6.9 WATER QUALITY

The landfill design and operation are subject to substantial regulation to prevent degradation of water quality. In accordance with these regulations, the Scholl Canyon Landfill (SCLF) employs various measures to protect water quality including comprehensive monitoring and reporting programs. This section addresses potential water quality impacts of Variations 1 and 2 of the expansion of the SCLF and details the extensive water quality protection systems in place and planned for both variations. Potential water quality impacts on surface water and groundwater are assessed for both variations.

6.9.1 EXISTING CONDITIONS

6.9.1.1 Regulatory Setting

Water quality protection at municipal solid waste landfill sites is governed by both federal and state regulations. At the federal level, the Water Pollution Control Act (also referred to as the Clean Water Act) requires surface water quality protection, and the Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act require groundwater quality protection. The United States Environmental Protection Agency (EPA) promulgates regulations in Title 40 CFR. At the state level, water quality protection is specified in the Porter-Cologne Water Quality Control Act. Regulations implementing both surface water and groundwater quality protection are contained in Title 27 CCR. The California State Water Resources Control Board (SWRCB) has designated oversight responsibility for the implementation of these regulations to nine Regional Water Quality Control Boards (RWQCBs). The SCLF is under the oversight of RWQCB, Los Angeles Region.

<u>Federal Regulations</u>

Relevant federal regulations to protect surface water and groundwater quality are discussed below.

Surface Water Protection

In 1972, the federal Clean Water Act was amended to prohibit the discharge of waters of the United States from any point source unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The 1987 amendments to the Clean Water Act added Section 402 (p) that established a framework for regulating municipal and industrial storm water discharges under the NPDES program. In 1990, the EPA published final regulations (Title 40 CFR Parts 122-124) that established application requirements for storm water permits. The regulations require that storm water associated with industrial activities, if discharged to surface waters directly or indirectly through municipal separate storm sewers, must be regulated by an NPDES permit. Activities at the SCLF that are relevant to these regulations include industrial activity associated with municipal solid waste disposal operations. Therefore, an NPDES permit is required for the SCLF.

Groundwater Protection

The federal Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, authorizes development of nationwide standards for disposal sites for municipal solid waste. In accordance with the act, the EPA in 1991 promulgated regulations that apply to dischargers that own or operate municipal solid waste landfills. These regulations, Solid Waste Disposal Facility Criteria, Final Rule, included revisions to the Criteria for Classification of Solid Waste Disposal Facilities and Practices as set forth in Title 40 CFR Part 257. Part 258 was added to the regulations and set forth revised minimum federal criteria for location restrictions, facility design (mainly for groundwater protection liner systems), operating criteria, groundwater monitoring requirements, corrective action requirements, financial assurance requirements, and closure and post-closure care requirements. The regulations required that each state adopt and implement a permit program to assure that each municipal solid waste landfill complies with the federal minimum requirements. The permitting authority in an EPA-approved state such as California may approve engineered alternatives to certain prescriptive water quality protection standards contained in the federal regulations provided that the alternative meets all applicable conditions and performance standards.

State and Local Regulations

Relevant state regulations to protect surface water and groundwater quality are discussed below.

Surface Water Protection

The federal EPA regulations allow approved states, such as California, to issue general NPDES permits to regulate storm water discharges. In 1991, the SWRCB issued a statewide General Industrial Permit that applied to all stormwater discharges requiring a permit, except construction activity (a separate statewide General Construction Permit has been issued for construction activity). The monitoring requirements of this General Industrial Permit were amended in 1992. The Sanitation Districts of Los Angeles County (Sanitation Districts) filed a Notice of Intent with the SWRCB on March 27, 1992 for the SCLF to obtain coverage under the General Industrial Permit for continued and future stormwater discharge from the SCLF facilities. The General Industrial Permit included specific requirements for water quality protection, as well as details for monitoring of and reporting on water quality to relevant regulatory agencies. The plan to comply with the General Industrial Permit was included in a Storm Water Pollution Prevention Plan (SWPPP) prepared by the Sanitation Districts. In 1997, the SWRCB adopted a revised General Industrial Permit (SWRCB, 1997) as a replacement for the expired 1992 NPDES General Industrial Permit. Pursuant to the revised General Industrial Permit, the Sanitation Districts revised the SWPPP and runoff monitoring program on August 1, 1997. The SWPPP (Sanitation Districts, 2007) and runoff monitoring program are reviewed annually and updated as necessary.

In 2011, the RWQCB, Los Angeles Region adopted Order No. R4-2011-0052 that amended the waste discharge requirements (WDRs) for active municipal solid waste landfills in the Los Angeles Region to include requirements for disposal and on site use of non-designated/non-hazardous[1] contaminated soils and related wastes. The adoption of this amendment assists in protecting groundwaters and surface waters of the state from pollution or contamination. The SCLF accepts non-hazardous soils, greenwaste and asphalt for beneficial reuse and is, therefore, subject to this order.

Groundwater Protection

California has been designated by the EPA as an approved state to implement federal groundwater protection regulations. Accordingly, in 1993 the SWRCB adopted the *Policy for Regulation of Discharges of Municipal Solid Waste* (Policy), which directed each RWQCB to revise the WDRs of each municipal solid waste landfill in its respective region to comply with the federal regulations. Pursuant to this Policy, the RWQCB, Los Angeles Region, issued Order No. 93-062, *Amended Waste Discharge*

[1] Per Title 27 CCR Section 20220(a), non-hazardous solid waste means all putrescible and nonputrescible solid, semi solid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semi solid wastes and other discarded waste (whether of solid or semi solid consistency); provided that such wastes do not contain wastes which must be managed as hazardous wastes, or wastes which contain soluble pollutants in concentrations which exceed applicable water quality objectives, or could cause degradation of waters of the state (i.e., designated waste).

Requirements for Municipal Solid Waste Disposal Sites, in 1993 (LARWQCB, 1993). These requirements became effective for the SCLF in October 1994.

The SWRCB consolidated all California regulations governing the design and operation of municipal solid waste landfills in Title 27 CCR Division 2, Subdivision 1. These regulations became effective in 1997. Included in these regulations are requirements for a groundwater monitoring and response program, and prescriptive methods for the design of groundwater protection systems including liquid collection, landfill gas collection, and liner and subsurface barrier systems.

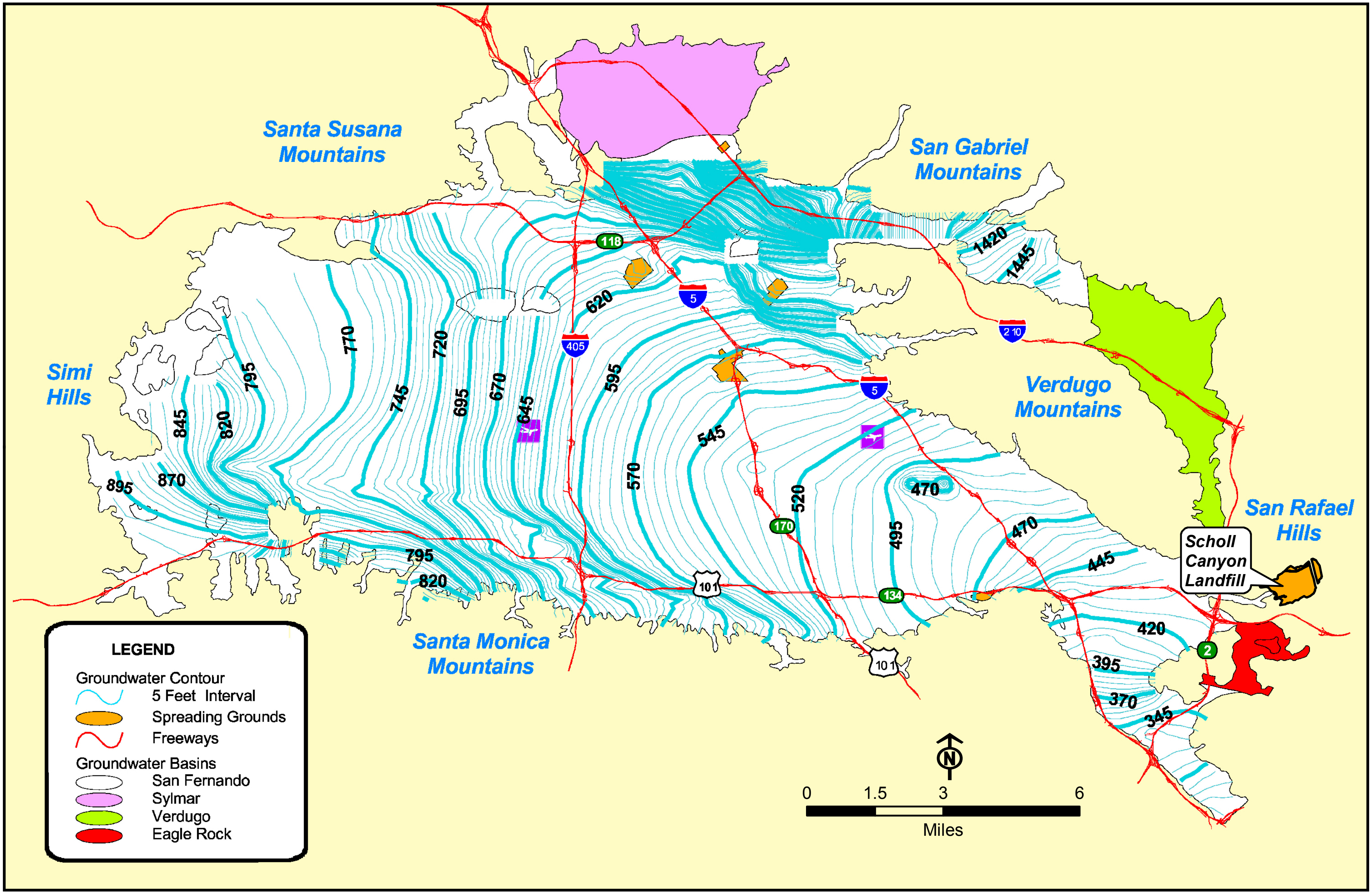
For groundwater protection and monitoring, the RWQCB has issued WDRs and a monitoring and reporting program (MRP) for the SCLF. Landfill operations are regulated by the conditions in WDRs Order No. 01-132 and MRP No. 2846. In addition, Order No. 93-062 implements the federal regulations and applies to the entire site.

