

INFORMATION HANDOUT

MATERIALS INFORMATION

**COMPARISON OF SOIL PROPOSED FOR EXCAVATION WITH WATER BOARD
ENVIRONMENT SCREENING LEVELS, DOYLE DRIVE REPLACEMENT PROJECT,
CONTRACT 4, SAN FRANCISCO, CALIFORNIA**

Y0239-04.A3.01414

ROUTE: 04-SF-101-8.2/9.2

REVISED PER ADDENDUM NO. 4 DATED FEBRUARY 4, 2010

BASELINE

ENVIRONMENTAL CONSULTING

21 January 2010
Y0239-04.A3.01414

Mr. John Karn
ARUP/PB Joint Venture
c/o Arup North America Ltd.
560 Mission Street, Suite 700
San Francisco, CA 94105

Subject: Comparison of Soil Proposed for Excavation with Water Board Environmental Screening Levels, Doyle Drive Replacement Project, Contract 4, San Francisco, California

Dear Mr. Karn:

This letter report provides information to assist the excavation contractor with soil management decisions during highway improvement construction within the Contract 4 area of the Doyle Drive Replacement Project (DDRP), shown on Figure 1. The proposed excavation areas are located on and adjacent to the existing Doyle Drive (Highway 101) in San Francisco, California, on Presidio Trust Lands (Figure 2). Construction is currently scheduled to begin in March 2010. This report has been prepared by BASELINE Environmental Consulting on behalf of the ARUP/PB Joint Venture and Caltrans.

Soils previously determined to be non-hazardous wastes for disposal purposes¹ were screened against Environmental Screening Levels (ESLs) established by the California Regional Water Quality Control Board (Water Board) for residential and commercial/industrial land uses where the groundwater is considered a current or potential source of drinking water,² and against ESLs for construction/trench worker direct exposure.³ Screening against ESLs was performed to provide information for Caltrans and/or contractor use to assist with developing offsite soil management options and assess health and safety concerns.

Evaluation of possible reuse of soils within Contract 4 of the DDRP in accordance with Presidio Trust reuse criteria is not addressed in this report, and may be presented in a separate report to be prepared by BASELINE. BASELINE understands the contractor will be preparing a Soil

¹ ARUP/PB Joint Venture, 2009, Doyle Drive Replacement Project, Environmental Soil Investigation, Contract 4, August.

² California Regional Water Quality Control Board (Water Board), San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A.

³ Ibid, Table K-3.

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Management Plan based on recommendations of the Contract 4 Environmental Soil Investigation Report⁴ and this supplemental letter report.

BACKGROUND

Soil proposed for excavation within the Contract 4 area has been chemically characterized in a previous environmental boring and soil sampling program.⁵ Soil sampling in the Contract 4 area was conducted in January 2009 in accordance with a Soil and Groundwater Sampling Work Plan,⁶ which was reviewed and accepted by the Presidio Trust. Boring locations and sample composite areas are shown on Figure 2. Discrete and composite sample correlations are provided on Table 1.

The sampling program was a systematic investigation of the quality of soils that were expected to be excavated during the DDRP, and was primarily intended to provide data to classify soil for waste disposal purposes. The soil classification study concluded that the materials that should be classified as hazardous waste in the Contract 4 area were: 1) all soil in the top 2.5 feet in Composite Area 11; and 2) serpentinite bedrock. Therefore, the quality of all other soils expected to be excavated in the Contract 4 area were compared against ESLs in this technical memorandum.

COMPARISON OF SOIL PROPOSED FOR EXCAVATION WITH ESLS

Soils previously determined to be non-hazardous included all soils from Composite Areas 9, 10, and 12 with the exception of serpentinite bedrock. Non-hazardous soils from these Composite Areas were grouped in subsets by potential waste stream, or chemically similar soil types, for comparison against screening levels. In particular, the following subsets were evaluated against ESLs:

- (1) top 2.5 feet of soil;
- (2) fill deeper than 2.5 feet below ground surface (bgs);
- (3) alluvium deeper than 2.5 feet bgs;
- (4) Colma Sand deeper than 2.5 feet bgs; and
- (5) non-serpentinite bedrock.

⁴ ARUP/PB Joint Venture, 2009, op cit.

⁵ ARUP/PB Joint Venture, 2009, op cit.

⁶ Caltrans and ARUP/PB Joint Venture, 2008, Doyle Drive Replacement Project, License to Enter and Conduct Geotechnical Investigations, Exhibit No. 3, Soil and Groundwater Sampling – Work Plan, October.

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Analytical results for all the soil samples are summarized in Tables 2 through 8, which are organized by the above subsets. Note that some composite samples are included in more than one subset in the tables. For example, composite sample EC09-F001 is summarized under “Top 2.5 Feet of Soil” and “Fill Deeper than 2.5 Feet below Ground Surface” subsets in Table 2 because the discrete samples used to make up EC09-F001 were from both subsets. Only compounds that were identified above laboratory reporting limits in at least one sample are presented on the tables. Semi-volatile organic compounds with the exception of certain polycyclic aromatic hydrocarbons (PAHs) (analyzed by EPA Method 8270C) and herbicides (analyzed by EPA Method 8151A) were not reported above laboratory reporting limits; therefore, the results are not tabulated.

ESLs are listed at the bottom of the summary tables for all compounds with established values. Concentrations that exceed any of the ESLs are shaded in the tables, and are discussed below.

Total Lead in Soil in Top 2.5 Feet Subset

Total lead concentrations exceeded residential ESLs only in one discrete sample from the top 2.5 feet of soil. This sample (E075F-1.0, Table 3) had a total lead concentration of 320 milligrams per kilogram (mg/kg), which is above the residential ESL of 200 mg/kg. Total lead concentrations did not exceed the commercial or construction/trench worker ESL of 750 mg/kg in any samples from this subset. Total lead was evaluated further to determine whether a representative concentration exceeded the residential ESL.

The EPA Risk Assessment Guidance for Superfund (RAGS) specifies that the 95 percent upper confidence limit (UCL) on the arithmetic average should be calculated and used as a reasonable estimate of the exposure concentration over time.⁷ Using ProUCL version 4.00.04 software, estimates of the 95 percent UCL for total lead concentrations in discrete samples from the top 2.5 feet of soil subset were calculated. The software tests the data to determine if it is consistent with normal, lognormal, or gamma distributions, and also calculates UCLs assuming these three distributions as well using nonparametric methods.

Only lead concentrations for discrete samples were used to estimate the 95 percent UCL since all samples collected from the top 2.5 feet of soil were analyzed discretely for lead (Table 3). Data for composite samples also listed in Table 3 are not representative of this subset since they contained discrete samples from both above and below 2.5 feet bgs.

⁷ U.S. Environmental Protection Agency, 1989, Risk Assessment Guidance for Superfund [“RAGS”], Volume 1, Human Health Evaluation Manual (Part A), EPA/540/1-89/002.

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Total lead concentrations for the 40 discrete samples were used to estimate the 95% UCL. The basic statistics on the data are summarized below.

	Number of Observations	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	Median (mg/kg)	Standard Deviation
Lead	40	1.6	320	46	13	66.28

The total lead concentrations and the ProUCL 95% UCL output file are provided in Attachment A. The lead data do not follow a normal, lognormal, or gamma distribution. The ProUCL algorithm recommended using the non-parametric, 99% Chebyshev UCL of 150 mg/kg, which is below the residential ESL of 200 mg/kg. Therefore, the representative lead concentration in soil from the top 2.5 feet of soil is below the residential ESL where the groundwater is considered a current or potential source of drinking water.

Arsenic and Vanadium in All Subsets

Arsenic and vanadium concentrations exceeded the residential ESLs in all samples from all soil subsets, and arsenic also equaled or exceeded the commercial ESL in all samples (Table 2). However, none of the arsenic or vanadium concentrations are above background concentrations published by the Lawrence Berkeley National Laboratory (LBNL).

Background concentrations for arsenic published by the LBNL are substantially higher than the ESLs for residential and commercial/industrial land uses, which are based on health risk considerations. The 95th and 99th percentile for arsenic determined by the LBNL is 17 and 28 mg/kg (LBNL, 2009),⁸ respectively, whereas the residential and commercial/industrial ESLs are 0.39 and 1.6 mg/kg, respectively. The 95th and 99th percentile determined by LBNL for vanadium is 77 and 90 mg/kg, respectively, above the residential ESL of 16 mg/kg. All arsenic and vanadium concentrations for all soil subsets are below the 95th percentile determined by the LBNL.

Polycyclic Aromatic Hydrocarbons in Top 2.5 Feet Subset

With the exception of one composite sample, EC12-F002, analyzed by EPA Method 8270C, PAH concentrations were fairly consistent. The EC12-F002 sample analyzed by EPA Method 8270C contained six PAHs at elevated concentrations, above residential and/or commercial ESLs (Table 6). This composite sample was also analyzed by EPA Methods 8310, and the PAHs concentrations were substantially lower than those determined by EPA Method 8270C, and were

⁸ Lawrence Berkeley National Laboratory (LBNL), 2009, Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory, revised, April.

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consistent with all the other composite samples analyzed. All quality assurance parameters for both methods were acceptable. The most plausible explanation for the differences between the EPA Method 8270C and 8310 results is composite sample non-homogeneity. The five discrete samples used to make up this composite sample were composited by the laboratory, and unique aliquots were used for each analysis. One of the five discrete samples was collected immediately below an asphalt road. Asphalt particles, which contain high concentrations of PAHs, may have been present in the aliquot used for the EPA Method 8270C analysis, which could account for the elevated concentrations. Since the EPA Method 8270C results are so much higher than the results for all the other soil samples and appear anomalous, the EPA Method 8270C PAH results are not considered representative, and are not considered in the ESL comparison discussed below.

With the exception of the composite sample EC12-F002 results determined by EPA Method 8270C, the only PAH that exceeds the residential ESL is benzo(a)pyrene in the soil from the top 2.5 feet. Two samples contained benzo(a)pyrene above the residential ESL of 0.038 mg/kg, but below the commercial/industrial and construction/trench worker ESLs. Benzo(a)pyrene was evaluated further to determine whether a representative concentration exceeds the residential ESL in this subset.

Using ProUCL software, estimates of the 95 percent UCL for benzo(a)pyrene concentrations in samples from the top 2.5 feet subset were calculated. The data used for these calculations and the ProUCL output file are provided in Attachment A. The basic statistics for this data set are summarized below.

	Number of Detections	Number of Non-Detects	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	Median (mg/kg)	Standard Deviation
Benzo(a)pyrene	12	3	0.0016	0.089	0.021	0.012	0.027

Fifteen samples were used to calculate the 95 percent UCL in the top 2.5 feet subset. It should be noted that most of the composite samples were made up of discrete samples collected from the top 2.5 feet of soil, as well as from fill, alluvium, and Colma Sand deeper than 2.5 feet bgs.

The data do not follow a normal distribution, but are consistent with lognormal and gamma distributions at a five percent significance level. The 95 percent UCLs estimated assuming lognormal and gamma distributions ranged from 0.028 to 0.035 mg/kg. However, the ProUCL algorithm suggests using the non-parametric, 95 percent KM Chebyshev UCL of 0.046 mg/kg. This 95 percent UCL is above the residential ESL of 0.038 mg/kg, and below the commercial/industrial ESL of 0.13 mg/kg for benzo(a)pyrene. Therefore, the representative benzo(a)pyrene concentration in soil from this subset exceeds the residential land uses ESL and

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is below the commercial/industrial ESL where the groundwater is considered a current or potential source of drinking water.

Polycyclic Aromatic Hydrocarbons in Fill Deeper than 2.5 Feet Subset

The benzo(a)pyrene concentration exceeded the residential ESL of 0.038 mg/kg in one out of eight composite samples from fill deeper than 2.5 feet bgs subset (Table 6). None of the benzo(a)pyrene concentrations were above the commercial/industrial ESLs. Benzo(a)pyrene was evaluated further to determine whether a representative concentration exceeded the residential ESL in this subset.

Using ProUCL software, estimates of the 95 percent UCL for benzo(a)pyrene concentrations in samples from fill deeper than 2.5 feet were calculated. The data used for these calculations and the ProUCL output file are provided in Appendix A. The basic statistics for this data set are summarized below.

