3.1.4 Water Quality

3.1.4.1 Affected Environment

The Project lies within the upper Santa Clara River Valley, which is located northwest of the City of Los Angeles in the Transverse Ranges of southern California. From its source on the north-facing slopes of the western San Gabriel Mountains, the Santa Clara River flows westward to the Pacific Ocean at the City of Ventura. Principal tributaries to the upper Santa Clara River are Castaic Creek, Bouquet Creek, and the South Fork of the Santa Clara River. These tributaries are all downstream of the Project site. Bear Creek, a smaller tributary to the upper Santa Clara River, discharges into the main channel slightly south of the Project site.

The Santa Clara River Valley has been divided into hydrologic units, subunits, and subareas delineated principally on the basis of topography and watershed divides. The primary hydrologic area (HA) in the vicinity of the Project site is the Upper Santa Clara River HA. Within the Upper Santa Clara River HA are five smaller subareas: Acton, Eastern, Bouquet, Mint Canyon, and Sierra Pelona (CRWQCB Los Angeles Region 1994). The most significant water-bearing formations are in the Eastern and Acton hydrologic subareas (HSA). The Project site lies within the Acton HSA. Subsurface waters of the Acton HSA move westward following the course of the Santa Clara River and merge with subsurface waters of the Eastern HSA at the community of Lang. Thus, the Project site lies near the boundary between the Acton and Eastern HSAs. Section 3.1.2 of this report provides further discussion of regional and site groundwater characteristics.

Regulatory Framework

The Clean Water Act (CWA) of 1972 (33 USC Section 1251 *et. seq.*) was passed to restore and maintain the chemical, physical, and biologial integrity of the Nation's waters. Specific sections of the Act control the discharge of pollutants and wastes into aquatic and marine environments.

Section 404 of the CWA establishes a program to regulate the discharge of dredge and fill material into navigable waters of the U.S. Under this provision, the U.S. Army Corps of Engineers (Corps) must issue permits for deposit of fill in waterways and wetland areas on both public and private lands. Other Federal agencies (e.g., USFWS and EPA) provide recommendations concerning whether permits should be issued and under what conditions.

Section 401 of the CWA requires certification that the permitted project complies with State Water Quality Standards for actions within State waters. A project must either be certified under Section 401 of the Federal Clean Water Act, or a waiver of certification must be obtained that water quality will not be affected. Projects often quality for the waiver with precautions designed into the project or with mitigation measures. Applications for certification or waiver are made to the Regional Water Quality Control Board.

On June 13, 1994, the CRWQCB adopted a Water Quality Control Plan for the Los Angeles Region that includes the Santa Clara River Basin. The Basin Plan contains water quality objectives for surface and groundwaters[1] and designates beneficial uses of the basin's water resources. This Basin Plan superseded the former version of the Basin Plan dated March 7, 1975 (CRWQCB 1975).

Existing beneficial uses of surface waters in the upper Santa Clara River are industrial service supply, industrial process supply, agricultural supply, groundwater recharge, freshwater replenishment of inland lakes and streams, warm freshwater habitat, wildlife habitat, preservation of rare and endangered species, contact water recreation, and noncontact water recreation. Existing beneficial uses of groundwater within the Acton HSA are municipal water supply, industrial service supply, industrial process supply, and agricultural supply. Water quality objectives set forth in the Basin Plan are meant to ensure the reasonable protection of beneficial uses and prevent nuisance. The discharge of waste into surface waters must not violate either the narrative water quality objectives for surface waters listed in Table 3.1.4-1 or the mineral quality objectives for surface and groundwaters in Tables 3.1.4-2 and 3.1.4-3. In all cases, the "nondegradation" policy in the Basin Plan requires that wherever the existing quality of groundwater is better than the quality of groundwater established in the Plan (as water quality objectives), the existing groundwater quality shall be maintained.

The mining Project will also be subject to the provisions of the statewide Water Quality Control Plan for Inland Surface Waters (Surface Waters Plan). The SWRCB adopted the Surface Waters Plan on April 11, 1991. Like the Basin Plan, the Surface Waters Plan contains narrative as well as numerical water quality objectives. The discharges of organic chemicals into municipal waters are presented in Table 3.1.4-4.

Surrounding Area

Surface Water Quality

Although surface water quality monitoring data for the upper part of the Santa Clara River Valley are limited, the water quality is generally considered good between Acton and Lang. Table 3.1.4-5 shows surface water data for samples collected from the Santa Clara River between the communities of Acton and Lang. The data represent samples collected from the river during different times of the year and under varying flow conditions. For example, the sample collected west of Acton is representative of dry weather flow from the uppermost reach of the Acton hydrographic subarea. The data from the Soledad Campground are the results of a 4-year (1978 to 1982) postflood measurement by the Angeles National Forest. The predominant ion is bicarbonate, and the total dissolved solids (TDS) are less than 550 milligrams per liter (mg/L). Trace metal content of waters from the upper Santa Clara River is low, with boron detected at low levels (<0.4 part per million [ppm]) (Bowers and Irwin 1978). Other

[1] For purposes of Section 3.1.4, the term "groundwater(s)" encompasses all subsurface water, regardless of its association with an established subsurface channel. For the legal definition of groundwater, which is pertinent to the issue of water rights, please refer to Section 3.1.2.

Table 3.1.4-1

WATER QUALITY OBJECTIVES FOR SURFACE WATERS OF SANTA CLARA RIVER BASIN

Parameter	Objective
Ammonia	Ammonia concentrations in receiving waters shall not exceed values listed in the Basin Plan (Tables 3-1 to 3-4, calculated for specific pH and temperature).
Bacteria	In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than four samples for any 30-day period shall not exceed a log mean of 200/100 mL, nor shall more than 10 percent of total samples during any 30-day period exceed 400/100 mL.
Bioaccumulation	Toxic pollutants shall not be present at levels that will bioaccumulate in aquatic life to levels that are harmful to aquatic life or human health.
Biostimulatory Substances	No biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.
BOD	No substances that result in increases in the biochemical oxygen demand that adversely affect beneficial uses.
Chemical Constituents	No concentrations of chemical constituents in amounts that adversely affect any designated beneficial use. Waters designated as Domestic and Municipal water supplies (MUN) are subject to provisions of CCR Title 22.
Chlorine	Chlorine residual shall not be present in surface water discharges at concentrations that exceed 1.0 mg/L or impair beneficial uses.
Color	No coloration that causes nuisance or adversely affects beneficial uses.
Exotic Vegetation	Exotic vegetation shall not be introduced around stream courses to the extent that such growth causes nuisance or adversely affects beneficial uses.
Floating Material	No floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.
Dissolved Oxygen	The mean annual dissolved oxygen concentration shall be greater than 7 mg/L, and no single determination shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations.
MBAS	No Methylene Blue Activated Substance concentrations greater than 0.5 mg/L in waters designated MUN.
Mineral Quality	Numerical mineral quality objectives for individual inland surface waters are shown in Table 3.1.4-2 of this EIR.
Nitrogen	Nitrogen levels shall not exceed 10 mg/L (nitrate-nitrogen plus nitrite-nitrogen), 45 mg/L (as nitrate), 10 mg/L (as nitrate-nitrogen), or 1 mg/L (as nitrite-nitrogen).
Oil and Grease	No 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, cause nuisance, or otherwise adversely affect beneficial uses.
PCBs	The purposeful discharge of PCBs to waters of the Region, or at locations where the waste can subsequently reach waters of the Region, is prohibited.
Pesticides	Waters designated as MUN shall not contain concentrations of pesticides in excess of the limiting concentrations contained in CCR Title 22 (see Table 3.1.4-4 of the EIR).

Table 3.1.4-1
(Continued)

WATER QUALITY OBJECTIVES FOR SURFACE WATERS OF SANTA CLARA RIVER BASIN

Parameter	Objective
pH	Not less than 6.5 or more than 8.5. No changes in normal ambient pH levels to exceed 0.5 unit as a result of waste discharge.
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
Suspended Material	No suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Settleable Material	No settleable material that causes nuisance or adversely affects beneficial uses.
Tastes and Odors	No 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.
Temperature	The natural receiving water temperature of all regional waters shall not be altered unless it can be demonstrated to the satisfaction of the RWQCB that such alteration in temperature does not adversely affect beneficial uses.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses on human, plant, or aquatic life.
Turbidity	No increases in turbidity that cause nuisance or adversely affect beneficial uses. Where natural turbidity is between 0 and 50 natural turbidity units (NTU), and greater than 50 NTU, increases shall not exceed 20% and 10% respectively.
Source: Summarized from Water Quality Control Plan, Los Angeles Region (CRWQCB 1994).	

