ENVIRONMENTAL SITE INVESTIGATION REPORT
Pier 70 Master Plan Area
San Francisco, California

Prepared For:
Port of San Francisco
San Francisco, California

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Project No. 4963.01

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APPENDIX I

Soil Gas Analytical Laboratory Reports (on CD-ROM)

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APPENDIX J

Data Validation Reports
(on CD-ROM)

TO: Dorinda Shipman, Treadwell & Rollo, Inc. March 31, 2010

FROM: Lisa Norosky and Donna Breaux Treadwell & Rollo Project No. 4963.01

DB 4/1/10

DATA VALIDATION SUMMARY REPORT FOR THE PIER 70 ENVIRONMENTAL SITE INVESTIGATION, SAN FRANCISCO, CA

LABORATORY: Curtis & Tompkins, Ltd., Berkeley, CA

SAMPLING DATE: December 14, 2009

Data validation of a Level IV laboratory data package was performed according to the project-specific guidelines. These guidelines were outlined in the U. S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Organic Data Review, October, 1999; the U. S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review, August, 2002; and the U. S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

The data were reviewed for holding times, surrogate recoveries, laboratory blanks, laboratory control samples, matrix spikes and matrix spike duplicates, GC/MS tunes, ICP interference check standards, ICP serial dilutions, initial calibrations, continuing calibration verification standards, internal standards, field QC samples and compound identification and quantitation.

The following paragraphs highlight the essential findings of the data validation effort:

I. **Polynuclear Aromatic Hydrocarbons (PAHs) by GC/MS (8270C-SIM)**
Overall, the data are usable as reported. Qualification was not required.

A. Reporting Limits
The laboratory reporting limits for PAHs in soil and water matrix samples were met, with the following exceptions:

1. Several samples were analyzed at dilutions due to the dark, viscous nature of the sample extracts. The reporting limits were raised by the dilution factors.
2. The results for PAHs in samples P4SB-15-1.5 (217242-016) and P4SB-14-1.5 (217242-018) were reported as non-detect or detected below the reporting limit at ten-fold and seven-fold dilutions, respectively, due to the dark, viscous nature of the sample extracts. The reporting limits were raised by the dilution factors.
3. Sample CPSB-04GW(15) (217242-005) was analyzed at a two-fold dilution due to the dark color of the sample extract. The reporting limits were raised by the dilution factor.

B. Holding Times
Technical holding time criteria were met for all project samples.

C. Surrogate Recoveries
Surrogate spike recoveries met QC acceptance criteria for all project samples. Samples which required dilutions of five-fold or greater that had failing surrogate recoveries did not require qualification, and were not noted in this report.

D. Blanks
Target analytes were not observed in any laboratory method blanks associated with the project samples. Target analytes were not observed in any field QC blanks associated with the project samples.

E. Laboratory Control Samples
All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate
All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples, with the following exception:
1. The percent recovery for pyrene was outside the 1%-152% project acceptance criteria in QC sample CPSB-04B-1.5 (217242-001) MS. The parent sample was diluted five-fold for pyrene analysis and qualification was not required. (QC Batch 158249)

G. GC/MS Tunes
All QC criteria were met for the GC/MS tunes associated with the project samples.

H. Initial Calibration
Initial calibration criteria were met for all calibration standards associated with the project samples.

I. Continuing Calibration
Continuing calibration criteria were met for all continuing calibration standards associated with the project samples.

J. Internal Standards
Internal standard areas and retention times met QC acceptance criteria for all project samples.

K. Compound Identification and Quantitation
All samples analyzed for PAHs in laboratory sample delivery group 217242 received full (Level IV) data validation. This included re-calculation of surrogate values, GC/MS tunes, initial and continuing calibrations and internal standard areas; in addition to re-calculation of all reported results

for PAHs in these samples. The results for PAHs in these samples were verified as correctly reported by the laboratory.

II. Dioxins and Furans by GC/MS (8290)

Overall, the data are usable as reported with any added qualifiers. Qualification was required for the reason noted in Section D.

A. Reporting Limits

The laboratory reporting limits for dioxins and furans in soil and water matrix samples were met. It should be noted that the reporting limits for all soils were raised due to dry weight correction.

B. Holding Times

Technical holding time criteria were met for all project samples.

C. Labeled Compound Recoveries

Labeled compound recoveries met QC acceptance criteria for all project samples.

D. Blanks

Target analytes were not observed in any laboratory method blanks or field QC blanks associated with the project samples, with the following exceptions:

1. The method blank for QC batch 2051265 had detected levels of 1,2,3,4,6,7,8-hepta CDD (1.34 pg/L), 2,3,4,7,8-penta CDF (0.88 pg/L), 1,2,3,4,6,7,8,9-octa CDD (8.7 pg/L), 1,2,3,4,6,7,8,9-octa CDF (1.3 pg/L), total hepta CDD (2.06 pg/L) and total penta CDF (0.88 pg/L). The results for these compounds in the associated project samples were changed to non-detect (U) if those values were less than the laboratory reporting limits.
2. The method blank for QC batch 2051498 had detected levels of 1,2,3,4,6,7,8-hepta CDD (1.18 pg/g), 1,2,3,4,7,8-hexa CDD (0.38 pg/g), 1,2,3,6,7,8-hexa CDD (0.34 pg/g), 1,2,3,6,7,8-hexa CDF (0.29 pg/g), 1,2,3,7,8-penta CDD (0.33 pg/g), 1,2,3,7,8-penta CDF (0.34 pg/g), 2,3,4,6,7,8-hexa CDF (0.33 pg/g), 2,3,4,7,8-penta CDF (0.4 pg/g), 2,3,7,8-tetra CDD (0.35 pg/g), 2,3,7,8-tetra CDF (0.3 pg/g), 1,2,3,4,6,7,8,9-octa CDD (4.36 pg/g), 1,2,3,4,6,7,8,9-octa CDF (1.09 pg/g), total hepta CDD (1.18 pg/g), total hexa CDD (0.89 pg/g), total hexa CDF (0.62 pg/g), total penta CDD (0.33 pg/g), total penta CDF (0.74 pg/g), total tetra CDD (0.35 pg/g) and total tetra CDF (0.3 pg/g). The levels of total hexa CDD present in the associated project samples were either non-detect or greater than the laboratory reporting limit, and qualification was not required. The results for the remaining compounds in the associated project samples were changed to non-detect (U) if those values were less than the laboratory reporting limits.

3. Equipment blank ER1-2009-12-14 (217242-020) had detected levels of 1,2,3,4,6,7,8-hepta CDD (2.24 pg/L), 2,3,4,7,8-penta CDF (0.89 pg/L), 2,3,7,8-tetra CDF (1.58 pg/L), 1,2,3,4,6,7,8,9-octa CDD (17.1 pg/L), 1,2,3,4,6,7,8,9-octa CDF (1.9 pg/L), total hepta CDD (3.54 pg/L), total penta CDF (0.89 pg/L) and total tetra CDF (3.29 pg/L). The values were converted to solid matrix units and the project soil samples were evaluated for blank contamination. The results for these compounds in the associated project samples were either non-detect or greater than one hundred times the blank amounts, and qualification was not required. It should be noted that the results for 1,2,3,4,6,7,8-hepta CDD, 2,3,4,7,8-penta CDF, 1,2,3,4,6,7,8,9-octa CDD, 1,2,3,4,6,7,8,9-octa CDF, total hepta CDD and total penta CDF in equipment blank ER1-2009-12-14 (217242-020) were subsequently changed to non-detect (U) due to method blank contamination.

See Table 2 of this report for a summary of samples qualified for blank contamination.

E. Laboratory Control Samples

All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate

All QC criteria were met for the matrix spike and matrix spike duplicate associated with the project samples. The spiked sample was from a site unrelated to the project site.

G. GC/MS System Performance Check

All QC criteria were met for the GC/MS mass calibration and column performance check standards associated with the project samples.

H. Initial Calibration

Initial calibration criteria were met for all calibration standards associated with the project samples.

I. Continuing Calibration

Continuing calibration criteria were met for all continuing calibration standards associated with the project samples.

J. Compound Identification and Quantitation

All samples analyzed for dioxins and furans in laboratory sample delivery group 217242 received full (Level IV) data validation. This included re-calculation of labeled compound values, GC/MS tunes, initial and continuing calibrations and internal standard areas; in addition to re-calculation of all reported results for dioxins and furans in these samples. The results for dioxins and furans in these samples were verified as correctly reported by the laboratory.

III. Total Petroleum Hydrocarbons (TPH) - Gasoline Range (8015B)

Overall, the data are usable as reported with any added qualifiers. Qualification was required for the reason noted in Section D.

A. Reporting Limits

The laboratory reporting limits for TPH-gasoline in soil and water matrix samples were met.

B. Holding Times

Technical holding time criteria were met for all project samples.

C. Surrogate Recoveries

Surrogate spike recoveries met QC acceptance criteria for all project samples.

D. Blanks

Target analytes were not observed in any laboratory method blanks or field QC blanks associated with the project samples, with the following exceptions:

1. Method blank QC525621 had a detected level of TPH-gasoline at 7.1 ug/L. The results for TPH-gasoline in the associated project samples were changed to non-detect (U) if those values were less than five times the blank amount.
2. Method blank QC525616 had a detected level of TPH-gasoline at 0.081 mg/kg. The results for TPH-gasoline in the associated project samples were changed to non-detect (U) if those values were less than five times the blank amount.
3. Equipment blank ER1-2009-12-14 (217242-020) had a detected level of TPH-gasoline at 13 ug/L. The results for TPH-gasoline in the associated project water samples were changed to non-detect (U) if those values were less than five times the blank amount. The value was converted to solid matrix units and the project soil samples were evaluated for blank contamination. The results for TPH-gasoline in the associated project soil samples were changed to non-detect (U) if those values were less than five times the blank amount. It should be noted that the result for TPH-gasoline in equipment blank ER1-2009-12-14 (217242-020) was subsequently changed to non-detect (U) due to method blank contamination.

See Table 2 of this report for a summary of samples qualified for blank contamination.

E. Laboratory Control Samples

All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate
All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples.

G. Initial Calibration
Initial calibration criteria were met for all calibration standards associated with the project samples.

H. Continuing Calibration
Continuing calibration criteria were met for all continuing calibration standards associated with the project samples.

I. Compound Identification and Quantitation
All samples analyzed for TPH-gasoline in laboratory sample delivery group 217242 received full (Level IV) data validation. This included re-calculation of surrogate values and initial and continuing calibrations; in addition to re-calculation of all reported results for TPH-gasoline in these samples. The results for TPH-gasoline in these samples were verified as correctly reported by the laboratory.

IV. Total Petroleum Hydrocarbons (TPH) – Diesel/Motor Oil Range (8015B)

Overall, the data are usable as reported with any added qualifiers. Qualification was required for the reason noted in Section D.

A. Reporting Limits
The laboratory reporting limits for TPH-diesel and TPH-motor oil in soil and water matrix samples were met, with the following exception:
1. Several soil matrix samples were analyzed at dilutions due to the dark, viscous nature of the sample extracts. The reporting limits in these samples were raised by the dilution factors.

B. Holding Times
Technical holding time criteria were met for all project samples.

C. Surrogate Recoveries
Surrogate spike recoveries met QC acceptance criteria for all project samples. Samples which required dilutions of five-fold or greater that had failing surrogate recoveries did not require qualification, and were not noted in this report.

D. Blanks
Target analytes were not observed in any field QC blanks associated with the project samples. Target analytes were not observed in any laboratory method blanks associated with the project samples, with the following exceptions:
1. Method blank QC525792 had detected levels of TPH-diesel (0.38 mg/kg) and TPH-motor oil (0.46 mg/kg). The results for

TPH-diesel in the associated project samples were changed to non-detect (U) if those values were less than five times the blank amount. The results for TPH-motor oil in the associated project samples were greater than five times the blank amount, and qualification was not required.

See Table 2 of this report for a summary of samples qualified for blank contamination.

E. Laboratory Control Samples
All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate
All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples.

G. Initial Calibration
Initial calibration criteria were met for all calibration standards associated with the project samples.

H. Continuing Calibration
Continuing calibration criteria were met for all continuing calibration standards associated with the project samples.

I. Compound Identification and Quantitation
All samples analyzed for TPH-diesel and TPH-motor oil in laboratory sample delivery group 217242 received full (Level IV) data validation. This included re-calculation of surrogate values and initial and continuing calibrations; in addition to re-calculation of all reported results for TPH-diesel and TPH-motor oil in these samples. The results for TPH-diesel and TPH-motor oil in these samples were verified as correctly reported by the laboratory.

V. Total and Dissolved Metals (6010B, 7470A, 7471A)

Overall, the data are usable as reported with any added qualifiers. Qualifications were required for the reasons noted in Sections C, G and I.

A. Reporting Limits
The laboratory reporting limits for metals in soil and water matrix samples were met.

B. Holding Times
Technical holding time criteria were met for all project samples.

C. Blanks

Target analytes were not observed in any laboratory method blanks or field QC blanks associated with the project samples, with the following exceptions:

1. Method blank QC525703 had a detected level of arsenic at 0.15 mg/kg. The results for arsenic in the associated project samples were either non-detect or greater than ten times the blank amount, and qualification was not required.
2. Method blank QC525751 had a detected level of nickel at 1.4 ug/L. The results for nickel in the associated project samples were changed to non-detect (U) if those values were less than ten times the blank amount.
3. The 12/17/09 at 9:06 initial calibration blank (ICB) analyzed on instrument MET08 had detected levels of arsenic (3.59 ug/L) and nickel (2.58 ug/L). The values were converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of arsenic and nickel present in the associated project samples were greater than ten times the blank amounts, and qualification was not required.
4. The 12/17/09 at 18:08 continuing calibration blank (CCB) analyzed on instrument MET08 had a detected level of arsenic at 4.41 ug/L. The value was converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of arsenic present in the associated project samples were greater than ten times the blank amount, and qualification was not required.
5. The 12/17/09 at 19:13 CCB analyzed on instrument MET08 had a detected level of arsenic at 4.58 ug/L. The value was converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of arsenic present in the associated project samples were greater than ten times the blank amount, and qualification was not required.
6. The 12/17/09 at 20:10 CCB analyzed on instrument MET08 had a detected level of arsenic at 3.95 ug/L. The value was converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of arsenic present in the associated project samples were greater than ten times the blank amount, and qualification was not required.
7. The 12/17/09 at 21:18 CCB analyzed on instrument MET08 had detected levels of copper (2.89 ug/L) and nickel (2.10 ug/L). The values were converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of copper and nickel present in the associated project samples were greater than ten times the blank amounts, and qualification was not required.
8. The 12/17/09 at 21:43 CCB analyzed on instrument MET08 had a detected level of arsenic at 4.41 ug/L. The value was converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of arsenic present in the associated project

samples were greater than ten times the blank amount, and qualification was not required.

9. The 12/18/09 at 11:21 CCB analyzed on instrument MET08 had a detected level of arsenic at 3.27 ug/L. The value was converted to solid matrix units and the project soil samples were evaluated for blank contamination. The results for arsenic in the associated project samples were changed to non-detect (U) if those values were less than ten times the blank amount.
10. Equipment blank ER1-2009-12-14 (217242-020) had detected levels of cobalt (1.1 ug/L) and nickel (2.8 ug/L). The levels of cobalt and nickel present in the associated project water sample were greater than ten times the blank amounts, and qualification was not required. The values were converted to solid matrix units and the project soil samples were evaluated for blank contamination. The results for cobalt and nickel in the associated project soil samples were greater than ten times the blank amounts, and qualification was not required. It should be noted that the result for nickel in equipment blank ER1-2009-12-14 (217242-020) was subsequently changed to non-detect (U) due to method blank contamination.

See Table 2 of this report for a summary of samples qualified for blank contamination.

D. Laboratory Control Samples

All QC criteria were met for the laboratory control samples associated with the project samples.

E. Matrix Spike/Matrix Spike Duplicate

All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples, with the following exception:

1. The percent recoveries for copper and nickel were outside the laboratory acceptance limits in QC sample CPSB-04B-1.5 (217242-001) MSD. The amounts of copper and nickel present in the parent sample were greater than four times the amounts spiked and qualification was not required. (QC Batch 158280)

F. ICP Interference Check Standards

All QC criteria were met for the ICP interference check standards associated with the project samples.

G. ICP Serial Dilution

All QC criteria were met for the ICP serial dilutions associated with the project samples, with the following exception:

1. In the serial dilution of sample CPSB-04B-1.5 (217242-001), the percent differences (%Ds) failed the 10% project acceptance criteria for arsenic (15%), cobalt (12%), lead (11%), nickel (12%) and zinc (12%). The results for these metals in the associated project samples were qualified as estimated (J/UJ). (QC Batch 158280)

See Table 2 of this report for a summary of samples qualified for serial dilution percent difference failure.

H. Initial and Continuing Calibrations

All initial and continuing calibration standards associated with the project samples met QC acceptance criteria.

I. Compound Identification and Quantitation

All samples analyzed for metals in laboratory sample delivery group 217242 received full (Level IV) data validation. This included re-calculation of all reported results for metals in these samples. The results for metals in these samples were verified as correctly reported by the laboratory.

Level IV validation of the instrument raw data revealed negative values with magnitudes greater than two times the reporting limits for lead in sample CCSB-04GW(15) (217242-011) and arsenic in samples P5SS-06-1.5 (217242-006) and CCSB-04-10 (217242-009). The non-detect results reported for these metals may be false negatives, and were qualified as estimated (UJ).

See Table 2 of this report for a summary of samples qualified for negative values with magnitudes greater than two times the reporting limits.

SUMMARY

The attached Table 1 lists the samples and analyses included in the data validation effort. All samples/analyses listed in Table 1 received full, Level IV data validation. The attached Table 2 summarizes the data qualifications required for the project samples for each test method included in the data package associated with this report.

USABILITY

The quality control criteria were reviewed, and other than those discussed above, all criteria were met and the data are considered acceptable. Estimated sample results (J/UJ) are usable only for limited purposes. Based upon the full data validation, all other results of the samples/analyses listed in Table 1 only are considered valid and usable for all purposes.

VALIDATION QUALIFIERS IDENTIFICATION

The definitions of the following qualifiers are prepared according to the document, "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," October, 1999.

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. *A minus sign (-) indicates the numerical value has a low bias. A plus sign (+) indicates the numerical value has a high bias.*

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table 1
Sample Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Site Sample ID	Laboratory Sample ID	Date Sampled	Analyses	Sample Type
CPSB-04B-1.5	217242-001	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil
CPSB-04-10	217242-003	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil
CPSB-04GW(15)	217242-005	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B)	Water
P5SS-06-1.5	217242-006	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil
CCSS-06-1.5	217242-007	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil
CCSB-04-1.5	217242-008	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil
CCSB-04-10	217242-009	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil
CCSB-04GW(15)	217242-011	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Dissolved Metals (6010, 7470A)	Water
CCSS-07-1.5	217242-012	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil
CCSB-05-1.5	217242-013	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil
CCSB-05-10	217242-014	14-Dec-09	PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil
P4SB-15-1.5	217242-016	14-Dec-09	PAHs (8270-SIM), Dioxins & Furans (8290), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil
P4SB-15-5.0	217242-017	14-Dec-09	Dioxins & Furans (8290)	Soil
P4SB-14-1.5	217242-018	14-Dec-09	PAHs (8270-SIM), Dioxins & Furans (8290), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6010, 7471A)	Soil

Table 1
Sample Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Site Sample ID	Laboratory Sample ID	Date Sampled	Analyses	Sample Type
P4SB-14-5.0	**217242-019**	**14-Dec-09**	**Dioxins & Furans (8290)**	**Soil**
ER1-2009-12-14	**217242-020**	**14-Dec-09**	**PAHs (8270-SIM), Dioxins & Furans (8290), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Dissolved Metals (6010, 7470A)**	**Equipment Blank**

PAHs: Polynuclear Aromatic Hydrocarbons

TPH: Total Petroleum Hydrocarbons

MO: Motor Oil

BOLD: Bold typeface indicates samples/analyses that received full (Level IV) data validation

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
CPSB-04B-1.5	217242-001	6010B	Arsenic, total	J	Serial dilution percent difference failure
CPSB-04B-1.5	217242-001	6010B	Cobalt, total	J	Serial dilution percent difference failure
CPSB-04B-1.5	217242-001	6010B	Lead, total	J	Serial dilution percent difference failure
CPSB-04B-1.5	217242-001	6010B	Nickel, total	J	Serial dilution percent difference failure
CPSB-04B-1.5	217242-001	6010B	Zinc, total	J	Serial dilution percent difference failure
CPSB-04-10	217242-003	6010B	Arsenic, total	J	Serial dilution percent difference failure
CPSB-04-10	217242-003	6010B	Cobalt, total	J	Serial dilution percent difference failure
CPSB-04-10	217242-003	6010B	Lead, total	J	Serial dilution percent difference failure
CPSB-04-10	217242-003	6010B	Nickel, total	J	Serial dilution percent difference failure
CPSB-04-10	217242-003	6010B	Zinc, total	J	Serial dilution percent difference failure
CPSB-04GW(15)	217242-005	8015B	Gasoline C7-C12	U	Method blank contamination, Equipment blank contamination
P5SS-06-1.5	217242-006	8015B	Gasoline C7-C12	U	Method blank contamination
P5SS-06-1.5	217242-006	8015B	Diesel C10-C24	U	Method blank contamination
P5SS-06-1.5	217242-006	6010B	Arsenic, total	UJ	Serial dilution %D failure, Negative value with a magnitude >2X the RL
P5SS-06-1.5	217242-006	6010B	Cobalt, total	J	Serial dilution percent difference failure
P5SS-06-1.5	217242-006	6010B	Lead, total	J	Serial dilution percent difference failure
P5SS-06-1.5	217242-006	6010B	Nickel, total	J	Serial dilution percent difference failure
P5SS-06-1.5	217242-006	6010B	Zinc, total	J	Serial dilution percent difference failure
CCSS-06-1.5	217242-007	8015B	Gasoline C7-C12	U	Method blank contamination
CCSS-06-1.5	217242-007	6010B	Arsenic, total	J	Serial dilution percent difference failure
CCSS-06-1.5	217242-007	6010B	Cobalt, total	J	Serial dilution percent difference failure
CCSS-06-1.5	217242-007	6010B	Lead, total	J	Serial dilution percent difference failure
CCSS-06-1.5	217242-007	6010B	Nickel, total	J	Serial dilution percent difference failure
CCSS-06-1.5	217242-007	6010B	Zinc, total	J	Serial dilution percent difference failure
CCSB-04-1.5	217242-008	8015B	Gasoline C7-C12	U	Method blank contamination
CCSB-04-1.5	217242-008	6010B	Arsenic, total	J	Serial dilution percent difference failure
CCSB-04-1.5	217242-008	6010B	Cobalt, total	J	Serial dilution percent difference failure
CCSB-04-1.5	217242-008	6010B	Lead, total	J	Serial dilution percent difference failure
CCSB-04-1.5	217242-008	6010B	Nickel, total	J	Serial dilution percent difference failure
CCSB-04-1.5	217242-008	6010B	Zinc, total	J	Serial dilution percent difference failure
CCSB-04-10	217242-009	8015B	Gasoline C7-C12	U	Method blank contamination

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
CCSB-04-10	217242-009	6010B	Arsenic, total	UJ	Serial dilution %D failure, Negative value with a magnitude >2X the RL
CCSB-04-10	217242-009	6010B	Cobalt, total	J	Serial dilution percent difference failure
CCSB-04-10	217242-009	6010B	Lead, total	J	Serial dilution percent difference failure
CCSB-04-10	217242-009	6010B	Nickel, total	J	Serial dilution percent difference failure
CCSB-04-10	217242-009	6010B	Zinc, total	J	Serial dilution percent difference failure
CCSB-04GW(15)	217242-011	8015B	Gasoline C7-C12	U	Method blank contamination, Equipment blank contamination
CCSB-04GW(15)	217242-011	6010B	Lead, dissolved	UJ	Negative value with a magnitude >2X the reporting limit
CCSS-07-1.5	217242-012	8015B	Gasoline C7-C12	U	Method blank contamination
CCSS-07-1.5	217242-012	6010B	Arsenic, total	J	Serial dilution percent difference failure
CCSS-07-1.5	217242-012	6010B	Cobalt, total	J	Serial dilution percent difference failure
CCSS-07-1.5	217242-012	6010B	Lead, total	J	Serial dilution percent difference failure
CCSS-07-1.5	217242-012	6010B	Nickel, total	J	Serial dilution percent difference failure
CCSS-07-1.5	217242-012	6010B	Zinc, total	J	Serial dilution percent difference failure
CCSB-05-1.5	217242-013	8015B	Gasoline C7-C12	U	Method blank contamination
CCSB-05-1.5	217242-013	6010B	Arsenic, total	J	Serial dilution percent difference failure
CCSB-05-1.5	217242-013	6010B	Cobalt, total	J	Serial dilution percent difference failure
CCSB-05-1.5	217242-013	6010B	Lead, total	J	Serial dilution percent difference failure
CCSB-05-1.5	217242-013	6010B	Nickel, total	J	Serial dilution percent difference failure
CCSB-05-1.5	217242-013	6010B	Zinc, total	J	Serial dilution percent difference failure
CCSB-05-10	217242-014	8015B	Gasoline C7-C12	U	Method blank contamination
CCSB-05-10	217242-014	6010B	Arsenic, total	J	Serial dilution percent difference failure
CCSB-05-10	217242-014	6010B	Cobalt, total	J	Serial dilution percent difference failure
CCSB-05-10	217242-014	6010B	Lead, total	J	Serial dilution percent difference failure
CCSB-05-10	217242-014	6010B	Nickel, total	J	Serial dilution percent difference failure
CCSB-05-10	217242-014	6010B	Zinc, total	J	Serial dilution percent difference failure
P4SB-15-1.5	217242-016	8290	1,2,3,4,7,8-HxCDD	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	1,2,3,6,7,8-HxCDD	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	1,2,3,6,7,8-HxCDF	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	1,2,3,7,8-PeCDD	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	1,2,3,7,8-PeCDF	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	2,3,4,6,7,8-HxCDF	U	Method blank contamination

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
P4SB-15-1.5	217242-016	8290	2,3,4,7,8-PeCDF	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	2,3,7,8-TCDD	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	2,3,7,8-TCDF	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	1,2,3,4,6,7,8,9-OCDF	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	Total HxCDF	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	Total PeCDD	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	Total TCDD	U	Method blank contamination
P4SB-15-1.5	217242-016	8290	Total TCDF	U	Method blank contamination
P4SB-15-1.5	217242-016	8015B	Gasoline C7-C12	U	Method blank contamination
P4SB-15-1.5	217242-016	6010B	Arsenic, total	UJ	Continuing calibration blank contamination, Serial dilution %D failure
P4SB-15-1.5	217242-016	6010B	Cobalt, total	J	Serial dilution percent difference failure
P4SB-15-1.5	217242-016	6010B	Lead, total	J	Serial dilution percent difference failure
P4SB-15-1.5	217242-016	6010B	Nickel, total	J	Serial dilution percent difference failure
P4SB-15-1.5	217242-016	6010B	Zinc, total	J	Serial dilution percent difference failure
P4SB-15-5.0	217242-017	8290	1,2,3,6,7,8-HxCDF	U	Method blank contamination
P4SB-15-5.0	217242-017	8290	1,2,3,7,8-PeCDF	U	Method blank contamination
P4SB-15-5.0	217242-017	8290	2,3,4,7,8-PeCDF	U	Method blank contamination
P4SB-15-5.0	217242-017	8290	2,3,7,8-TCDF	U	Method blank contamination
P4SB-15-5.0	217242-017	8290	1,2,3,4,6,7,8,9-OCDD	U	Method blank contamination
P4SB-15-5.0	217242-017	8290	1,2,3,4,6,7,8,9-OCDF	U	Method blank contamination
P4SB-15-5.0	217242-017	8290	Total HpCDD	U	Method blank contamination
P4SB-15-5.0	217242-017	8290	Total HxCDF	U	Method blank contamination
P4SB-15-5.0	217242-017	8290	Total PeCDF	U	Method blank contamination
P4SB-15-5.0	217242-017	8290	Total TCDF	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	1,2,3,4,7,8-HxCDD	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	1,2,3,6,7,8-HxCDD	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	1,2,3,6,7,8-HxCDF	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	1,2,3,7,8-PeCDD	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	1,2,3,7,8-PeCDF	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	2,3,4,6,7,8-HxCDF	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	2,3,4,7,8-PeCDF	U	Method blank contamination

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
P4SB-14-1.5	217242-018	8290	2,3,7,8-TCDF	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	1,2,3,4,6,7,8,9-OCDF	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	Total PeCDD	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	Total TCDD	U	Method blank contamination
P4SB-14-1.5	217242-018	8290	Total TCDF	U	Method blank contamination
P4SB-14-1.5	217242-018	8015B	Gasoline C7-C12	U	Method blank contamination, Equipment blank contamination
P4SB-14-1.5	217242-018	6010B	Arsenic, total	J	Serial dilution percent difference failure
P4SB-14-1.5	217242-018	6010B	Cobalt, total	J	Serial dilution percent difference failure
P4SB-14-1.5	217242-018	6010B	Lead, total	J	Serial dilution percent difference failure
P4SB-14-1.5	217242-018	6010B	Nickel, total	J	Serial dilution percent difference failure
P4SB-14-1.5	217242-018	6010B	Zinc, total	J	Serial dilution percent difference failure
P4SB-14-5.0	217242-019	8290	1,2,3,4,6,7,8-HpCDD	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	1,2,3,6,7,8-HxCDF	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	1,2,3,7,8-PeCDF	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	2,3,4,7,8-PeCDF	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	2,3,7,8-TCDD	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	2,3,7,8-TCDF	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	1,2,3,4,6,7,8,9-OCDD	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	1,2,3,4,6,7,8,9-OCDF	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	Total HpCDD	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	Total HxCDF	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	Total PeCDF	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	Total TCDD	U	Method blank contamination
P4SB-14-5.0	217242-019	8290	Total TCDF	U	Method blank contamination
ER1-2009-12-14	217242-020	8290	1,2,3,4,6,7,8-HpCDD	U	Method blank contamination
ER1-2009-12-14	217242-020	8290	2,3,4,7,8-PeCDF	U	Method blank contamination
ER1-2009-12-14	217242-020	8290	1,2,3,4,6,7,8,9-OCDD	U	Method blank contamination
ER1-2009-12-14	217242-020	8290	1,2,3,4,6,7,8,9-OCDF	U	Method blank contamination
ER1-2009-12-14	217242-020	8290	Total HpCDD	U	Method blank contamination
ER1-2009-12-14	217242-020	8290	Total PeCDF	U	Method blank contamination
ER1-2009-12-14	217242-020	8015B	Gasoline C7-C12	U	Method blank contamination

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
ER1-2009-12-14	217242-020	6010B	Nickel, dissolved	U	Method blank contamination

%D: Percent difference
RL: Reporting limit

DataVal, Inc.

TO: Dorinda Shipman, Treadwell & Rollo, Inc. December 8, 2009

FROM: Donna Breaux, DataVal, Inc. Treadwell & Rollo Project No. 4963.01

DB 12/8/09

DATA VALIDATION SUMMARY REPORT FOR THE PIER 70 ENVIRONMENTAL SITE INVESTIGATION, SAN FRANCISCO, CA

LABORATORY: Curtis & Tompkins, Ltd., Berkeley, CA

SAMPLING DATES: August 27, 28, 31, September 3 and October 5, 2009

Data validation of Level IV laboratory data packages was performed according to the project-specific guidelines. These guidelines were outlined in the U. S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Organic Data Review, October, 1999; the U. S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review, August, 2002; and the U. S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

The data were reviewed for holding times, surrogate recoveries, laboratory blanks, laboratory control samples, matrix spikes and matrix spike duplicates, laboratory duplicate samples, GC/MS tunes, performance evaluation mix standards, ICP interference check standards, ICP serial dilutions, initial calibrations, continuing calibration verification standards, internal standards, field QC samples and compound identification and quantitation.