	Number of Detections	Number of Non-Detects	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	Median (mg/kg)	Standard Deviation
Benzo(a)pyrene	7	1	0.0027	0.063	0.017	0.011	0.0206

Eight samples were used to calculate the 95 percent UCL in this subset. Most of these samples are composite samples of soil both above and below 2.5 feet bgs, and were also used in the statistical analysis of the top 2.5 feet subset. The data do not follow a normal distribution, but are consistent with lognormal and gamma distributions at a five percent significance level. The 95 percent UCLs estimated assuming lognormal and gamma distributions ranged from 0.028 to 0.12 mg/kg. However, the ProUCL algorithm suggests using the non-parametric, 95 percent KM Chebyshev UCL of 0.046 mg/kg. This 95 percent UCL is above the residential ESL of 0.038 mg/kg, and below the commercial/industrial ESL of 0.13 mg/kg for benzo(a)pyrene. Therefore, the representative benzo(a)pyrene concentration in soil from this subset exceeds the residential land uses ESL and is below the commercial/industrial ESL where the groundwater is considered a current or potential source of drinking water.

CONCLUSIONS

A systematic investigation of the quality of the soils previously determined to be nonhazardous wastes that are expected to be excavated within the Contract 4 area of the DDRP has been evaluated against ESLs established by the Water Board.

All soil subsets exceeded residential and commercial/industrial ESLs for arsenic, and exceeded the residential ESL for vanadium. However, these metals appear to be present at concentrations

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below regional background levels, as discussed above. ESL exceedances due to compounds other than these two metals are listed below.

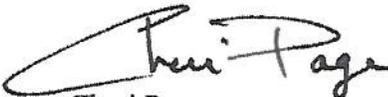
The soil subsets where the representative concentrations exceeded residential ESLs are as follows:

- Benzo(a)pyrene in soil in top 2.5 feet subset
- Benzo(a)pyrene in fill deeper than 2.5 feet bgs

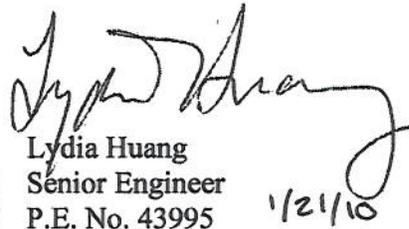
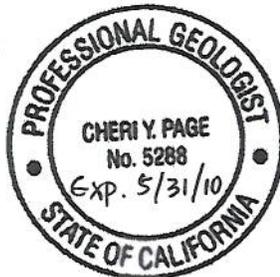
No compounds in any of the subsets were present in concentrations that exceeded the commercial/industrial or construction/trench worker ESLs.

Should you have any questions or need additional information regarding the data presented in this letter, please do not hesitate to contact us at your convenience.

Sincerely,



Cheri Page
Senior Geologist 1/21/10
P.G. No. 5288



Lydia Huang
Senior Engineer
P.E. No. 43995 1/21/10



CP:LH:cr

Attachments:

- Figure 1 – Contract 4 Area and Regional Plan
- Figure 2 – Boring Locations and Composite Areas

- Table 1: Soil Composite and Discrete Sample Correlations
- Table 2: Total Metal Concentrations in Soil
- Table 3: Total and Soluble Chromium and Lead Concentrations in Soil
- Table 4: Total Petroleum Hydrocarbon Concentrations in Soil
- Table 5: Volatile Organic Compound Concentrations in Soil
- Table 6: Polycyclic Aromatic Hydrocarbon Concentrations in Soil
- Table 7: Pesticide Concentrations in Soil
- Table 8: Polychlorinated Biphenyl Concentrations in Soil

Attachment A: Statistical Analyses

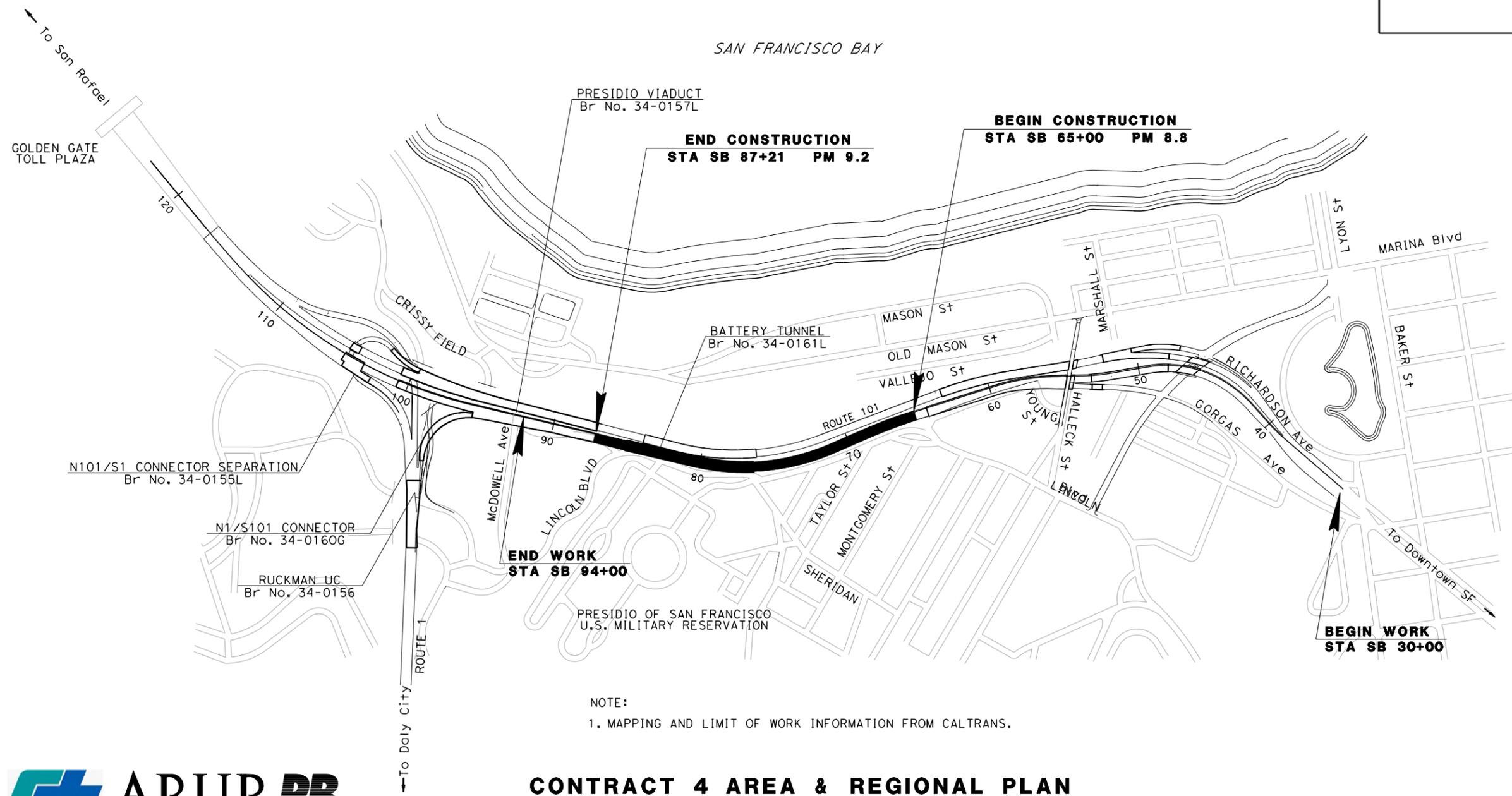
FIGURES

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
 PROJECT PLANS FOR CONSTRUCTION ON
 STATE HIGHWAY
 IN THE CITY AND COUNTY OF SAN FRANCISCO
 0.4 MILE SOUTH OF THE
 ROUTE 101/1 SEPARATION

TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	101,1	9.2/9.8, 6.8/7.1		

LOCATION MAP



**END WORK
 STA SB 94+00**

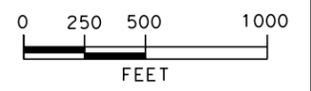
**END CONSTRUCTION
 STA SB 87+21 PM 9.2**

**BEGIN CONSTRUCTION
 STA SB 65+00 PM 8.8**

**BEGIN WORK
 STA SB 30+00**

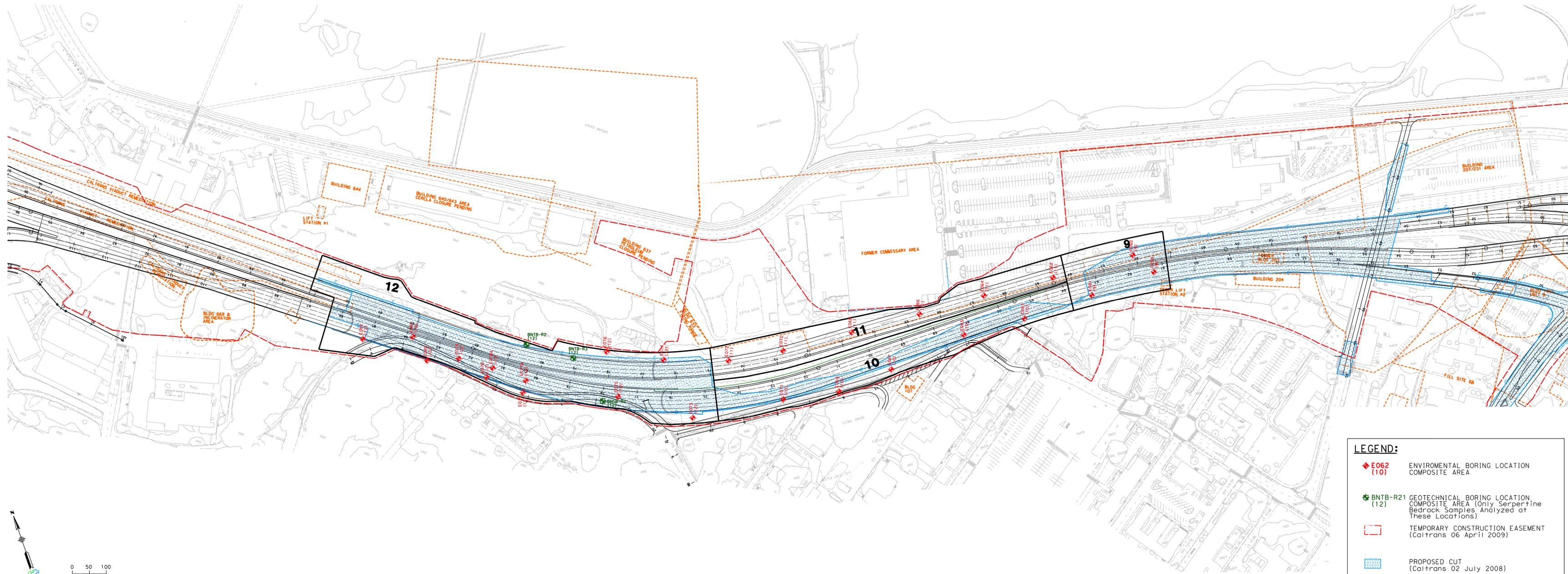
NOTE:
 1. MAPPING AND LIMIT OF WORK INFORMATION FROM CALTRANS.