Table 3.1.4-2

MINERAL QUALITY OBJECTIVES FOR SURFACE WATERS OF ACTON AND EASTERN HSAs OF UPPER SANTA CLARA RIVER

Hydrologic Subarea	Objective (mg/L)					
	TDS	Sulfate	Chloride	Boron	Nitrogen	SAR
Acton	500	100	50	0.5	5	5
Eastern (Lang to Bouquet Canyon and West Pier of the old road)	800	150	100	1.0	5	5
Eastern (Reach bounded by Bouquet Canyon Road and Los Angeles-Ventura County Line)	1,000	300-400	100	1.5	5	10

TDS = total dissolved solids
SAR = sodium adsorption ratio; ratio of sodium to calcium and magnesium. Development of excess sodium in soils will result from irrigation water that has a high SAR (18 or above). A low SAR value for surface waters (2 to 10) indicates little damage from sodium.
Source: CRWQCB 1994

Table 3.1.4-3

MINERAL QUALITY OBJECTIVES FOR GROUNDWATERS OF UPPER SANTA CLARA RIVER

Basin	Objective (mg/L)					
	TDS	Sulfate	Chloride	Boron	Nitrogen	SAR
Acton Valley	550	150	100	1.0	10	NO
Eastern (Santa Clara Mint)	800	150	150	1.0	10	NO
Eastern (Above Castaic Creek to Bouquet Canyon)	700	250	100	1.0	10	NO

TDS = total dissolved solids
NO = No objective
Source: CRWQCB 1994

Table 3.1.4-4
THE MAXIMUM CONTAMINANT LEVELS: ORGANIC CHEMICALS (FOR MUNICIPAL BENEFICIAL USE) SPECIFIED IN TABLE 64444-A OF SECTION 64444 OF TITLE 22 OF THE CALIFORNIA CODE OF REGULATIONS AS OF 9-8-94

Constituent	Maximum Contaminant Level (mg/L)	Constituent	Maximum Contaminant Level (mg/L)
A. Volatile Organic Chemicals (VOCs)		Benzo(a)pyrene	0.0002
Benzene	0.001	Carbofuran	0.018
Carbon Tetrachloride	0.0005	Chlordane	0.0001
1,2-Dichlorobenzene	0.6	2,4-D	0.07
1,4-Dichlorobenzene	0.005	Dalapon	0.2
1,1-Dichloroethane	0.005	1,2-Dibromo-3-chloropropane	0.0002
1,2-Dichloroethane	0.0005	Di(2-ethylhexyl)adipate	0.4
1,1-Dichloroethylene	0.006	Di(2-ethylhexyl)phthalate	0.004
cis-1,2-Dichloroethylene	0.006	Dinoseb	0.007
trans-1,2-Dichloroethylene	0.01	Diquat	0.02
Dichloromethane	0.005	Endothall	0.1
1,2-Dichloropropane	0.005	Endrin	0.002
1,3-Dichloropropene	0.0005	Ethylene Dibromide	0.00005
Ethylbenzene	0.7	Glyphosate	0.7
Monochlorobenzene	0.07	Heptachlor	0.00001
Styrene	0.1	Heptachlor Epoxide	0.00001
1,1,2,2-Tetrachlorethane	0.001	Hexachlorobenzene	0.001
Tetrachloroethylene	0.005	Hexachlorocyclopentadiene	0.05
Toluene	0.15	Lindane	0.0002
1,2,4-Trichlorobenzene	0.07	Methoxychlor	0.04
1,1,1-Trichloroethane	0.200	Molinate	0.02
1,1,2-Trichloroethane	0.005	Oxarnyl	0.2
Trichloroethylene	0.005	Pentachlorophenol	0.001
Trichlorofluoromethane	0.15	Picloram	0.5
1,12-Trichloro-1,2,2-Trifluoroethane	1.2	Polychlorinated Biphenyls	0.0005
Vinyl Chloride	0.0005	Simazine	0.004
Xylenes (single isomer or sum of isomers)	1.750	Thiobencarb	0.07
B. Nonvolatile Synthetic Organic Chemcials (SOCs)		Toxaphene	0.003
Alachlor	0.002	2,37,8-TCDD (Dioxin)	$3X10^{-8}$
Atrazine	0.003	2,4,5-TP (Silvex)	0.05
Bentazon	0.018	---	---
Source: CRWQCB 1994			

Table 3.1.4-5

SURFACE WATER QUALITY - UPPER SANTA CLARA RIVER

Constituent	Santa Clara River at SPRR Bridge West of Acton - Low Flow[1] (1971)	Santa Clara River at Soledad Campground[2] (1978-1982)	Santa Clara River Above RR Station Near Lang (1974-1976)[3, 4]
Cations, mg/L			
Calcium (Ca)	57	65.3*	77-82
Magnesium (Mg)	27	16.6*	21-24
Sodium (Na)	55	48.0*	49-59
Potassium (K)	2	2.3*	2.4-3.8
Ammonium (NH_4)	0.2	--	0-5.6
Anions, mg/L			
Carbonate (CO_3)	0	10.2*	--
Bicarbonate (HCO_3)	266	233*	293-311
Sulfate (SO_4)	99	74.5	78-100
Chloride (Cl)	43	31	33-45
Nitrate (NO_3)	0	3.6	3.5-3.8
Fluoride (F)	--	0.3*	--
Phosphate (PO_3)	0.5	0.3	--
Other Constituents			
TDS, mg/L	550	--	424-503
Total hardness, mg/L as Ca CO_3	254	239	270-300
Dissolved oxygen, mg/L	--	7.3	--
Specific Conductance			
EC (micromhos)	665	587*	680-820
pH	8.0	8.0	--

1 From CRWQCB (1975) (Data not updated in the 1994 Basin Plan)
2 From Rish (1982); table values are 4-year averages except where noted
3 From Winzler and Kelly 1977
4 From Bowers and Irwin 1978
* 1982 data only

data compiled by the California Department of Water Resources contained in the 1975 Basin Plan show that the average TDS concentration in the surface water leaving the Acton subarea was approximately 394 mg/L, with rising water outflow ranging from 600 to 700 mg/L and stormflows on the order of 200 mg/L (CRWQCB 1975).

The surface water quality in the streams tributary to the Santa Clara River is generally good. For streams tributary to the river above its confluence with the South Fork, the TDS ranges between 200 and 800 mg/L, and bicarbonate concentrations range between 100 and 400 mg/L (CRWQCB 1975).

Subsurface Water Quality

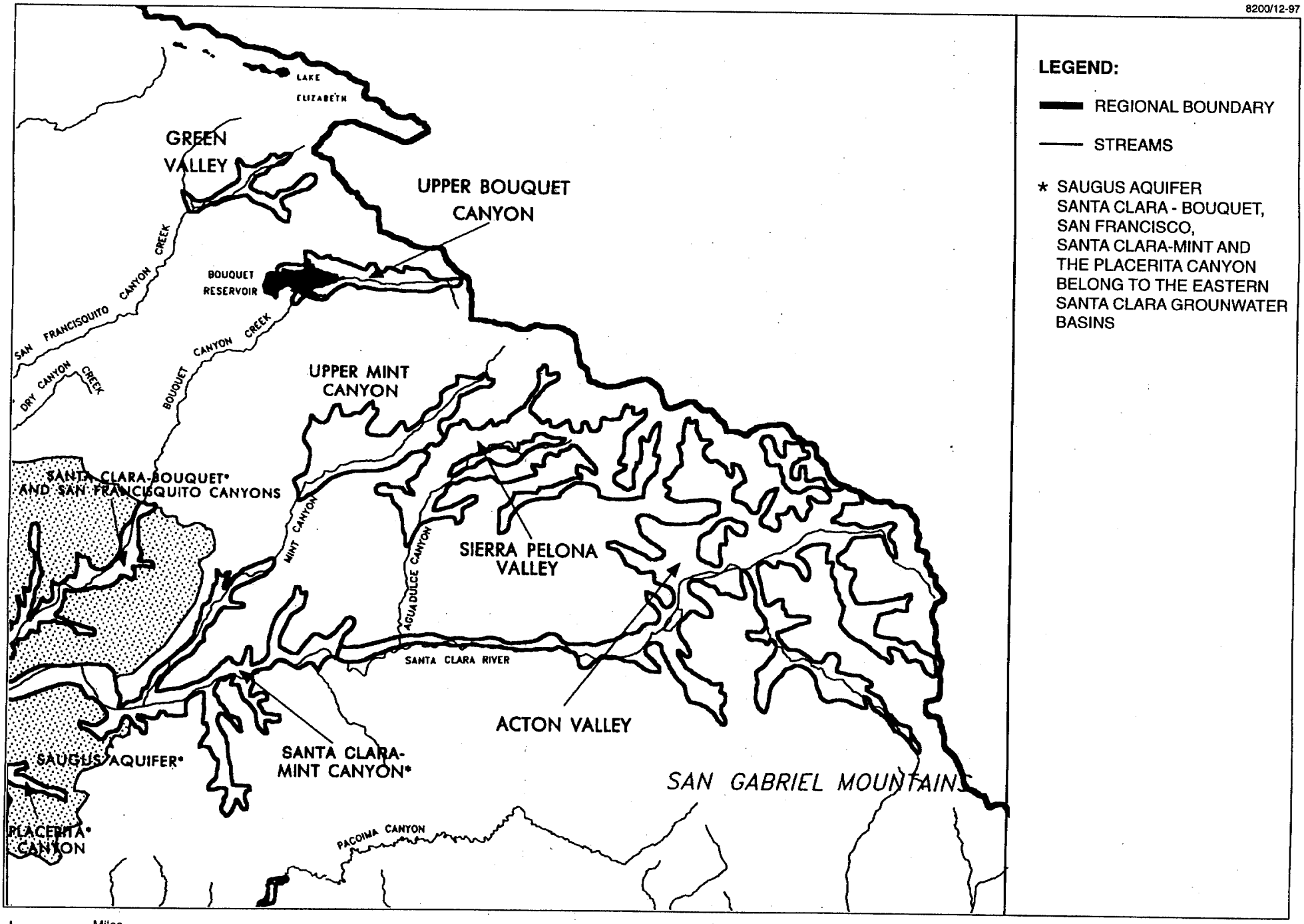
The following description of regional subsurface water quality conditions and flow patterns near the Project is derived from the discussion of groundwater hydrology in the Basin Plan (CRWQCB 1975 and 1994).