The following paragraphs highlight the essential findings of the data validation effort:

I. **Volatile Organic Compounds (VOCs) by GC/MS (8260B)**

Overall, the data are usable as reported with any added qualifiers. Qualifications were required for the reasons noted in Sections C, D, H, I and J.

A. Reporting Limits

The laboratory reporting limits for VOCs in soil and water matrix samples were met, with the following exception:

1. The results for VOCs in sample P9SB-06-15.0 (214532-003) were reported as non-detect at a one hundred-fold dilution due to the presence of hydrocarbons. The reporting limits in this sample were raised by the dilution factor.

B. Holding Times

Technical holding time criteria were met for all project samples.

C. Surrogate Recoveries

Surrogate spike recoveries met QC acceptance criteria for all project samples, with the following exceptions:

1. Samples with high-failing surrogate recoveries and non-detect results did not require qualification, and were not noted in this report.
2. The percent recovery for surrogate 4-bromofluorobenzene was outside the 75%-130% laboratory acceptance limits in sample SPSB-04-6.0 (214561-009) at 134%. The detected result for acetone in the sample was qualified as estimated with a high bias (J+). The detected result for methylene chloride in the sample was subsequently qualified as non-detect due to method blank contamination and qualification for high-failing surrogate recovery was not required.
3. The percent recovery for surrogate toluene-d8 was outside the 88%-113% laboratory acceptance limits in sample CPSB-03-9.5 (214561-006) at 149%. The detected results for acetone and 2-butanone in the sample were qualified as estimated with a high bias (J+). The detected result for methylene chloride in the sample was subsequently qualified as non-detect due to method blank contamination and qualification for high-failing surrogate recovery was not required.

See Table 2 of this report for a summary of samples qualified for surrogate percent recovery failure.

D. Blanks

Target analytes were not observed in any laboratory method blanks or field QC blanks associated with the project samples, with the following exceptions:

1. Method blank QC510361 had detected levels of 1,2,3-trichlorobenzene (0.4 ug/L), 1,2,4-trichlorobenzene (0.5 ug/L), n-butylbenzene (0.2 ug/L), hexachlorobutadiene (0.6 ug/L) and naphthalene (0.7 ug/L). The results for these compounds in the associated project samples were non-detect, and qualification was not required.
2. Method blank QC510609 had a detected level of acetone at 2.8 ug/kg. The results for acetone in the associated project samples were changed to non-detect (U) if those values were less than ten times the blank amount.
3. Method blank QC510333 had a detected level of methylene chloride at 4.5 ug/kg. The results for methylene chloride in the associated project samples were changed to non-detect (U) if those values were less than ten times the blank amount.
4. Method blank QC516440 had a detected level of bromomethane at 0.3 ug/L. The results for bromomethane in the associated project samples were non-detect, and qualification was not required.
5. Equipment blank ER1-2009-08-28 (214531-002) had detected levels of acetone (3.9 ug/L) and methylene chloride (1.2 ug/L). The results for methylene chloride in the associated project samples were non-detect, and qualification was not required. The results for acetone in the

associated project samples were changed to non-detect (U) if those values were less than ten times the blank amount.

See Table 2 of this report for a summary of samples qualified for blank contamination.

E. Laboratory Control Samples

All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate

All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples.

G. GC/MS Tunes

All QC criteria were met for the GC/MS tunes associated with the project samples.

H. Initial Calibration

Initial calibration criteria were met for all calibration standards associated with the project samples, with the following exception:

1. The 8/7/09 initial calibration analyzed on instrument MSVOA08 had vinyl acetate with a percent relative standard deviation (%RSD) greater than the 30% acceptance criteria at 36%. The non-detect results for vinyl acetate in the associated project samples were qualified as estimated (UJ).

See Table 2 of this report for a summary of samples qualified for initial calibration relative standard deviation failure.

I. Continuing Calibration

Continuing calibration criteria were met for all continuing calibration standards associated with the project samples, with the following exceptions:

1. Qualification was not required for samples with non-detect results associated with high-failing continuing calibration verification (CCV) standards. Such failures were not noted in this report.
2. The 9/2/09 at 12:44 CCV standard analyzed on instrument MSVOA08 had bromomethane with a percent difference (%D) less than the +/-25% acceptance criteria at -26%. The non-detect results for bromomethane in the associated project samples were qualified as estimated (UJ).
3. The 9/2/09 at 20:03 CCV standard analyzed on instrument MSVOA05 had freon-12 and chloromethane with %Ds less than the +/-25% acceptance criteria at -28% and -30%, respectively. The non-detect results for these compounds in the associated project samples were qualified as estimated (UJ).
4. The 9/2/09 at 12:05 CCV standard analyzed on instrument MSVOA02 had four compounds with %Ds less than the +/-25% acceptance

criteria: freon-12 (-34%), 1,2,3-trichlorobenzene (-26%), 1,2,4-trichlorobenzene (-29%) and hexachlorobutadiene (-28%). The non-detect results for these compounds in the associated project samples were qualified as estimated (UJ).

5. The 9/3/09 at 18:41 CCV standard analyzed on instrument MSVOA02 had four compounds with %Ds less than the +/-25% acceptance criteria: freon-12 (-34%), 1,2,3-trichlorobenzene (-32%), 1,2,4-trichlorobenzene (-29%) and naphthalene (-37%). The non-detect results for these compounds in the associated project samples were qualified as estimated (UJ).
6. The 9/4/09 at 11:14 CCV standard analyzed on instrument MSVOA05 had chloromethane with a %D less than the +/-25% acceptance criteria at -26%. The non-detect result for chloromethane in the associated project sample was qualified as estimated (UJ).
7. The 9/10/09 at 17:02 CCV standard analyzed on instrument MSVOA02 had 1,2-dibromo-3-chloropropane with a %D less than the +/-25% acceptance criteria at -27%. The non-detect result for 1,2-dibromo-3-chloropropane in the associated project sample was qualified as estimated (UJ).

See Table 2 of this report for a summary of samples qualified for continuing calibration verification percent difference failure.

J. Internal Standards

Internal standard areas and retention times met QC acceptance criteria for all project samples, with the following exception:

1. One project sample had an internal standard area outside the -50% to +100% project acceptance criteria. The non-detect results for the compounds associated with the outlying internal standard were qualified as estimated (UJ). The following table lists the sample with the failing internal standard.

Project Sample ID	Laboratory Sample ID	Internal Standard	Area Count	Area Acceptance Range
CPSB-03-9.5	214561-006	1,4-Dichlorobenzene-d4	131148	202729-810918

See Table 2 of this report for a summary of compounds qualified for internal standard area count failure.

K. Compound Identification and Quantitation

All samples analyzed for VOCs in laboratory sample delivery groups 214531, 214532, 214561, 214680 and 215443 received full (Level IV) data validation. This included re-calculation of surrogate values, GC/MS tunes, initial and continuing calibrations and internal standard areas; in addition to re-calculation of all reported results for VOCs in these samples. The results for VOCs in these samples were verified as correctly reported by the laboratory.

II. Polynuclear Aromatic Hydrocarbons (PAHs) by GC/MS (8270C-SIM)

Overall, the data are usable as reported. Qualification was not required.

A. Reporting Limits

The laboratory reporting limits for PAHs in soil and water matrix samples were met, with the following exceptions:

1. The results for PAHs in samples P9SB-06-5.5 (214532-001) and SPSB-04-25.0 (214561-013) were reported as non-detect at one hundred-fold and three-fold dilutions, respectively, due to the dark, viscous nature of the sample extracts. The reporting limits in these samples were raised by the dilution factors.
2. Samples P9SB-06-15.0 (214532-003) and CCSB-03-9.5 (214532-007) were analyzed at dilutions due to the dark, viscous nature of the sample extracts. The reporting limits in these samples were raised by the dilution factors.
3. Sample CCSB-03-15.0 (214532-008) was analyzed at a dilution due to the dark color of the sample extract. The reporting limits in this sample were raised by the dilution factor.

B. Holding Times

Technical holding time criteria were met for all project samples.

C. Surrogate Recoveries

Surrogate spike recoveries met QC acceptance criteria for all project samples, with the following exceptions:

1. Samples with fewer than two failing base-neutral surrogate recoveries did not require qualification, and were not noted in this report.
2. Samples which required dilutions of five-fold or greater that had failing surrogate recoveries did not require qualification, and were not noted in this report.

D. Blanks

Target analytes were not observed in any laboratory method blanks or field QC blanks associated with the project samples, with the following exceptions:

1. Method blank QC515586 had a detected level of naphthalene at 0.2 ug/L. The levels of naphthalene present in the associated project samples were non-detect, and qualification was not required.
2. Equipment blank ER1-2009-08-28 (214531-002) had detected levels of fluoranthene (0.02 ug/L), phenanthrene (0.04 ug/L) and pyrene (0.03 ug/L). The levels of fluoranthene, phenanthrene and pyrene present in the associated project samples were greater than five times the blank amounts, and qualification was not required.

E. Laboratory Control Samples

All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate
All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples.

G. GC/MS Tunes
All QC criteria were met for the GC/MS tunes associated with the project samples.

H. Initial Calibration
Initial calibration criteria were met for all calibration standards associated with the project samples.

I. Continuing Calibration
Continuing calibration criteria were met for all continuing calibration standards associated with the project samples.

J. Internal Standards
Internal standard areas and retention times met QC acceptance criteria for all project samples.

K. Compound Identification and Quantitation
All samples analyzed for PAHs in laboratory sample delivery groups 214531, 214532, 214561, 214680 and 215443 received full (Level IV) data validation. This included re-calculation of surrogate values, GC/MS tunes, initial and continuing calibrations and internal standard areas; in addition to re-calculation of all reported results for PAHs in these samples. The results for PAHs in these samples were verified as correctly reported by the laboratory.

III. Dioxins and Furans by GC/MS (8290)

Overall, the data are usable as reported with any added qualifiers. Qualifications were required for the reasons noted in Sections D and G.

A. Reporting Limits
The laboratory reporting limits for dioxins and furans in soil matrix samples were met. It should be noted that the reporting limits for all soils were raised due to dry weight correction.

B. Holding Times
Technical holding time criteria were met for all project samples.

C. Labeled Compound Recoveries
Labeled compound recoveries met QC acceptance criteria for all project samples.

D. Blanks

Target analytes were not observed in any laboratory method blanks associated with the project samples, with the following exception:

1. The method blank for QC batch 1946630 had detected levels of 1,2,3,4,6,7,8,9-octa CDD (1.01 pg/g), 2,3,7,8-tetra CDF (0.25 pg/g) and total tetra CDF (0.25 pg/g). The levels of 2,3,7,8-tetra CDF present in the associated project samples were non-detect, and qualification was not required. The results for 1,2,3,4,6,7,8,9-octa CDD and total tetra CDF in the associated project samples were changed to non-detect (U) if those values were less than five times the blank amounts.

See Table 2 of this report for a summary of samples qualified for blank contamination.

E. Laboratory Control Samples

All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate

All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples.

G. Laboratory Duplicate Samples

All QC criteria were met for the laboratory duplicate samples associated with the project samples, with the following exception:

1. In the laboratory duplicate of sample P4SB-07-2.0 (214680-001), the relative percent differences (RPDs) between the detected results were greater than the 25% laboratory acceptance limit for 1,2,3,7,8,9-hexa CDD (30%), total tetra CDD (65%) and total hepta CDF (131%). In the same laboratory duplicate pair, the absolute difference between the detected results was greater than the reporting limit for 2,3,7,8-tetra CDF. The results for these compounds in the associated project samples were qualified as estimated (J/UJ). (QC Batch 1946630)

See Table 2 of this report for a summary of samples qualified for laboratory duplicate relative percent difference failure.

H. GC/MS System Performance Check

All QC criteria were met for the GC/MS mass calibration and column performance check standards associated with the project samples.

I. Initial Calibration

Initial calibration criteria were met for all calibration standards associated with the project samples.

J. Continuing Calibration

Continuing calibration criteria were met for all continuing calibration standards associated with the project samples.

K. Compound Identification and Quantitation
All samples analyzed for dioxins and furans in laboratory sample delivery group 214680 received full (Level IV) data validation. This included re-calculation of labeled compound values, GC/MS tunes, initial and continuing calibrations, and internal standard areas; in addition to re-calculation of all reported results for dioxins and furans in these samples. The results for dioxins and furans in these samples were verified as correctly reported by the laboratory.

IV. Total Petroleum Hydrocarbons (TPH) - Gasoline Range (8015B)

Overall, the data are usable as reported with any added qualifiers. Qualification was required for the reason noted in Section D.

A. Reporting Limits
The laboratory reporting limits for TPH-gasoline in soil and water matrix samples were met.

B. Holding Times
Technical holding time criteria were met for all project samples.

C. Surrogate Recoveries
Surrogate spike recoveries met QC acceptance criteria for all project samples. Samples with high failing surrogate recoveries due to co-elution with high levels of hydrocarbons did not require qualification, and were not noted in this report.

D. Blanks
Target analytes were not observed in any laboratory method blanks or field QC blanks associated with the project samples, with the following exceptions:

1. Method blank QC510354 had a detected level of TPH-gasoline at 0.065 mg/kg. The results for TPH-gasoline in the associated project samples were changed to non-detect (U) if those values were less than five times the blank amount.
2. Method blank QC510559 had a detected level of TPH-gasoline at 0.017 mg/kg. The results for TPH-gasoline in the associated project samples were changed to non-detect (U) if those values were less than five times the blank amount.
3. Method blank QC511089 had a detected level of TPH-gasoline at 0.016 mg/kg. The results for TPH-gasoline in the associated project samples were changed to non-detect (U) if those values were less than five times the blank amount.
4. Method blank QC516395 had a detected level of TPH-gasoline at 12 ug/L. The results for TPH-gasoline in the associated project samples were changed to non-detect (U) if those values were less than five times the blank amount.

5. Equipment blank ER1-2009-08-28 (214531-002) had a detected level of TPH-gasoline at 11 ug/L. The results for TPH-gasoline in the associated project samples were either non-detect or greater than five times the blank amount, and qualification was not required.

See Table 2 of this report for a summary of samples qualified for blank contamination.

E. Laboratory Control Samples
All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate
All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples.

G. Initial Calibration
Initial calibration criteria were met for all calibration standards associated with the project samples.

H. Continuing Calibration
Continuing calibration criteria were met for all continuing calibration standards associated with the project samples.

I. Compound Identification and Quantitation
All samples analyzed for TPH-gasoline in laboratory sample delivery groups 214531, 214532, 214561, 214680 and 215443 received full (Level IV) data validation. This included re-calculation of surrogate values and initial and continuing calibrations; in addition to re-calculation of all reported results for TPH-gasoline in these samples. The results for TPH-gasoline in these samples were verified as correctly reported by the laboratory.

V. Total Petroleum Hydrocarbons (TPH) – Diesel/Motor Oil Range (8015B)

Overall, the data are usable as reported with any added qualifiers. Qualification was required for the reason noted in Section D.

A. Reporting Limits
The laboratory reporting limits for TPH-diesel and TPH-motor oil in soil and water matrix samples were met, with the following exception:

1. Samples P9SB-06-5.5 (214532-001), P9SB-06-15.0 (214532-003), SPSB-04-6.0 (214561-009), P4SB-07-2.0 (214680-001) and P4SB-07-5.0 (214680-002) were analyzed at dilutions due to the dark, viscous nature of the sample extracts. The reporting limits in these samples were raised by the dilution factors.

B. Holding Times
Technical holding time criteria were met for all project samples.

C. Surrogate Recoveries
Surrogate spike recoveries met QC acceptance criteria for all project samples. Samples which required dilutions of five-fold or greater that had failing surrogate recoveries did not require qualification, and were not noted in this report.

D. Blanks
Target analytes were not observed in any field QC blanks associated with the project samples. Target analytes were not observed in any laboratory method blanks associated with the project samples, with the following exceptions:

1. Method blank QC510130 had a detected level of TPH-diesel at 0.2 mg/kg. The results for TPH-diesel in the associated project samples were greater than five times the blank amount, and qualification was not required.
2. Method blank QC510347 had a detected level of TPH-diesel at 0.18 mg/kg. The results for TPH-diesel in the associated project samples were changed to non-detect (U) if those values were less than five times the blank amount.
3. Method blank QC511027 had a detected level of TPH-diesel at 0.17 mg/kg. The results for TPH-diesel in the associated project samples were greater than five times the blank amount, and qualification was not required.

See Table 2 of this report for a summary of samples qualified for blank contamination.

E. Laboratory Control Samples
All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate
All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples.

G. Initial Calibration
Initial calibration criteria were met for all calibration standards associated with the project samples.

H. Continuing Calibration
Continuing calibration criteria were met for all continuing calibration standards associated with the project samples.

I. Compound Identification and Quantitation
All samples analyzed for TPH-diesel and TPH-motor oil in laboratory sample delivery groups 214531, 214532, 214561, 214680 and 215443 received full (Level IV) data validation. This included re-calculation of surrogate values and initial and continuing calibrations; in addition to re-

calculation of all reported results for TPH-diesel and TPH-motor oil in these samples. The results for TPH-diesel and TPH-motor oil in these samples were verified as correctly reported by the laboratory.

VI. Organochlorine Pesticides (8081A)

Overall, the data are usable as reported. Qualification was not required.

A. Reporting Limits
The laboratory reporting limits for pesticides in soil matrix samples were met.

B. Holding Times
Technical holding time criteria were met for all project samples.

C. Surrogate Recoveries
Surrogate spike recoveries met QC acceptance criteria for all project samples.

D. Blanks
Target analytes were not observed in any laboratory method blanks associated with the project samples.

E. Laboratory Control Samples
All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate
All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples.

G. Performance Evaluation Mix (PEM) Check Standards
All PEM check standards met the project degradation criteria of 20% for endrin and 4,4'-DDT.

H. Initial Calibration
Initial calibration criteria were met for all calibration standards associated with the project samples.

I. Continuing Calibration
Continuing calibration criteria were met for all continuing calibration standards associated with the project samples, with the following exceptions:

1. Data was reported from two columns. Continuing calibration verification (CCV) standards with percent differences (%Ds) that failed criteria on one column did not require qualification of sample results if those results were reported from the column in control. Such failures were not noted in this report.

2. Qualification was not required for samples with non-detect results associated with high-failing CCV standards. Such failures were not noted in this report.

J. Compound Identification and Quantitation
The sample analyzed for pesticides in laboratory sample delivery group 214680 received full (Level IV) data validation. This included re-calculation of surrogate values, performance evaluation mix standards and initial and continuing calibrations; in addition to re-calculation of all reported results for pesticides in this sample. The non-detect results for pesticides in this sample were verified as correctly reported by the laboratory.

VII. Polychlorinated Biphenyls (PCBs) (8082)

Overall, the data are usable as reported with any added qualifiers. Qualification was required for the reason noted in Section C.

A. Reporting Limits
The laboratory reporting limits for PCBs in soil and water matrix samples were met.

B. Holding Times
Technical holding time criteria were met for all project samples.

C. Surrogate Recoveries
Surrogate spike recoveries met QC acceptance criteria for all project samples, with the following exceptions:

1. Samples with high-failing surrogate recoveries and non-detect results did not require qualification, and were not noted in this report.
2. The percent recovery for surrogate decachlorobiphenyl was outside the 52%-140% laboratory acceptance limits in sample P9SB-06-5.5 (214532-001) at 37%. The results for PCB-1248, PCB-1254 and PCB-1260 in the sample were qualified as estimated with a low bias (J-/UJ).
3. The percent recovery for surrogate decachlorobiphenyl was outside the 46%-133% laboratory acceptance limits in sample P4SB-07-5.0 (214680-002) at 44%. The results for PCB-1248, PCB-1254 and PCB-1260 in the sample were qualified as estimated with a low bias (J-/UJ).

See Table 2 of this report for a summary of samples qualified for surrogate percent recovery failure.

D. Blanks
Target analytes were not observed in any laboratory method blanks associated with the project samples. Target analytes were not observed in any field QC blanks associated with the project samples.

E. Laboratory Control Samples
All QC criteria were met for the laboratory control samples associated with the project samples.

F. Matrix Spike/Matrix Spike Duplicate
All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples.

G. Initial Calibration
Initial calibration criteria were met for all calibration standards associated with the project samples.

H. Continuing Calibration
Continuing calibration criteria were met for all continuing calibration standards associated with the project samples. Data was reported from two columns. Continuing calibration verification (CCV) standards with percent differences (%Ds) that failed criteria on one column did not require qualification of sample results if those results were reported from the column in control. Such failures were not noted in this report.

I. Compound Identification and Quantitation
All samples analyzed for PCBs in laboratory sample delivery groups 214531, 214532, 214561 and 214680 received full (Level IV) data validation. This included re-calculation of surrogate values and initial and continuing calibrations; in addition to re-calculation of all reported results for PCBs in these samples. The results for PCBs in these samples were verified as correctly reported by the laboratory.

VIII. Total and Dissolved Metals (6010B, 6020, 7470A, 7471A)

Overall, the data are usable as reported with any added qualifiers. Qualifications were required for the reasons noted in Sections C, E, G and I.

A. Reporting Limits
The laboratory reporting limits for metals in soil and water matrix samples were met, with the following exception:
1. The result for total mercury in sample CPSB-03-14.5 (214561-007) was reported as non-detect at a five-fold dilution. The reporting limit for mercury in this sample was raised by the dilution factor.

B. Holding Times
Technical holding time criteria were met for all project samples.

C. Blanks
Target analytes were not observed in any field QC blanks associated with the project samples. Target analytes were not observed in any laboratory method blanks associated with the project samples, with the following exceptions:

1. Method blank QC509887 had a detected level of arsenic at 2.3 ug/L. The results for arsenic in the associated project samples were changed to non-detect (U) if those values were less than ten times the blank amount.
2. Method blank QC510040 had detected levels of antimony (0.23 mg/kg), arsenic (0.18 mg/kg), chromium (0.052 mg/kg), cobalt (0.051 mg/kg), lead (0.15 mg/kg) and nickel (0.15 mg/kg). The results for these metals in the associated project samples were either non-detect or greater than ten times the blank amounts, and qualification was not required.
3. Method blank QC510248 had detected levels of chromium (0.057 mg/kg), cobalt (0.022 mg/kg) and nickel (0.11 mg/kg). The results for these metals in the associated project samples were greater than ten times the blank amounts, and qualification was not required.
4. Method blank QC515248 had detected levels of chromium (0.2 ug/L), molybdenum (0.048 ug/L) and vanadium (0.11 ug/L). The results for molybdenum in the associated project samples were greater than ten times the blank amount, and qualification was not required. The results for chromium and vanadium in the associated project samples were changed to non-detect (U) if those values were less than ten times the blank amounts.
5. The 9/1/09 at 9:17 initial calibration blank (ICB) analyzed on instrument MET08 had a detected level of arsenic at 3.33 ug/L. The value was converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of arsenic present in the associated project samples were greater than ten times the blank amount, and qualification was not required.
6. The 9/1/09 at 13:10 continuing calibration blank (CCB) analyzed on instrument MET08 had detected levels of arsenic (4.80 ug/L) and nickel (2.79 ug/L). The values were converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of arsenic and nickel present in the associated project samples were greater than ten times the blank amounts, and qualification was not required.
7. The 9/1/09 at 14:02 CCB analyzed on instrument MET08 had detected levels of arsenic (4.38 ug/L), cobalt (1.31 ug/L), nickel (3.07 ug/L) and thallium (5.49 ug/L). The values were converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of arsenic, cobalt, nickel and thallium present in the associated project samples were greater than ten times the blank amounts or non-detect, and qualification was not required.
8. The 9/2/09 at 12:09 CCB analyzed on instrument MET08 had a detected level of arsenic at 2.67 ug/L. The value was converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of arsenic present in the associated project samples were greater than ten times the blank amount, and qualification was not required.

9. The 9/3/09 at 13:27 CCB analyzed on instrument MET08 had a detected level of thallium at 6.34 ug/L. The value was converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of thallium present in the associated project samples were non-detect, and qualification was not required.
10. The 9/3/09 at 14:27 CCB analyzed on instrument MET08 had a detected level of copper at 3.59 ug/L. The value was converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of copper present in the associated project samples were greater than ten times the blank amount, and qualification was not required.
11. The 9/3/09 at 15:39 CCB analyzed on instrument MET08 had detected levels of thallium (8.31 ug/L) and vanadium (1.32 ug/L). The values were converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of thallium and vanadium present in the associated project samples were either non-detect or greater than ten times the blank amounts, and qualification was not required.
12. The 9/9/09 at 11:37 ICB analyzed on instrument MET09 had detected levels of copper (3.93 ug/L) and vanadium (1.29 ug/L). The values were converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of copper and vanadium present in the associated project samples were greater than ten times the blank amounts, and qualification was not required.
13. The 9/9/09 at 20:29 CCB analyzed on instrument MET09 had detected levels of barium (2.81 ug/L), cobalt (2.13 ug/L), copper (3.81 ug/L), lead (2.61 ug/L), molybdenum (2.65 ug/L) and vanadium (2.77 ug/L). The values were converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of barium, cobalt, copper, lead and vanadium present in the associated project samples were greater than ten times the blank amounts, and qualification was not required. The results for molybdenum in the associated project samples were changed to non-detect (U) if those values were less than ten times the blank amount.
14. The 9/9/09 at 21:38 CCB analyzed on instrument MET09 had detected levels of copper (3.57 ug/L), lead (1.60 ug/L) and vanadium (2.16 ug/L). The values were converted to solid matrix units and the project soil samples were evaluated for blank contamination. The levels of copper, lead and vanadium present in the associated project samples were greater than ten times the blank amounts, and qualification was not required.
15. The 10/6/09 at 12:59 ICB analyzed on instrument MET26 had detected levels of molybdenum (0.059 ug/L) and thallium (0.035 ug/L). The levels of molybdenum and thallium present in the associated project samples were greater than ten times the blank amounts or non-detect, and qualification was not required.

16. The 10/6/09 at 20:12 CCB analyzed on instrument MET26 had detected levels of lead (0.091 ug/L), molybdenum (0.076 ug/L), silver (0.028 ug/L), thallium (0.015 ug/L) and zinc (0.110 ug/L). The levels of molybdenum, silver, thallium and zinc present in the associated project samples were either non-detect or greater than ten times the blank amounts, and qualification was not required. The results for lead in the associated project samples were changed to non-detect (U) if those values were less than ten times the blank amount.
17. The 10/6/09 at 22:13 CCB analyzed on instrument MET26 had detected levels of barium (0.051 ug/L), lead (0.078 ug/L), molybdenum (0.064 ug/L), silver (0.035 ug/L), thallium (0.014 ug/L) and zinc (0.135 ug/L). The levels of barium, molybdenum, silver, thallium and zinc present in the associated project samples were either non-detect or greater than ten times the blank amounts, and qualification was not required. The results for lead in the associated project samples were changed to non-detect (U) if those values were less than ten times the blank amount.

See Table 2 of this report for a summary of samples qualified for blank contamination.

D. Laboratory Control Samples

All QC criteria were met for the laboratory control samples associated with the project samples.

E. Matrix Spike/Matrix Spike Duplicate

All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples, with the following exceptions:

1. The percent recoveries were outside the laboratory acceptance limits in QC samples P9SB-06-5.5 (214532-001) MS and/or MSD for copper (150% / 7%), lead (146% / 41%) and zinc (pass / 3%). In addition, the relative percent differences (RPDs) were outside the laboratory acceptance limits in the same MS/MSD pair for copper (69%), lead (71%) and zinc (62%). The detected results for these metals in the associated project samples were qualified as estimated (J) for matrix spike percent recovery and RPD failures. (QC Batch 154433)
2. The percent recoveries were outside the laboratory acceptance limits in QC samples P8SB-01-5.5 (214561-001) MS/MSD for cobalt (151% / 129%) and vanadium (142% / 161%). The amount of vanadium present in the parent sample was greater than four times the amount spiked and qualification was not required. The detected results for cobalt in the associated project samples were qualified as estimated (J). (QC Batch 154477)
3. The results for mercury were not reported by the laboratory in QC samples CPSB-03-6.5 (214561-005) MS/MSD. The amount of mercury present in the parent sample was substantially greater than the amount spiked, and qualification was not required. (QC Batch 154520)

4. The percent recoveries for antimony were outside the laboratory acceptance limits in QC samples 215442-002 MS/MSD. The parent sample was from a site unrelated to the project site, and qualification of project samples was not required. (QC Batch 155696)

See Table 2 of this report for a summary of samples qualified for matrix spike percent recovery and relative percent difference failures.

F. ICP Interference Check Standards

All QC criteria were met for the ICP interference check standards associated with the project samples, with the following exception:

1. The 9/1/09 at 17:44 interference check standard solution AB analyzed on instrument MET08 had antimony and thallium with percent recoveries less than the 80%-120% project acceptance criteria at 76% and 74%, respectively. Interferent element concentrations in the associated project samples were either below those in the interference check standard, or project sample results were not reported from the associated analytical run, and qualification was not required.

G. ICP Serial Dilution

All QC criteria were met for the ICP serial dilutions associated with the project samples, with the following exceptions:

1. The percent differences (%Ds) failed the 10% project acceptance criteria for barium and lead in the serial dilution of sample CCSB-03GW(13) (214531-001) at 21% and 54%, respectively. The results for barium and lead in the associated project samples were qualified as estimated (J/UJ). (QC Batch 154393)
2. The %D failed the 10% project acceptance criteria for arsenic in the serial dilution of sample P8SB-01-5.5 (214561-001) at 24%. The detected results for arsenic in the associated project samples were qualified as estimated (J). (QC Batch 154477)
3. In the serial dilution of sample P4SB-07-2.0 (214680-001), the %Ds failed the 10% project acceptance criteria for arsenic (31%), cobalt (13%) and zinc (14%). The detected results for arsenic, cobalt and zinc in the associated project samples were qualified as estimated (J). (QC Batch 154613)

See Table 2 of this report for a summary of samples qualified for serial dilution percent difference failure.

H. Initial and Continuing Calibrations

All initial and continuing calibration standards associated with the project samples met QC acceptance criteria.

I. Compound Identification and Quantitation

All samples analyzed for metals in laboratory sample delivery groups 214531, 214532, 214561, 214680 and 215443 received full (Level IV) data validation. This included re-calculation of all reported results for metals in

these samples. The results for metals in these samples were verified as correctly reported by the laboratory.

Level IV validation of the instrument raw data revealed negative values with magnitudes greater than two times the reporting limits for chromium and lead in the project water samples in SDG 214531. Level IV validation of the instrument raw data revealed negative values with magnitudes greater than two times the reporting limits for antimony, lead, selenium, silver and thallium in the project soil samples associated with SDGs 214532, 214561 and 214680. The non-detect results reported for these metals may be false negatives, and were qualified as estimated (UJ) if the absolute values of the results were greater than two times the reporting limits.

See Table 2 of this report for a summary of samples qualified for negative values with magnitudes greater than two times the reporting limits.

IX. Various General Chemistry Methods

Overall, the data are usable as reported with any added qualifiers. Qualification was required for the reason noted in Section E.

