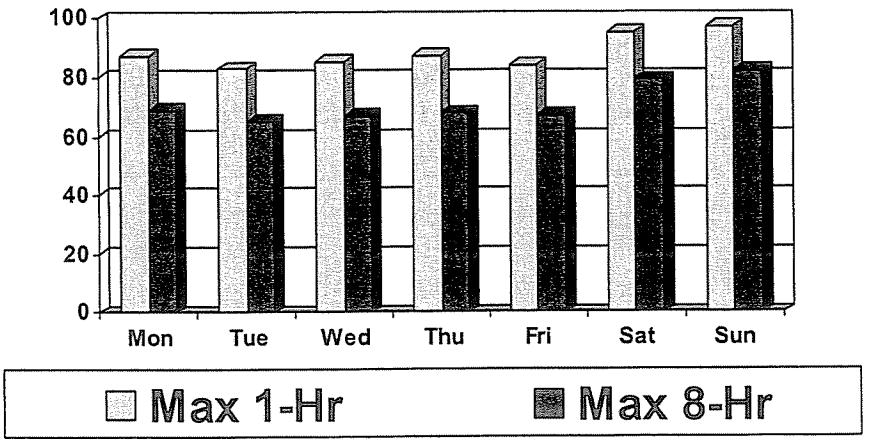


FIGURE 3-3

2001-2003 Average Santa Clarita Daily Maximum 1-Hour Average Ozone Concentration (ppb)

The results of the weekend simulations for the Santa Clarita modeling area are presented in Table 3-4. The analysis indicated that on weekend days experiencing average transport, ozone concentrations could increase by as much as 23 percent over weekdays. Under weak or local transport conditions, the weekend effect would be negated.

TABLE 3-4

Simulated Weekend Change in Ozone Concentration from Weekdays at Santa Clarita

Transport Regime	**Percentage Change in Ozone Concentrations**
Local	-6.5
Weak	-3.3
Average	+ 22.9

4.0 PARTICULATE SIMULATIONS: CURRENT IMPACTS

PM10 and PM2.5 are comprised of several components which are associated with a variety of sources. Sulfate, nitrate and organic particulate are mostly associated with urban smog that is transported to Santa Clarita and comprise the bulk of the fine particulate PM2.5 mass. Elemental carbon (including diesel soot) together with roadway and construction dust have local emissions source contributions as well as the urban signature. This is clearly observed in Santa Clarita where traffic generates re-entrained road dust and diesel soot and construction projects are widespread.

Air quality modeling simulations were conducted to examine the relative contributions of smog transport and local source emissions to the PM10 impact on Santa Clarita. The modeling analyses were conducted to answer specific questions including:

- What is Santa Clarita's contribution to local PM10 and PM2.5 levels?
- What will be the impact of valley growth on PM10 air quality?
- What will be the impact of the Cemex/TMC mining operations on PM10 air quality

4.1 PM10 Gradient

Figure 4-1 depicts the 2002 simulated annual average PM10 concentration for the Santa Clarita Valley. The peak particulate concentrations are well represented by the air monitoring site (grid 17,29) where the southern and central portions of the city experience the highest concentrations. The concentration drops significantly in the northern third and eastern portion of the city. The easternmost edge of the city is roughly 18 $\mu g/m^3$ cleaner than the central portion of the city. The highest PM10 concentrations occur nearby the traffic arteries where road dust is a major contributing factor. Localized hot-spots for particulate emissions are also observed and correspond to construction activities and mining in the valley. The valley, overall, is in compliance with the federal annual average PM10 standard.

4.2 Santa Clarita's Contribution to Observed PM10 and PM2.5

A series of annual air quality simulations was conducted to assess the local Santa Clarita emissions contribution to its observed PM10 air quality profile. The UAMAERO-LT regional particulate simulation model used in the 2003 AQMP annual PM10 modeling analyses was simulated for the 2002 modeling inventory (see Table 3-1) and the AQMP modeling domain. The Santa Clarita Valley subset of the 5 square kilometer modeling domain is evaluated for this portion of the analysis.

The UAMAERO-LT simulation model provides predictions of both PM10 and the PM2.5 fraction. While PM2.5 is not routinely measured in the Santa Clarita Valley, the model predictions are driven by the regional emissions and they afford a

perspective of the expected local impact. A first simulation removed all area source emissions from the city of Santa Clarita (but included the mobile source contribution). A second simulation doubled the mobile source emissions over the current level while leaving the area source emissions unchanged.

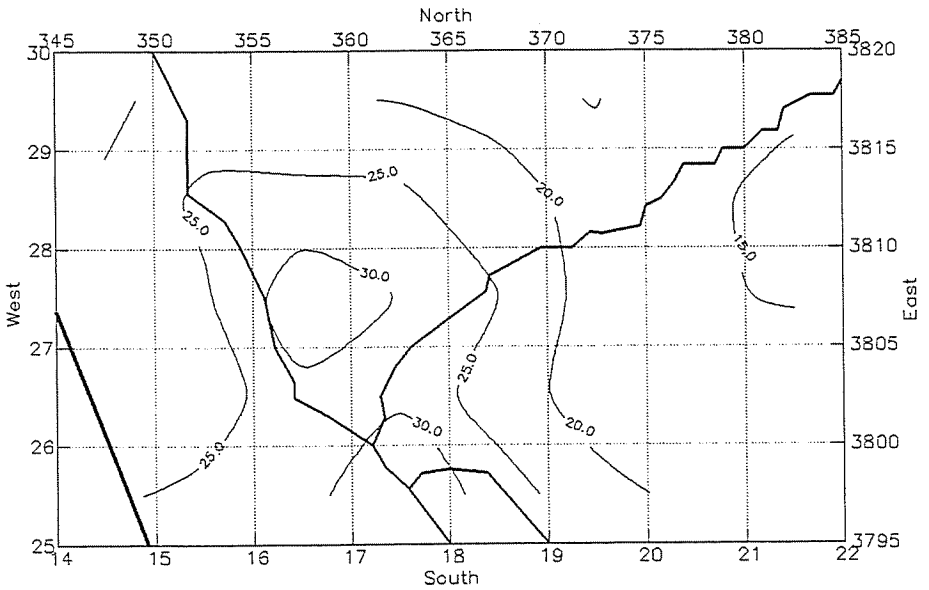


FIGURE 4-1

2002 Simulated Annual Average Santa Clarita PM10 (µg/m3)

While construction contributes to a portion of the mobile source emissions, its direct impact is in the area source category. By taking the area source emissions out of Santa Clarita, an estimate can be made of the impact of current (2002) construction to dust levels in the area. Doubling the mobile source emissions provides an estimate of the impact of growth on the community after the construction activities have stabilized. The impact of future construction emissions on Santa Clarita particulate air quality is addressed separately, and discussed in a later section of this document.