As previously stated, the subject Project site is located within the Acton HSA, which is an administrative subarea of the Santa Clara Calleguas Hydrologic Unit. The Acton HSA is located farthest upstream in the upper Santa Clara River system, east of the Eastern HSA (Figure 3.1.4-1). The water-bearing sediments within the Acton HSA are (1) Recent alluvium, consisting of coarse sand, gravel, and boulders; and (2) terrace deposits located above the existing riverbed. The thickness of the permeable sediments in the Recent alluvium is estimated to be 100 feet. The groundwater in this HSA is unconfined and flows into the Eastern HSA near Lang. In the past, it was thought that there was minimal subsurface flow from the Acton HSA into the Eastern HSA due to a bedrock constriction at the entrance to the Eastern HSA (CRWQCB 1975). However, a seismic investigation to evaluate water resources in the vicinity of the TMC Project (GWSI 1993) indicates that the alluvium near the contact of the two basins is as much as 80 feet thick; thus, there is a significantly higher subsurface outflow than was previously thought to exist.

Subsurface waters in the Acton HSA are replenished by percolation of precipitation and runoff. The recent alluvium of Santa Clara River is considered to be very permeable and is quickly recharged by surface runoff. Thus, the subsurface water quality directly reflects the quality of surface runoff water.

The quality of subsurface water in the Acton HSA is high; it is suitable for domestic use and irrigation of most crops. Although well monitoring within the Acton HSA was initiated only in 1950, the quality has been stable since that time. A summary of known analyses of well water quality conducted by various public agencies is presented in Table 3.1.4-6. A survey of the Acton HSA by the County Flood Control District in the early 1970s reached the following conclusions:

- TDS concentrations progressively increase as groundwater moves downstream from Acton (about 270 mg/L) to River's End (about 600 mg/L), located at the mouth of Soledad Canyon.



Miles
0 4
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Source: California Regional Water Quality Control Board, Los Angeles Region

GROUNDWATER BASIN LOCATIONS
Figure 3.1.4-1

Table 3.1.4-6

GENERAL MINERAL ANALYSES OF SUBSURFACE WATER SAMPLES FROM ACTON BASIN

State Well Number	Date of Analysis	SO_4 (mg/L)	Cl (mg/L)	NO_3 (mg/L)	B (mg/L)	F (mg/L)	TDS (mg/L)	TH (mg/L)	pH
5N/13W-25CO1	11/21/69	144	88	28.0	0.36	0.6	509	304	--
5N/12W-28F01	03/16/72	62	124	40.4	--	--	566	302	--
5N/12W-31H02	04/21/71	70	27	20.8	--	--	365	258	--
4N/13W-12C04	11/21/69	71	30	22.5	0.18	0.4	372	224	--
4N/13W-10Q01	11/21/69	83	36	8.7	0.15	0.4	385	236	--
5N/14W-34B01	11/21/69	120	62	16.0	0.27	0.8	530	341	--
4N/13W-08P	04/20/89	71	35	1.0	ND	0.3	406	224	8.0
4N/13W-11H	04/20/89	49	30	10.0	ND	0.4	340	208	7.8
4N/13W-11N	04/20/89	55	28	9.0	ND	0.5	328	200	8.0
4N/13W-13P	04/18/89	39	10	2.0	ND	0.1	329	200	7.8
4N/13W-14P	04/18/89	66	23	16.0	ND	0.3	437	288	8.0
4N/14W-11P	04/18/89	76	39	0.0	0.10	0.4	451	278	7.8

Source: CRWQCB 1989

Note: TDS = total dissolved solids
TH = total hardness

- Substantial reduction in TDS occurs after the storm season, amounting to approximately 100 mg/L, which appears to reflect a relatively small aquifer zone combined with the recharge of good quality flood waters.

- The groundwater levels can be expected to be at or near the surface during stormflows. Therefore, the river alluvium has little capacity for further recharge immediately after heavy rains (CRWQCB 1975).

As shown on Figure 3.1.4-1, the Eastern HSA is situated at the outlet of the Acton HSA near Lang Station. The water-bearing deposits in the reach between Lang and downstream to Saugus are principally found along the main stem of the Santa Clara River and its tributary canyons. The river channel recent alluvium ranges in thickness from a few feet to about 200 feet near Saugus.

Summaries of known well water quality analyses conducted by various public agencies for the Eastern Basin are presented in Tables 3.1.4-7 and 3.1.4-8. The groundwater quality of the Eastern Basin is suitable for domestic use and irrigation of most crops. The concentrations of mineral constituents in the groundwater generally increase westward along the basin (Slade 1986). Concentrations of chlorides and nitrates are generally lower than 100 and 28 mg/L, respectively.

TDS concentrations are normally between 500 and 700 mg/L, with increases in TDS in dry periods and decreases in wet periods.

Water Quality Issues

The Basin Plan identifies the following as significant surface water quality and quantity problems known to occur in the Basin: pollution of domestic water supplies, eutrophication of lakes and reservoirs, effects of inadequately treated wastes, animal confinement area wastes, toxicants and pesticides washed into watercourses from urban and agricultural land, effects of past and present mining activities, silt and sediment deposition, and sustaining fisheries and riparian habitat.

Within the upper Santa Clara River Hydrographic Unit, mining activities, silt and sediment deposition, and fish and wildlife maintenance are the most apparent surface water quality issues. Silt and sediment deposition in watercourses and streams as a result of new land developments increases stream turbidity and could destroy fish spawning areas. The Soledad Canyon reach of the Santa Clara River supports the federally listed (endangered) fish species, the unarmored threespine stickleback. Streamflow and other habitat requirements of the unarmored threespine stickleback near the Project and water needs of riparian vegetation found at the project site are discussed in Section 3.1.8. Land uses in the surrounding area that could contribute to water quality problems of the river are identified in Section 3.1.12.