A. Reporting Limits

The laboratory reporting limits for total cyanide (SM4500CN-E), sulfide (SM4500S2-D) and pH (EPA 150.1 and 9045D) were met.

B. Holding Times

Technical holding time criteria were met for all project samples.

C. Blanks

Target analytes were not observed in any laboratory method blanks associated with the project samples. Target analytes were not observed in any field QC blanks associated with the project samples.

D. Laboratory Control Samples

All QC criteria were met for the laboratory control samples associated with the project samples.

E. Matrix Spike/Matrix Spike Duplicate

All QC criteria were met for the matrix spikes and matrix spike duplicates associated with the project samples, with the following exception:

1. The percent recoveries for total cyanide were outside the 76%-122% laboratory acceptance limits in QC samples SPSB-04-6.0 (214561-009) MS/MSD at 51% / 54%. The non-detect results for total cyanide in the associated project samples were qualified as estimated (UJ). (QC Batch 154706)

See Table 2 of this report for a summary of samples qualified for matrix spike percent recovery failure.

F. Laboratory Duplicate Samples
All QC criteria were met for the laboratory duplicate samples associated with the project samples.

G. Initial and Continuing Calibrations
All initial and continuing calibration standards associated with the project samples met QC acceptance criteria.

H. Compound Identification and Quantitation
All samples analyzed for total cyanide, sulfide and pH in laboratory sample delivery groups 214531, 214532 and 214561 received full (Level IV) data validation. This included re-calculation of all reported results for total cyanide and sulfide in these samples. The non-detect results for total cyanide and sulfide in these samples were verified as correctly reported by the laboratory.

FIELD DUPLICATES

Field duplicate precision was evaluated by calculating the relative percent difference (RPD) between detected results in the original sample and its associated duplicate. The control limit used for field duplicates was an RPD less than or equal to 50 percent, or the absolute difference of the two results must be less than the reporting limit for those analytes that were at or near the detection limit. One sample was collected in duplicate for the Pier 70 Environmental Site Investigation sampling event.

Project Sample Primary ID	Laboratory Sample ID	Project Sample Duplicate ID	Laboratory Sample ID
SPMW-01-2009-10-5	215443-004	DUP1-2009-10-5	215443-005

The attached Table 3 summarizes the field duplicate sample results. The detected results of the original sample and the associated duplicate sample were compared and the calculated RPDs reported. All RPDs met the 50 percent precision control limit requirement, with the following exception:

1. In field duplicates SPMW-01-2009-10-5 and DUP1-2009-10-5, the relative percent difference (RPD) between the detected results failed a 50% acceptance criteria for dissolved zinc at 91%. In addition, the absolute difference between the results was greater than the reporting limit for dissolved copper. The original result for dissolved copper was non-detect at 1 ug/L and the duplicate result was 3.1 ug/L.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results in the field duplicate pair listed above may be due to the sample matrix, sampling or laboratory technique, or method defects. Since the effect on the quality of the data is not known, data is not qualified for field duplicate failure.

SUMMARY

The attached Table 1 lists the samples and analyses included in the data validation effort. All samples/analyses listed in Table 1 received full, Level IV data validation. The attached Table 2 summarizes the data qualifications required for the project samples for each test method included in the data packages associated with this report.

USABILITY

The quality control criteria were reviewed, and other than those discussed above, all criteria were met and the data are considered acceptable. Estimated sample results (J/UJ) are usable only for limited purposes. Based upon the full data validation, all other results of the samples/analyses listed in Table 1 only are considered valid and usable for all purposes.

VALIDATION QUALIFIERS IDENTIFICATION

The definitions of the following qualifiers are prepared according to the document, "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," October, 1999.

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. *A minus sign (-) indicates the numerical value has a low bias. A plus sign (+) indicates the numerical value has a high bias.*

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table 1
Sample Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Site Sample ID	Laboratory Sample ID	Date Sampled	Analyses	Sample Type
CCSB-03GW(13)	214531-001	28-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Dissolved Metals (6010, 7470A), General Chemistry Parameters (1, 2, 3)	Water
ER1-2009-08-28	214531-002	28-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Dissolved Metals (6010, 7470A), General Chemistry Parameters (1, 2, 3)	Equipment Blank
P3SB-02GW(20)	214531-003	28-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Dissolved Metals (6010, 7470A), General Chemistry Parameters (1, 2, 3)	Water
TRIP1-2009-08-28	214531-004	28-Aug-09	Volatile Organic Compounds (8260B)	Trip Blank
P9SB-06-5.5	214532-001	27-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
P9SB-06-15.0	214532-003	27-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
P9SB-06-25.0	214532-005	27-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
CCSB-03-9.5	214532-007	27-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
CCSB-03-15.0	214532-008	28-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
CCSB-03-29.0	214532-011	28-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
P8SB-01-5.5	214561-001	31-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010), General Chemistry Parameters (1, 2, 3)	Soil

Table 1
Sample Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Site Sample ID	Laboratory Sample ID	Date Sampled	Analyses	Sample Type
P8SB-01-9.0	214561-002	31-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010), General Chemistry Parameters (1, 2, 3)	Soil
P8SB-01-19.0	214561-004	31-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010), General Chemistry Parameters (1, 2, 3)	Soil
CPSB-03-6.5	214561-005	31-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
CPSB-03-9.5	214561-006	31-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
CPSB-03-14.5	214561-007	31-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
SPSB-04-6.0	214561-009	31-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
SPSB-04-15.0	214561-011	31-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
SPSB-04-25.0	214561-013	31-Aug-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A), General Chemistry Parameters (1, 2, 3)	Soil
P4SB-07-2.0	214680-001	3-Sep-09	VOCs (8260B), PAHs (8270-SIM), Dioxins & Furans (8290), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Pesticides (8081A), PCBs (8082), Total Metals (6010, 7471A)	Soil
P4SB-07-5.0	214680-002	3-Sep-09	(8015B), TPH-Diesel/MO (8015B), PCBs (8082), Total Metals (6010, 7471A)	Soil
SPMW-01-2009-10-5	215443-004	5-Oct-09	VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6020, 7470A)	Water (3)

Table 1
Sample Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Site Sample ID	Laboratory Sample ID	Date Sampled	Analyses	Sample Type
DUP1-2009-10-5	**215443-005**	**5-Oct-09**	**VOCs (8260B), PAHs (8270-SIM), TPH-Gasoline (8015B), TPH-Diesel/MO (8015B), Total Metals (6020, 7470A)**	**FD (3)**

VOCs: Volatile Organic Compounds
PAHs: Polynuclear Aromatic Hydrocarbons
TPH: Total Petroleum Hydrocarbons
MO: Motor Oil
BTEX: Benzene, Toluene, Ethylbenzene, Xylenes
MTBE: Methyl tertiarybutyl ether
PCBs: Polychlorinated Biphenyls
FD: Field duplicate of previous numbered sample, (1), (2), etc.
BOLD: Bold typeface indicates samples/analyses that received full (Level IV) data validation

General Chemistry Parameters
(1) Total Cyanide (SM4500CN-E)
(2) Sulfide (SM4500S2-D)
(3) pH (EPA 150.1)

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
CCSB-03GW(13)	214531-001	8260B	Acetone	U	Equipment blank contamination
CCSB-03GW(13)	214531-001	8260B	Vinyl acetate	UJ	Initial calibration percent relative standard deviation failure
CCSB-03GW(13)	214531-001	8260B	Bromomethane	UJ	Continuing calibration verification percent difference failure
CCSB-03GW(13)	214531-001	6010B	Barium, dissolved	J	Serial dilution percent difference failure
CCSB-03GW(13)	214531-001	6010B	Lead, dissolved	J	Serial dilution percent difference failure
ER1-2009-08-28	214531-002	8260B	Vinyl acetate	UJ	Initial calibration percent relative standard deviation failure
ER1-2009-08-28	214531-002	8260B	Bromomethane	UJ	Continuing calibration verification percent difference failure
ER1-2009-08-28	214531-002	6010B	Barium, dissolved	UJ	Serial dilution percent difference failure
ER1-2009-08-28	214531-002	6010B	Lead, dissolved	UJ	Serial dilution percent difference failure
P3SB-02GW(20)	214531-003	8260B	Acetone	U	Equipment blank contamination
P3SB-02GW(20)	214531-003	8260B	Vinyl acetate	UJ	Initial calibration percent relative standard deviation failure
P3SB-02GW(20)	214531-003	8260B	Bromomethane	UJ	Continuing calibration verification percent difference failure
P3SB-02GW(20)	214531-003	6010B	Arsenic, dissolved	U	Method blank contamination
P3SB-02GW(20)	214531-003	6010B	Barium, dissolved	J	Serial dilution percent difference failure
P3SB-02GW(20)	214531-003	6010B	Lead, dissolved	UJ	Serial dilution percent difference failure
P9SB-06-5.5	214532-001	8260B	Chloromethane	UJ	Continuing calibration verification percent difference failure
P9SB-06-5.5	214532-001	8015B	Gasoline C7-C12	U	Method blank contamination
P9SB-06-5.5	214532-001	8082	PCB-1248	UJ	Surrogate percent recovery failure
P9SB-06-5.5	214532-001	8082	PCB-1254	UJ	Surrogate percent recovery failure
P9SB-06-5.5	214532-001	8082	PCB-1260	J-	Surrogate percent recovery failure
P9SB-06-5.5	214532-001	6010B	Antimony, total	UJ	Negative value with a magnitude >2X the reporting limit
P9SB-06-5.5	214532-001	6010B	Copper, total	J	MS/MSD %R failure, MS/MSD RPD failure
P9SB-06-5.5	214532-001	6010B	Lead, total	J	MS/MSD %R failure, MS/MSD RPD failure
P9SB-06-5.5	214532-001	6010B	Selenium, total	UJ	Negative value with a magnitude >2X the reporting limit
P9SB-06-5.5	214532-001	6010B	Zinc, total	J	MS/MSD %R failure, MS/MSD RPD failure
P9SB-06-15.0	214532-003	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
P9SB-06-15.0	214532-003	8260B	Chloromethane	UJ	Continuing calibration verification percent difference failure
P9SB-06-15.0	214532-003	6010B	Copper, total	J	MS/MSD %R failure, MS/MSD RPD failure
P9SB-06-15.0	214532-003	6010B	Lead, total	J	MS/MSD %R failure, MS/MSD RPD failure
P9SB-06-15.0	214532-003	6010B	Selenium, total	UJ	Negative value with a magnitude >2X the reporting limit
P9SB-06-15.0	214532-003	6010B	Thallium, total	UJ	Negative value with a magnitude >2X the reporting limit

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
P9SB-06-15.0	214532-003	6010B	Zinc, total	J	MS/MSD %R failure, MS/MSD RPD failure
P9SB-06-25.0	214532-005	8260B	Acetone	U	Method blank contamination
P9SB-06-25.0	214532-005	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
P9SB-06-25.0	214532-005	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
P9SB-06-25.0	214532-005	8260B	Naphthalene	UJ	Continuing calibration verification percent difference failure
P9SB-06-25.0	214532-005	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
P9SB-06-25.0	214532-005	8015B	Gasoline C7-C12	U	Method blank contamination
P9SB-06-25.0	214532-005	6010B	Copper, total	J	MS/MSD %R failure, MS/MSD RPD failure
P9SB-06-25.0	214532-005	6010B	Lead, total	J	MS/MSD %R failure, MS/MSD RPD failure
P9SB-06-25.0	214532-005	6010B	Selenium, total	UJ	Negative value with a magnitude >2X the reporting limit
P9SB-06-25.0	214532-005	6010B	Zinc, total	J	MS/MSD %R failure, MS/MSD RPD failure
CCSB-03-9.5	214532-007	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
CCSB-03-9.5	214532-007	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
CCSB-03-9.5	214532-007	8260B	Naphthalene	UJ	Continuing calibration verification percent difference failure
CCSB-03-9.5	214532-007	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
CCSB-03-9.5	214532-007	6010B	Copper, total	J	MS/MSD %R failure, MS/MSD RPD failure
CCSB-03-9.5	214532-007	6010B	Lead, total	J	MS/MSD %R failure, MS/MSD RPD failure
CCSB-03-9.5	214532-007	6010B	Selenium, total	UJ	Negative value with a magnitude >2X the reporting limit
CCSB-03-9.5	214532-007	6010B	Zinc, total	J	MS/MSD %R failure, MS/MSD RPD failure
CCSB-03-15.0	214532-008	8260B	Acetone	U	Method blank contamination
CCSB-03-15.0	214532-008	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
CCSB-03-15.0	214532-008	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
CCSB-03-15.0	214532-008	8260B	Naphthalene	UJ	Continuing calibration verification percent difference failure
CCSB-03-15.0	214532-008	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
CCSB-03-15.0	214532-008	8015B	Gasoline C7-C12	U	Method blank contamination
CCSB-03-15.0	214532-008	6010B	Antimony, total	UJ	Negative value with a magnitude >2X the reporting limit
CCSB-03-15.0	214532-008	6010B	Copper, total	J	MS/MSD %R failure, MS/MSD RPD failure
CCSB-03-15.0	214532-008	6010B	Lead, total	J	MS/MSD %R failure, MS/MSD RPD failure
CCSB-03-15.0	214532-008	6010B	Selenium, total	UJ	Negative value with a magnitude >2X the reporting limit
CCSB-03-15.0	214532-008	6010B	Thallium, total	UJ	Negative value with a magnitude >2X the reporting limit
CCSB-03-15.0	214532-008	6010B	Zinc, total	J	MS/MSD %R failure, MS/MSD RPD failure

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
CCSB-03-29.0	214532-011	8260B	Acetone	U	Method blank contamination
CCSB-03-29.0	214532-011	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
CCSB-03-29.0	214532-011	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
CCSB-03-29.0	214532-011	8260B	Naphthalene	UJ	Continuing calibration verification percent difference failure
CCSB-03-29.0	214532-011	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
CCSB-03-29.0	214532-011	6010B	Antimony, total	UJ	Negative value with a magnitude >2X the reporting limit
CCSB-03-29.0	214532-011	6010B	Copper, total	J	MS/MSD %R failure, MS/MSD RPD failure
CCSB-03-29.0	214532-011	6010B	Lead, total	J	MS/MSD %R failure, MS/MSD RPD failure
CCSB-03-29.0	214532-011	6010B	Thallium, total	UJ	Negative value with a magnitude >2X the reporting limit
CCSB-03-29.0	214532-011	6010B	Zinc, total	J	MS/MSD %R failure, MS/MSD RPD failure
P8SB-01-5.5	214561-001	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
P8SB-01-5.5	214561-001	8260B	Chloromethane	UJ	Continuing calibration verification percent difference failure
P8SB-01-5.5	214561-001	8015B	Gasoline C7-C12	U	Method blank contamination
P8SB-01-5.5	214561-001	8015B	Diesel C10-C24	U	Method blank contamination
P8SB-01-9.0	214561-002	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
P8SB-01-9.0	214561-002	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
P8SB-01-9.0	214561-002	8260B	Hexachlorobutadiene	UJ	Continuing calibration verification percent difference failure
P8SB-01-9.0	214561-002	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
P8SB-01-9.0	214561-002	8015B	Gasoline C7-C12	U	Method blank contamination
P8SB-01-9.0	214561-002	8015B	Diesel C10-C24	U	Method blank contamination
P8SB-01-19.0	214561-004	8260B	Methylene chloride	U	Method blank contamination
P8SB-01-19.0	214561-004	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
P8SB-01-19.0	214561-004	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
P8SB-01-19.0	214561-004	8260B	Hexachlorobutadiene	UJ	Continuing calibration verification percent difference failure
P8SB-01-19.0	214561-004	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
P8SB-01-19.0	214561-004	8015B	Gasoline C7-C12	U	Method blank contamination
P8SB-01-19.0	214561-004	8015B	Diesel C10-C24	U	Method blank contamination
P8SB-01-19.0	214561-004	6010B	Lead, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-6.5	214561-005	8260B	Methylene chloride	U	Method blank contamination
CPSB-03-6.5	214561-005	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
CPSB-03-6.5	214561-005	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
CPSB-03-6.5	214561-005	8260B	Hexachlorobutadiene	UJ	Continuing calibration verification percent difference failure
CPSB-03-6.5	214561-005	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
CPSB-03-6.5	214561-005	8015B	Gasoline C7-C12	U	Method blank contamination
CPSB-03-6.5	214561-005	6010B	Antimony, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-6.5	214561-005	6010B	Arsenic, total	J	Serial dilution percent difference failure
CPSB-03-6.5	214561-005	6010B	Cobalt, total	J	MS/MSD percent recovery failure
CPSB-03-6.5	214561-005	6010B	Selenium, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-6.5	214561-005	6010B	Silver, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-6.5	214561-005	6010B	Thallium, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-9.5	214561-006	8260B	2-Butanone	J+	Surrogate percent recovery failure
CPSB-03-9.5	214561-006	8260B	Acetone	J+	Surrogate percent recovery failure
CPSB-03-9.5	214561-006	8260B	Methylene chloride	U	Method blank contamination
CPSB-03-9.5	214561-006	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
CPSB-03-9.5	214561-006	8260B	Isopropylbenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	1,1,2,2-Tetrachloroethane	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	1,2,3-Trichloropropane	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	Propylbenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	Bromobenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	1,3,5-Trimethylbenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	2-Chlorotoluene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	4-Chlorotoluene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	tert-Butylbenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	1,2,4-Trimethylbenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	sec-Butylbenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	para-Isopropyl toluene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	1,3-Dichlorobenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	1,4-Dichlorobenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	n-Butylbenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	1,2-Dichlorobenzene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	1,2-Dibromo-3-chloropropane	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	1,2,4-Trichlorobenzene	UJ	CCV %D failure, Internal standard area count failure

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
CPSB-03-9.5	214561-006	8260B	Hexachlorobutadiene	UJ	CCV %D failure, Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	Naphthalene	UJ	Internal standard area count failure
CPSB-03-9.5	214561-006	8260B	1,2,3-Trichlorobenzene	UJ	CCV %D failure, Internal standard area count failure
CPSB-03-9.5	214561-006	6010B	Antimony, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-9.5	214561-006	6010B	Arsenic, total	J	Serial dilution percent difference failure
CPSB-03-9.5	214561-006	6010B	Cobalt, total	J	MS/MSD percent recovery failure
CPSB-03-9.5	214561-006	6010B	Selenium, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-9.5	214561-006	6010B	Silver, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-9.5	214561-006	6010B	Thallium, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-14.5	214561-007	8260B	Methylene chloride	U	Method blank contamination
CPSB-03-14.5	214561-007	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
CPSB-03-14.5	214561-007	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
CPSB-03-14.5	214561-007	8260B	Hexachlorobutadiene	UJ	Continuing calibration verification percent difference failure
CPSB-03-14.5	214561-007	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
CPSB-03-14.5	214561-007	6010B	Antimony, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-14.5	214561-007	6010B	Arsenic, total	J	Serial dilution percent difference failure
CPSB-03-14.5	214561-007	6010B	Cobalt, total	J	MS/MSD percent recovery failure
CPSB-03-14.5	214561-007	6010B	Lead, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-14.5	214561-007	6010B	Selenium, total	UJ	Negative value with a magnitude >2X the reporting limit
CPSB-03-14.5	214561-007	6010B	Thallium, total	UJ	Negative value with a magnitude >2X the reporting limit
SPSB-04-6.0	214561-009	8260B	Acetone	J+	Surrogate percent recovery failure
SPSB-04-6.0	214561-009	8260B	Methylene chloride	U	Method blank contamination
SPSB-04-6.0	214561-009	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
SPSB-04-6.0	214561-009	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
SPSB-04-6.0	214561-009	8260B	Hexachlorobutadiene	UJ	Continuing calibration verification percent difference failure
SPSB-04-6.0	214561-009	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
SPSB-04-6.0	214561-009	8015B	Gasoline C7-C12	U	Method blank contamination
SPSB-04-6.0	214561-009	6010B	Antimony, total	UJ	Negative value with a magnitude >2X the reporting limit
SPSB-04-6.0	214561-009	6010B	Arsenic, total	J	Serial dilution percent difference failure
SPSB-04-6.0	214561-009	6010B	Cobalt, total	J	MS/MSD percent recovery failure
SPSB-04-6.0	214561-009	6010B	Thallium, total	UJ	Negative value with a magnitude >2X the reporting limit

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
SPSB-04-6.0	214561-009	SM4500CN-E	Cyanide, total	UJ	MS/MSD percent recovery failure
SPSB-04-15.0	214561-011	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
SPSB-04-15.0	214561-011	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
SPSB-04-15.0	214561-011	8260B	Hexachlorobutadiene	UJ	Continuing calibration verification percent difference failure
SPSB-04-15.0	214561-011	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
SPSB-04-15.0	214561-011	8015B	Gasoline C7-C12	U	Method blank contamination
SPSB-04-15.0	214561-011	8015B	Diesel C10-C24	U	Method blank contamination
SPSB-04-15.0	214561-011	6010B	Antimony, total	UJ	Negative value with a magnitude >2X the reporting limit
SPSB-04-15.0	214561-011	6010B	Arsenic, total	J	Serial dilution percent difference failure
SPSB-04-15.0	214561-011	6010B	Cobalt, total	J	MS/MSD percent recovery failure
SPSB-04-15.0	214561-011	SM4500CN-E	Cyanide, total	UJ	MS/MSD percent recovery failure
SPSB-04-25.0	214561-013	8260B	Methylene chloride	U	Method blank contamination
SPSB-04-25.0	214561-013	8260B	Freon 12	UJ	Continuing calibration verification percent difference failure
SPSB-04-25.0	214561-013	8260B	1,2,4-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
SPSB-04-25.0	214561-013	8260B	Hexachlorobutadiene	UJ	Continuing calibration verification percent difference failure
SPSB-04-25.0	214561-013	8260B	1,2,3-Trichlorobenzene	UJ	Continuing calibration verification percent difference failure
SPSB-04-25.0	214561-013	8015B	Gasoline C7-C12	U	Method blank contamination
SPSB-04-25.0	214561-013	6010B	Antimony, total	UJ	Negative value with a magnitude >2X the reporting limit
SPSB-04-25.0	214561-013	6010B	Arsenic, total	J	Serial dilution percent difference failure
SPSB-04-25.0	214561-013	6010B	Cobalt, total	J	MS/MSD percent recovery failure
SPSB-04-25.0	214561-013	6010B	Thallium, total	UJ	Negative value with a magnitude >2X the reporting limit
SPSB-04-25.0	214561-013	SM4500CN-E	Cyanide, total	UJ	MS/MSD percent recovery failure
P4SB-07-2.0	214680-001	8260B	1,2-Dibromo-3-chloropropane	UJ	Continuing calibration verification percent difference failure
P4SB-07-2.0	214680-001	8290	1,2,3,4,6,7,8,9-OCDD	U	Method blank contamination
P4SB-07-2.0	214680-001	8290	Total Tetra CDF	U	Method blank contamination
P4SB-07-2.0	214680-001	8290	1,2,3,7,8,9-Hexa CDD	J	Laboratory duplicate relative percent difference failure
P4SB-07-2.0	214680-001	8290	Total Tetra CDD	J	Laboratory duplicate relative percent difference failure
P4SB-07-2.0	214680-001	8290	2,3,7,8-Tetra CDF	UJ	Laboratory duplicate relative percent difference failure
P4SB-07-2.0	214680-001	8290	Total Hepta CDF	J	Laboratory duplicate relative percent difference failure
P4SB-07-2.0	214680-001	8015B	Gasoline C7-C12	U	Method blank contamination
P4SB-07-2.0	214680-001	6010B	Arsenic, total	J	Serial dilution percent difference failure

Table 2
Qualified Data Summary
Pier 70 Environmental Site Investigation
San Francisco, CA

Sample ID	Laboratory ID	Analysis Method	Compound	Qualifier	Reason
P4SB-07-2.0	214680-001	6010B	Cobalt, total	J	Serial dilution percent difference failure
P4SB-07-2.0	214680-001	6010B	Molybdenum, total	U	Continuing calibration blank contamination
P4SB-07-2.0	214680-001	6010B	Thallium, total	UJ	Negative value with a magnitude >2X the reporting limit
P4SB-07-2.0	214680-001	6010B	Zinc, total	J	Serial dilution percent difference failure
P4SB-07-5.0	214680-002	8290	1,2,3,7,8,9-Hexa CDD	UJ	Laboratory duplicate relative percent difference failure
P4SB-07-5.0	214680-002	8290	Total Tetra CDD	UJ	Laboratory duplicate relative percent difference failure
P4SB-07-5.0	214680-002	8290	2,3,7,8-Tetra CDF	UJ	Laboratory duplicate relative percent difference failure
P4SB-07-5.0	214680-002	8290	Total Hepta CDF	UJ	Laboratory duplicate relative percent difference failure
P4SB-07-5.0	214680-002	8082	PCB-1248	UJ	Surrogate percent recovery failure
P4SB-07-5.0	214680-002	8082	PCB-1254	UJ	Surrogate percent recovery failure
P4SB-07-5.0	214680-002	8082	PCB-1260	J-	Surrogate percent recovery failure
P4SB-07-5.0	214680-002	6010B	Arsenic, total	J	Serial dilution percent difference failure
P4SB-07-5.0	214680-002	6010B	Cobalt, total	J	Serial dilution percent difference failure
P4SB-07-5.0	214680-002	6010B	Molybdenum, total	U	Continuing calibration blank contamination
P4SB-07-5.0	214680-002	6010B	Thallium, total	UJ	Negative value with a magnitude >2X the reporting limit
P4SB-07-5.0	214680-002	6010B	Zinc, total	J	Serial dilution percent difference failure
SPMW-01-2009-10-5	215443-004	6020	Chromium, dissolved	U	Method blank contamination
SPMW-01-2009-10-5	215443-004	6020	Lead, dissolved	U	Continuing calibration blank contamination
SPMW-01-2009-10-5	215443-004	6020	Vanadium, dissolved	U	Method blank contamination
DUP1-2009-10-5	215443-005	8015B	Gasoline C7-C12	U	Method blank contamination
DUP1-2009-10-5	215443-005	6020	Vanadium, dissolved	U	Method blank contamination

MS/MSD: Matrix spike/matrix spike duplicate
%R: Percent recovery
RPD: Relative percent difference
CCV: Continuing calibration verification
%D: Percent difference

Table 3
Summary of Field Duplicates
Pier 70 Environmental Site Investigation
San Francisco, CA

Original Sample ID	Laboratory ID	Matrix	Compound	Original Results*	Duplicate Sample ID	Laboratory ID	Duplicate Results*	RPD
SPMW-01-2009-10-5	215443-004	Water	para-Isopropyl Toluene	0.9	DUP1-2009-10-5	215443-005	1.3	-36%
SPMW-01-2009-10-5	215443-004	Water	All other VOCs	ND	DUP1-2009-10-5	215443-005	ND	NA
SPMW-01-2009-10-5	215443-004	Water	All PAHs	ND	DUP1-2009-10-5	215443-005	ND	NA
SPMW-01-2009-10-5	215443-004	Water	Gasoline C7-C12	ND<50	DUP1-2009-10-5	215443-005	14	NC
SPMW-01-2009-10-5	215443-004	Water	Diesel C10-C24	10	DUP1-2009-10-5	215443-005	9.8	2.0%
SPMW-01-2009-10-5	215443-004	Water	Motor Oil C24-C36	ND	DUP1-2009-10-5	215443-005	ND	NA
SPMW-01-2009-10-5	215443-004	Water	Antimony, dissolved	0.21	DUP1-2009-10-5	215443-005	0.23	-9.1%
SPMW-01-2009-10-5	215443-004	Water	Arsenic, dissolved	0.95	DUP1-2009-10-5	215443-005	0.89	6.5%
SPMW-01-2009-10-5	215443-004	Water	Barium, dissolved	130	DUP1-2009-10-5	215443-005	130	0%
SPMW-01-2009-10-5	215443-004	Water	Chromium, dissolved	0.54	DUP1-2009-10-5	215443-005	ND<1	NC
SPMW-01-2009-10-5	215443-004	Water	Cobalt, dissolved	7.2	DUP1-2009-10-5	215443-005	7	2.8%
SPMW-01-2009-10-5	215443-004	Water	Copper, dissolved	ND<1	DUP1-2009-10-5	215443-005	3.1	**>+/-RL**
SPMW-01-2009-10-5	215443-004	Water	Lead, dissolved	0.18	DUP1-2009-10-5	215443-005	ND<1	NC
SPMW-01-2009-10-5	215443-004	Water	Molybdenum, dissolved	4	DUP1-2009-10-5	215443-005	3.9	2.5%
SPMW-01-2009-10-5	215443-004	Water	Nickel, dissolved	5.5	DUP1-2009-10-5	215443-005	5	9.5%
SPMW-01-2009-10-5	215443-004	Water	Vanadium, dissolved	0.63	DUP1-2009-10-5	215443-005	0.62	1.6%
SPMW-01-2009-10-5	215443-004	Water	Zinc, dissolved	17	DUP1-2009-10-5	215443-005	6.4	**91%**
SPMW-01-2009-10-5	215443-004	Water	All other metals	ND	DUP1-2009-10-5	215443-005	ND	NA

*Units for all analyses are ug/L.

RL: Reporting limit

VOCs: Volatile Organic Compounds

PAHs: Polynuclear Aromatic Hydrocarbons

ND: Not detected

NC: Not calculated. The absolute difference between the sample result and the duplicate sample result is less than the reporting limit.

NA: Not applicable. Calculation of the relative percent difference between the sample result and the duplicate sample result is not applicable.

Treadwell&Rollo
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APPENDIX K

PTS Laboratory Reports and NAPL Calculations

CORE PHOTOGRAPHY AND PHYSICAL PROPERTIES DATA

Project: Pier 70

Project No.: 4963.01

PTS File No.: 40109 **February 2010**

PTS Laboratories

8100 Secura Way – Santa Fe Springs, CA 90670
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April 23, 2010

Dustyne Sutherland
Treadwell & Rollo
555 Montgomery, Suite 1300
San Francisco, CA 94111

Re: PTS File No: 40109
Physical Properties Data
Pier 70; 4963.01

Dear Ms. Sutherland:

Please find enclosed report of Core Photography and Physical Properties data from analysis conducted on cores and fluids received from your Pier 70; 4963.01 project. All analyses were performed by applicable ASTM, EPA, or API methodologies. Electronic versions of the core images and physical properties report have previously been sent to your attention via internet. The cores remain in frozen storage and will be held indefinitely. Please note that core storage will be billed quarterly beginning September 1, 2010.

PTS Laboratories appreciates the opportunity to be of service. If you have any questions or require additional information, please give me a call at (562) 347-2504.

Sincerely,
PTS Laboratories

Rachel Spitz
Project Manager

Encl.

