

June 23, 2014
Project No. 208449026

Mr. Wayne Chiou
State of California Department of Transportation
District 12, Environmental Engineering
3347 Michelson Drive, Suite 100
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Subject: Aerially Deposited Lead and Oil Sampling Site Investigation
Northbound State Route 57 between the Lambert Road On-Ramp and Tonner
Canyon Road
Brea, California
Task Order No. 12-0N1300-26
EA No. 0N1300
Contract No. 12A1340

Dear Mr. Chiou:

In accordance with the State of California Department of Transportation Contract No. 12A1340, Task Order No. 12-0N1300-26, Ninyo & Moore has conducted an aerially deposited lead and oil sampling investigation on State Route 57 in the city of Brea, California.

The following report documents our methodologies, findings, conclusions, and recommendations.

We appreciate the opportunity to be of service to you on this project.

Sincerely,
NINYO & MOORE



Jonathan Johnson
Senior Staff Geologist



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Principal Environmental Engineer



JJJ/MSC/JOS/NA/lr

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**AERIALY DEPOSITED LEAD AND OIL SAMPLING
SITE INVESTIGATION
NORTHBOUND STATE ROUTE 57 BETWEEN THE LAMBERT
ROAD ON-RAMP AND TONNER CANYON ROAD
BREA, CALIFORNIA
TASK ORDER NO. 12-0N1300-26
EA NO. 0N1300, CONTRACT NO. 12A1340**

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June 23, 2014
Project No. 208449026

AERIALY DEPOSITED LEAD INVESTIGATION REPORT

Task Order No. 12-0N1300-26
E.A. 0N1300

This report was prepared by the staff of Ninyo & Moore Geotechnical and Environmental Sciences Consultants under the supervision of the Engineer and/or Geologist whose signature appears hereon.

The findings, recommendations, specifications, or professional opinions are presented within the limits described by the client, after being prepared in accordance with generally accepted professional engineering and geologic practice. No warranty is expressed or implied.



Joohee R. Sood, PE
Principal Environmental Engineer



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EXECUTIVE SUMMARY

The State of California Department of Transportation (Caltrans) authorized Ninyo & Moore to conduct an aerially deposited lead (ADL) and oil site investigation along State Route 57 (SR-57) in the city of Brea, California. The site includes the northbound SR-57 between Lambert Road on-ramp and Tonner Canyon Road. Work was conducted in general accordance with Caltrans Contract No. 12A1340, Task Order No. 12-0N1300-26 (TO 26), dated April 28, 2014.

It is our understanding that Caltrans is planning to install safety light poles along the northbound SR-57. This investigation was performed to evaluate the presence of lead in soil resulting from automobile exhaust from nearby traffic during the age of leaded fuel and oil concentrations along the unpaved shoulder areas of the site as a result of known natural oil deposits within the site vicinity. Data collected during this investigation were used to develop recommendations for the potential reuse or disposal of soil excavated from the site and to inform Caltrans of potential health and safety issues concerning the presence of lead and petroleum in soil for workers at the site during construction activities.

Ninyo & Moore collected 28 soil samples from eight borings at the site (B1 through B8). None of the 28 samples contained a total lead concentration greater than 50 milligrams per kilogram (mg/kg), therefore the samples were not analyzed for soluble lead. Three samples were analyzed for pH, and the levels ranged between 7.4 and 8.1. Ten samples were collected and analyzed for total petroleum hydrocarbons (TPH). Detectable concentrations of TPH in the gas range (TPHg) were non detectable except for one sample which had a concentration of 38 mg/kg. Detectable concentrations of TPH in the diesel range (TPHd) were not reported in the samples analyzed. Detectable concentrations of TPH in the oil range (TPHo) ranged between 58 and 3,700 mg/kg which would cause disturbed soil to be classified as non-hazardous petroleum-impacted.

Our recommendations for soil reuse on the site are based on the guidelines set forth by the Department of Toxic Substances Control (DTSC) Lead Variance issued to Caltrans on June 30, 2009 (DTSC Variance) and the Santa Ana Regional Water Quality Control Board's (SARWQCB) Informal Guidelines for Petroleum Hydrocarbons and other Contaminated Soil Remediation and Reuse Projects (Informal Guidelines). Laboratory results were compared to these guidelines.

Our recommendations for off-site disposal were based on the comparison of lead concentrations in soil samples to the California Health and Safety Code thresholds and Title 40 Code of Federal Regulations 261.24 thresholds.

Based on the analytical results, the on-site reuse and the off-site disposal recommendations are summarized below.

Recommendations for Soil for Reuse by Caltrans (TPH Contamination)

Due to the presence of TPH concentrations in excess of the SARWQCB reuse guidelines, if Caltrans elects to reuse the soil on site, a proposal as outlined in the SARWQCB Informal Guidelines must be made and approved by the SARWQCB and then the following applies..

Recommendations for Soil for Reuse by Caltrans (ADL)

- Scenario A: The soil in the surface layer (surface to 0.5 feet below ground surface [bgs]) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X). The remaining soil from the 1.5- to 4-foot layers combined (0.5 to 4 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X).
- Scenario B: The soil in the surface and 1.5-foot layers combined (surface to 1.5 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X). The remaining soil from the 3- and 4-foot layers combined (1.5 to 4 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X).
- Scenario C: The soil in the surface to 3-foot layers combined (surface to 3 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X). The remaining soil from the 4-foot layer (3 to 4 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X).
- Scenario D: The soil in the layers combined (surface to 4 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X).

Recommendations for Soil to be Disposed Off-Site

If Caltrans elects to dispose the soil off site, the soil must be disposed as non-hazardous petroleum-impacted waste and must be disposed at a disposal facility or a recycling facility which is licensed to receive this waste, pursuant to State of California Regulations. Local facilities licensed to receive the waste include, but are not limited to:

- Thermal Remediation Solutions

1211 West Gladstone, Azusa, CA 91702

(626) 815-0233

- Soil Safe

12328 Hibiscus Road

Adelanto, CA 92301

(760) 246-8001

- Chiquita Canyon Landfill

29201 Henry Mayo Drive

Castaic, CA 91384

(661) 257-3655

The estimated cost for transportation and disposal of 17 cubic yards of soil is \$3,000.00.

1. INTRODUCTION

The State of California Department of Transportation (Caltrans) authorized Ninyo & Moore to conduct an aerially deposited lead (ADL) and oil site investigation along State Route 57 (SR-57) in the city of Brea, California. The site includes the northbound SR-57 between Lambert Road on-ramp and Tonner Canyon Road (Figure 1). Work was conducted in general accordance with Caltrans Contract No. 12A1340, Task Order No. 12-0N1300-26 (TO 26), dated April 28, 2014.

1.1. Project Description and Objective

It is our understanding that Caltrans is planning to install safety light poles along the northbound SR-57. This report has been prepared by Ninyo & Moore to document the results of a study to evaluate the presence of ADL and oil concentrations along the unpaved shoulder areas of the site.

1.2. Scope of Work

Ninyo & Moore performed the tasks described in the following sections.

1.2.1. Prefield Activities

Prefield activities included:

- Preparing a site-specific health and safety plan (HSP),
- Marking boring locations at the site,
- Notifying Underground Service Alert (USA) that Ninyo & Moore would be advancing soil borings in the area (USA ticket number A41250866), and
- Preparing a project schedule and coordinating work with subcontractor (traffic control).

1.2.2. Soil Sampling

Soil sampling was conducted on May 8, 2014. Eight borings (B1 through B8) were advanced for this task order as shown on Figure 2. Each boring was advanced and sampled using a hand auger. Four samples were attempted for collection from each boring at depths of surface to ½, 1½, 3, and 4 feet below ground surface (bgs). The depths reached for each boring are presented on Table 1.

1.2.3. Laboratory Analysis

Ninyo & Moore submitted the soil samples under chain-of-custody (COC) protocol to Pat-Chem Laboratories of Moorpark, California; a laboratory certified by the State of California Department of Health Services Environmental Laboratory Accreditation Program.

1.2.4. Global Positioning System Surveying

Approximate latitude and longitude (North American Datum 83) of sampling locations were recorded with a handheld global positioning system unit (GeoXT, Trimble). The latitude and longitude data for each boring are presented on Table 1.

1.2.5. Report Preparation

This report was prepared in general accordance with Caltrans Contract No. 12A1340, TO 26, dated April 28, 2014.

1.3. Previous Site Investigation

Ninyo & Moore has not performed previous investigation at this site. In addition, Caltrans has not notified Ninyo & Moore of previous investigation performed at the site.

2. BACKGROUND

Caltrans obtained a variance (V09 HQSCD006) from the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), on June 30, 2009 (DTSC Variance). The DTSC Variance allows for conditional reuse of lead-impacted soil within the Caltrans right-of-way (ROW). Background information regarding the source of ADL and the reuse or disposal of lead-impacted soil is discussed in the following sections.

2.1. Aerially Deposited Lead in Soil

Analyses for lead in soil along highways throughout the state of California have revealed that lead is commonly present along the shoulders of the highways as a result of automobile exhaust containing lead from the combustion of leaded gasoline. Elevated concentrations of lead are commonly found in the upper 2 feet of soil. Lead concentrations in soil are

dependent on many variables; but in general, are a function of the age of the highway and the volume of traffic using the highway.