**CONTRACT 4 AREA & REGIONAL PLAN
 FIGURE 1 - JULY 24, 2009**



RELATIVE BORDER SCALE
 IS IN INCHES

LAST REVISION: 00-00-00
 DATE PLOTTED => 8/DATE
 TIME PLOTTED => 8:TIME



LEGEND:

	ENVIRONMENTAL BORING LOCATION COMPOSITE AREA
	GEOTECHNICAL BORING LOCATION COMPOSITE AREA (Only Serpentine Bedrock Samples Analyzed at These Locations)
	TEMPORARY CONSTRUCTION EASEMENT (Caltrans 06 April 2009)
	PROPOSED CUT (Caltrans 02 July 2008)
	LOCATION OF POSSIBLE CONTAMINATION AND POTENTIAL LAND USE CONTROL BOUNDARY UNLESS NOTED OTHERWISE
	COMPOSITE AREA BOUNDARY



DOYLE DRIVE REPLACEMENT PROJECT - CONTRACT 4
Environmental Boring Locations and Composite Areas
FIGURE 2 - August 21, 2009 - Rev 02

TABLES

TABLE 1: Soil Composite and Discrete Sample Correlations
Contract 4 of Doyle Drive Replacement Project

Composite Area	Composite Sample ID	Lithology	Sample Depth (feet bgs)	Discrete Sample ID
Top 2.5 Feet of Soil				
9	EC09-C001	CO	2.5-12.5	E061C-2.5
				E061C-7.5
				E061C-12.5
9	EC09-F001	F	1.0-7.5	E057F-1.0
				E059F-1.0
				E059F-2.5
				E059F-7.5
				E061F-1.0
9	EC09-F003	F/FS	1.0-12.5	E055F-7.5
				E055F-12.5
				E060F-1.0
				E060FS-2.5
9	EC09-F004	F	1.0-7.5	E058F-1.0
				E058F-2.5
				E058F-7.5
				E060F-7.5
10	EC10-F001	F	1.0-7.5	E069F-1.0
				E069F-2.5
				E071F-1.0
				E071F-2.5
				E071F-7.5
10	EC10-F002	F	1.0-7.5	E065F-1.0
				E065F-2.5
				E065F-7.5
				E067F-1.0
				E067F-2.5
10	EC10-F003	F	1.0-22.0	E063F-1.0
				E063F-2.5
				E065F-12.5
				E065F-17.5
				E065F-22.0
12	EC12-A002	A	1.0-7.5	E080A-2.5
				E080A-7.5
				E082A-1.0
				E082A-2.5
				E082A-7.5
12	EC12-A004	A	2.5-22.5	E078A-2.5
				E078A-7.5
				E078A-12.5
				E078A-17.5
				E078A-22.5
12	EC12-A005	A	1.0-27.5	E077A-2.5
				E077A-7.5
				E078A-27.5
				E078AA-1.0
				E078AA-2.5

**TABLE 1: Soil Composite and Discrete Sample Correlations
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Composite Sample ID	Lithology	Sample Depth (feet bgs)	Discrete Sample ID
12	EC12-A006	A	1.0-17.5	E075A-7.5
				E077AA-1.0
				E077AA-2.0
				E077A-12.5
				E077A-17.5
12	EC12-F002	F	1.0-2.5	E078F-1.0
				E079F-1.0
				E079F-2.5
				E081F-1.0
				E081F-2.5
12	EC12-F003	F	1.0-2.5	E073F-1.0
				E075F-1.0
				E075F-2.5
				E077F-1.0
12	EC12-F004	F	2.5-12.5	E073F-2.5
				E073F-7.5
				E073F-12.5
12	EC12-F005	F	1.0-2.5	E074F-1.0
				E074F-2.5
				E076F-1.0
				E076F-2.5
				E080F-1.0
Fill Deeper than 2.5 Feet below Ground Surface				
9	EC09-F001	F	1.0-7.5	E057F-1.0
				E059F-1.0
				E059F-2.5
				E059F-7.5
				E061F-1.0
9	EC09-F003	F/FS	1.0-12.5	E055F-7.5
				E055F-12.5
				E060F-1.0
				E060FS-2.5
9	EC09-F004	F	1.0-7.5	E058F-1.0
				E058F-2.5
				E058F-7.5
				E060F-7.5
9	EC09-F005	F	7.5-12.5	E055F-7.5
				E055F-12.5
				E058F-7.5
				E059F-7.5
				E060F-7.5
10	EC10-F001	F	1.0-7.5	E069F-1.0
				E069F-2.5
				E071F-1.0
				E071F-2.5
				E071F-7.5

**TABLE 1: Soil Composite and Discrete Sample Correlations
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Composite Sample ID	Lithology	Sample Depth (feet bgs)	Discrete Sample ID
10	EC10-F002	F	1.0-7.5	E065F-1.0
				E065F-2.5
				E065F-7.5
				E067F-1.0
				E067F-2.5
10	EC10-F003	F	1.0-22.0	E063F-1.0
				E063F-2.5
				E065F-12.5
				E065F-17.5
				E065F-22.0
10	EC10-F004	F/FS	7.5-22.5	E063F-7.5
				E063F-11.5 ¹
				E063F-17.5
				E063FS-22.5
10	EC10-F005	F	7.5-22.0	E065F-7.5
				E065F-12.5
				E065F-17.5
				E065F-22.0
				E071F-7.5
12	EC12-F004	F	2.5-12.5	E073F-2.5
				E073F-7.5
				E073F-12.5
12	EC12-F006	F	7.5-12.5	E073F-7.5
				E073F-12.5
Alluvium Deeper than 2.5 Feet below Ground Surface				
10	EC10-A001	A	7.0-17.5	E069A-7.0
				E069A-12.5
				E071A-12.5
				E071A-17.5
10	EC10-A002	A	7.5-17.5	E067A-7.5
				E067A-12.5
				E069A-17.5
12	EC12-A001	A	7.5-17.5	E074A-7.5
				E074A-12.5
				E076A-7.5
				E076A-12.5
				E076A-17.5
12	EC12-A002	A	1.0-7.5	E080A-2.5
				E080A-7.5
				E082A-1.0
				E082A-2.5
				E082A-7.5
12	EC12-A003	A	7.5-27.5	E079A-7.5
				E079A-12.5
				E079A-17.5
				E079A-22.5
				E079A-27.5

**TABLE 1: Soil Composite and Discrete Sample Correlations
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Composite Sample ID	Lithology	Sample Depth (feet bgs)	Discrete Sample ID
12	EC12-A004	A	2.5-22.5	E078A-2.5
				E078A-7.5
				E078A-12.5
				E078A-17.5
				E078A-22.5
12	EC12-A005	A	1.0-27.5	E077A-2.5
				E077A-7.5
				E078A-27.5
				E078AA-1.0
				E078AA-2.5
12	EC12-A006	A	1.0-17.5	E075A-7.5
				E077AA-1.0
				E077AA-2.0
				E077A-12.5
				E077A-17.5
12	EC12-A007	A	12.5-22.5	E073A-17.5
				E073A-22.5
				E075A-12.5
				E075A-17.5
Colma Sand Deeper than 2.5 Feet below Ground Surface				
9	EC09-C001	C	2.5-12.5	E061C-2.5
				E061C-7.5
				E061C-12.5
10	EC10-C001	C	17.5-27.5	E067C-17.5
				E067C-22.5
				E069C-22.5
				E071C-22.5
				E071C-27.5
12	EC12-C001	C	17.5-32.5	E074C-17.5
				E074C-22.5
				E076C-22.5
				E076C-27.5
				E076C-32.5
12	EC12-C002	C	12.5-37.5	E074C-27.5
				E074C-32.5
				E074C-37.5
				E082C-12.5
12	EC12-C003	C	22.5-32.5	E073C-27.5
				E073C-32.5
				E075C-22.5
				E075C-27.5

**TABLE 1: Soil Composite and Discrete Sample Correlations
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Composite Sample ID	Lithology	Sample Depth (feet bgs)	Discrete Sample ID
Non-Serpentinite Bedrock				
12	EC12-BR001	BR	7.5-22.5	E080BR-12.5
				E080BR-17.5
				E081BR-7.5
				E082BR-17.5
				E082BR-22.5
12	EC12-BR002	BR	23.0-38.0	E077BR-23.0
				E077BR-28.0
				E079BR-33.0
				E079BR-38.0

Notes:

Boring locations are shown on Figure 2.

Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma Sand (C=Colma Sand), and sample depth is 2.0 to 2.5 feet bgs.

Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma Sand (C=Colma Sand).

Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
bgs = below ground surface.

¹ The laboratory sample identification was E063F-12.5. BASELINE changed the sample identification to E063F-11.5 based on review of the boring log.

TABLE 2: Total Metal Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Top 2.5 Feet of Soil																				
9	EC09-C001	2.5-12.5	1/22/2009	<0.29	1.6	30	0.19	<0.29	80	8.4	8	2.5	<0.024	<0.29	50	<0.29	<0.29	<0.29	44	27
9	EC09-F001	1.0-7.5	1/22/2009	0.08	2	53	0.18	0.063	72	9.1	18	12	0.072	0.16	51	0.19	0.082	<0.28	46	38
9	EC09-F003	1.0-12.5	1/23/2009	0.2	3.1	90	0.3	0.087	79	8.1	33	6.5	<0.024	0.16	44	0.11	<0.29	<0.29	42	33
9	EC09-F004	1.0-7.5	1/23/2009	0.22	2.9	80	0.22	0.35	45	6.5	21	140	0.043	0.28	31	<0.29	<0.29	<0.29	38	76
10	EC10-F001	1.0-7.5	1/21/2009	0.18	3.4	58	0.29	0.072	62	6.5	15	24	<0.022	0.31	35	0.19	<0.27	0.034	46	41
10	EC10-F002	1.0-7.5	1/21/2009	0.35	4.4	110	0.41	0.14	63	12	28	96	0.17	0.34	72	0.16	0.078	0.037	45	94
10	EC10-F003	1.0-22.0	1/22/2009	0.24	3.6	140	0.26	0.2	69	12	23	90	0.13	0.33	65	0.11	0.12	<0.27	49	150
12	EC12-A002	1.0-7.5	1/13/2009	0.092	4	84	0.3	<0.27	48	13	12	5.9	<0.023	0.27	35	0.2	<0.27	<0.27	43	38
12	EC12-A004	2.5-22.5	1/14/2009	<0.26	2.6	30	0.12	<0.26	42	6.2	9.3	2	<0.022	0.066	25	<0.26	<0.26	<0.26	33	23
12	EC12-A005	1.0-27.5	1/14/2009	<0.26	2.9	29	0.1	<0.26	35	5.3	9	4.5	<0.021	0.075	29	<0.26	<0.26	<0.26	29	22
12	EC12-A006	1.0-17.5	1/14/2009	<0.27	2.9	37	0.12	<0.27	44	7.1	34	4.9	<0.022	0.072	37	<0.27	<0.27	<0.27	33	43
12	EC12-F002	1.0-2.5	1/13/2009	0.14	3.1	180	0.23	0.097	43	9.2	39	34	0.2	0.58	38	0.15	<0.27	<0.27	37	61
12	EC12-F003	1.0-2.5	1/15/2009	0.22	2.6	120	0.22	0.24	39	8.9	34	120	0.092	0.28	41	0.12	<0.28	<0.28	30	94
12	EC12-F004	2.5-12.5	1/15/2009	<0.27	3	87	0.22	<0.27	45	7.4	14	3.6	<0.021	0.23	27	0.19	<0.27	<0.27	39	31
12	EC12-F005	1.0-2.5	1/12/2009	0.41	3.6	170	0.36	0.22	60	11	28	50	0.18	0.59	35	0.23	0.14	0.13	46	65
Fill Deeper than 2.5 Feet below Ground Surface																				
9	EC09-F001	1.0-7.5	1/22/2009	0.08	2	53	0.18	0.063	72	9.1	18	12	0.072	0.16	51	0.19	0.082	<0.28	46	38
9	EC09-F003	1.0-12.5	1/23/2009	0.2	3.1	90	0.3	0.087	79	8.1	33	6.5	<0.024	0.16	44	0.11	<0.29	<0.29	42	33
9	EC09-F004	1.0-7.5	1/23/2009	0.22	2.9	80	0.22	0.35	45	6.5	21	140	0.043	0.28	31	<0.29	<0.29	<0.29	38	76
10	EC10-F001	1.0-7.5	1/21/2009	0.18	3.4	58	0.29	0.072	62	6.5	15	24	<0.022	0.31	35	0.19	<0.27	0.034	46	41
10	EC10-F002	1.0-7.5	1/21/2009	0.35	4.4	110	0.41	0.14	63	12	28	96	0.17	0.34	72	0.16	0.078	0.037	45	94
10	EC10-F003	1.0-22.0	1/22/2009	0.24	3.6	140	0.26	0.2	69	12	23	90	0.13	0.33	65	0.11	0.12	<0.27	49	150
10	EC10-F004	7.5-22.5	1/22/2009	0.16	4.5	180	0.4	<0.3	78	13	20	21	0.059	0.47	53	0.19	<0.3	0.06	57	45
12	EC12-F004	2.5-12.5	1/15/2009	<0.27	3	87	0.22	<0.27	45	7.4	14	3.6	<0.021	0.23	27	0.19	<0.27	<0.27	39	31
Alluvium Deeper than 2.5 Feet below Ground Surface																				
10	EC10-A001	7.0-17.5	1/21/2009	0.19	5.3	83	0.54	<0.29	77	14	21	5.5	0.023	0.55	55	0.11	<0.29	0.076	68	49
10	EC10-A002	7.5-17.5	1/21/2009	0.11	4.9	45	0.34	0.092	110	14	16	4.1	<0.024	0.32	73	<0.28	<0.28	0.036	67	39
12	EC12-A001	7.5-17.5	1/12/2009	0.13	4.5	110	0.38	<0.29	68	15	25	5.2	0.055	0.4	50	0.15	<0.29	<0.29	58	73
12	EC12-A002	1.0-7.5	1/13/2009	0.092	4	84	0.3	<0.27	48	13	12	5.9	<0.023	0.27	35	0.2	<0.27	<0.27	43	38
12	EC12-A003	7.5-27.5	1/16/2009	<0.27	3.4	58	0.22	<0.27	43	9.1	15	2.7	0.038	0.17	30	0.1	<0.27	<0.27	35	36
12	EC12-A004	2.5-22.5	1/14/2009	<0.26	2.6	30	0.12	<0.26	42	6.2	9.3	2	<0.022	0.066	25	<0.26	<0.26	<0.26	33	23
12	EC12-A005	1.0-27.5	1/14/2009	<0.26	2.9	29	0.1	<0.26	35	5.3	9	4.5	<0.021	0.075	29	<0.26	<0.26	<0.26	29	22
12	EC12-A006	1.0-17.5	1/14/2009	<0.27	2.9	37	0.12	<0.27	44	7.1	34	4.9	<0.022	0.072	37	<0.27	<0.27	<0.27	33	43
12	EC12-A007	12.5-22.5	1/15/2009	0.073	3.5	120	0.31	<0.29	69	8.9	19	4.4	0.1	0.26	39	0.13	<0.29	<0.29	48	45
Colma Sand Deeper than 2.5 Feet below Ground Surface																				
9	EC09-C001	2.5-12.5	1/22/2009	<0.29	1.6	30	0.19	<0.29	80	8.4	8	2.5	<0.024	<0.29	50	<0.29	<0.29	<0.29	44	27
10	EC10-C001	17.5-27.5	1/21/2009	0.056	3.7	39	0.23	<0.28	82	12	13	2.7	<0.023	0.17	71	<0.28	<0.28	<0.28	61	32
12	EC12-C001	17.5-32.5	1/12/2009	<0.29	5.7	75	0.21	<0.29	70	22	9.6	3.3	<0.026	0.11	86	<0.29	<0.29	<0.29	53	45
12	EC12-C002	12.5-37.5	1/12/2009	<0.3	3.5	52	0.2	<0.3	55	13	27	2.9	<0.025	0.092	71	<0.3	<0.3	<0.3	42	50
12	EC12-C003	22.5-32.5	1/15/2009	<0.29	4.3	50	0.22	<0.29	75	12	12	2.9	<0.024	0.13	62	<0.29	<0.29	<0.29	56	36