Table 4-1 summarizes the results of these sensitivity analyses. From the 2003 AQMP air quality simulations, PM2.5 accounts for roughly 57 percent of the PM10 total mass concentration in the city of Santa Clarita. When area source emissions were removed from the city of Santa Clarita, the PM10 concentrations were projected to decrease by an average of 10 percent. For the same emissions scenario, PM2.5 concentrations were predicted to decrease by approximately 7 percent. When mobile source emissions were doubled, only a nominal increase in PM10 and PM2.5 concentrations was predicted. What can be inferred from these analyses is that current construction activities are an identifiable contributor to particulate levels in the community; however, the overwhelming contribution is from upwind transport.

In addition, growth within the valley (excluding direct construction emissions or mining activities) will have a nominal impact on air quality.

TABLE 4-1

Annual Particulate Air Quality Simulation Sensitivity Analyses Summary:
Percentage Change in Concentration from 2002 Base Emissions

	No Area Sources	**Doubled Mobile Source Emissions**
PM10	-10 %	+1%
PM2.5	-7%	+2%

5.0 PARTICULATE SIMULATIONS: CONSTRUCTION AND DEVELOPMENT

A significant portion of the analysis was directed towards determining the impact of future construction on PM10 air quality in the Santa Clarita Valley. The AQMP 2006 and 2010 future year projections of air quality in the Santa Clarita Valley reflect the growth estimates provided by the Southern California Association of Governments (SCAG). Regardless, the Santa Clarita Valley is not expected to complete its build-out by 2010. City growth estimates expect place construction activities continuing over the next 25 to 30 years. Included in this estimate is the development of Newhall Ranch which will produce more than 21,000 homes before the project is completed. In the short term, mining activities from the Soledad Sand and Gravel Mining Project (Cemex/TMC) located to the east of the city are expected to commence mid-decade and expand operations at an accelerated rate thereafter. This will result in increased local particulate emissions.

Two sensitivity analyses were conducted to estimate the potential impacts of construction and mining to the air quality profile. These included simulating (1) the simultaneous build-out of all recorded, pending and approved land parcels in the valley over a 25-year period and (2) the phased development of the Cemex/TMC mining operations. The 25-year build-out of the valley was simulated to determine the additional annual impact on PM10 air quality that would be added to the current profile. It is noted that the simultaneous build-out of all parcels over the 25-year period is unlikely; however, this estimate places and upper bound on the estimated PM10 impact.

5.1 Emissions for the Twenty-five Year Build-Out

Residential construction growth and associated PM10 emissions were determined for each available land parcel by scaling development on an acreage basis to the profile of development determined for the Newhall Ranch project. PM10 emissions from multi-dwelling, commercial and industrial development were scaled on an acreage basis and then allocated based on required time estimated for building construction (e.g. a commercial dwelling requires 1 year to complete construction). Figure 5-1 depicts the distribution of parcel tracts in the study area with the modeling grid overlaid. CARB construction emissions factors were used to translate development into PM10 emissions. The phased and maximum allowable PM10 emissions for the Cemex/TMC mining operations were extracted from the project's Final Environmental Impact Statement (EIS) and the Consent Decree settlement document in the lawsuit Cemex v. County of Los Angeles (Case Number CV-02-747 DT).

Figure 5-2 depicts the daily PM10 emissions expected to result from the projected 25-year build-out of the Santa Clarita Valley overlaid on the modeling grid. The daily PM10 emissions total just over 3 tons per day in the Valley. As an example of the diversity of the development, Table 5-1 lists the tracts that contribute to the construction estimation and their status for development for grid 19,29. Fifteen tracts covering 1,567 acres of land in the 5 square kilometer grid are projected to contribute 337 lbs of PM10 emissions on a daily basis.

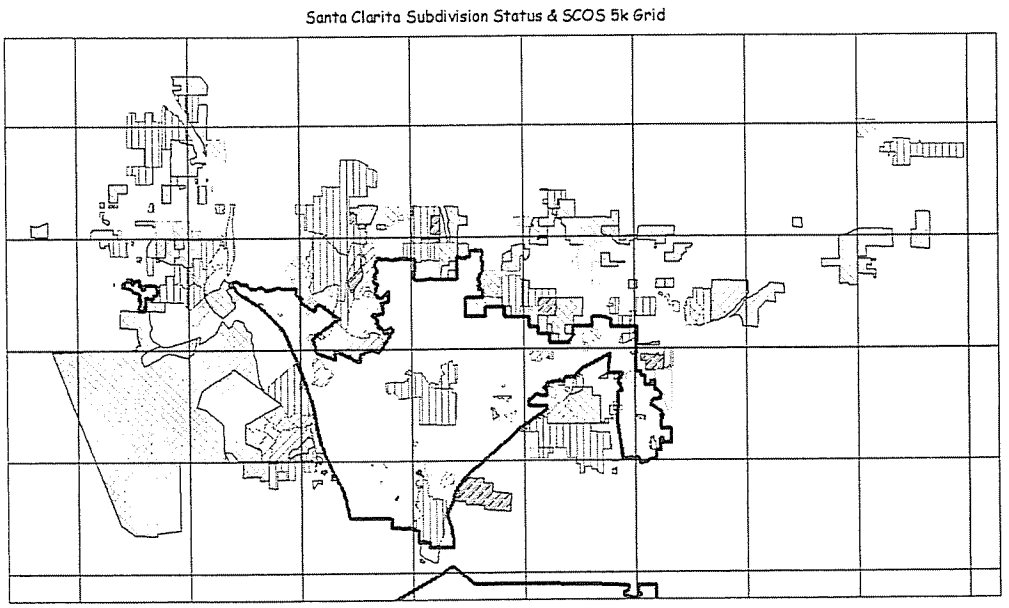


FIGURE 5-1

Santa Clarita Land Parcel Subdivisions

j \ i	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*
30	387	130	182	62	101	18	7	99
29	365	411	378	288	337	143	81	42
28	552	383	90	101	273	46	0	0
27	227	44	15	266	13	0	0	0
26	0	0	0	0	0	0	0	0