Regional Setting

As described in Section 6.5 (Geology and Soils/Hydrogeology) of the DEIR, the SCLF is located in the upper portion of Scholl Canyon to the south of Flint Peak in the San Rafael Hills approximately one mile north-northeast of the Eagle Rock groundwater basin, two miles east-northeast of the San Fernando basin, and 0.7 miles west of the Raymond basin. Except for the western mouth of Scholl Canyon, the landfill is surrounded by high ridges that restrict inflow to seasonal recharge from precipitation along the ridges. Groundwater generally flows to the west, eventually entering the water-bearing strata of the Los Angeles River watershed known as the Upper Los Angeles River Area (ULARA). Figure 6.9-1 depicts simulated groundwater elevation contours in the ULARA groundwater basins near the SCLF in September 2010 as reported in the ULARA Watermaster (ULARAW) report for the 2009-10 water year (ULARAW, 2011).

The groundwater quality in the ULARA groundwater basins is generally within the recommended limits of the California Title 22 drinking water standards except for 1) areas in the eastern San Fernando groundwater basin where high concentrations of trichloroethylene (TCE), tetrachloroethylene (PCE), hexavalent chromium, and nitrate nitrogen are present; 2) areas in the western end of the San Fernando groundwater basin with excess concentrations of naturally-occurring sulfate and total dissolved solids; and 3) areas within the Verdugo Basin that have high concentrations of methyl tertiary butyl ether (MTBE) (a gasoline additive) and nitrate nitrogen.

Contamination in large areas of the San Fernando groundwater basin prompted the EPA in 1986 to place four areas in the eastern portion of the San Fernando Valley on the National Priorities List (NPL) under the EPA's Superfund program. The NPL identifies the highest priority hazardous waste sites for investigation and cleanup in the United States. The primary contaminants of concern are TCE, PCE, nitrate nitrogen, and hexavalent chromium, as mentioned above. TCE and PCE were widely used in a variety of industries including aerospace and defense manufacturing, metal plating, machinery degreasing and dry cleaning. The nitrate nitrogen contamination may be the result of past agricultural practices and/or septic system or ammonia releases. The hexavalent chromium contamination is predominantly the result of past industrial activity including metal plating. Figures A-1 through A-4 in Appendix K of the DEIR depict groundwater contamination in the ULARA groundwater basins as reported in the ULARA Watermaster report for the 2009-10 water year (ULARAW, 2011). The cities and agencies that extract groundwater from the ULARA groundwater basins either treat the groundwater or blend it with imported water to meet state drinking water standards.



Source: 2009-10 Water Year ULARA Watermaster Report

Figure 6.9-1

Upper Los Angeles River Area Simulated Groundwater Elevation Contours (September 2010)

Scholl Canyon Landfill Expansion EIR

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Local Setting

The quality of naturally occurring groundwater is determined by a number of factors including the composition of subsurface materials that come in contact with the groundwater. For example, naturally occurring minerals (such as calcium, magnesium, and sodium) can dissolve in the water and elevate the amount of dissolved solids, producing water that is characterized as "hard".[2] ULARA groundwater is moderately hard to very hard due to mineral salts. In the eastern part of the basin, where the SCLF is located, hardness is primarily due to calcium bicarbonate.

The local groundwater quality at the SCLF has been extensively analyzed to establish a background with which to measure any effect from the landfill. To explore the range of background water quality at the SCLF, the Sanitation Districts performed two soil studies. In the first study conducted in 1984, samples of native soil and bedrock from areas not affected by waste disposal operations were examined. The second study, conducted between 1989 and 1995, was more comprehensive and used representative soil samples from various on site locations not impacted by landfill operations (Sanitation Districts, 1995). Results from these studies provide theoretical background water quality parameters and are useful to augment background water quality information developed using other approaches. Table 1 of Appendix K of the DEIR summarizes the range of background water quality as determined through these two experimental studies. The results from these studies demonstrate the range of natural variations in groundwater quality that may result from contact with native geologic materials.

The upgradient monitoring well located on the northeast ridge of Scholl Canyon was not used to determine background groundwater quality because its groundwater quality is not characteristic of the background conditions for the down-canyon monitoring wells. For canyon landfills such as the SCLF, where groundwater originates primarily from local precipitation, canyon groundwater at up-canyon locations has not equilibrated with the unweathered soils. As the groundwater flows down-canyon, constituent concentrations increase as the groundwater approaches equilibrium conditions with the soils. This phenomenon results in groundwater quality data from the up-canyon monitoring well different from that of the down-canyon monitoring wells. It should be noted that this phenomenon would occur without the presence of the landfill between up- and down-canyon monitoring wells.

Existing Landfill Operations

The SCLF has been in operation since 1961. As a result, the landfill currently has many groundwater and surface water protection systems in place. In addition, the operation of the landfill has been optimized to avoid potential water quality impacts. A discussion of relevant existing facilities and their effectiveness in preventing water quality impacts is presented below.

Landfill Surface Water and Groundwater Protection Systems and Programs

Multiple systems at the SCLF protect groundwater quality at the site. The SCLF is equipped with a surface water drainage system, described in Section 6.8 (Surface Water Hydrology) of the DEIR, and is graded to direct surface water around areas of active landfilling and provide for rapid removal of surface water while minimizing erosion. These features aid in avoiding direct contact between surface water and refuse, reducing the infiltration of surface water, and thus reducing the generation of landfill liquids that could contaminate groundwater. A subsurface barrier and groundwater extraction system mitigates the potential for any landfill-affected groundwater to migrate off site and potentially impact the water quality

[2] Water hardness is directly related to the presence of multivalent cations, most notably calcium and magnesium ions, in the water. Groundwater is especially prone to excessive concentrations of these ions.

and beneficial uses[3] of groundwater in the ULARA groundwater basins. A seepage collection system removes natural seepage water[4] from beneath the landfill and prevents this seep from contacting refuse. A landfill gas collection system minimizes the contact between groundwater and landfill gas, which contains volatile organic compounds (VOCs) that may dissolve into and contaminate groundwater. The Sanitation Districts implement waste diversion and waste load checking programs to ensure that hazardous waste is not disposed of at the SCLF. The Sanitation Districts also implement a soil acceptance program to prevent the reuse and disposal of soil that could potentially generate pollutants that would degrade groundwater or downstream surface waters. The Sanitation Districts assess the effectiveness of these groundwater protection measures using an extensive groundwater monitoring system, as described in this section (page 6.9-13) titled "Groundwater Monitoring."

Regulatory requirements for landfill groundwater protection systems have evolved over time, becoming progressively more rigorous. The Sanitation Districts work closely with regulatory agencies to ensure that all groundwater protection systems at the SCLF meet or exceed applicable state or federal regulations. The RWQCB, Los Angeles Region provides regulatory oversight for the design and construction of groundwater protection systems. Prior to any construction, all design and construction aspects for each groundwater protection system are reviewed and approved by the RWQCB, Los Angeles Region. The RWQCB, Los Angeles Region conducts periodic inspections to ensure that the construction activities and quality assurance testing are conducted according to the approved specifications.

Subsurface Barrier and Groundwater Extraction System

Rainfall in the San Rafael Hills drains into the Scholl Canyon alluvium[5], flowing westward through the interconnected alluvium and fractured bedrock of the canyon mouth towards the San Fernando groundwater basin. The subsurface barrier and groundwater extraction system mitigates the potential for any landfill-affected groundwater to migrate off site and affect regional groundwater. The SCLF and Inactive SCLF are each equipped with a low permeability cement-bentonite subsurface barrier – Barriers 1 and 2, respectively – that impede the flow of groundwater off site (see Figure 6.9-2). Both barriers are keyed into bedrock to maximize their effectiveness. Barriers 1 and 2 are each equipped with an upgradient groundwater extraction system that prevents groundwater build-up behind the subsurface barrier and down-gradient monitoring wells.

Barrier 1 was installed in 1987 to cut off any alluvial or uppermost weathered bedrock pathway that could serve as a potential conduit for water to migrate off site from the landfill. Six extraction wells (EW1B, EW2B, EW3B, EW4B, EW5B, and EW6A) have been installed to collect groundwater that may be affected by the landfill (see Figure 6.9-3). The "A" designation identifies extraction and monitoring wells completed in alluvium, while the "B" designation identifies wells completed in fractured bedrock. The extraction wells are located along the main flow line of the canyon, just upgradient of the barrier. The spacing of the extraction wells is such that they have overlapping capture zones. Automated submersible pumps are activated when groundwater builds up to a predetermined level in the extraction well. This level is set several feet lower than the groundwater level found downgradient of the barriers. As a result, the groundwater flow direction downgradient of the subsurface barrier is always maintained towards the extraction wells. The pumps are deactivated when the water level reaches the desired lower level.