2.2. Hazardous Waste Classification Criteria

Soil that exceeds the following limitations may be classified as hazardous waste with respect to lead, and pH concentrations:

- The soil contains 1,000 milligrams per kilogram (mg/kg) or more total lead, exceeding the Total Threshold Limit Concentration (TTL) for California hazardous waste (Title 22 California Code of Regulations [CCR], Section 66261.24);
- The soil contains 5.0 milligrams per liter (mg/l) or more citric acid-extractable lead, exceeding the Soluble Threshold Limit Concentration (STLC) for California hazardous waste (Title 22 CCR, Section 66261.24);
- The soil contains 5.0 mg/l or more leachable lead using the Toxicity Characteristic Leaching Procedure (TCLP), exceeding the maximum concentration for the toxicity characteristic of the Resource, Conservation, and Recovery Act (RCRA; Title 40 Code of Federal Regulations [CFR] 261.24); or
- The soil pH is less than or equal to 2.0 or greater than or equal to 12.5, which exceeds the limits for the corrosivity characteristic of RCRA hazardous waste (40 CFR 261.22) and California hazardous waste (Title 22 CCR, Section 66261.22).

2.3. DTSC Variance

In accordance with the DTSC Variance, soil that is subject to the guidelines presented below may be reused within the Caltrans ROW. A chart presenting the different ADL soil type classifications is included in Appendix A.

2.3.1. Reuse – Condition 1

Soil containing less than 1.5 mg/l extractable lead by the Waste Extraction Test (WET) using deionized water as the extractant (WET-DI) and less than or equal to 1,411 mg/kg total lead (United States Environmental Protection Agency [EPA] Method 6010B) may be used as fill in the Caltrans ROW provided the soil is placed a minimum of 5 feet above the maximum level of the water table and covered with at least 1 foot of non-hazardous soil.

2.3.2. Reuse – Condition 2

Soil containing greater than or equal to 1.5 mg/l, but less than 150 mg/l, extractable lead by WET-DI method, or more than 1,411 mg/kg total lead but less than 3,397 mg/kg total lead, may be used as fill in the Caltrans ROW provided the soil is placed a minimum of 5 feet above the minimum level of the water table and protected from infiltration by a paved structure that will be maintained by Caltrans.

2.3.3. Reuse – Condition 3

Lead-contaminated soil with a pH less than 5.5 but greater than 5.0 shall only be used as fill material under the paved portion of the roadway. Lead-contaminated soil with a pH at or less than 5.0 shall be managed as a hazardous waste.

2.4. Petroleum Hydrocarbons in Soil

Total petroleum hydrocarbons (TPH) in soil is historically known to be present in the vicinity of the site. TPH concentrations in soil do not have a regulatory limit to determine hazardous conditions. However, TPH-impacted soil is considered to be contaminated soil and is regulated for reuse and disposal. A copy of the Santa Ana Regional Water Quality Control Board (SARWQCB) guidelines is included in Appendix B.

2.5. Criteria for ADL-Impacted Disposal of Soil Not Intended for Reuse On-Site

If Caltrans elects to dispose soil within the Caltrans ROW that has been excavated during construction activities, the soil may be classified either as hazardous waste or non-hazardous waste. The distinction is based on the total and soluble lead concentrations compared to the TTLC and STLC criteria. As mentioned in Section 2.2, the TTLC for total lead is 1,000 mg/kg and the STLC for citric acid extractable lead is 5.0 mg/l. Waste containing lead concentrations in excess of or equal to those listed must be disposed at a Class I hazardous waste disposal facility pursuant to State of California Regulations.

2.6. Criteria for Petroleum-Impacted Soil Reuse On-Site

Non-hazardous soil that contains TPH that exceeds the following limitations may not be reused on site without prior approval from the SARWQCB.

TPH as gasoline – 50 mg/kg

TPH as diesel – 100 mg/kg

TPH as oil – 1,000 mg/kg

2.7. Criteria for Petroleum-Impacted Disposal of Soil Not Intended for Reuse On-Site

If Caltrans elects to dispose the soil off site, the soil will be classified as non-hazardous petroleum-impacted waste and must be disposed at a disposal facility or a recycling facility which is licensed to receive the waste, pursuant to State of California Regulations.

3. INVESTIGATION METHODS

The investigation activities are described in the following subsections and were conducted in general accordance with the TO that was approved by Caltrans prior to beginning the field activities.

3.1. Site-Specific Health and Safety Plan (HSP)

A site-specific HSP dated May 6, 2014, was prepared by Ninyo & Moore and submitted to Caltrans for approval prior to commencing field work.

3.2. Traffic Control

Shoulder closures were set up and maintained by California Barricade for the duration of the field work.

3.3. Utility Clearance

The boring locations were described to USA during the notification at least two working days prior to conducting the soil sampling. USA marked the member utilities known to be in the vicinity of the boring locations.

3.4. Hand-Auger Sampling

The field work was conducted on May 8, 2014. The boring locations were approved by the Caltrans TO Manager and are shown on the attached Figure 2. Borings B1 through B8 were

advanced by hand-auger. Hand augering activities and sample collection was performed by Ninyo & Moore personnel. Four samples were collected from each boring at depths of surface to ½, 1½, 3, and 4 feet bgs, with the exception of borings B5 and B7, which encountered refusal at approximately 2 feet bgs. A step-out was attempted on both borings, but refusal was encountered at approximately 2 feet bgs, so borings were terminated.

Samples were placed into new, 4-ounce and 8-ounce, glass jars; capped with Teflon-coated plastic lids; labeled; placed in a resealable plastic bag; and stored in an ice chilled cooler. The sampling equipment was decontaminated between each boring. Soil samples were transferred under COC protocol to Pat-Chem Laboratories within 24 hours of collection. In accordance with the TO, soil sample homogenization for lead testing was performed in the laboratory.

Additionally, samples were field screened for the presence of methane, hydrogen sulfide, and volatile organic compounds using a 4-gas meter and a photo ionizing detector.

3.5. Investigation Derived Wastes

Soil cuttings generated by hand-auger drilling were returned to their corresponding boreholes after collection of soil samples. Decontamination water was transported to Ninyo & Moore's Irvine office and placed in a drum pending chemical characterization. Based on the analytical result of the decontamination water sample, the decontamination water was subsequently disposed in the sanitary sewer.

3.6. Laboratory Analyses

Once the samples were received by Pat-Chem Laboratories the samples were analyzed for the following.

- Ten samples were analyzed for TPH using EPA method 8015M.
- Twenty-eight soil samples were separately homogenized and analyzed for total lead using EPA Method 6010B.
- Three soil samples were analyzed for pH using EPA Method 9045.
- One decontamination water sample was analyzed for total lead using EPA Method 6010B.

4. ANALYTICAL RESULTS

The results of this investigation are described in the following subsections. The analytical results of lead, pH, and TPH are summarized in Tables 1 and 2, and Figures 3 and 4. Laboratory reports and COC records are included in Appendix C.

4.1. Total Lead

Twenty-eight soil samples were analyzed for total lead. The maximum total lead concentration was 21 mg/kg. The minimum total lead concentration was less than the laboratory practical quantitation limit (PQL) of 1.0 mg/kg.

The decontamination water sample contained total lead at a concentration less than the laboratory PQL of 0.02 mg/l.

4.2. Soluble Lead – Citric Acid

None of the samples were analyzed for soluble lead using the WET-citric.

4.3. Soluble Lead – Deionized Water

None of the samples were analyzed for soluble lead using the WET-DI.

4.4. Leachable Lead – TCLP

None of the samples were analyzed for leachable lead by the TCLP.

4.5. pH

Three samples were collected and analyzed for pH. The results ranged between 7.4 and 8.1.

4.6. TPH

Ten samples were collected and analyzed for TPH. Detectable concentrations of TPHg were non detectable except for one sample (B8-4.0) which had a concentration of 38 mg/kg. Detectable concentrations of TPHd were not reported in the samples analyzed. Detectable concentrations of TPHo ranged from 58 (B2-4.0) and 3,700 mg/kg (B8-4.0).

5. STATISTICAL EVALUATION

Based on the data reported for the site, none of the samples contained concentrations that would drive the soil to be classified as hazardous. Therefore, statistical analyses were not performed.

The following depth combinations are used to define layers:

- **Scenario A** – surface soil (0 to ½ foot) and underlying subsurface soil (½ foot to 4 feet)
- **Scenario B** – the upper 1½ feet (0 to 1½ feet) and the underlying subsurface soil (1½ to 4 feet)
- **Scenario C** – the upper 3 feet (0 to 3 feet) and the underlying subsurface soil (3 to 4 feet)
- **Scenario D** – the entire 4-foot soil column

6. CONCLUSIONS

The analyses of the lead data indicate that the surface layers tend to have the highest concentrations of total lead, followed by the 1 ½ -, 3-, and 4-foot layers. Assuming the soil has not been disturbed since construction of the route; concentrations of total lead would be expected to decrease with depth.

The samples analyzed contained detectable concentrations of TPHs. Therefore, soil within the site will be classified as non-hazardous petroleum-impacted soil when disturbed.

7. RECOMMENDATIONS

Based on the findings of this study, recommendations are summarized on block diagrams in Appendix C and discussed below.

The soil reuse conditions noted below are only applicable with approval through proposal to the SARWQCB as outlined in the Informal Guidelines presented in Appendix B.

7.1. Recommendations for Soil for Reuse by Caltrans

Due to the presence of TPH concentrations in excess of the SARWQCB reuse guidelines, if Caltrans elects to reuse the soil on site, a proposal as outlined in the SARWQCB Informal Guidelines must be made and approved by the SARWQCB and then the following applies:

- Scenario A: The soil in the surface layer (surface to 0.5 feet below ground surface [bgs]) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X). The remaining soil from the 1.5- to 4-foot layers combined (0.5 to 4 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X).
- Scenario B: The soil in the surface and 1.5-foot layers combined (surface to 1.5 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X). The remaining soil from the 3- and 4-foot layers combined (1.5 to 4 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X).
- Scenario C: The soil in the surface to 3-foot layers combined (surface to 3 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X). The remaining soil from the 4-foot layer (3 to 4 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X).
- Scenario D: The soil in the layers combined (surface to 4 feet bgs) is suitable for on-site reuse by Caltrans with no restrictions based on total lead concentrations (Soil Type X).