FIGURE 5-2

25-Year Build-Out Grid Level PM10 Emissions (lbs/day)
(Grid coordinates are listed as italics)

TABLE 5-1

Parcel Tracts Contributing PM10 Emissions in Grid 19,29 (Shaded in Figure 5-2)

TRACT	STATUS	ACRES
44967	RECORDED	338
45416	RECORDED	115
46353	APPROVED	65
46626	RECORDED	79
46716	APPROVED	30
49024	PENDING	37
49621	APPROVED	9
50467	PENDING	58
50846	PENDING	477
52194	PENDING	63
52355	APPROVED	33
52777	PENDING	79
52790	APPROVED	53
52990	PENDING	79
53074	APPROVED	52

5.2 PM10 Emissions from the Cemex/TMC Mining Site

As previously stated, PM10 emissions from the Cemex/TMC mining site reflect the projected routine operation and maximum allowable levels of production for two scheduled, phase-in periods. The emissions for the mining site (located in grid 21,29) were extracted from the Final EIS for the project. For all scenarios, the mining site was assumed to operate on a Monday through Friday schedule for 16 hours a day. Figure 5-3 depicts the topography of the Cemex/TMC mining site in reference to the surrounding area.

Mining operations were projected to occur in two phases: Phase I, years 1-10; and Phase II, years 11-20. The PM10 emissions for Phase I were estimated at 445 lbs/day. Phase II emissions were estimated at 641 lbs/day. As part of the Concent Decree settlement document, a maximum allowable PM10 emissions rate of 761 lbs/day was included in the finer scaled PM10 analysis. This rate reflected a maximum allowable production rate of five million tons of excavation per year. All mining emissions were allocated to grid 21,29 for the analysis.

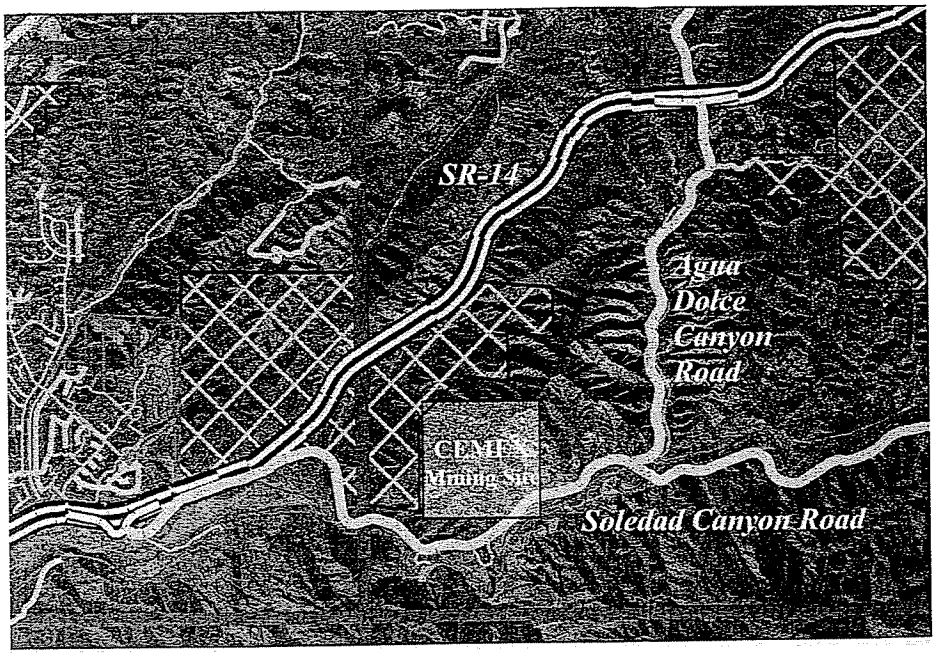


FIGURE 5-3

Cemex/TMC Mining Site in Soledad Canyon

5.3 Projected Future Year Impacts from Sensitivity Analyses

The projected PM10 impacts from the 25-year build-out and the two phases of mining operations were simulated to determine the upper bounds of additional PM10 that would be expected to impact the Santa Clarita Valley in the near term (1-10 years) and long term (10-20 years). The additional PM10 impacts from the 25-year build-out and the Phase I mining operation are presented in Figure 5-4. A maximum increase in annual PM10 concentration of 5 $\mu g/m^3$ is projected from the 25-year build-out. The predicted impact of the Cemex/TMC mining operation is approximately 2 $\mu g/m^3$, focused on the immediate area surrounding the mine. When the mining operation shift to Phase II, the impact will increase to 3 $\mu g/m^3$; however, there will be no net change in the impact caused by the 25-year build-out.

Figure 5-5 combines the projected 25-year annual build-out and Phase I mining operations PM10 impacts with the observed 2002 concentrations. Figure 5-6 repeats this process for the annual 25-year build-out impact and Phase II mining operations and the 2006 AQMP projected PM10 air quality. (While 2006 is within the Phase I time frame, future year modeling beyond 2006 shows little change in the spatial distribution and concentration levels in the Santa Clarita portion of the modeling domain; as a consequence 2006 is representative of the Phase-II projected PM10 baseline). As depicted, the federal PM10 standard would not be exceeded with the proposed build-out or development of the mining site in either the near-term or long-term analysis. PM10 air quality would exceed the more protective California standard in both scenarios.