PTS Laboratories

Project Name: Pier 70
Project Number: 4963.01

PTS File No: 40109
Client: Treadwell & Rollo

TEST PROGRAM - PHASE 2

CORE ID	Depth ft.	Core Recovery ft.	Slab and Core Photo	Grain Size Analyses	Total Organic Carbon	Pore Fluid Saturation Package	Hydraulic Conductivity EPA 9100	OILPRINT™ Gas Chromatography	Fluid Properties Pkg.	Notes
		Plugs:	1/4:3/4	Grab	Grab	Whole Core	Whole Core	Bulk	Bulk	Keep core frozen
Date Received: 2/17/10										
P9SB10-11	11-14.8	3.50	4	11.8-12.3, 12.8-13.2		11.8-12.3, 12.8-13.2	11.8-12.3, 12.8-13.2			
P9SB04-12-14	12-14	2.75	3	12.2-12.7, 13.4-13.8		12.2-12.7, 13.4-13.8	12.2-12.7, 13.4-13.8			
P9SB06-13	13-14.1	1.83	2							
Date Received: 2/18/10										
P9MW02-NAPL	NAPL	N/A								Hold
P9SB10-NAPL	NAPL	N/A						X		
P9SB04-NAPL	NAPL	N/A						X	X	
Date Received: 3/5/10										
P9SB06 B-14-15	14-15	1.00	1	14-15		14-15	14-15			COC/Cores labeled P9SB04 B-14-15
P9SB06 B-15.5-16.5	15.5-16.5	1.00	2	15.3-16.3		15.3-16.3	15.3-16.3			COC/Cores labeled P9SB04 B-15.5-16.5
P9SB06 B-17-18	17-18	0.95	1							COC/Cores labeled P9SB04 B-17-18
P9SB06 B-19-19.5	19-19.5	0.50	1							COC/Cores labeled P9SB04 B-19-19.5
P9SB06 B-NAPL	NAPL	N/A						X	X	COC/Fluid labeled P9SB04 B-NAPL
TOTALS:	10 cores 4 fluids	11.5	14	6	0	6	6	3	2	14

Laboratory Test Program Notes

Sample locations to be selected by Treadwell & Rollo personnel from core photography.
Take grain size analysis samples from adjacent to Hydraulic Conductivity sample locations.
Run OILPRINT analysis on samples P9SB10-NAPL and P9SB04-NAPL first. If same product, combine samples for Fluid
Hold Fluid Properties analysis, run OILPRINT™ only per D. Sutherland/Treadwell & Rollo 2/18/10.
Samples P9SB04 incorrectly labeled on cores/fluids and COC. Change ID to P9SB06 per Anna/Treadwell & Rollo 3/5/10.
No site water received. Use filtered SFS tap water for fluid properties.

PTS File No: 40109
Client: Treadwell & Rollo

PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY

PROJECT NAME: Pier 70
PROJECT NO: 4963.01

		METHODS:	API RP 40; EPA 9100	
			25 PSI CONFINING STRESS	
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	EFFECTIVE (2,3) PERMEABILITY TO WATER, millidarcy	HYDRAULIC CONDUCTIVITY (2,3), cm/s
*P9SB10-11	12.2	V	308	3.11E-04
P9SB10-11	13.15	V	1264	1.28E-03
*P9SB04-12-14	12.6	V	1425	1.43E-03
P9SB04-12-14	13.5	V	6.76	6.84E-06
P9SB06 B-14-15	14.2	V	205	2.08E-04
P9SB06 B-15.5-16.5	16.1	V	1460	1.48E-03

*Due to level of hydrocarbon saturation, samples were cleaned by Dean-Stark extraction prior to hydraulic conductivity testing

(1) Sample Orientation: H = horizontal; V = vertical
(2) Native State or Effective = With as-received pore fluids in place
(3) Permeability to water and hydraulic conductivity measured at saturated conditions

PTS File No: 40109
Client: Treadwell & Rollo

PHYSICAL PROPERTIES DATA - PORE FLUID SATURATIONS

PROJECT NAME: Pier 70
PROJECT NO: 4963.01

		METHODS:	API RP 40 / ASTM D2216	API RP 40		API RP 40		API RP 40	
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	MOISTURE CONTENT, % weight	DENSITY BULK, g/cc	DENSITY GRAIN, g/cc	POROSITY, %Vb (2) TOTAL	POROSITY, %Vb (2) AIR FILLED	PORE FLUID SATURATIONS, % Pv (3) WATER	PORE FLUID SATURATIONS, % Pv (3) NAPL
P9SB10-11	11.9	V	20.8	1.73	2.70	35.9	1.2	62.7	33.9
P9SB10-11	12.9	V	11.7	1.91	2.72	29.7	7.1	66.7	9.4
P9SB04-12-14	12.3	V	15.6	1.82	2.68	32.3	2.6	59.6	32.2
P9SB04-12-14	13.65	V	24.9	1.51	2.71	44.4	7.2	74.7	9.1
P9SB06	14.4	V	50.1	0.93	2.07	54.9	7.2	71.3	15.6
P9SB06	15.95	V	43.9	0.83	2.26	63.2	26.1	52.0	6.7

(1) Sample Orientation: H = horizontal; V = vertical
(2) Total Porosity = all interconnected pore channels; Air Filled = pore channels not occupied by pore fluids
(3) Water = 0.9996 g/cc, Hydrocarbon = 0.8600 g/cc
Vb = Bulk Volume, cc; Pv = Pore Volume, cc; ND = Not Detected

PTS Laboratories, Inc.

Treadwell & Rollo
PTS File No: 40109

PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422)

PROJECT NAME: Pier 70
PROJECT NO: 4963.01

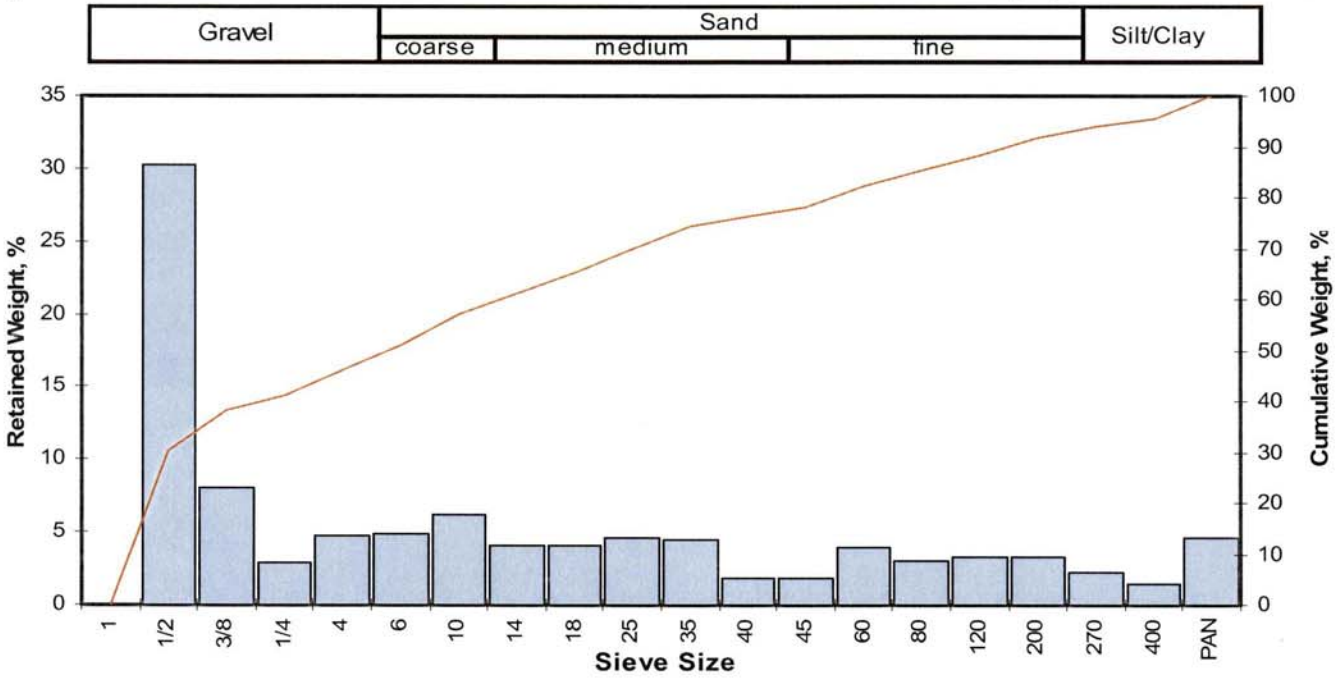
Sample ID	Depth, ft.	Description USCS/ASTM (1)	Median Grain Size, mm	Particle Size Distribution, wt. percent				
				Gravel	Sand Size			Silt/Clay
					Coarse	Medium	Fine	
P9SB10-11	12.0	Gravel	3.569	45.90	11.19	19.21	15.41	8.29
P9SB10-11	13.0	Gravel	6.994	59.29	12.58	10.41	9.99	7.73
P9SB04-12-14	12.45	Coarse sand	1.930	35.96	13.52	19.84	19.87	10.81
P9SB04-12-14	13.75	Gravel	2.131	38.95	11.90	19.71	17.65	11.79
P9SB06 B-14-15	14.05	Gravel	3.943	47.03	11.35	14.52	14.60	12.51
P9SB06 B-15.5-16.5	16.25	Coarse sand	3.516	38.48	25.33	22.62	8.46	5.11

(1) based on Mean fromTrask

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	Treadwell & Rollo	**PTS File No:**	40109
Project:	Pier 70	**Sample ID:**	P9SB10-11
Project No:	4963.01	**Depth, ft:**	12.0



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	16.82	30.25	30.25
0.3740	9.500	-3.25	3/8	4.47	8.04	38.29
0.2500	6.351	-2.67	1/4	1.60	2.88	41.17
0.1873	4.757	-2.25	4	2.63	4.73	45.90
0.1324	3.364	-1.75	6	2.75	4.95	50.85
0.0787	2.000	-1.00	10	3.47	6.24	57.09
0.0557	1.414	-0.50	14	2.31	4.15	61.24
0.0394	1.000	0.00	18	2.25	4.05	65.29
0.0278	0.707	0.50	25	2.60	4.68	69.96
0.0197	0.500	1.00	35	2.47	4.44	74.41
0.0166	0.420	1.25	40	1.05	1.89	76.29
0.0139	0.354	1.50	45	1.04	1.87	78.17
0.0098	0.250	2.00	60	2.18	3.92	82.09
0.0070	0.177	2.50	80	1.68	3.02	85.11
0.0049	0.125	3.00	120	1.82	3.27	88.38
0.0029	0.074	3.75	200	1.85	3.33	91.71
0.0021	0.053	4.25	270	1.22	2.19	93.90
0.0015	0.037	4.75	400	0.81	1.46	95.36
			PAN	2.58	4.64	100.00
TOTALS				55.60	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-4.48	0.8778	22.296
10	-4.31	0.7828	19.883
16	-4.12	0.6822	17.329
25	-3.82	0.5551	14.100
40	-2.90	0.2945	7.480
50	-1.84	0.1405	3.569
60	-0.65	0.0618	1.568
75	1.08	0.0186	0.473
84	2.32	0.0079	0.201
90	3.36	0.0038	0.097
95	4.63	0.0016	0.040

Measure	Trask	Inman	Folk-Ward
Median, phi	-1.84	-1.84	-1.84
Median, in.	0.1405	0.1405	0.1405
Median, mm	3.569	3.569	3.569
Mean, phi	-2.87	-0.90	-1.21
Mean, in.	0.2869	0.0734	0.0912
Mean, mm	7.287	1.865	2.315
Sorting	5.457	3.216	2.988
Skewness	0.724	0.291	0.355
Kurtosis	0.344	0.416	0.762
Grain Size Description (ASTM-USCS Scale)			Gravel (based on Mean from Trask)

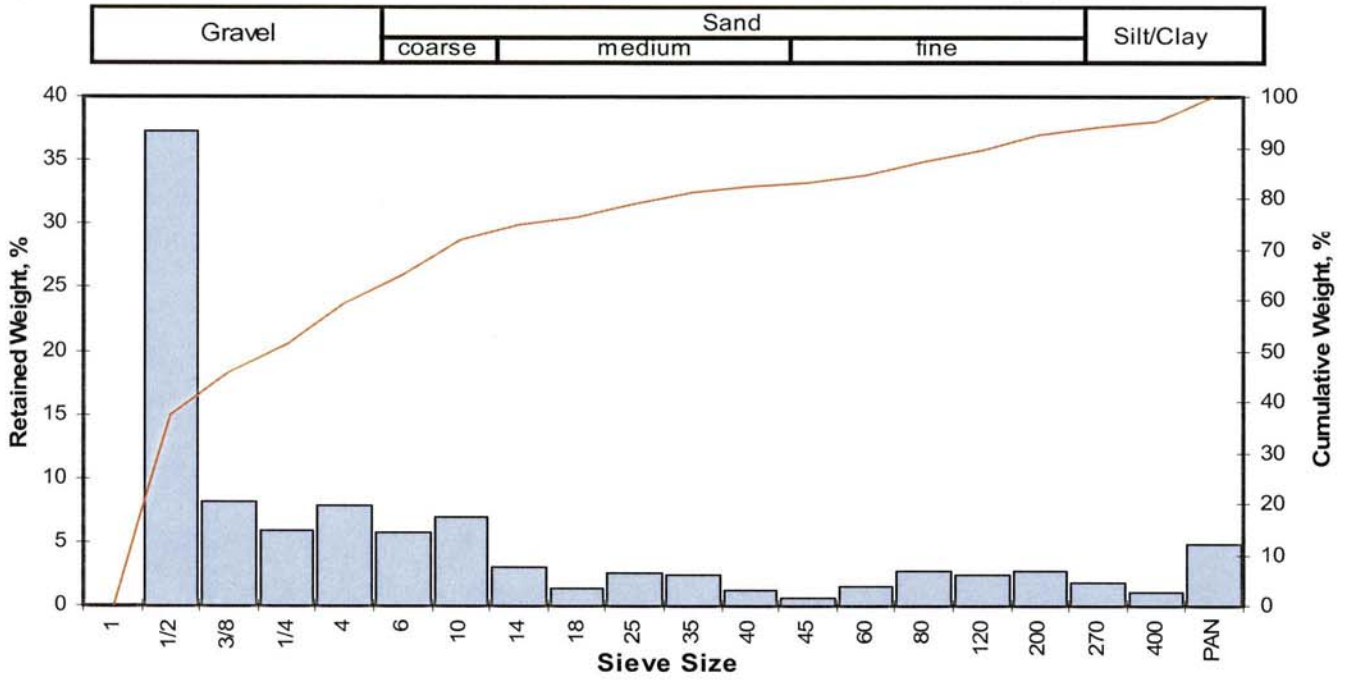
Description	Retained on Sieve #	Weight Percent
Gravel	4	45.90
Coarse Sand	10	11.19
Medium Sand	40	19.21
Fine Sand	200	15.41
Silt/Clay	<200	8.29
	Total	100

Phone: (562) 907-3607
Fax: (562) 907-3610

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	Treadwell & Rollo	**PTS File No:**	40109
Project:	Pier 70	**Sample ID:**	P9SB10-11
Project No:	4963.01	**Depth, ft:**	13.0



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	20.94	37.27	37.27
0.3740	9.500	-3.25	3/8	4.61	8.21	45.48
0.2500	6.351	-2.67	1/4	3.34	5.95	51.42
0.1873	4.757	-2.25	4	4.42	7.87	59.29
0.1324	3.364	-1.75	6	3.21	5.71	65.01
0.0787	2.000	-1.00	10	3.86	6.87	71.88
0.0557	1.414	-0.50	14	1.66	2.95	74.83
0.0394	1.000	0.00	18	0.75	1.33	76.17
0.0278	0.707	0.50	25	1.46	2.60	78.76
0.0197	0.500	1.00	35	1.32	2.35	81.11
0.0166	0.420	1.25	40	0.66	1.17	82.29
0.0139	0.354	1.50	45	0.35	0.62	82.91
0.0098	0.250	2.00	60	0.85	1.51	84.43
0.0070	0.177	2.50	80	1.54	2.74	87.17
0.0049	0.125	3.00	120	1.33	2.37	89.53
0.0029	0.074	3.75	200	1.54	2.74	92.27
0.0021	0.053	4.25	270	1.04	1.85	94.13
0.0015	0.037	4.75	400	0.62	1.10	95.23
			PAN	2.68	4.77	100.00
TOTALS				56.18	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-4.51	0.8969	22.783
10	-4.38	0.8173	20.760
16	-4.21	0.7310	18.568
25	-3.97	0.6184	15.706
40	-3.51	0.4493	11.411
50	-2.81	0.2754	6.994
60	-2.19	0.1794	4.557
75	-0.44	0.0533	1.353
84	1.86	0.0108	0.276
90	3.13	0.0045	0.114
95	4.65	0.0016	0.040

Measure	Trask	Inman	Folk-Ward
Median, phi	-2.81	-2.81	-2.81
Median, in.	0.2754	0.2754	0.2754
Median, mm	6.994	6.994	6.994
Mean, phi	-3.09	-1.18	-1.72
Mean, in.	0.3358	0.0891	0.1297
Mean, mm	8.530	2.262	3.295
Sorting	3.407	3.037	2.906
Skewness	0.659	0.536	0.582
Kurtosis	0.348	0.507	1.061
Grain Size Description (ASTM-USCS Scale)		Gravel (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	59.29
Coarse Sand	10	12.58
Medium Sand	40	10.41
Fine Sand	200	9.99
Silt/Clay	<200	7.73
	Total	100

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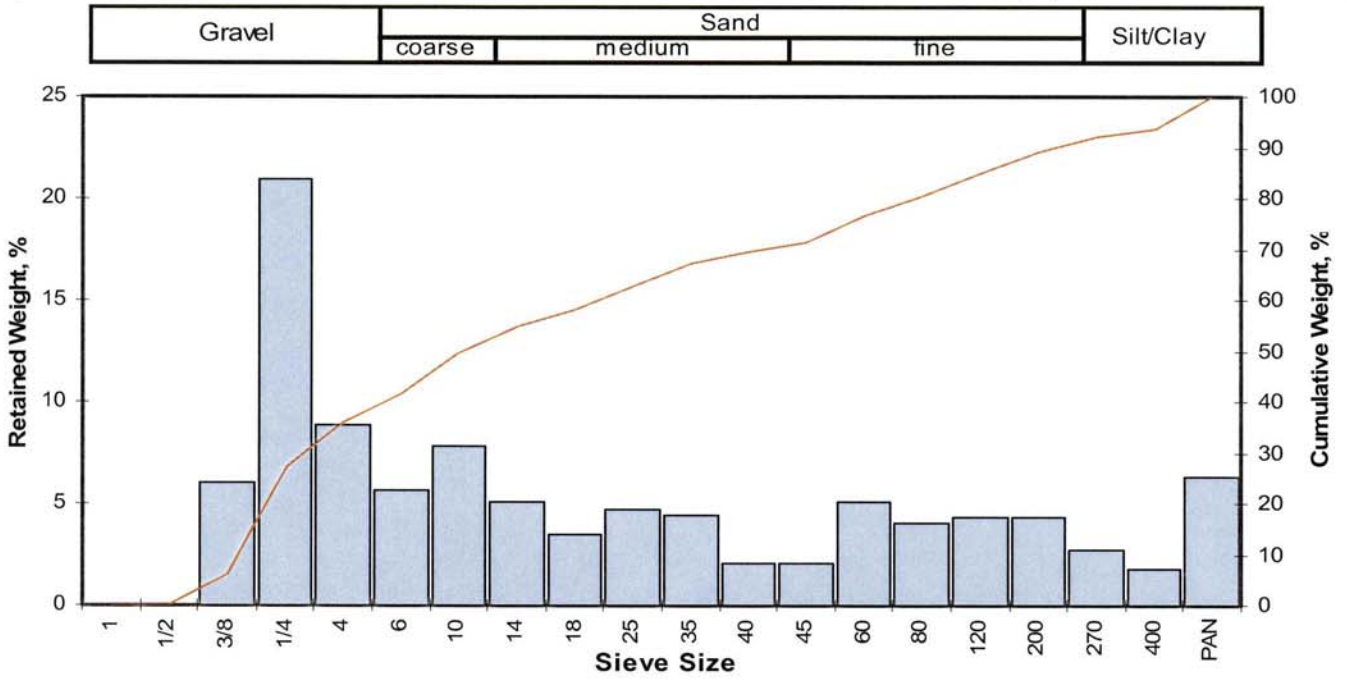
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	Treadwell & Rollo	**PTS File No:**	40109
Project:	Pier 70	**Sample ID:**	P9SB04-12-14
Project No:	4963.01	**Depth, ft:**	12.45



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	0.00	0.00	0.00
0.3740	9.500	-3.25	3/8	1.75	6.08	6.08
0.2500	6.351	-2.67	1/4	6.04	20.99	27.07
0.1873	4.757	-2.25	4	2.56	8.90	35.96
0.1324	3.364	-1.75	6	1.64	5.70	41.66
0.0787	2.000	-1.00	10	2.25	7.82	49.48
0.0557	1.414	-0.50	14	1.46	5.07	54.55
0.0394	1.000	0.00	18	1.01	3.51	58.06
0.0278	0.707	0.50	25	1.36	4.73	62.79
0.0197	0.500	1.00	35	1.28	4.45	67.23
0.0166	0.420	1.25	40	0.60	2.08	69.32
0.0139	0.354	1.50	45	0.60	2.08	71.40
0.0098	0.250	2.00	60	1.46	5.07	76.48
0.0070	0.177	2.50	80	1.16	4.03	80.51
0.0049	0.125	3.00	120	1.25	4.34	84.85
0.0029	0.074	3.75	200	1.25	4.34	89.19
0.0021	0.053	4.25	270	0.78	2.71	91.90
0.0015	0.037	4.75	400	0.51	1.77	93.68
			PAN	1.82	6.32	100.00
TOTALS				28.78	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-3.32	0.3927	9.975
10	-3.14	0.3469	8.812
16	-2.97	0.3092	7.854
25	-2.72	0.2602	6.608
40	-1.90	0.1465	3.721
50	-0.95	0.0760	1.930
60	0.21	0.0342	0.867
75	1.85	0.0109	0.277
84	2.90	0.0053	0.134
90	3.90	0.0026	0.067
95	3.76	0.0029	0.074

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.95	-0.95	-0.95
Median, in.	0.0760	0.0760	0.0760
Median, mm	1.930	1.930	1.930
Mean, phi	-1.78	-0.04	-0.34
Mean, in.	0.1355	0.0404	0.0498
Mean, mm	3.442	1.025	1.266
Sorting	4.888	2.938	2.541
Skewness	0.700	0.311	0.320
Kurtosis	0.362	0.204	0.633
Grain Size Description (ASTM-USCS Scale)		Coarse sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	35.96
Coarse Sand	10	13.52
Medium Sand	40	19.84
Fine Sand	200	19.87
Silt/Clay	<200	10.81
	Total	100

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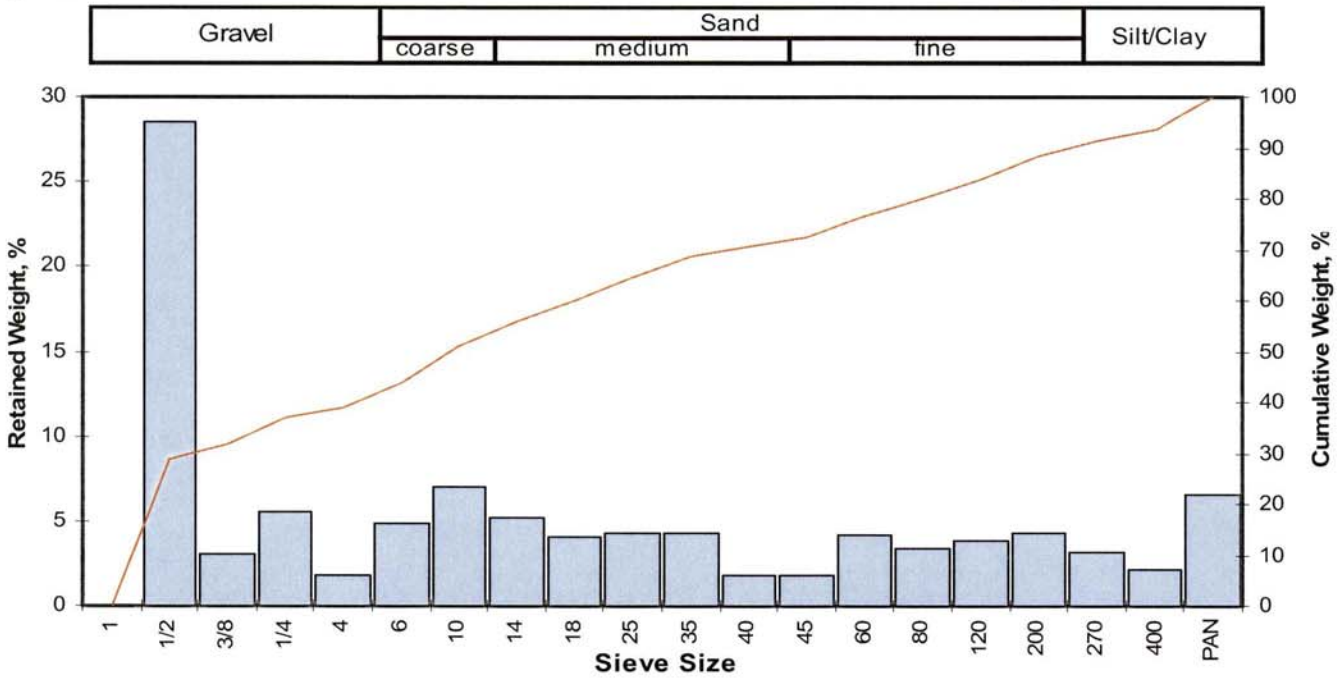
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	Treadwell & Rollo	**PTS File No:**	40109
Project:	Pier 70	**Sample ID:**	P9SB04-12-14
Project No:	4963.01	**Depth, ft:**	13.75



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	13.40	28.52	28.52
0.3740	9.500	-3.25	3/8	1.44	3.07	31.59
0.2500	6.351	-2.67	1/4	2.62	5.58	37.16
0.1873	4.757	-2.25	4	0.84	1.79	38.95
0.1324	3.364	-1.75	6	2.31	4.92	43.87
0.0787	2.000	-1.00	10	3.28	6.98	50.85
0.0557	1.414	-0.50	14	2.43	5.17	56.02
0.0394	1.000	0.00	18	1.91	4.07	60.09
0.0278	0.707	0.50	25	2.04	4.34	64.43
0.0197	0.500	1.00	35	2.02	4.30	68.73
0.0166	0.420	1.25	40	0.86	1.83	70.56
0.0139	0.354	1.50	45	0.85	1.81	72.37
0.0098	0.250	2.00	60	1.99	4.24	76.61
0.0070	0.177	2.50	80	1.59	3.38	79.99
0.0049	0.125	3.00	120	1.82	3.87	83.87
0.0029	0.074	3.75	200	2.04	4.34	88.21
0.0021	0.053	4.25	270	1.49	3.17	91.38
0.0015	0.037	4.75	400	0.99	2.11	93.49
			PAN	3.06	6.51	100.00
TOTALS				46.98	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-4.47	0.8717	22.142
10	-4.29	0.7720	19.608
16	-4.08	0.6672	16.948
25	-3.77	0.5362	13.619
40	-2.14	0.1740	4.418
50	-1.09	0.0839	2.131
60	-0.01	0.0397	1.008
75	1.81	0.0112	0.285
84	3.02	0.0048	0.123
90	4.03	0.0024	0.061
95	3.65	0.0031	0.080

Measure	Trask	Inman	Folk-Ward
Median, phi	-1.09	-1.09	-1.09
Median, in.	0.0839	0.0839	0.0839
Median, mm	2.131	2.131	2.131
Mean, phi	-2.80	-0.53	-0.72
Mean, in.	0.2737	0.0568	0.0647
Mean, mm	6.952	1.444	1.644
Sorting	6.911	3.553	3.006
Skewness	0.925	0.158	0.163
Kurtosis	0.341	0.142	0.596

Grain Size Description (ASTM-USCS Scale)	Gravel (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	38.95
Coarse Sand	10	11.90
Medium Sand	40	19.71
Fine Sand	200	17.65
Silt/Clay	<200	11.79
	Total	100

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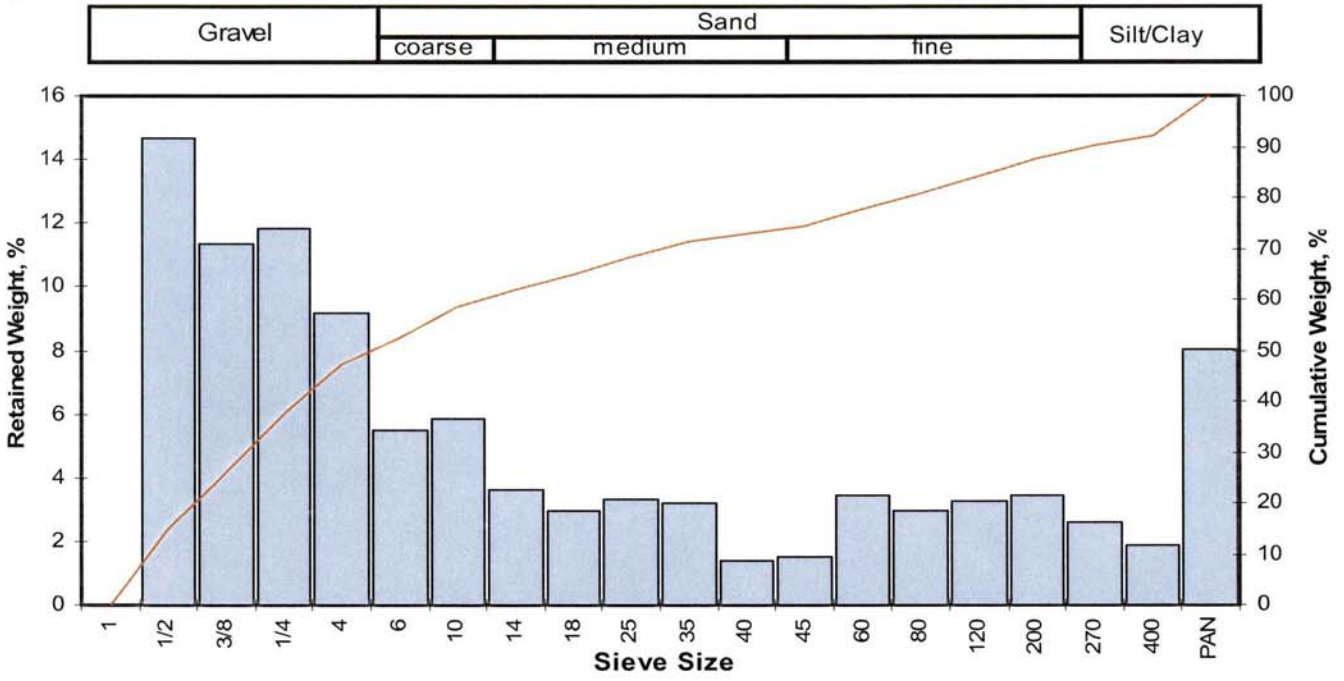
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	Treadwell & Rollo	**PTS File No:**	40109
Project:	Pier 70	**Sample ID:**	P9SB06 B-14-15
Project No:	4963.01	**Depth, ft:**	14.05



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	5.18	14.66	14.66
0.3740	9.500	-3.25	3/8	4.02	11.38	26.03
0.2500	6.351	-2.67	1/4	4.18	11.83	37.86
0.1873	4.757	-2.25	4	3.24	9.17	47.03
0.1324	3.364	-1.75	6	1.94	5.49	52.52
0.0787	2.000	-1.00	10	2.07	5.86	58.38
0.0557	1.414	-0.50	14	1.27	3.59	61.97
0.0394	1.000	0.00	18	1.04	2.94	64.91
0.0278	0.707	0.50	25	1.18	3.34	68.25
0.0197	0.500	1.00	35	1.14	3.23	71.48
0.0166	0.420	1.25	40	0.50	1.41	72.89
0.0139	0.354	1.50	45	0.53	1.50	74.39
0.0098	0.250	2.00	60	1.22	3.45	77.84
0.0070	0.177	2.50	80	1.04	2.94	80.79
0.0049	0.125	3.00	120	1.15	3.25	84.04
0.0029	0.074	3.75	200	1.22	3.45	87.49
0.0021	0.053	4.25	270	0.91	2.57	90.07
0.0015	0.037	4.75	400	0.67	1.90	91.96
			PAN	2.84	8.04	100.00
TOTALS				35.34	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-4.30	0.7771	19.738
10	-3.96	0.6134	15.581
16	-3.60	0.4765	12.103
25	-3.28	0.3835	9.740
40	-2.57	0.2337	5.937
50	-1.98	0.1552	3.943
60	-0.77	0.0673	1.710
75	1.59	0.0131	0.333
84	2.99	0.0049	0.126
90	4.24	0.0021	0.053
95	2.96	0.0051	0.129