7.2. Recommendations for Soil to be Disposed Off Site

If Caltrans elects to dispose the soil off site, the soil will be classified as non-hazardous petroleum-impacted waste and must be disposed at a disposal facility or a recycling facility which is licensed to receive this waste, pursuant to State of California Regulations. Local facilities licensed to receive the waste include, but are not limited to:

- Thermal Remediation Solutions
1211 West Gladstone, Azusa, CA 91702
(626) 815-0233
- Soil Safe
12328 Hibiscus Road
Adelanto, CA 92301
(760) 246-8001
- Chiquita Canyon Landfill
29201 Henry Mayo Drive
Castaic, CA 91384

(661) 257-3655

The estimated cost for transportation and disposal of 17 cubic yards of soil is \$3,000.00.

7.3. Health Effects of Lead

Concentrations of lead in soil at the site represent a potential threat to the health of site workers performing earthwork activities.

Lead in its element form is a heavy, ductile, soft, gray metal. The permissible exposure limit for lead is 0.05 milligrams per cubic meter (mg/m^3) in air based on an eight-hour time-weighted average. The immediately dangerous to life and health exposure limit is $100 \text{ mg}/\text{m}^3$ as established by the National Institute of Occupational Safety and Health. Exposure may produce several symptoms including weakness, eye irritation, facial pallor, pale eyes, lassitude, insomnia, anemia, tremors, malnutrition, constipation, paralysis of the wrists and ankles, abdominal pain, colic, nephropathy, encephalopathy, gingival lead line, hypertension, anorexia, and weight loss. Target organs are the central nervous system, kidneys, eyes, blood, gingival tissue, and the gastrointestinal tract.

Because of the potential hazard from exposure to lead-contaminated soil, a lead HSP should be prepared by a Certified Industrial Hygienist (CIH). In addition, all site workers (earthwork) should have completed a training program meeting the requirements of 29 CFR 1910.120 and 8 CCR 1532.1. The plan developed by the CIH should include a hazard analysis, dust control measures, air monitoring, signage, work practices, emergency response plans, personal protective equipment, decontamination, and documentation.

7.4. Health Effects of TPH

Concentrations of TPH in soil at the site represent a potential threat to the health of site workers performing earthwork activities.

Some of the TPH compounds can affect your central nervous system. One compound can cause headaches and dizziness at high levels in the air. Another compound can cause a nerve disorder called "peripheral neuropathy," consisting of numbness in the feet and legs. Other TPH compounds can cause effects on the blood, immune system, lungs, skin, and eyes.

Animal studies have shown effects on the lungs, central nervous system, liver, and kidney from exposure to TPH compounds. Some TPH compounds have also been shown to affect reproduction and the developing fetus in animals.

Because of the potential hazard from exposure to TPH, the CIH should include preventive measures within the HSP noted in Section 7.3

8. LIMITATIONS

The services outlined in this report have been conducted in a manner generally consistent with current regulatory guidelines. No warranty, expressed or implied, is made regarding the professional opinions presented in this report. Ninyo & Moore's opinions are based on an analysis of observed conditions and on information obtained from third parties. It is likely that variations in soil conditions may exist.

The samples collected and chemically analyzed and the observations made are believed to be representative of the general area evaluated; however, conditions can vary significantly between sampling locations. The interpretations and opinions contained in this report are based on the results of laboratory tests and analyses intended to detect the presence and measure the concentration of selected chemical or physical constituents in samples collected from the site. The analyses have been conducted by an independent laboratory certified by the State of California to conduct such analyses. Ninyo & Moore has no involvement in, or control over, such analyses and has no means of confirming the accuracy of laboratory results. Ninyo & Moore, therefore, disclaims any responsibility for inaccuracy in such laboratory results.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader wants any additional information, or has questions regarding content, interpretations presented, or completeness of this document. Opinions and judgments expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

For individuals with sensory disabilities, this document is available in alternate formats upon request. For any questions regarding this document, please call or write Wayne Chiou, Environmental Engineering, 3347 Michelson Drive, Suite 100, Irvine, California 92612-8894. Phone Number (949) 724-2221.

TABLE 1 – SOIL ANALYTICAL RESULTS – AERIALY DEPOSITED LEAD, pH, AND GPS COORDINATES

Sample	Sample Depth (feet)	Sample Date	Total Lead (mg/kg)	WET-citric (mg/l)	WET-DI (mg/l)	TCLP (mg/l)	pH	Latitude	Longitude
B1-0.5	0.5	5/8/2014	21	--	--	--	7.4	33.930564135	-117.879547846
B1-1.5	1.5	5/8/2014	21	--	--	--	--		
B1-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--		
B1-4.0	4.0	5/8/2014	ND<1.0	--	--	--	--	33.931374503	-117.879340634
B2-0.5	0.5	5/8/2014	14	--	--	--	--		
B2-1.5	1.5	5/8/2014	19	--	--	--	--		
B2-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--	33.932150117	-117.879102875
B2-4.0	4.0	5/8/2014	ND<1.0	--	--	--	--		
B3-0.5	0.5	5/8/2014	3.6	--	--	--	--		
B3-1.5	1.5	5/8/2014	ND<1.0	--	--	--	--	33.932940715	-117.878833635
B3-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--		
B3-4.0	4.0	5/8/2014	ND<1.0	--	--	--	--		
B4-0.5	0.5	5/8/2014	2.2	--	--	--	7.6	33.933714927	-117.878554381
B4-1.5	1.5	5/8/2014	ND<1.0	--	--	--	--		
B4-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--		
B4-4.0	4.0	5/8/2014	ND<1.0	--	--	--	--	33.934485247	-117.878295332
B5-0.5	0.5	5/8/2014	2.8	--	--	--	--		
B5-1.5	1.5	5/8/2014	ND<1.0	--	--	--	--		
B6-0.5	0.5	5/8/2014	ND<1.0	--	--	--	--	33.935311364	-117.878025400
B6-1.5	1.5	5/8/2014	ND<1.0	--	--	--	--		
B6-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--		
B6-4.0	4.0	5/8/2014	ND<1.0	--	--	--	--	33.936111875	-117.877750672
B7-0.5	0.5	5/8/2014	ND<1.0	--	--	--	8.1		
B7-1.5	1.5	5/8/2014	ND<1.0	--	--	--	--		
B8-0.5	0.5	5/8/2014	2.9	--	--	--	--	33.936111875	-117.877750672
B8-1.5	1.5	5/8/2014	6.5	--	--	--	--		
B8-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--		
B8-4.0	4.0	5/8/2014	ND<1.0	--	--	--	--		
Maximum			21	--	--	--	8.1		
Average			5.0	--	--	--	7.7		
Minimum			ND<1.0	--	--	--	7.4		
Regulatory Limits			1,411 ⁽¹⁾	5 ⁽²⁾	1.5 ⁽³⁾	5 ⁽⁴⁾	5 ⁽⁵⁾		
Decontamination Water (mg/l)									
R1	--	5/8/2014	ND<0.02	--	--	--	--		

Notes:
1 – Limit specified in addendum to Variance issued by the Department of Toxic Substance Control to Caltrans
2 – Soluble Threshold Limit Concentration for California Hazardous Waste (California Code of Regulations [CCR] Title 22, Section 66261.24)
3 – Limit Specified by DTSC Variance
4 – Maximum concentration for the TCLP of Resource Conservation and Recovery Act (RCRA) hazardous waste (40 Code of Federal Regulations, Section 261.24)
5 – Minimum value specified by DTSC Variance
mg/kg – milligrams per kilogram
mg/l – milligrams per liter
ND – not detected above reporting limits presented in Appendix C
TCLP – soluble lead by the Toxicity Characteristic Leaching Procedure
TTLC – total lead for comparison to the Total Threshold Limit Concentration
WET – Waste Extraction Test
WET-citric – soluble lead by WET using citric acid for comparison to the Soluble Threshold Limit Concentration
WET-DI – soluble lead by WET using deionized water for comparison to the DTSC Variance
-- – not analyzed

TABLE 2 – SOIL ANALYTICAL RESULTS – TPH

Sample	Sample Depth (feet)	Sample Date	TPHg (mg/kg)	TPHd (mg/kg)	TPHo (mg/kg)
B1-0.5	0.5	5/8/2014	--	--	--
B1-1.5	1.5	5/8/2014	--	--	--
B1-3.0	3.0	5/8/2014	--	--	--
B1-4.0	4.0	5/8/2014	ND<0.050	ND<2.5	62
B2-0.5	0.5	5/8/2014	--	--	--
B2-1.5	1.5	5/8/2014	--	--	--
B2-3.0	3.0	5/8/2014	--	--	--
B2-4.0	4.0	5/8/2014	ND<0.050	ND<2.5	58
B3-0.5	0.5	5/8/2014	--	--	--
B3-1.5	1.5	5/8/2014	--	--	--
B3-3.0	3.0	5/8/2014	--	--	--
B3-4.0	4.0	5/8/2014	ND<0.050	ND<2.5	160
B4-0.5	0.5	5/8/2014	--	--	--
B4-1.5	1.5	5/8/2014	--	--	--
B4-3.0	3.0	5/8/2014	--	--	--
B4-4.0	4.0	5/8/2014	ND<0.050	ND<2.5	ND<10
B5-0.5	0.5	5/8/2014	--	--	--
B5-1.5	1.5	5/8/2014	ND<0.050	ND<2.5	1,100
B6-0.5	0.5	5/8/2014	--	--	--
B6-1.5	1.5	5/8/2014	ND<0.050	ND<2.5	1,900
B6-3.0	3.0	5/8/2014	--	--	--
B6-4.0	4.0	5/8/2014	--	--	--
B7-0.5	0.5	5/8/2014	ND<0.050	ND<2.5	1,100
B7-1.5	1.5	5/8/2014	ND<0.050	ND<2.5	640
B8-0.5	0.5	5/8/2014	--	--	--
B8-1.5	1.5	5/8/2014	ND<0.050	ND<2.5	1,600
B8-3.0	3.0	5/8/2014	--	--	--
B8-4.0	4.0	5/8/2014	38	ND<2.5	3,700
SARWQCB Guidelines			50	100	1,000
Notes: mg/kg – milligrams per kilogram ND – not detected above reporting limits presented in Appendix C SARWQCB - Santa Ana Regional Water Quality Control Board TPH - total petroleum hydrocarbons TPHd - total petroleum hydrocarbons in the diesel range TPHg - total petroleum hydrocarbons in the gasoline range TPHo - total petroleum hydrocarbons in the heavy oil range -- -- not analyzed					



REFERENCE: 2007 THOMAS GUIDE FOR LOS ANGELES/ORANGE COUNTIES, STREET GUIDE AND DIRECTORY.

