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By Alameda County Environmental Health at 2:25 pm, Oct 07, 2013



October 2, 2013

Mr. Jerry Wickham  
Alameda County Health Care Services  
Environmental Health Services  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

**Subject:** Soil and Groundwater Site Management Plan at the Mission Valley Rock and Asphalt Plant Located at 7999 Athenour Way in Sunol, California Alameda County Case No. RO0000207 and GeoTracker Global ID T0600102092

Dear Mr. Wickham:

The attached Soil and Groundwater Site Management Plan was prepared by ARCADIS U.S., Inc. (ARCADIS) on behalf of Lehigh Hanson West Region ("Hanson") for the asphalt plant area of the Hanson Aggregates Former Mission Valley Rock Facility, located at 7999 Athenour Way, Sunol, California ("the Site"). The site management plan was prepared in response to the Alameda County Environmental Health Services (ACEH) letter to Hanson dated March 13, 2013 and presents the management processes for the residual petroleum-affected soil and groundwater.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report are true and correct to the best of my knowledge.

If you have any questions or comments concerning this report, please call Tina Lau, Environmental Manager, at (925) 244-6584 or Ron Goloubow of ARCADIS at (510) 596-9550.

Sincerely,

Mike Roth  
Vice President/General Manager  
Lehigh Hanson West Region

Attachment

## **Lehigh Hanson West Region**

### **Soil and Groundwater Site Management Plan**

Hanson Aggregates Mission Valley Rock  
Facility, 7999 Athenour Way  
Sunol, Alameda County, California  
(SLIC Case #RO0000207 and  
GeoTracker ID T0600102092)

October 2, 2013



*Caitlin Bell*

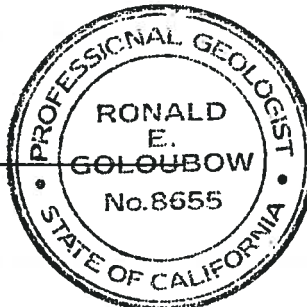
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Caitlin Bell, P.E.  
Staff Environmental Engineer

*R. Goloubow*

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Ron Goloubow, P.G.  
Principal Geologist  
California Professional Geologist (8655)



Expires No. 30. 2013

**Soil and Groundwater Site  
Management Plan**

Mission Valley Rock and Asphalt  
Plant, 7999 Athenour Way, Sunol,  
California

Prepared for:  
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Our Ref.:  
EM009480.0016

Date:  
October 2, 2013

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## **1. Introduction**

On behalf of Lehigh Hanson West Region (Hanson), ARCADIS U.S., Inc. (ARCADIS) is submitting this Soil and Groundwater Site Management Plan (SMP) to prevent future exposure to residual contamination that remains in place following the completion of site investigation and cleanup activities at the Mission Valley Rock and Asphalt Plant located at 7999 Athenour Way in Sunol, California (Figure 1). The portion of the facility that is subject to the SMP is illustrated on Figure 2 and will be referred to in the remainder of this SMP as the Burdened Property. This SMP is incorporated by reference into a Covenant and Environmental Restriction on Property, which has been recorded for the Burdened Property. The SMP includes the following information, per the request of the ACEH in the letter dated March 13, 2013:

1. Site background
2. Summary of remedial actions and current environmental conditions
3. Summary of human health risks
4. Institutional controls
5. Specific controls on the use of groundwater at the Burdened Property
6. Requirement for ACEH notification and approval of subsurface activities that will encounter residual contamination
7. Requirement for a health and safety plan for all subsurface work
8. Protocols for excavation, grading, and management of excavated materials
9. Periodic inspection
10. Contingency plan for discovery of unknown features of environmental concern

The objective of this SMP is to provide a mechanism for continued protection of the health and safety of future Site workers and visitors due to residual contamination remaining in soil and groundwater within the Burdened Property (Figure 2).

### **1.1. Soil and Groundwater Site Management Plan Organization**

The remainder of this SMP is organized as follows:

- Section 2 provides a summary of the Site background, geology, hydrogeology, environmental conditions, and historical investigations and remedial actions.
- Section 3 provides a review of the human health risks at the Burdened Property.
- Section 4 provides the summary of the institutional controls being employed at the Burdened Property.
- Section 5 is the management plan for soil and groundwater including notification requirements, health and safety considerations, groundwater use controls, guidance for soil management, inspection requirements, contingency plan for discovery of unknown features of environmental concern, record keeping requirements, and availability of the SMP.
- Section 6 provides cited references.

## **2. Site Background**

The Burdened Property is located within the 588-acre Mission Valley Rock Facility previously owned by Mission Valley Rock (MVR) Company since the 1950s. Hanson purchased the property in early 2005 but retained the business and legal entity of MVR. The facility is currently operated as a sand and gravel quarry with an asphalt manufacturing facility and a ready mix concrete plant. Additionally, various areas throughout the facility are leased for industrial, agricultural, and storage purposes. The Burdened Property, which is the portion of the facility subject to this SMP, has been impacted by unauthorized releases of petroleum hydrocarbons from gasoline and diesel fuel underground storage tank systems.

### **2.1. Geology and Hydrogeology**

Sediments beneath the Site consist of approximately 5 to 20 feet of relatively low-permeability silts, clays, and clayey gravels overlying approximately 20 to 30 feet of relatively permeable fine- to coarse-grained gravels, that are considered to be the predominant water-bearing stratum. The Livermore Formation encountered at approximately 30 to 40 feet below ground surface (bgs) underlies these shallower water-bearing strata and appears to be somewhat less permeable than the overlying strata due to increased fines content.

The depth to groundwater beneath the Site typically ranges from 2 to 6 feet bgs. Groundwater flow conditions in the vicinity of the Site are influenced by low-permeability features, such as the former gravel pits filled with relatively less permeable, finer-grained sediment, and by groundwater removal from adjacent former mining pits. The local flow direction generally has been to the south, southeast, and east, as measured in site groundwater monitoring wells since approximately 1998 (Figures 3 through 5). Historically, the groundwater table likely fluctuated significantly as nearby aggregate mining pits were advanced, dewatered, and then filled with water and silt.

## **2.2. Environmental Conditions and Chemicals of Concern**

The asphalt plant has been in operation since approximately 1980. Operations from 1980 to 1996 included two 10,000-gallon diesel fuel underground storage tanks (USTs) and one 2,000-gallon gasoline UST used to fuel company vehicles (Figure 2), all of which were removed in June 1996.

A fourth UST (10,000-gallon diesel; designated "D-4") was located in the southeastern portion of the Burdened Property and apparently was partially buried (Figure 2). UST D-4 reportedly was abandoned and removed and is not believed to have released significant quantities of petroleum hydrocarbons to the environment. A fifth UST (diesel, approximately 8,000 to 10,000 gallons) may have been located in the southern portion of the Burdened Property, approximately beneath the two existing 25,000-gallon asphalt cement aboveground storage tanks (ASTs). Per an unverified account of a former Site worker, this fifth UST was used for a few years before being abandoned in place (likely filled with concrete) during the 1970s, before the asphalt plant was built. No other USTs or ASTs are reported to have existed at the Burdened Property since approximately 1970. The chemicals of concern are those related to diesel and gasoline stored in the area shown in Figure 2. The existing 25,000-gallon ASTs contain asphalt cement and are not considered a potential source of the diesel-range organic compounds that have been detected in groundwater samples collected from the Burdened Property (Figure 2).

## **2.3. Investigations and Remedial Activities**

Remedial actions were initiated at the Burdened Property when the two 10,000-gallon diesel fuel USTs and one 2,000-gallon gasoline UST were removed in June 1996 by Tank Protect Engineering (1997). Impacted soil and groundwater were found during the UST removal. The USTs were found to be in good condition with no holes evident, although a ¼-inch-diameter hole was observed in one of the fuel lines. Several



subsurface investigations have been completed by past consultants from 1996 through the present in the vicinity of the asphalt plant (Tank Protect Engineering 1997).

Several investigations have been completed at the Burdened Property since 1996. The scope of these investigations included the analysis of soil and grab groundwater samples collected during the advancement of approximately 18 soil borings, and the installation and monitoring of 27 groundwater monitoring wells (currently there are 26 groundwater monitoring wells; former well MW-2 was abandoned in 2005).

Groundwater monitoring wells MW-1 through MW-8 were installed as single, double, or triple completion wells where one or more wells are completed in a single boring. Well clusters MW-9 through MW-12 were installed during April and May 2006 as groups of single completion wells with well screens at three different depths. Groundwater monitoring wells at the Burdened Property are designated based on their well screen depths as shallow ("S", screened approximately from 5 to 10 feet bgs), deep ("D", screened approximately between 15 and 25 feet bgs), and Livermore Formation ("LF", screened approximately from 35 to 40 feet bgs and believed to be approximately within the top 5 to 10 feet of the Livermore Formation). A summary of the construction details for each groundwater monitoring well installed, including latitudinal and longitudinal location of each well or well cluster, is included for ease of future identification of the areas of residual soil and groundwater impacts (Table 1).

The soil data collected in the vicinity of the asphalt plant indicate the presence of low concentrations (less than 1,400 milligrams per kilogram [mg/kg]) of petroleum-related constituents, specifically diesel-range total petroleum hydrocarbons (TPHd), near the former USTs (Figure 6 and Appendix A). Residual soil impacts are located in similar areas to residual groundwater impacts, as discussed below.

### 2.3.1. Remedial Action

Based on the results of previous investigations and groundwater monitoring conducted at the Burdened Property, ACEH concurred with LFR Inc. (LFR) in an April 27, 2007 letter that no additional characterization investigations are necessary for this Site. ACEH requested that a scope of work be submitted to implement pilot testing of the LFR proposed remedial alternative for affected groundwater in the vicinity of well cluster MW-9 (ACEH 2007a). LFR submitted a work plan on August 3, 2007 describing the scope of work to perform a pilot study to test the effectiveness of injecting air to enhance the natural biodegradation in the vicinity of well cluster MW-9 (LFR 2007b). The pilot test work plan was approved by ACEH on August 30, 2007 (ACEH 2007b), and LFR conducted the pilot test in January and February 2008.

As described in the Air Sparge Pilot Test Completion Report (LFR 2008a), results of the pilot test indicated that effective delivery of oxygen into groundwater to approximately 45 feet bgs (into the “S”, “D,” and “LF” groundwater depth intervals) can be achieved using a conventional air injection approach. Increases in microbial populations, oxidation-reduction potential (ORP), and dissolved oxygen (DO) concentrations, and decreases in total petroleum hydrocarbons (TPH) and TPH-related compound concentrations observed during and/or after the pilot test indicated that oxygen injection created conditions that enhanced biodegradation in the source area.

Based on the successful results of the pilot test, LFR submitted a work plan on October 3, 2008 (LFR 2008b) proposing the adoption of air injection as the remedial approach in the vicinity of monitoring well MW-9 and adoption of a monitored natural attenuation (MNA) approach for the remainder of affected groundwater. MNA was proposed as an effective remedial approach because historical groundwater data indicated attenuation mechanisms were effective at stabilizing the migration of the affected groundwater and resulted in decreasing trends in the majority of the plume. These remedial approaches were approved by ACEH in a letter dated October 24, 2008 (ACEH 2008).