**TABLE 2: Total Metal Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Non-Serpentinite Bedrock																				
12	EC12-BR001	7.5-22.5	1/13/2009	0.27	6.7	140	0.53	<0.3	36	12	45	9.2	0.056	0.52	68	0.095	<0.3	<0.3	38	77
12	EC12-BR002	23.0-38.0	1/15/2009	0.27	7	130	0.53	<0.29	64	12	36	7.3	0.088	0.29	71	0.2	<0.29	<0.29	64	65
ESL for Residential Land Use (mg/kg) ¹				6.3	0.39	750	4.0	1.7	750 ⁵	40	230	200	1.3	40	150	10	20	1.3	16	600
ESL for Commercial/Industrial Land Use (mg/kg) ²				40	1.6	1,500	8.0	7.4	750 ⁵	80	230	750	10	40	150	10	40	16	200	600
ESL for Construction/Trench Worker Exposure (mg/kg) ³				310	15	2,600	98	39	1,200,000 ⁵	94	310,000	750	58	3,900	260	3,900	3,900	62	770	230,000
LBNL Upper 95th Percentile of Background Metals ⁴				NV	17	280	NV	NV	100	22	58	17	NV	NV	164	NV	NV	NV	77	110
LBNL Upper 99th Percentile of Background Metals ⁴				<6	28	410	1.0	5.6	120	25	63	43	0.42	4.8	272	4.9	2.9	10	90	140

Shading Key:

 Analytical results with shaded gray stripes indicate that concentrations were greater than or equal to ESLs, but less than background metal concentrations.
 Screening values shaded blue indicate that at least one analytical result was greater than or equal to the screening value.

Notes:

Boring locations are shown on Figure 2.
Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma Sand (C=Colma Sand).
Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan ("QAPP").
Values shown in bold indicate compound was quantified above the laboratory reporting limit.
Additional samples that were analyzed for lead only are included in Table 3.
Title 22 Metals analyzed by Environmental Protection Agency Methods 6020, 6010B, and 7471A (Mercury).
bgs = below ground surface.
mg/kg = milligram per kilogram.
<x.x = Compound was not identified above laboratory reporting limit of x.x.
-- = Not analyzed or not applicable.
NV = No Value.
ESL = Environmental Screening Level.

¹ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use, May.
² California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use, May.
³ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario, May
⁴ Lawrence Berkeley National Laboratory ("LBNL"), 2009, Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory, Revised, April.
⁵ ESL is for chromium III.

TABLE 3: Total and Soluble Chromium and Lead Concentrations in Soil
Contract 4 of Doyle Drive Replacement Project

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Units	Chromium	Chromium, TCLP	Chromium, WET	Lead	Lead, TCLP	Lead, WET
						mg/kg	mg/L	mg/L	mg/kg	mg/L	mg/L
Top 2.5 Feet of Soil											
9	E059	E059F-1.0	1.0	1/23/2009		--	--	--	2.2	--	--
9	E059	E059F-2.5	2.5	1/23/2009		--	--	--	120	<0.03	1.1
9	E060	E060F-1.0	1.0	1/23/2009		--	--	--	9.9	--	--
9	E060	E060FS-2.5	2.5	1/23/2009		--	--	--	21	--	--
9	E061	E061C-2.5	2.5	1/22/2009		--	--	--	2.5	--	--
9	E061	E061F-1.0	1.0	1/22/2009		--	--	--	8.2	--	--
9	--	EC09-C001	2.5-12.5	1/22/2009		80	--	<0.25	2.5	--	--
9	--	EC09-F001	1.0-7.5	1/22/2009		72	--	<0.25	12	--	--
9	--	EC09-F003	1.0-12.5	1/23/2009		79	--	<0.25	6.5	--	--
9	--	EC09-F004	1.0-7.5	1/23/2009		45	--	--	140	0.32	3.7
10	E063	E063F-1.0	1.0	1/22/2009		--	--	--	110	0.071	7.8
10	E063	E063F-2.5	2.5	1/22/2009		--	--	--	160	<0.03	1.9
10	E065	E065F-1.0	1.0	1/22/2009		--	--	--	100	0.23	15
10	E065	E065F-2.5	2.5	1/22/2009		--	--	--	23	--	--
10	E067	E067F-1.0	1.0	1/21/2009		--	--	--	160	<0.03	2.9
10	E067	E067F-2.5	2.5	1/21/2009		--	--	--	13	--	--
10	E069	E069F-1.0	1.0	1/21/2009		--	--	--	20	--	--
10	E069	E069F-2.5	2.5	1/21/2009		--	--	--	4	--	--
10	E071	E071F-1.0	1.0	1/21/2009		--	--	--	79	--	1.9
10	E071	E071F-2.0	2.0	1/21/2009		--	--	--	12	--	--
10	--	EC10-F001	1.0-7.5	1/21/2009		62	--	<0.25	24	--	--
10	--	EC10-F002	1.0-7.5	1/21/2009		63	--	<0.25	96	--	6.7
10	--	EC10-F003	1.0-22.0	1/22/2009		69	--	<0.25	90	--	1.1
12	E073	E073F-1.0	1.0	1/15/2009		--	--	--	120	0.056	4.9
12	E073	E073F-2.5	2.5	1/15/2009		--	--	--	3	--	--
12	E074	E074F-1.0	1.0	1/12/2009		--	--	--	59	--	1.2
12	E074	E074F-2.5	2.5	1/12/2009		--	--	--	4.6	--	--
12	E075	E075F-1.0	1.0	1/15/2009		--	--	--	320	0.063	2.7
12	E075	E075F-2.5	2.5	1/15/2009		--	--	--	30	--	--
12	E076	E076F-1.0	1.0	1/12/2009		--	--	--	130	<0.03	2
12	E076	E076F-2.5	2.5	1/12/2009		--	--	--	2.4	--	--
12	E077	E077A-2.5	2.5	1/15/2009		--	--	--	1.8	--	--
12	E077A	E077AA-1.0	1.0	1/14/2009		--	--	--	20	--	--
12	E077A	E077AA-2.5	2.5	1/14/2009		--	--	--	6.9	--	--
12	E077	E077F-1.0	1.0	1/15/2009		--	--	--	14	--	--
12	E078	E078A-2.5	2.5	1/14/2009		--	--	--	1.9	--	--
12	E078A	E078AA-1.0	1.0	1/14/2009		--	--	--	7.4	--	--
12	E078A	E078AA-2.5	2.5	1/14/2009		--	--	--	2.8	--	--
12	E078	E078F-1.0	1.0	1/14/2009		--	--	--	8.2	--	--
12	E079	E079F-1.0	1.0	1/16/2009		--	--	--	120	0.033	4.3
12	E079	E079F-2.5	2.5	1/16/2009		--	--	--	49	--	--
12	E080	E080A-2.5	2.5	1/14/2009		--	--	--	1.6	--	--

**TABLE 3: Total and Soluble Chromium and Lead Concentrations in Soil
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Chromium	Chromium, TCLP	Chromium, WET	Lead	Lead, TCLP	Lead, WET
					Units	mg/kg	mg/L	mg/L	mg/kg	mg/L
12	E080	E080F-1.0	1.0	1/14/2009	--	--	--	60	--	1.1
12	E081	E081F-1.0	1.0	1/13/2009	--	--	--	3.7	--	--
12	E081	E081F-2.5	2.5	1/13/2009	--	--	--	13	--	--
12	E082	E082A-1.0	1.0	1/13/2009	--	--	--	4.1	--	--
12	E082	E082A-2.5	2.5	1/13/2009	--	--	--	5.1	--	--
12	--	EC12-A002	1.0-7.5	1/13/2009	48	--	--	5.9	--	--
12	--	EC12-A004	2.5-22.5	1/14/2009	42	--	--	2	--	--
12	--	EC12-A005	1.0-27.5	1/14/2009	35	--	--	4.5	--	--
12	--	EC12-A006	1.0-17.5	1/14/2009	44	--	--	4.9	--	--
12	--	EC12-F002	1.0-2.5	1/13/2009	43	--	--	34	--	--
12	--	EC12-F003	1.0-2.5	1/15/2009	39	--	--	120	0.14	1.2
12	--	EC12-F004	2.5-12.5	1/15/2009	45	--	--	3.6	--	--
12	--	EC12-F005	1.0-2.5	1/12/2009	60	--	0.28	50	--	0.67
Fill Deeper than 2.5 Feet below Ground Surface										
9	--	EC09-F001	1.0-7.5	1/22/2009	72	--	<0.25	12	--	--
9	--	EC09-F003	1.0-12.5	1/23/2009	79	--	<0.25	6.5	--	--
9	--	EC09-F004	1.0-7.5	1/23/2009	45	--	--	140	0.32	3.7
9	--	EC09-F005	7.5-12.5	1/23/2009	--	--	--	7.3	--	--
10	--	EC10-F001	1.0-7.5	1/21/2009	62	--	<0.25	24	--	--
10	--	EC10-F002	1.0-7.5	1/21/2009	63	--	<0.25	96	--	6.7
10	--	EC10-F003	1.0-22.0	1/22/2009	69	--	<0.25	90	--	1.1
10	--	EC10-F004	7.5-22.5	1/22/2009	78	--	0.45	21	--	--
10	--	EC10-F005	7.5-22.0	1/22/2009	--	--	--	18	--	--
12	--	EC12-F004	2.5-12.5	1/15/2009	45	--	--	3.6	--	--
12	--	EC12-F006	7.5-12.5	1/15/2009	--	--	--	3.1	--	--
Alluvium Deeper than 2.5 Feet below Ground Surface										
10	--	EC10-A001	7.0-17.5	1/21/2009	77	--	<0.25	5.5	--	--
10	--	EC10-A002	7.5-17.5	1/21/2009	110	<0.05	<0.25	4.1	--	--
12	--	EC12-A001	7.5-17.5	1/12/2009	68	--	<0.25	5.2	--	--
12	--	EC12-A002	1.0-7.5	1/13/2009	48	--	--	5.9	--	--
12	--	EC12-A003	7.5-27.5	1/16/2009	43	--	--	2.7	--	--
12	--	EC12-A004	2.5-22.5	1/14/2009	42	--	--	2	--	--
12	--	EC12-A005	1.0-27.5	1/14/2009	35	--	--	4.5	--	--
12	--	EC12-A006	1.0-17.5	1/14/2009	44	--	--	4.9	--	--
12	--	EC12-A007	12.5-22.5	1/15/2009	69	--	--	4.4	--	--
Colma Sand Deeper than 2.5 Feet below Ground Surface										
9	--	EC09-C001	2.5-12.5	1/22/2009	80	--	<0.25	2.5	--	--
10	--	EC10-C001	17.5-27.5	1/21/2009	82	--	<0.25	2.7	--	--
12	--	EC12-C001	17.5-32.5	1/12/2009	70	--	<0.25	3.3	--	--
12	--	EC12-C002	12.5-37.5	1/12/2009	55	--	<0.25	2.9	--	--
12	--	EC12-C003	22.5-32.5	1/15/2009	75	--	<0.25	2.9	--	--