Table 3.1.4-7

GENERAL MINERAL ANALYSES OF GROUNDWATER SAMPLES FROM EASTERN BASIN*

State Well Number[a]	Date of Analysis	SO_4 (mg/L)	Cl (mg/L)	NO_3 (mg/L)	TDS[b] (mg/L)	TH (mg/L)	pH	EC
4N/14W-17E1	08/30/61	93.4	96.4	1.0	781	347	8.5	967
4N/15W-13Q2	04/12/62	77	41	20.0	498	237	7.6	710
4N/14W-17H2	01/22/62	115	93	0	648	374	7.7	1040
4N/14W-17H2	06/18/62	94	61	1.3	562	333	7.6	910
4N/14W-17H1	01/22/62	64	108	0	608	331	7.7	945
4N/14W-17H1	06/18/62	99	74	2.2	582	326	7.7	900
4N/14W-17H04	03/16/72	149	54	--	688	300	7.6	--
4N/14W-17H04	03/21/73	112	73	--	677	311	8.0	--
4N/14W-17H04	03/18/74	116	73	--	687	308	7.7	--
4N/14W-17H04	04/23/75	107	70	--	--	310	7.7	--
4N/14W-17H04	03/09/76	125	70	0.0	742	353	7.7	--
4N/14W-17H04	06/23/77	106	69	10	717	290	7.5	--
4N/14W-17H04	04/26/78	97	117	0.2	788	259	7.1	--
4N/14W-17H04	03/21/79	90	83	0.2	692	270	7.8	--
4N/14W-17H04	03/11/80	82	37	0.2	--	226	8.1	--
4N/14W-17H04	03/23/81	65	63	0.01	--	270	7.5	--
4N/14W-17H04	03/23/82	89	60	0.09	--	282	7.6	--

Table 3.1.4-7 (Continued)

GENERAL MINERAL ANALYSES OF GROUNDWATER SAMPLES FROM EASTERN BASIN*

State Well Number[a]	Date of Analysis	SO_4 (mg/L)	Cl (mg/L)	NO_3 (mg/L)	TDS[b] (mg/L)	TH (mg/L)	pH	EC
4N/14W-17H04	03/21/86	85	76	0.2	510	290	--	--
4N/14W-17H04	03/12/87	81	88	--	--	--	--	--
4N/14W-17H04	03/15/89	92	148	0.1	686	360	--	--
4N/14W-17E03	04/21/71	84	42	7.2	434	273	--	--
4N/15W/14J01	04/21/71	83	54	26.0	454	262	--	--
4N/15W-22H01	04/21/71	78	43	28.0	460	277	--	--
4N/15W-21M05	04/21/71	94	39	25.4	483	290	--	--
4N/15W-18NO2	04/19/71	86	34	16.5	412	244	--	--

Sources: Santa Clara River Basin Water Quality Control Plan (1975) and the California Department of Water Resources.

[a] The State Well Number indicates the well's location within the rectangular system used by the USGS for subdivision of public lands. For example, well number 4N/14W-17H04 indicates that the well is located within Township 4 North, Range 14 West, Section 17. The last digits refer to the well's location within a 40-acre subdivision of the section, as shown in the accompanying diagram. Within the 40-acre tract, the wells are numbered serially as indicated by the final digit. Thus, 4N/14W-17H04 is the fourth well in the southeast quadrant of the northeast quadrant of Section 17.

[b] TDS indirectly determined by summation of anions and cations for 1971 data only.

* Lang to Saugus well monitoring results.

Table 3.1.4-8

DISSOLVED MINERAL CONSTITUENTS IN GROUNDWATER SAMPLES FROM EASTERN BASIN

Agency	Well	Location[1]	Date	TDS	TH	NO_3
NC[2]	Pinetree-1	T4N, R15W, Sec 13, SE ¼	July 1984	440	249	13
NC	Pinetree-2	T4N, R15W, Sec 13, SW ¼	July 1984	490	268	15
NC	Pinetree-3	T4N, R15W, Sec 14, SE ¼	July 1984	376	236	8
NC	Pinetree-4	T4N, R15W, Sec 14, SE ¼	July 1984	438	242	11
SC[3]	Lost Canyon	T4N, R15W, Sec 23, NW ¼	July 1982	434	248	12
SC	Sand Canyon	T4N, R15W, Sec 23, NW ¼	June 1980	515	343	25
SC	Mitchell	T4N, R15W, Sec 22, NE ¼	June 1983	460	241	8
SC	N. Oaks West	T4N, R15W, Sec 21, SW ¼	June 1983	510	307	22
SC	Honby	T4N, R15W, Sec 18, SW ¼	June 1980	422	287	18
NLF[4]	U3	T4N, R16W, Sec 24 (Proj), NE ¼	July 1985	510	296	17
NLF	U4	T4N, R16W, Sec 24 (Proj), NE ¼	July 1985	520	309	17
NLF	T2	T4N, R16W, Sec 23 (Proj), NE ¼	July 1985	490	295	18
NLF	Q2	T4N, R16W, Sec 15 (Proj), SE ¼	May 1984	510	285	18
NLF	N-68	T4N, R16W, Sec 22 (Proj), NW ¼	August 1985	560	320	20
NLF	I	T4N, R16W, Sec 17 (Proj), NE ¼	August 1985	640	403	19

[1] Data are presented in order of the east to west location of the wells (i.e., Pinetree-1 is the easternmost well). Well locations are provided according to township and range coordinates on the USGS quadrangle. Section numbers for Wells NLF-U3 through NLF-I are projected sections, which have not been delimited on the USGS quadrangle.
[2] NC = Newhall County Water District
[3] SC = Santa Clarita Water Company
[4] NLF = Newhall Land and Farming Company
TH = total hardness
NO_3 = nitrates
Source: Slade 1986

Project Site

Surface Water Quality

Water quality monitoring of the Santa Clara River at the Project site during 1990, 1991, and 1992 has provided comparable measured values to the regional values presented in Table 3.1.4-5 and indicates good water quality conditions. Tables 3.1.4-9 and 3.1.4-10 show the monitoring results for samples collected from several sites along the river near the Project site and for samples collected from the confluence of Bear Canyon Creek with the main river channel.

Table 3.1.4-9

CATIONS, ANIONS, AND TOTAL DISSOLVED SOLIDS IN SURFACE WATER ADJACENT TO PROJECT SITE

Constituent	4-17-90[1]	3-21-91[1]	5-19-91[1]	9-11-92	10-15-92
Cations, mg/L					
Calcium (Ca)	73.0	82.0	92.0	--	--
Magnesium (Mg)	19.0	24.0	24.0	--	--
Sodium (Na)	52.0	59.0	63.0	--	--
Potassium (K)	1.8	3.9	3.3	--	--
Anions, mg/L					
Carbonate ($C0_3$)	--	<0.6	<0.6	--	--
Bicarbonate (HCO_3)	310.0	270.0	310.0	--	--
Sulfate (SO_4)	91.0	90.0	100.0	--	--
Chloride (Cl)	48.0	46.0	45.0	--	--
Nitrate (NO_3)	<0.2	9.3	3.4	--	--
TDS, mg/L	480.0	450.0	510.0	339.0	343.0

[1] From Law/Crandall, Inc. 1992

Bear Canyon Creek is an important tributary stream to the river at the Project site. Surface water quality testing of Bear Canyon waters from January 1990 to December 1995 showed a pH range from 6.7 to 9.9, a water temperature range from 9 to 27°C, and a specific conductance range from 260 to 600 micromhos/centimeter (Law/Crandall, Inc. 1996)[2].

[2] The measured values presented in this section and Tables 3.1.4-9 and 3.1.4-10 do not reflect water quality during stormflows.

Table 3.1.4-10

SURFACE WATER QUALITY ADJACENT TO PROJECT SITE

Date	Dissolved Oxygen (mg/L)	Specific Conductance (field) (micromhos)	pH (field)	Temperature (°C)
3-12-90	--	780.0	--	14.0
4-04-90[1]	5.6	695.0	7.4	16.4
4-17-90[2]	--	790.0	8.5	--
5-05-90[1]	7.3	688.0	7.4	17.2
8-27-90[1]	6.2	678.0	6.7	18.7
9-25-90[1]	5.9	510.0	7.1	25.0
10-31-90[1]	5.5	690.0	7.8	16.0
11-28-90[1]	5.4	608.0	8.1	12.0
12-29-90[1]	4.2	615.0	7.8	11.0
1-30-91	5.5	598.0	8.0	12.2
2-28-91	6.0	633.0	8.1	15.1
3-19-91	--	490.0	8.7	12.0
3-21-91[2]	--	620.0	7.9	--
3-22-91	--	650.0	8.6	13.0
3-25-91	--	540.0	8.8	11.0
3-29-91	--	580.0	9.2	19.0
3-30-91	8.4	627.0	8.2	15.6
4-01-91	--	650.0	9.5	17.0
4-20-91	9.1	502.0	8.4	14.7
5-09-91[2]	--	800.0	8.3	--
5-19-91	6.9	500.0	8.0	16.7
9-11-92	5.8	672.0	7.9	18.8
10-15-92	6.2	690.0	8.2	19.3
11-1-93[3]	--	500.0	7.4	16.7
11-29-93[3]	--	400.0	8.4	13.3
12-27-93[3]	--	550.0	8.2	15.6
1-24-94[3]	--	500.0	8.3	12.2
3-1-94[3]	--	470.0	8.0	14.4
3-29-94[3]	--	450.0	8.3	17.8
4-29-94[3]	--	500.0	8.2	20.0
5-26-94[3]	--	450.0	--	20.0
6-24-94[3]	--	430.0	8.2	23.3

[1] From Chambers Group, Inc. 1990
[2] From Law/Crandall, Inc. 1992
[3] From Law/Crandall, Inc. 1996

Subsurface Water Quality

The mineral quality of subsurface waters in the vicinity of the Project site has been investigated separately by Western Technologies, Inc. (1989) and Law/Crandall, Inc. (1992, 1996). The results of these investigations on well water samples collected from monitoring wells near the subject property are shown in Table 3.1.4-11. The Basin Plan objectives for groundwater of the Acton and Eastern Subareas are also listed in Table 3.1.4-11 for comparative purposes. It appears that subsurface water associated with the upper Santa Clara River in the vicinity of the Project site meets the Basin Plan objectives for groundwater quality. It is important to note that the chloride content of groundwater in the vicinity of the subject property is consistently below the Basin limit of 100 mg/L.