A full-scale air injection system was installed in March 2009. The air injection system consisted of an air compressor and associated piping to inject compressed air through a series of regulators, filters, valves, flow meters, hoses, and eventually through the screened intervals of injection wells OXY-1D and OXY-1LF. These two wells were constructed with wells screens located somewhat deeper than well screens for wells MW-9D and MW-9LF, respectively. The air injection system was started on April 6, 2009 and operated until July 15, 2010.

### 2.3.2 Groundwater Monitoring

As requested by ACEH, groundwater monitoring of select wells located in the vicinity of the air injection system was conducted on a quarterly basis to monitor the performance of the air injection system. Semi-annual groundwater monitoring of all Burdened Property wells was conducted until September 2010. The area extent of residual petroleum hydrocarbons in groundwater in September 2010 is shown on Figures 7 through 9.

Light non-aqueous phase liquid (LNAPL) was measured in groundwater monitoring wells MW-2, MW-2S, MW-2D, MW-3, MW-9D, and MW-11D (ARCADIS 2011; ARCADIS 2012; ARCADIS 2013). LNAPL thicknesses in those wells ranged from a non-measurable sheen (less than 0.01 foot) to approximately 4 feet (well MW-2 in January 1999). However, data collected through 2010 indicated LNAPL thicknesses

decreased significantly over time, and an appreciable measurable amount of LNAPL had not been measured in any wells at the Burdened Property between 2002 and 2010 (ARCADIS 2011).

In response to comments provided by ACEH in a June 21, 2012 letter (and as part of the regulatory case closure process) a water level elevation survey was conducted at the Burdened Property in May 2012 (ARCADIS 2012). During that water level elevation survey, approximately 0.61-foot of LNAPL was measured in well MW-11D. In addition, during two previous water level measurement events on December 24, 2010 and September 27, 2010 a “petroleum hydrocarbon-like liquid,” was observed on the water level probe; however, LNAPL thickness was not measured using an interface probe (ARCADIS 2011). As a result of the measurement of the LNAPL at well MW-11D, in a letter dated June 21, 2012 the ACEH requested an additional investigation to assess the vertical extent of the LNAPL and the properties of the LNAPL.

### 2.3.3 LNAPL Investigation

From December 2012 through January 2013, ARCADIS conducted a series of investigations to determine the characteristics of the LNAPL in MW-11D, including a bail down test to determine the transmissivity of the LNAPL, characterization of a sample of the LNAPL, and a cone penetrometer test/laser induced fluorescence (CPT/LIF) investigation to determine the vertical extent of the LNAPL in the vicinity of monitoring well MW-11D (ARCADIS 2013). The results of these activities suggested the nature of the LNAPL is a highly-weathered diesel with limited transmissivity (i.e., not mobile). Based on the high degree of microbial degradation identified within the LNAPL, it was concluded that the original release of LNAPL occurred in the distant past. The anticipated source of the LNAPL is the former USTs; there is no indication that there is an ongoing source of LNAPL at the Burdened Property. The mass of residual LNAPL remaining in the subsurface is expected to decrease with time and remain within the area it currently occupies; the residual LNAPL within the subsurface is likely immobile based on its age and the results of the bail down test. Therefore, it is not anticipated that the LNAPL will move laterally within the subsurface to impact other areas of the Burdened Property.

The results of the LIF investigation indicate the vertical extent of potentially petroleum-impacted soil within this area is approximately 18 feet thick. The screen interval of monitoring well MW-11D lies within this vertical interval; therefore, it is not anticipated that LNAPL within MW-11D will move vertically to impact a new area. The integrity of

monitoring well MW-11D remains intact so further migration of LNAPL through cracks or other imperfections in the well construction of MW-11D is not anticipated.

### **3 Summary of Human Health Risks**

The following is a summary of the potential human health risks associated with the residual petroleum concentrations in the vadose zone soil, soil gas, and groundwater at the Burdened Property. There are several potential exposure pathways (LFR 2007a). These include ingestion, inhalation, or dermal contact with soil; inhalation of ambient air; and ingestion, inhalation, or dermal contact with groundwater. For a potential exposure pathway to be considered a complete exposure pathway there must be a source of chemical concentrations above thresholds for risk to human health, a media through which contamination moves, and a receptor that comes into contact with the media.

The former USTs and historical operations have resulted in residual concentrations of petroleum constituents in three media: soil, soil gas, and groundwater. Potential receptors include Site workers and Site visitors, including contractors. Based on current routine Site activities that do not involve subsurface excavation, there are no completed pathways for a Site worker or visitor in the area outlined in Figure 2 to contact with any of the media identified above. However, there is a potential for future exposure to residual contamination for human receptors involved in excavation or construction activities. Section 5 of this SMP identifies management protocols to minimize potential exposure.

#### **3.3 Soil**

Petroleum-affected vadose zone soil is generally located in the vicinity of the former USTs and asphalt plant (Figure 6). During historical investigation activities, petroleum-related constituents were detected in soil samples collected within the vadose zone (taken as the top 5 feet of soil) at concentrations ranging from 0.0043 mg/kg benzene at the soil boring associated with monitoring wells MW-5S and MW-5D to 1,400 mg/kg TPHd at soil boring TB-6. These values represent the highest concentrations of petroleum constituents detected within the top 5 feet of soil. Many of these detected values were above the applicable 2013 Tier 1 Environmental Screening Levels (ESLs) put forth by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) for commercial land use soils that are less than 3 meters bgs in an area where the groundwater is considered a current or potential drinking water source.

Potential exposure pathways for Site workers and Site visitors or contractors to shallow soil contamination include ingestion, inhalation, or dermal contact of affected media. Based on routine Site operations and the institutional controls described in Section 4 below, these potential exposure pathways are not anticipated to be completed. Section 4 and Section 5 of this SMP detail the actions to be taken to prevent human exposure to petroleum-related constituents in soil while performing routine and infrequent subsurface activities at the Burdened Property.

### **3.4 Soil Gas**

Based on the analytical results for soil gas samples collected between February 2008 and December 2010 (LFR 2010), historical concentrations of petroleum constituents in soil gas ranged from 6 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of toluene in SG-3 to 550,000  $\mu\text{g}/\text{m}^3$  of gasoline-range total petroleum hydrocarbons (TPHg) in samples collected from soil gas point SG-4. These concentrations were detected during the air injection pilot study, as well as during operation of the full air injection system. There were no soil gas concentrations detected above the applicable 2013 Tier 1 ESLs to screen for vapor intrusion concerns for commercial/industrial land use (Table 2). The protocols detailed in Section 4 and Section 5 for management of affected soil are also designed to detect and eliminate human exposure to petroleum-related constituents in soil gas while performing routine and infrequent subsurface activities at the Burdened Property.

### **3.5 Groundwater**

Petroleum-affected groundwater is generally located in the vicinity of the former USTs (Figures 7 through 9). The horizontal extent of groundwater impacts varies with vertical depth, with the largest extent within the deeper aquifer zone and the smallest extent within the Livermore Formation. TPHg detected in groundwater samples collected in September 2010 ranged from 50 micrograms per liter ( $\mu\text{g}/\text{L}$ ) at monitoring well MW-2D to 13,000  $\mu\text{g}/\text{L}$  at monitoring well MW-7D (see Figure 8). Similarly, TPHd detected in groundwater samples collected in the most recent groundwater sampling event (September 2010) ranged from 51  $\mu\text{g}/\text{L}$  at monitoring well MW-5D to 47,000  $\mu\text{g}/\text{L}$  at monitoring well MW-11D (see Figure 8). Lastly, methyl-tert-butyl ether (MTBE) detected in groundwater samples collected in September 2010 ranged from 0.61  $\mu\text{g}/\text{L}$  at monitoring well MW-12LF to 110  $\mu\text{g}/\text{L}$  at monitoring well MW-11LF. Many of these groundwater concentrations of TPHg, TPHd, and MTBE were detected above the applicable Tier 1 ESLs for groundwater that is a current or potential drinking water

source. These ESLs for TPHg, TPHd, and MTBE are 100 µg/L, 100 µg/L, and 5 µg/L, respectively.

Potential exposure pathways for Site workers and Site visitors or contractors include ingestion, inhalation, or dermal contact of the affected groundwater. Based on the current land use, routine Site operations, current water supply sources, and the institutional controls described below, these potential exposure pathways are not considered complete. Section 4 and Section 5 of this SMP detail the actions to be taken to eliminate human exposure to petroleum-related constituents in groundwater when performing routine and infrequent subsurface activities. The extent of impacted groundwater has been demonstrated to be stable in size and is anticipated to remain within the area identified in Figure 2.

#### **4 Summary of Institutional Controls**

Institutional controls include administrative and legal controls to limit human contact with residual contamination in soil and groundwater remaining within the Burdened Property identified on Figure 2. A Covenant and Environmental Restriction on Property (Covenant) has been recorded for the Burdened Property which is identified on Figure 2. The Covenant and this SMP limit the land use within the area identified in Figure 2 to industrial, commercial, or office space. However, notification and approval by ACEH is required prior to excavation or subsurface disturbance during construction. Agricultural use of the land to grow any type of food for human consumption is not allowed. However, use of the land for cattle grazing, or other livestock grazing, is permitted. This is due to the limited root depth necessary for grass growth and the associated limited human interaction with the impacted soils. No residence or human habitation, hospital, school for persons under 21 years of age, day care centers for children or seniors, or gardening will be permitted under the Covenant.

The Covenant and this SMP also restrict the use of groundwater at the Burdened Property. No water supply wells are to be installed within the Burdened Property unless approved in writing by ACEH. Furthermore, water wells are not to be installed within 1,000 feet in any direction from the area outlined as the Burdened Property on Figure 2. Water supply wells may be installed at the Mission Valley Rock facility at a distance of more than 1,000 feet from the Burdened Property without prior approval of ACEH.

Additionally, activities that cause a disturbance to soil or groundwater within the Burdened Property are not to be conducted without the approval of ACEH and are to be performed in accordance with the requirements set forth in this SMP.

## **5 Soil and Groundwater Site Management Plan**

The following specifies the general procedures for notifications and approvals, health and safety requirements, and handling, moving, storing, and reusing or disposing of soil and groundwater that may be encountered during routine or infrequent subsurface activities conducted at the Burdened Property.. Activities that may cause soil or groundwater disturbance at the Burdened Property include, but are not limited to, the following:

- grading,
- removing/installing underground utilities and utility pipeline repair activities,
- installing foundations,
- mining operations,
- and performing other construction activities.

### **5.3 Notification and Approval Requirements**

Prior to the commencement of subsurface activities listed above that are proposed to take place within the area illustrated on Figure 2, a work plan detailing the scope of the activities and compliance with this SMP will be prepared and submitted to the ACEH for review and approval. After approval is obtained from ACEH the subsurface activities at the Burdened Property may be initiated.

### **5.4 Health and Safety Requirements**

Subsurface activities that may involve contact with impacted soil or groundwater at the Burdened Property within the area illustrated on Figure 2 are subject to the provisions specified in this SMP. Personnel at the Burdened Property who handle, or have the potential to come in contact with, potentially contaminated soil or groundwater shall have the appropriate health and safety training and wear the appropriate personal protective equipment.

Subsurface activities conducted at the Burdened Property within the area illustrated on Figure 2 must be in compliance with applicable rules and regulations governed by the California Division of Occupational Safety and Health (Cal/OSHA), even if not

expressly noted in this SMP. A project-specific health and safety plan shall be prepared prior to initiating subsurface construction work at the Burdened Property.