SCALE IN FEET



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.
Map © Rand McNally, R.L.07-S-129

Ninyo & Moore

SITE LOCATION

FIGURE

PROJECT NO.	DATE
208449026	6/14

NORTHBOUND SR-77
BREA, CALIFORNIA

1



REFERENCE: GOOGLE EARTH IMAGERY, 2014.



SCALE IN FEET



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND	
B8	 BORING

Ninyo & Moore

BORING LOCATIONS

FIGURE

2

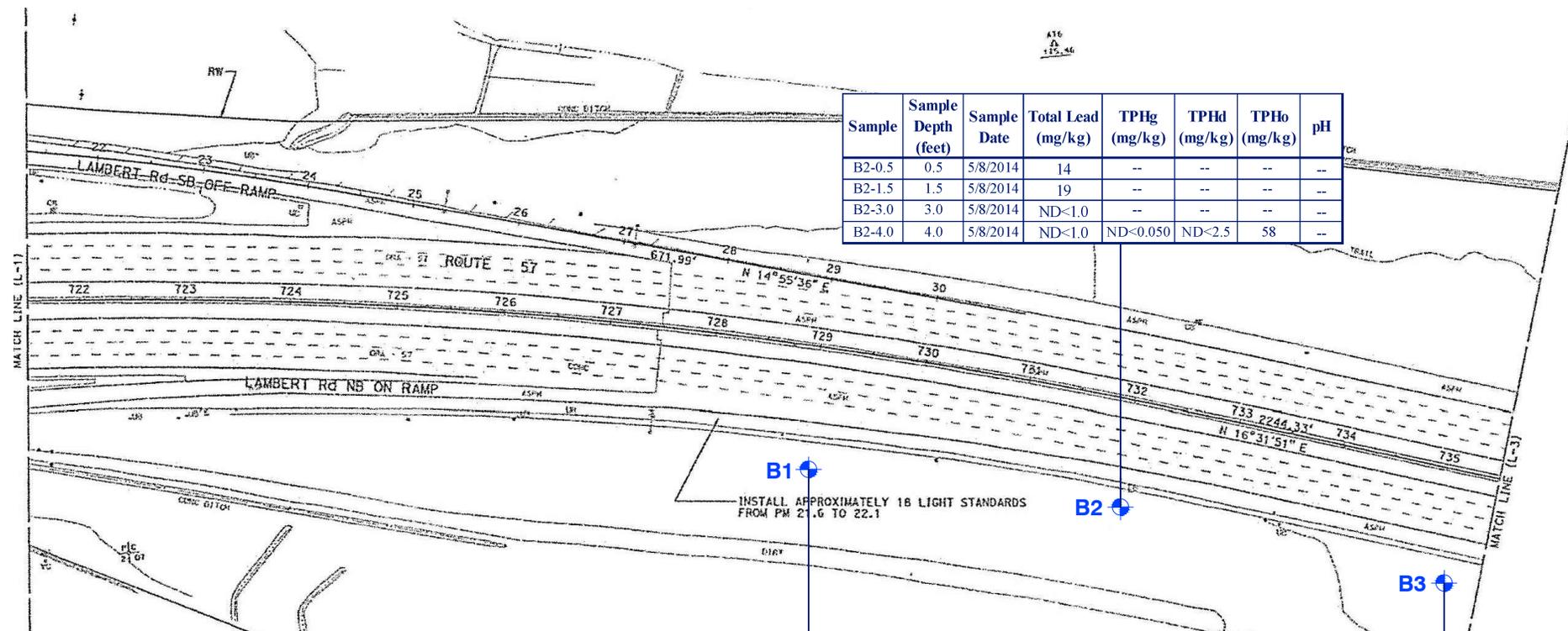
PROJECT NO.

DATE

NORTHBOUND SR-57
BREA, CALIFORNIA

208449026

6/14



Sample	Sample Depth (feet)	Sample Date	Total Lead (mg/kg)	TPHg (mg/kg)	TPHd (mg/kg)	TPHo (mg/kg)	pH
B2-0.5	0.5	5/8/2014	14	--	--	--	--
B2-1.5	1.5	5/8/2014	19	--	--	--	--
B2-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--
B2-4.0	4.0	5/8/2014	ND<1.0	ND<0.050	ND<2.5	58	--

B1 
 INSTALL APPROXIMATELY 18 LIGHT STANDARDS FROM PM 21.6 TO 22.1

B2 

B3 

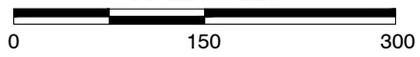
Sample	Sample Depth (feet)	Sample Date	Total Lead (mg/kg)	TPHg (mg/kg)	TPHd (mg/kg)	TPHo (mg/kg)	pH
B1-0.5	0.5	5/8/2014	21	--	--	--	7.4
B1-1.5	1.5	5/8/2014	21	--	--	--	--
B1-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--
B1-4.0	4.0	5/8/2014	ND<1.0	ND<0.050	ND<2.5	62	--

Sample	Sample Depth (feet)	Sample Date	Total Lead (mg/kg)	TPHg (mg/kg)	TPHd (mg/kg)	TPHo (mg/kg)	pH
B3-0.5	0.5	5/8/2014	3.6	--	--	--	--
B3-1.5	1.5	5/8/2014	ND<1.0	--	--	--	--
B3-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--
B3-4.0	4.0	5/8/2014	ND<1.0	ND<0.050	ND<2.5	160	--

LEGEND	
B3 	BORING
mg/kg	MILLIGRAMS PER KILOGRAM
TPHg	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
TPHd	TOTAL PETROLEUM HYDROCARBONS AS DIESEL
TPHo	TOTAL PETROLEUM HYDROCARBONS AS OIL RANGE



SCALE IN FEET



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

REFERENCE: SITE PLAN BY CALTRANS, SHEET L-2, APRIL 2013.

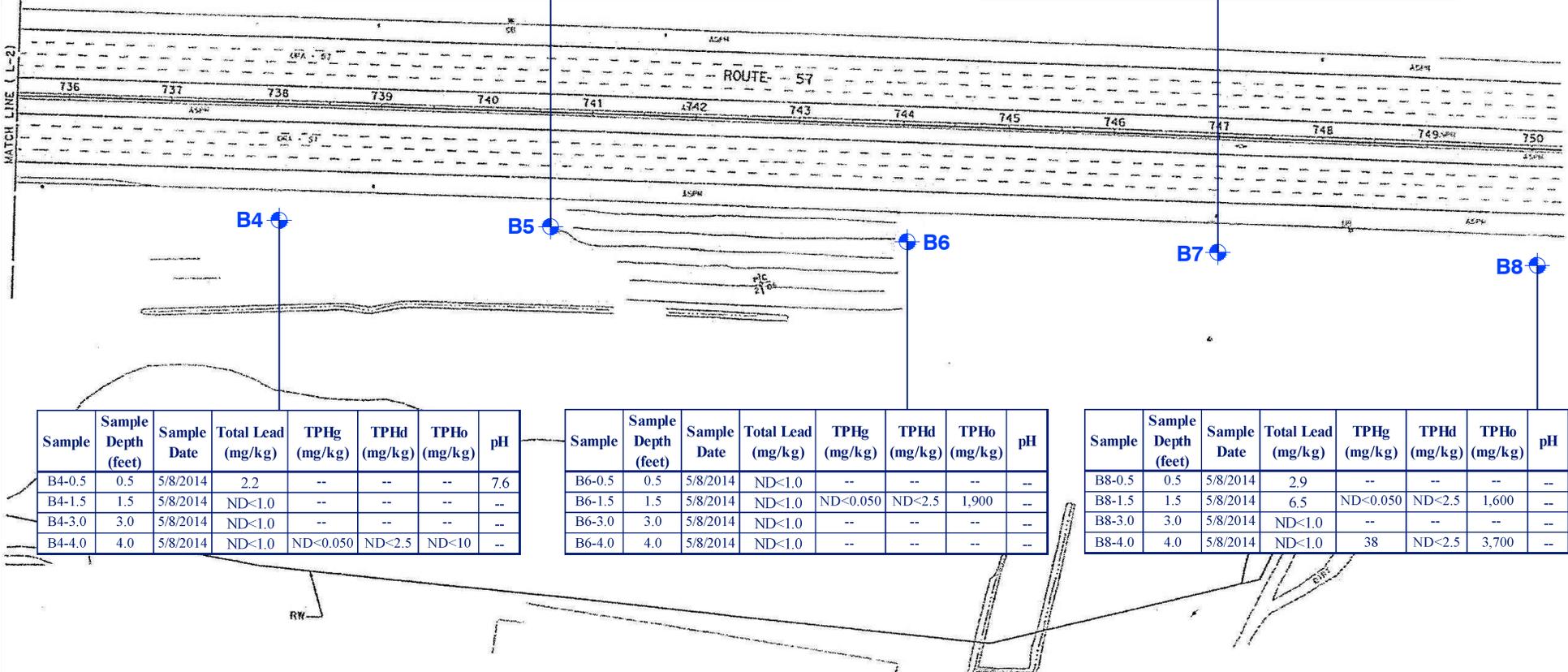


PROJECT NO.		DATE	BORING DATA (SOUTH)	FIGURE
208449026		6/14		

Sample	Sample Depth (feet)	Sample Date	Total Lead (mg/kg)	TPHg (mg/kg)	TP Hd (mg/kg)	TPHo (mg/kg)	pH
B5-0.5	0.5	5/8/2014	2.8	--	--	--	--
B5-1.5	1.5	5/8/2014	ND<1.0	ND<0.050	ND<2.5	1,100	--