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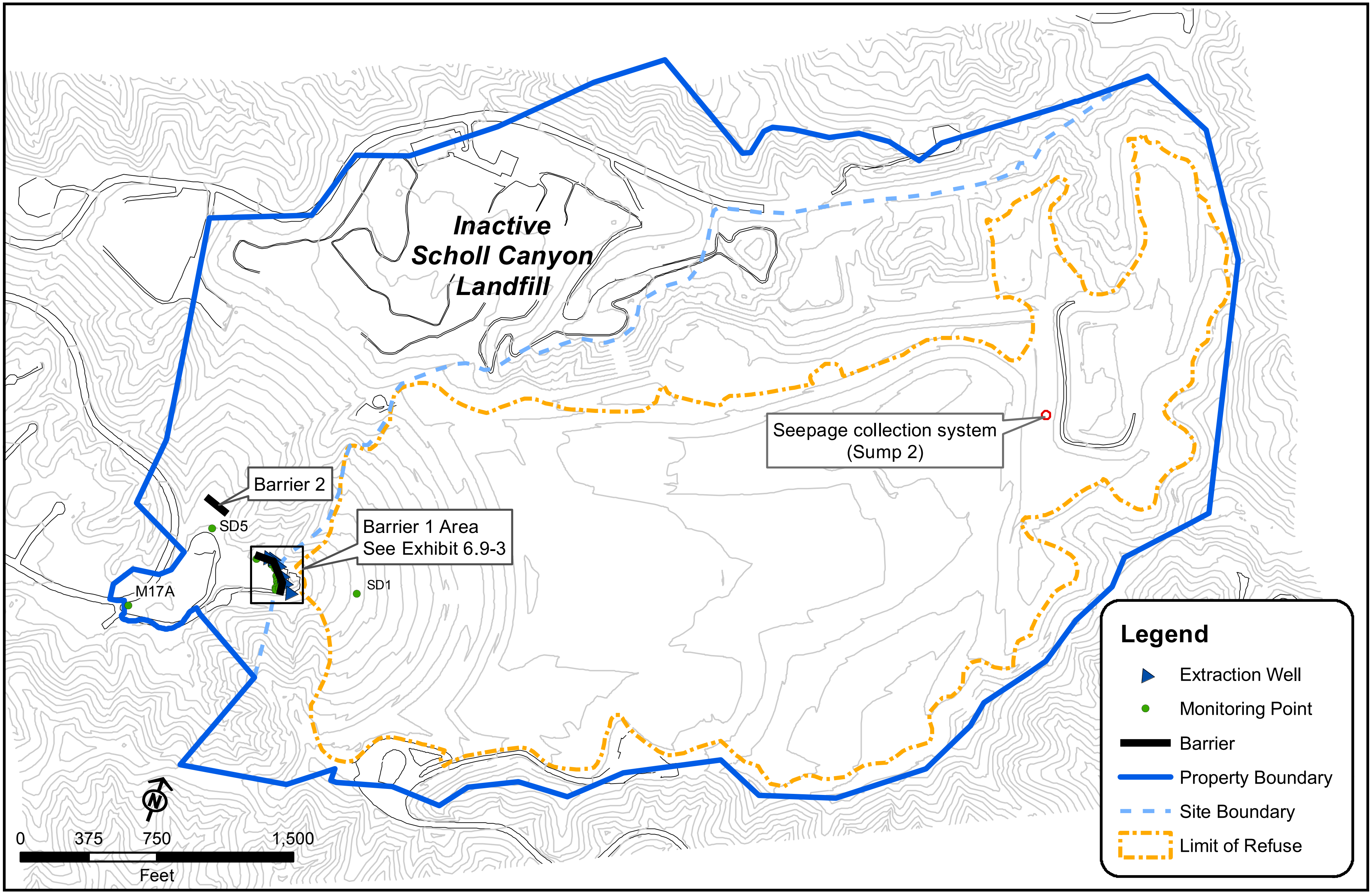
[3] The SWRCB and RWQCBs designate beneficial uses to protect surface and ground waters based upon past, current, and projected future uses. The SWRCB and RWQCBs set water quality standards to protect these beneficial uses.

[4] Seepage water is groundwater that emerges at the ground surface.

[5] Alluvium, which is sediment deposited by moving water, occurs along the axis of the native Scholl Canyon and extends from beneath the refuse fill westward towards the San Fernando groundwater basin. In the Barrier 1 area, alluvium typically reaches a depth of 24 to 30 feet below ground surface.



Source: County Sanitation Districts of Los Angeles County

Figure 6.9-2

Monitoring Point Locations

Scholl Canyon Landfill Expansion EIR

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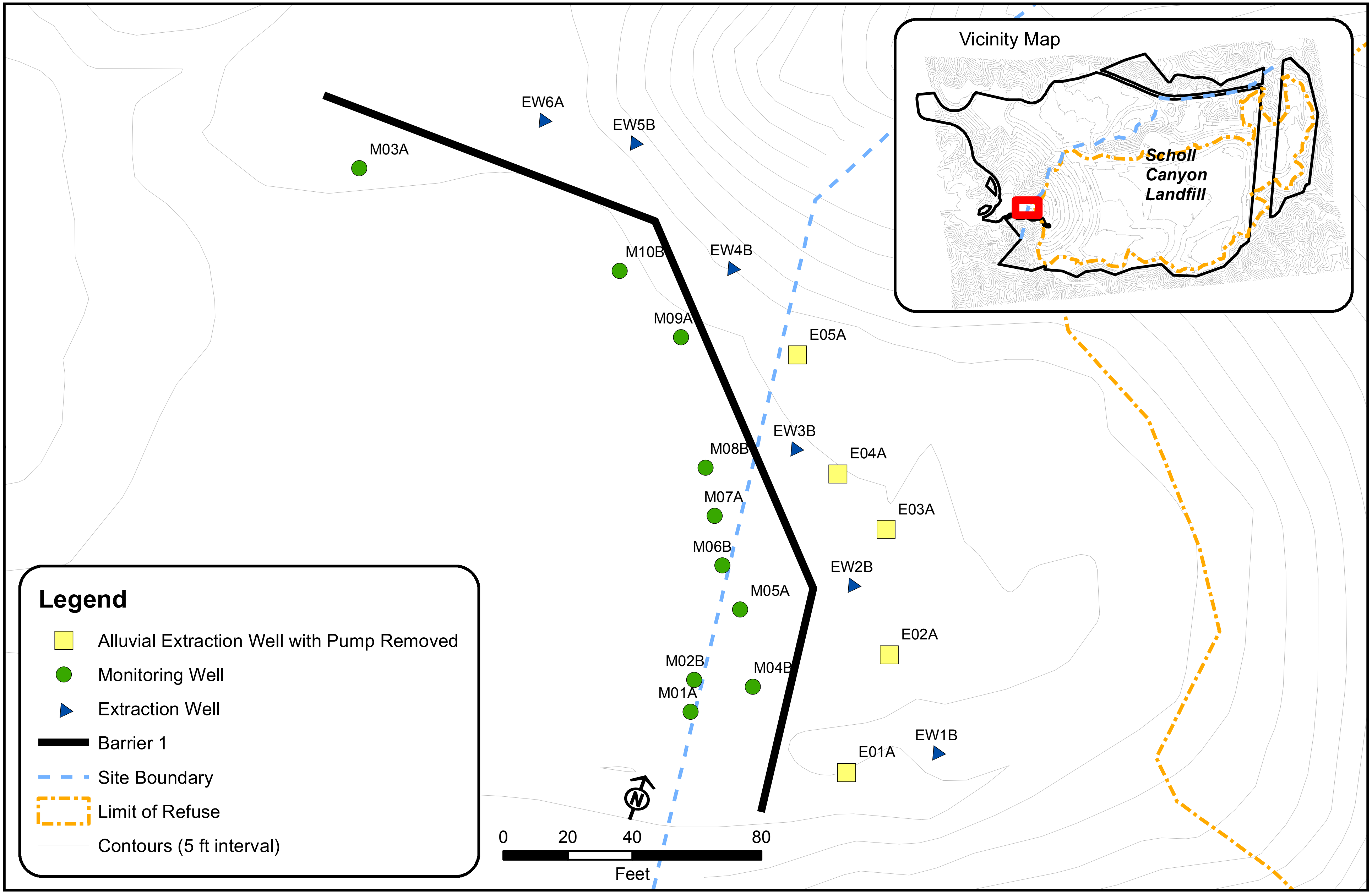

Source: County Sanitation Districts of Los Angeles County

Figure 6.9-3

Subsurface Barrier 1 System

Scholl Canyon Landfill Expansion EIR

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Barrier 2 was installed in 1987 about 300 feet northwest of Barrier 1 to limit potential contaminant migration from the Inactive SCLF. Barrier 2 was constructed, and is operated and monitored similar to Barrier 1. Maintenance and monitoring of the Inactive SCLF reverted to the City of Glendale when that area became inactive in 1975. The Sanitation Districts do not monitor groundwater quality at Barrier 2.

Seepage Collection System

A seepage collection system was constructed in 1985 to remove natural seepage water from beneath the eastern filled portion of the landfill and to eliminate the possibility of this seep encountering refuse. Access to the seepage collection system is through a vertical well to a collection sump (Sump 2) at the low point of the system (shown in Figure 6.9-2).

Sump 2 is connected to a gravel-filled trench that crosses the canyon. An additional trench was constructed along the main Scholl Canyon floor to collect and drain groundwater. All seepage water collected in this system flows by gravity to Sump 2 for extraction via the vertical well. The collected seep water is discharged to the City of Glendale sewer system and, ultimately, to the Glendale Water Reclamation Plant pursuant to City of Glendale Industrial Wastewater Discharge Permit No. W-2762.

During the continuing excavation of native materials at the site and following periods of precipitation, intermittent seepage areas are occasionally encountered. When seepage areas are encountered, the water is collected if it occurs where it may encounter refuse; otherwise it is treated as surface runoff. When new seepage areas are encountered, they are reported to the RWQCB, Los Angeles Region. On the front face of the landfill, there have been two intermittent seepage areas associated with rainfall percolation into the cover soil. To prevent this seepage from entering the storm drain on the front face and leaving the site, French seep drains[6] have been installed to collect the seepage. The collected seepage is also discharged to the City of Glendale sewer system.