Measure	Trask	Inman	Folk-Ward
Median, phi	-1.98	-1.98	-1.98
Median, in.	0.1552	0.1552	0.1552
Median, mm	3.943	3.943	3.943
Mean, phi	-2.33	-0.30	-0.86
Mean, in.	0.1983	0.0485	0.0715
Mean, mm	5.036	1.233	1.816
Sorting	5.412	3.296	2.747
Skewness	0.456	0.509	0.434
Kurtosis	0.303	0.101	0.611
Grain Size Description (ASTM-USCS Scale)		Gravel (based on Mean from Trask)	

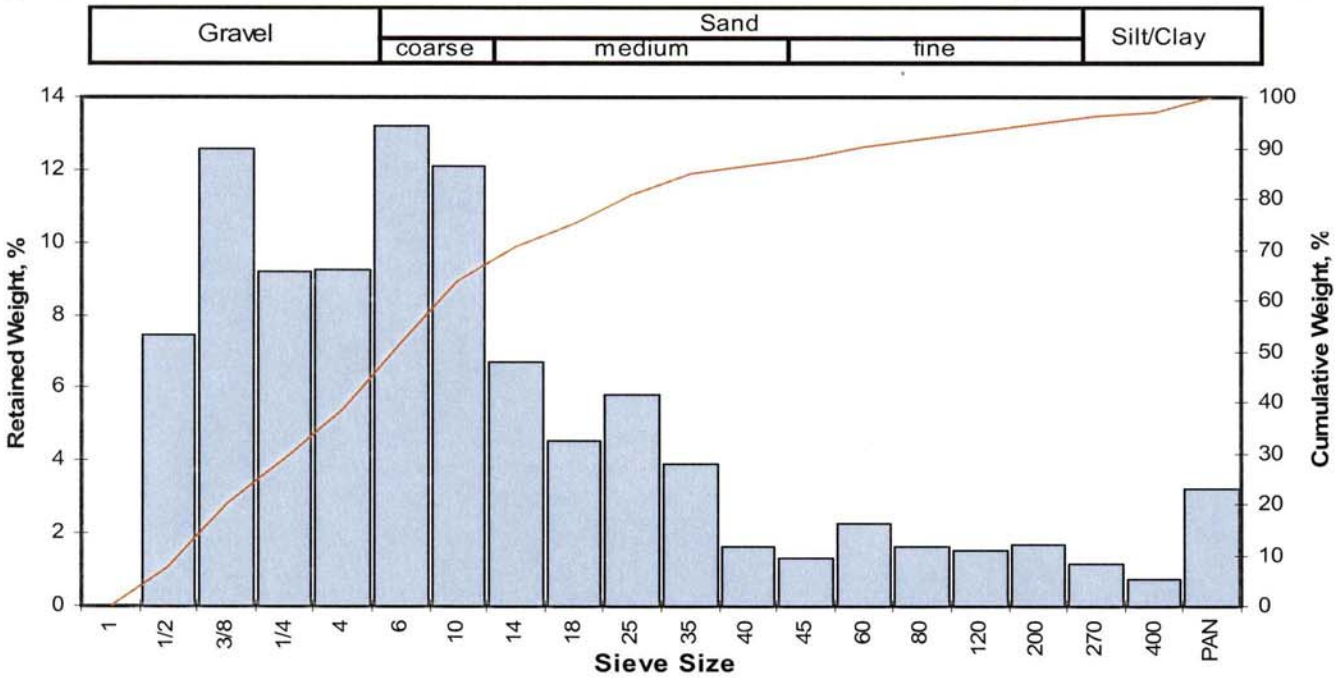
Description	Retained on Sieve #	Weight Percent
Gravel	4	47.03
Coarse Sand	10	11.35
Medium Sand	40	14.52
Fine Sand	200	14.60
Silt/Clay	<200	12.51
	Total	100

Phone: (562) 907-3607 Fax: (562) 907-3610

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	Treadwell & Rollo	**PTS File No:**	40109
Project:	Pier 70	**Sample ID:**	P9SB06 B-15.5-16.5
Project No:	4963.01	**Depth, ft:**	16.25



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	2.11	7.43	7.43
0.3740	9.500	-3.25	3/8	3.57	12.58	20.01
0.2500	6.351	-2.67	1/4	2.61	9.20	29.21
0.1873	4.757	-2.25	4	2.63	9.27	38.48
0.1324	3.364	-1.75	6	3.75	13.21	51.69
0.0787	2.000	-1.00	10	3.44	12.12	63.81
0.0557	1.414	-0.50	14	1.91	6.73	70.54
0.0394	1.000	0.00	18	1.29	4.55	75.09
0.0278	0.707	0.50	25	1.65	5.81	80.90
0.0197	0.500	1.00	35	1.11	3.91	84.81
0.0166	0.420	1.25	40	0.46	1.62	86.43
0.0139	0.354	1.50	45	0.38	1.34	87.77
0.0098	0.250	2.00	60	0.64	2.26	90.03
0.0070	0.177	2.50	80	0.46	1.62	91.65
0.0049	0.125	3.00	120	0.44	1.55	93.20
0.0029	0.074	3.75	200	0.48	1.69	94.89
0.0021	0.053	4.25	270	0.33	1.16	96.05
0.0015	0.037	4.75	400	0.21	0.74	96.79
			PAN	0.91	3.21	100.00
TOTALS				28.38	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-3.97	0.6176	15.687
10	-3.56	0.4654	11.821
16	-3.37	0.4083	10.370
25	-2.93	0.3007	7.637
40	-2.19	0.1799	4.571
50	-1.81	0.1384	3.516
60	-1.24	0.0927	2.355
75	-0.01	0.0396	1.007
84	0.90	0.0212	0.537
90	1.99	0.0099	0.251
95	3.80	0.0028	0.072

Measure	Trask	Inman	Folk-Ward
Median, phi	-1.81	-1.81	-1.81
Median, in.	0.1384	0.1384	0.1384
Median, mm	3.516	3.516	3.516
Mean, phi	-2.11	-1.24	-1.43
Mean, in.	0.1702	0.0929	0.1061
Mean, mm	4.322	2.361	2.696
Sorting	2.754	2.135	2.245
Skewness	0.789	0.269	0.357
Kurtosis	0.287	0.819	1.089

Grain Size Description (ASTM-USCS Scale)	Coarse sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	38.48
Coarse Sand	10	25.33
Medium Sand	40	22.62
Fine Sand	200	8.46
Silt/Clay	<200	5.11
	Total	100

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PTS File No: 40109
Client: Treadwell & Rollo

PTS Laboratories

VISCOSITY, DENSITY, and SPECIFIC GRAVITY DATA

(METHODOLOGY: ASTM D445, ASTM D1481, API RP40)

PROJECT NAME: Pier 70
PROJECT NO: 4963.01

SAMPLE ID	MATRIX	TEMPERATURE, °F	SPECIFIC GRAVITY	DENSITY, g/cc	VISCOSITY	
					centistokes	centipoise
P9SB06 B-NAPL	NAPL	70	0.9804	0.9785	11767	11514
		100	0.9766	0.9698	2302	2232
		130	0.9747	0.9610	400	384
P9SB04-NAPL	NAPL	70	0.9716	0.9696	5682	5509
		100	0.9665	0.9598	848	814
		130	0.9607	0.9473	256	243

PTS File No: 40109
Client: Treadwell & Rollo

PTS Laboratories

INTERFACIAL / SURFACE TENSION DATA

(METHODOLOGY: DuNuoy Method - ASTM D971)

PROJECT NAME: Pier 70
PROJECT NO: 4963.01

PHASE PAIR		TEMPERATURE,	INTERFACIAL TENSION,
SAMPLE ID / PHASE	SAMPLE ID / PHASE	°F	Dynes/centimeter
PTS SFS Tap-Water	Air	70	72.4
P9SB06 B-NAPL	Air	70	33.9
PTS SFS Tap-Water	P9SB06 B-NAPL	70	101
PTS SFS Tap-Water	Air	70	72.5
P9SB04-NAPL	Air	70	34.6
PTS SFS Tap-Water	P9SB04-NAPL	70	95.8

QUALITY CONTROL DATA

PHASE PAIR:	DIWATER / AIR
TEMPERATURE, °F:	70
IFT, MEASURED:	73.1
IFT, PUBLISHED:	72.6
RPD:	0.75

PTS File No: 40109
Client: Treadwell & Rollo
Project Name: Pier 70
Project No: 4963.01
Date: March 1, 2010

Hydrocarbon Characterization

Introduction

Two NAPL samples from the subject area were received for hydrocarbon characterization. The samples are identified as P9SB04 and P9SB10.

Conclusions

The two samples contain hydrocarbons in the range of C_6 to C_{34}. They appear to be complex mixtures of gasoline, diesel, fuel oils, or lubricating products, etc. Considerable degradation of the normal paraffins has occurred and the very light components ($C_4 - C_7$) of the gasoline fractions have been weathered to low concentrations. Two small peaks appearing in the C_2 to C_5 range of components, where no hydrocarbon profile is seen, are probably from chlorohydrocarbons such as chloroethane or trichloroethane, etc. The overall hydrocarbon profiles are quite similar but they are not identical in specific hydrocarbon composition nor in molecular weight distribution.

Analyses and Discussion

The samples were analyzed by OILPRINT™ which provides information on the detailed hydrocarbon composition. The results are presented in Figures 1 thru 3 and Tables 1 and 2. Figures 1 and 2 are reduced scale copies of the chromatograms with some peak retention times added for guidance in visual examination of the traces. Table 1 contains the approximate values for the carbon number fractions. These values are obtained from the chromatograms where peak heights are directly related to abundance. These results can be considered similar to a simulated distillation. They are fairly similar with the biggest differences occurring in the C_{14} to C_{22} and C_{26} to C_{34} fractions.

Table 2 contains data from hydrocarbon ratios and could be considered a numerical representation of the specific fingerprints. Peak numbers are assigned in order of increasing molecular weight from C_2 to C_{34}. Figure 3 is a polar plot based on some of the ratio values and illustrates the differences in specific composition throughout the C_5 to C_{21} fractions. Variations in the heavier fraction are smaller.

L.W. Slentz

PTS File No: 40109
Client: Treadwell & Rollo
Project Name: Pier 70
Project No: 4963.01
Date: March 1, 2010

Table 1
Hydrocarbon Composition by Carbon Numbers

		Percentages by Carbon Number													
Run #	Sample ID	C_2 - C_8	C_8 - C_{10}	C_{10} - C_{12}	C_{12} - C_{14}	C_{14} - C_{16}	C_{16} - C_{18}	C_{18} - C_{20}	C_{20} - C_{22}	C_{22} - C_{24}	C_{24} - C_{26}	C_{26} - C_{28}	C_{28} - C_{30}	C_{30} - C_{32}	C_{32} - C_{34}
280	P9SB04	0.2	3.9	8.5	12.4	11.8	10.7	7.0	2.7	1.9	2.1	8.0	9.8	14.5	6.6
279	P9SB10	0.1	3.3	8.3	13.7	14.5	13.6	11.2	6.1	2.4	1.4	5.1	6.5	10.0	3.8

Table 2
Hydrocarbon Composition by Carbon Ratios

		Hydrocarbon Ratios by Peak Numbers																	
Run #	Sample ID	36 / 37	51 / 54	60 / 63	69 / 68	84 / 86	90 / 88	107 / 111	165 / 166	182 / 169	183 / 184	192 / 189	200 / 202	211 / 212	249 / 252	267 / 264	277 / 275	283 / 280	298 / 302
				4		11	10	5	1		2	3	12			9	6	8	7
280	P9SB04	1.45	2.24	0.70	1.15	1.27	1.00	1.13	1.05	1.21	1.94	1.35	1.54	1.16	1.62	2.04	0.54	1.08	1.52
279	P9SB10	0.40	0.92	1.29	2.44	1.67	0.67	2.04	0.72	1.70	1.03	0.93	2.08	0.86	0.88	1.50	1.00	0.70	2.20

Numbers "1-12" below peak hydrocarbon numbers = sequence of points on polar plot

FIGURE 1
Sample ID: P9SB04-NAPL_280

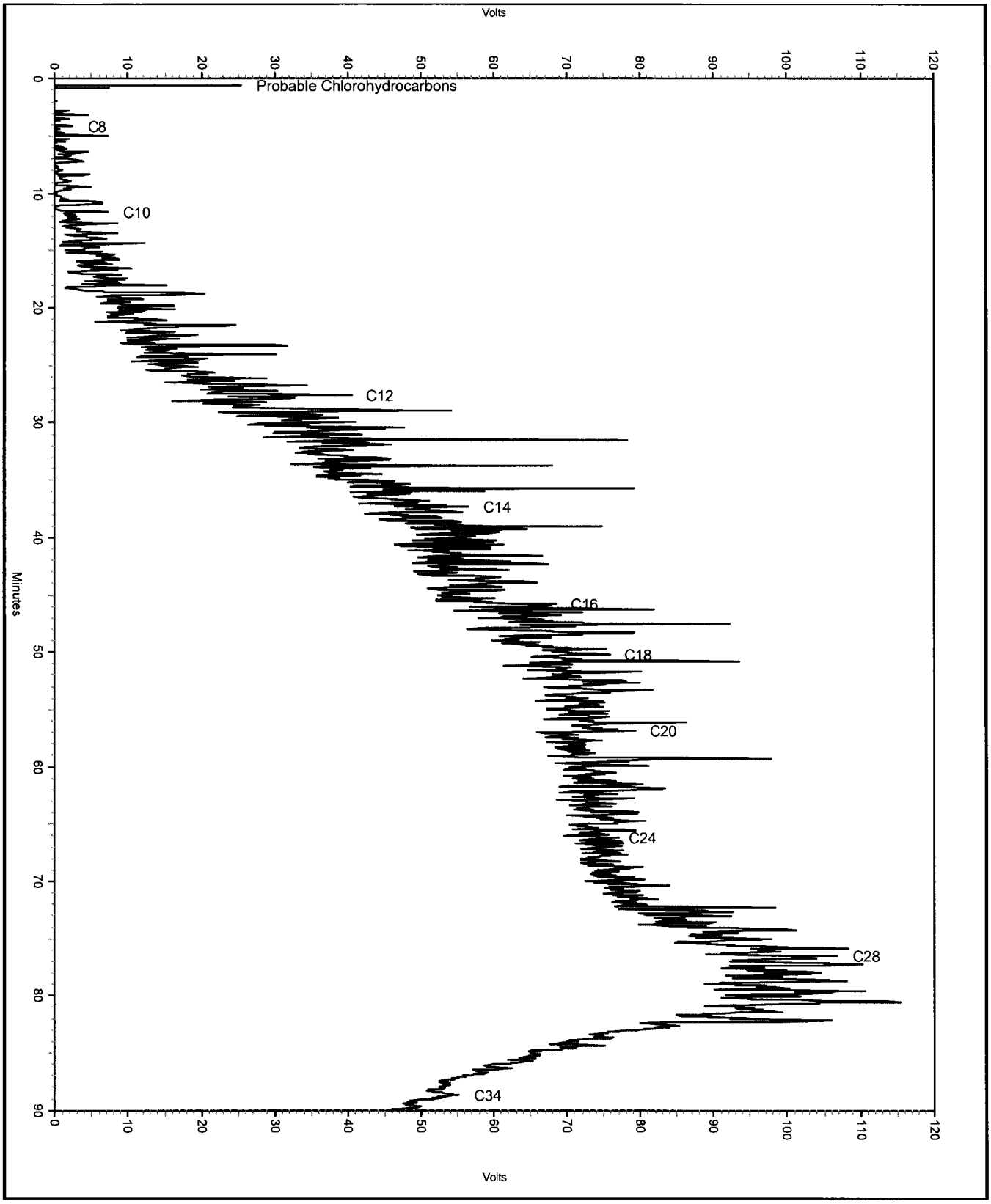


FIGURE 2
Sample ID: P9SB10-NAPL

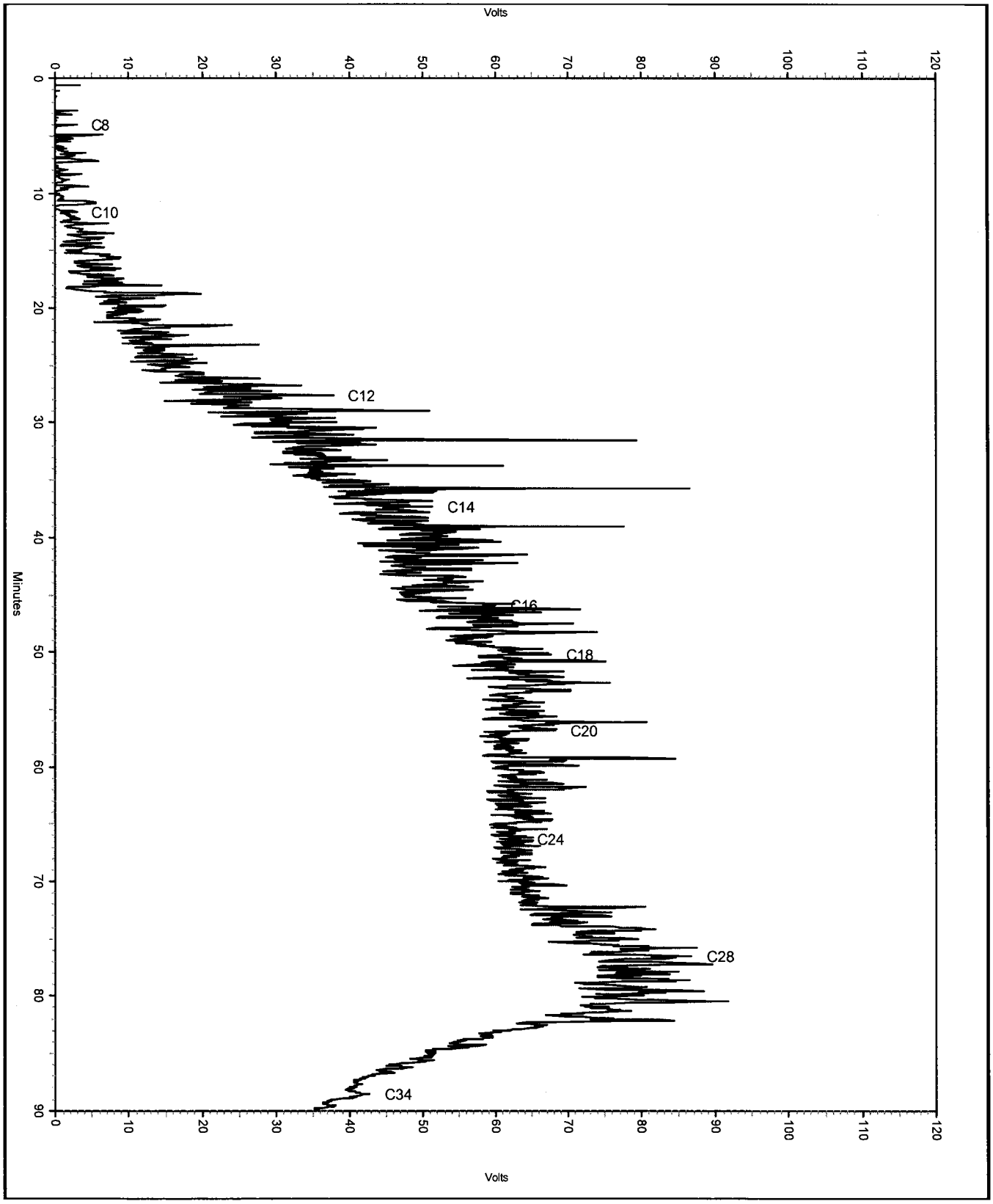
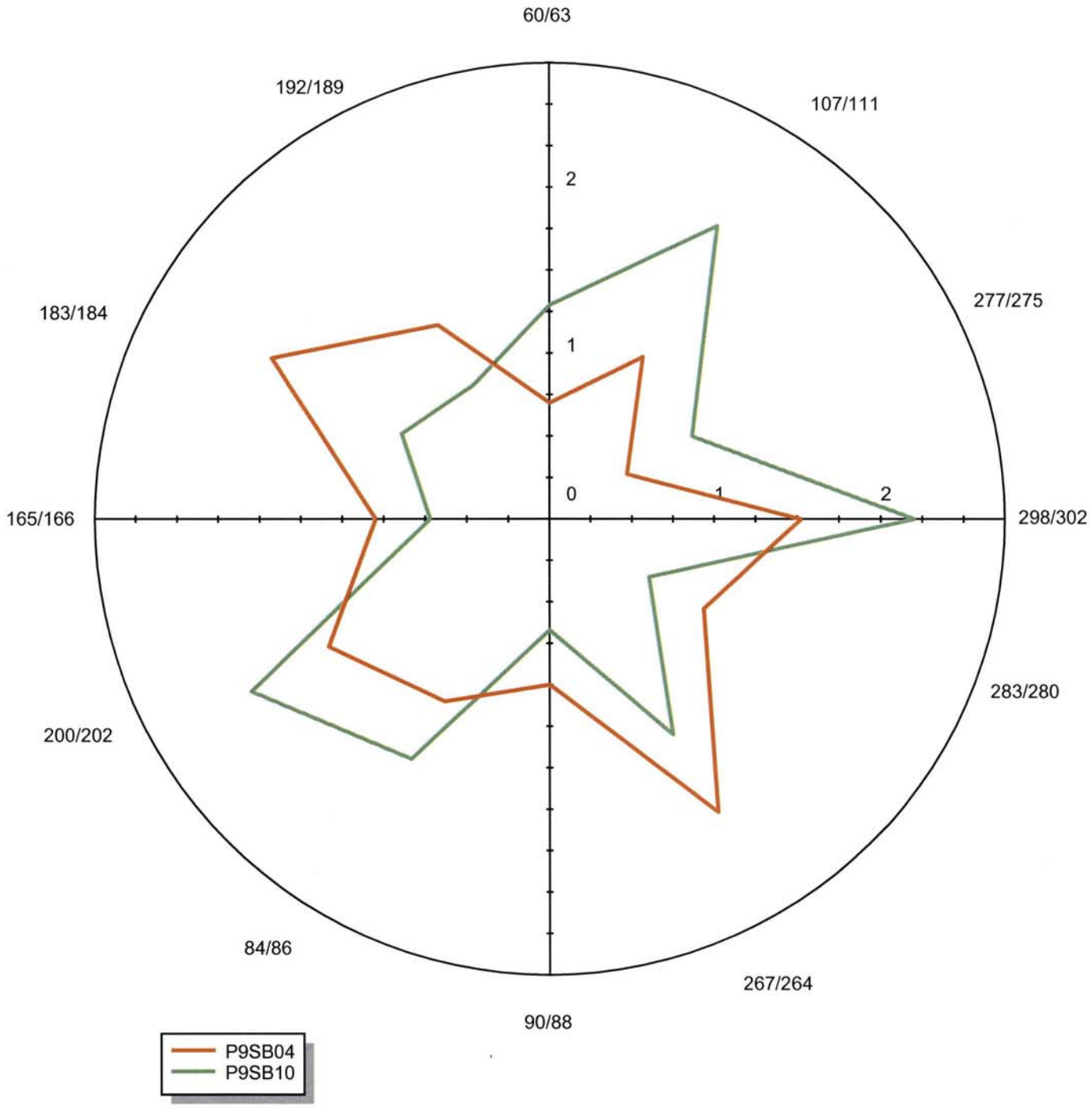


Figure 3

Polar Plot of Hydrocarbon Composition of P9SB04 and P9SB10



PTS File No: 40109
Client: Treadwell & Rollo
Project Name: Pier 70
Project No: 4963.01
Date: March 16, 2010

Hydrocarbon Characterization

Introduction

A single sample identified as P9SB06 was received for hydrocarbon characterization. It was requested that the results be compared and correlated to two earlier samples analyzed and reported on in February. They were P9SB04 and P9SB10.

Conclusions

P9SB06 is generally similar to P9SB04 and P9SB10 but contains less light gasoline (C4 - C8) compounds and no chlorohydrocarbons components were detected. In addition to these differences there are some significant differences in the specific hydrocarbon fingerprint which are more pronounced than those that were detected between P9SB04 and P9SB10. Such variations can also be seen in the simulated distillation values.

Analyses and Discussion

The samples was analyzed by the OIL PRINT™ method and data processed in the same manner as the two earlier samples. The data are presented in Figures 1 and 2 and Tables 1 and 2. Figure 1 is a reduced scale copy of the chromatogram with peak identifications added as shown in the earlier report.

Table 1 contains the hydrocarbon ratios digitized from the chromatogram. In this instance it was not possible to obtain all the exact ratios determined for P9SB04 and P9SB10 because of lower concentration of light ends. Figure 2 is a star plot generated from some of the ratios. Again, it is not exactly the same plot shown in the first report, but all three samples are plotted using the data in the accompanying report. The plots plus the tabular data illustrate the significant difference among the three fluids.

Table 2 is similar to Table 2 in the first report and is obtained from the peak areas in the chromatograms. It also shows the somewhat larger variations in the carbon number distribution for P9SB06 compared to P9SB04 and P9SB10.

L.W. Slentz

PTS File No: 40109
Client: Treadwell & Rollo
Project Name: Pier 70
Project No: 4963.01
Date: March 16, 2010

Table 1
Hydrocarbon Composition by Carbon Ratios

		Hydrocarbon Ratios using Peak Numbers													
Run #	Sample ID	69/68	114/115	136/129	156/158	165/166	182/169	183/184	192/189	200/202	211/212	249/252	267/264	283/280	298/302
		4			6	1		2	3	9	7		8		5
280	P9SB04	1.15	1.08	1.26	2.96	1.05	1.21	1.94	1.35	1.54	1.16	1.62	2.04	1.08	1.52
279	P9SB10	2.44	1.36	1.28	3.10	0.72	1.70	1.03	0.93	2.08	0.86	0.88	1.50	0.74	2.20
287	P9SB06	3.50	0.56	0.68	1.24	1.56	0.38	2.44	1.70	0.59	1.55	1.00	0.56	0.88	0.90

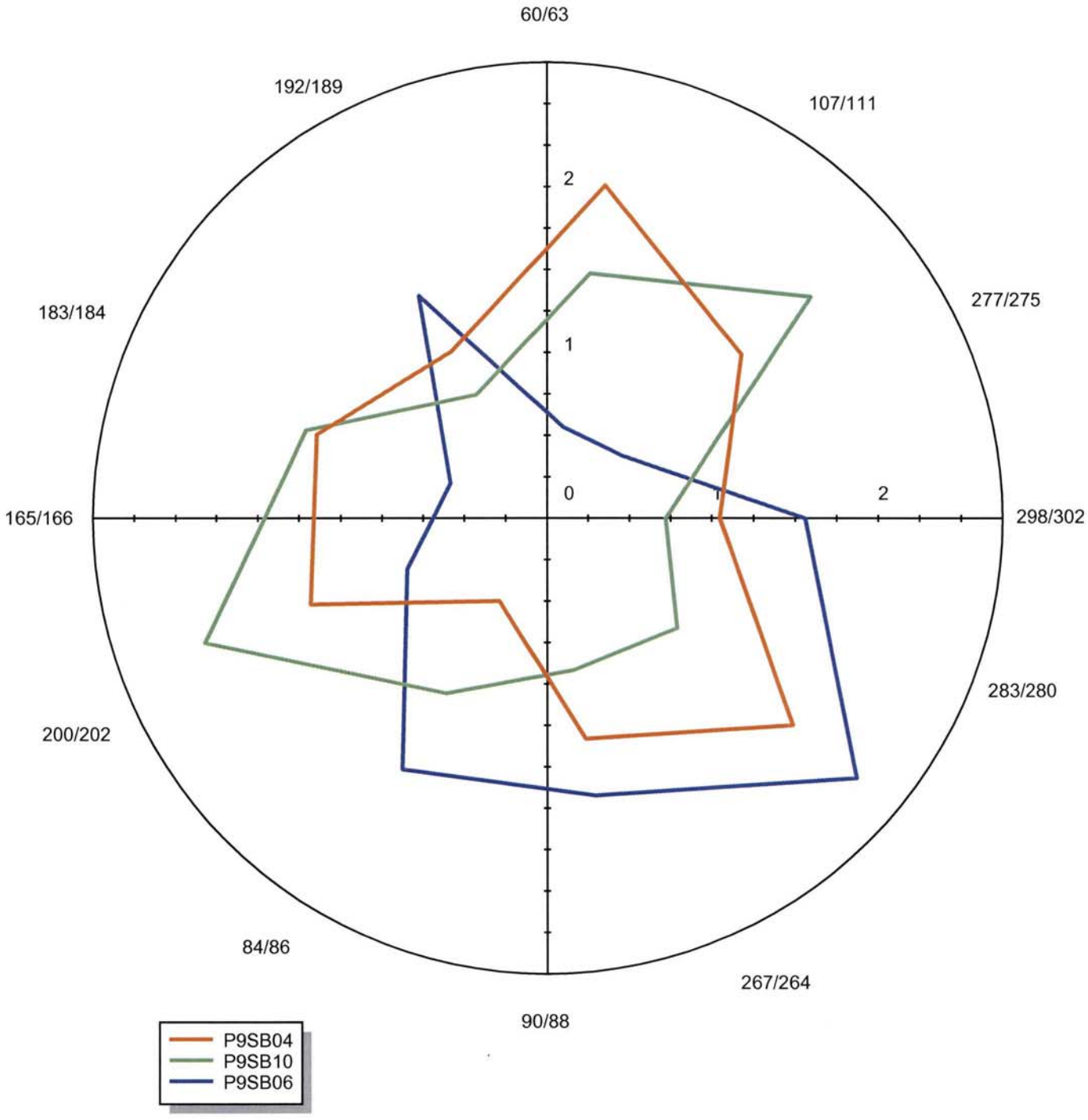
Numbers "1-9" below peak hydrocarbon numbers = sequence of points on polar plot

Table 2
Hydrocarbon Composition by Carbon Numbers

		Percentages by Carbon Number													
Run #	Sample ID	C_2 - C_8	C_8 - C_{10}	C_{10} - C_{12}	C_{12} - C_{14}	C_{14} - C_{16}	C_{16} - C_{18}	C_{18} - C_{20}	C_{20} - C_{22}	C_{22} - C_{24}	C_{24} - C_{26}	C_{26} - C_{28}	C_{28} - C_{30}	C_{30} - C_{32}	C_{32} - C_{34}
280	P9SB04	0.2	3.9	8.5	12.4	11.8	10.7	7.0	2.7	1.9	2.1	8.0	9.8	14.5	6.6
279	P9SB10	0.1	3.3	8.3	13.7	14.5	13.6	11.2	6.1	2.4	1.4	5.1	6.5	10.0	3.8
287	P9SB06	0.1	2.7	9.5	12.7	9.5	5.1	5.6	3.1	1.3	3.9	11.5	11.0	15.0	7.0

Figure 2

Polar Plot of Hydrocarbon Composition of P9SB04, P9SB10, P9SB06



PTS Laboratories, Inc.