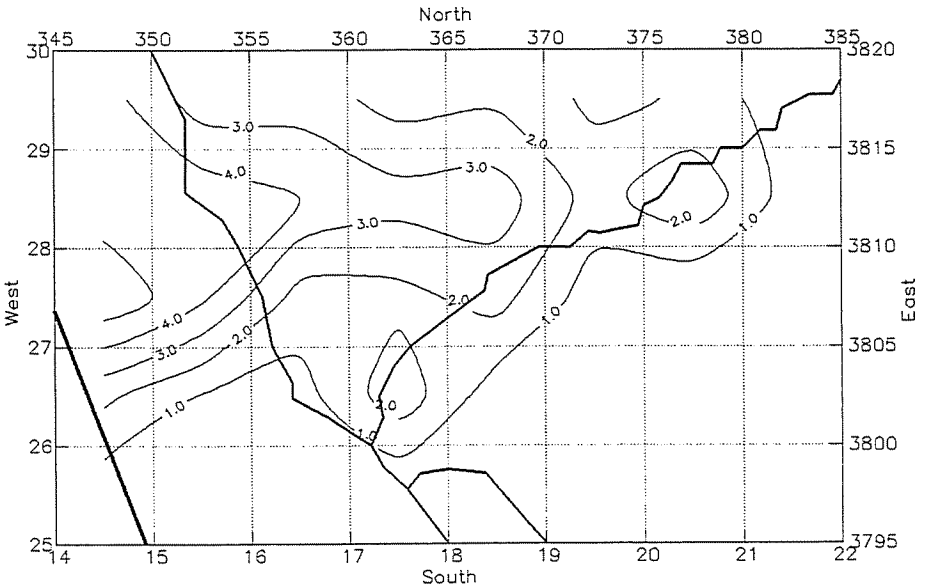


FIGURE 5-4

Simulated Annual PM10 Impact ($\mu g/m^3$): 25-Year Build-Out & Phase I Mining

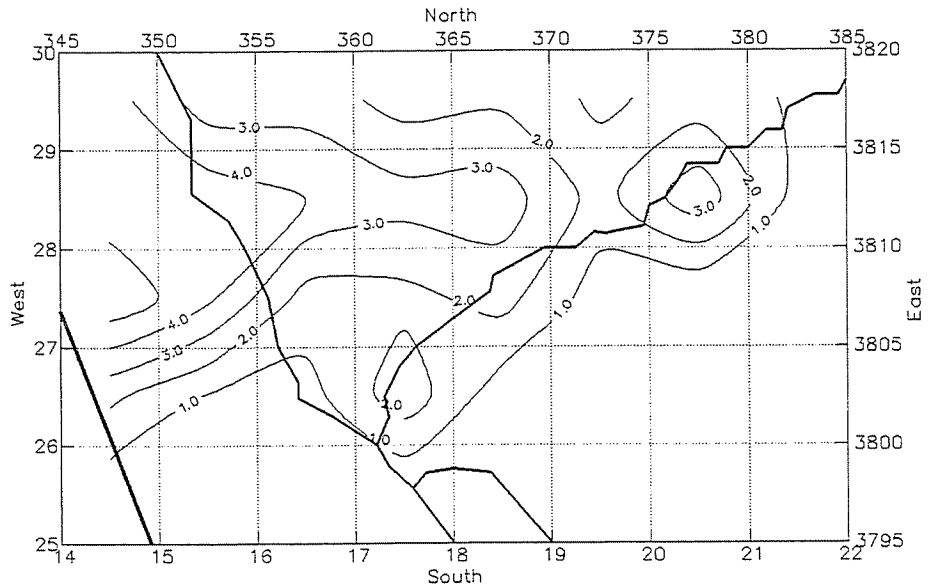


FIGURE 5-5

Simulated Annual PM10 Impact ($\mu g/m^3$): 25-Year Build-Out & Phase II Mining

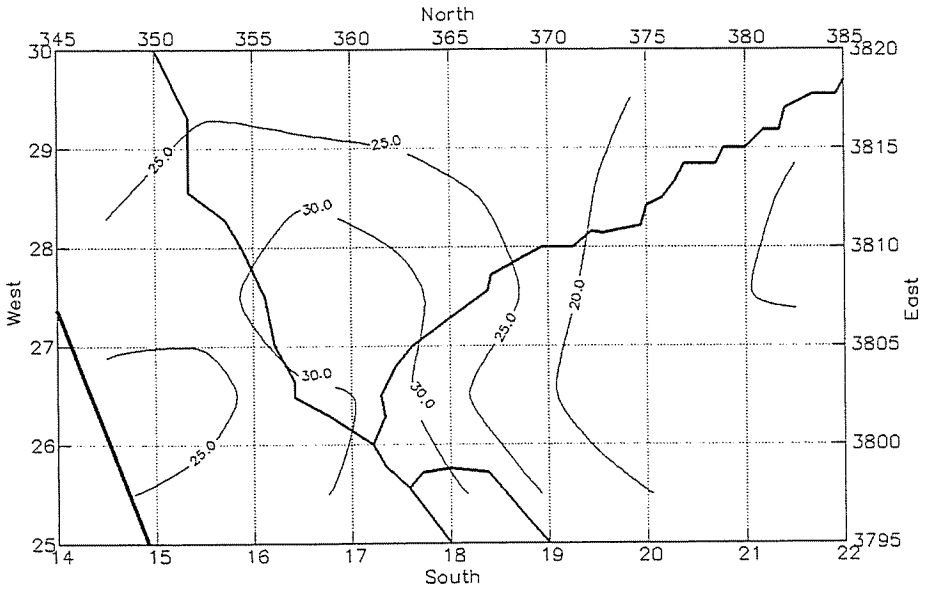


FIGURE 5-6

Simulated 2002 Annual PM10 ($\mu g/m^3$) With Build-Out and Phase I Cemex/TMC Mining