Landfill Gas Collection System

Landfill gas is a natural product of solid waste decomposition in a landfill. Landfill gas consists primarily of methane and carbon dioxide but also contains VOCs that, if not collected, may dissolve into and contaminate groundwater. Additionally, the carbon dioxide, methane, and VOCs in landfill gas could cause the groundwater to become slightly acidic. This acidity could cause an increase in the solubilization of soil minerals, leading to higher concentrations of various soil constituents in the groundwater. To prevent landfill gas emissions to neighboring properties and groundwater, the Sanitation Districts have installed an extensive gas collection system at the SCLF. As part of the groundwater monitoring program, groundwater samples are tested for constituents that indicate potential landfill gas interaction with groundwater.

The existing landfill gas collection system consists of 136 vertical gas collection wells installed on the slopes and approximately 13 miles of horizontal gas collection trenches throughout the interior of the landfill. This network of vertical and horizontal collectors (trenches and wells) is continuously under vacuum to collect landfill gas from within the solid waste fill and prevent gas from escaping to the atmosphere or migrating laterally off site. Installation of the landfill gas collection system began in the early 1980's and has continued coincident with solid waste placement over the years. In 2011, approximately 7,300 actual cubic feet per minute of landfill gas was collected from the active and inactive portions of the landfill and conveyed via a long pipeline to the City of Glendale’s Grayson Power Plant. The compressed landfill gas displaces approximately 120 million British thermal units per hour

[6] A French drain is a trench covered with gravel or rock that redirects water away from an area.

(MMBTU/hr)[7] of natural gas. Any gas not conveyed to the power plant is destroyed by combustion using the site's flare station.

Landfill gas monitoring is required by state and local regulations and includes: landfill gas migration probes installed around the perimeter of the site, on site structure monitoring, ambient air quality monitoring; surface landfill gas emission monitoring, landfill gas quality analyses, and landfill gas combustion efficiency testing. Results of these monitoring programs are reported to the South Coast Air Quality Management District (SCAQMD) and the Local Enforcement Agency (LEA) – the Los Angeles County Department of Public Health (LADPH) – depending on the monitoring program. In addition to the required monitoring programs, the Sanitation Districts monitor each gas collection well and trench on a regular basis, key locations in the gas collection header system on a daily basis, and the landfill gas supply to the flare station continuously. For further details about the landfill gas monitoring program, see Section 3.3.7.3 (Landfill Gas Control and Monitoring) of the DEIR.

Landfill gas condensate is produced during the withdrawal of landfill gas as the gas cools to ambient conditions. The condensate forms in the landfill gas collection system pipes and is collected at low points on the laterals and collection headers. The collected condensate is treated using an air stripper, then chemically neutralized and discharged to the City of Glendale sewer system and ultimately the Glendale Water Reclamation Plant pursuant to City of Glendale Industrial Wastewater Discharge Permit No. W-2762.

Waste Inspection

To help maintain the environmental integrity of the landfill and prevent water quality impacts, only acceptable, non-hazardous waste is authorized for disposal at the site. A hazardous waste screening program at the landfill in accordance with federal regulations in Title 40 CFR Part 258 has been implemented to check for unauthorized waste. This program includes continuous inspection of the disposal area, random inspection of incoming loads, maintenance of inspection records, training of facility personnel, and notification of regulatory agencies if hazardous waste is discovered. Heavy equipment (e.g. dozer) operators and other landfill staff are trained to identify likely sources of hazardous wastes in the fill area. Additionally, the Sanitation Districts conduct a random load checking program to monitor for hazardous wastes. Each day, several loads at the landfill are randomly selected for inspection and examined in detail by trained inspectors. Any waste deemed not acceptable is taken to a licensed hazardous waste disposal facility. If concealed loads of hazardous waste are found at the landfill, licensed haulers transfer the loads to an appropriate hazardous waste disposal site. The results from this extensive waste inspection program are submitted to the RWQCB, Los Angeles Region on a quarterly basis and to the LADPH on a monthly basis.

There are situations in which small quantities of unacceptable waste are found during landfilling and cannot be safely removed. For example, a few gallons of paint may escape from a broken container, become mixed in the solid waste, and cannot be recovered. In this case, pursuant to authority from the RWQCB, Los Angeles Region, the spilled waste is carefully buried. The absorptive capacity of the solid waste in the landfill is more than adequate to sequester small incidental quantities of hazardous materials that would have to be buried under such circumstances. The Sanitation Districts document such incidents in monthly solid waste facility operating reports submitted to the LADPH. These incidents are also described and included in quarterly monitoring reports submitted to the RWQCB, Los Angeles Region.

[7] 1 MMBTU is equivalent to 1,000 cubic feet of natural gas.

All vehicles entering the site are screened for radioactive materials as they pass through the weigh scales. A gamma scintillation counter capable of detecting very low levels of radioactive waste is used at the scales facility. No radioactive wastes, as defined by the Department of Toxic Substances Control, are accepted for disposal at the landfill. If a load appears to contain radioactive materials, the suspect load is taken to an isolated area of the site to await inspection by the LADPH, Solid Waste Management Program and Radiation Management Program. Any identified radioactive materials are traced to the producer through a manifest system, and the LADPH determines appropriate action and any subsequent enforcement action.

Household Hazardous Waste Diversion

Household hazardous wastes (HHWs) are unwanted household chemicals that are corrosive, flammable, reactive or poisonous. When disposed of improperly or in excessive quantities, they can endanger solid waste personnel who must handle the waste and can impact the integrity of the environmental and water quality control systems in place at the landfill. To divert as much of this waste from the landfill as possible, the Sanitation Districts and the Los Angeles County Department of Public Works (LADPW) jointly sponsor the Los Angeles County Household Hazardous Waste Collection Program. Through this program, citizens deliver unwanted HHWs such as batteries, pesticides, used motor oil, solvents and old paint to local roundups. The wastes are categorized and sorted. During the 2009-2010 fiscal year, approximately 65% of the wastes were recycled or reused and the remainder was disposed of legally. For example, latex paint is recycled for use in graffiti control programs and is given back to the cities free of charge. The program is free to all Los Angeles County residents.

Soil Acceptance Program (SAP)

The SCLF accepts non-hazardous soils for on site beneficial uses in accordance with Order No. R4-2011-0052. The Sanitation Districts submitted and implemented a Soil Acceptance Program for the landfill in May 2011 and revised it in November 2011 and September 2012. The SAP clarifies acceptable contaminant concentration limits for soil appropriate for on site reuse and disposal. The landfill has established screening procedures for incoming soil loads to ensure accepted soil will not generate pollutants that can impact the site's groundwater or downstream surface water.

SCLF staff screen incoming dirt loads for odor and visual evidence of contamination and, if necessary, monitor the load with a toxic vapor analyzer. If contamination is observed, the Sanitation Districts' hazardous waste monitoring staff may request soil testing or reject the load.

Water Quality Monitoring Programs

Several monitoring programs are implemented at the SCLF for water quality protection purposes. These programs include groundwater monitoring, surface water monitoring, and industrial wastewater monitoring. These programs are described in detail below.

Sampling and Analysis

Qualified personnel perform the required groundwater and surface water monitoring using approved sampling and analysis programs and properly calibrated equipment. The sampling and analysis plan in Section 5 of the *Scholl Canyon Landfill Water Quality Monitoring System Report for Compliance with RWQCB Order No. 93-062* (Sanitation Districts, 1995) provides details about groundwater and surface water sampling methods, field and laboratory quality assurance/quality control (QA/QC) measures, and laboratory testing methods. All collection and analysis of industrial wastewater samples is completed by a qualified outside laboratory.

Field QA/QC procedures ensure that the sample collection procedures maintain the integrity of the sample. For groundwater sampling, field QA/QC procedures include trip blanks and field duplicate samples. Each day of sampling, a separate trip blank is filled with distilled water and given to the sampling personnel to carry throughout the sampling event. The purpose of this trip blank is to indicate if any external contamination has occurred between the sampling point and laboratory. The trip blanks are handled and shipped in the same manner as groundwater samples and analyzed for VOCs. Each day of sampling, the sampling personnel collect a field duplicate to verify the precision of the sampling procedures. The field duplicates are prepared in the same manner as the regular sample. Because dedicated sampling equipment is used for sampling at the SCLF, no equipment blanks are necessary for groundwater sampling. For storm water sampling, field QA/QC procedures include collecting a trip blank and equipment blank for each storm water sample. The equipment blank is used to identify the total contamination from sampling equipment whereas the trip blank is used to establish if contamination of the sample occurred during shipping or field handling procedures.

Collected samples are transferred to the laboratory, usually on the same day sampled, under proper chain of custody procedures. Documentation includes labeling sample bottles and completing field sampling forms and sample request/chain of custody forms to track all pertinent information during sample collection.

Laboratory QA/QC procedures ensure the reliability of analytical results. The Sanitation Districts' San Jose Creek Water Quality Laboratory or Joint Water Pollution Control Plant Water Quality Laboratory, both of which are certified by the California Department of Public Health (CDPH), or certified independent laboratories analyze the water quality samples. Method blanks, matrix spikes, and surrogate spikes are prepared and analyzed as a check on the quality and reliability of the laboratory analytical equipment.[8] Analytical test methods are listed in the laboratory analytical reports and submitted with the monitoring results.

Sanitation Districts' staff perform the following QA/QC procedures in reviewing the monitoring results. Results are compared with historical values to identify any anomalous data, which are investigated to determine whether they are representative of water quality at the site. Field sampling forms and procedures are reviewed for possible reasons for the anomaly. For example, staff check whether field parameters met the stabilization requirements of the sampling and analysis plan before groundwater samples were collected. Staff review whether groundwater extraction rates and volumes were within the range recommended to ensure representative samples. Laboratory QA/QC information is also reviewed for possible explanations. For example, VOC detections in corresponding trip blanks indicate possible sample contamination. Relative percent differences greater than 35% in duplicate samples indicate problems with laboratory contamination or precision.