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

COMPANY	ADDRESS	CITY	ZIP CODE
Treadwell & Rollo Inc	555 Montgomery Street #1300	SF	CA 94111

PROJECT MANAGER	PHONE NUMBER
Dustyne Sutherland	415 955 9040
PROJECT NAME	
Pier 70	
PROJECT NUMBER	**FAX NUMBER**
4963.01	415 955 9041
SITE LOCATION	
San Francisco	
SAMPLER SIGNATURE	
DRuell	

TURNAROUND TIME: 24 HOURS ☐ 48 HOURS ☐ 72 HOURS ☐ 5 DAYS ☐ NORMAL ☑

OTHER: _____

SAMPLE INTEGRITY (CHECK): INTACT ✓ ON ICE ✓

PTS QUOTE NO.:

PTS FILE: 40109

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	NUMBER OF SAMPLES	SOIL PROPERTIES PACKAGE	HYDRAULIC CONDUCTIVITY PACKAGE	PORE FLUID SATURATIONS PACKAGE	TCEQ/TNRCC PROPERTIES PACKAGE	CAPILLARITY PACKAGE	FLUID PROPERTIES PACKAGE	PHOTOLOG: CORE PHOTOGRAPHY	MOISTURE CONTENT, ASTM D2216	POROSITY: TOTAL, API RP40	POROSITY: EFFECTIVE, ASTM D425M	SPECIFIC GRAVITY, ASTM D854	BULK DENSITY (DRY), API RP40 or ASTM D2937	AIR PERMEABILITY, API RP40	HYDRAULIC CONDUCTIVITY, EPA9100, API RP40, D5084	GRAIN SIZE DISTRIBUTION, ASTM D422/4464M	TOC: WALKLEY-BLACK	ATTERBERG LIMITS, ASTM D4318	Oil fluid analysis				COMMENTS
P9SB10-11	2-16-10	1030	11-14.8	2		X					X															
P9MW3-NAPL	2-16-10	1		1																						Hold
P9SB04-12-14	2-16-10	1300	12-14	1		X					X															
P9SB10-NAPL	2-16-10	1300		1						X												X				
P9SB04-NAPL	2-16-10	1400		1																		X				
P9SB06-13	2-16-10	1630	13-14.10	1		X					X															

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
D.Ruell			
COMPANY: Treadwell & Rollo	COMPANY: PTS Labs Inc	COMPANY	COMPANY
DATE: 2-16-10 TIME:	DATE: 2/17/10 TIME: 12:40.	DATE: TIME:	DATE: TIME:

PTS Laboratories, Inc.

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

COMPANY: Treadwell & Rollo Inc

ADDRESS: 555 Montgomery Street #1300 CITY: SF, CA ZIP CODE: 94111

PROJECT MANAGER: Dustyne Sutherland

PROJECT NAME: Pier 70 PHONE NUMBER: 415 955 9040

PROJECT NUMBER: 4963.01 FAX NUMBER: 415 955 9041

SITE LOCATION: San Francisco

SAMPLER SIGNATURE: [signature]

PO#:

TURNAROUND TIME: 24 HOURS ☐ 48 HOURS ☐ 72 HOURS ☐ 5 DAYS ☐ NORMAL ☑

OTHER:

SAMPLE INTEGRITY (CHECK): INTACT ✓ ON ICE ✓

PTS QUOTE NO.:

PTS FILE: 40109

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	NUMBER OF SAMPLES	SOIL PROPERTIES PACKAGE	HYDRAULIC CONDUCTIVITY PACKAGE	PORE FLUID SATURATIONS PACKAGE	TCEQ/TNRCC PROPERTIES PACKAGE	CAPILLARITY PACKAGE	FLUID PROPERTIES PACKAGE	PHOTOLOG: CORE PHOTOGRAPHY	MOISTURE CONTENT, ASTM D2216	POROSITY: TOTAL, API RP40	POROSITY: EFFECTIVE, ASTM D425M	SPECIFIC GRAVITY, ASTM D854	BULK DENSITY (DRY), API RP40 or ASTM D2937	AIR PERMEABILITY, API RP40	HYDRAULIC CONDUCTIVITY, EPA9100, API RP40, D5084	GRAIN SIZE DISTRIBUTION, ASTM D422/4464M	TOC: WALKLEY-BLACK	ATTERBERG LIMITS, ASTM D4318	oil print analysis			COMMENTS
P9SB10-11	2-16-10	1030	11-14.8	2		X	~~X~~				X														
P9MW2-NAPL	2-16-10			1																					HOLD ~~8oz~~ 16oz JAR
P9SB04-12-14	2-16-10	1300	12-14	1		X	~~X~~				X														
P9SB10-NAPL	2-16-10	1300		1						X												X			4oz JAR
P9SB04-NAPL	2-16-10	1400		1																		X			4oz JAR
P9SB06-13	2-16-10	1630	13-14.10	1		X					X														

Received fluids 2-18-10

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
D. Nuell [signature]	[signature]		[signature]
COMPANY: Treadwell & Rollo	COMPANY: PTS Labs Inc	COMPANY:	COMPANY: PTS Labs Inc
DATE: 2-16-10 TIME:	DATE: 2/17/10 TIME: 12:40.	DATE: TIME:	DATE: 2-18-10 TIME: 0814

PTS Laboratories, Inc.

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

COMPANY: Treadwell & Rollo, Inc.

ADDRESS: 555 Montgomery St 1300 CITY: SF, CA ZIP CODE: 94111

PROJECT MANAGER: Dustane Sutherland

PROJECT NAME: Pier 70

PHONE NUMBER: (415) 955-9040

PROJECT NUMBER: 4963.01

FAX NUMBER: (415) 955-9041

SITE LOCATION: San Francisco

SAMPLER SIGNATURE:

PO#:

TURNAROUND TIME: 24 HOURS ☐ 48 HOURS ☐ 72 HOURS ☐ 5 DAYS ☐ NORMAL ☑ OTHER: _____

SAMPLE INTEGRITY (CHECK): INTACT ✓ ON ICE ✓

PTS QUOTE NO.:

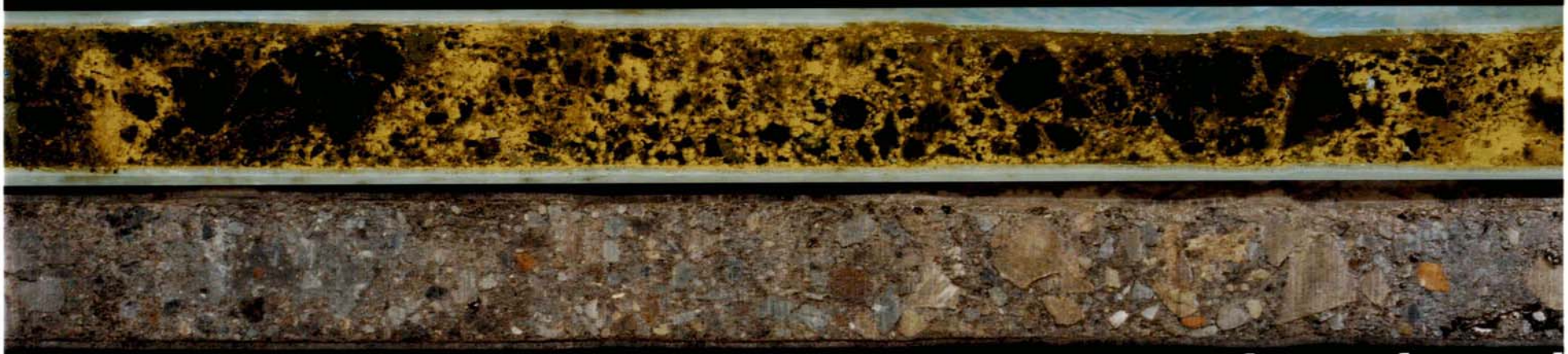
PTS FILE: ~~40109~~ 40167.

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	NUMBER OF SAMPLES	SOIL PROPERTIES PACKAGE	HYDRAULIC CONDUCTIVITY PACKAGE	PORE FLUID SATURATIONS PACKAGE	TCEQ/TNRCC PROPERTIES PACKAGE	CAPILLARITY PACKAGE	FLUID PROPERTIES PACKAGE	PHOTOLOG: CORE PHOTOGRAPHY	MOISTURE CONTENT, ASTM D2216	POROSITY: TOTAL, API RP40	POROSITY: EFFECTIVE, ASTM D425M	SPECIFIC GRAVITY, ASTM D854	BULK DENSITY (DRY), API RP40 or ASTM D2937	AIR PERMEABILITY, API RP40	HYDRAULIC CONDUCTIVITY, EPA9100, API RP40, D5084	GRAIN SIZE DISTRIBUTION, ASTM D422/4464M	TOC: WALKLEY-BLACK	ATTERBERG LIMITS, ASTM D4318	OIL PRINT ANALYSIS				COMMENTS
~~P9~~SB04 B-14-15	3/4/10	0930	14-15.0 feet	2		X					X															Two samples 6" core A & B
~~P9~~SB04 B-15.5-16.5		0943	15.5-16.5	2		X					X															core A & B
~~P9~~SB04 B-17-18		1004	17.0-18.0	2		X					X															core A & B
~~P9~~SB04 B-19-19.5		1015	19.0-19.5	1		X					X															core A
~~P9~~SB04 B-NAPL	↓	1207		1						X												X				in a separate small bag

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
COMPANY: Treadwell & Rollo, Inc.	COMPANY: PTS Labs Inc	COMPANY:	COMPANY:
DATE: 3/4/10 TIME:	DATE: 3/5/10 TIME: 11:07.	DATE: TIME:	DATE: TIME:

PTS Laboratories
PTS File No.: 40109



11.0

Each Interval Equals One Tenth of a Foot

12.0

Project: Pier 70 Boring ID: P9SB10-11
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109

12.0

Each Interval Equals One Tenth of a Foot

13.0

Project: Pier 70 Boring ID: P9SB10-11
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109

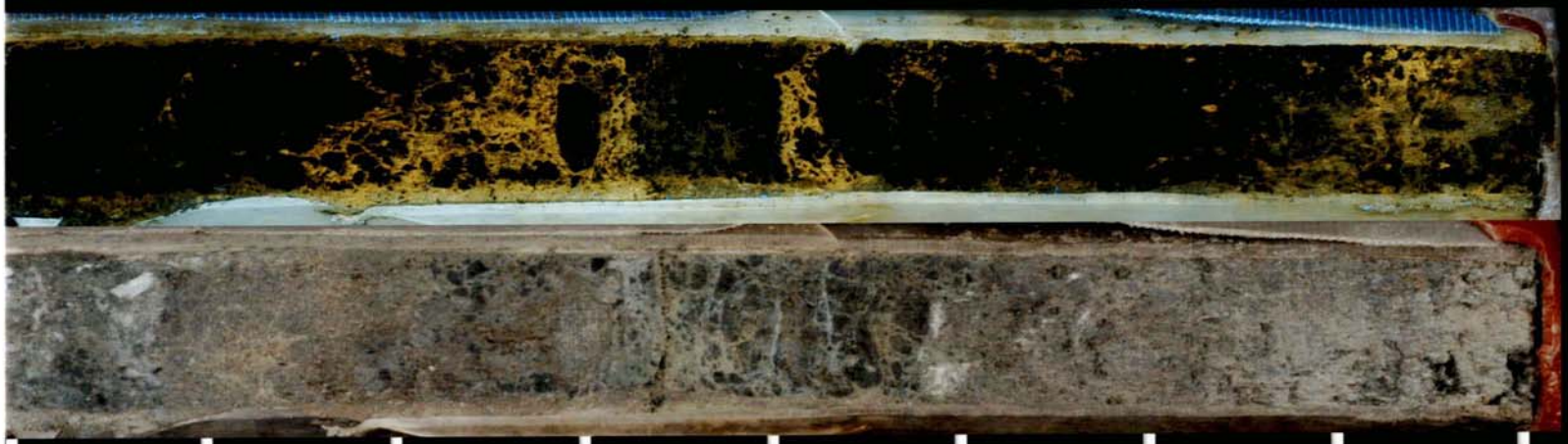
13.0

Each Interval Equals One Tenth of a Foot

14.0

Project: Pier 70 Boring ID: P9SB10-11
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109



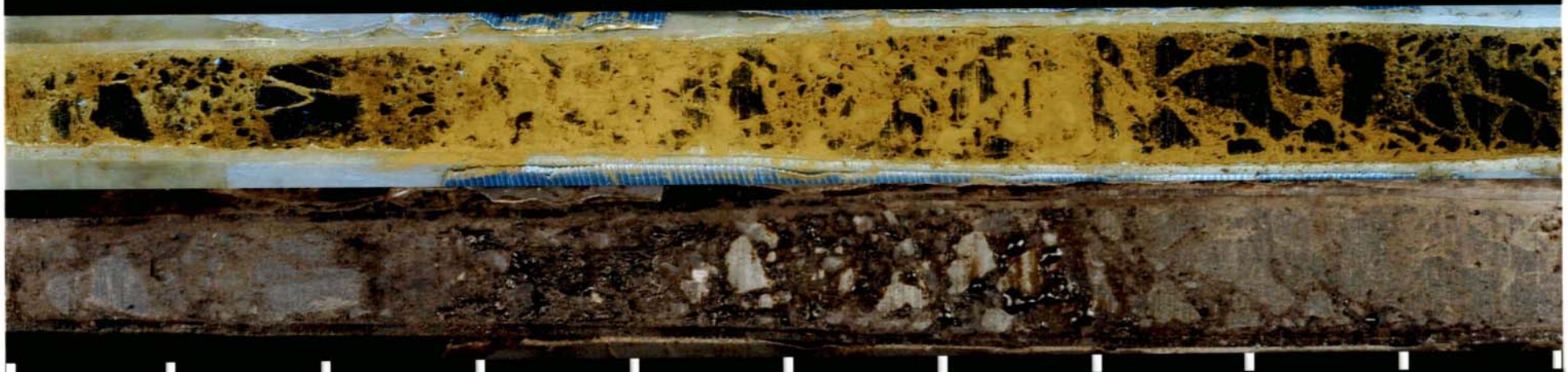
14.0

Each Interval Equals One Tenth of a Foot

15.0

Project: Pier 70 Boring ID: P9SB10-11
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109



12.0

Each Interval Equals One Tenth of a Foot

13.0

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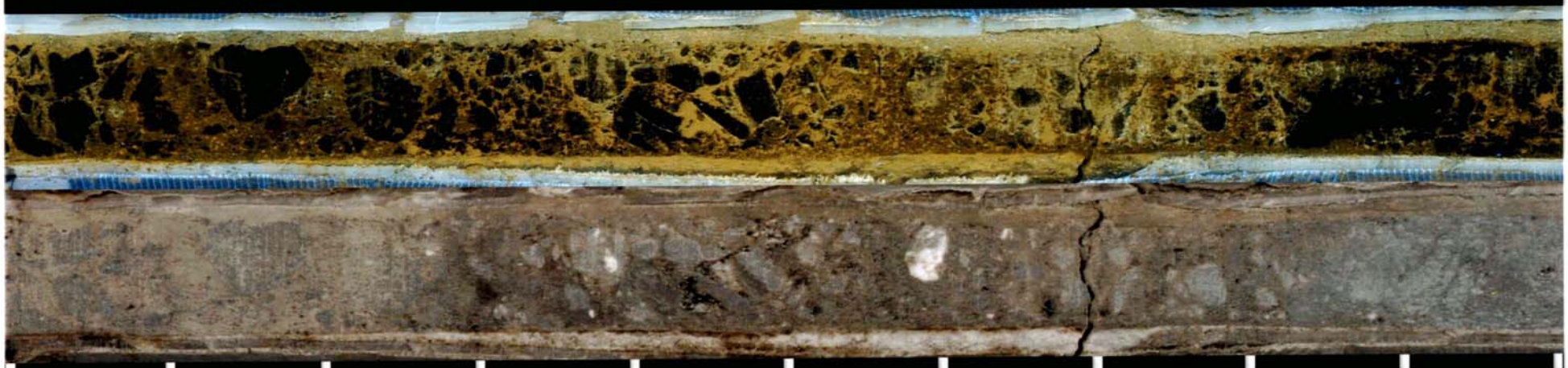
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109



13.0

Each Interval Equals One Tenth of a Foot

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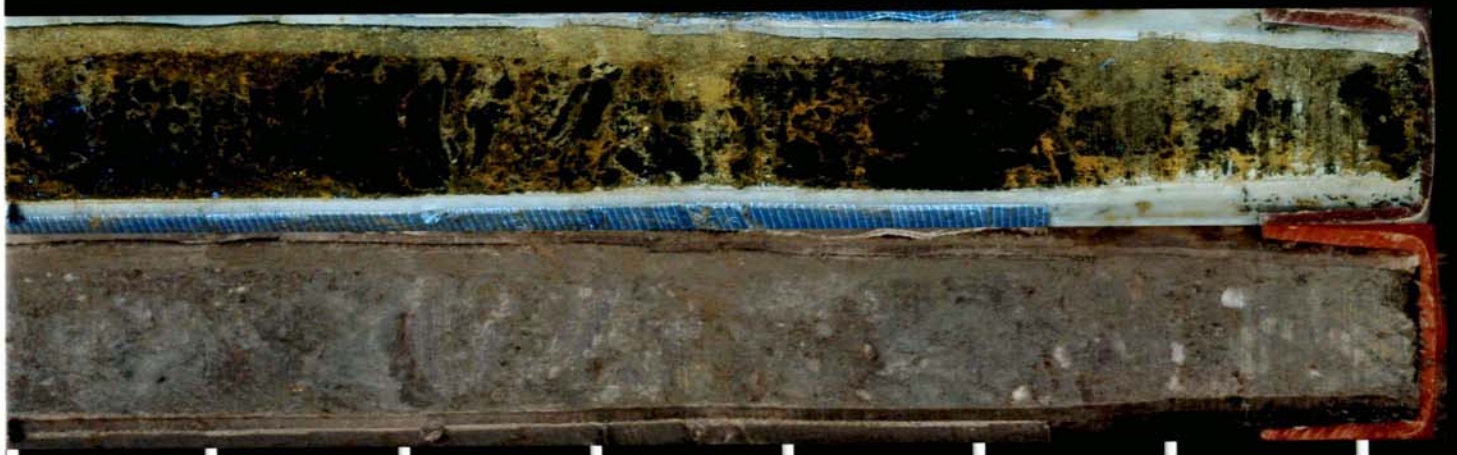
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109



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Each Interval Equals One Tenth of a Foot

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Project: Pier 70 Boring ID: P9SB04-12-14
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109

13.0

Each Interval Equals One Tenth of a Foot

14.0

Project: Pier 70 Boring ID: P9SB06-13
Project No.: 4963.01

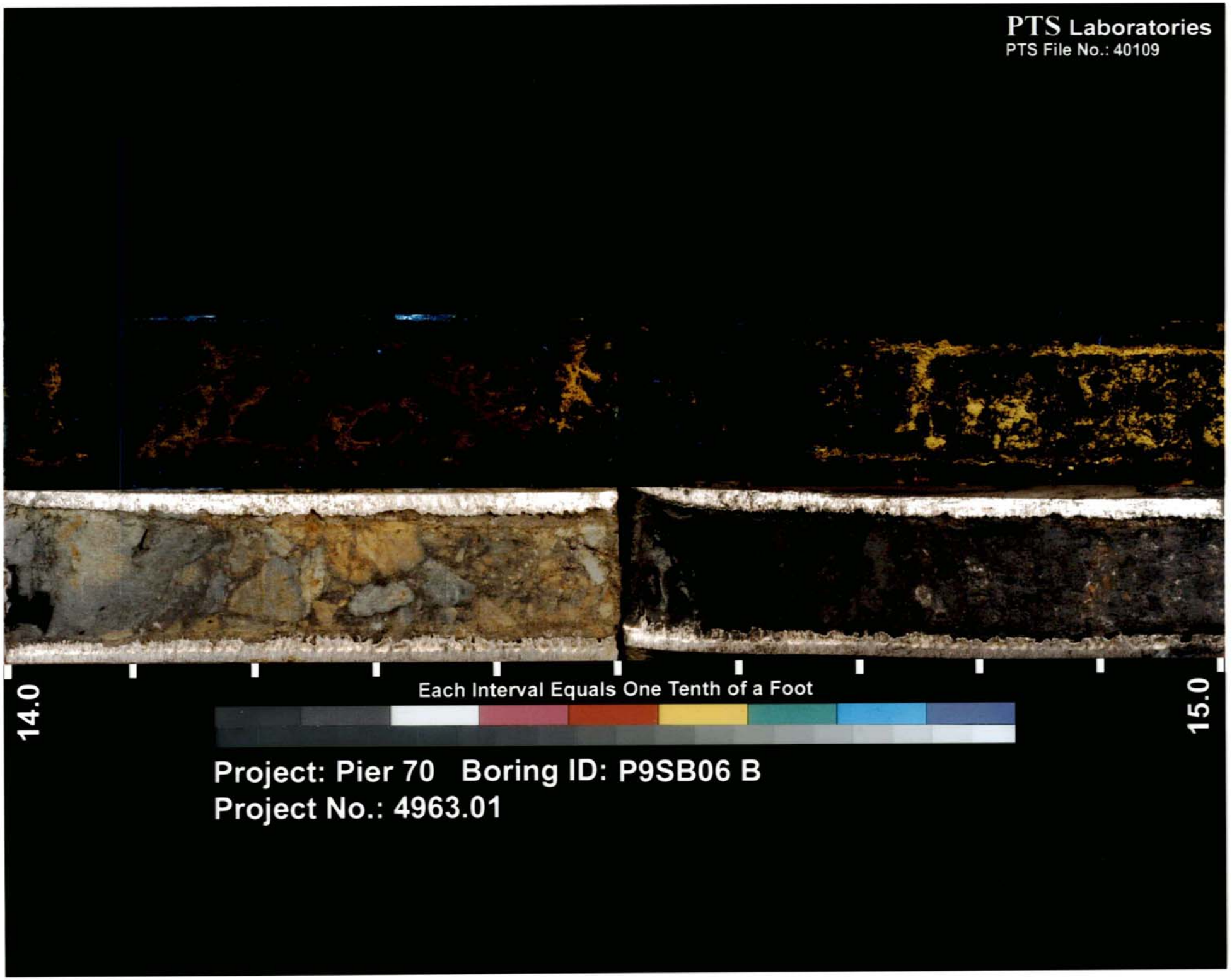
PTS Laboratories
PTS File No.: 40109

14.0

Each Interval Equals One Tenth of a Foot

15.0

Project: Pier 70 Boring ID: P9SB06-13
Project No.: 4963.01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Each Interval Equals One Tenth of a Foot
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Project: Pier 70 Boring ID: P9SB06 B
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109

15.0

Each Interval Equals One Tenth of a Foot

16.0

Project: Pier 70 Boring ID: P9SB06 B
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109

16.0

Each Interval Equals One Tenth of a Foot

17.0

Project: Pier 70 Boring ID: P9SB06 B
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109

Project: Pier 70 Boring ID: P9SB06 B
Project No.: 4963.01

PTS Laboratories
PTS File No.: 40109

19.0

Each Interval Equals One Tenth of a Foot

20.0

Project: Pier 70 Boring ID: P9SB06 B
Project No.: 4963.01

APPENDIX K
NAPL Velocity Calculations

1. List of variables / acronyms

d_f	-	fluid travel distance (ft)
g	-	gravitational constant = 32.2 ft/s^2
i	-	groundwater gradient (unitless)
J_w	-	one dimensional groundwater flux rate (ft/d)
k	-	intrinsic permeability (ft^2)
K_d	-	adsorption distribution coefficient (unitless)
Kh	-	saturated hydraulic conductivity (ft/d)
NAPL	-	non-aqueous phase liquid
t	-	travel time (d)
ρ_b	-	bulk soil density (g/cm^3)
ρ_{LNAPL}	-	LNAPL density (g/cm^3)
ρ_{water}	-	water density = (1 g/cm^3 at 4^{0}C)
$\dot{\eta}_f$	-	dynamic fluid viscosity (lb/ft^2)

2. Units

d	-	days
ft	-	feet
ft/d	-	feet per day
ft/s^2	-	feet per second squared
g/cm^3	-	grams per cubic centimeter

3. Estimation of Kh_{LNAPL}

Kh_{LNAPL} was calculated based on the following equation[1]:

$$Kh_{LNAPL} = \frac{k \cdot \rho_{LNAPL} \cdot g}{\eta_{LNAPL}} \quad (1)$$

where ρ_{LNAPL}, the density of the LNAPL and $\dot{\eta}_{LANPL}$, the fluid density of the LNAPL were estimated by laboratory analysis of field LNAPL samples. k, the intrinsic permeability is a media specific parameter and was calculated after estimation of the Kh_{water} using equation (1):

$$k = \frac{Kh_{water} \cdot \eta_{water}}{\rho_{water} \cdot g} \quad (2)$$

Kh_{water} was estimated using results from PTS analytical laboratory data from soil borings P9SB04, P9SB06and P9SB-10.

[1] Freeze, R.A., J.A. Cherry, 1979. Groundwater. Prentice Hall, Englewood Cliffs, NJ.

4. Estimation of LNAPL travel distance

The travel distance was estimated using Darcy's Law and an estimated release period of 100 years. The estimated travel distance is assumed to be based on horizontal flow of LNAPL on top of the groundwater table and therefore is assumed to follow a hydraulic gradient that can be approximated using the horizontal shallow groundwater gradient. Flow of LNAPL is assumed to occur as simple piston flow (i.e. no diffusion or dispersion). Using Darcy's Law, for one-dimensional flow, the travel distance (d) was calculated using the following equation[1]:

$$J_w = -Kh_{LNAPL} \cdot i \quad (3)$$

where J_w is the one dimensional flux rate. The groundwater gradient was calculated based on an average gradient of historical data from the shallow groundwater zone. The travel distance is:

$$d_{LNAPL} = J_w \cdot t \quad (4)$$

where t is assumed to be 100 years (36,500 days).

Table K-1
NAPL Hydraulic Conductivity Values
Pier 70 Environmental Site Investigation
San Francisco, California

	Boring	Sample Depth feet bgs	K (cm/s) Hydraulic conductivity of Water	K (ft/d)	k (m^2) Intrinsic Permeability	Kh NAPL (ft/d) Hydraulic conductivity of NAPL
	P9SB10-11	12.2	3.11E-04	**0.88**	**3.18E-10**	**7.50E-05**
	P9SB10-11	13.2	1.28E-03	**3.63**	**1.31E-09**	**3.09E-04**
	P9SB04-12-14	12.6	1.43E-03	**4.05**	**1.46E-09**	**7.15E-04**
	P9SB04-12-14	13.5	6.84E-06	**0.02**	**6.99E-12**	**3.41E-06**
	P9SB06B-14-15	14.2	2.08E-04	**0.59**	**2.13E-10**	**5.02E-05**
	P9SB06B-15.5-16.5	16.1	1.48E-03	**4.20**	**1.51E-09**	**3.57E-04**
					Average KhNAPL	**2.51E-04**

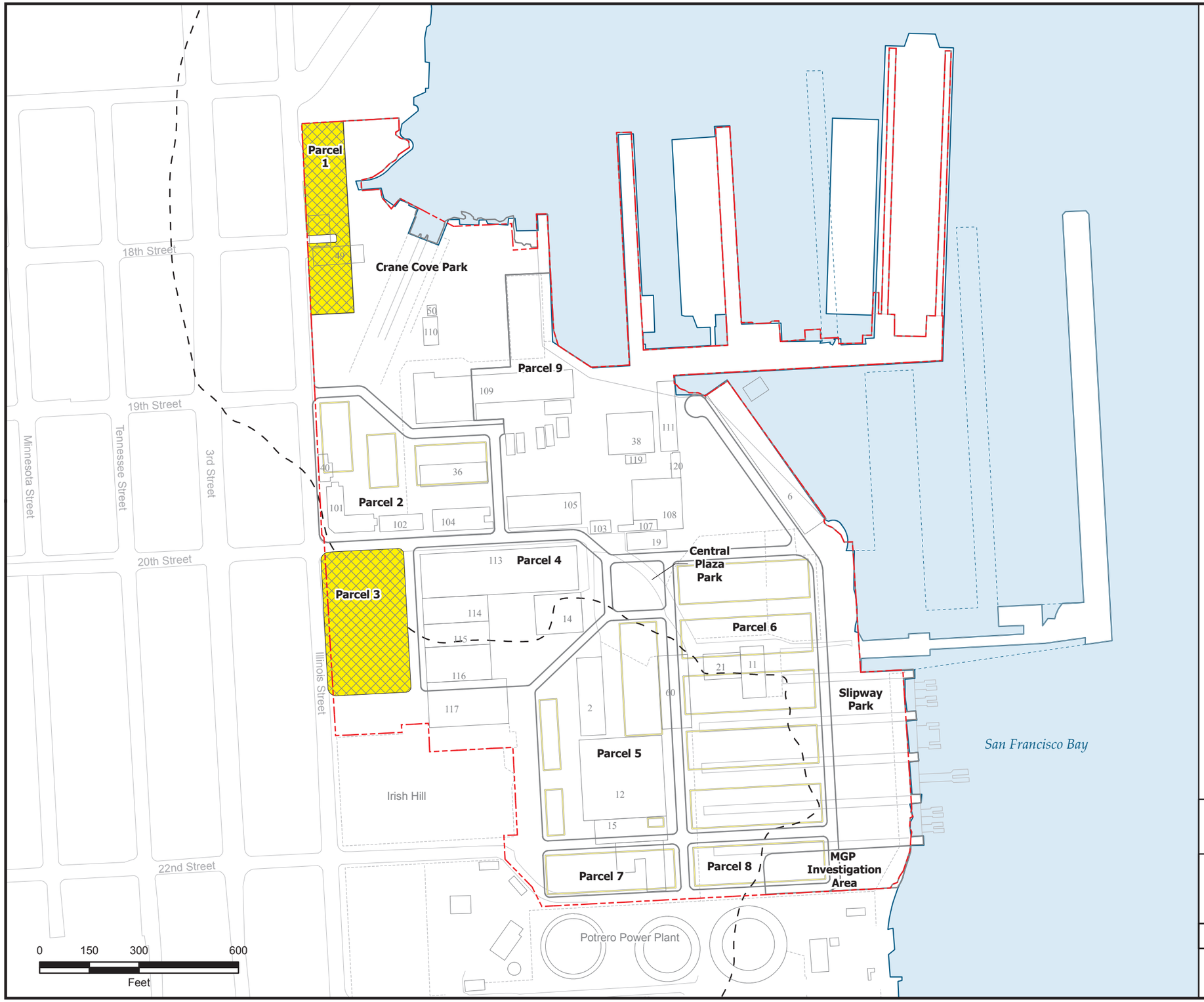
Notes:
K values from PTS Laboratory Data
bgs below ground surface
cm/s - cenitmeter per secon
ft/d - foot per day
m^{2} - meter squared

Treadwell&Rollo
A LANGAN COMPANY

APPENDIX L

Human Health Risk Assessment

Figures
Tables (on CD-ROM)
Attachment L.1 Raw Data (on CD-ROM)
Attachment L.2 ProUCL Input/output Files and Exposure Point Concentrations (on CD-ROM)



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N

Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Lead Exposure Point Concentration > 80 mg/kg
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

1. Parcel 2, Parcels 4-9, MGP Investigation area, Central Plaza Park, Crane Cove Park, and Slipway Park not evaluated for an outdoor resident.