**TABLE 3: Total and Soluble Chromium and Lead Concentrations in Soil
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Boring ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Chromium	Chromium, TCLP	Chromium, WET	Lead	Lead, TCLP	Lead, WET
Units					mg/kg	mg/L	mg/L	mg/kg	mg/L	mg/L
Non-Serpentinite Bedrock										
12	--	EC12-BR001	7.5-22.5	1/13/2009	36	--	--	9.2	--	--
12	--	EC12-BR002	23.0-38.0	1/15/2009	64	--	<0.25	7.3	--	--
ESL for Residential Land Use (mg/kg) ¹					750 ⁵	NV	NV	200	NV	NV
ESL for Commercial/Industrial Land Use (mg/kg) ²					750 ⁵	NV	NV	750	NV	NV
ESL for Construction/Trench Worker Exposure (mg/kg) ³					1,200,000 ⁵	NV	NV	750	NV	NV
LBNL Upper 95th Percentile of Background Metals ⁴					100	NV	NV	17	NV	NV
LBNL Upper 99th Percentile of Background Metals ⁴					120	NV	NV	43	NV	NV

Shading Key:

Analytical results shaded gray indicate that concentrations were greater than or equal to ESLs.
 Screening values shaded blue indicate that at least one analytical result was greater than or equal to the screening value.

Notes:

Boring locations are shown on Figure 2.

Key to Discrete Sample IDs: E061C-2.5 indicates sample collected from environmental boring number E061, lithology of sample is Colma Sand (C=Colma Sand), and sample depth is 2.0 to 2.5 feet bgs.

Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma Sand (C=Colma Sand).

Key to Lithologies: F = Fill; FS = Fill with serpentine; A = Alluvium; C = Colma Sand; BR = Bedrock.

Total metal results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan (QAPP).

Values shown in bold indicate compound was quantified above the laboratory reporting limit.

Total chromium and lead analyzed by Environmental Protection Agency Methods 6010B and 6020.

Soluble chromium and lead analyzed by Waste Extraction Test ("WET") and Toxicity Characteristic Leaching Procedure ("TCLP") methods.

bgs = below ground surface.

mg/kg = milligram per kilogram.

mg/L = milligram per liter.

<x.x = Compound was not identified above laboratory reporting limit of x.x.

-- = Not analyzed or not applicable.

NV = No Value.

ESL = Environmental Screening Level.

¹ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use, May.

**TABLE 3: Total and Soluble Chromium and Lead Concentrations in Soil
Contract 4 of Doyle Drive Replacement Project**

- ² California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use, May.
- ³ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario, May
- ⁴ Lawrence Berkeley National Laboratory ("LBNL"), 2009, Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory, Revised, April.

**TABLE 4: Total Petroleum Hydrocarbon Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	TPH as Gasoline C7-C12	TPH as Diesel C12-C24	TPH as Motor Oil C24-C36
Top 2.5 Feet of Soil						
9	EC09-C001	2.5-12.5	1/22/2009	<1.1	<1.2	<5.9
9	EC09-F001	1.0-7.5	1/22/2009	<1.2	22	94
9	EC09-F003	1.0-12.5	1/23/2009	<1.1	24	240
9	EC09-F004	1.0-7.5	1/23/2009	<1.1	29	260
10	EC10-F001	1.0-7.5	1/21/2009	<1.1	5.4	32
10	EC10-F002	1.0-7.5	1/21/2009	<1	11	49
10	EC10-F003	1.0-22.0	1/22/2009	<1.1	19	74
12	EC12-A002	1.0-7.5	1/13/2009	<1.2	3.8	<5.5
12	EC12-A004	2.5-22.5	1/14/2009	<0.97	<1	<5.2
12	EC12-A005	1.0-27.5	1/14/2009	<0.96	<1	<5.2
12	EC12-A006	1.0-17.5	1/14/2009	<1.2	<1.1	<5.4
12	EC12-F002	1.0-2.5	1/13/2009	<1.1	7.7	19
12	EC12-F003	1.0-2.5	1/15/2009	<1.1	8.1	49
12	EC12-F004	2.5-12.5	1/15/2009	<1.1	7.8	<5.3
12	EC12-F005	1.0-2.5	1/12/2009	<1.1	10	49
Fill Deeper than 2.5 Feet below Ground Surface						
9	EC09-F001	1.0-7.5	1/22/2009	<1.2	22	94
9	EC09-F003	1.0-12.5	1/23/2009	<1.1	24	240
9	EC09-F004	1.0-7.5	1/23/2009	<1.1	29	260
10	EC10-F001	1.0-7.5	1/21/2009	<1.1	5.4	32
10	EC10-F002	1.0-7.5	1/21/2009	<1	11	49
10	EC10-F003	1.0-22.0	1/22/2009	<1.1	19	74
10	EC10-F004	7.5-22.5	1/22/2009	<1.2	20	66
12	EC12-F004	2.5-12.5	1/15/2009	<1.1	7.8	<5.3
Alluvium Deeper than 2.5 Feet below Ground Surface						
10	EC10-A001	7.0-17.5	1/21/2009	<1.1	<1.1	<5.7
10	EC10-A002	7.5-17.5	1/21/2009	<1.2	<1.1	<5.7
12	EC12-A001	7.5-17.5	1/12/2009	<1.2	<1.2	<5.8
12	EC12-A002	1.0-7.5	1/13/2009	<1.2	3.8	<5.5
12	EC12-A003	7.5-27.5	1/16/2009	<1	1.4	<5.4
12	EC12-A004	2.5-22.5	1/14/2009	<0.97	<1	<5.2
12	EC12-A005	1.0-27.5	1/14/2009	<0.96	<1	<5.2
12	EC12-A006	1.0-17.5	1/14/2009	<1.2	<1.1	<5.4
12	EC12-A007	12.5-22.5	1/15/2009	<1.2	<1.2	<5.9
Colma Sand Deeper than 2.5 Feet below Ground Surface						
9	EC09-C001	2.5-12.5	1/22/2009	<1.1	<1.2	<5.9
10	EC10-C001	17.5-27.5	1/21/2009	<1.2	<1.1	<5.7
12	EC12-C001	17.5-32.5	1/12/2009	<1.2	<1.2	<5.9
12	EC12-C002	12.5-37.5	1/12/2009	<1.3	<1.2	<5.9
12	EC12-C003	22.5-32.5	1/15/2009	<1.2	<1.2	<5.8
ESL for Residential Land Use (mg/kg) ¹				83	83	370
ESL for Commerical/Industrial Land Use (mg/kg) ²				83	83	2,500
ESL for Construction/Trench Worker Exposure (mg/kg) ³				4,200	4,200	12,000

**TABLE 4: Total Petroleum Hydrocarbon Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project**

Notes:

Boring locations are shown on Figure 2.

Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma Sand (C=Colma Sand).

Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.

Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan ("QAPP").

Values shown in bold indicate compound was quantified above the laboratory reporting limit.

Total petroleum hydrocarbons analyzed by Environmental Protection Agency Method 8015B.

bgs = below ground surface.

mg/kg = milligram per kilogram.

<x.x = Compound was not identified above laboratory reporting limit of x.x.

ESL = Environmental Screening Level.

¹ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use, May.

² California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use, May.

³ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario, May

**TABLE 5: Volatile Organic Compound Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	Acetone	Methylene Chloride
Top 2.5 Feet of Soil					
9	EC09-C001	2.5-12.5	1/22/2009	<0.022	<0.022
9	EC09-F001	1.0-7.5	1/22/2009	0.031	<0.021
9	EC09-F003	1.0-12.5	1/23/2009	<0.022	0.0047
9	EC09-F004	1.0-7.5	1/23/2009	<0.021	<0.021
10	EC10-F001	1.0-7.5	1/21/2009	<0.021	<0.021
10	EC10-F002	1.0-7.5	1/21/2009	<0.021	<0.021
10	EC10-F003	1.0-22.0	1/22/2009	<0.022	0.0028
12	EC12-A002	1.0-7.5	1/13/2009	<0.022	<0.022
12	EC12-A004	2.5-22.5	1/14/2009	0.0022	<0.019
12	EC12-A005	1.0-27.5	1/14/2009	<0.021	<0.021
12	EC12-A006	1.0-17.5	1/14/2009	<0.021	<0.021
12	EC12-F002	1.0-2.5	1/13/2009	<0.02	<0.02
12	EC12-F003	1.0-2.5	1/15/2009	<0.021	<0.021
12	EC12-F004	2.5-12.5	1/15/2009	0.0085	<0.021
12	EC12-F005	1.0-2.5	1/12/2009	<0.023	<0.023
Fill Deeper than 2.5 Feet below Ground Surface					
9	EC09-F001	1.0-7.5	1/22/2009	0.031	<0.021
9	EC09-F003	1.0-12.5	1/23/2009	<0.022	0.0047
9	EC09-F004	1.0-7.5	1/23/2009	<0.021	<0.021
10	EC10-F001	1.0-7.5	1/21/2009	<0.021	<0.021
10	EC10-F002	1.0-7.5	1/21/2009	<0.021	<0.021
10	EC10-F003	1.0-22.0	1/22/2009	<0.022	0.0028
10	EC10-F004	7.5-22.5	1/22/2009	0.029	0.0032
12	EC12-F004	2.5-12.5	1/15/2009	0.0085	<0.021
Alluvium Deeper than 2.5 Feet below Ground Surface					
10	EC10-A001	7.0-17.5	1/21/2009	<0.023	<0.023
10	EC10-A002	7.5-17.5	1/21/2009	<0.022	<0.022
12	EC12-A001	7.5-17.5	1/12/2009	<0.019	<0.019
12	EC12-A002	1.0-7.5	1/13/2009	<0.022	<0.022
12	EC12-A003	7.5-27.5	1/16/2009	0.011	<0.021
12	EC12-A004	2.5-22.5	1/14/2009	0.0022	<0.019
12	EC12-A005	1.0-27.5	1/14/2009	<0.021	<0.021
12	EC12-A006	1.0-17.5	1/14/2009	<0.021	<0.021
12	EC12-A007	12.5-22.5	1/15/2009	0.0031	<0.023
Colma Sand Deeper than 2.5 Feet below Ground Surface					
9	EC09-C001	2.5-12.5	1/22/2009	<0.022	<0.022
10	EC10-C001	17.5-27.5	1/21/2009	<0.022	<0.022
12	EC12-C001	17.5-32.5	1/12/2009	<0.023	<0.023
12	EC12-C002	12.5-37.5	1/12/2009	<0.024	<0.024
12	EC12-C003	22.5-32.5	1/15/2009	0.0042	<0.022
ESL for Residential Land Use (mg/kg) ¹				0.5	0.077
ESL for Commercial/Industrial Land Use (mg/kg) ²				0.5	0.077
ESL for Construction/Trench Worker Exposure (mg/kg) ³				100,000	630

**TABLE 5: Volatile Organic Compound Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project**

Notes:

Boring locations are shown on Figure 2.

Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma Sand (C=Colma Sand).

Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.

Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan ("QAPP").

Values shown in bold indicate compound was quantified above the laboratory reporting limit.

Only compounds that were identified above laboratory reporting limits in at least one sample are presented.

Volatile organic compounds analyzed by Environmental Protection Agency Method 8260B.

bgs = below ground surface.

mg/kg = milligram per kilogram.

<x.x = Compound was not identified above laboratory reporting limit of x.x.

ESL = Environmental Screening Level.

¹ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use, May.

² California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use, May.

³ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario, May

TABLE 6: Polycyclic Aromatic Hydrocarbon Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

Composite Area	Sample ID	Analysis Method	Sample Depth (feet bgs)	Sample Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
Top 2.5 Feet of Soil																		
9	EC09-C001	EPA 8310	2.5-12.5	1/22/2009	<0.078	<0.0039	<0.0039	<0.0039	<0.0078	<0.0078	<0.0039	<0.0039	<0.0078	<0.0078	<0.0078	<0.0039	<0.0039	<0.0039
9	EC09-F001	EPA 8310	1.0-7.5	1/22/2009	<0.074	0.0015	0.0058	0.011	0.012	0.012	0.0046	0.017	0.0065	0.075	<0.0074	0.0045	0.016	0.016
9	EC09-F003	EPA 8310	1.0-12.5	1/23/2009	<0.076	0.0065	0.028	0.0027	0.024	0.049	0.0039	0.057	<0.0076	0.032	<0.0076	<0.0038	0.0095	0.013
9	EC09-F004	EPA 8310	1.0-7.5	1/23/2009	<0.076	0.0054	0.009	0.016	0.024	0.033	0.01	0.039	0.0052	0.076	<0.0076	0.011	0.052	0.037
10	EC10-F001	EPA 8310	1.0-7.5	1/21/2009	<0.072	0.00099	0.0048	0.0062	0.0049	<0.0072	<0.0036	0.0082	0.0046	0.011	<0.0072	0.0019	0.0079	0.009
10	EC10-F002	EPA 8310	1.0-7.5	1/21/2009	<0.071	0.0012	0.0063	0.011	0.0092	0.02	0.0039	0.013	0.0074	0.027	<0.0071	0.0021	0.016	0.014
10	EC10-F003	EPA 8310	1.0-22.0	1/22/2009	0.12	0.0084	0.049	0.063	0.049	0.066	0.023	0.068	0.058	0.14	<0.0073	0.026	0.093	0.14
12	EC12-A002	EPA 8310	1.0-7.5	1/13/2009	<0.073	<0.0037	0.0016	0.0016	0.0017	0.0042	<0.0037	0.0032	<0.0073	0.0053	<0.0073	0.00053	0.0023	0.0012
12	EC12-A004	EPA 8310	2.5-22.5	1/14/2009	<0.07	<0.0035	<0.0035	<0.0035	<0.007	<0.007	<0.0035	<0.0035	<0.007	<0.007	<0.007	<0.0035	<0.0035	<0.0035
12	EC12-A005	EPA 8310	1.0-27.5	1/14/2009	<0.07	0.0011	0.0032	0.0029	0.0023	<0.007	0.0013	0.0035	0.0023	0.0086	<0.007	0.0011	0.0093	0.0076
12	EC12-A006	EPA 8310	1.0-17.5	1/14/2009	<0.072	0.008	0.013	0.012	0.0092	0.019	0.0054	0.015	0.0087	0.049	<0.0072	0.0061	0.026	0.041
12	EC12-F002	EPA 8310	1.0-2.5	1/13/2009	<0.071	0.02	0.084	0.089	0.066	0.14	0.04	0.11	0.058	0.26	<0.0071	0.043	0.078	0.23
12	EC12-F002	EPA 8270C ¹	1.0-2.5	1/13/2009	0.53	1.7	2.9	2.3	2.3	1.2	0.98	3.1	0.3	5.8	0.52	1.1	4.5	5.8
12	EC12-F003	EPA 8310	1.0-2.5	1/15/2009	<0.074	0.0015	0.0085	0.013	0.015	0.031	0.0056	0.027	0.01	0.043	<0.0074	0.0072	0.018	0.022
12	EC12-F004	EPA 8310	2.5-12.5	1/15/2009	<0.071	<0.0036	<0.0036	<0.0036	<0.0071	<0.0071	<0.0036	<0.0036	<0.0071	<0.0071	<0.0071	<0.0036	<0.0036	<0.0036
12	EC12-F005	EPA 8310	1.0-2.5	1/12/2009	<0.077	0.0017	0.017	0.023	0.019	0.046	0.0065	0.049	0.0066	0.15	<0.0077	0.0041	<0.0039	0.015
Fill Deeper than 2.5 Feet below Ground Surface																		
9	EC09-F001	EPA 8310	1.0-7.5	1/22/2009	<0.074	0.0015	0.0058	0.011	0.012	0.012	0.0046	0.017	0.0065	0.075	<0.0074	0.0045	0.016	0.016
9	EC09-F003	EPA 8310	1.0-12.5	1/23/2009	<0.076	0.0065	0.028	0.0027	0.024	0.049	0.0039	0.057	<0.0076	0.032	<0.0076	<0.0038	0.0095	0.013
9	EC09-F004	EPA 8310	1.0-7.5	1/23/2009	<0.076	0.0054	0.009	0.016	0.024	0.033	0.01	0.039	0.0052	0.076	<0.0076	0.011	0.052	0.037
10	EC10-F001	EPA 8310	1.0-7.5	1/21/2009	<0.072	0.00099	0.0048	0.0062	0.0049	<0.0072	<0.0036	0.0082	0.0046	0.011	<0.0072	0.0019	0.0079	0.009
10	EC10-F002	EPA 8310	1.0-7.5	1/21/2009	<0.071	0.0012	0.0063	0.011	0.0092	0.02	0.0039	0.013	0.0074	0.027	<0.0071	0.0021	0.016	0.014
10	EC10-F003	EPA 8310	1.0-22.0	1/22/2009	0.12	0.0084	0.049	0.063	0.049	0.066	0.023	0.068	0.058	0.14	<0.0073	0.026	0.093	0.14
10	EC10-F004	EPA 8310	7.5-22.5	1/22/2009	<0.079	0.0011	0.0057	0.011	0.0061	0.01	0.017	0.0082	0.0091	0.017	0.0095	0.0033	0.0076	0.011
12	EC12-F004	EPA 8310	2.5-12.5	1/15/2009	<0.071	<0.0036	<0.0036	<0.0036	<0.0071	<0.0071	<0.0036	<0.0036	<0.0071	<0.0071	<0.0071	<0.0036	<0.0036	<0.0036
Alluvium Deeper than 2.5 Feet below Ground Surface																		
10	EC10-A001	EPA 8310	7.0-17.5	1/21/2009	<0.076	<0.0038	<0.0038	<0.0038	<0.0076	<0.0076	<0.0038	<0.0038	<0.0076	<0.0076	<0.0076	<0.0038	<0.0038	<0.0038
10	EC10-A002	EPA 8310	7.5-17.5	1/21/2009	<0.075	<0.0038	<0.0038	<0.0038	<0.0075	<0.0075	<0.0038	<0.0038	<0.0075	<0.0075	<0.0075	<0.0038	<0.0038	<0.0038
12	EC12-A001	EPA 8310	7.5-17.5	1/12/2009	<0.076	<0.0038	<0.0038	<0.0038	<0.0076	<0.0076	<0.0038	<0.0038	<0.0076	<0.0076	<0.0076	<0.0038	<0.0038	<0.0038
12	EC12-A002	EPA 8310	1.0-7.5	1/13/2009	<0.073	<0.0037	0.0016	0.0016	0.0017	0.0042	<0.0037	0.0032	<0.0073	0.0053	<0.0073	0.00053	0.0023	0.0012
12	EC12-A003	EPA 8310	7.5-27.5	1/16/2009	<0.071	<0.0036	<0.0036	<0.0036	<0.0071	<0.0071	<0.0036	<0.0036	<0.0071	<0.0071	<0.0071	<0.0036	<0.0036	<0.0036
12	EC12-A004	EPA 8310	2.5-22.5	1/14/2009	<0.07	<0.0035	<0.0035	<0.0035	<0.007	<0.007	<0.0035	<0.0035	<0.007	<0.007	<0.007	<0.0035	<0.0035	<0.0035
12	EC12-A005	EPA 8310	1.0-27.5	1/14/2009	<0.07	0.0011	0.0032	0.0029	0.0023	<0.007	0.0013	0.0035	0.0023	0.0086	<0.007	0.0011	0.0093	0.0076
12	EC12-A006	EPA 8310	1.0-17.5	1/14/2009	<0.072	0.008	0.013	0.012	0.0092	0.019	0.0054	0.015	0.0087	0.049	<0.0072	0.0061	0.026	0.041
12	EC12-A007	EPA 8310	12.5-22.5	1/15/2009	<0.078	<0.0039	<0.0039	<0.0039	<0.0078	<0.0078	<0.0039	<0.0039	<0.0078	<0.0078	<0.0078	<0.0039	<0.0039	<0.0039

**TABLE 6: Polycyclic Aromatic Hydrocarbon Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Sample ID	Analysis Method	Sample Depth (feet bgs)	Sample Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
Colma Sand Deeper than 2.5 Feet below Ground Surface																		
9	EC09-C001	EPA 8310	2.5-12.5	1/22/2009	<0.078	<0.0039	<0.0039	<0.0039	<0.0078	<0.0078	<0.0039	<0.0039	<0.0078	<0.0078	<0.0078	<0.0039	<0.0039	<0.0039
10	EC10-C001	EPA 8310	17.5-27.5	1/21/2009	<0.076	<0.0038	<0.0038	<0.0038	<0.0076	<0.0076	<0.0038	<0.0038	<0.0076	<0.0076	<0.0076	<0.0038	<0.0038	<0.0038
12	EC12-C001	EPA 8310	17.5-32.5	1/12/2009	<0.079	<0.0039	<0.0039	<0.0039	<0.0079	<0.0079	<0.0039	<0.0039	<0.0079	<0.0079	<0.0079	<0.0039	<0.0039	<0.0039
12	EC12-C001-RE	EPA 8310	17.5-32.5	1/12/2009	<0.079	<0.0039	<0.0039	<0.0039	<0.0079	<0.0079	<0.0039	<0.0039	<0.0079	<0.0079	<0.0079	<0.0039	<0.0039	<0.0039
12	EC12-C002	EPA 8310	12.5-37.5	1/12/2009	<0.079	<0.004	<0.004	<0.004	<0.0079	<0.0079	<0.004	<0.004	<0.0079	<0.0079	<0.0079	<0.004	<0.004	<0.004
12	EC12-C002-RE	EPA 8310	12.5-37.5	1/12/2009	<0.079	<0.0039	<0.0039	<0.0039	<0.0079	<0.0079	<0.0039	<0.0039	<0.0079	<0.0079	<0.0079	<0.0039	<0.0039	<0.0039
12	EC12-C003	EPA 8310	22.5-32.5	1/15/2009	<0.078	<0.0039	<0.0039	<0.0039	<0.0078	<0.0078	<0.0039	<0.0039	<0.0078	<0.0078	<0.0078	<0.0039	<0.0039	<0.0039
ESL for Residential Land Use (mg/kg) ²					13	2.8	0.38	0.038	0.38	27	0.38	23	0.062	40	8.9	0.62	11	85
ESL for Commercial/Industrial Land Use (mg/kg) ³					13	2.8	1.3	0.13	1.3	27	1.3	23	0.21	40	8.9	2.1	11	85
ESL for Construction/Trench Worker Exposure (mg/kg) ⁴					11,000	100,000	15	1.5	15	11,000	15	2,400	2.4	14,000	12,000	24	11,000	21,000

Shading Key:

- Analytical results shaded gray indicate that concentrations were greater than or equal to ESLs.
- Screening values shaded blue indicate that at least one analytical result was greater than or equal to the screening value.