[8] Method blanks prepared by extracting and analyzing deionized water are run to check for contamination in laboratory equipment. Since the sample matrix (e.g. water or sediment) may impact the accuracy and precision of the laboratory results, matrix spikes are preformed to evaluate the efficiency of the sample extraction and analysis procedures. The matrix spike is prepared by adding known concentrations of target compounds to a sample, then extracting and analyzing the sample to see if the detected concentrations fall close enough to their original concentrations for the results to be considered valid. Surrogate spikes are used to determine the accuracy of analytical methods in the sample matrix. Known amounts of surrogate compounds chemically similar but not identical to the compounds being analyzed for are added to the field sample. The surrogate compounds are analyzed for and the results compared to the original amounts added to determine if the percent recovery falls within acceptable limits established for each surrogate compound. Surrogate spikes allow for tests of analytical accuracy without the interference problems that may occur with normal spikes due to the presence of the spiked compounds in the sample.

Groundwater Monitoring

The following sections describe the groundwater monitoring system at the SCLF, development of the corrective action program (CAP) currently in place, the groundwater monitoring program, and groundwater monitoring results.

Groundwater Monitoring System

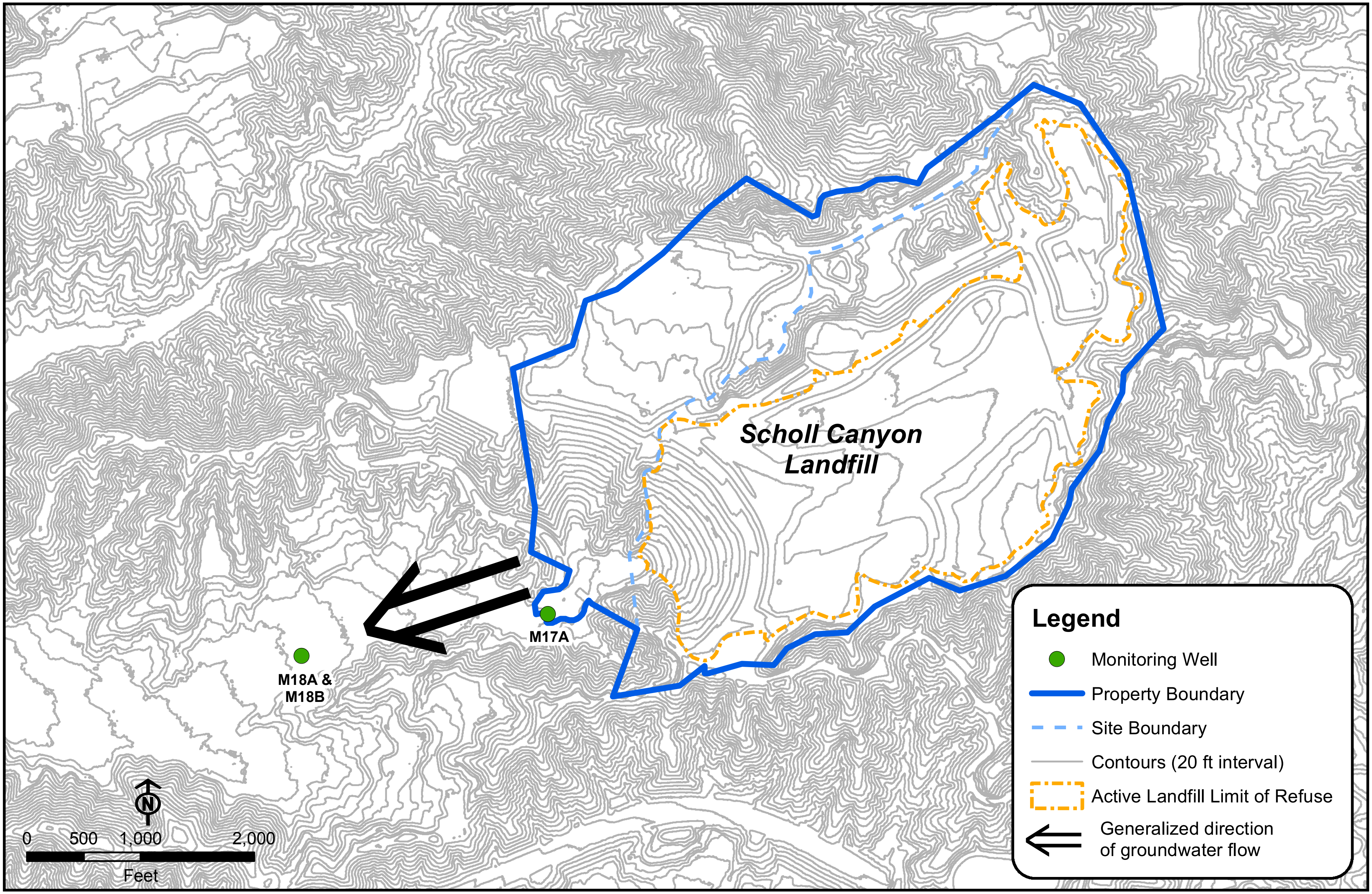
The SCLF groundwater monitoring system approved by the RWQCB, Los Angeles Region, includes 10 on site monitoring wells immediately downgradient of Barrier 1 (M01A, M02B, M03A, M04B, M05A, M06B, M07A, M08B, M09A, and M10B) as shown in Figure 6.9-3 and three off site downgradient monitoring wells (M17A, M18A, and M18B) as shown in Figure 6.9-4. All of the above monitoring wells were installed in 1987 except monitoring well M18B, which was installed in 1992. The 10 monitoring wells at Barrier 1 monitor the effect of the SCLF on groundwater quality immediately downgradient of the barrier. Four of the alluvial monitoring wells (M01A, M03A, M07A, and M09A) do not typically contain water and thus are not routinely sampled.

Off site monitoring well M17A is located approximately 850 feet downgradient of Barrier 1 on the western edge of Scholl Canyon Park. Monitoring well M17A characterizes groundwater quality leaving the site property boundary and the degree of natural attenuation of VOCs in the Scholl Canyon Park area. Monitoring wells M18A and M18B are approximately 3,200 feet downgradient of Barrier 1 in Glenoaks Park. These monitoring wells allow evaluation of groundwater quality at a distance from the site. As discussed in the section on local groundwater quality, the upgradient monitoring well located on the northeast ridge of Scholl Canyon is not representative of the downgradient monitoring wells, and thus is not used to monitor background water quality at the SCLF. Instead, the Sanitation Districts performed the two experimental studies with native soil and bedrock to establish background water quality conditions, refer to Table 1 (Appendix K of the DEIR).

Corrective Action Program

As part of an evaluation monitoring program (EMP), the Sanitation Districts monitored groundwater quality and characterized subsurface conditions at the SCLF. These studies, which were completed in 1996, indicated that the groundwater immediately downgradient of Barrier 1 was affected by the SCLF. The Sanitation Districts determined that enhancing groundwater control at Barrier 1 would be the most effective way to mitigate the water quality concerns at the site. As described in *Piezometer Installation and Pump Testing, Scholl Canyon Landfill Barrier One Area* (HLA, 1994), which was submitted to the RWQCB, Los Angeles Region on March 29, 1996, one set of extraction wells screened in both alluvium and bedrock was identified as the most cost-effective way to enhance groundwater control at Barrier 1, since the alluvial and bedrock groundwater are interconnected components of a single aquifer system. Although there had been no pronounced landfill effect on groundwater quality at off site monitoring wells M18A and M18B due to natural attenuation, the Sanitation Districts proposed a Corrective Action Program (CAP) based on the results of the EMP.

The Sanitation Districts submitted *Amended Report of Waste Discharge – Corrective Action Program, Scholl Canyon Landfill* (AROWD-CAP) (Sanitation Districts, 1997a) to the RWQCB, Los Angeles Region on March 31, 1997. In it, the Sanitation Districts proposed: 1) a CAP based on the results of the HLA study; 2) a water quality monitoring program to assess the effectiveness of the corrective action measures; and 3) a water quality protection standard (WQPS) to determine when the SCLF can return to a more standard detection monitoring program. The Sanitation Districts proposed



Source: County Sanitation Districts of Los Angeles County

Figure 6.9-4
Downgradient Groundwater Monitoring Wells

Scholl Canyon Landfill Expansion EIR

Path: R:\Planning\GIS-Team\SolidWaste\SCLF\projects\SCLF_EIR_WQ_Exhibit_4_Downgradient_GW_Monitoring_Wells.mxd to enhance the existing groundwater extraction system by installing five new extraction wells that would be screened in both alluvium and bedrock upgradient of the Barrier 1. The six existing alluvial extraction wells (EW1A, EW2A, EW3A, EW4A, EW5A, and EW6A), which were installed in 1987, would serve as backup to the new extraction wells. Because enhanced groundwater extraction at Barrier 1 may induce landfill gas migration and contact with groundwater by lowering the groundwater level, the Sanitation Districts proposed to monitor for landfill gas migration in existing groundwater wells in the vicinity of the barrier and, if necessary, install new gas control wells near the toe of the landfill.

The Sanitation Districts subsequently submitted an addendum to the AROWD-CAP on November 10, 1997 (Sanitation Districts, 1997b), pursuant to comments received from the RWQCB, Los Angeles Region on October 16, 1997. The addendum revised the proposed WQPS to be used during the CAP. The proposed CAP was approved by the RWQCB, Los Angeles Region on November 24, 1997, and the Sanitation Districts began implementing the CAP in January 1998.