Sample	Sample Depth (feet)	Sample Date	Total Lead (mg/kg)	TPHg (mg/kg)	TP Hd (mg/kg)	TPHo (mg/kg)	pH
B7-0.5	0.5	5/8/2014	ND<1.0	ND<0.050	ND<2.5	1,100	8.1
B7-1.5	1.5	5/8/2014	ND<1.0	ND<0.050	ND<2.5	640	--

MATCH LINE (L-2)



Sample	Sample Depth (feet)	Sample Date	Total Lead (mg/kg)	TPHg (mg/kg)	TP Hd (mg/kg)	TPHo (mg/kg)	pH
B4-0.5	0.5	5/8/2014	2.2	--	--	--	7.6
B4-1.5	1.5	5/8/2014	ND<1.0	--	--	--	--
B4-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--
B4-4.0	4.0	5/8/2014	ND<1.0	ND<0.050	ND<2.5	ND<10	--

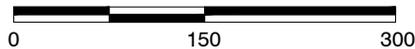
Sample	Sample Depth (feet)	Sample Date	Total Lead (mg/kg)	TPHg (mg/kg)	TP Hd (mg/kg)	TPHo (mg/kg)	pH
B6-0.5	0.5	5/8/2014	ND<1.0	--	--	--	--
B6-1.5	1.5	5/8/2014	ND<1.0	ND<0.050	ND<2.5	1,900	--
B6-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--
B6-4.0	4.0	5/8/2014	ND<1.0	--	--	--	--

Sample	Sample Depth (feet)	Sample Date	Total Lead (mg/kg)	TPHg (mg/kg)	TP Hd (mg/kg)	TPHo (mg/kg)	pH
B8-0.5	0.5	5/8/2014	2.9	--	--	--	--
B8-1.5	1.5	5/8/2014	6.5	ND<0.050	ND<2.5	1,600	--
B8-3.0	3.0	5/8/2014	ND<1.0	--	--	--	--
B8-4.0	4.0	5/8/2014	ND<1.0	38	ND<2.5	3,700	--

LEGEND	
	BORING
mg/kg	MILLIGRAMS PER KILOGRAM
TPHg	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
TP Hd	TOTAL PETROLEUM HYDROCARBONS AS DIESEL
TPHo	TOTAL PETROLEUM HYDROCARBONS AS OIL RANGE



SCALE IN FEET



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

REFERENCE: SITE PLAN BY CALTRANS, SHEET L-3, APRIL 2013.

Ninyo & Moore

PROJECT NO.	DATE
208449026	6/14

BORING DATA (NORTH)

NORTHBOUND SR-57 BREA, CALIFORNIA

FIGURE

4

APPENDIX A

AERIALY DEPOSITED LEAD SOIL MANAGEMENT CHART

AERIALLY DEPOSITED LEAD SOIL MANAGEMENT

SOLUBLE LEAD (mg/l)	TOTAL LEAD (mg/kg)	SOIL TYPE	HANDLING
CALIFORNIA TESTING			
STLC <5.0	TTLC <1000	X	Non-hazardous Waste. Notify and require Lead Compliance Plan for worker safety.
	1000 – 1411 and DI WET < 1.5 mg/l	Y1	Hazardous Waste. Variance applies – cover with minimum 1 foot of clean soil.*
	1411 – 3397 and DI WET < 150 mg/l	Y2	Hazardous Waste. Variance applies – cover with pavement structure. *
	1000 – 3397 but Surplus	Z2	Hazardous Waste - Surplus. Dispose at Class 1 disposal site.
	> 3397 or 1000 – 3397 & DI WET > 150 mg/l	Z2	Hazardous Waste – not reusable under Variance. Dispose at Class 1 disposal site.
STLC >5.0	TTLC < 1411 and DI WET < 1.5 mg/l	Y1	Hazardous Waste. Variance applies – cover with minimum of 1 foot of clean soil.*
	1411 – 3397 and DI WET < 150 mg/l	Y2	Hazardous Waste. Variance applies – cover with pavement structure.*
	< 3397 and DI WET < 150 mg/l but Surplus	Z2	Hazardous Waste - Surplus. Dispose at Class 1 disposal site.
	> 3397 or DI WET > 150 mg/l	Z2	Hazardous Waste – not reusable under Variance. Dispose at Class 1 disposal site.
FEDERAL TESTING			
TCLP > 5.0 mg/l	N/A	Z3	RCRA Hazardous Waste Dispose at Class 1 disposal site as a RCRA waste regardless of TTLC and STLC results.

*Note: For hazardous waste levels of lead - if pH is less than 5.5 soil must be placed under a pavement structure. If pH is less than 5.0 variance can not be used and the soil must be disposed as Z-2 material.

APPENDIX B
LOCAL AGENCY REUSE GUIDELINES

**REGIONAL WATER QUALITY CONTROL BOARD
SANTA ANA REGION**

**Informal Guidelines for Petroleum Hydrocarbon and other Contaminated Soil
Remediation and Reuse Projects**

GENERAL

The following are informal guidelines only and are provided to aid in preparing and proposing remedial and cleanup plans for projects involving non-hazardous contaminated soils. These guidelines contain information on the following types of projects:

1. Clean closure/unrestricted disposal or reuse of clean soil.
2. General storage, remediation and reuse.
3. Reuse as construction fill.

Contaminated soil project proposals are reviewed on a case- by-case basis by the Regional Water Quality Control Board (RWQCB) staff.

Contaminated soil is defined as soil that:

1. Contains designated or non-hazardous concentrations of waste constituents, as defined in Section 13173(a) and (b) of the California Water Code (CWC). "Waste" is defined under Section 13050(d) of the CWC;
2. Has been determined pursuant to Section 13263(a) of the Water Code to be a waste that requires regulation by the RWQCB.

A revised Water Quality Control Plan (Basin Plan) for the Santa Ana Region became effective on January 24, 1995. This Plan contains water quality objectives and beneficial use designations for waters in the Santa Ana Region. Regulating the contaminated soil storage, treatment, or disposal projects is necessary to implement the Basin Plan objectives.

BACKGROUND

An increasing quantity of contaminated soils are generated from various operations and remedial projects such as underground tank removals and cleanup activities, oil field remediation and cleanup activities, aboveground tank spills and other contaminated soil related projects within the Santa Ana Region. If these contaminated soils are left in place untreated, they could degrade the waters of the state. Therefore, it is necessary and appropriate to regulate these site cleanups to protect the waters of the State.

Soils Contaminated by petroleum hydrocarbon (PHC)-contamination**CRITERIA FOR DISPOSAL/REUSE OF SOILS
IN SANTA ANA REGION**

Contaminated soils may be disposed or reused anywhere in the region if concentrations of individual constituents do not exceed any of the discharge specifications listed below. These numbers are baseline limits.

<u>COMPOUND</u>	<u>METHOD</u>	<u>CONCENTRATION</u>	
Gasoline Range PHC	EPA 8015M	50	mg/kg
Diesel Range PHC	EPA 8015M	100	mg/kg
Heavy Hydrocarbons	EPA 8015M	1000	mg/kg
Benzene	EPA 8020	0.010	mg/kg
Toluene	EPA 8020	10	mg/kg
Ethylbenzene	EPA 8020	6.8	mg/kg
Xylene	EPA 8020	17.5	mg/kg
Ethylene dibromide	EPA 8260	0.0002	mg/kg
1,2-Dichloroethane	EPA 8260	0.005	mg/kg
Methyl t-butyl ether (MTBE)	EPA 8260	0.013	mg/kg
Tetrachloroethylene (PCE)	EPA 8260	0.05	mg/kg
Trichloroethylene (TCE)	EPA 8260	0.05	mg/kg
1,1,1-Trichloroethane	EPA 8260	2.0	mg/kg
Methylene chloride	EPA 8260	0.05	mg/kg
Vinyl chloride	EPA 8260	0.005	mg/kg

Soils with higher concentrations of these constituents may also be acceptable on a case-by-case basis for certain disposal/reuse sites. A proposal must be submitted to the RWQCB staff for review. The proposal should follow the following guidelines.

PROPOSAL

Individuals planning for storage, remediation or disposals of PHC-contaminated soils are required to submit a workplan and proposal to the RWQCB. The remedial or disposal project proposals must be reviewed and approved by the RWQCB prior to commencement of the activities. At a minimum, proposals must include the following information:

1. A cover letter identifying in detail the situation, responsible party(ies), and the nature of the proposal.
2. Site generating the PHC-contaminated soil, type of facility, type of operations performed at the site, and the location of the soil contamination at the site (shown in scale on a map of the facility).
3. Source of the contaminants - under ground tank, aboveground Tank, hazardous material storage area, industrial waste clarifier, spills, etc.
4. Nature of the contamination - Type of material spilled, crude oil from oil field operations, waste oil tank leaks, etc.

5. Proposed method of storage, treatment, remediation or disposal.
6. Location of storage, treatment, remediation or disposal.
7. Total volume of PHC-contaminated soils (lateral and vertical extents of the contamination if in-situ).
8. Waste characterization test results.
9. Depth to groundwater beneath the storage, treatment or disposal area.
10. Distance to the nearest surface water body.
11. A map showing the surface water bodies within a 1/4 of mile boundary of the site.