## **5.5 Groundwater Use Controls**

Residual concentrations of petroleum-related compounds remain within the groundwater at the Burdened Property. As shown on Figures 7 through 9, remaining concentrations are present at various magnitudes at different depths. During current standard operations, Site workers or contractors are not expected to encounter impacted groundwater. Current water usage at the facility is primarily for dust control and aggregate washing. The water is comprised primarily of recycled wash water and collected storm water run-off. As needed, the recycled water system is supplemented with water pumped from containment ponds approximately 2,200 feet north of the area outlined in Figure 2.

Water supply wells are not to be installed within the Burdened Property unless approved in writing by ACEH. Water supply wells for industrial/mining uses may be installed outside the Burdened Property at the MVR facility provided they meet the following conditions:

- The water supply well will be located a minimum of approximately 1,000 feet away (in all directions) from the perimeter of the Burdened Property illustrated on Figure 2.
- The minimum depth of the seal of an industrial water supply well must be located 50 feet bgs per the guidance from the Department of Water Resources California Well Standards.

## **5.6 Potential Future Mining Development**

Per the nature of mining operations at the facility, there is the potential to mine the Burdened Property illustrated on Figure 2 in the future. Prior to initiating mining activities, a plan describing the scope of activities and compliance with the SMP is to be submitted to ACEH for review and approval.

## **5.7 Soil and Groundwater Management During Subsurface Activities**

Subsurface activities that may occur within the Burdened Property identified in Figure 2 include soil or groundwater removal as part of potential future mining operations, and infrequent subsurface intrusions, such as accessing underground utilities. The soil and



groundwater management protocols detailed in this section will be followed during these types of subsurface activities. The protocols described herein may be modified as appropriate if additional site characterization is performed prior to initiation of potential future mining operations or subsurface intrusions. The SMP applies to the Burdened Property but does not apply to mining activities conducted elsewhere on the MVR facility.

#### 5.7.2 Soil Management Procedures

Within the Burdened Property shown on Figure 2, excavated soil will be inspected for visual/olfactory evidence of impacts. If potentially-impacted soil (e.g., soil exhibiting discoloration, oily liquids, a petroleum odor, or other signs of contamination from petroleum fuels) is observed, the following actions shall be taken:

- Stockpile potentially-impacted soil separately on polyethylene sheeting and in accordance with this SMP;
- Screen the stockpiled potentially-impacted soil with a photoionization detector (PID), if appropriate;
- Characterize the stockpiled soils as specified below, and appropriately dispose of stockpiled soil at an appropriately licensed facility or suitable end use (e.g., reuse on a portion of the facility); and,
- Document and report the discovery of the apparently impacted soil as required to the appropriate jurisdictional agency.

Potentially-impacted soil generated from excavation activities will be stockpiled on-site. The stockpiles will be placed on, and covered with, polyethylene sheeting to provide separation and to prevent off-site soil migration due to wind and water erosion. In addition, a berm made of hay bales or another accepted material will be placed around each stockpile to limit potential runoff from the stockpile.

Dust control measures will be used during excavation activities such that no visible dust migration is observed. Typically, misting with water can be used to control dust emissions. Mitigation procedures to prevent wind erosion of an active stockpile will include applying sufficient water, or other accepted material, to keep the soil slightly damp, but not so much water to create runoff from oversaturation. Stockpiles will not be piled excessively high to further prevent airborne transport of stockpiled material.

Should odor issues be identified by Site workers or contractors during subsurface activities, personnel shall have appropriate health and safety training, wear the appropriate personal protective equipment, and field instruments shall be used to screen for the presence of VOCs within the breathing zone as appropriate. Should the detected concentrations of specific VOCs identified as part of a health and safety plan exceed the identified action levels, subsurface activities will be stopped and the mitigation measures identified within the health and safety plan will be performed.

Soils will be adequately sampled and characterized/profiled per the disposal facility requirements in the event that off-site disposal is selected as the method of final disposition of the soils. Soils identified for transportation and off-site disposal should be profiled, either in-place or from the stockpile.

### 5.7.3 Groundwater Management Procedures

If groundwater is encountered during subsurface activities, or if dewatering is necessary, the following procedures should be followed. Field instruments shall be used to screen for the presence of volatile organic compounds (VOCs) within the breathing zone of Site workers and contractors. Groundwater produced during dewatering activities may be treated to remove sediment and/or dissolved fuel hydrocarbons and related constituents and discharged to a sanitary sewer in accordance with applicable permits from the appropriate regulatory agencies. Alternatively, groundwater may be collected, removed from the Burdened Property, and disposed of appropriately. Both potential means of disposal may require collection and analysis of the groundwater for petroleum-related constituents to ensure compliance with the applicable permits. Groundwater shall not be used for dust control, either during routine operations or infrequent activities, unless groundwater analyses indicate concentrations of petroleum-related constituents are below analytical laboratory reporting limits.

## 5.8 Contingency Plan

This section describes the protocols to be followed in the event that unknown areas of affected soil, groundwater and/or underground structures are identified at the facility. These protocols will be followed by all involved parties, including Hanson and other entities, such as a contractor or qualified consultant, designated or certified by Hanson.

Unknown conditions (e.g., suspected affected soil) that may trigger contingency monitoring procedures during Site activities include, but are not limited to, those listed

below. Discovery of any of these conditions could require either alternative or additional measures to protect human health and the environment:

- Oily, shiny, or saturated soil or free product;
- Soil with a strong chemical odor;
- Discovery of objects of environmental concern such as USTs and associated piping or buried drums;
- Discovery of potentially-hazardous debris (e.g., automobile tires, asbestos-containing pipes, and transite pipes);
- Discovery of hazardous storage areas; and
- Other conditions that vary materially from those documented during previous investigations.

If suspected affected soil is detected during subsurface activities, the following procedures shall be followed:

- All field activities that may potentially disturb the suspected affected soil must be immediately stopped and the area around the suspected affect soil vacated.
- If an emergency situation arises such that emergency services are needed, call 911 and follow the emergency procedures given in the health and safety plan, including notification of the appropriate Hanson employees.
- Any equipment and clothing that comes in contact with the suspected or known affected soil must be decontaminated as specified in the health and safety plan.
- If stockpiling is necessary, stockpiles will be placed on polyethylene sheeting and covered at the end of each work day.

During the subsurface activities conducted at the Burdened Property, it is possible that USTs, sumps, or other underground structures that were not identified during previous investigations will be discovered. For example, a UST may be unearthed during grading and site excavation. Other subsurface structures might not have features that

extend above the excavated surface and could be unearthed when construction equipment comes into contact with them. The remainder of this section outlines the measures that govern identification and removal of USTs, and appropriate measures for addressing other underground structures encountered during development.

Chapter 6.7 of the California Health and Safety Code contains the specific requirements for removing and remediating affected soil associated with a leaking UST (LUST). The county within which the UST is encountered is responsible for local oversight and oversees the removal of USTs. Environmental investigations and responses required following removal of the UST will be conducted under the direction of the ACEH and in accordance with the specific provisions delineated in Chapter 6.7 of the California Health and Safety Code. Additionally, the Alameda County Fire Department will be notified in the event that a LUST or appurtenant piping is discovered at the Burdened Property.

For other subsurface structures that may have been related to former use and storage of chemicals, such as underground vaults and sumps, the following procedures will be implemented to determine the proper disposition of the encountered structure.

The structure will be inspected to assess whether it contains any indication of chemical residuals or free liquids, other than water. A qualified individual will make this assessment in the field using visual or olfactory evidence, or field monitoring equipment (e.g., PID). If there is no indication, based on visual observation, odor, or field air monitoring equipment, of chemical impact within the vault or sump, then removal of the structure is not necessary for environmental reasons, but may be prudent for other reasons.

If a sump or vault contains liquids that appear to contain chemicals, based on visual observations, odor, or field air monitoring equipment, then the following steps shall be taken:

- The potentially chemical-containing liquids will be sampled and analyzed for profiling purposes.
- The chemical will be characterized and the appropriate response action will be determined. If appropriate, the liquids will be properly removed and disposed.
- A report will be prepared documenting response activities for submittal to the Alameda County Fire Department and ACEH.

If LNAPL is encountered, the horizontal and vertical extent will be assessed, the chemical characterized, and the soil managed in a manner approved by ACEH.

### **5.9 Record Keeping, Inspections, and Reporting**

Record keeping and inspection procedures to monitor compliance with this SMP shall be the responsibility of the party performing the work (i.e., Hanson or contractors). During intrusive subsurface work in the area identified in Figure 2 in which there is potential exposure to contaminated soil, soil vapor and/or groundwater, a daily log will be maintained to provide detailed documentation of work activities until potential contamination is removed or contained.

Additionally, Hanson will perform an annual inspection of the Burdened Property to ensure compliance with this SMP. The items to be inspected will be developed by Hanson as part of their existing inspection processes. The results of the annual inspection will be communicated via letter to the ACEH. At this time, any upcoming plans for land use or operational changes that may initiate the protocols set forth herein will also be communicated to the ACEH.

### **5.10 Soil and Groundwater Site Management Plan Availability**

The location of affected soil and groundwater remaining at the Burdened Property will be communicated to Site workers and contractors through this SMP. The existence of this SMP will be documented as part of a Covenant to be recorded with the deed for the property. Additionally, this SMP will be provided to the current property owner for distribution to Site workers or contractors performing intrusive subsurface work.

## 6 References

ARCADIS-U.S., Inc. (ARCADIS). 2011. Fourth Quarter 2010 Air Injection System and Groundwater Monitoring Report. March 18.

ARCADIS. 2012. Response to Alameda County Environmental Health Public Comments for Fuel Leak Case No. RO0000207 and GeoTracker Global ID T0600102092, Mission Valley Rock and Asphalt, 7999 Athenour Way, Sunol, CA 94586. June 1.

ARCADIS. 2013. Investigation to Assess Non-Aqueous Phase Liquid at the Mission Valley Rock and Asphalt Plant Located at 7999 Athenour Way in Sunol, California. February 1.

Alameda County Environmental Health (ACEH). 2007a. Letter to Lee Cover of Hanson Aggregates West Region from Jerry Wickham, re: Fuel Leak Case No. RO0000207 and GeoTracker Global ID T0600102092, Mission Valley Rock and Asphalt, 7999 Athenour Way, Sunol, CA 94586. April 27.

ACEH. 2007b. Letter to Lee Cover of Hanson Aggregates West Region from Jerry Wickham, re: Fuel Leak Case No. RO0000207 and GeoTracker Global ID T0600102092, Mission Valley Rock and Asphalt, 7999 Athenour Way, Sunol, CA 94586. August 30.

ACEH. 2008. Letter to Lee Cover of Hanson Aggregates West Region from Jerry Wickham, re: Fuel Leak Case No. RO0000207 and GeoTracker Global ID T0600102092, Mission Valley Rock and Asphalt, 7999 Athenour Way, Sunol, CA 94586. October 24.

ACEH, 2012. Letter to Lee Cover of Hanson Aggregates from Jerry Wickham, re: Case File Review for Fuel Leak Case No. RO0000207 and GeoTracker Global ID T0600102092, Mission Valley Rock and Asphalt, 7999 Athenour Way, Sunol, CA 94586. June 21.