As part of the approved CAP, five bedrock extraction wells (EW1B, EW2B, EW3B, EW4B, and EW5B) were installed in October 1998. Operation of these new extraction wells began on December 17, 1998. The existing alluvial extraction wells (EW1A, EW2A, EW3A, EW4A, EW5A, and EW6A) were not abandoned, but the pumps were removed from alluvial extraction wells EW1A, EW2A, EW3A, EW4A, and EW5A upon completion of the bedrock extraction wells. Alluvial extraction well EW6A is still operational, but is usually too dry to be pumped. The final report for the CAP project, *Hydrogeological Investigation and Installation of Extraction Wells for a Corrective Action Program at Scholl Canyon Landfill* (AES, 1999), was submitted to the RWQCB, Los Angeles Region on July 1, 1999.

On September 19, 2001, WDRs Order No. 01-132 was adopted and MRP No. 2846 was amended to incorporate provisions of the CAP. The updated groundwater monitoring requirements were implemented in fourth quarter 2001. Landfill gas monitoring results showed that enhanced groundwater extraction did not promote landfill gas migration in the Scholl Canyon Park area or cause the VOC concentration in groundwater to increase. In accordance with the revised monitoring requirements in Order No. 01-132 and MRP No. 2846, the Sanitation Districts discontinued the landfill gas monitoring portion of the CAP (the monitoring of the groundwater wells near the barrier) at the end of third quarter 2001.

Groundwater Monitoring Program

Groundwater monitoring programs must comply with federal regulations (Title 40 CFR Part 258), California state regulations (Title 27 CCR Division 2), and WDRs and MRPs issued by the RWQCB. Currently, groundwater monitoring at the SCLF is conducted subject to the conditions in WDRs Order No. 01-132 and MRP No. 2846. In addition, RWQCB Order No. 93-062 applies to the entire site.

The groundwater monitoring system includes the 13 on site (M01A, M02B, M03A, M04B, M05A, M06B, M07A, M08B, M09A, and M10B) and off site (M17A, M18A, and M18B) monitoring wells described in the section discussing the groundwater monitoring system. These 13 monitoring wells are monitored quarterly for the parameters listed in Table 2 (refer to Appendix K of the DEIR), which summarizes the groundwater monitoring results, and once every five years for the constituents of concern listed in Table 3 (Appendix of K of the DEIR) to demonstrate the effectiveness of the corrective action measures and to ensure that the landfill does not affect the beneficial uses of the groundwater in nearby groundwater basins. Alluvial monitoring wells M01A, M03A, M07A, and

M09A are typically dry and, thus, usually not sampled. The monitoring results are reported in quarterly and annual water quality monitoring reports to the RWQCB, Los Angeles Region.

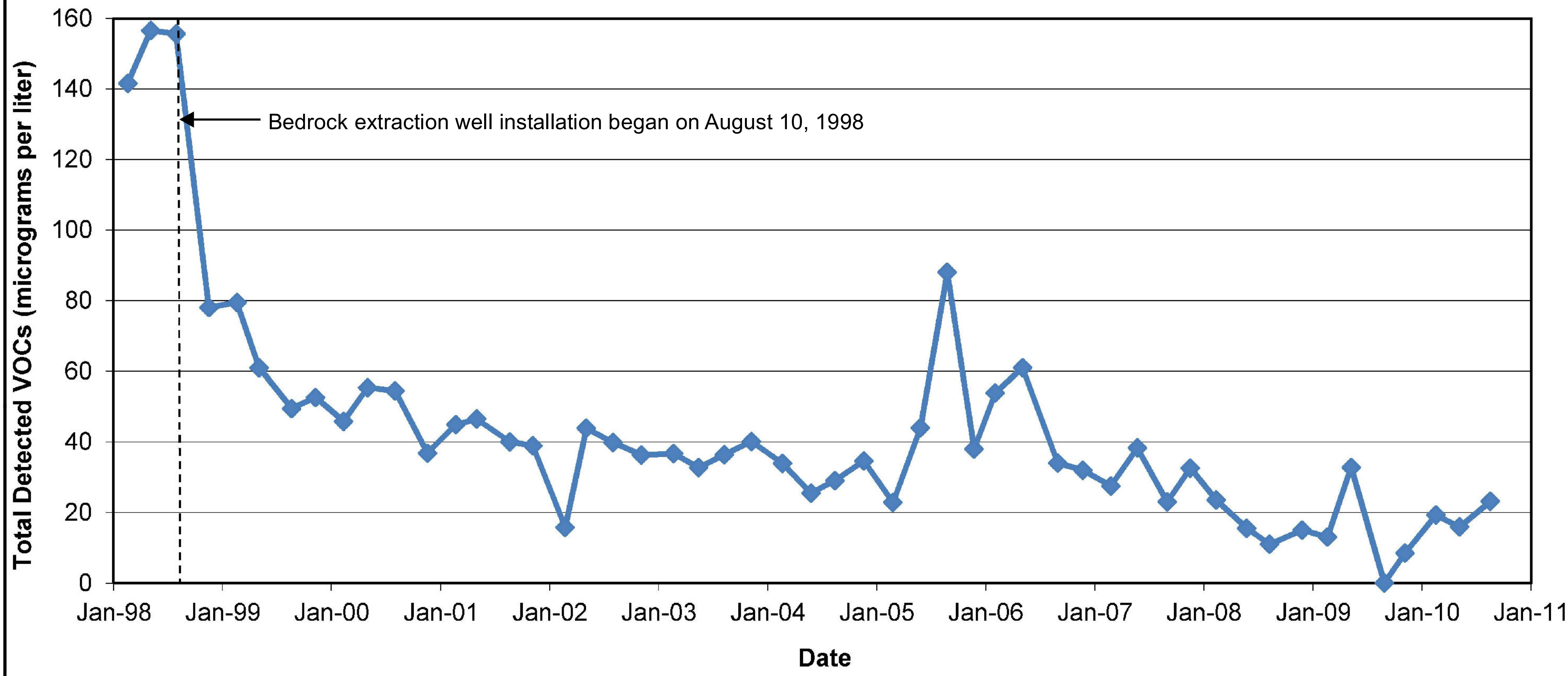
In the AROWD-CAP, the Sanitation Districts proposed to evaluate changes in water quality to determine the long-term effectiveness of enhanced groundwater extraction and to submit the results in the quarterly and annual water quality monitoring reports. Since the first quarter of 2000, the Sanitation Districts have been performing statistical trend analyses of the VOCs most frequently detected in groundwater and reporting the results quarterly and annually. The results have shown that the CAP being implemented is effective because VOC levels have been either decreasing or have stabilized. Figure 6.9-5 shows the total concentration of detected VOCs in monitoring well M06B, which had the highest total concentration of detected VOCs among the Barrier 1 monitoring wells before bedrock groundwater extraction began in December 1998. Data from 1998 is included to show VOC concentrations before bedrock groundwater extraction began. Figure 6.9-5 shows detected VOCs decreasing by almost 90% and supports the findings of the trend analyses.

When VOCs are detected at monitoring well M18A or M18B, the Sanitation Districts look for corresponding upgradient detections at off site monitoring well M17A and the on site monitoring wells to determine whether the VOC detections are related to the SCLF. If there are no corresponding detections, the Sanitation Districts conclude that the VOC detections are not related to the landfill. Since the CAP was implemented in 1998, eight VOCs have been detected at downstream monitoring well M18A and one VOC has been detected once at downstream monitoring well M18B. There have been no corresponding detections at the Barrier 1 monitoring wells or monitoring well M17A. Thus, the Sanitation Districts conclude that the VOC detections in monitoring wells M18A and M18B are not related to the SCLF and that these monitoring wells are not affected by the landfill. Nevertheless, the Sanitation Districts continue to monitor these VOCs during routine monitoring events and have established a set of contingent remediation and reporting measures in the event that VOCs potentially related to landfill operations are detected at these monitoring wells. In the future, if necessary, additional measures could include immediately adjusting landfill gas and groundwater extraction operations to mitigate any landfill impacts.

In a letter dated March 6, 2003, the RWQCB, Los Angeles Region required the one-time sampling of compliance groundwater monitoring wells to determine the presence or absence of the following emergent chemicals[9]: perchlorate, N-nitrosodimethylamine, 1,4-dioxane, 1,2,3-trichloropropane, and total chromium/hexavalent chromium. 1,4-dioxane was the only emergent chemical detected at monitoring well M06B during the May 15, 2003, sampling event. To evaluate the extent of emergent chemicals, off site monitoring well M18A was sampled for 1,4-dioxane on May 30 and June 19, 2003. Low levels of 1,4-dioxane were detected at monitoring well M18A. Because of the detection of 1,4-dioxane at monitoring wells M06B and M18A, the Sanitation Districts added 1,4-dioxane to the list of parameters for all monitored wells at the SCLF starting third quarter 2003.

1,4-dioxane occurs in ordinary household products such as shampoos [50 to 300 parts per million (ppm)], dishwashing products (2 to 65 ppm), baby lotion (11 ppm), hair lotions (47 to 108 ppm), bath foams (22 to 41 ppm), and other cosmetic products (6 to 160 ppm). It has been found as an impurity in used ethyl glycol (antifreeze). 1,4-Dioxane is also found in manufactured food additives (at up to 10 ppm) and occurs naturally in shrimp, chicken, tomatoes, coffee, and some condiments (NICNAS, 1998).

[9] Emergent chemicals are synthetic or naturally occurring chemicals not commonly monitored in the environment, but that have the potential to enter the environment and cause known or suspected adverse ecological and/or human health effects.



Note: If duplicate samples were collected on a certain day, the total concentrations of detected VOCs in the two samples were averaged. If a VOC was detected in both a groundwater sample and the corresponding trip blank sample, the concentration in the groundwater sample was included if it was greater than or equal to the concentration in the trip blank sample. If the concentration in the trip blank sample was greater, the VOC was excluded from the calculation.