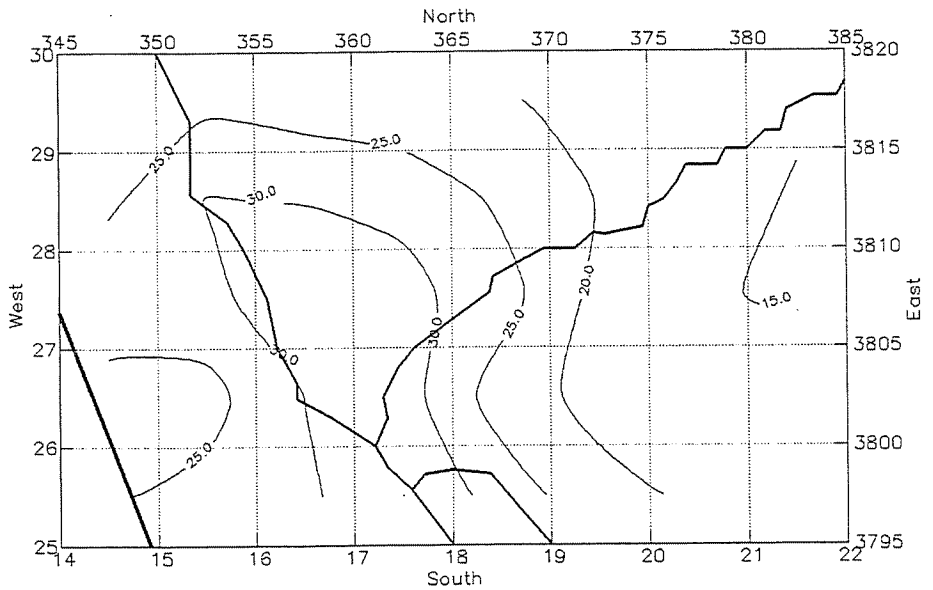


FIGURE 5-7

Simulated 2006 Annual PM10 ($\mu g/m^3$) With Build-Out and Phase II Cemex/TMC Mining

5.4 Simulating Cemex/TMC Emissions at a Finer Scale of Resolution

The preceding PM10 simulations provided the regional impacts due to growth and development of the Cemex/TMC mining site. However, the 5 square kilometer grid resolution does not lend itself to determining the local impacts from the mine operations to nearby sensitive receptors of PM10. A second sensitivity modeling simulation analysis was conducted to determine the finer scale gradient of projected PM10 impact. This analysis used the U.S. EPA ISCST3 point source model to simulate mining operations and determine the offsite impacts at a grid resolution of 500 meters. Annual average PM10 concentrations were calculated for each grid intersection or "flag pole" emanating from the mine boundary at 500 m intervals out to 5 km.

Figure 5-8 depicts the mining site with the 500 m and 5 km grid overlaid. The closest residential dwelling is located approximately 500 m to the south of the mining site and the nearest sensitive receptor (school) is located approximately 4,500 m to the west of the mining site.

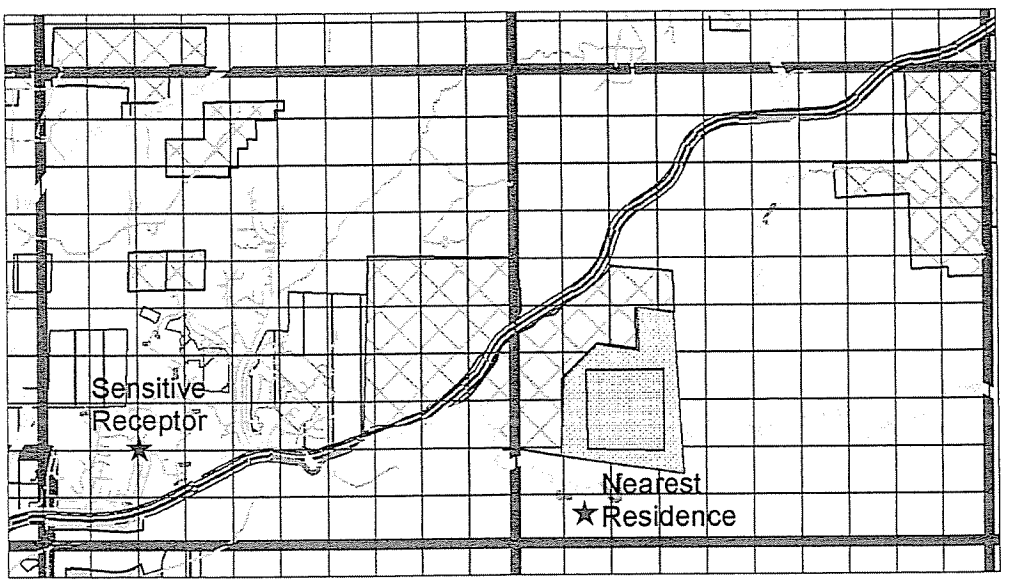


FIGURE 5-8

Cemex/TMC Mining Site With Flag Pole Grid

The simulation was conducted for a one-year period using both urban and rural meteorology developed for the mining site from the 1998-99 MATES-II meteorological modeling data. In general, simulations using a Gaussian model in the Basin are conducted using the urban meteorological assumption. Due to its unique

topography, the Santa Clarita Valley was simulated using both the urban and rural meteorological assumptions to bound the analysis.

Table 5-2 summarizes the results of the simulations. As expected, the modeling analysis using the rural meteorological option produced the highest impacts to the community with concentrations projected to reach approximately 18 $\mu g/m^3$ at the fence line. The maximum impacts to the nearest residence and nearest sensitive receptor (Phase II using the rural option) were calculated at 12.5 and 0.2 $\mu g/m^3$ respectively. When the flag pole concentrations were averaged over the 5 square km grid (21,29), the average impact was consistent with that simulated using the AQMP modeling platform. In all of the scenarios, including the rural maximum allowable case, the projected impact added tot he baseline PM10 would not result in a violation of the federal annual average standard.

TABLE 5-2

ISCST3 Simulated PM10 Impacts ($\mu g/m^3$) from Cemex/TMC Mining Site

Impacted Receptor	**Phase I**		**Phase II**		**Maximum Allowable**	
	Urban	Rural	Urban	Rural	Urban	Rural
5-Km^2 Grid Average	1.4	3.1	2.0	4.5	2.6	5.7
Fence Line	4.2	12.2	6.0	17.6	7.7	22.3
Nearest Residential	2.9	8.7	4.2	12.5	5.3	15.9
City Line - Canyon Country	0.3	0.7	0.4	1.0	0.5	1.3
Northeast Modeling Region	0.2	0.4	0.3	0.6	0.4	0.7
Nearest Sensitive Receptor	0.1	0.2	0.1	0.2	0.2	0.3

6.0 RISK FROM DIESEL PARTICULATES

The final phase of the analysis focused on the potential toxic impact or "risk" that could arise from the development of the Cemex/TMC mining site due to emissions of diesel particulate, both from in-situ operations and from gravel hauling offsite.