DISPOSAL SITE PARAMETERS

The specific disposal parameters are determined by the RWQCB staff in accordance with the applicable objectives and beneficial uses outlined in the Basin Plan for the groundwater and surface waters at the or nearby the site.

SOIL SAMPLING METHODS

1. Soil sampling methods must be identified; only discrete soil samples are acceptable.
2. Composite soil samples are unacceptable.
3. For excavated soils, surface samples are unacceptable; soil samples must be collected from a depth of at least 2 feet below the stockpile surface.
4. For in-situ soils, depth dependent soil samples must be collected.

NUMBER OF COLLECTED SAMPLES

The following schedule must be used for determining the number of soil samples need to be collected for laboratory analysis:

CUBIC YARDS OF SOIL	NO. OF SAMPLES
Less than 100	2
100 to 500	4
500 to 2500	6
For each 500 CY greater than 2500	1 additional sample

CONTAMINATED SOIL TESTING

Soil samples should be tested in accordance with the following schedule:

1. PETROLEUM HYDROCARBON (PHC) - Includes all of the following:
 - a. Gasoline (C₆ - C₁₂) - test soils using EPA Methods 8020 and 8015 Modified for gasoline, EPA prep method 5030. Have results of 8015M reported as C₆ to C₉ and C₉ to C₁₂.
 - b. Diesel/Kerosene (C₈ to C₃₀) - test soils using EPA Methods 8015 Modified for Diesel, EPA prep method 3550. Have results of 8015M reported as C₈ to C₁₂, C₁₃ to C₁₈ and C₁₉ to C₃₀.
 - c. Crude Oil (C₁ to C₅₀₊) - see Diesel.
 - d. Hydraulic Oil/Break Fluid (C₁₈ to C₄₅) - test soils using EPA Method 8015 Modified, EPA prep method 3550; Title 22 Metals, EPA Method 8240.
 - e. Waste Oil - see Hydraulic Oil.
2. VOLATILE ORGANIC COMPOUNDS (VOCs)
 - a. Aromatics (BTEX) - test soils using EPA Method 8020, 8240 or 8260, with EPA prep method 5030.
 - b. Halogenated (PCE, TCE, TCA, DCE, DCA, etc) - test soils using EPA Method 8010 or 8240, with EPA prep method 5030.
3. STANDARD MINERALS ANALYSIS (EC, NO₃, TDS, SO₄, etc.)
4. SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs); (DDD, DDE, and DDT; and PCBs such as Anchlor 1016 to 1260) - test solids using EPA 8270, with EPA prep. Method 3550.
5. PESTICIDES
 - a) Organophosphorus - test soils using EPA 8140, with EPA prep method 3550.
 - b) Organochlorine - test soils using EPA 8080, with EPA prep method 3550.
6. METALS - soils should be tested using CA WET test for STLC; TCLP is not acceptable.

EXTRACTION AND TEST METHODS

Extraction methods used in the characterization process of PHC-contaminated soils are as follows:

1. 3510 – For water samples, liquid/liquid extract in separating funnel using methylene chloride.
2. 3550 – For solid samples, ultrasonic extraction using methylene chloride.
3. 5030 – For VOCs, purge and trap.

4. TCLP – For organic compounds, extraction using sodium acetate, under aerobic conditions, 20 hours, 20:1 dilution, particle size < 1mm.
5. WET – For metals, extraction using sodium citrate (pH 5), under anaerobic conditions, 48 hours, 10:1 dilution, particle size <2mm.
6. 1312 (SPLP) – For solids, extraction using sulfuric/nitric acid mixture (pH 5), 18 hours, 20:1 dilution, particle size <1mm.

Test methods for treated or processed soils are as follows:

1. For treated soil* formerly contaminated by:
 - Gasoline use 8015 Modified with prep. Method 5030.
 - Diesel use 8015 Modified with prep. Method 3550.
 - VOCs use 8260 with prep. Method 5030.
2. For processed soil** containing:
 - Gasoline use 8015 Modified with TCLP, and purge and trap.
 - Diesel use 8015 Modified with TCLP.
 - VOCs use 8260 with TCLP prep.

* **Treated Soil** – Is defined as soils from which the organic contaminants have been removed by an active mechanical, thermal, chemical, or biological process.

** **Processed soil** – Is defined as soils, which the organic compounds have been encapsulated through mixing with cold emulsion asphalt or similar process.

**GENERAL GUIDELINES FOR REUSE OF PETROLEUM CONTAMINATED SOILS AS
CONSTRUCTION FILL PROJECTS**

The following are recommended guidelines for reuse of PHC contaminated soils as construction fill. However, the criteria may be different from site to site due to site specific conditions.

1. Regional Board staff must receive and approve a written proposal for disposal/reuse of PHC contaminated soils.
2. PHC contaminated soils shall be placed at a minimum of 10 vertical feet above the highest groundwater elevation expected to occur at the reuse site. Please be advised that additional constraints regarding the placement of contaminated soils may be applicable based on the results of the waste soil characterization.
3. Contaminated soils shall be compacted to achieve a minimum of 90% relative compaction and permeability not greater than 1×10^{-5} cm/sec.
4. Water applied to contaminated soils for moisture conditioning or dust control shall not result in runoff.
5. Contaminated soils shall be placed where the soil will be permanently beneath and completely covered by a continuous impervious surface such as concrete or asphalt pavements or structures.
6. Impermeable surfaces covering the contaminated soils shall extend at least 8 feet horizontally beyond the area of contaminated soil placement.
7. Impermeable surfaces covering the contaminated soils shall be designed and maintained to ensure that water or other liquids will not reach the soil through joints, fractures, cracks, or other openings in the impermeable surfaces.
8. The generator shall permanently record the exact location(s) where the contaminated soils are used as construction fill, and the volumes used at each location. The generator shall retain these records indefinitely.
9. The generator and its successors, and owner(s) of the sites where the contaminated soils are used and their successors shall accept all liability that may arise from the use of these soils. This includes addressing any water quality issues concerning the use of these contaminated soils, notwithstanding the approval for limited use of the contaminated soils given by this letter.

REPORTING

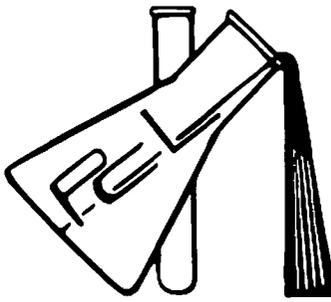
At the completion of the project, a final report shall be submitted to the Regional Board. This report shall include the following items:

1. Total volume of the contaminated soils used for the project.
2. Specific location(s) where the contaminated soils are used as construction fill. This information is to be provided on maps as well as narrative.

3. The area, depth, and volume of contaminated soils placed in each site.
4. Certification that all of the placement conditions have been met.

APPENDIX C

LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION



PAT-CHEM LABORATORIES

11990 Discovery Ct. • Moorpark, CA 93021 • Ph. (805) 532-0012 • Fax (805) 532-0016

Customer: **Ninyo & Moore, Geo. & Enviro. Sciences Consul**
475 Goddard, Suite 200
Irvine CA, 92618

Page 1 of 5

Attention: **Mike Cushner**
Report Date: **23-May-14 12:22**
Subject: **Lead Soil Samples**

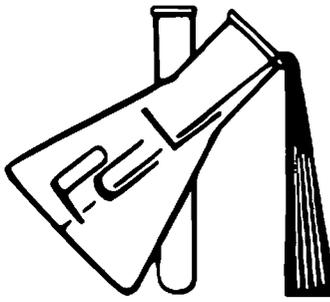
Project/P.O.#: 208449002

PARAMETER	METHOD	QC BATCH	MDL	REPORT LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
B1-0.5 (Sample I.D.# : 1405117-01) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	21 mg/kg	
pH	EPA 9045B	AE40904		0.1	09-May-14 (PL)	7.4 pH Units	pHa
B1-1.5 (Sample I.D.# : 1405117-02) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	21 mg/kg	
B1-3.0 (Sample I.D.# : 1405117-03) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
B1-4.0 (Sample I.D.# : 1405117-04) Collected: 08-May-14 By N&M							
Diesel	EPA 8015DRO	AE41303		2.5	14-May-14 (SM)	< 2.5 mg/kg	
Heavy Oil	EPA 8015DRO	AE41303		10	14-May-14 (SM)	62 mg/kg	
Surrogate: <i>o</i> -Terphenyl	EPA 8015DRO	AE41303			14-May-14 (SM)	81.6 % (38-115)	
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
Gasoline	EPA 8015M	AE41517		0.050	15-May-14 (KH)	< 0.050 mg/kg	
Surrogate: 1-chloro-4-fluorobenzene	EPA 8015M	AE41517			15-May-14 (KH)	84.2 % (60-140)	
B2-0.5 (Sample I.D.# : 1405117-05) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	14 mg/kg	
B2-1.5 (Sample I.D.# : 1405117-06) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	19 mg/kg	
B2-3.0 (Sample I.D.# : 1405117-07) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
B2-4.0 (Sample I.D.# : 1405117-08) Collected: 08-May-14 By N&M							
Diesel	EPA 8015DRO	AE41303		2.5	14-May-14 (SM)	< 2.5 mg/kg	
Heavy Oil	EPA 8015DRO	AE41303		10	14-May-14 (SM)	58 mg/kg	
Surrogate: <i>o</i> -Terphenyl	EPA 8015DRO	AE41303			14-May-14 (SM)	85.4 % (38-115)	

Respectfully Submitted,

Seira Mendez
Laboratory Director

5/23/2014



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Irvine CA, 92618

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Attention: **Mike Cushner**
Report Date: **23-May-14 12:22**
Subject: **Lead Soil Samples**