Source: 2009-10 Water Year ULARA Watermaster Report

Figure 6.9-5

Monitoring Well M06B - Total Concentration of Detected Volatile Organic Compounds

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1,4-dioxane has been detected at low concentrations in various monitoring wells at the SCLF and in the off site monitoring wells M17A, M18A and M18B. However, the multiple VOCs that would be detected if a landfill release occurred are not found frequently at M17A or ever at off site wells M18A and M18B. Because 1,4-dioxane is not detected consistently at the off site wells, the landfill does not appear to be contributing over time to the 1,4-dioxane levels in the groundwater in the area of the landfill. The Sanitation Districts continue to monitor for 1,4-dioxane during routine monitoring.

Surface Water Monitoring

As described in Section 6.8 (Surface Water Hydrology) of the DEIR, surface water diversion and control facilities for the SCLF are designed and constructed to be in compliance with various regulatory requirements. In particular, surface water conveyance systems are designed and constructed to minimize contact of surface water with refuse. These systems operate by: 1) intercepting run-on that would otherwise enter the landfill active disposal area; 2) conveying water that falls within the active disposal area away from the storm drain system at the site; and 3) preventing ponding of water within the active disposal footprint. Landfill surface water runoff is controlled by maintaining a minimum 2 to 3 percent slope on all operating decks to ensure that all stormwater runoff is carried quickly to a collection and conveyance drain pipe. Permanent drainage facilities such as down-drains and catch basins are designed to accommodate discharge from a 100-year occurrence design storm. During wet weather conditions, additional operational measures are implemented, such as minimizing the solid waste cell surface area to limit the solid waste area exposed to rain. Further, all stormwater that drains from the active disposal area is collected, stored in a lined stormwater basin, and reused for dust control. The water from this basin will be discharged to the sanitary sewer through City of Glendale Industrial Wastewater Discharge Permit No. FIW-1229142 once the stormwater basin is connected to the sanitary sewer.

Surface water monitoring at the SCLF is conducted pursuant to the requirements in the NPDES permit for the site. NPDES permits are administered by the RWQCBs. The NPDES permit requires that a SWPPP and a runoff monitoring program be implemented at the site. A SWPPP was implemented for the SCLF in 1992 and has been periodically updated since then. The objectives of the SWPPP are to identify potential sources of pollution that may enter storm or non-storm water discharges and ensure implementation of best management practices (BMPs) to prevent pollutants from entering surface water discharges. The SWPPP includes:

- Identification of landfill activities that could impact surface water quality.
- Identification of materials stored on site that could impact surface water quality.
- Maps of site information relevant to storm water control and pollution prevention.
- BMPs including: scheduling, preventative maintenance, materials handling and storage, employee training, record keeping, spill prevention and response procedures, secondary containment, erosion control, sediment control, and pollution control.

The runoff monitoring program was implemented at the site in 1993. This program consists of visual inspections and runoff sampling and analysis. The objectives of this program are to:

- Ensure storm water discharges do not adversely affect downstream surface water quality.
- Ensure BMPs are evaluated and revised to meet changing site conditions.

- Measure the effectiveness of the BMPs implemented at the site.

The Sanitation Districts implement the runoff monitoring program at the SCLF during each wet season (October through May). Monitoring results, as well as a record of site inspections, are submitted to the RWQCB by July 1 each year in a NPDES stormwater annual report. Surface runoff samples are collected from a designated location, SD5 (shown on Figure 6.9-2), two times a year if the sampling conditions specified in the NPDES permit are met. Samples are analyzed for general parameters, anions, cations, organics, metals, and VOCs. The complete list of monitoring parameters is contained in Section IV.B of MRP No. 2846. Runoff monitoring data collected in 2009 from the NPDES program are presented in Table 4 (Appendix K of the DEIR). Metals detected in the samples are generally associated with natural on site soil, particles from vehicular traffic, and windblown particles. Acetone was detected in 1995 and 1999 and chloroform in 2004 at very low levels in samples from a previous designated sampling location, SD1 (shown on Figure 6.9-2). Acetone has no health-based standards and is a known laboratory contaminant. Chloroform was detected below its maximum contaminant level (MCL) and is a known laboratory contaminant. The monitoring data show that runoff generated at the SCLF does not pose a threat to the water quality of downstream surface water bodies.

The SWRCB recently began using EPA stormwater benchmark values to gauge the effectiveness of BMPs used at facilities operating under the NPDES General Industrial Permit. The EPA stormwater benchmark values are not specified as numerical effluent limits or as action levels in the NPDES General Industrial Permit. The Sanitation Districts monitor surface runoff sampling data and visual observations to determine whether BMPs are effective and adjust BMPs accordingly on an ongoing basis.

The *Waste Acceptance Program and Revised Stormwater Monitoring Program in Response to Amendments to the Waste Discharge Requirements for Puente Hills, Calabasas, and Scholl Canyon Landfills Order No. R4-2011-0052* (Sanitation Districts, 2011) submitted for the SAP includes a revised SWPPP incorporating BMPs that limit constituents in contaminated soils or beneficially reused materials, such as greenwaste and asphalt, from contributing to stormwater runoff. The submittal also includes an updated list of contaminants of concern for the surface water monitoring program that includes potential contaminants from accepted contaminated soil and beneficially reused materials.

Starting September 1, 2011, the Sanitation Districts implemented the runoff monitoring program required by Order No. R4-2011-0052 alongside the program required by the General Industrial Permit. Under this new program, surface runoff samples are collected year-round from SD5 whenever sampling conditions specified in Order No. R4-2011-0052 are met. Monitoring results are submitted to the RWQCB in the quarterly water quality monitoring report for the landfill WDRs.

Industrial Wastewater Monitoring

The Sanitation Districts currently maintain three industrial wastewater discharge permits for the SCLF. Permit No. W-2762 enables the discharge of landfill gas condensate, extracted seep water, and water removed from the radiator filling area to the City of Glendale’s sanitary sewer system. Permit No. W-3835 enables the discharge of extracted groundwater to the sanitary sewer. Permit No. FIW-1229142 enables the discharge of stormwater from the active disposal area to the sanitary sewer. Wastewater discharge through Permit No. FIW-1229142 will begin once the stormwater basin used to collect this water is connected to the sanitary sewer. The majority (approximately 85%) of the wastewater generated at the site is discharged through Permit No. W-3835. During 2009, approximately 11 million gallons of wastewater was discharged to the sewer from the site.

The discharged wastewater is sampled and analyzed in accordance with the requirements specified in the industrial wastewater discharge permits. The City of Glendale Fire Division administers this permit program under the oversight of federal EPA. The constituents detected in these wastewater streams typically include low levels of metals, VOCs and semi-volatile organic compounds. The Sanitation Districts conduct quarterly monitoring to ensure the discharges meet the conditions specified in the permits. Table 5 (Appendix K of the DEIR) summarizes the results of the industrial wastewater monitoring in 2009.

Seep water extracted from Sump 2 and extracted groundwater have historically been reused for dust control, but are not currently being reused. Should the Sanitation Districts decide to reuse seep water or extracted groundwater in the future, they would treat and monitor the reuse water per Sections F.6 and F.7 of WDRs Order No. 01-132.

6.9.2 THRESHOLDS OF SIGNIFICANCE

Adapted from Appendix G of the CEQA Guidelines, implementation of the proposed project would result in a significant adverse impact on the environment related to water quality if it would:

- Violate any surface water quality standards or WDRs.
- Violate any groundwater quality standards or WDRs.
- Otherwise substantially degrade water quality.

6.9.3 METHODOLOGY

The Sanitation Districts have operated the landfill site since 1961. As a result, the Sanitation Districts have considerable knowledge of the site and have conducted extensive studies on the potential water quality impacts of the landfill. The existing water quality protection systems have been designed and operated based on this extensive experience and have been demonstrated to be effective in controlling water quality impacts on the project site. Variations 1 and 2 would both employ similar systems. As part of both variations, the existing water quality control systems would remain in place and be maintained to continue their effectiveness.

To determine the water quality impacts related to the proposed landfill expansion, potential impacts from construction and operational activities were qualitatively analyzed relative to SCLF facilities, programs and practices that protect water quality. The information is this section was compiled from various sources including SCLF permits and reports.

6.9.4 IMPACTS

6.9.4.1 Variation 1

Variation 1 exclusively involves the vertical placement of solid waste over areas already landfilled. Since this is a vertical extension of the current landfill design, the proposed solid waste fill area has groundwater protection systems already in place.

Surface Water Quality

Construction Impacts

Stormwater flows that drain from the project site are routed to storm water receiving structures maintained by the LADPW. The discharge to the stormwater receiving structures is subject to various regulations regarding water quality. On site construction related to Variation 1 could potentially impact the water quality of the flows discharged to the stormwater receiving structures.

Construction activities related to Variation 1 include extending the landfill gas collection system and installing drainage improvements. These activities have the potential to expose disturbed and loosened slopes to the weathering effects of precipitation and wind. Increased erosion and sedimentation could occur if soil is exposed during wet periods. Eroded soils could increase turbidity and concentrations of nutrients, metals and other pollutants associated with sediment in storm water receiving structures. In addition, gas collection trench excavation performed during the extension of the landfill gas collection system could expose solid waste and cause the solid waste to come in contact with storm waterrunoff.

Pollutants may also be introduced into the stormwater receiving structures in the form of chemicals and other materials commonly used at construction sites. Leaked gasoline, oil, solvents, and lubricants are examples of pollutants that may reach storm water receiving structures if not properly contained. The Sanitation Districts have a Spill Prevention Control and Countermeasure (SPCC) Plan to avoid any potential leaks. The potential impacts on water quality related to construction projects are usually short term and diminish once construction is complete.