Risk is expressed as a probability of the development of excess cancer cases to the community based upon a lifetime (70 years) of exposure. The 1999 Multiple Air Toxics Exposure Study II (MATES II) analysis conducted for the South Coast Air Basin estimated that the Santa Clarita average community risk from all sources of toxic emissions was approximately 500 in million. (The basin-wide average estimated by MATES II exceeded 1,400 in one million). Exposure to diesel particulates was the major driver of risk to the community.

Diesel particulates have been shown to have a unit risk factor of 300 in one million for every 1.0 $\mu g/m^3$ of exposure. As a consequence, even comparatively small emissions can have a significant increased risk to the community. For comparison purposes, AB2588-Air Toxics "Hot Spots" Program notification and risk reduction levels are 10 and 25 in one million. Risk is presented in this analysis for both the urban and rural meteorological assumptions. In general, the SCAQMD uses the urban meteorological mode for hazardous risk assessments. Since the Santa Clarita Valley has a rural component, the simulations were conducted for the rural mode as well as the urban model. The assessment of risk using the two meteorological assumptions places an upper bound on the expected risk to the community.

6.1 In-Situ Mining Operations

Table 6-1 provides the Final EIS estimated annual diesel emissions rates for the various operations option and load considerations for the Cemex/TMC mine. Note: emissions for Phase II operations decrease compared with Phase I. This reflects the implementation of federal and California diesel control measures later in this decade. The diesel emissions were used to scale the ISCST3 predicted point source impacts to determine risk to the community neighboring the mining site. The results of the analysis are presented in Table 6-2.

TABLE 6-1

Diesel Particulate Emissions From Cemex/TMC Mine

Operation Option	**Annual Emissions Rate**
Phase I	1,528 lb/yr
Phase I Maximum Allowable	3,043 lb/yr
Phase II	1,431 lb/yr
Phase II Maximum Allowable	1,817 lb/yr

TABLE 6-2

ISCST3 Simulated Risk from Diesel Particulate from Cemex/TMC Mining
(Increased Probability of Excess Cancers Per Million People Exposed)

Impacted Receptor	Phase I				Phase II			
	Average Operations		Maximum Allowable		Average Operations		Maximum Allowable	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Fence Line	16	47	32	93	15	44	18	52
Nearest Residential	11	33	22	66	10	31	12	37
City Line - Canyon Country	1	3	2	6	1	2	1	3
Northeast Modeling Region	1	2	2	4	1	1	1	2
Nearest Sensitive Receptor	0	1	1	2	0	1	0	1

The maximum risk predicted by the model simulation occurs at the fence line of the mining site for the Phase I maximum allowable emissions scenario and the rural meteorology option. The maximum predicted risk to the nearest residence exceeds the 25 in one million criteria required for implementing risk reduction measures for the rural meteorology scenarios. However, when the impacts are estimated for the Santa Clarita city line and the nearest sensitive receptor (i.e. school), regardless of the emissions rate or meteorology, the risk falls below 10 in one million. Figure 6-1

depicts this tight gradient of impact for the rural meteorological mode, this time drawn over the two square kilometer grid used for the MATES II analysis. Impacts offsite quickly dissipate with distance from the Cemex/TMC Soledad Canyon facility.

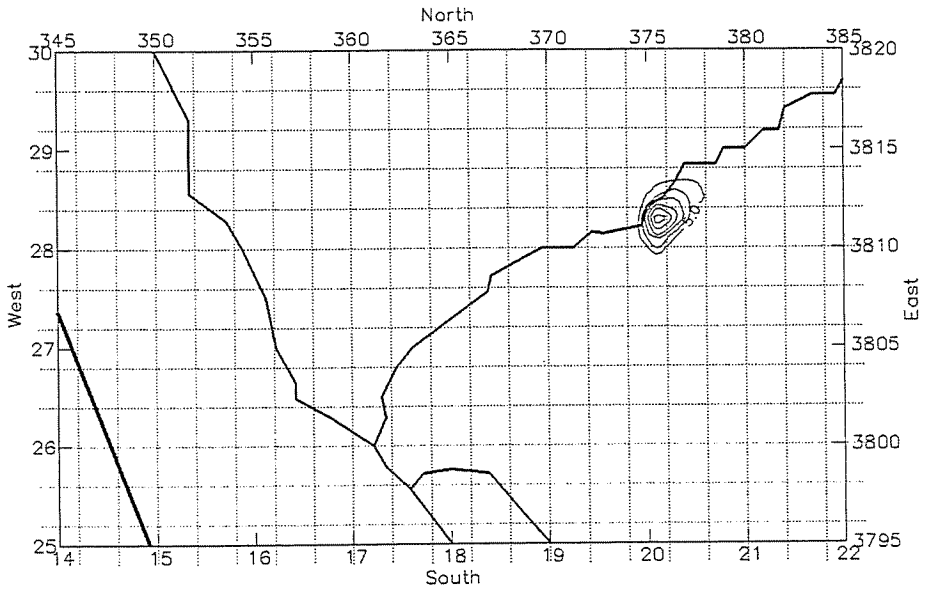


FIGURE 6-1

ISCST3 Phase I Simulated Diesel Risk From Cemex/TMC Mine Operations: Rural Mode
(Increased Probability of Excess Cancers Per Million People Exposed)

6.2 Gravel Hauling Operations

The simulation of risk due to diesel emissions was not limited to in-situ operations but extended beyond the mine due to gravel hauling through the Santa Clarita Valley to local end users and recipients in adjacent valleys. Based upon assumptions provided in the Final EIS, Phase I gravel hauling from the mine will result in 347 round trips by heavy-duty diesel trucks. Phase II will see an increase to 582 round trips. The truck hauling operations are expected to continue 24 hours a day with truck traveling at an average speed of 45 mph. Emission rates for heavy-duty diesels operating under these two travel scenarios (Phase I, 0.312 grams/mile; Phase II, 0.185) were extracted from the CARB EMFAC2002 emissions factor model.

Note again, the emissions rate for Phase II operations is lower than for Phase I reflecting the required introduction of cleaner vehicles and fuels. As a consequence, the daily emissions rate (truck trips multiplied by the appropriate diesel emissions factor) for Phase I and Phase II gravel hauling operations are essentially equal. Since

the difference between the estimated daily emissions rates is nominal, (Phase I being slightly higher), the projected Phase I risk from diesel truck hauling operations stands as a baseline for this analysis and is the only assessment presented.