Table 3.1.4-12 compares the groundwater quality (mineral content) at the Project site with the results of well water quality monitoring for the Eastern and Acton Subareas.

Water Quality Issues

Sources of Contamination

To determine the nature of past activities that might have contaminated soils and water resources on and adjacent to the site, Phase 1 and 2 Environmental Assessments (EAs) of the Project site were completed in August 1990 (Chambers Group 1990) and 1997 (West Coast Environmental 1997a, 1997b). The findings are discussed below.

It is expected that herbicides and pesticides were not used onsite based on the lack of evidence of past agricultural activity. Until 1989, explosives used in quarrying were stored in an approved magazine onsite, after which time mining was discontinued and all explosives were removed. There has been no contamination of the site due to the use of explosives, and no significant contamination due to oil and grease storage was found. A survey of historic uses of the site indicates that diesel fuel and other hazardous materials have been stored onsite.

At the time of the 1990 assessments, disposal or dumping on and adjacent to the Project site had been limited to stockpiling of process fines and disposing of wastewater from previous sand and gravel processing operations. Two process fines disposal locations (see Figure 3.1.1-3) were used on the Project site prior to TMC's purchase of sand and gravel mining rights from the BLM. The first, a fill sand stockpile, is located north of Soledad Canyon Road, approximately 1,200 feet from the Santa Clara River channel. This stockpile is composed of minus ¼-inch fines that were screened off the mined conglomerate. Some of the fines were washed from the stockpile during the 1992 rainy season, and the fill sand stockpile is in the process of being hauled away.

During the period between the 1990 and 1997 site assessments, the surface estate owner had placed a substantial quantity of debris and refuse material on the site. The March 1997 site reconnaissance identified this material as a potential source of contamination. The July 1997

Table 3.1.4-11

GENERAL MINERAL ANALYSES OF SUBSURFACE WATER SAMPLES FROM TMC SOLEDAD CANYON SITE[1,2]

Well	Date of Analyses	Constituent (mg/L)					pH	EC (micromhos)
		SO_4	Cl	NO_3	B	TDS		
PW-1	11/16/89[2]	91	52	0.8	--	--	--	800
PW-1	01/15/90[2]	86	49	0.9	--	500	--	840
MW-1	07/25/89[1]	110	50	<0.52	--	476	8.5	--
MW-1	04/17/90[2]	92	46	1.0	--	490	7.6	810
MW-1	07/18/90[2]	90	49	--	--	490	7.6	710
MW-1	10/15/90[2]	96	50	0.7	--	--	7.6	830
MW-1	01/14/91[2]	100	50	1.5	--	550	7.5	850
MW-1	05/09/91[2]	92	42	6.2	--	480	7.6	760
MW-3	11/16/89[2]	130	53	2.4	--	500	7.8	810
MW-3	01/15/90[2]	--	--	--	--	--	--	780
MW-3	03/12/90[2]	--	--	--	--	--	--	780
MW-3	04/17/90[2]	--	--	--	--	--	7.6	750
MW-3	05/17/90[2]	--	--	--	--	--	--	710
MW-3	06/14/90[2]	--	--	--	--	--	7.4	720
MW-3	07/18/90[2]	--	--	--	--	--	7.5	720
MW-3	08/17/90[2]	--	--	--	--	--	7.7	850
MW-3	09/14/90[2]	--	--	--	--	--	7.5	750
MW-3	10/15/90[2]	--	--	--	--	--	7.4	650
MW-3	11/13/90[2]	--	--	--	--	--	7.5	660
MW-3	12/11/90[2]	--	--	--	--	--	7.6	750
MW-3	01/14/91[2]	--	--	--	--	--	7.9	690
MW-3	02/18/91[2]	--	--	--	--	--	7.7	650
MW-3	6/24/94	56	45	1.4	--	480	--	---
MW-3	7/26/94	74	49	1.9	--	450	7.7	810
MW-3	8/25/94	82	46	24	--	470	7.7	810
MW-3	9/27/94	91	49	2.5	--	410	7.5	780
MW-3	10/27/94	75	45	2.6	--	480	7.6	820

Table 3.1.4-11 (Continued)

GENERAL MINERAL ANALYSES OF SUBSURFACE WATER SAMPLES FROM TMC SOLEDAD CANYON SITE[1,2]

Well	Date of Analyses	Constituent (mg/L)					pH	EC (micromhos)
		SO_4	Cl	NO_3	B	TDS		
MW-3	11/30/94	78	43	1.8	--	490	7.5	860
MW-3	12/30/94	--	--	--	--	470	7.4	880
MW-3	1/24/95	--	--	--	--	410	7.4	680
MW-3	2/24/95	66	34	7.2	<0.05	430	7.6	3,900
MW-3	3/28/95	--	--	--	--	410	7.4	750
MW-3	4/26/95	--	--	--	--	410	7.3	700
MW-3	5/24/95	--	--	--	--	420	7.8	660
MW-3	6/28/95	70	30	5.3	0.18	420	7.8	760
MW-3	7/28/95	--	--	--	--	410	7.9	670
MW-3	8/25/95	75	38	5	0.28	430	7.6	720
MW-3	9/29/95	--	--	--	--	460	7.8	730
MW-3	10/25/95	--	--	--	--	490	7.6	740
MW-3	10/28/95	--	--	--	--	460	7.7	700
MW-3	12/28/95	--	--	--	--	440	7.5	700
*Acton Valley Objectives[3]	--	150	100	45	1.0	550	--	--
*Eastern Santa Clara Mint Canyon[4]	--	150	150	45	1.0	800	--	--
*Eastern above Castaic Creek to Bouquet Canyon[5]	--	250	100	45	1.0	700	--	--

[1] Sample analyzed by Western Technologies Inc., Phoenix, Arizona, for Western Technologies Inc. (1989)
[2] Samples analyzed by Brown and Caldwell Analytical Laboratories, for Law/Crandall, Inc.
[3] Mineral quality objectives for groundwater of the Acton Subarea
[4] Mineral quality objectives for groundwater of the Eastern Subarea above Bouquet Canyon
[5] Mineral quality objectives for groundwater of the Eastern Subarea above Castaic Creek to Bouquet Canyon
--: Not analyzed
Source: Water quality objectives come from the Water Quality Control Plan, CRWQCB 1994

Table 3.1.4-12

SUMMARY OF GROUNDWATER MINERAL CONTENT AT PROJECT SITE COMPARED TO EASTERN AND ACTON BASINS

Constituent	Soledad Canyon[1] Project Site (1989 - 1995) Value Ranges	Eastern Basin[2] (1961 - 1986) Value Ranges	Acton Basin[3] (1969 - 1989) Value Ranges
EC (umhos/cm)	650-880	710-1,040	--
pH	7.4-8.5	7.1-8.5	7.8-8.0
SO_4 (mg/L)	56-130	64-149	39-144
Cl (mg/L)	30-53	34-148	10-124
NO_3 (mg/L)	<0.5-24	0-28	0.0-40.4
TDS (mg/L)	410-550	376-788	328-566
TH (mg/L)	--	226-403	200-341

[1] From Table 3.1.4-11
[2] From Tables 3.1.4-7 and 3.1.4-8
[3] From Table 3.1.4-6

environmental sampling revealed that essentially all the debris and refuse material had been removed, and sample results did not indicate that contamination was present except for a small area around two 55-gallon drums. It should be noted that the immediate area around the aggregate plant previously operated by Curtis Sand and Gravel was not included in the 1997 assessments. Historical records indicate that aboveground storage tanks (ASTs) and underground storage tanks (USTs) may have been present in this area. For a complete discussion of the site assessments, refer to Section 3.1.1.1.