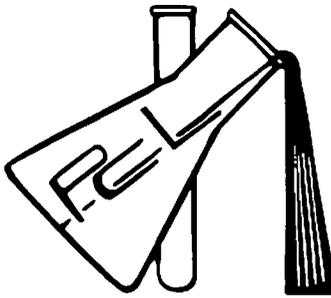
Project/P.O.#: 208449002

PARAMETER	METHOD	QC BATCH	MDL	REPORT LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
B2-4.0 (Sample I.D.# : 1405117-08) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
Gasoline	EPA 8015M	AE41517		0.050	15-May-14 (KH)	< 0.050 mg/kg	
Surrogate: 1-chloro-4-fluorobenzene	EPA 8015M	AE41517			15-May-14 (KH)	88.0 % (60-140)	
B3-0.5 (Sample I.D.# : 1405117-09) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	3.6 mg/kg	
B3-1.5 (Sample I.D.# : 1405117-10) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
B3-3.0 (Sample I.D.# : 1405117-11) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
B3-4.0 (Sample I.D.# : 1405117-12) Collected: 08-May-14 By N&M							
Diesel	EPA 8015DRO	AE41303		2.5	14-May-14 (SM)	< 2.5 mg/kg	
Heavy Oil	EPA 8015DRO	AE41303		10	14-May-14 (SM)	160 mg/kg	
Surrogate: o-Terphenyl	EPA 8015DRO	AE41303			14-May-14 (SM)	82.1 % (38-115)	
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
Gasoline	EPA 8015M	AE41517		0.050	15-May-14 (KH)	< 0.050 mg/kg	
Surrogate: 1-chloro-4-fluorobenzene	EPA 8015M	AE41517			15-May-14 (KH)	90.7 % (60-140)	
B4-0.5 (Sample I.D.# : 1405117-13) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	2.2 mg/kg	
pH	EPA 9045B	AE40904		0.1	09-May-14 (PL)	7.6 pH Units	pH
B4-1.5 (Sample I.D.# : 1405117-14) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
B4-3.0 (Sample I.D.# : 1405117-15) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
B4-4.0 (Sample I.D.# : 1405117-16) Collected: 08-May-14 By N&M							
Diesel	EPA 8015DRO	AE41303		2.5	14-May-14 (SM)	< 2.5 mg/kg	
Heavy Oil	EPA 8015DRO	AE41303		10	14-May-14 (SM)	< 10 mg/kg	
Surrogate: o-Terphenyl	EPA 8015DRO	AE41303			14-May-14 (SM)	79.5 % (38-115)	

Respectfully Submitted,

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Page 3 of 5

Attention: **Mike Cushner**
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Subject: **Lead Soil Samples**

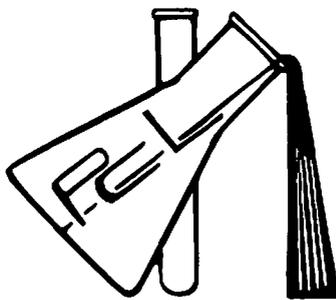
Project/P.O.#: 208449002

PARAMETER	METHOD	QC BATCH	MDL	REPORT LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
B4-4.0 (Sample I.D.# : 1405117-16) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
Gasoline	EPA 8015M	AE41517		0.050	15-May-14 (KH)	< 0.050 mg/kg	
Surrogate: 1-chloro-4-fluorobenzene	EPA 8015M	AE41517			15-May-14 (KH)	84.8 % (60-140)	
B5-0.5 (Sample I.D.# : 1405117-17) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	2.8 mg/kg	
B5-1.5 (Sample I.D.# : 1405117-18) Collected: 08-May-14 By N&M							
Diesel	EPA 8015DRO	AE41303		2.5	14-May-14 (SM)	< 2.5 mg/kg	
Heavy Oil	EPA 8015DRO	AE41303		10	14-May-14 (SM)	1100 mg/kg	
Surrogate: o-Terphenyl	EPA 8015DRO	AE41303			14-May-14 (SM)	92.7 % (38-115)	
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
Gasoline	EPA 8015M	AE41517		0.050	15-May-14 (KH)	< 0.050 mg/kg	
Surrogate: 1-chloro-4-fluorobenzene	EPA 8015M	AE41517			15-May-14 (KH)	73.8 % (60-140)	
B6-0.5 (Sample I.D.# : 1405117-19) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
B6-1.5 (Sample I.D.# : 1405117-20) Collected: 08-May-14 By N&M							
Diesel	EPA 8015DRO	AE41303		2.5	14-May-14 (SM)	< 2.5 mg/kg	
Heavy Oil	EPA 8015DRO	AE41303		10	14-May-14 (SM)	1900 mg/kg	
Surrogate: o-Terphenyl	EPA 8015DRO	AE41303			14-May-14 (SM)	103 % (38-115)	
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
Gasoline	EPA 8015M	AE41517		0.050	16-May-14 (KH)	< 0.050 mg/kg	
Surrogate: 1-chloro-4-fluorobenzene	EPA 8015M	AE41517			16-May-14 (KH)	63.8 % (60-140)	
B6-3.0 (Sample I.D.# : 1405117-21) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
B6-4.0 (Sample I.D.# : 1405117-22) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
B7-0.5 (Sample I.D.# : 1405117-23) Collected: 08-May-14 By N&M							
Diesel	EPA 8015DRO	AE41303		2.5	14-May-14 (SM)	< 2.5 mg/kg	

Respectfully Submitted,

Seira Mendez
Laboratory Director

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Attention: **Mike Cushner**
Report Date: **23-May-14 12:22**
Subject: **Lead Soil Samples**

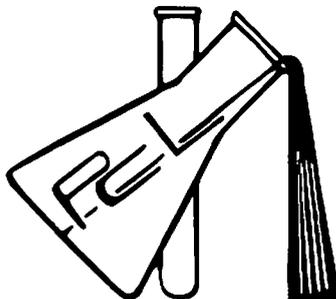
Project/P.O.#: 208449002

PARAMETER	METHOD	QC BATCH	MDL	REPORT LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
B7-0.5 (Sample I.D.# : 1405117-23) Collected: 08-May-14 By N&M							
Heavy Oil	EPA 8015DRO	AE41303		10	14-May-14 (SM)	1100 mg/kg	
Surrogate: o-Terphenyl	EPA 8015DRO	AE41303			14-May-14 (SM)	90.3 % (38-115)	
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
pH	EPA 9045B	AE40904		0.1	09-May-14 (PL)	8.1 pH Units	pH
Gasoline	EPA 8015M	AE41517		0.050	16-May-14 (KH)	< 0.050 mg/kg	
Surrogate: 1-chloro-4-fluorobenzene	EPA 8015M	AE41517			16-May-14 (KH)	90.1 % (60-140)	
B7-1.5 (Sample I.D.# : 1405117-24) Collected: 08-May-14 By N&M							
Diesel	EPA 8015DRO	AE41303		2.5	14-May-14 (SM)	< 2.5 mg/kg	
Heavy Oil	EPA 8015DRO	AE41303		10	14-May-14 (SM)	640 mg/kg	
Surrogate: o-Terphenyl	EPA 8015DRO	AE41303			14-May-14 (SM)	84.3 % (38-115)	
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
Gasoline	EPA 8015M	AE41517		0.050	16-May-14 (KH)	< 0.050 mg/kg	
Surrogate: 1-chloro-4-fluorobenzene	EPA 8015M	AE41517			16-May-14 (KH)	90.7 % (60-140)	
B8-0.5 (Sample I.D.# : 1405117-25) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	2.9 mg/kg	
B8-1.5 (Sample I.D.# : 1405117-26) Collected: 08-May-14 By N&M							
Diesel	EPA 8015DRO	AE41303		2.5	14-May-14 (SM)	< 2.5 mg/kg	
Heavy Oil	EPA 8015DRO	AE41303		10	14-May-14 (SM)	1600 mg/kg	
Surrogate: o-Terphenyl	EPA 8015DRO	AE41303			14-May-14 (SM)	98.7 % (38-115)	
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	6.5 mg/kg	
Gasoline	EPA 8015M	AE41517		0.050	16-May-14 (KH)	< 0.050 mg/kg	
Surrogate: 1-chloro-4-fluorobenzene	EPA 8015M	AE41517			16-May-14 (KH)	79.4 % (60-140)	
B8-3.0 (Sample I.D.# : 1405117-27) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
B8-4.0 (Sample I.D.# : 1405117-28) Collected: 08-May-14 By N&M							
Diesel	EPA 8015DRO	AE41303		2.5	14-May-14 (SM)	< 2.5 mg/kg	
Heavy Oil	EPA 8015DRO	AE41303		10	14-May-14 (SM)	3700 mg/kg	
Surrogate: o-Terphenyl	EPA 8015DRO	AE41303			14-May-14 (SM)	138 % (38-115)	S-04

Respectfully Submitted,

Seira Mendez
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5/23/2014



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Page 5 of 5

Attention: **Mike Cushner**
Report Date: **23-May-14 12:22**
Subject: **Lead Soil Samples**

Project/P.O.#: **208449002**

PARAMETER	METHOD	QC BATCH	MDL	REPORT LIMIT	ANALYZED (ANALYST)	RESULT	NOTE
B8-4.0 (Sample I.D.# : 1405117-28) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40902		1.0	12-May-14 (AF)	< 1.0 mg/kg	
Gasoline	EPA 8015M	AE41517		0.050	18-May-14 (KH)	38 mg/kg	
Surrogate: 1-chloro-4-fluorobenzene	EPA 8015M	AE41517			18-May-14 (KH)	117 % (60-140)	
R1 (Sample I.D.# : 1405117-29) Collected: 08-May-14 By N&M							
Lead	EPA 6010B	AE40901		0.02	09-May-14 (AF)	< 0.02 mg/l	