If the option is exercised to expand gravel production to the maximum allowable rate provided in the Consent Decree, then hauling and the number of truck trips is expected to increase accordingly. Phase I projected risk due to diesel truck emissions under the maximum allowable production rate is estimated to increase by approximately 70 percent over the baseline while Phase II projected risk is estimated to increase by approximately 19 percent over the baseline.

The EIS provided some direct guidance on the direction of truck hauling with 95 percent of the transit moving west towards Santa Clarita and San Fernando Valleys and 5 percent routed east towards the Antelope Valley. However the truck routing through the Santa Clarita Valley was not explicitly provided. Based on estimates of population growth rates and estimates of future aggregate consumption (EIS Table 1.1-3), it was assumed that 54 percent of the westward-bound hauling would be earmarked for the San Fernando Valley traveling exclusively along SR 14. The remaining 46 percent of the westward-bound hauling would fill the needs of the Santa Clarita Valley and would be split between routes including SR 14 and Soledad Canyon Road. Gravel hauling was assumed to extend as far west as the Newhall Ranch development.

Meteorological data sets for four representative locations in the Santa Clarita Valley and the ISCST3 dispersion model were used to calculate diesel impacts to the Santa Clarita Valley for both urban and rural modes. The impacts were calculated for a one kilometer grid for each meteorological data set and the results were merged to provide a mapping of probable diesel impacts and risk to the Valley.

Figure 6-2 depicts the estimated baseline risk from truck hauling for the urban meteorological assumption. In isolated areas, risk exceeds 10 in one million with the maximum impact occurring along the SR 14 freeway. When the less dispersive rural meteorological assumption is used, the impacts increase along the SR 14 corridor and expand along Soledad Canyon Road. (See Figure 6-3). The highest estimated risk for both model simulations occurs near the SR 14 - Soledad Canyon Road separation with a maximum of 25 in one million for the rural meteorological option. In addition the maximum risk to a sensitive receptor occurs within one kilometer of the SR 14 freeway with values of 7 in one million for the urban meteorological mode and 20 in one million for the rural mode.

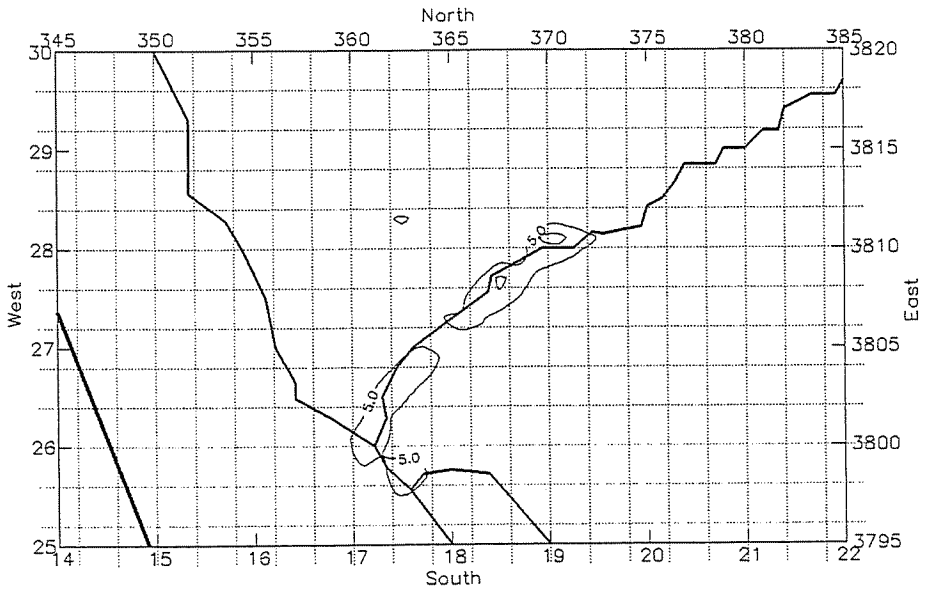


FIGURE 6-2

Simulated Baseline Diesel Risk from Cemex/TMC Gravel Hauling Operations: Urban Mode
(Increased Probability of Excess Cancers Per Million People Exposed)

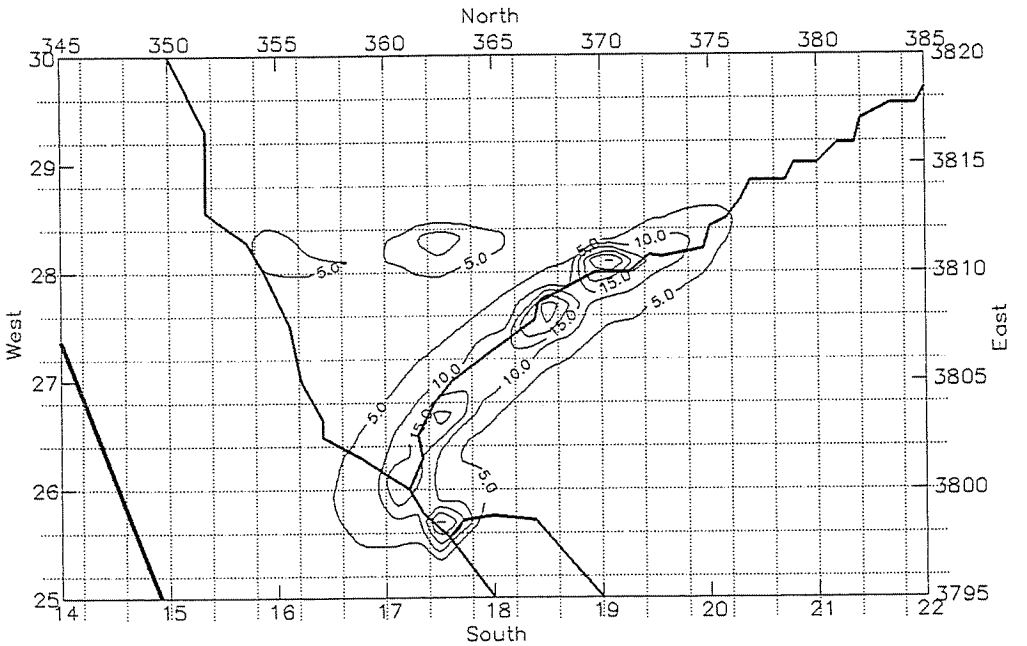


FIGURE 6-3

Simulated Baseline Diesel Risk From Cemex/TMC Gravel Hauling Operations: Rural Mode
(Increased Probability of Excess Cancers Per Million People Exposed)

6.3 Merged Diesel Risk: Mining and Gravel Hauling Operations

Figure 6-4 shows the simulated baseline risk when the mining and gravel hauling operations are merged (for the rural meteorological assumption). Because of the localized impact caused by the in-situ mining operations, there is very little overlapping risk caused by the hauling operations. As a consequence, the results of the risk assessment reported through the table and graphics in the two previous sections do not change significantly when the analyses are merged.