ACEH, 2013. Letter to Gregory Knapp of Lehigh Hanson from Jerry Wickham, re: Case File Review for Fuel Leak Case No. RO0000207 and GeoTracker Global ID T0600102092, Mission Valley Rock and Asphalt, 7999 Athenour Way, Sunol, CA 94586. March 13.



## Soil and Groundwater Site Management Plan

Mission Valley Rock and Asphalt Plant  
7999 Athenour Way, Sunol, California

Department of Toxic Substances Control. 2001. Information Advisory: Clean Imported Fill Material. October.

LFR Inc. (LFR). 2007a. Site Assessment Report of Additional Lateral and Vertical Characterization and Plan for Interim Remediation at the Asphalt Plant, Hanson Aggregates Mission Valley Rock Facility. April 10.

LFR. 2007b. Work Plan to Conduct a Groundwater Remediation Pilot Test at the Asphalt Plant and Additional Subsurface Characterization in the Former Diesel Spray Area, Hanson Aggregates Mission Valley Rock Facility. August 3.

LFR. 2008a. Air Sparge Pilot Test Completion Report, Hanson Aggregates Mission Valley Rock Facility, 7999 Athenour Way, Sunol, Alameda County, California. March 28.

LFR. 2008b. Work Plan to Conduct Air Injection and Implement Monitored Natural Attenuation, Hanson Aggregates Mission Valley Rock Facility, 7999 Athenour Way, Sunol, Alameda County, California. October 3.

LFR Inc. and ARCADIS Company. 2010. Fourth Quarter Air Injection System and Groundwater Monitoring Report, Hanson Aggregates Mission Valley Rock Facility, 7999 Athenour Way, Sunol, Alameda County, California. February 12.

Tank Protect Engineering of Northern California Inc., May 13, 1997, Preliminary Site Assessment Report, Mission Valley Rock Company, 7999 Athenour Way, Sunol, California 94586.

**Tables**



**Table 1**  
**Groundwater Monitoring Well Details**  
**Hanson Aggregates**  
**7999 Athenour Way, Sunol, California**

WELL ID #	NORTHING (FT.) / LATITUDE (D.MS)	EASTING (FT.) / LONGITUDE (D.MS)	ELEVATION (FT.)	DESCRIPTION
MW-1	2033631.2	6162569.3	258.68	PVC
	37.5718715	-121.8771414	259.03	Box
MW-2S	2033560.2	6162561.6	258.84	PVC
	37.5716762	-121.8771643	259.09	Box
MW-2M	2033560.2	6162561.6	258.99	PVC
	37.5716762	-121.8771643	259.09	Box
MW-2D	2033560.2	6162561.6	258.91	PVC
	37.5716762	-121.8771643	259.09	Box
MW-3	2033545.9	6162615.1	259.08	PVC
	37.5716392	-121.8769792	259.64	Box
MW-4S	2033585.5	6162653.7	259.14	PVC
	37.5717493	-121.8768479	259.57	Box
MW-4D	2033585.5	6162653.7	259.22	PVC
	37.5717493	-121.8768479	259.57	Box
MW-5S	2033577.7	6162610.5	259.43	PVC
	37.5717264	-121.8769967	259.78	Box
MW-5D	2033577.7	6162610.5	259.40	PVC
	37.5717264	-121.8769967	259.78	Box
MW-6S	2033559.6	6162581.5	258.75	PVC
	37.5716753	-121.8770956	259.62	Box
MW-6D	2033559.6	6162581.5	259.27	PVC
	37.5716753	-121.8770956	259.62	Box
MW-7S	2033611.9	6162537.7	258.82	PVC
	37.5718173	-121.8772494	259.09	Box
MW-7D	2033611.9	6162537.7	258.07	PVC
	37.5718173	-121.8772494	259.09	Box
MW-8	2033607.6	6162516.9	258.84	PVC
	37.5718047	-121.8773211	259.40	Box
MW-9S	2033664.2	6162537.6	258.41	TOP 2" PVC N. SIDE
	37.341905897	-121.523810911	259.12	LID
			258.82	GROUND
MW-9D	2033657.0	6162535.6	258.86	TOP 2" PVC N. SIDE
	37.341898750	-121.523813263	259.21	LID
			258.92	GROUND
MW-9LF	2033650.0	6162534.0	258.94	TOP 2" PVC N. SIDE
	37.341891807	-121.523815123	259.20	LID
			258.94	GROUND
MW-10S	2033614.1	6162622.3	260.67	TOP 2" PVC N. SIDE
	37.341857601	-121.523704793	261.01	LID

**Table 1**  
**Groundwater Monitoring Well Details**  
**Hanson Aggregates**  
**7999 Athenour Way, Sunol, California**

WELL ID #	NORTHING (FT.) / LATITUDE (D.MS)	EASTING (FT.) / LONGITUDE (D.MS)	ELEVATION (FT.)	DESCRIPTION
			260.63	GROUND
MW-10D	2033619.6	6162621.8	260.64	TOP 2" PVC N. SIDE
	37.341863031	-121.523705515	261.34	LID
			261.08	GROUND
MW-10LF	2033615.6	6162638.9	260.58	TOP 2" PVC N. SIDE
	37.341859325	-121.523684203	261.02	LID
			259.59	GROUND
MW-11S	2033488.3	6162571.1	258.96	TOP 2" PVC N. SIDE
	37.341732489	-121.523766087	259.33	LID
			258.87	GROUND
MW-11D	2033493.5	6162569.1	258.98	TOP 2" PVC N. SIDE
	37.341737601	-121.523768666	259.27	LID
			258.93	GROUND
MW-11LF	2033488.0	6162566.0	259.01	TOP 2" PVC N. SIDE
	37.341732119	-121.523772416	259.32	LID
			258.97	GROUND
MW-12S	2033494.7	6162438.2	262.69	TOP 2" PVC N. SIDE
	37.341736883	-121.523931272	263.17	LID
			262.93	GROUND
MW-12D	2033498.8	6162439.1	262.70	TOP 2" PVC N. SIDE
	37.341740949	-121.523930229	262.23	LID
			262.86	GROUND
MW-12LF	2033504.3	6162441.4	262.90	TOP 2" PVC N. SIDE
	37.341746420	-121.523927472	263.17	LID
			262.82	GROUND

**BENCH MARK:** MW-6(D) TOP PVC

MORROW SURVEYING PLATE DATED 2-8-05

Elevation =259.27 FEET NAVD88 Datum

**HORIZONTAL CONTROL:** MW2 AND MW 4 COORDINATES PER LFR

**MW-2**

NORTHING =2,033,560.2 , EASTING = 6,162,561.6 FEET; EPOCH DATE = 2000.35

**MW-4**

NORTHING =2,033,585.5 , EASTING = 6,162,653.7 FEET; EPOCH DATE = 2000.35

Coordinate values are based on the California Coordinate System, Zone III NAD 83 Datum.

Table 2  
Historical Soil Gas Analytical Data  
Hanson Aggregates  
7999 Athenour Way, Sunol, California

Soil-Gas Probe ID	SG-1		SG-2		SG-3				SG-4				Tier 1 ESL				
	12/18/09		12/18/09		2/18/08		2/19/08		12/18/09		2/18/08			2/19/08		12/18/09	
Date Sampled	12/18/09		12/18/09		2/18/08		2/19/08		12/18/09		2/18/08		2/19/08		12/18/09		
Sample Collection Timing	2 - 4 Hours After Turning Off Air Injection		2 - 4 Hours After Turning Off Air Injection		During Continuous Air Injection Test		One Day After Test Air Injection Ceased		2 - 4 Hours After Turning Off Air Injection		During Continuous Air Injection Test		One Day After Test Air Injection Ceased		2 - 4 Hours After Turning Off Air Injection		
Sample Volume (ml)	1,037		943		2,015		2,003		1,003		2,000		2,003		962		
Units	ng	mg/m <sup>3</sup>	ng	mg/m <sup>3</sup>	ng	mg/m <sup>3</sup>	ng	mg/m <sup>3</sup>	ng	mg/m <sup>3</sup>	ng	mg/m <sup>3</sup>	ng	mg/m <sup>3</sup>	ng	mg/m <sup>3</sup>	mg/m <sup>3</sup>
TPHd	< 1,000	< 960	< 1,000	< 1,100	< 1,000	< 500	< 1,000	< 500	< 1,000	< 1,000	< 1,000	< 500	< 1,000	< 500	< 1,000	< 1,100	1,300,000
TPHg	< 1,000	< 960	< 1,000	< 1,100	150,000	74,000	1,000 J	500 J	480,000 E	480,000 E	1,100,000	550,000	1,400	700	74,000	77,000	3,066,000
Benzene	< 10	< 9.6	< 10	< 11	< 5.0	< 2.5	< 5.0	< 2.5	< 10	< 10	41	21	< 5.0	< 2.5	11	11	420
Toluene	< 5.0	< 4.8	< 5.0	< 5.3	12	6	5.8	2.9	< 5.0	< 5.0	130	65	69	34	< 5.0	< 5.2	1,300,000
Ethylbenzene	< 5.0	< 4.8	< 5.0	< 5.3	21	10	< 5.0	< 2.5	< 5.0	< 5.0	280	140	< 5.0	< 2.5	< 5.0	< 5.2	4,900
m, p-Xylene	< 10	< 9.8	< 10	< 11	26	13	< 10	< 5.0	< 10	< 10	70	35	< 10	< 5.0	< 10	< 11	440,000
o-Xylene	< 5.0	< 4.8	< 5.0	< 5.3	< 5.0	< 2.5	< 5.0	< 2.5	< 5.0	< 5.0	21	11	< 5.0	< 2.5	< 5.0	< 5.2	440,000
Napthalene	< 5.0	< 4.8	< 5.0	< 5.3	< 5.0	< 2.5	< 5.0	< 2.5	< 5.0	< 5.0	< 5.0	< 2.5	< 5.0	< 2.5	< 5.0	< 5.2	360
MTBE	< 50	< 48	< 50	< 53	< 50	< 25	< 50	< 25	< 50	< 50	< 50	< 25	< 50	< 25	< 50	< 52	47,000

Notes:

"< " = analyte not detected at or above the noted laboratory reporting limit

ml = milliliters

ng = nanograms

µg/m<sup>3</sup> = micrograms per cubic meter

J = estimated value

TPHg = total petroleum hydrocarbons as gasoline

TPHd = total petroleum hydrocarbons as diesel

MTBE = methyl tertiary-butyl ether

E = Exceeds instrument calibration range

Bolded values are above the 2013 Tier 1 ESL

Tier 1 ESL = Commercial/Industrial 2013 Tier 1 Environmental Screening Levels (ESLs) put forth by the San Francisco Bay Regional Water Quality Control Board