All construction under Variation 1 would conform to the BMPs in the existing SWPPP for the site, as the SWPPP applies for all activities on site. Thus, the Sanitation Districts would require all contractors to implement all applicable BMPs listed in the SWPPP for on site construction. Sanitation Districts' personnel will monitor the construction to ensure compliance. The requirements to conform to the BMPs in the SWPPP would be contained in the project specifications for each construction project.

The specific BMPs applicable to on site construction include measures to prevent erosion, prevent pollutants in the construction materials from mixing with stormwater, and contain pollutants before they can be discharged. These BMPs are achieved through limiting construction areas to the extent feasible, using silt fences or other means to filter sediment before discharge, and locating material storage areas away from drainage channels. Construction activities may also be restricted by the SWPPP during wet periods. Other standard policies of the SWPPP, including water quality monitoring to ensure that background levels of turbidity and other constituents are not being exceeded, would still be applicable for construction activities. In addition, the SWPPP would require that the construction contractors prepare and implement a hazardous materials management plan, as necessary, to minimize the possibility of construction related chemical spills and prevent releases to drainage facilities. Proper hazardous materials handling, storage, and disposal protocols would be established and enforced. For construction projects in which solid waste would be exposed, the magnitude and time of exposure will be limited to the maximum extent practicable to minimize the potential contact between solid waste and stormwater runoff. Landfill construction procedures that minimize direct contact of stormwater runoff with solid waste during wet weather operations would continue to be implemented.

Therefore, with the continuation of existing practices and compliance with all applicable BMPs listed in the SWPPP, construction related impacts to surface water quality would be considered less than significant.

Operational Impacts

An inadequately designed and/or operated landfill has the potential to cause degradation of surface waters. The quality of surface water could be degraded if allowed to come in contact with solid waste. Also, landfill areas that are exposed and subject to uncontrolled storm run-off can contribute to sediment impacts on the storm water receiving structures. In addition, the site contains various above ground storage structures for materials such as oil, diesel fuel, and landfill gas condensate; if these structures are not designed and maintained properly, surface water quality could be impacted.

Variation 1 includes specific measures to ensure that surface water quality on site would not be degraded. The existing NPDES permit and Order No. R4-2011-0052 require that a SWPPP, SAP, and runoff monitoring program be implemented. The conditions contained in these programs would be continued under Variation 1. The SWPPP identifies specific operations and handling procedures for various materials used at the landfill and identifies controls to protect surface water quality. The implementation of the SAP reduces or eliminates potential pollutants that can be generated from on site reuse of soil.

Therefore, with the implementation of existing practices including compliance with the existing NPDES permit, SWPPP, SAP and runoff monitoring program, operational related impacts to surface water quality would be considered less than significant.

Groundwater Quality

Construction Impacts

There is limited potential impact to groundwater quality due to construction activity. The main concern would be a leak of oil or fuel from construction equipment. Equipment is routinely inspected for leaks. Further, materials to contain and remove leaked materials are maintained on site with a Spill Prevention Control and Countermeasure (SPCC) Plan and SWPPP.

Therefore, construction related impacts to groundwater quality would be considered less than significant.

Operational Impacts

As with potential surface water impacts, an inadequately designed and/or operated landfill has the potential to cause degradation of off site groundwater. Potential impacts on groundwater quality from Variation 1 could result if landfill liquids or gas migrated from the landfill site. Liquid could be generated from the infiltration of surface water through solid waste or from disposal of solid waste with excessive moisture content. This moisture could percolate through the landfill mass, leaching solids and soluble organics from the waste. Landfill gas contains carbon dioxide, methane, and VOCs that could cause the groundwater to become slightly acidic. This acidity could cause an increase in the solubilization of soil minerals, leading to increasing concentrations of soil constituents in the groundwater.

These effects have the potential to degrade groundwater quality if environmental control systems as previously discussed are not in place. As described earlier in this section, there are a variety of landfill groundwater protection systems currently in place. These systems would continue to be operated and monitored. Design and construction of all landfill groundwater protection systems at the SCLF would be reviewed and approved by the RWQCB, Los Angeles Region, prior to any construction.

To reduce the potential for liquid formation, the Sanitation Districts have existing operation and control systems that would be continued as part of Variation 1. These operations and control systems include:

- Implementation of a hazardous waste inspection program and SAP.
- Adhering to the limits specified by the RWQCB for liquid content of incoming waste.
- Operation and maintenance of a landfill gas condensate collection system.
- Operation and maintenance of a stormwater diversion and collection system.
- Installation and maintenance of a low permeability, engineered final cover to control infiltration.

To ensure that any liquid that could potentially be generated does not impact groundwater quality, the Sanitation Districts have existing groundwater protection systems that would be continued as part of Variation 1 and throughout the closure and post-closure period. These groundwater protection systems include:

- Continued operation and monitoring of subsurface barrier extraction system including increased extraction of groundwater or landfill gas, if necessary, by the installation of additional extraction wells.
- Implementation of the approved groundwater monitoring programs under RWQCB, Los Angeles Region's oversight.
- Continued operation of the landfill gas collection system and gas monitoring programs to minimize potential gas contact with groundwater.
- Continued operation of the seepage collection system.
- Implementation of revised CAP measures in the event that water quality is degraded by the landfill.

Therefore, operational related impacts to groundwater quality would be considered less than significant.

Otherwise Substantially Degrade Water Quality

As discussed, compliance with the existing NPDES permit, SWPPP, applicable BMPs, SAP, and runoff monitoring program, as well as the continued operation and monitoring of landfill groundwater protection systems would reduce potential impacts to surface water and groundwater quality to a level that is considered less than significant. Implementation of Variation 1 would not involve any additional potential water quality impacts beyond those described in the impact discussions, above. Therefore, no substantial degradation of water quality would occur.

6.9.4.2 Variation 2

Variation 2 is mainly a vertical extension over previously landfilled areas, but includes a relatively small horizontal expansion as well. Variation 2 involves a 13-acre lateral expansion to the north and would require the installation of a new composite liner system and liquids collection and removal system (LCRS). The composite liner system would prevent migration of any landfill liquid or gas from the expansion area into the soil below or adjacent unfilled areas. The LCRS would ensure that any liquid reaching the bottom of the expansion area does not impact groundwater quality by draining the liquid to an appropriate treatment system. All aspects of liner design and installation would be subject to regulatory review and approval. Construction of these systems would be monitored by an independent quality assurance inspection monitor who would submit all required certifications to regulatory agencies prior to commencement of disposal operations in the lined area. The independent monitor would also submit a final construction report to the regulatory agencies documenting construction methods and quality assurance protocols. The proposed composite liner would meet or exceed all state and federal regulatory requirements. The Sanitation Districts would install a liner as prescribed under Subtitle D regulations or an alternative system approved by the RWQCB, Los Angeles Region that would be equally protective of the environment.

The composite liner system would contain any liquid that may drain through waste in the horizontal expansion area and direct the liquid to LCRS drainpipes. The liquid would then drain by gravity through pipes and be collected for proper disposal. If the liquid cannot gravity drain to the final collection point, a sump could be installed and the liquid pumped to the final collection point. The LCRS would be designed and constructed to ensure that liquid does not accumulate to a depth of more than 30 centimeters above the liner.

Surface Water Quality

Construction Impacts

The same concerns and responses as mentioned for Variation 1 in Section 6.9.4.1 apply to Variation 2 with the exception of more overall construction activity due to construction of the liner and LCRS for the horizontal expansion area. This additional construction activity would not significantly raise the likelihood of a negative impact.

Therefore, the less than significant construction impact related to surface water quality conclusion for Variation 1 also applies to Variation 2.

Operational Impacts

The same concerns and responses as mentioned for Variation 1 in Section 6.9.4.1 apply to Variation 2. With the implementation of existing practices including compliance with the existing NPDES permit, SWPPP, SAP and runoff monitoring program, operational impacts related to surface water quality would be considered less than significant.

Groundwater Quality

Construction Impacts

The same concerns and responses as mentioned for Variation 1 in Section 6.9.4.1 apply to Variation 2 with the exception of more overall construction activity due to construction of the liner and LCRS for the horizontal expansion area. This additional construction activity would not significantly raise the likelihood of a negative impact.

Therefore, the less than significant construction impact related to groundwater quality conclusion for Variation 1 also applies to Variation 2.

Operational Impacts

The same concerns and responses as mentioned for Variation 1 in Section 6.9.4.1 apply to Variation 2. Variation 2 also has the potential to impact groundwater underneath or adjacent to the expansion area if landfill liquids or gas were to migrate. Such migration would be prevented through the construction and operation of the liner system, LCRS and gas collection system for the expansion area. As such, operational impacts related to groundwater quality would be considered less than significant.

Otherwise Substantially Degrade Water Quality

Compliance with the existing NPDES permit, SWPPP, applicable BMPs, SAP, and runoff monitoring program, construction of liner and LCRS for the expansion area, and the continued operation and monitoring of landfill groundwater protection systems would reduce potential impacts to surface water and groundwater quality to a level that is considered less than significant. Implementation of Variation 2 would not involve any additional potential water quality impacts beyond those described in the impact discussions, above. Therefore, no substantial degradation of water quality would occur.

6.9.5 MITIGATION MEASURES

6.9.5.1 Variation 1

No mitigation measures are required.

6.9.5.2 Variation 2

No mitigation measures are required.

6.9.6 LEVEL OF SIGNIFICANCE AFTER MITIGATION

6.9.6.1 Variation 1

Implementation of Variation 1 would result in less than significant impacts related to a violation of surface water quality standards or waste discharge requirements and groundwater quality standards or waste discharge requirements, and would not result in significant adverse impacts related to a degradation of water quality.

6.9.6.2 Variation 2

Implementation of Variation 2 would result in less than significant impacts related to a violation of surface water quality standards or waste discharge requirements and groundwater quality standards or waste discharge requirements, and would not result in significant adverse impacts related to water quality.