Three silt ponds located on the south side of Soledad Canyon Road received washwater from the previous mining operation onsite. The ponds were in active use by the previous operator for desilting rock and gravel process washwater until approximately mid-1990. Tests performed for the 1990 EA of the site showed minor concentrations of oil and grease in the silt ponds. The southern perimeter of the ponds is diked by a service road that runs east to west through the property. During heavy rains, water overflows from the western pond into a culvert passing under the service road and the railroad trestle, and into the river.

Because mining activities have occurred at the site, the following pollutants are expected to be present in stormwater discharges from the site: total organic carbon (measured as TOC), TDS, and total suspended solids (measured as TSS) from uncontrolled storm runoff. Sampling of stormwater runoff from the site was conducted during the 1991-1992 winter, and testing for the pollutants described above was performed. The TSS concentration (2,200 mg/L) was high compared to that which is normally encountered at undisturbed sites but was not considered unusual given the site's 20-year mining history. Currently, there are no effluent limitations for TSS in stormwater. No pollutants exceeded the Basin Plan limits.

3.1.4.2 Environmental Effects

The potential for surface water quality degradation that facility construction and operation could have on the Santa Clara River will be evaluated based on surface drainage patterns, the potential for site erosion and sedimentation, and the corresponding effect on stormwater runoff into the Santa Clara River. The potential for groundwater degradation will be assessed based on the effects of stormwater discharges to local groundwater conditions.

Significance Criteria

An impact will be considered significant if:

- degradation of groundwater or surface water quality resulting from project implementation impairs beneficial uses of water of the Santa Clara River Basin, and

- degradation of groundwater and surface water quality results from project implementation such that the receiving body of water no longer meets the water quality objectives of the Water Quality Control Plan, Los Angeles Region, relative to Santa Clara River.

In terms of the spatial extent of impacts, a local impact will be considered to occur in the immediate vicinity of the discharge. Short-term impacts will be considered to be those lasting a few days. An impact will be considered beneficial if it improves upon the criteria mentioned above.

Water quality impacts will be considered for the following major classes of activities planned over the lifetime of the proposed mining operation:

- premining construction activities,
- mining and processing operations, and
- postmining land reclamation activities.

Premining Construction Impacts

Disturbed surfaces from road construction and site grading will drain water more rapidly than natural or vegetated slopes. Increased debris flow and sedimentation of downstream watercourses will occur if road construction and site grading are scheduled during the rainy season and slope stabilization measures are not commenced before the winter rainy season. Several steep canyons traverse the proposed mining area. The canyons nearest the NFSA drain toward Bee Canyon; the remaining canyons onsite drain toward the Santa Clara River. Premining and mining activities in these canyons could degrade water quality of the Santa Clara River by increasing TDS and TSS in runoff and debris flows.

Premining activities planned include construction of seven desilting/debris basins and ditches for erosion control purposes and construction of access roads for the mobile mine equipment. The purpose of the ditches is to direct surface runoff around the quarry and the NFSA. Basins A, B, C, D, 2E, and F will be constructed in stages during road construction as necessary to

provide adequate runoff control. Basin 1 will be constructed during initial cut-and-fill placement in order to provide sediment control for any runoff from the stockpile area. If construction of the basins is ongoing during the rainy season (October 11 to May 30), temporary sandbag walls will be used, as necessary, to redirect runoff. Also, sandbags will be placed on the benches and roads across the longitudinal flow lines, as necessary, for temporary drainage control. This preproduction construction work is shown on Figure 2.1-6.

With construction of the desilting/debris basins, site drainage will be controlled through seven outfalls, as shown on Figure 3.1.3-4. A summary of operations in the drainage area that might be a source of stormwater runoff pollution to individual outfalls is presented in Table 3.1.4-13. Runoff to Outfalls 1 and 2E will first pass through desilting/debris basins before discharging into the Santa Clara River through County culverts and the railroad culvert. Runoff to Outfalls D and F passes through desilting/debris Basins D and F, respectively, before discharging to the Santa Clara River via County culverts under Soledad Canyon Road. Runoff to Outfalls A, B, and C passes through desilting/debris Basins A, B, and C, respectively, before discharging into Bee Canyon and on to the Santa Clara River. The drainage facilities are designed to retain debris of a 50-year storm event but will also provide an important function during the more frequent storm events. Retained volumes of stormwater runoff from high-frequency, lower-quantity storm events will be released over a 40-hour period, resulting in removal of 80 percent of the sediments from the runoff. Provision of the proposed drainage control features (see Mitigation Measure WQ1) will avoid potentially significant impacts associated with stormwater runoff from the site.

Stormwater discharges are regulated by the federal Clean Water Act. In California, the State Water Resources Control Board elected to issue a statewide general permit (Permit) that applies to all discharges requiring a permit except construction activities. This statewide permit was last updated on April 17, 1997. In addition, the County of Los Angeles and 85 incorporated cities adopted Order No. 96-054, National Pollutant Discharge Elimination System Permit CAS614001. This order is designed to help cities in, and the County of Los Angeles control discharges from Municipal Separate Storm Sewer Systems (MS4).

A SWPPP has been prepared for the Project that meets the requirements of the April 1997 statewide general permit and Order No. 96-054. This SWPPP identifies potential sources of pollutants that may affect the quality of stormwater discharges from the site and describes practices to reduce those pollutants in stormwater discharges (West Coast Environmental, 1997b). The SWPPP mitigates potentially significant impacts related to pollutant constituents in site runoff (see Mitigation Measure WQ2). A copy of the SWPPP is presented in Appendix B1. Potential pollutants associated with each outfall and its corresponding drainage area are summarized in Table 3.1.4-14. A brief summary of the findings and recommendations of the SWPPP is provided here. Additional analysis is included in the discussion of mining activities in the water quality section.

Mining operations and activity areas were identified in the SWPPP that are potential sources of pollutants to stormwater runoff from the site. Mining areas will disturb the natural ground cover, and potential sources of pollution from these areas include suspended solids, oil and grease from machinery, and hydraulic oil from machinery failure. Activities that occur in the

Table 3.1.4-13

OUTFALL SUMMARY

Outfall No.	Outfall Location	Description of Operations in Drainage Area
1	SE corner of facility, discharge from Desilting/Debris Basin 1 to Los Angeles County Culvert No. 1 and on to Santa Clara River	Material storage, mining, maintenance, fueling
2E	SE corner of facility, discharge from Desilting/Debris Basin 2E to Los Angeles County Culvert No. 2 and Proposed Culvert No. 2A, and on to Santa Clara River	Concrete plant, mining, material processing, fueling, and fines storage
A	NW corner of facility, discharge from Desilting/Debris Basin A to Bee Canyon and on to the Santa Clara River	Future mining, fines storage
B	NW corner of facility, discharge from Desilting/Debris Basin B to Bee Canyon and on to the Santa Clara River	Fines storage
C	NW corner of facility, discharge from Desilting/Debris Basin C via "blue line" creek to Bee Canyon and on to the Santa Clara River	Fines storage
D	SW corner of the facility, discharge from Desilting/Debris Basin D to DPW Culvert 4 and on to Santa Clara River	Mining, fines storage
F	SW corner of facility, discharge from Desilting/Debris Basin F, through DPW Culvert 5 and on to the Santa Clara River	Future mining
Source: SWPPP (West Coast Environmental 1997b)		

process area can contribute suspended solids from aggregate processing, oil and grease from machinery, and chemical flocculents from the fines separation and water treatment process. After mining and processing, material storage piles and excess fines material storage at the NFSA have the potential to release suspended solids from storage. The batch plant can contribute suspended solids from processing and transfer of aggregate and concrete, and oil and grease from machinery operations. Fueling areas are located at the maintenance building and the concrete batch plant. These areas will be sloped to drain toward a sump, and the fuel storage tanks will have secondary containment. Unpaved roads and some material storage piles will be treated with a chemical dust palliative which can increase biochemical oxygen demand (BOD) and dissolved solids.

Several stormwater best management practices are recommended in the SWPPP to address the above-listed potential pollutants that could impact stormwater discharges from the site. Among these are a preventive maintenance program for vehicles and stormwater conveyance systems; good housekeeping to control contamination of stormwater runoff; a spill response, containment, and cleanup plan to prevent and respond to a spill of petroleum products; employee training in the SWPPP; and an inspection program for stormwater-specific equipment. A key element of the SWPPP is to use desilting/debris basins to control downstream siltation. The desilting/debris basins for the proposed site have been designed to allow enough time for excess suspended sediments to settle, thereby reducing TSS in runoff into the Santa Clara River.