**Figures**



HANSON AGGREGATES, 7999 ATHENOUR WAY,  
SUNOL, CALIFORNIA

**SITE LOCATION MAP**

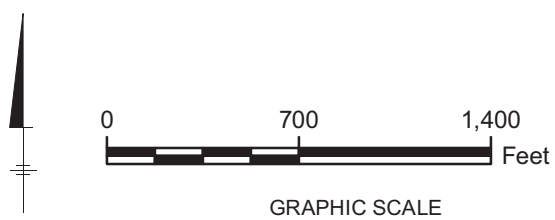


FIGURE  
**1**



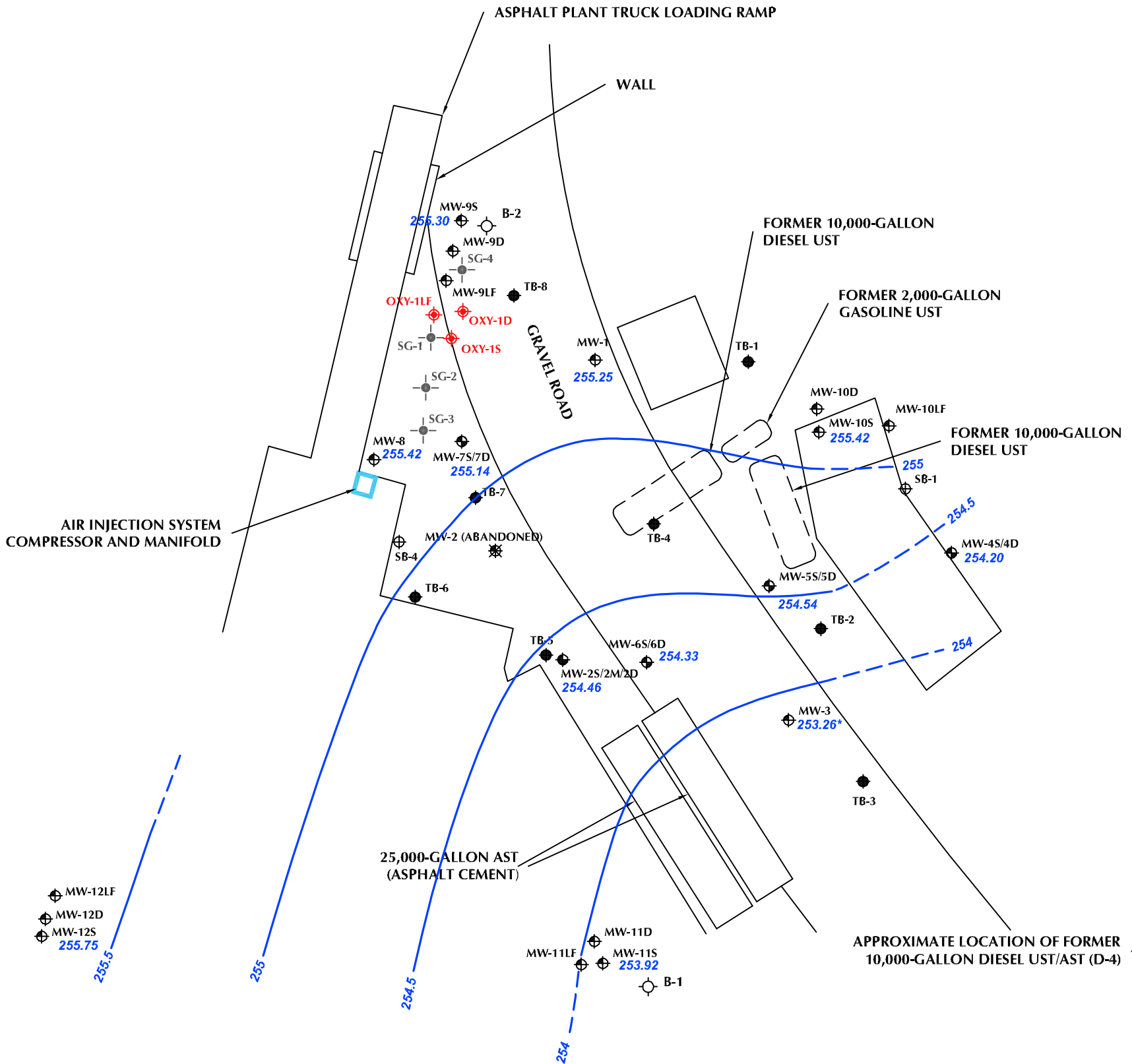
- EXPLANATION:**
- MW-9S Groundwater monitoring well (single completion; well cluster)
  - MW-7S/7D Groundwater monitoring well (dual nested)
  - MW-2S/2M/2D Groundwater monitoring well (triple nested)
  - MW-2 Abandoned groundwater monitoring well
  - TB-6 Grab groundwater sample location
  - SB-4 Temporary soil boring location
  - B-2 Sonic boring / grab groundwater
  - MIP-3 MIP boring / grab groundwater
  - OXY-1S Air injection well (approximate location)
  - SG-1 Soil gas monitoring probe (approximate location)
  - LIF-1 CPT/LIF boring location
  - AST = Aboveground storage tank
  - UST = Underground storage tank
  - MIP = Membrane Interface Probe
  - CPT = Cone Penetrometer
  - LIF = Laser induced Fluorescence
  - Portion of the site subject to the Soil and Groundwater Site Management Plan



HANSON AGGREGATES 7999 ATHEOUR WAY SUNOL, CALIFORNIA	
<b>SITE PLAN</b>	
	FIGURE <b>2</b>

XREFS: IMAGES: PROJECTNAME: ---  
 AERIAL HANSON SUNOL.jpg

MIP-1



**EXPLANATION:**

- MW-9S Groundwater monitoring well (single completion; well cluster)
- MW-7S/7D Groundwater monitoring well (dual nested)
- MW-2S/2M/2D Groundwater monitoring well (triple nested)
- MW-2 Abandoned groundwater monitoring well
- TB-6 Grab groundwater sample location
- SB-4 Temporary soil boring location
- B-2 Sonic boring / grab groundwater
- MIP-3 MIP boring / grab groundwater
- SG-1 Soil gas monitoring probe (approximate location)
- OXY-1S Air injection well (approximate location)

255.5 Groundwater elevation contour (feet above mean sea level), dashed where inferred

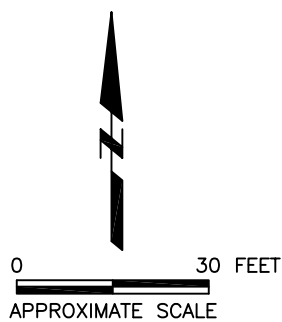
256.89 Groundwater elevation (feet above mean sea level)

\* Not used in contouring

AST = Aboveground storage tank  
 UST = Underground storage tank  
 MIP = Membrane Interface Probe

MIP-3

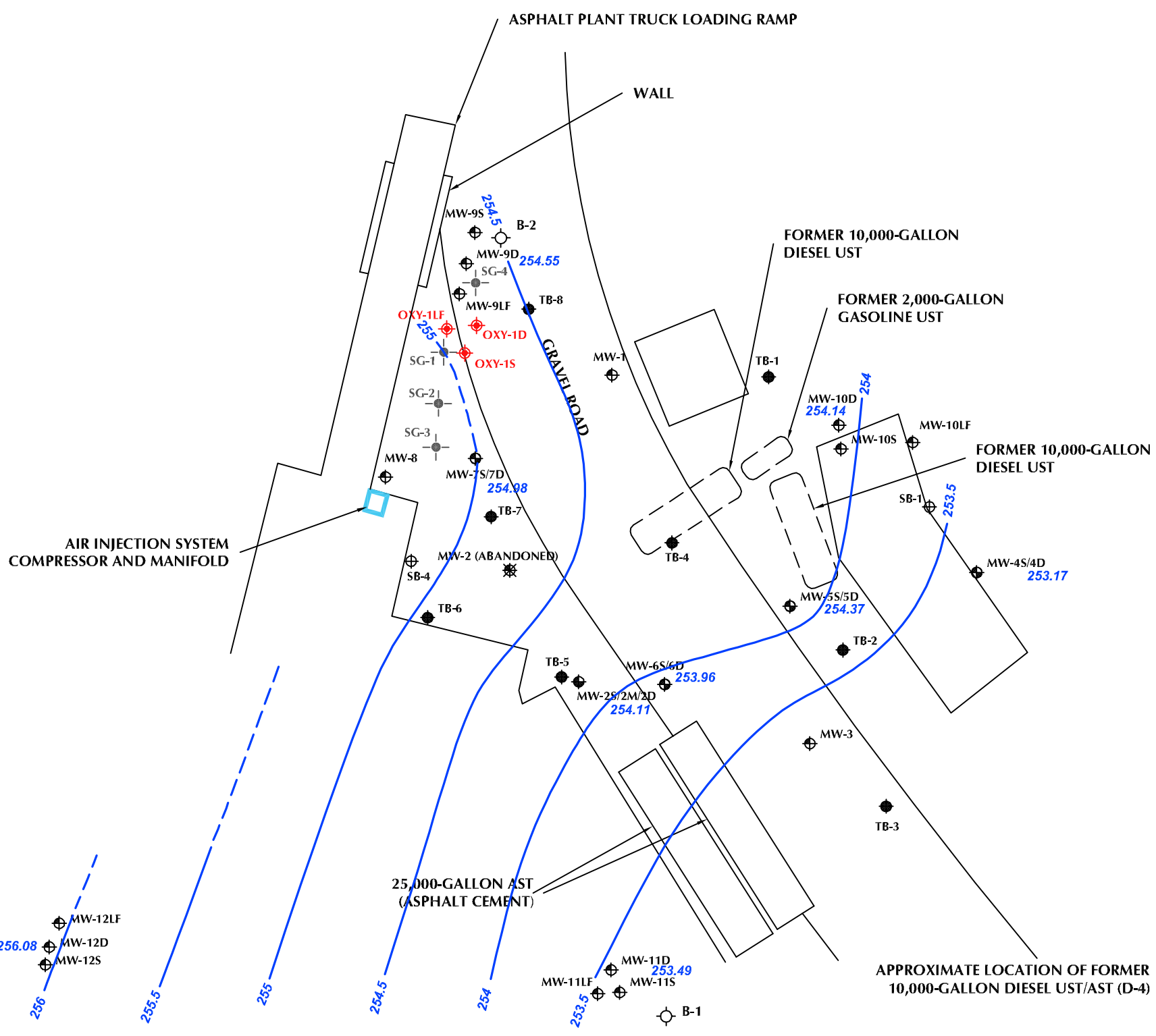
MIP-6



HANSON AGGREGATES 7999 ATHEOUR WAY SUNOL, CALIFORNIA	
<b>GROUNDWATER ELEVATION CONTOURS FOR THE SHALLOW INTERVAL (SEPTEMBER 27, 2010)</b>	
	FIGURE <b>3</b>

XREFS: IMAGES: PROJECTNAME: ---  
 AERIAL HANSON SUNOL.jpg

MIP-1



MIP-2

**EXPLANATION:**

- MW-9S Groundwater monitoring well (single completion; well cluster)
- MW-7S/7D Groundwater monitoring well (dual nested)
- MW-2S/2M/2D Groundwater monitoring well (triple nested)
- MW-2 Abandoned groundwater monitoring well
- TB-6 Grab groundwater sample location
- SB-4 Temporary soil boring location
- B-2 Sonic boring / grab groundwater
- MIP-3 MIP boring / grab groundwater
- SG-1 Soil gas monitoring probe (approximate location)
- OXY-1S Air injection well (approximate location)

- 258 Groundwater elevation contour (feet above mean sea level), dashed where inferred
- 257.57 Groundwater elevation (feet above mean sea level)

- AST = Aboveground storage tank
- UST = Underground storage tank
- MIP = Membrane Interface Probe