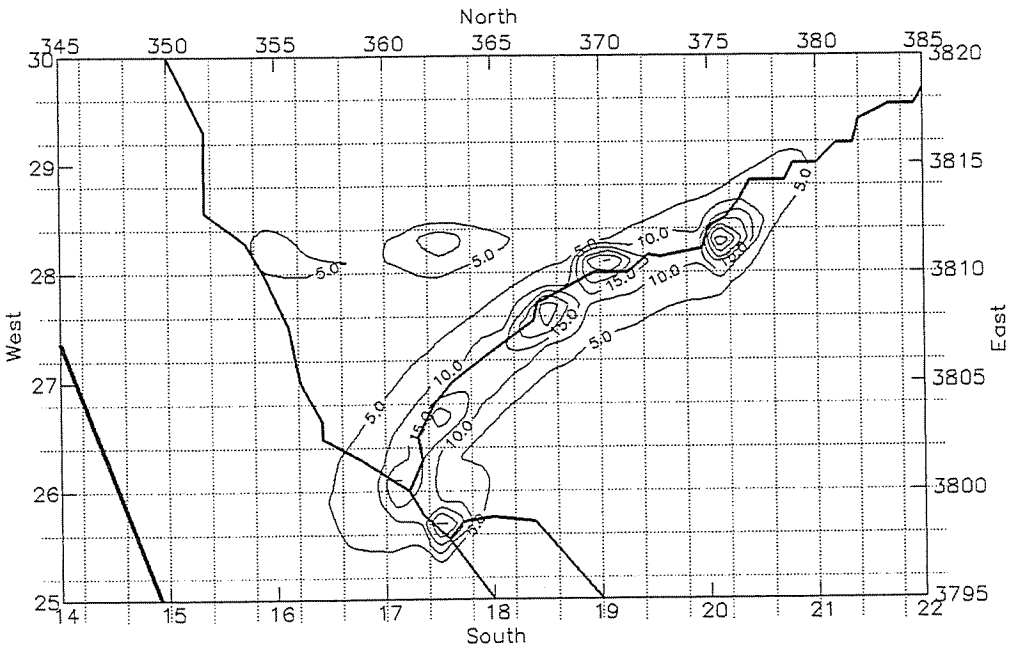


FIGURE 6-4

Merged Baseline Diesel Risk From Cemex/TMC Mining and
Gravel Hauling Operations: Rural Mode
(Increased Probability of Excess Cancers Per Million People Exposed)

7.0 POTENTIAL MITIGATION ACTIONS

The City of Santa Clarita is drafting an aggressive air quality element to its General Plan that will contain many potential mitigation measures to offset the air quality impacts associated with growth and regional transport of smog. The draft element includes measures that address traffic flow through the Valley, the use of alternatively fueled city vehicles and refueling stations, and rideshare programs, among others that address the city's commitment to reducing regional smog. Two bullet lists follow which provide potential additional mitigation measures that specifically address impacts from the issues of PM10 fugitive dust associated with growth and diesel mobile source emissions from the development of the Soledad Canyon mining site.

7.1 Potential Mitigation Measures for PM10 Fugitive Dust

Rule 403-Fugitive Dust provides a comprehensive list of dust control measures. Required control measures and recommended guidance measures that go beyond the requirements of Rule 403 can be implemented to mitigate fugitive dust emissions during construction and operation of aggregate handling facilities. For example, where Rule 403 identifies an option for implementing several control measures, mitigation measures can include several or all of the control measures and recommended guidance. In addition, mitigation measures can also include increasing the frequency of measures, such as watering, to go beyond the recommended guidance under Rule 403.

- Installation of monitoring devices around perimeter of site to collect samples during the construction and operation of the project to ensure that the PM10 levels do not exceed 50 $\mu g/m^3$ pursuant to requirements under Rule 403.
- Signs posted with a phone number for the public to report dust problems.
- Apply water three times daily, or non-toxic soil stabilizers according to manufacturers' specifications, to all unpaved parking or staging areas or unpaved road surfaces (compared to watering twice daily as the minimum required by Rule 403).
- Pave construction roads that have a traffic volume of more than 50 daily trips by construction equipment, 150 total daily trips for all vehicles (compared to watering twice daily as the minimum required by Rule 403).
- Pave all construction access roads at least 100 feet onto the site from the main road (for sites $\leq$ 5 acres or $\leq$ 100 cubic yards daily import/export of bulk material).

- Pave construction roads that have a daily traffic volume of more than 50 vehicular trips (compared to watering twice daily as the minimum required by Rule 403).

7.2 Potential Mitigation from Diesel Mobile Sources

- Use of aftertreatment control technologies such as diesel oxidation catalysts.
- Use of alternative diesel fuels such as emulsified diesel fuel.
- Provide a minimum buffer zone of 300 meters between truck traffic and/or and sensitive receptors.
- Re-route truck traffic by adding direct off-ramps for the truck traffic or by restricting truck traffic on certain sensitive routes.
- Improve traffic flow by signal synchronization.
- Enforce truck parking restrictions.
- Develop park-and-ride programs.
- Restrict truck engine idling.
- Restrict operation to "clean" trucks.
- Provide electrical hook-ups for trucks that need to cool their load.
- Electrify auxiliary power units.
- Provide onsite services to minimize truck traffic in or near residential areas, including, but not limited to, the following services: meal or cafeteria service, automated teller machines, etc.
- Require or provide incentives to use low-sulfur diesel fuel with particulate traps.
- Conduct air quality monitoring at sensitive receptors.