Table 3.1.4-14

POTENTIAL POLLUTANTS EXPECTED FROM STORMWATER OUTFALLS

Potential Pollutant	Potential Quantity/Value	Outfall Expected	Possible Sources/Comments
Oil and Grease	ND/Trace	1,2	Diesel fuel/oil dispensing or vehicle maintenance operations.
TDS	100 to 400 ppm	All	Exposed mining areas, aggregate or fines storage, material processing, or concrete mixing operations.
TSS	<2,200 ppm	All	Exposed mining areas, aggregate or fines storage, material processing, or concrete mixing.
Iron (Fe)	ND/Trace	All	The General Storm Water Permit requires that facilities identified by the Standard Industrial Classification (SIC) Code 327 (Ready Mix Operations) test their effluent for iron.
Chlorine	ND/Trace	None	If the chlorine-containing dust palliatives are used, chlorine may be present.
pH	>7.0	All	Particulates from aggregate and cement can raise the pH of the runoff.
BOD	Slightly above background	All	Organic compounds in the dust control agents may slightly increase BOD.
Toxic	ND/Trace	None	Solvents and concrete admixtures all may contain very small amounts of a variety of compounds that could enter stormwater runoff.

TOC = total organic carbon
TSS = total suspended solids
BOD = biochemical oxygen demand
TDS = total dissolved solids
Metals = Metals listed in CCR Title 22
pH = Measure of acidity/alkalinity

Source: SWPPP (West Coast Environmental 1997b)

Additionally, the site facilities have been designed to minimize stormwater runoff contact with hazardous material operations. Site facilities include eight ASTs to hold dust palliative, diesel fuel, waste oil, fresh motor oil, and hydraulic fluid. The sizes of these tanks range from 250 to 10,000 gallons. For the subject project, use of ASTs may be preferable to USTs because of the numerous state and federal regulations governing installation, maintenance, monitoring, and closure of USTs. Many of these regulations were put in place in the early 1980s, after the cumulative effects of undetected leaking (e.g., groundwater contamination and other environmental problems) called attention to the inadequacy of traditional UST management. Undetected leaking has tended to be a less severe problem on sites using aboveground storage. Visual observations of stormwater discharges will be done monthly during the October 1 to May 30 rainy season. The stormwater effluent will be sampled and analyzed twice a year.

To prevent and minimize accidental but potentially significant releases of petroleum products into the Santa Clara River, an SPCCP for the site has been prepared and will be implemented (see Mitigation Measure WQ3; Appendix B2 for the entire SPCCP). The SPCCP was prepared in

accordance with federal and state requirements for aboveground petroleum storage and spill prevention. The plan recommends that the maintenance area be enclosed, fueling areas be covered, and ASTs be secondarily contained. It addresses all ASTs planned for the facility, and it will be amended as necessary over the lifetime of the Project to incorporate any significant management changes that may be required.

Implementing the best management practices outlined in the SWPPP and following the requirements described in the SPCCP will minimize contamination of stormwater runoff leaving the site. In addition, construction of the desilting/debris basins will mitigate impacts on water quality of the Santa Clara River because the basins will reduce TSS in stormwater runoff ranging from small storm events to 50-year storms.

A separate premining operation that relates to groundwater quality is the placement and construction of two septic tank leach fields, one to service the office building for company employees and the second for a service and maintenance building. The County Department of Planning has classified the location of the Project site as an area having severe septic tank limitations because of high groundwater, impermeable soils, fractured rock, or other geotechnical limitations. To avoid potentially significant impacts associated with sanitary waste disposal, a detailed percolation test at the proposed location of the leach field will be performed prior to construction in accordance with standard practices required by the County. If the percolation test results are unsatisfactory, alternative leach field locations or septic tank design will be proposed until County requirements are met. The proposed disposal system can be built only after the required percolation tests have been completed and County approval of the leach field sites has been obtained (see Mitigation Measure WQ4). Therefore, although severe hydrologic and substrate limitations exist in areas onsite, there is no possibility of a significant impact on surface water or groundwater quality occurring as a result of the disposal system.

In conjunction with the above preconstruction activities, any known areas of contaminated soils will be removed and properly disposed of at a Class I hazardous waste facility. All known areas of suspected contamination, such as the area near the abandoned drums and other areas encountered during project operations and deemed suspect of contamination, will be tested and disposed of in a manner consistent with pertinent regulations.

<u>Mining Activities</u>

Upon completion of the preproduction work, including construction of facilities, mining may begin with Cut 1 followed by Cuts 2, 3, and 4 over a 20-year period. Mining activities will take place 6 days a week, with aggregate processing and shipping taking place 24 hours a day. Water resources for the operation will be used for aggregate production, truck washing, and concrete batch plant operations. Raw water for the Project will be drawn from three wells below the plant site along the Santa Clara River (see Figure 2.1-4).

The water balance for the mining operation can be divided between the water needs for aggregate production and the water needs for batch plant operation. A water recycling system for the aggregate rock plant is described in Section 2.1.3.3. The system is briefly summarized as follows. The washwater discharged from the aggregate plant is clarified using a chemical

polymer flocculating agent, and the separated solids are brought by a conveyor to a small stockpile and then transported to the NFSA using a loader and trucks from the main mine fleet. The clarified water is then returned to the process system for reuse.

The semi-dry solids conveyed from the clarifier system to the NFSA contain not only wash fines and clays off the sand and gravel but also traces of the chemical polymer flocculating agent. This agent is used in the water recovery and clarification system and belongs to the group of chemicals known as anionic polyacrylamides. These compounds contain detectable amounts of acrylamide, which is known to the state of California to be a carcinogen. However, the components of the chemical flocculent are not considered hazardous, the product is chemically stable to extreme temperatures, it has been approved by the EPA, and it is commonly used for potable water treatment (personal communication, J. Ben, Aqua Ben Corporation, March 1992). Even if surface drainage from the NFSA causes some of the chemical flocculent to leach into the Bee Canyon watershed, no adverse impacts on water quality would be expected because the concentration of the chemical flocculent in the runoff would be extremely low. These compounds are commonly used in the water treatment and sand and gravel industries, and their use has not been a matter of concern to the CRWQCB. No significant impacts will occur from use of the chemical flocculating agent.

The truck washdown area at the Batch Plant will also be equipped with a water recycling system. Minor amounts of washwater that seep into the ground from truckwashing are not expected to have a significant impact on surface or groundwater quality.

Stormwater runoff from the mining site will be diverted to the desilting/debris basins described in the previous section. Although the mining activities will result in disturbance of more land area, the desilting/debris and revegetation plans will limit the TSS discharged from the site to less-than-significant levels.

The facility has been designed to minimize stormwater runoff contact with petroleum hydrocarbons. Fueling areas at the maintenance building and the concrete batch plant will be sloped to drain toward a sump, and the fuel storage tanks will have secondary containment.

Spills of hazardous materials and accidents involving mining machinery can contaminate surface water and groundwater if such spills are not detected, contained, and promptly cleaned up. Implementation of the requirements outlined in the SPCCP should ensure that any major accidental spills are promptly contained and cleaned up. Minor spills or leaks are not expected to have a significant impact on surface water or groundwater quality. The worst possible spill potentially impacting surface or groundwater quality would involve a catastrophic spill from the 10,000-gallon diesel fuel AST onsite. If a large-scale spill occurs, the combination of the SPCCP procedures and the desilting/debris basins will work to contain the spill, preventing its entry into the river and avoiding significant adverse impact.

Fugitive dust from onsite roads and dust generated during aggregate and concrete production can potentially degrade water quality of the surrounding area. Dust that comes in contact with stormwater runoff will become suspended in the water as part of the TSS load discharged from the site. Dust suppression for the Project will be accomplished in part with the use of chemical

dust palliatives, which are materials that control dust and have binding characteristics. The road surfaces of the site that will be either paved, gravel, or dirt are listed in Table 3.1.4-15. The access road to the NFSA will be dirt for its entire length, while the roads within the aggregate production area will be a combination of gravel and asphalt because of the level of traffic and road steepness.

Table 3.1.4-15

ROAD SURFACES AND AREA AT SOLEDAD CANYON PLANT SITE

Road Surface Type	Area (acres)
Asphalt	3.3
Gravel	3.3
Dirt	16.6

Chemical dust palliatives will be applied primarily to dirt roads and, to a limited extent, gravel-surfaced roads. Water will be used to control dust on stockpiles of aggregate. Some water may be needed for prewetting the dirt access roads to compact and prepare road surfaces before applying of the dust palliative.

In addition to water, several liquid chemical dust suppressant compounds are available for use to control fugitive dust. These dust control materials can be categorized as follows:

- **Bitumens** - These are products derived from petroleum that seal the road surface and hold the soil particles. Examples from this group include bunker oil, asphalt primers, and petroleum resins.