MIP-3

MIP-6



0 30 FEET  
 APPROXIMATE SCALE

HANSON AGGREGATES  
 7999 ATHEOUR WAY  
 SUNOL, CALIFORNIA

**GROUNDWATER ELEVATION CONTOURS FOR THE DEEP INTERVAL (SEPTEMBER 27, 2010)**

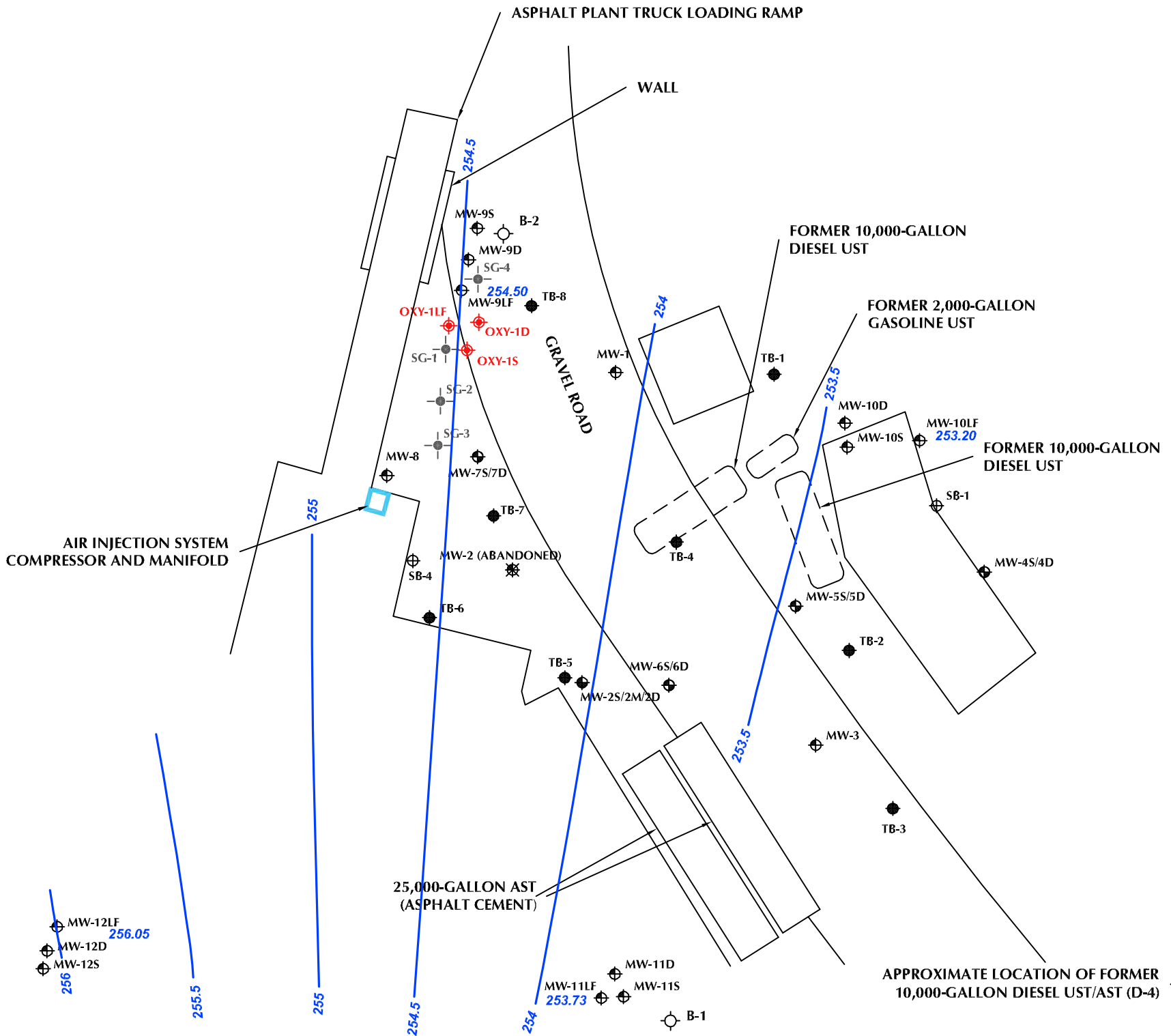


FIGURE  
**4**



XREFS: IMAGES: PROJECTNAME: ---  
 AERIAL HANSON SUNOL.jpg

MIP-1



**EXPLANATION:**

- MW-9S Groundwater monitoring well (single completion; well cluster)
- MW-7S/7D Groundwater monitoring well (dual nested)
- MW-2S/2M/2D Groundwater monitoring well (triple nested)
- MW-2 Abandoned groundwater monitoring well
- TB-6 Grab groundwater sample location
- SB-4 Temporary soil boring location
- B-2 Sonic boring / grab groundwater
- MIP-3 MIP boring / grab groundwater
- SG-1 Soil gas monitoring probe (approximate location)
- OXY-1S Air injection well (approximate location)

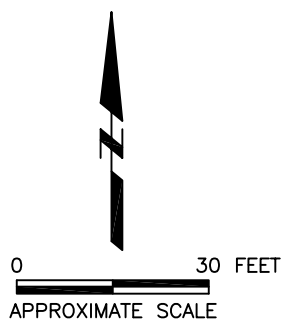
255 Groundwater elevation contour (feet above mean sea level), dashed where inferred

253.73 Groundwater elevation (feet above mean sea level)

- AST = Aboveground storage tank
- UST = Underground storage tank
- MIP = Membrane Interface Probe

MIP-3

MIP-6



HANSON AGGREGATES 7999 ATHEOUR WAY SUNOL, CALIFORNIA	
<b>GROUNDWATER ELEVATION CONTOURS FOR THE LIVERMORE FORMATION (SEPTEMBER 27, 2010)</b>	
	FIGURE <b>5</b>

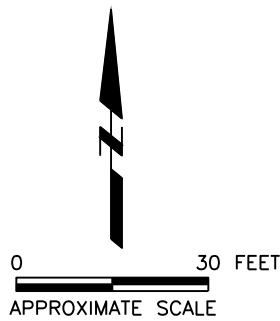
XREFS: IMAGES: PROJECTNAME: ---  
 Google Earth image August 2012.jpg



**EXPLANATION:**

- ⊕ MW-9S Groundwater monitoring well (single completion; well cluster)
  - ⊕ MW-7S/7D Groundwater monitoring well (dual nested)
  - ⊕ MW-2S/2M/2D Groundwater monitoring well (triple nested)
  - ⊕ MW-2 Abandoned groundwater monitoring well
  - TB-6 Grab groundwater sample location
  - ⊕ SB-4 Temporary soil boring location
  - B-2 Sonic boring / grab groundwater
  - ⊕ MIP-3 MIP boring / grab groundwater
  - ⊕ OXY-1S Air injection well (approximate location)
  - ⊕ SG-1 Soil gas monitoring probe (approximate location)
  - ⊗ LIF-1 CPT/LIF boring location
- AST = Aboveground storage tank  
 UST = Underground storage tank  
 MIP = Membrane Interface Probe  
 CPT = Cone Penetrometer  
 LIF = Laser induced Fluorescence
- (970 TPHg) MAXIMUM CONCENTRATION OF THE COMPOUND INDICATED WITHIN THE VADOSE ZONE TAKEN AS THE TOP 5 FEET OF SOIL BASED ON A RANGE OF GROUNDWATER DEPTHS OF 2 TO 6 FEET BELOW GROUND SURFACE
- TPHg TOTAL PETROLEUM HYDROCARBONS AS GASOLINE  
 TPHd TOTAL PETROLEUM HYDROCARBONS AS DIESEL  
 ND NOT DETECTED ABOVE THE APPLICABLE LABORATORY REPORTING LIMIT  
 CLEAN NO POSITIVE IDENTIFICATION OF PETROLEUM COMPOUNDS  
 LNAPL OBSERVED PRESENCE OF LIGHT NON-AQUEOUS PHASE LIQUID

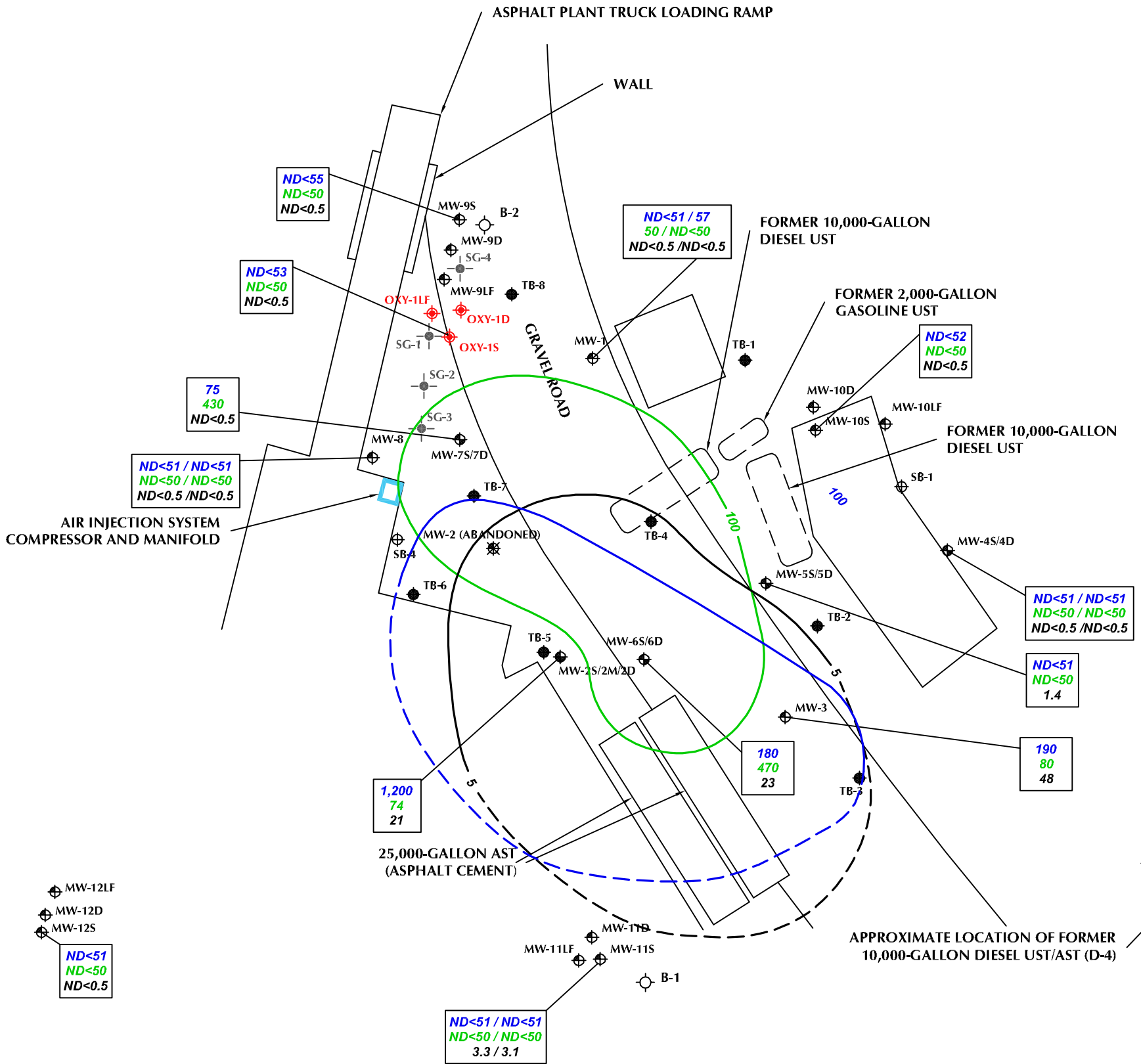
SOIL INVESTIGATION RESULTS OBTAINED FROM:  
 TAIT ENVIRONMENTAL MANAGEMENT, INC. 2006. SUMMARY REPORT: ENVIRONMENTAL ACTIVITIES, MISSION VALLEY ROCK COMPANY, 7999 ATHENOUR WAY, SUNOL, CALIFORNIA. MAY 16.