Notes and Definitions

- S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- pHa The temperature in Celcius was 21.4 when the pH was recorded.
- pH The temperature in Celcius was 21.3 when the pH was recorded.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis

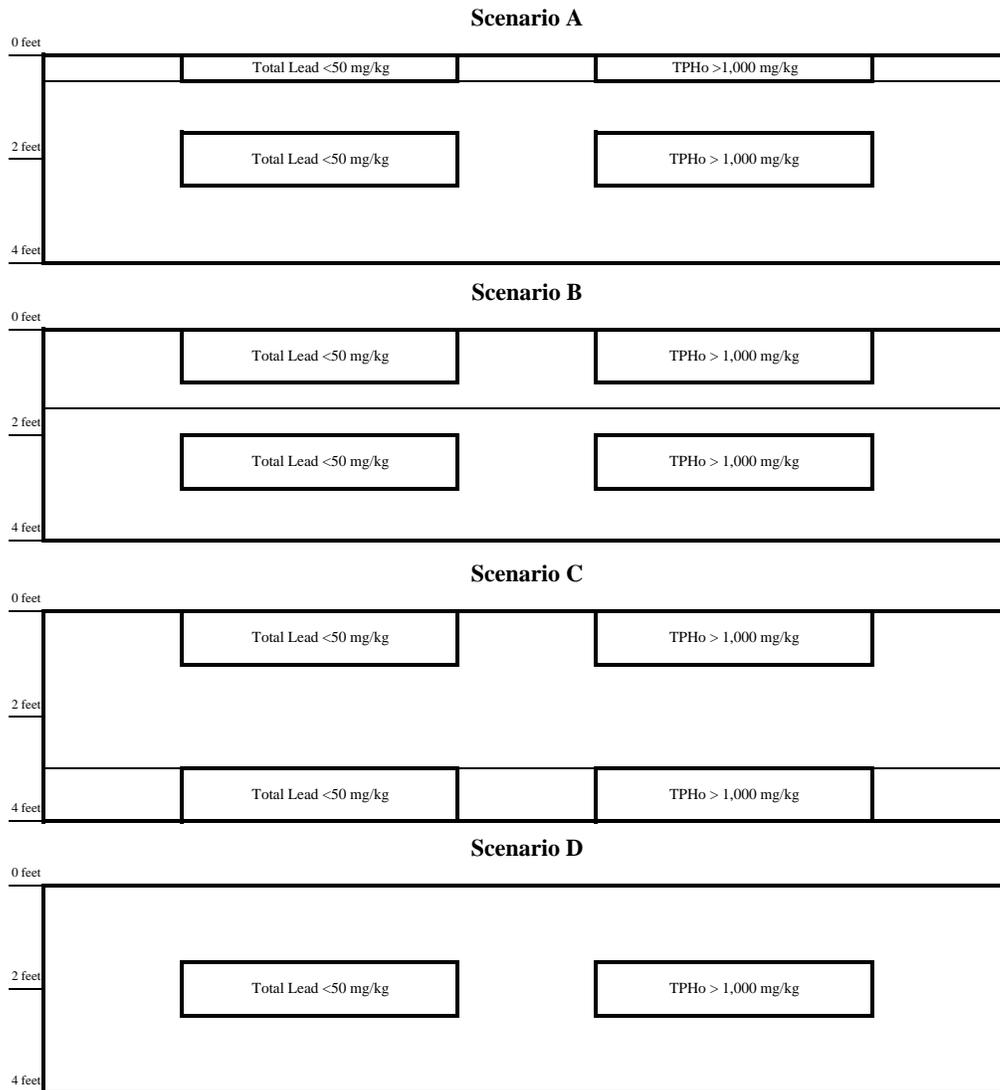
Respectfully Submitted,

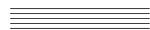
Seira Mendez
Laboratory Director

5/23/2014

APPENDIX D
BLOCK DIAGRAMS

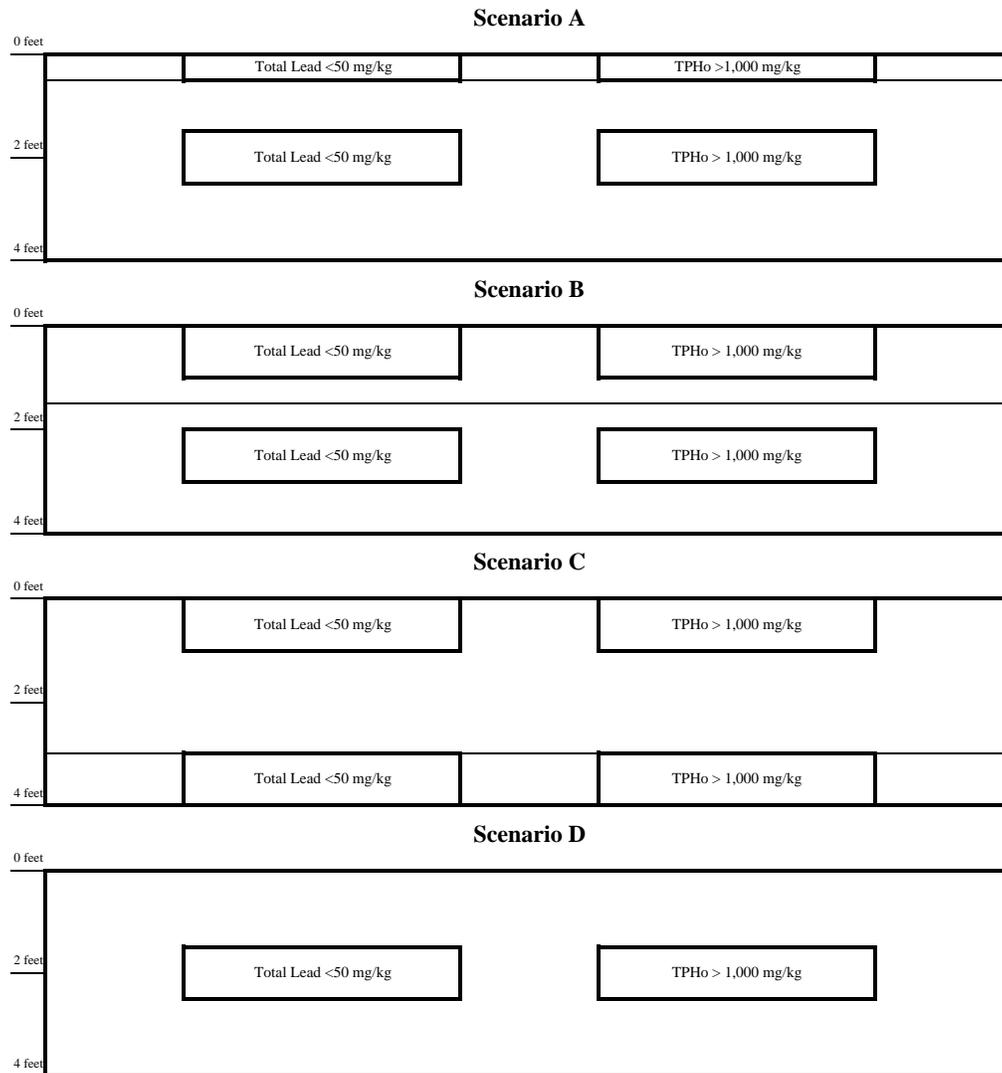
FIGURE D1 – BLOCK DIAGRAM FOR POTENTIAL CALTRANS RIGHT-OF-WAY REUSE



-  – Petroleum-impacted, non-hazardous soil with respect to TPH and lead. May remain on site if pre-approved by SARWQC
-  – Reuse Condition 1 [Hazardous. Variance applies. Use material on job site. Place a minimum of 5 feet above maximum water table elevation and cover with at least 1 foot of non-hazardous soil]
-  – Reuse Condition 2 [Hazardous. Variance applies. Use material on job site. Place a minimum of 5 feet above maximum water table elevation and protect from infiltration with a pavement structure which will be maintained by Caltrans]
-  – Hazardous. Class 1 disposal site, all other Title 22 CCR requirements apply
-  – Hazardous. Class 1 disposal site RCRA based on the layer having a TCLP value ≥ 5 mg/l

- CCR – California Code of Regulations
- mg/kg – milligrams per kilogram
- mg/l – milligrams per liter
- ND – not detected above reporting limits presented in Appendix C
- OCHCA – Orange County Health Care Agency
- RCRA – Resource, Conservation, and Recovery Act
- SARWQCB – Santa Ana Regional Water Quality Control Board
- TCLP – Toxicity Characteristic Leaching Procedure
- TPHo – total petroleum hydrocarbons in the heavy oil range
- UCL – upper confidence limit
- WET-DI – soluble lead using the Waste Extraction Test with deionized water
- WET-citric acid – soluble lead using the Waste Extraction Test with citric acid

FIGURE D2 – BLOCK DIAGRAM FOR POTENTIAL CALTRANS OFF SITE DISPOSAL



-  – Petroleum-impacted, non-hazardous soil with respect to TPH and lead. Must be disposed in accordance with State requirements.
-  – Reuse Condition 1 [Hazardous. Variance applies. Use material on job site. Place a minimum of 5 feet above maximum water table elevation and cover with at least 1 foot of non-hazardous soil]
-  – Reuse Condition 2 [Hazardous. Variance applies. Use material on job site. Place a minimum of 5 feet above maximum water table elevation and protect from infiltration with a pavement structure which will be maintained by Caltrans]
-  – Hazardous. Class 1 disposal site, all other Title 22 CCR requirements apply
-  – Hazardous. Class 1 disposal site RCRA based on the layer having a TCLP value ≥ 5 mg/l
- CCR – California Code of Regulations
- mg/kg – milligrams per kilogram
- mg/l – milligrams per liter
- ND – not detected above reporting limits presented in Appendix C
- OCHCA – Orange County Health Care Agency
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