- **Salts** - These are chemicals that absorb moisture from the atmosphere or road surface and maintain a film of water that attracts dust particles. Examples from this group include calcium chloride, magnesium chlorides, and natural brines containing chloride salts.

- **Adhesives** - This category is large and diverse. It includes classes of compounds such as synthetic resins, synthetic polymers (vinyl polymers, polysulfides), and natural adhesives (lignin sulfonates, vegetable gums). These products physically bind the soil particles together or adhere to individual soil particles, weighing them down. Ligno-sulfonate products are the most common in this category.

Bituminous compounds are generally inert unless contaminated by aromatics or other byproducts of the petroleum refining process. The relatively low solubility of asphaltics and resins in water limits their migration in either surface or groundwater. These compounds are applied as either emulsions in water or solutions in an organic solvent. Once applied, bituminous compounds form a strong bond with the road surface. The surface of the main road in the aggregate

processing area will be asphaltic concrete because of the steep grade and high level of traffic expected.

Unlike petroleum products, salts are readily transported by water and are therefore capable of adversely affecting the quality of surface and groundwaters. Calcium chloride ($CaCl_2$) and magnesium chloride ($MgCl_2$) are the two most common salts used for dust suppression on dirt and gravel roads. In water, these compounds exist as positive Ca and Mg ions and negative chloride ions. Ca and Mg ions are readily absorbed by the soil and will not travel far from the point of application. Calcium and magnesium are also abundant in rivers and natural freshwater systems; therefore, the amount added by dust control will be relatively insignificant (Cowherd et al. 1990). The chloride ion is essentially unaffected by soil and moves freely away from the point of application. Natural waters also contain chloride ions but at a much lower concentration. Aquatic organisms display a tolerance to high salt concentrations, but low concentrations of salt may be toxic to plants, depending on plant species, age, season, and other factors.

Little environmental data are available on the effect of synthetic or natural adhesives when used as dust control agents. Because of their adhesive nature, these compounds resist migration after application, and because of their slow movement through soils, they are likely to have little effect on groundwater. Lignin sulfonates are widely used as dust palliatives, and the Food and Drug Administration allows their use as a binding aid in animal feed and a component in paper that comes into contact with aqueous or fatty foods. Lignin sulfonates have no effect on seed germination, and toxic effects on aquatic organisms are observed only at high concentrations (7,500 ppm) (Cowherd et al. 1990). Lignin sulfonates may cause aesthetic problems in surface water because of discoloration.

The combination of dust palliatives used at the mining site will depend on the average daily traffic patterns expected on individual road segments. Generally, the life expectancy of dust palliatives decreases with higher traffic volumes and higher percentages of truck traffic. Also, the type of dust palliative should be selected to suit the existing road surface material or the subgrade where surfacing structure exists. Table 3.1.4-16 shows a dust palliative selection chart that rates materials with respect to traffic, subgrade type, fines content, and climate. For the proposed roads, it appears that the most appropriate dust palliatives are magnesium chloride and ligno-sulfonates. Magnesium chloride is more suitable than calcium chloride in dry climates because it remains hygroscopic at much higher temperatures and lower humidity than calcium chloride (Public Works Magazine 1990).

Areas where chlorides will be applied are of concern because of their ability to move readily through the soil. Significant impacts on groundwater quality from chloride migration may result where the groundwater table is less than 25 feet deep. Because the depth to groundwater at the Project site is more than 25 feet, no significant impact on groundwater quality is anticipated from the migration of chloride ions. Chloride washed off road surfaces will either be carried in runoff into the desilting/debris basins or downslope into soils on the road shoulder. Given the relatively small areas to be treated with chloride containing dust palliatives, and relative to the large quantities of stormwater flowing off the site, it is expected that the limited amount of chloride released with stormwater discharges into the Santa Clara River will not be significant.

Table 3.1.4-16

GENERAL DUST PALLIATIVE PERFORMANCE CHART
(with respect to traffic, subgrade type, fines content, and climate)

	Traffic Volumes Average Daily Traffic			Subgrade Type[2]			Surface Material Fines Content					Climate			Environmental Impacts[5]
							% Passing 75 μm Sieve								
	Light <100	Medium 100-250	Heavy >250[7]	Clay	Silt	Granular	<5	5-10	10-20	20-30	>30	Rainy	Normal	Dry Spells >20 Days <40% RH	
$CaCl^2$	●	●	⊗	●	⊗	○	○	⊗	●	⊗	○[3]	○[1,3]	●	○	⊗
$MgCl^2$	●	●	⊗	●	⊗	○	○	⊗	●	⊗	○[3]	○[1,3]	●	⊗	⊗
Ligno-sulfonates	●	⊗[6]	○	●	⊗	○	○	⊗	●	●	⊗[3]	⊗[1]	●	●	⊗
Petroleum Products	⊗	○[6]	○	⊗	⊗	⊗	○	⊗	⊗	○	○[4]	○[4]	⊗	⊗	⊗

[1] May leach out in heavy rain.
[2] Subgrade will mix with surface material and impact on the quantity of fines.
[3] May become slippery in wet weather.
[4] Difficult to coat all particles and prevent "dust pockets."
[5] All products listed may have an adverse environmental impact if used improperly.
[6] Hard surface crust promotes potholes and break up under heavy traffic.
[7] May require higher or more frequent application rates (especially with high truck volumes).

Dust Palliative Performance

● Good
⊗ Fair
○ Poor

Source: Public Works Magazine (January 1990)

Therefore, no significant impact on surface water quality is anticipated from chlorides derived from dust palliatives.

Postmining Reclamation Impacts

Reclamation plans for the site include final contouring and revegetating disturbed areas consistent with the preexisting density of vegetation. Revegetation is programmed to occur before the first wet season after the areas are mined. Soil erosion control practices will be important to limit the amount of sedimentation potentially occurring downstream. In order to avoid significant impact due to sedimentation of downstream areas, the desilting/debris basins should not be removed until disturbed areas have been revegetated (see Mitigation Measure WQ5). During site reclamation, the area tributary to Basin A, as well as Basins B and C, will be regraded to reestablish the preconstruction runoff patterns as much as is practicable. Basins A, B, and C will then be removed.

3.1.4.3 Mitigation Measures

Mitigation measures have been developed as part of the Project to avoid and minimize impacts of the Project on water quality.

WQ1. The proposed Drainage Concept Plan will be implemented by TMC. The drainage concept establishes a drainage plan and facility requirements for the Project and provides the design parameters for the location, sizing, and scheduling of the erosion control facilities to handle the runoff, sedimentation, and debris flows generated by the Project. The plan addresses drainage during the premining road construction and grading phase, during the mining operation, and after completion of mining.

WQ2. TMC will implement provisions of the SWPPP. The SWPPP (1) identifies potential sources of pollutants that will adversely affect stormwater discharges from the site and (2) describes in detail specific best management practices to reduce the levels of pollutants in stormwater discharges. Key elements of the SWPPP include a preventive maintenance program for vehicles and the stormwater conveyance systems, a system of good housekeeping measures to control contamination of runoff, and a system of desilting/debris basins designed for settling out excess suspended sediments in the site runoff, thus controlling downstream sedimentation.

WQ3. TMC will implement provisions of the SPCCP. Use of secondarily contained ASTs to hold dust palliative, diesel fuel, waste oil, fresh motor oil, and hydraulic fluid onsite will minimize exposure of these products to surface water and groundwater. As previously stated, the risk of undetected leaks is much smaller with ASTs than with USTs. Additionally, the SPCCP identifies procedures and controls that will be implemented over the life of the Project to prevent and minimize the release of chemicals into the area's surface waters. The SPCCP's main focus is storage of diesel, hydraulic oil, motor oil, and waste oil in all ASTs having capacities of greater than 55 gallons (no USTs are planned for the facility). However, areas of the site designated for storage of smaller

volumes of potentially hazardous materials (e.g., solvents and cleaners) are also covered in the SPCCP. General compliance requirements relating to facility operations that are addressed in the SPCCP include spill response, leaks and malfunctions, rainwater accumulation, inspection, changes, training, and recordkeeping.

WQ4. The proposed onsite sanitary septic tank leach field will be built following County review and approval of the location to ensure that there will be no possible impact on water quality. If an appropriate onsite location for the leach field is not found because of the presence of impermeable soils, fractured rock, or other geotechnical limitations, TMC will install a septic tank onsite that is designed for routine pump-out.

WQ5. Desilting/debris basins will not be removed until disturbed areas have been successfully revegetated.

3.1.4.4 Unavoidable Significant Adverse Effects

The measures proposed above can be feasibly implemented and will reduce the identified impacts to a less-than-significant level. No potential significant unavoidable adverse impacts will remain after mitigation.