HANSON AGGREGATES 7999 ATHEOUR WAY SUNOL, CALIFORNIA	
<b>VADOSE ZONE SOIL ANALYTICAL RESULTS</b>	
	FIGURE <b>6</b>

XREFS: IMAGES: PROJECTNAME: ---  
 AERIAL HANSON SUNOL.jpg

MIP-1



**EXPLANATION:**

- MW-9S Groundwater monitoring well (single completion; well cluster)
- MW-7S/7D Groundwater monitoring well (dual nested)
- MW-2S/2M/2D Groundwater monitoring well (triple nested)
- MW-2 Abandoned groundwater monitoring well
- TB-6 Grab groundwater sample location
- SB-4 Temporary soil boring location
- B-2 Sonic boring / grab groundwater
- MIP-3 MIP boring / grab groundwater
- OXY-1S Air injection well (approximate location)
- SG-1 Soil gas monitoring probe (approximate location)

75  
430  
3.3

TPHd - Total petroleum hydrocarbons as diesel (measured in µg/L)  
 TPHg - Total petroleum hydrocarbons as gasoline (measured in µg/L)  
 MTBE - Methyl tert-butyl ether (measured in µg/L)

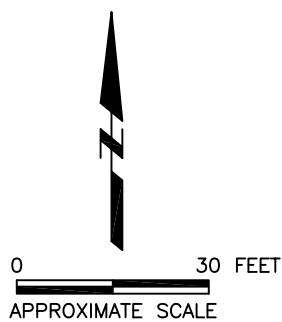
100  
100  
10

TPHd  
 TPHg  
 MTBE

- AST - Aboveground storage tank
- UST - Underground storage tank
- MIP - Membrane Interface Probe
- µg/L - Micrograms per liter
- ND< - Not detected at the given reporting limit

MIP-3

MIP-6



HANSON AGGREGATES  
 7999 ATHEOUR WAY  
 SUNOL, CALIFORNIA

**CONCENTRATIONS OF TPHd, TPHg, AND MTBE IN GROUNDWATER FOR THE SHALLOW INTERVAL (SEPTEMBER 2010)**

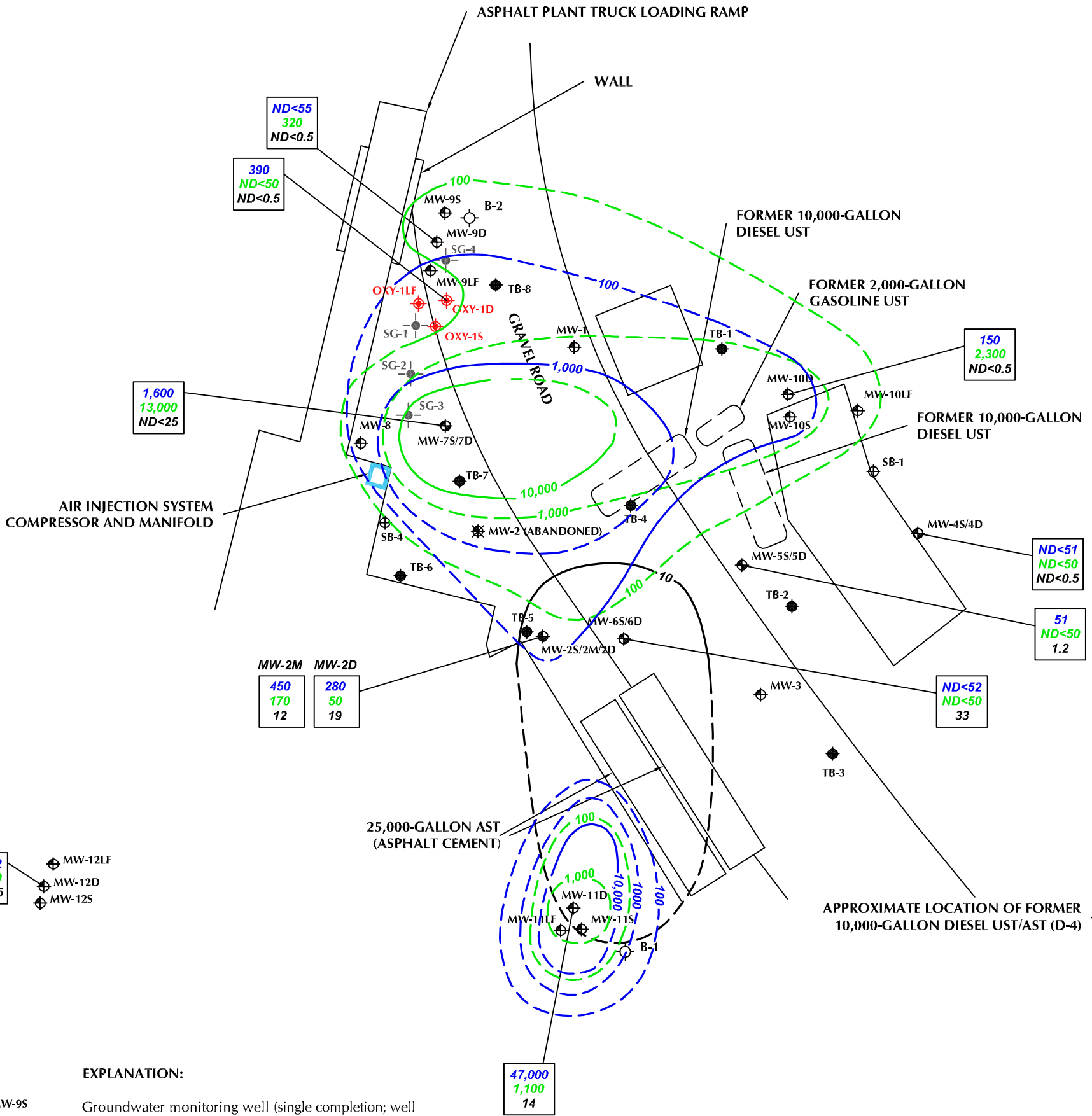


FIGURE

7

XREFS: IMAGES: PROJECTNAME: ---  
 AERIAL HANSON SUNOL.jpg

MIP-1

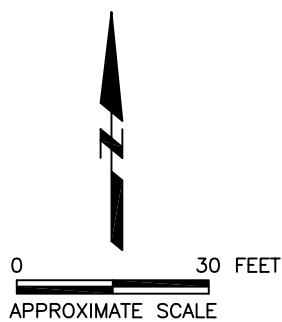


**EXPLANATION:**

- MW-9S Groundwater monitoring well (single completion; well cluster)
  - MW-7S/7D Groundwater monitoring well (dual nested)
  - MW-2S/2M/2D Groundwater monitoring well (triple nested)
  - MW-2 Abandoned groundwater monitoring well
  - TB-6 Grab groundwater sample location
  - SB-4 Temporary soil boring location
  - B-2 Sonic boring / grab groundwater
  - MIP-3 MIP boring / grab groundwater
  - SG-1 Soil gas monitoring probe (approximate location)
  - OXY-1S Air injection well (approximate location)
- 280  
50  
19
- TPHd - Total petroleum hydrocarbons as diesel (measured in  $\mu\text{g/L}$ )
  - TPHg - Total petroleum hydrocarbons as gasoline (measured in  $\mu\text{g/L}$ )
  - MTBE - Methyl tert-butyl ether (measured in  $\mu\text{g/L}$ )

- TPHd
- TPHg
- MTBE

- AST = Aboveground storage tank
- UST = Underground storage tank
- MIP = Membrane Interface Probe
- $\mu\text{g/L}$  = Micrograms per liter
- ND< = Not detected at the given reporting limit



HANSON AGGREGATES  
 7999 ATHEOUR WAY  
 SUNOL, CALIFORNIA

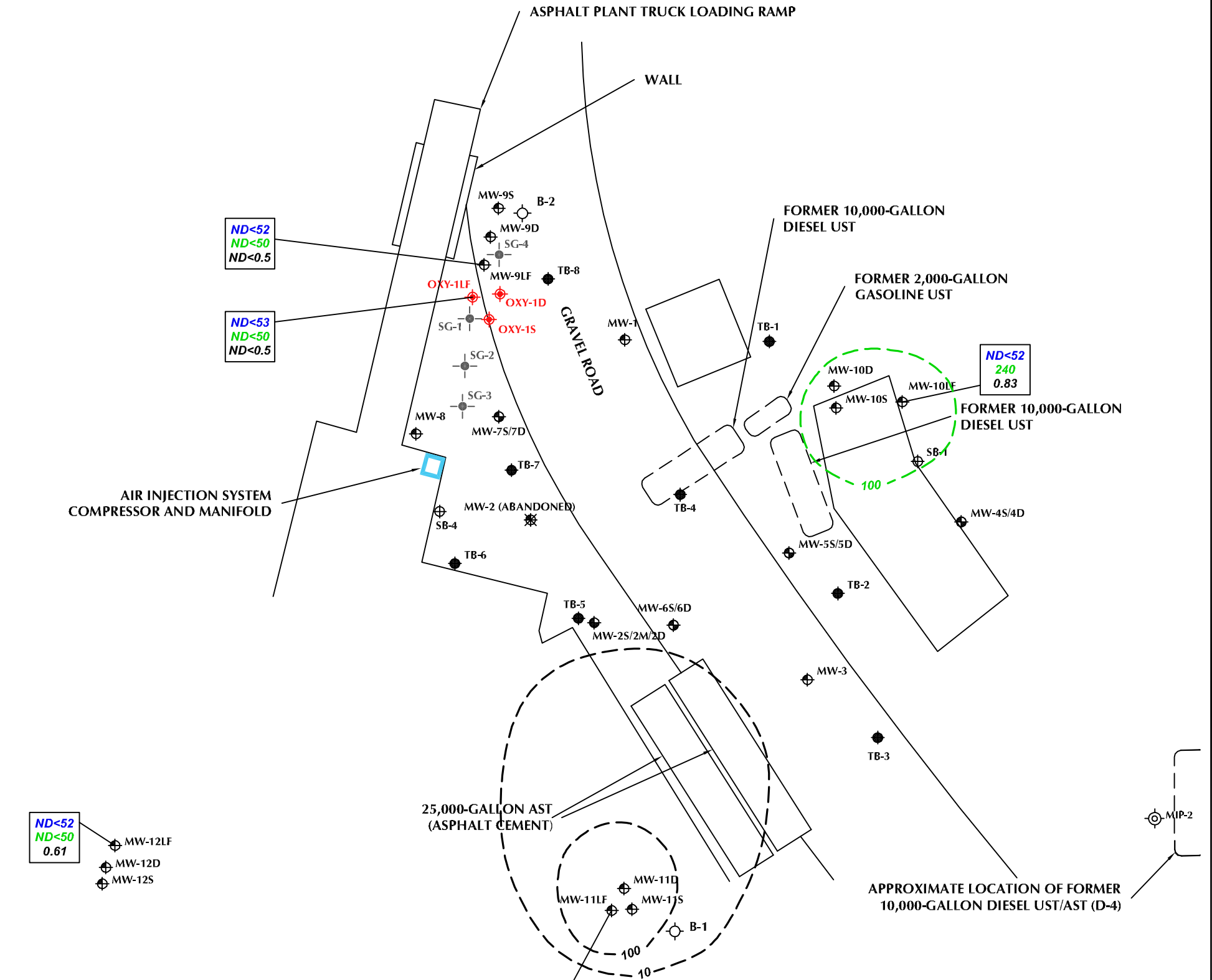
**CONCENTRATIONS OF TPHd, TPHg, AND  
 MTBE IN GROUNDWATER FOR THE  
 DEEP INTERVAL (SEPTEMBER 2010)**