Notes:

Boring locations are shown on Figure 2.
 Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma Sand (C=Colma Sand).
 Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.
 "RE" at the end of a Sample ID indicates the sample was re-extracted for quality assurance reasons and was analyzed outside the method sample hold time. Both original and re-extraction results are included in this table.
 Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan ("QAPP").
 Values shown in bold indicate compound was quantified above the laboratory reporting limit.
 Only compounds that were identified above laboratory reporting limits in at least one sample are presented.
 Polycyclic aromatic hydrocarbons analyzed by Environmental Protection Agency Method 8310.
 bgs = below ground surface.
 mg/kg = milligram per kilogram.
 <x.x = Compound was not identified above laboratory reporting limit of x.x.
 ESL = Environmental Screening Level.

¹ Analytical results for this composite sample by EPA Methods 8310 and 8270C were significantly different, and are likely due to lab composite sample non-homogeneity. Results for all quality assurance samples for both methods were acceptable. The five subsamples for this composite sample were composited by the laboratory, and unique aliquots were collected for each analysis. One of the five subsamples was collected immediately below an asphalt road. Asphalt particles, which contain polycyclic aromatic hydrocarbons, may have been present in the EPA Method 8270C sample aliquot.
² California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use, May.
³ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use, May.
⁴ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario, May

**TABLE 7: Pesticide Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	4,4'-DDD	4,4'-DDT	alpha-Chlordane	gamma-Chlordane
Top 2.5 Feet of Soil							
9	EC09-F001	1.0-7.5	1/22/2009	<0.0037	<0.0037	<0.0019	<0.0019
9	EC09-F003	1.0-12.5	1/23/2009	<0.019	<0.019	<0.0099	<0.0099
9	EC09-F004	1.0-7.5	1/23/2009	0.027	0.026	0.14	0.12
10	EC10-F001	1.0-7.5	1/21/2009	<0.0036	<0.0036	<0.0018	<0.0018
10	EC10-F002	1.0-7.5	1/21/2009	<0.0036	<0.0036	<0.0018	<0.0018
10	EC10-F003	1.0-22.0	1/22/2009	<0.036	<0.036	<0.019	<0.019
12	EC12-F002	1.0-2.5	1/13/2009	<0.0036	<0.0036	<0.0018	<0.0018
12	EC12-F003	1.0-2.5	1/15/2009	<0.0037	0.0091	<0.0019	<0.0019
12	EC12-F004	2.5-12.5	1/15/2009	<0.0035	<0.0035	<0.0018	<0.0018
12	EC12-F005	1.0-2.5	1/12/2009	<0.0038	<0.0038	<0.002	<0.002
Fill Deeper than 2.5 Feet below Ground Surface							
9	EC09-F001	1.0-7.5	1/22/2009	<0.0037	<0.0037	<0.0019	<0.0019
9	EC09-F003	1.0-12.5	1/23/2009	<0.019	<0.019	<0.0099	<0.0099
9	EC09-F004	1.0-7.5	1/23/2009	0.027	0.026	0.14	0.12
10	EC10-F001	1.0-7.5	1/21/2009	<0.0036	<0.0036	<0.0018	<0.0018
10	EC10-F002	1.0-7.5	1/21/2009	<0.0036	<0.0036	<0.0018	<0.0018
10	EC10-F003	1.0-22.0	1/22/2009	<0.036	<0.036	<0.019	<0.019
10	EC10-F004	7.5-22.5	1/22/2009	<0.0039	<0.0039	<0.002	<0.002
12	EC12-F004	2.5-12.5	1/15/2009	<0.0035	<0.0035	<0.0018	<0.0018
ESL for Residential Land Use (mg/kg) ¹				2.4	1.7	0.44	0.44
ESL for Commerical/Industrial Land Use (mg/kg) ²				10	4.0	1.7	1.7
ESL for Construction/Trench Worker Exposure (mg/kg) ³				120	87	21	21

Notes:

Boring locations are shown on Figure 2.

Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma Sand (C=Colma Sand).

Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.

Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan ("QAPP").

Values shown in bold indicate compound was quantified above the laboratory reporting limit.

Only compounds that were identified above laboratory reporting limits in at least one sample are presented.

Pesticides analyzed by Environmental Protection Agency Method 8081A.

bgs = below ground surface.

mg/kg = milligram per kilogram.

<x.x = Compound was not identified above laboratory reporting limit of x.x.

ESL = Environmental Screening Level.

¹ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use, May.

TABLE 7: Pesticide Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project

- ² California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use, May.
- ³ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario, May

**TABLE 8: Polychlorinated Biphenyl Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project**

Composite Area	Sample ID	Sample Depth (feet bgs)	Sample Date	Aroclor-1254	Aroclor-1260
Top 2.5 Feet of Soil					
9	EC09-C001	2.5-12.5	1/22/2009	<0.014	<0.014
9	EC09-F001	1.0-7.5	1/22/2009	<0.013	<0.013
9	EC09-F003	1.0-12.5	1/23/2009	<0.014	<0.014
9	EC09-F004	1.0-7.5	1/23/2009	<0.014	0.04
10	EC10-F001	1.0-7.5	1/21/2009	<0.013	<0.013
10	EC10-F002	1.0-7.5	1/21/2009	<0.013	<0.013
10	EC10-F003	1.0-22.0	1/22/2009	<0.013	<0.013
12	EC12-A002	1.0-7.5	1/13/2009	<0.013	<0.013
12	EC12-A004	2.5-22.5	1/14/2009	<0.013	<0.013
12	EC12-A005	1.0-27.5	1/14/2009	<0.013	<0.013
12	EC12-A006	1.0-17.5	1/14/2009	<0.013	<0.013
12	EC12-F002	1.0-2.5	1/13/2009	<0.013	<0.013
12	EC12-F003	1.0-2.5	1/15/2009	0.046	0.018
12	EC12-F004	2.5-12.5	1/15/2009	<0.013	<0.013
12	EC12-F005	1.0-2.5	1/12/2009	<0.014	<0.014
Fill Deeper than 2.5 Feet below Ground Surface					
9	EC09-F001	1.0-7.5	1/22/2009	<0.013	<0.013
9	EC09-F003	1.0-12.5	1/23/2009	<0.014	<0.014
9	EC09-F004	1.0-7.5	1/23/2009	<0.014	0.04
10	EC10-F001	1.0-7.5	1/21/2009	<0.013	<0.013
10	EC10-F002	1.0-7.5	1/21/2009	<0.013	<0.013
10	EC10-F003	1.0-22.0	1/22/2009	<0.013	<0.013
10	EC10-F004	7.5-22.5	1/22/2009	<0.014	<0.014
12	EC12-F004	2.5-12.5	1/15/2009	<0.013	<0.013
Alluvium Deeper than 2.5 Feet below Ground Surface					
10	EC10-A001	7.0-17.5	1/21/2009	<0.014	<0.014
10	EC10-A002	7.5-17.5	1/21/2009	<0.014	<0.014
12	EC12-A001	7.5-17.5	1/12/2009	<0.014	<0.014
12	EC12-A002	1.0-7.5	1/13/2009	<0.013	<0.013
12	EC12-A003	7.5-27.5	1/16/2009	<0.013	<0.013
12	EC12-A004	2.5-22.5	1/14/2009	<0.013	<0.013
12	EC12-A005	1.0-27.5	1/14/2009	<0.013	<0.013
12	EC12-A006	1.0-17.5	1/14/2009	<0.013	<0.013
12	EC12-A007	12.5-22.5	1/15/2009	<0.014	<0.014
Colma Sand Deeper than 2.5 Feet below Ground Surface					
9	EC09-C001	2.5-12.5	1/22/2009	<0.014	<0.014
10	EC10-C001	17.5-27.5	1/21/2009	<0.014	<0.014
12	EC12-C001	17.5-32.5	1/12/2009	<0.014	<0.014
12	EC12-C002	12.5-37.5	1/12/2009	<0.014	<0.014
12	EC12-C003	22.5-32.5	1/15/2009	<0.014	<0.014
ESL for Residential Land Use (mg/kg) ¹				0.22	0.22
ESL for Commerical/Industrial Land Use (mg/kg) ²				0.74	0.74
ESL for Construction/Trench Worker Exposure (mg/kg) ³				6.7	6.7

**TABLE 8: Polychlorinated Biphenyl Concentrations in Soil (mg/kg, dry weight basis)
Contract 4 of Doyle Drive Replacement Project**

Notes:

Boring locations are shown on Figure 2.

Key to Composite Sample IDs: EC09-C001 indicates an environmental composite sample made up of discrete samples collected from Composite Area 9, and lithology of sample is Colma Sand (C=Colma Sand).

Key to Lithologies: F = Fill; FS = Fill with serpentinite; A = Alluvium; C = Colma Sand; BR = Bedrock.

Soil results are reported on a dry-weight basis in accordance with the Presidio Trust Quality Assurance Project Plan ("QAPP").

Values shown in bold indicate compound was quantified above the laboratory reporting limit.

Only compounds that were identified above laboratory reporting limits in at least one sample are presented.

Polychlorinated biphenyls analyzed by Environmental Protection Agency Method 8082.

bgs = below ground surface.

mg/kg = milligram per kilogram.

<x.x = Compound was not identified above laboratory reporting limit of x.x.

ESL = Environmental Screening Level.

- ¹ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Residential Land Use, May.
- ² California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table A, Environmental Screening Levels, Shallow Soils (≤ 3 meters bgs), Groundwater is a Current or Potential Source of Drinking Water, Commercial/Industrial Land Use, May.
- ³ California Regional Water Quality Control Board, San Francisco Bay Region, 2008, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, May, Table K-3, Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario, May

ATTACHMENT A

	A	B	C	D	E	F	G	H	I	J	K	L			
1	General UCL Statistics for Full Data Sets														
2	User Selected Options														
3	From File			C:\Documents and Settings\Julie Pettijohn\My Documents\Active Jobs\Doyle Drive SF\Soil											
4	Full Precision			OFF											
5	Confidence Coefficient			95%											
6	Number of Bootstrap Operations			2000											
7															
8															
9	Total Lead Upper 2.5 Feet, Discrete Samples Only														
10															
11	General Statistics														
12	Number of Valid Observations						40			Number of Distinct Observations			34		
13															
14	Raw Statistics						Log-transformed Statistics								
15	Minimum						1.6			Minimum of Log Data			0.47		
16	Maximum						320			Maximum of Log Data			5.768		
17	Mean						45.83			Mean of log Data			2.77		
18	Median						13			SD of log Data			1.553		
19	SD						66.28								
20	Coefficient of Variation						1.446								
21	Skewness						2.26								
22															
23	Relevant UCL Statistics														
24	Normal Distribution Test						Lognormal Distribution Test								
25	Shapiro Wilk Test Statistic						0.698			Shapiro Wilk Test Statistic			0.928		
26	Shapiro Wilk Critical Value						0.94			Shapiro Wilk Critical Value			0.94		
27	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level								
28															
29	Assuming Normal Distribution						Assuming Lognormal Distribution								
30	95% Student's-t UCL						63.49			95% H-UCL			115.8		
31	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL			120.6		
32	95% Adjusted-CLT UCL						67.07			97.5% Chebyshev (MVUE) UCL			151.1		
33	95% Modified-t UCL						64.11			99% Chebyshev (MVUE) UCL			211		
34															
35	Gamma Distribution Test						Data Distribution								
36	k star (bias corrected)						0.56			Data do not follow a Discernable Distribution (0.05)					
37	Theta Star						81.8								
38	MLE of Mean						45.83								
39	MLE of Standard Deviation						61.23								
40	nu star						44.82								
41	Approximate Chi Square Value (.05)						30.47			Nonparametric Statistics					
42	Adjusted Level of Significance						0.044			95% CLT UCL			63.07		
43	Adjusted Chi Square Value						30.02			95% Jackknife UCL			63.49		
44										95% Standard Bootstrap UCL			62.95		
45	Anderson-Darling Test Statistic						1.511			95% Bootstrap-t UCL			70.11		
46	Anderson-Darling 5% Critical Value						0.805			95% Hall's Bootstrap UCL			74.35		
47	Kolmogorov-Smirnov Test Statistic						0.167			95% Percentile Bootstrap UCL			63.94		
48	Kolmogorov-Smirnov 5% Critical Value						0.147			95% BCA Bootstrap UCL			66.94		
49	Data not Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL			91.51		
50										97.5% Chebyshev(Mean, Sd) UCL			111.3		
51	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL			150.1		
52	95% Approximate Gamma UCL						67.43								
53	95% Adjusted Gamma UCL						68.43								
54															
55	Potential UCL to Use						Use 99% Chebyshev (Mean, Sd) UCL						150.1		
56															

Lead, Top 2.5 Feet
ProUCL Worksheet

	A	B	C	D	E
1	Composite	Boring ID	Sample ID	Sample De	Lead
2	9	E059	E059F-1.0	1	2.2
3	9	E059	E059F-2.5	2.5	120
4	9	E060	E060F-1.0	1	9.9
5	9	E060	E060FS-2.5	2.5	21
6	9	E061	E061C-2.5	2.5	2.5
7	9	E061	E061F-1.0	1	8.2
8	10	E063	E063F-1.0	1	110
9	10	E063	E063F-2.5	2.5	160
10	10	E065	E065F-1.0	1	100
11	10	E065	E065F-2.5	2.5	23
12	10	E067	E067F-1.0	1	160
13	10	E067	E067F-2.5	2.5	13
14	10	E069	E069F-1.0	1	20
15	10	E069	E069F-2.5	2.5	4
16	10	E071	E071F-1.0	1	79
17	10	E071	E071F-2.0	2	12
18	12	E073	E073F-1.0	1	120
19	12	E073	E073F-2.5	2.5	3
20	12	E074	E074F-1.0	1	59
21	12	E074	E074F-2.5	2.5	4.6
22	12	E075	E075F-1.0	1	320
23	12	E075	E075F-2.5	2.5	30
24	12	E076	E076F-1.0	1	130
25	12	E076	E076F-2.5	2.5	2.4
26	12	E077	E077A-2.5	2.5	1.8
27	12	E077A	E077AA-1.0	1	20
28	12	E077A	E077AA-2.5	2.5	6.9
29	12	E077	E077F-1.0	1	14
30	12	E078	E078A-2.5	2.5	1.9
31	12	E078A	E078AA-1.0	1	7.4
32	12	E078A	E078AA-2.5	2.5	2.8
33	12	E078	E078F-1.0	1	8.2
34	12	E079	E079F-1.0	1	120
35	12	E079	E079F-2.5	2.5	49
36	12	E080	E080A-2.5	2.5	1.6
37	12	E080	E080F-1.0	1	60
38	12	E081	E081F-1.0	1	3.7
39	12	E081	E081F-2.5	2.5	13
40	12	E082	E082A-1.0	1	4.1
41	12	E082	E082A-2.5	2.5	5.1

Benzo(a)pyrene, Top 2.5 Feet
 ProUCL Output

	A	B	C	D	E	F	G	H	I	J	K	L		
1	General UCL Statistics for Data Sets with Non-Detects													
2	User Selected Options													
3	From File			C:\Documents and Settings\Julie Pettijohn\My Documents\Active Jobs\Doyle Drive SF\Soil										
4	Full Precision			OFF										
5	Confidence Coefficient			95%										
6	Number of Bootstrap Operations			2000										
7														
8														
9	Benzo(a)Pyrene top 2.5 feet, no outlier													
10														
11	General Statistics													
12	Number of Valid Data					15		Number of Detected Data					12	
13	Number of Distinct Detected Data					11		Number of Non-Detect Data					3	
14												Percent Non-Detects		20.00%
15														
16	Raw Statistics						Log-transformed Statistics							
17	Minimum Detected			0.0016			Minimum Detected			-6.438				
18	Maximum Detected			0.089			Maximum Detected			-2.419				
19	Mean of Detected			0.021			Mean of Detected			-4.513				
20	SD of Detected			0.027			SD of Detected			1.204				
21	Minimum Non-Detect			0.0035			Minimum Non-Detect			-5.655				
22	Maximum Non-Detect			0.0039			Maximum Non-Detect			-5.547				
23														
24	Note: Data have multiple DLs - Use of KM Method is recomm						Number treated as Non-Detect						6	
25	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected						9	
26	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage						40.00%	
27														
28	UCL Statistics													
29	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only							
30	Shapiro Wilk Test Statistic			0.69			Shapiro Wilk Test Statistic			0.956				
31	5% Shapiro Wilk Critical Value			0.859			5% Shapiro Wilk Critical Value			0.859				
32	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level							
33														
34	Assuming Normal Distribution						Assuming Lognormal Distribution							
35	DL/2 Substitution Method						DL/2 Substitution Method							
36	Mean			0.0171			Mean			-4.871				
37	SD			0.0252			SD			1.299				
38	95% DL/2 (t) UCL			0.0286			95% H-Stat (DL/2) UCL			0.0396				
39														
40	Maximum Likelihood Estimate(MLE) Method						Log ROS Method							
41	Mean			0.00726			Mean in Log Scale			-4.817				
42	SD			0.0346			SD in Log Scale			1.238				
43	95% MLE (t) UCL			0.023			Mean in Original Scale			0.0172				
44	95% MLE (Tiku) UCL			0.0249			SD in Original Scale			0.0251				
45							95% Percentile Bootstrap UCL			0.0287				
46							95% BCA Bootstrap UCL			0.0317				
47														
48	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only							
49	k star (bias corrected)			0.733			Data appear Gamma Distributed at 5% Significance Level							
50	Theta Star			0.0286										
51	nu star			17.58										
52														
53	A-D Test Statistic						Nonparametric Statistics							
54	5% A-D Critical Value			0.76			Kaplan-Meier (KM) Method							
55	K-S Test Statistic			0.76			Mean			0.0172				
56	5% K-S Critical Value			0.253			SD			0.0243				
57	Data appear Gamma Distributed at 5% Significance Level						SE of Mean			0.00655				
58							95% KM (t) UCL			0.0288				
59	Assuming Gamma Distribution						95% KM (z) UCL			0.028				
60	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL			0.0287				
61	Minimum			0.00155			95% KM (bootstrap t) UCL			0.0542				
62	Maximum			0.089			95% KM (BCA) UCL			0.0291				
63	Mean			0.0171			95% KM (Percentile Bootstrap) UCL			0.0286				
64	Median			0.011			95% KM (Chebyshev) UCL			0.0458				
65	SD			0.0252			97.5% KM (Chebyshev) UCL			0.0581				

Benzo(a)pyrene, Top 2.5 Feet
 ProUCL Worksheet

Composite Area	Sample ID	Analysis Method	Sample Depth (feet bgs)	Benzo(a)pyrene	D_BaP
9	EC09-C001	EPA 8310	2.5-12.5	0.0039	0
9	EC09-F001	EPA 8310	1.0-7.5	0.0110	1
9	EC09-F003	EPA 8310	1.0-12.5	0.0027	1
9	EC09-F004	EPA 8310	1.0-7.5	0.0160	1
10	EC10-F001	EPA 8310	1.0-7.5	0.0062	1
10	EC10-F002	EPA 8310	1.0-7.5	0.0110	1
10	EC10-F003	EPA 8310	1.0-22.0	0.0630	1
12	EC12-A002	EPA 8310	1.0-7.5	0.0016	1
12	EC12-A004	EPA 8310	2.5-22.5	0.0035	0
12	EC12-A005	EPA 8310	1.0-27.5	0.0029	1
12	EC12-A006	EPA 8310	1.0-17.5	0.0120	1
12	EC12-F002	EPA 8310	1.0-2.5	0.0890	1
12	EC12-F003	EPA 8310	1.0-2.5	0.0130	1
12	EC12-F004	EPA 8310	2.5-12.5	0.0036	0
12	EC12-F005	EPA 8310	1.0-2.5	0.0230	1

Benzo(a)pyrene, Deeper than 2.5 Feet
 ProUCL Output

	A	B	C	D	E	F	G	H	I	J	K	L				
1	General UCL Statistics for Data Sets with Non-Detects															
2	User Selected Options															
3	From File			C:\Documents and Settings\Julie Pettijohn\My Documents\Active Jobs\Doyle Drive SF\Soil												
4	Full Precision			OFF												
5	Confidence Coefficient			95%												
6	Number of Bootstrap Operations			2000												
7																
8																
9	Benzo(a)Pyrene Deeper than 2.5 feet bgs															
10																
11	General Statistics															
12	Number of Valid Data				8				Number of Detected Data				7			
13	Number of Distinct Detected Data				5				Number of Non-Detect Data				1			
14	Percent Non-Detects												12.50%			
15																
16	Raw Statistics						Log-transformed Statistics									
17	Minimum Detected			0.0027			Minimum Detected			-5.915						
18	Maximum Detected			0.063			Maximum Detected			-2.765						
19	Mean of Detected			0.0173			Mean of Detected			-4.49						
20	SD of Detected			0.0206			SD of Detected			0.956						
21	Minimum Non-Detect			0.0036			Minimum Non-Detect			-5.627						
22	Maximum Non-Detect			0.0036			Maximum Non-Detect			-5.627						
23																
24																
25	Warning: There are only 7 Detected Values in this data															
26	Note: It should be noted that even though bootstrap may be performed on this data set															
27	the resulting calculations may not be reliable enough to draw conclusions															
28																
29	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.															
30																
31																
32	UCL Statistics															
33	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only									
34	Shapiro Wilk Test Statistic			0.646			Shapiro Wilk Test Statistic			0.924						
35	5% Shapiro Wilk Critical Value			0.803			5% Shapiro Wilk Critical Value			0.803						
36	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level									
37																
38	Assuming Normal Distribution						Assuming Lognormal Distribution									
39	DL/2 Substitution Method						DL/2 Substitution Method									
40	Mean			0.0153			Mean			-4.718						
41	SD			0.0198			SD			1.097						
42	95% DL/2 (t) UCL			0.0286			95% H-Stat (DL/2) UCL			0.0298						
43																
44	Maximum Likelihood Estimate(MLE) Method						Log ROS Method									
45	Mean			0.0118			Mean in Log Scale			-4.677						
46	SD			0.0226			SD in Log Scale			1.031						
47	95% MLE (t) UCL			0.027			Mean in Original Scale			0.0154						
48	95% MLE (Tiku) UCL			0.0272			SD in Original Scale			0.0198						
49							95% Percentile Bootstrap UCL			0.0283						
50							95% BCA Bootstrap UCL			0.0348						
51																
52	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only									
53	k star (bias corrected)			0.839			Data appear Gamma Distributed at 5% Significance Level									
54	Theta Star			0.0206												
55	nu star			11.75												
56																
57	A-D Test Statistic			0.624			Nonparametric Statistics									
58	5% A-D Critical Value			0.724			Kaplan-Meier (KM) Method									
59	K-S Test Statistic			0.724			Mean			0.0155						
60	5% K-S Critical Value			0.318			SD			0.0185						
61	Data appear Gamma Distributed at 5% Significance Level						SE of Mean			0.00706						
62							95% KM (t) UCL			0.0288						
63	Assuming Gamma Distribution						95% KM (z) UCL			0.0271						
64	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL			0.0285						
65	Minimum			1E-09			95% KM (bootstrap t) UCL			0.0597						

Benzo(a)pyrene, Deeper than 2.5 Feet
 ProUCL Output

	A	B	C	D	E	F	G	H	I	J	K	L
66					Maximum	0.063				95% KM (BCA) UCL		0.0305
67					Mean	0.0151				95% KM (Percentile Bootstrap) UCL		0.0287
68					Median	0.011				95% KM (Chebyshev) UCL		0.0462
69					SD	0.02				97.5% KM (Chebyshev) UCL		0.0595
70					k star	0.269				99% KM (Chebyshev) UCL		0.0857
71					Theta star	0.0562						
72					Nu star	4.302				Potential UCLs to Use		
73					AppChi2	0.845				95% KM (Chebyshev) UCL		0.0462
74					95% Gamma Approximate UCL	0.077						
75					95% Adjusted Gamma UCL	0.123						
76	Note: DL/2 is not a recommended method.											
77												

Benzo(a)pyrene, Deeper Than 2.5 Feet
ProUCL Worksheet

Composite Area	Sample ID	Analysis Method	Sample Depth (feet bgs)	BaP	D_BaP
9	EC09-F001	EPA 8310	1.0-7.5	0.011	1
9	EC09-F003	EPA 8310	1.0-12.5	0.0027	1
9	EC09-F004	EPA 8310	1.0-7.5	0.016	1
10	EC10-F001	EPA 8310	1.0-7.5	0.0062	1
10	EC10-F002	EPA 8310	1.0-7.5	0.011	1
10	EC10-F003	EPA 8310	1.0-22.0	0.063	1
10	EC10-F004	EPA 8310	7.5-22.5	0.011	1
12	EC12-F004	EPA 8310	2.5-12.5	0.0036	0