**ARCADIS**

FIGURE  
**8**

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 AERIAL HANSON SUNOL.jpg

MIP-1



**EXPLANATION:**

- MW-9S Groundwater monitoring well (single completion; well cluster)
- MW-7S/7D Groundwater monitoring well (dual nested)
- MW-2S/2M/2D Groundwater monitoring well (triple nested)
- MW-2 Abandoned groundwater monitoring well
- TB-6 Grab groundwater sample location
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- SG-1 Soil gas monitoring probe (approximate location)
- OXY-1S Air injection well (approximate location)

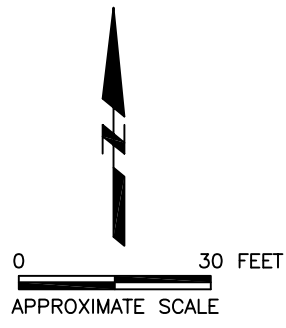
ND<50  
 ND<50  
 0.83

TPHd - Total petroleum hydrocarbons as diesel (measured in  $\mu\text{g/L}$ )  
 TPHg - Total petroleum hydrocarbons as gasoline (measured in  $\mu\text{g/L}$ )  
 MTBE - Methyl tert-butyl ether (measured in  $\mu\text{g/L}$ )

TPHd was not detected in samples from any of the Livermore formation wells; therefore, no concentration contours are provided.



- AST - Aboveground storage tank
- UST - Underground storage tank
- MIP - Membrane Interface Probe
- $\mu\text{g/L}$  - Micrograms per liter
- ND< - Not detected at the given reporting limit



HANSON AGGREGATES  
 7999 ATHEOUR WAY  
 SUNOL, CALIFORNIA

**CONCENTRATIONS OF TPHd, TPHg, AND MTBE IN GROUNDWATER FOR THE LIVERMORE FORMATION (SEPTEMBER 2010)**

FIGURE 9



**Appendix A**

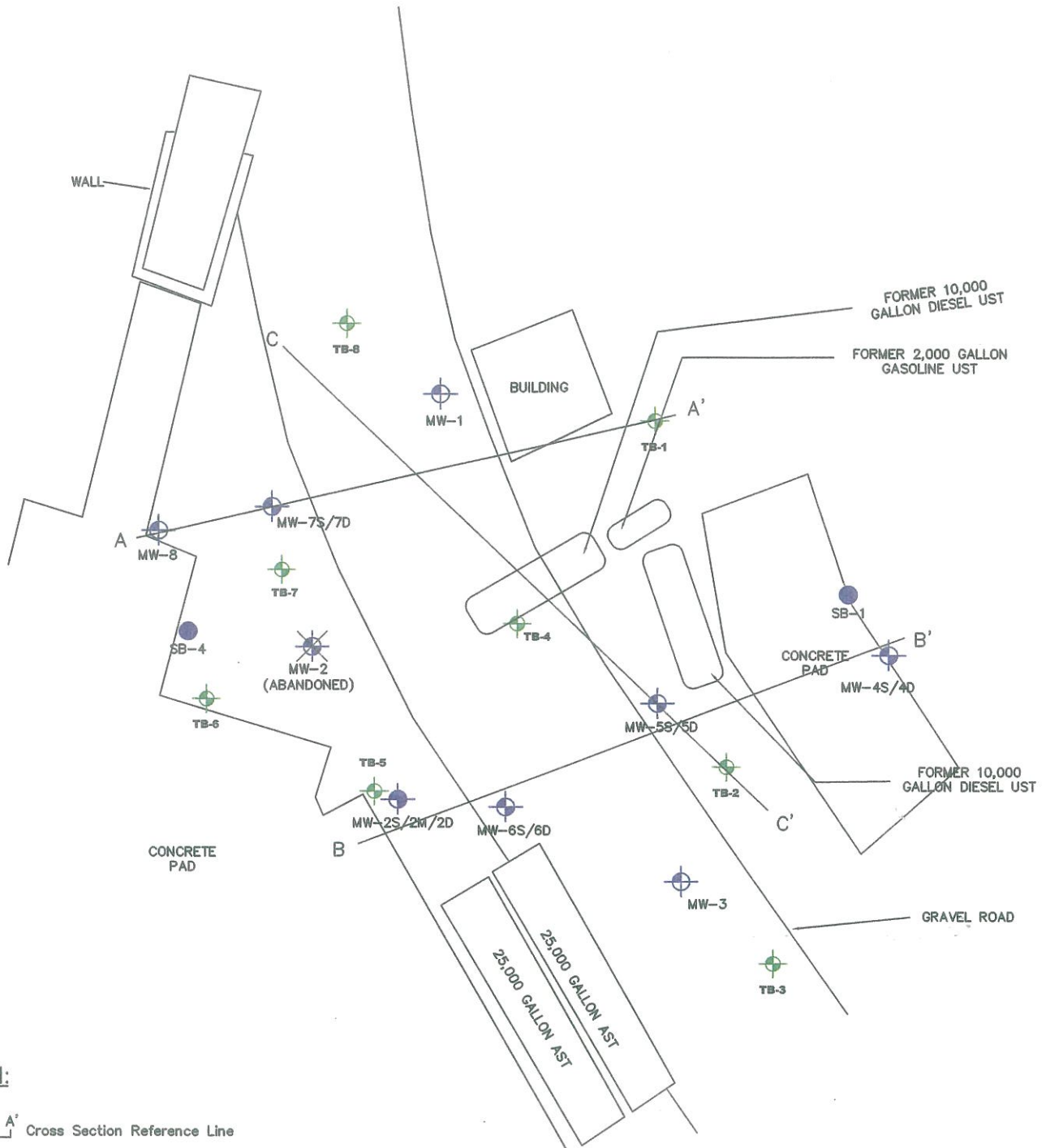
Historical Soil Data

**Summary Report  
Environmental Activities**

Mission Valley Rock Company  
7999 Athenour Way  
Sunol, California





Prepared by:  
**Tait Environmental Management, Inc.**

*May 16, 2006*



**Legend:**

A A' Cross Section Reference Line

-  Groundwater Monitoring Well - Single Completion  
MW-1
-  Groundwater Monitoring Well - Dual Nested  
MW-7S/7D
-  Groundwater Monitoring Well - Triple Nested  
MW-2S/2M/2D
-  Abandoned Groundwater Monitoring Well  
MW-2
-  Soil Boring  
SB-1



SCALE: 1 INCH=30 FEET

 701 NORTH PARKCENTER DRIVE  
SANTA ANA, CALIFORNIA 92705  
(714) 580-8200  
(714) 580-8235 FAX  
ENVIRONMENTAL MANAGEMENT, INC.

**HISTORICAL SITE PLAN WITH  
CROSS-SECTION REFERENCE LINES**  
MISSION VALLEY ROCK  
7999 ATHENOUR WAY  
SUNOL, CALIFORNIA

PROJECT NO. EM-5009B

FIGURE 2





**TABLE 6  
SOIL ANALYTICAL RESULTS - JANUARY 2005**

MISSION VALLEY ROCK  
7999 ATHENOUR WAY  
SUNOL, CALIFORNIA

Sample ID	Date	Sample Depth (feet bgs)	Constituents (milligrams per kilogram)										
			TPH-D	TPH-G	Methyl-tert-Butyl Ether	Benzene	Toluene	Ethylbenzene	Total Xylenes	tert-Butanol	Di-isopropyl Ether	Ethyl-tert-Butyl Ether	tert-Amyl Methyl Ether
MW5-5	1/4/2005	5	ND<10	ND<1	ND<0.005	<b>0.0043</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW5-10	1/4/2005	10	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW5-20	1/4/2005	20	ND<10	ND<1	ND<0.005	<b>0.0038</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW2-5	1/4/2005	5	<b>900</b>	<b>14</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	<b>0.002</b>	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW2-10	1/4/2005	10	<b>740</b>	<b>15</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW2-15	1/4/2005	15	<b>23</b>	<b>0.96</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW6-10	1/5/2005	10	<b>78</b>	<b>6.8</b>	<b>0.0077</b>	ND<0.005	ND<0.005	<b>0.0044</b>	<b>0.0094</b>	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW6-25	1/5/2005	25	<b>12</b>	<b>1.2</b>	<b>0.024</b>	<b>0.0041</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW4-5	1/5/2005	5	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW4-10	1/5/2005	10	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW4-20	1/5/2005	20	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW2-30	1/5/2005	30	ND<10	ND<1	<b>0.022</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
MW6-25	1/5/2005	25	<b>17</b>	<b>5.4</b>	<b>0.047</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB1-5	1/6/2005	5	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB1-15	1/6/2005	15	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB1-20	1/6/2005	20	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB2-5	1/6/2005	5	ND<10	<b>0.67</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB2-10	1/6/2005	10	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB2-15	1/6/2005	15	ND<10	<b>0.86</b>	ND<0.005	ND<0.005	ND<0.005	<b>0.012</b>	<b>0.0273</b>	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB2-23	1/6/2005	23	<b>16</b>	<b>510</b>	ND<0.005	ND<0.005	ND<0.005	<b>9.7</b>	<b>14.86</b>	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB2-26	1/6/2005	26	<b>39</b>	<b>840</b>	ND<0.005	ND<0.005	ND<0.005	<b>10</b>	<b>16.4</b>	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB3-5	1/6/2005	5	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB3-15	1/6/2005	15	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	<b>0.0049</b>	<b>0.0107</b>	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB3-20	1/6/2005	20	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB3-25	1/6/2005	25	ND<10	<b>0.51</b>	ND<0.005	<b>0.03</b>	ND<0.005	ND<0.005	<b>0.0046</b>	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB4-5	1/6/2005	5	<b>190</b>	<b>42</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB4-10	1/6/2005	10	<b>14</b>	<b>2.7</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB4-15	1/6/2005	15	ND<10	<b>4.5</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB4-20	1/6/2005	20	<b>17</b>	<b>2.7</b>	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050
SB4-25	1/6/2005	25	ND<10	ND<1	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.10	ND<0.050	ND<0.050	ND<0.050

Notes:

bgs = Below Ground Surface

ND = Not detected at or above the indicated laboratory reporting limit.

TPH-D = Total Petroleum Hydrocarbons as Diesel

TPH-G = Total Petroleum Hydrocarbons as Gasoline

Concentrations of TPH-D and TPH-G reported using EPA Method No. 8015M.

Concentrations of Methyl-tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, Total Xylenes, tert-Butanol, Di-isopropyl Ether, Ethyl-tert-Butyl Ether, and tert-Amyl Methyl Ether reported using EPA Method No. 8260B.