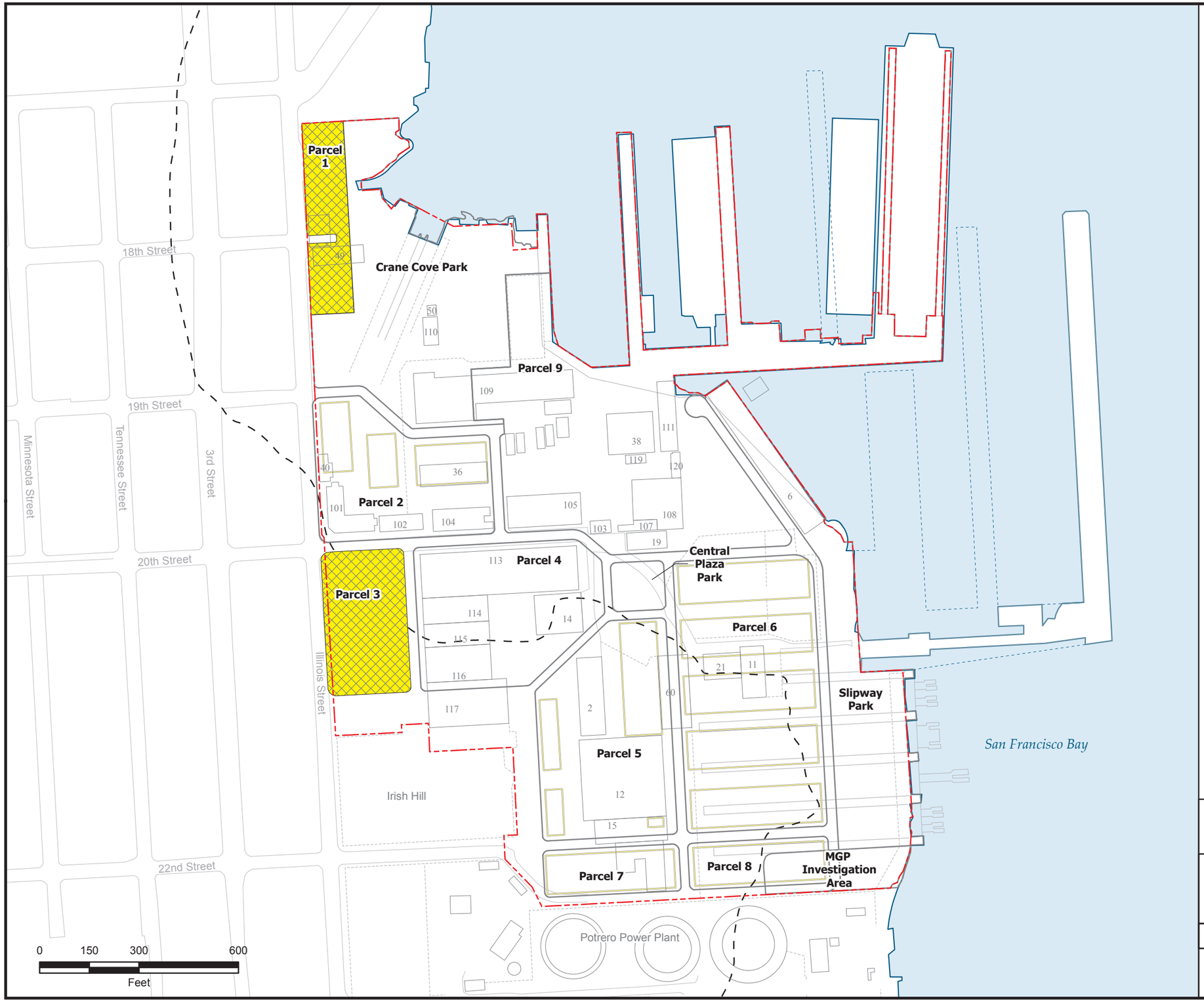
2. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

TOTAL RISK SUMMARY OUTDOOR RESIDENT

Date 7/20/2010	Project 4963.01	Figure L-1

Treadwell&Rollo



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Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Lead Exposure Point Concentration > 80 mg/kg
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

1. Parcel 2, Parcels 4-9, MGP Investigation area, Central Plaza Park, Crane Cove Park, and Slipway Park not evaluated for an outdoor resident.

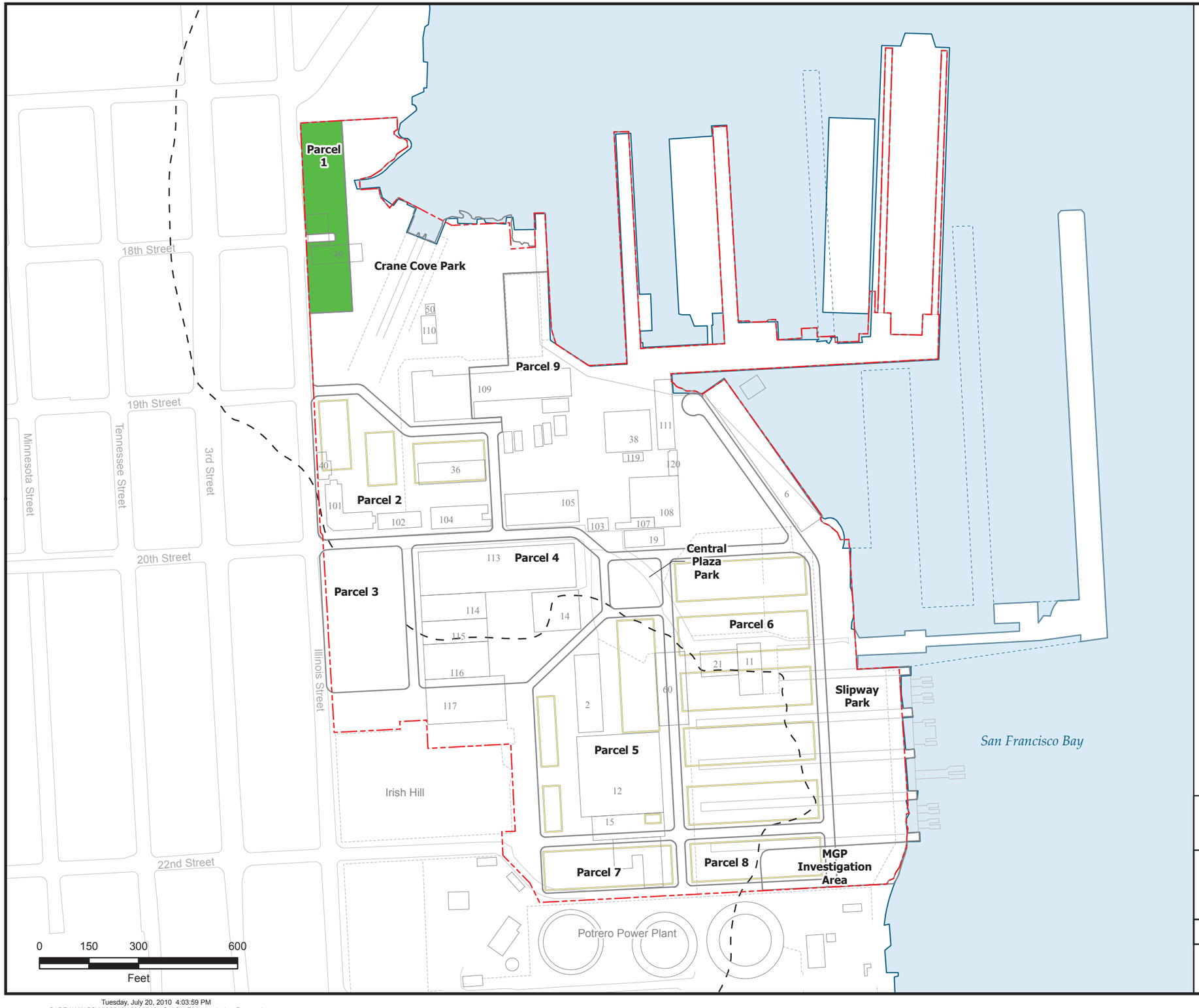
2. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

SOIL RISK SUMMARY
OUTDOOR RESIDENT

Date 7/20/2010	Project 4963.01	Figure L-2

Treadwell&Rollo



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Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

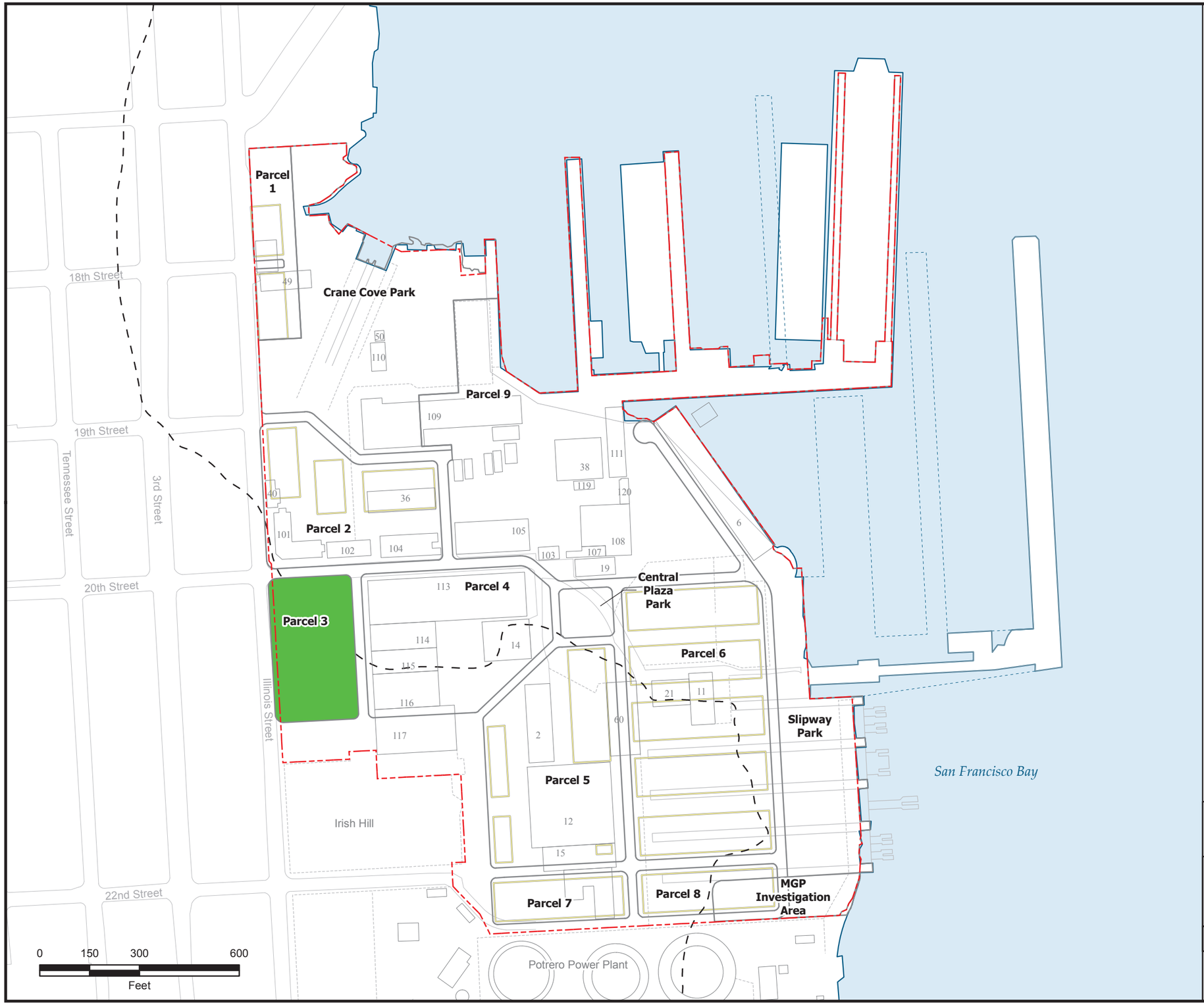
1. Parcel 3 was not evaluated for soil gas because no COPCs were detected.
2. Parcel 2, Parcels 4-9, MGP Investigation area, Central Plaza Park, Crane Cove Park, and Slipway Park not evaluated for an indoor resident.
3. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

SOIL GAS RISK SUMMARY INDOOR RESIDENT

Date 6/15/2010	Project 4963.01	Figure L-3

Treadwell&Rollo



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Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

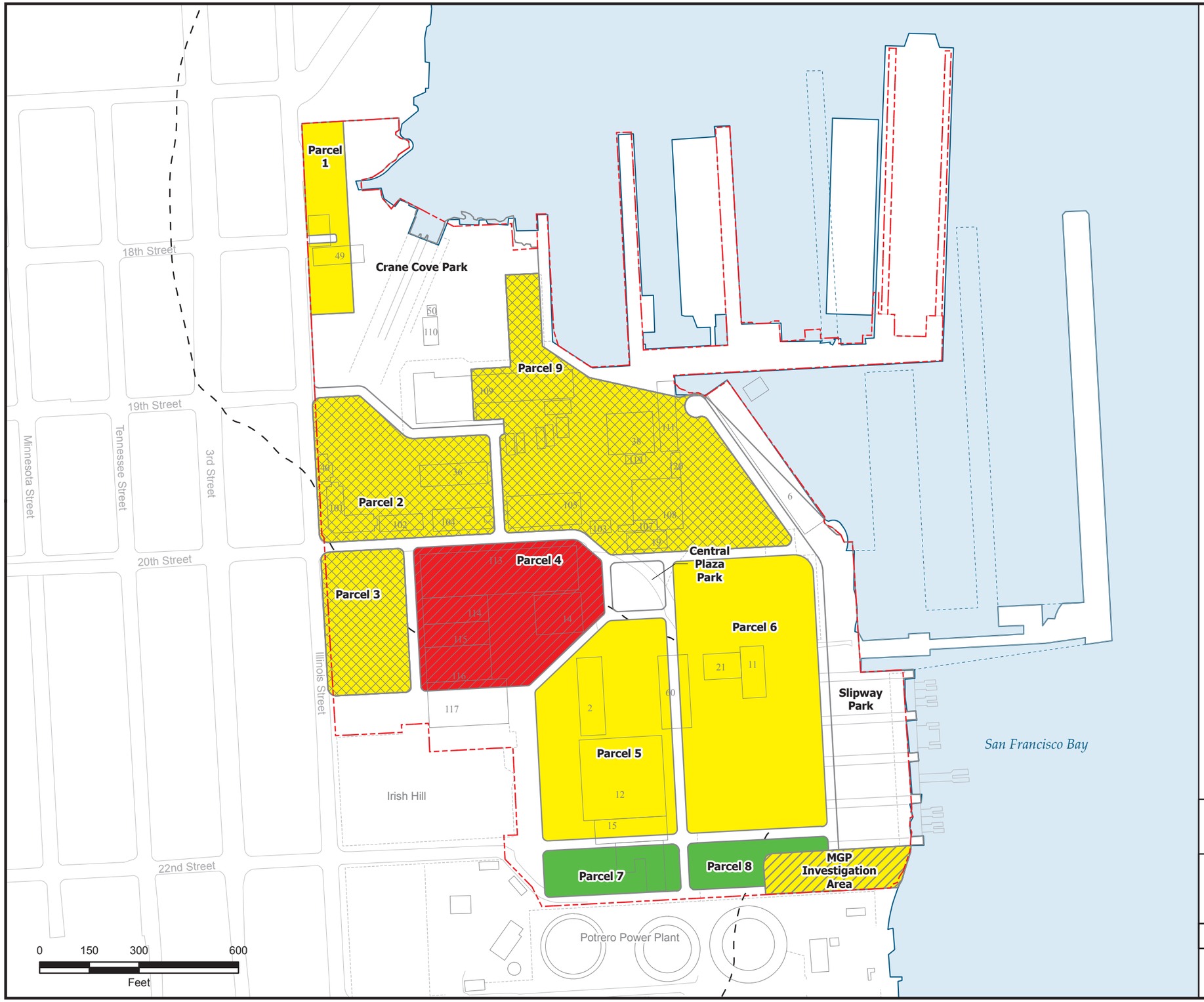
1. Groundwater data not available for parcel 1.
2. Parcel 2, Parcels 4-9, MGP Investigation area, Central Plaza Park, Crane Cove Park, and Slipway Park not evaluated for an indoor resident.
3. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

GROUNDWATER RISK SUMMARY INDOOR RESIDENT

Date 6/15/2010	Project 4963.01	Figure L-4

Treadwell&Rollo



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Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Lead Exposure Point Concentration > 320 mg/kg
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

1. Central Plaza Park, Crane Cove Park, and Slipway Park not evaluated for a commercial worker.

2. MGP Investigation Area = Historical manufactured

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

TOTAL RISK SUMMARY COMMERCIAL WORKER

Date 6/15/2010	Project 4963.01	Figure L-5

Treadwell&Rollo

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Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Lead Exposure Point Concentration > 320 mg/kg
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

1. Soil data not available for Parcel 8.
2. Central Plaza Park, Crane Cove Park, and Slipway Park not evaluated for an outdoor commercial worker.
3. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

SOIL RISK SUMMARY OUTDOOR COMMERCIAL WORKER

Date 6/15/2010	Project 4963.01	Figure L-6

Treadwell&Rollo

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N

Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

1. Soil gas data not available for Parcel 7.
2. Parcel 3 was not evaluated because no COPCs were detected.
3. Parcel 5 was not evaluated for cancer risk because COPCs detected are not carcinogens.
4. Central Plaza Park, Crane Cove Park, and Slipway Park not evaluated for an indoor commercial worker.
5. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

SOIL GAS RISK SUMMARY
INDOOR COMMERCIAL WORKER

Date 6/15/2010	Project 4963.01	Figure L-7

Treadwell&Rollo

Wednesday, June 16, 2010 12:39:11 PM
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Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

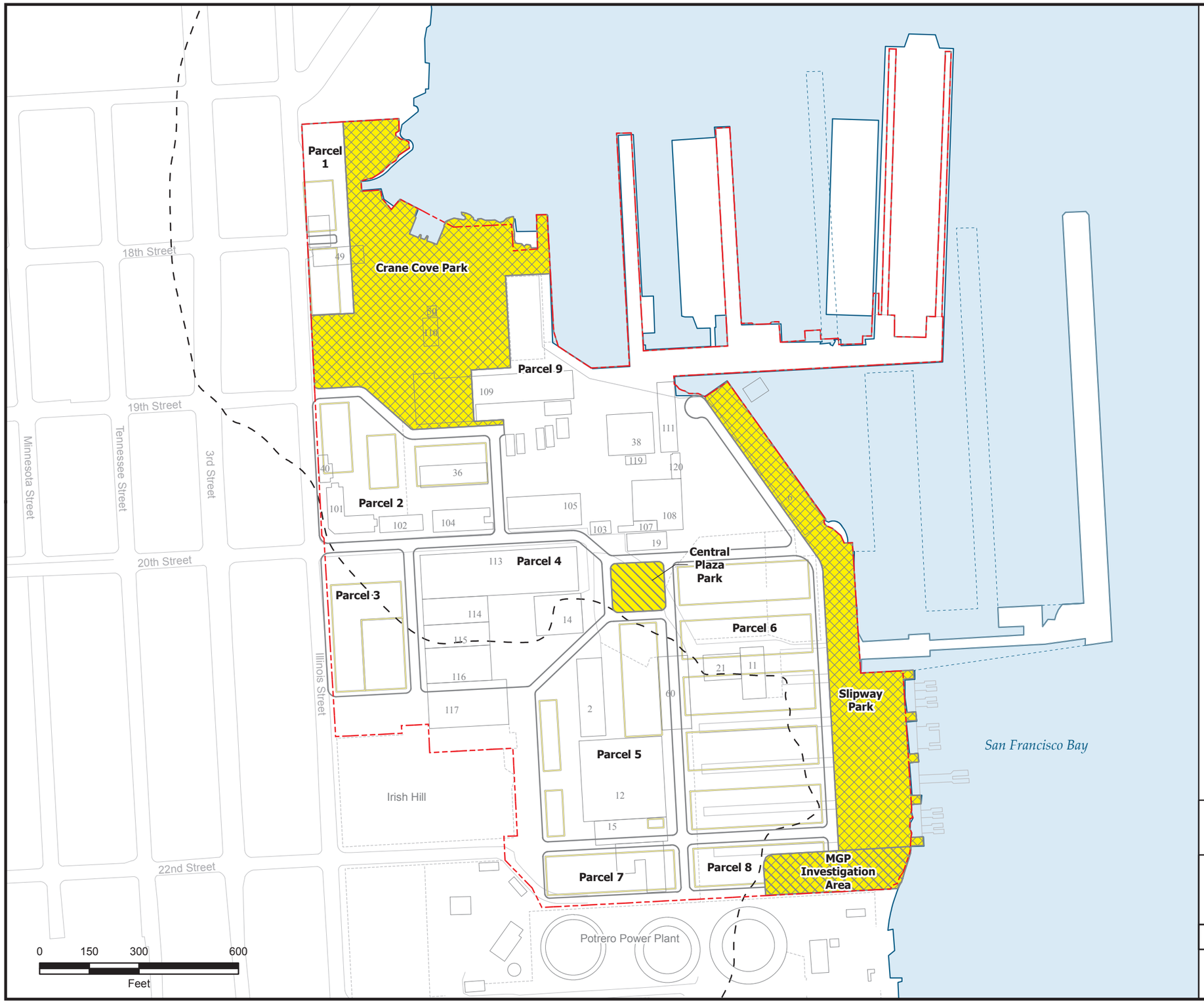
1. Groundwater data not available for Parcel 1, Parcel 5, and Parcel 7.
2. Central Plaza Park, Crane Cove Park, and Slipway Park not evaluated for an indoor commercial worker.
3. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

GROUNDWATER RISK SUMMARY INDOOR COMMERCIAL WORKER

Date 6/15/2010	Project 4963.01	Figure L-8

Treadwell&Rollo



Monday, July 26, 2010 4:45:13 PM
Q:\DRAWINGS\0323512a\0323512a-TotalRiskmap-RecreationalVisitor.mxd

N

Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Lead Exposure Point Concentration >80 mg/kg
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

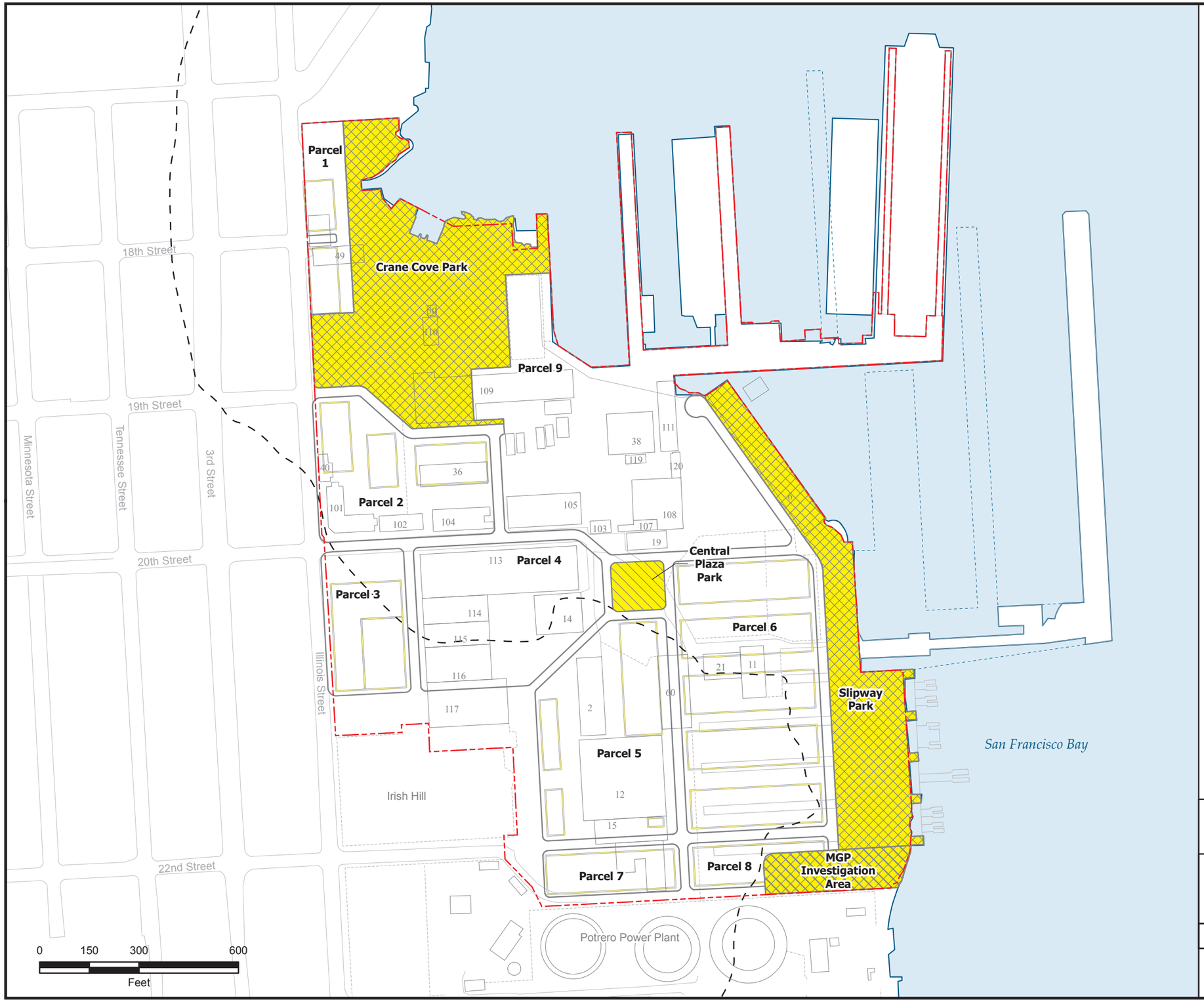
1. Parcels 1-9 were not evaluated for a recreational visitor.
2. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

TOTAL RISK SUMMARY RECREATIONAL VISITOR

Date 6/15/2010	Project 4963.01	Figure L-9

Treadwell&Rollo



Tuesday, July 20, 2010 4:45:18 PM
Q:\DRAWINGS\0323512a\0323512a-SoilRiskmap-RecreationalVisitor.mxd

Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Lead Exposure Point Concentration >80 mg/kg
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

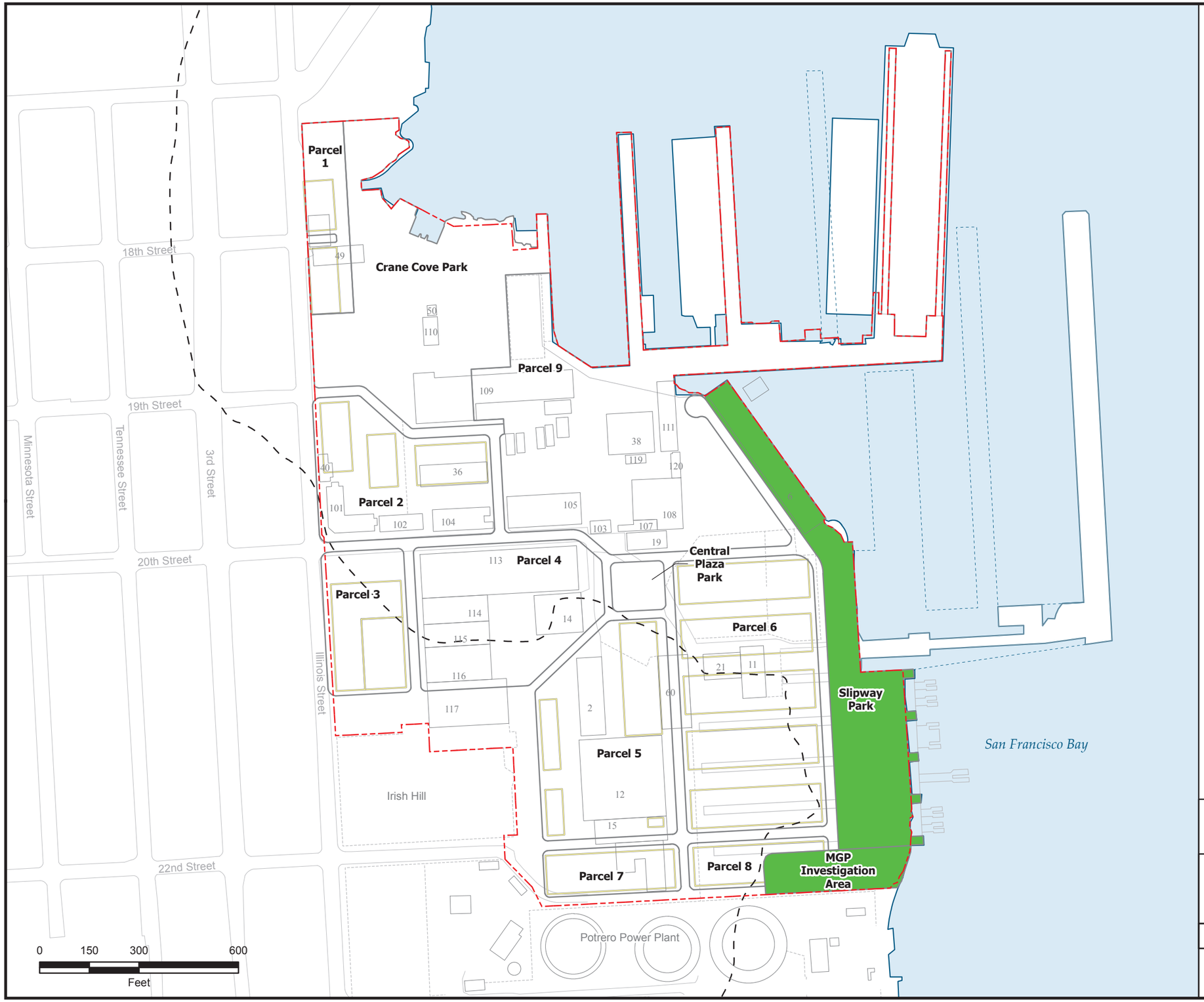
1. Parcels 1-9 were not evaluated for a recreational visitor.
2. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

SOIL RISK SUMMARY RECREATIONAL VISITOR

Date 6/15/2010	Project 4963.01	Figure L-10

Treadwell&Rollo



Friday, July 23, 2010 12:19:03 PM
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N

Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

1. Soil gas data not available for Crane Cove Park and Central Plaza Park.
2. Parcels 1-9 were not evaluated for a recreational visitor.
3. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

SOIL GAS RISK SUMMARY RECREATIONAL VISITOR

Date 6/15/2010	Project 4963.01	Figure L-11

Treadwell&Rollo

Friday, July 23, 2010 5:59:32 PM
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Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

Notes:

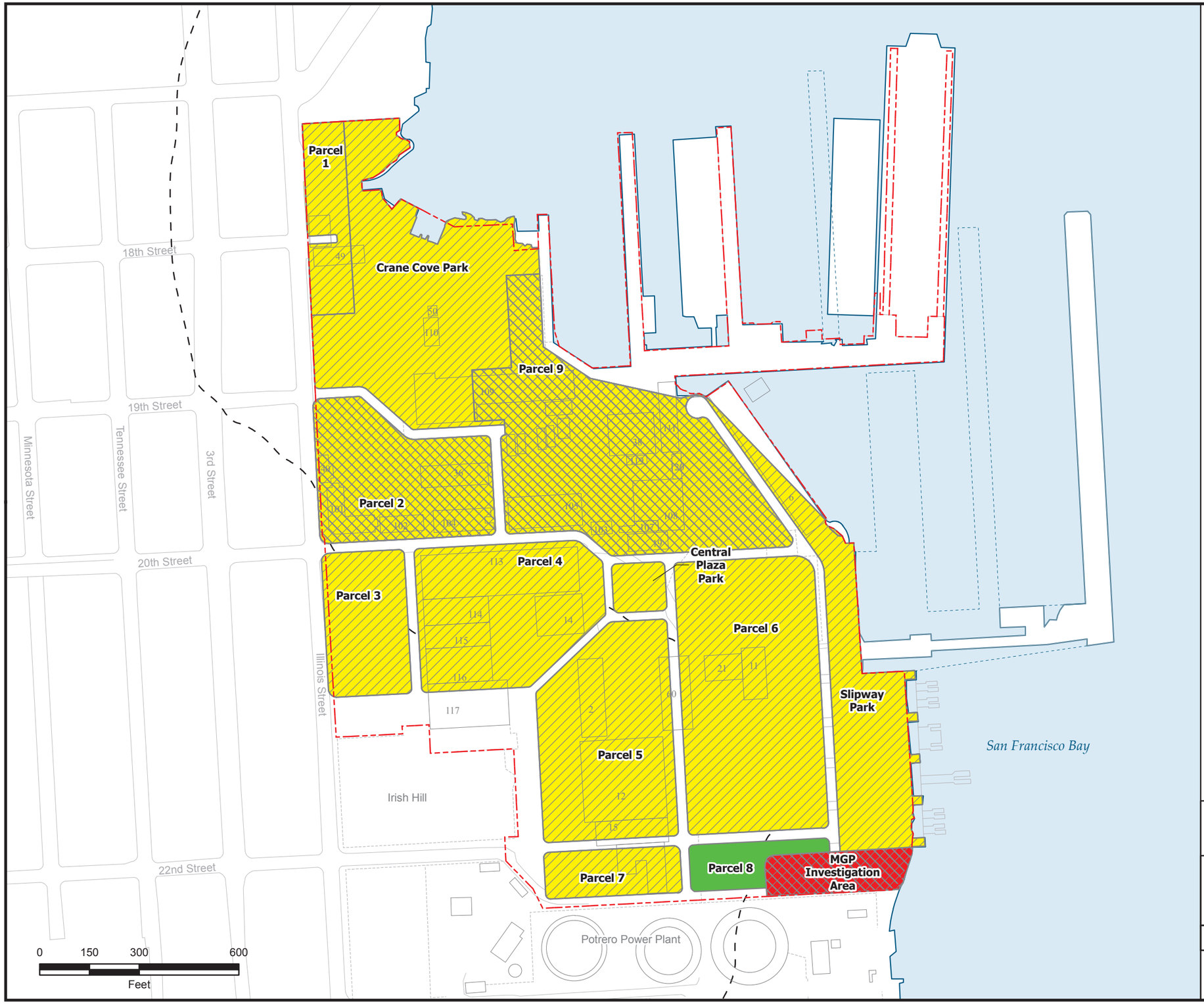
1. Parcels 1-9 were not evaluated for a recreational visitor.
2. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

GROUNDWATER RISK SUMMARY RECREATIONAL VISITOR

Date 6/15/2010	Project 4963.01	Figure L-12

Treadwell&Rollo



Tuesday, July 20, 2010 4:49:46 PM
Q:\DRAWINGS\0323512a\0323512a-SOILRISKmap-Const-worker.mxd

N

Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Lead Exposure Point Concentration >800 mg/kg in the 0-10 feet depth interval
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTE:

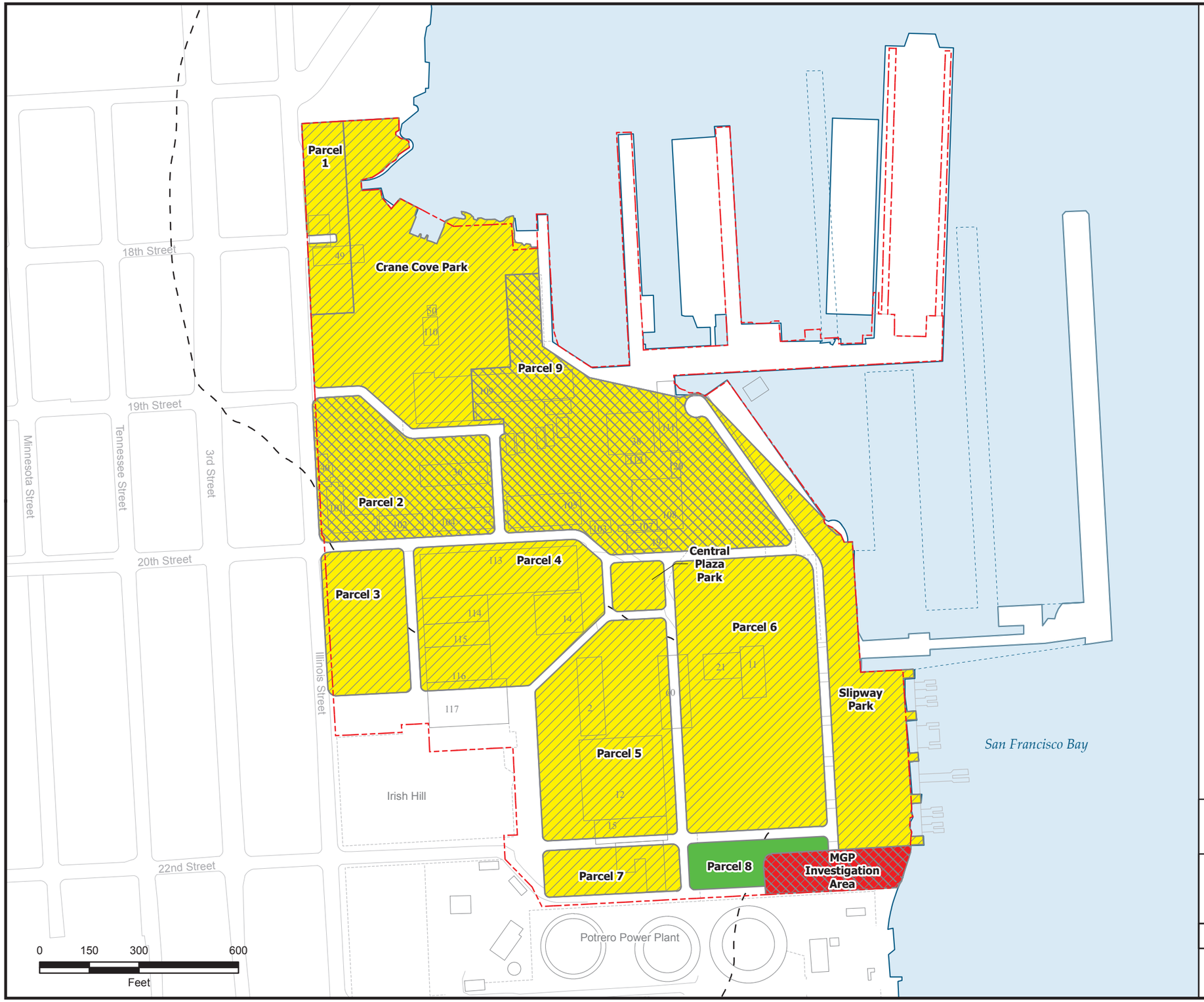
MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

TOTAL RISK SUMMARY CONSTRUCTION WORKER

Date 6/15/2010	Project 4963.01	Figure L-13

Treadwell&Rollo



Tuesday, July 20, 2010 4:49:46 PM
Q:\DRAWINGS\0323512a\0323512a-SOILRISKmap-Const-worker.mxd

Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Lead Exposure Point Concentration > 800 mg/kg
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTE:

MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

SOIL RISK SUMMARY CONSTRUCTION WORKER

Date 6/15/2010	Project 4963.01	Figure L-14

Treadwell&Rollo

Friday, July 23, 2010 5:52:13 PM
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N

Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area
- Pile-Supported Structure Over Water

- Hazard Index >1
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

Note:

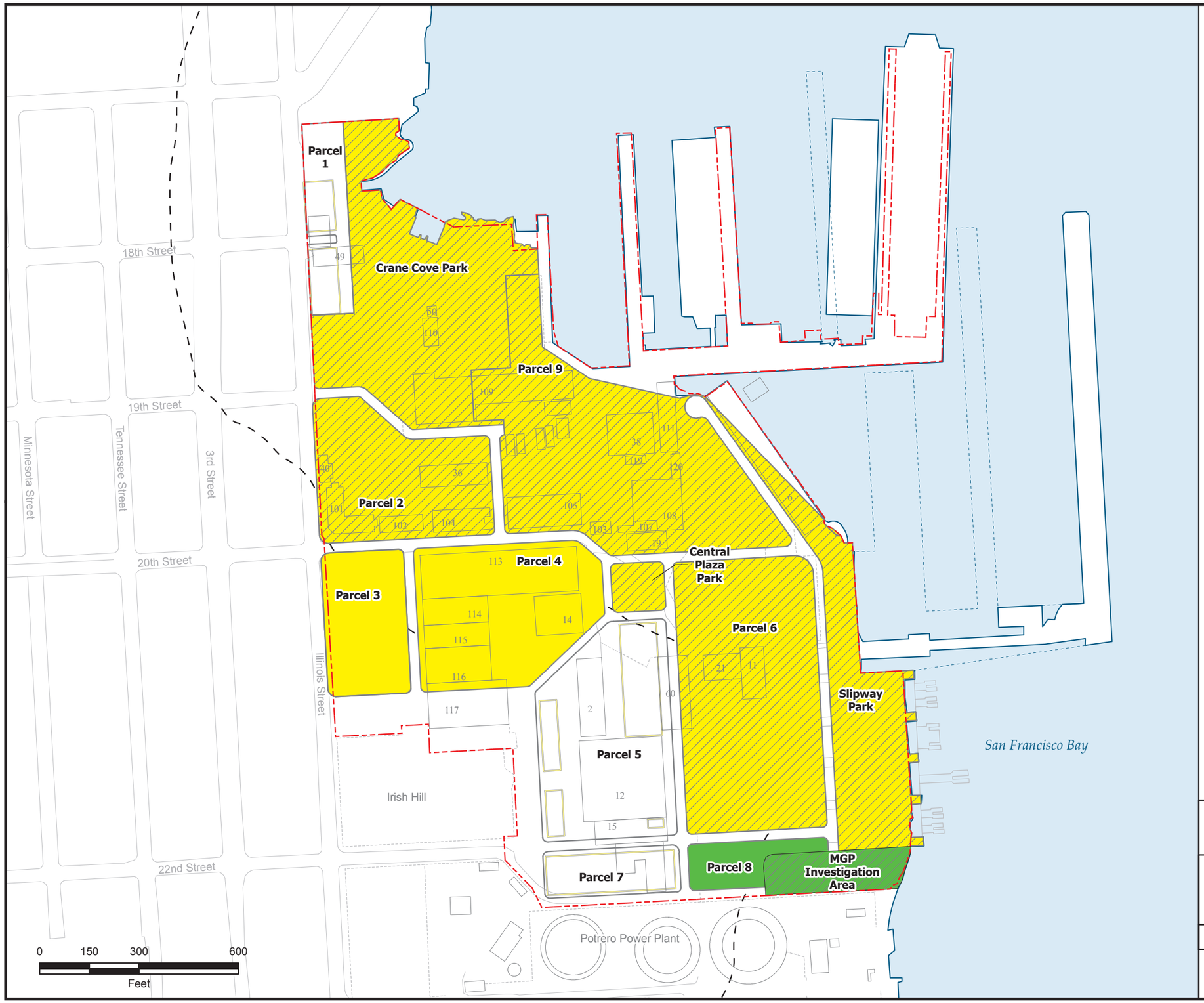
1. Soil gas data not available for Crane Cove Park, Central Plaza Park, and Parcel 7.
2. Parcel 3 was not evaluated because no COPCs were detected.
3. Parcel 5 was not evaluated for cancer risk because COPCs detected are not carcinogens.
4. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

SOIL GAS RISK SUMMARY CONSTRUCTION WORKER

Date 6/15/2010	Project 4963.01	Figure L-15

Treadwell&Rollo



Tuesday, June 15, 2010 4:56:14 PM
Q:\DRAWINGS\0323512a\0323512a-gwRiskmap-costWorker.mxd

N

Legend

Surface Feature
- Fence
- Other
- Approximate 1869 Shoreline
- Road Edge
- Building
- Proposed Building
- Pier 70 Site Area

- Hazard Index >1
- Cancer Risk < 1:1,000,000
- Cancer Risk Range > 1:1,000,000 to 1:10,000
- Cancer Risk > 1:10,000

NOTES:

1. Groundwater data not available for Parcels 1, 5, and 7.

2. MGP Investigation Area = Historical manufactured gas plant (MGP) subsurface investigation area.

PIER 70 ENVIRONMENTAL SITE INVESTIGATION
San Francisco, California

GROUNDWATER RISK SUMMARY CONSTRUCTION WORKER (WET TRENCH)

Date 6/15/2010	Project 4963.01	Figure L-16

Treadwell&Rollo

TABLE L-1
Chemicals of Potential Concern (COPCs)
Pier 70 Master Plan Area
San Francisco, California

Chemical	CAS #	Environmental Media		
		Soil Gas	Soil	Groundwater
Volatile Organic Compounds (VOCs)				
Acetone	67-64-1	X	X	X
Benzene	71-43-2	X	X	X
Bromobenzene	108-86-1			X
2-Butanone	78-93-3	X	X	X
Butylbenzene	104-51-8		X	
sec-Butylbenzene	135-98-8			X
tert-Butylbenzene	98-06-6			X
Carbon Disulfide	75-15-0	X	X	X
Carbon Tetrachloride	56-23-5		X	
Chloroform	67-66-3	X	X	X
Chloromethane	74-87-3		X	X
Cumene	98-82-8			X
Cyclohexane	110-82-7		X	
p-Cymene	99-87-6		X	X
Dichlorodifluoromethane	75-71-8	X		
1,1-Dichloroethane	75-34-3			X
1,2-Dichloroethane	107-06-2		X	
1,1-Dichloroethene	75-35-4			X
trans-1,3-Dichloropropene	10061-02-6		X	
1,1-Difluoroethane	75-37-6	X		
Ethanol	64-17-5	X		
Ethylbenzene	100-41-4	X	X	X
4-Ethyltoluene	622-96-8	X		
2-Hexanone	591-78-6		X	
Methyl Acetate	79-20-9		X	
Methyl tert-butyl ether	1634-04-4			X
4-Methyl-2-pentanone	108-10-1		X	
Methylcyclohexane	108-87-2		X	
Methylene Chloride	75-09-2		X	X
n-Propylbenzene	103-65-1		X	X
Tetrachloroethene	127-18-4	X	X	
Toluene	108-88-3	X	X	X
1,1,1-Trichloroethane	71-55-6	X	X	
Trichloroethene	79-01-6	X	X	
Trichlorofluoromethane	75-69-4	X	X	
1,2,4-Trimethylbenzene	95-63-6	X	X	X
1,3,5-Trimethylbenzene	108-67-8	X		
Vinyl Acetate	108-05-4	X	X	

TABLE L-1
Chemicals of Potential Concern (COPCs)
Pier 70 Master Plan Area
San Francisco, California

Chemical	CAS #	Environmental Media		
		Soil Gas	Soil	Groundwater
m,p-Xylene	106-42-3	X	X	X
o-Xylene	95-47-6	X	X	X
Xylenes (total)	1330-20-7		X	X
Semi-Volatile Organic Compounds (SVOCs)				
Acenaphthene	83-32-9		X	X
Acenaphthylene	208-96-8		X	X
Anthracene	120-12-7		X	X
Benzo(a)anthracene	56-55-3		X	X
Benzo(a)pyrene	50-32-8		X	X
Benzo(b)fluoranthene	205-99-2		X	X
Benzo(g,h,i)perylene	191-24-2		X	X
Benzo(k)fluoranthene	207-08-9		X	X
bis(2-Ethylhexyl)phthalate	117-81-7		X	X
Butylbenzylphthalate	85-68-7		X	
Chrysene	218-01-9		X	X
Dibenz(a,h)anthracene	53-70-3		X	X
Fluoranthene	206-44-0		X	X
Fluorene	86-73-7		X	X
Indeno(1,2,3-cd)pyrene	193-39-5		X	X
2-Methylnaphthalene	91-57-6		X	
Naphthalene	91-20-3	X	X	X
4-Nitrophenol	100-02-7			X
Phenanthrene	85-01-8		X	X
Pyrene	129-00-0		X	X
Pesticides/Polychlorinated Biphenyls				
Aroclor 1254	11097-69-1		X	
Aroclor 1260	1-26-0		X	
gamma-Chlordane	5566-34-7		X	
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6		X	
Endosulfan I	959-98-8		X	
Heptachlor epoxide	1024-57-3		X	
beta-Hexachlorocyclohexane	319-85-7		X	
Metals				
Aluminum	7429-90-5		X	X
Antimony	7440-36-0		X	X
Arsenic	7440-38-2		X	X
Barium	7440-39-3		X	X
Beryllium	7440-41-7		X	X
Boron	7440-42-8			X

TABLE L-1
Chemicals of Potential Concern (COPCs)
Pier 70 Master Plan Area
San Francisco, California

Chemical	CAS #	Environmental Media		
		Soil Gas	Soil	Groundwater
Cadmium	7440-43-9		X	X
Chromium (total)	7440-47-3		X	X
Chromium VI	18540-29-9		X	
Cobalt	7440-48-4		X	X
Copper	7440-50-8		X	X
Cyanide (total)	57-12-5		X	X
Iron	7439-89-6		X	X
Lead	7439-92-1		X	X
Manganese	7439-96-5		X	X
Mercury	7439-97-6		X	X
Molybdenum	7439-98-7		X	X
Nickel	7440-02-0		X	X
Selenium	7782-49-2		X	X
Silver	7440-22-4		X	X
Thallium	7440-28-0		X	X
Tin	7440-31-5		X	
Vanadium	7440-62-2		X	X
Zinc	7440-66-6		X	X
Total Petroleum Hydrocarbons (TPH)				
TPH-Diesel	tphd		X	X
TPH-Gasoline	tphg	X	X	X
TPH-Residual (Oil and Grease)	tphr		X	X

Notes:
X = Chemical was detected in specified media

TABLE L-2
Intake Equations for Exposure via Inhalation of Vapors
Pier 70 Master Plan Area
San Francisco, California

VAPOR INHALATION EXPOSURE FACTOR

$$IF = \frac{TF \times EF \times ED \times ET}{CF \times AT}$$

IF = Inhalation Intake Factor, (micrograms [ug]/liter [L])/(ug/L) for soil gas or (milligrams [mg]/m3)/(mg/L) for ground water
TF = Transfer Factor, (micrograms [ug]/liter [L])/(ug/L) for soil gas or (milligrams [mg]/m^3)/(mg/L) for ground water [a]
EF = Exposure Frequency, days/year
ED = Exposure Duration, years
ET = Exposure Time, hours/day
CF = Conversion factor, 24 hours/day
AT = Averaging Time, days

Notes:
[a] Soil Gas and groundwater transfer factors are presented in Tables L-14 and L-15, respectively.

TABLE L-3
Intake Equations for Exposure via Inhalation of Windblown Soil Particulates
Pier 70 Master Plan Area
San Francisco, California

INTAKE FACTOR FOR EXPOSURE VIA INHALATION OF WINDBLOWN SOIL PARTICULATES

$$IF = \frac{EF \times ED \times ET}{PEF \times CF \times AT}$$

IF = Inhalation Intake Factor, milligram per cubic meter per milligram per kilogram $(mg/m^3)/(mg/kg)$
PEF = Particulate Emission Factor, (milligram [mg]/m^3)/(mg/kg)
EF = Exposure Frequency, days/year
ED = Exposure Duration, years
ET = Exposure Time, hours/day
CF = Conversion factor, 24 hours/day
AT = Averaging Time, days

TABLE L-4
Intake Equations for Exposure via Incidental Ingestion of Soil
Pier 70 Master Plan Area
San Francisco, California

SOIL INGESTION INTAKE FACTOR
NONCARCINOGENS:

$$IF = \frac{IR \times CF \times EF \times ED}{BW \times AT}$$

IF	=	Ingestion Intake Factor, kilograms (kg) soil/kg body weight-day
IR	=	Ingestion Rate, milligrams (mg)/day
CF	=	Conversion Factor, kg/mg
EF	=	Exposure Frequency, days/year
ED	=	Exposure Duration, years
BW	=	Body weight, kg
AT	=	Averaging Time, days

SOIL INGESTION INTAKE FACTOR
CARCINOGENS (Age Adjusted):

$$IF_{age\text{-}adj} = \frac{IR_{child} \times CF \times EF_{child} \times ED_{child}}{BW_{child} \times AT} + \frac{IR_{adult} \times CF \times EF_{adult} \times ED_{adult}}{BW_{adult} \times AT}$$

$IF_{age\text{-}adj}$	=	Ingestion Intake Factor, age-adjusted, kilograms (kg) soil/kg body weight-day
IR_{child}	=	Ingestion Rate, Child, mg/day
IR_{adult}	=	Ingestion Rate, Adult, mg/day
CF	=	Conversion Factor, kg/mg
EF_{child}	=	Child Exposure Frequency, days/year
EF_{adult}	=	Adult Exposure Frequency, days/year
ED_{child}	=	Child Exposure Duration, years
ED_{adult}	=	Adult Exposure Duration, years
BW_{child}	=	Child Body Weight, kg
BW_{adult}	=	Adult Body Weight, kg
AT	=	Averaging Time, days

TABLE L-5
Intake Equations for Exposure via Dermal Contact with Soil
Pier 70 Master Plan Area
San Francisco, California

SOIL DERMAL INTAKE FACTOR
NONCARCINOGENS:

$$IF = \frac{SA \times AF \times ABS \times CF \times EF \times ED}{BW \times AT}$$

IF	=	Dermal Intake Factor, kilogram (kg) soil/kg body weight-day
SA	=	Surface Area of Exposed Skin, square centimeters (cm^2)/day
AF	=	Soil-to-Skin Adherence Factor, milligrams (mg)/cm^2
ABS	=	Absorption Factor (unitless)[a]
CF	=	Conversion Factor, kg/mg
EF	=	Exposure Frequency, days/year
ED	=	Exposure Duration, years
BW	=	Body weight, kg
AT	=	Averaging Time, days

SOIL DERMAL INTAKE FACTOR
CARCINOGENS (Age Adjusted):

$$IF_{age\text{-}adj} = \frac{SA_{child} \times AF_{child} \times ABS \times CF \times EF_{child} \times ED_{child}}{BW_{child} \times AT} + \frac{SA_{adult} \times AF_{adult} \times ABS \times CF \times EF_{adult} \times ED_{adult}}{BW_{adult} \times AT}$$

$IF_{age\text{-}adj}$	=	Dermal Intake Factor, age-adjusted, kg soil/kg body weight-day
SA_{child}	=	Surface Area of Exposed Skin, Child, cm^2/day
SA_{adult}	=	Surface Area of Exposed Skin, Adult, cm^2/day
AF_{child}	=	Soil-to-Skin Adherence Factor, Child, mg/cm^2
AF_{adult}	=	Soil-to-Skin Adherence Factor, Adult, mg/cm^2
ABS	=	Absorption Factor (unitless)[a]
CF	=	Conversion Factor, kg/mg
EF_{child}	=	Child Exposure Frequency, days/year
EF_{adult}	=	Adult Exposure Frequency, days/year
ED_{child}	=	Child Exposure Duration, years
ED_{adult}	=	Adult Exposure Duration, years
BW_{child}	=	Child Body Weight, kg
BW_{adult}	=	Adult Body Weight, kg
AT	=	Averaging Time, days

Notes:

[a] Soil absorption factors are presented in Table L-9.

TABLE L-6
Intake Equations for Exposure via Ingestion of Water
Pier 70 Master Plan Area
San Francisco, California

WATER INGESTION INTAKE FACTOR
NONCARCINOGENS:

$$IF = \frac{IR \times EF \times ED}{BW \times AT}$$

IF = Ingestion Intake Factor, liters water/kilogram (kg) body weight-day
IR = Ingestion Rate, liters/day
EF = Exposure Frequency, days/year
ED = Exposure Duration, years
BW = Body weight, kg
AT = Averaging Time, days

WATER INGESTION INTAKE FACTOR
CARCINOGENS (Age Adjusted):

$$IF = \frac{IR_{child} \times EF_{child} \times ED_{child}}{BW_{child} \times AT} + \frac{IR_{adult} \times EF_{adult} \times ED_{adult}}{BW_{adult} \times AT}$$

$IF_{age\text{-}adj}$ = Ingestion Intake Factor, age-adjusted, liters water/kg body weight-day
IR_{child} = Ingestion Rate, Child, liters/day
IR_{adult} = Ingestion Rate, Adult, liters/day
EF_{child} = Child Exposure Frequency, days/year
EF_{adult} = Adult Exposure Frequency, days/year
ED_{child} = Child Exposure Duration, years
ED_{adult} = Adult Exposure Duration, years
BW_{child} = Child Body Weight, kg
BW_{adult} = Adult Body Weight, kg
AT = Averaging Time, days

TABLE L-7
Intake Equations for Exposure via Dermal Contact with Water
Pier 70 Master Plan Area
San Francisco, California

WATER DERMAL INTAKE FACTOR
NONCARCINOGENS:

$$IF = \frac{SA \times PC \times CF \times ET \times EF \times ED}{BW \times AT}$$

IF	=	Dermal Intake Factor, liters water/kilogram (kg) body weight-day
SA	=	Surface Area of Exposed Skin, square centimeters (cm^2)
PC	=	Dermal Permeability Constant, cm/hour[a]
CF	=	Conversion Factor, liters/ cubic centimeters (cm^3)
ET	=	Exposure Time, hours/event
EF	=	Exposure Frequency, events/year
ED	=	Exposure Duration, years
BW	=	Body weight, kg
AT	=	Averaging Time, days

WATER DERMAL INTAKE FACTOR
CARCINOGENS (Age Adjusted):

$$IF_{age\text{-}adj} = \frac{SA_{child} \times PC \times CF \times ET_{child} \times EF_{child} \times ED_{child}}{BW_{child} \times AT} + \frac{SA_{adult} \times PC \times CF \times ET_{adult} \times EF_{adult} \times ED_{adult}}{BW_{adult} \times AT}$$

$IF_{age\text{-}adj}$	=	Dermal Intake Factor, age-adjusted, liters water/kg body weight-day
SA_{child}	=	Surface Area of Exposed Skin, Child, cm^2
SA_{adult}	=	Surface Area of Exposed Skin, Child, cm^2
PC	=	Dermal Permeability Constant, cm/hour[a]
CF	=	Conversion Factor, liters/cm^3
ET_{child}		Child Exposure Time, hours/event
ET_{adult}		Adult Exposure Time, hours/event
EF_{child}	=	Child Exposure Frequency, events/year
EF_{adult}	=	Adult Exposure Frequency, events/year
ED_{child}	=	Child Exposure Duration, years
ED_{adult}	=	Adult Exposure Duration, years
BW_{child}	=	Child Body Weight, kg
BW_{adult}	=	Adult Body Weight, kg
AT	=	Averaging Time, days

WATER DERMAL EXPOSURE TIME
INORGANIC COMPOUNDS:

$$ET = t_{event}$$

ET	=	Exposure Time, hours/event
t_{event}	=	Event Duration, hours/event

ORGANIC COMPOUNDS:

If $t_{event} \leq t^*$, then: $ET = 2 \times \sqrt{\frac{6\tau_{event} \times t_{event}}{\pi}}$; If $t_{event} > t^*$, then: $ET = \frac{t_{event}}{1+B} + 2\tau_{event}\left(\frac{1+3B+3B^2}{(1+B)^2}\right)$

τ_{event}	=	Lag time per event (hr/event)
t^*	=	Time to reach steady-state (hr) = $2.4\ \tau_{event}$
B	=	Ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless)

Notes:

[a] The chemical-specific parameters, PC (Kp), τevent, and B are presented Table L-10.

TABLE L-8
Exposure Assumptions
Pier 70 Master Plan Area
San Francisco, California

Parameter	Symbol	Potentially Exposed Populations											
		Construction Worker		Commercial Worker		Recreational Park User				Resident			
						Adult		Child		Adult		Child	
Target Risk	TR	1.0E-06		1.0E-06		1.0E-06		1.0E-06		1.0E-06		1.0E-06	
Target Hazard Quotient	HI	1		1		1		1		1		1	
Inhalation of Vapors and Particulates													
Inhalation Rate (m^3/hour)	IRhour	2.5	a	2.5	b	1.6	c	1.2	c	0.83	b	0.42	b
Exposure Time (hours/day)	ET	8	d	8	d	2	e	2	e	24	d	24	d
Inhalation Rate (m^3/day)	IRday	20	a	20	b	3.2	c	2.4	c	20	b	10	b
Particulate Emission Factor (mg/kg)/ (mg/m^3)	PEF	1.4E+06	a	1.3E+09	b	1.3E+09	b	1.3E+09	b	1.3E+09	b	1.3E+09	b
Conversion Factor (hours/day)	CF	24		24		24		24		24		24	
Ingestion of Soil													
Ingestion Rate (mg/day)	IR	330	f	100	b	100	b	200	b	100	b	200	b
Conversion Factor (kg/mg)	CF	1.0E-06		1.0E-06		1.0E-06		1.0E-06		1.0E-06		1.0E-06	
Dermal Contact with Soil													
Surface Area (cm^2/day)	SA	3,300	a	3,300	b	5,700	b	2,800	b	5,700	b	2,800	b
Adherence Factor (mg/cm^2)	AF	0.3	a	0.2	b	0.07	g	0.2	b	0.07	g	0.2	b
Absorption Factor (unitless)	ABS	See Table 10		See Table 10		See Table 10		See Table 10		See Table 10		See Table 10	
Conversion Factor (kg/mg)	CF	1.0E-06		1.0E-06		1.0E-06		1.0E-06		1.0E-06		1.0E-06	
Ingestion of Water													
Ingestion Rate (liters/day)	IR	0.057	h	NC		NC		NC		NC		NC	
Exposure Frequency (days/year)	EF	125	i	NC		NC		NC		NC		NC	
Use Factor (unitless)	UF	1		NC		NC		NC		NC		NC	
Exposure Duration (years)	ED	1	a	NC		NC		NC		NC		NC	
Exposure Duration (years) - Age-Adjusted	$ED_{age-adj}$	NA		NC		NC		NC		NC		NC	
Body Weight (kg)	BW	70	b	NC		NC		NC		NC		NC	
Averaging Time for Carcinogens (days)	AT_c	25,550		NC		NC		NC		NC		NC	
Averaging Time (chronic) for Noncarcinogens (days)	AT_{nc}	365		NC		NC		NC		NC		NC	
Dermal Contact with Water													
Surface Area (cm^2)	SA	3,300	a	NC		NC		NC		NC		NC	
Dermal Permeability Constant (cm/hour)	PC	See Table 11		NC		NC		NC		NC		NC	
Exposure Time (hours/event)	t_{event}	1	j	NC		NC		NC		NC		NC	
Exposure Frequency (events/year)	EF	125	i	NC		NC		NC		NC		NC	
Exposure Duration (years)	ED	1	a	NC		NC		NC		NC		NC	
Body Weight (kg)	BW	70	b	NC		NC		NC		NC		NC	
Averaging Time for Carcinogens (days)	AT_c	25,550		NC		NC		NC		NC		NC	
Averaging Time (chronic) for Noncarcinogens (days)	AT_{nc}	365		NC		NC		NC		NC		NC	
Conversion Factor ($liters/cm^3$)	CF	0.001		NC		NC		NC		NC		NC	
Population-Specific Assumptions													
Exposure Frequency (days or events/year)	EF	250	a	250	b	156	k	156	k	350	b	350	b
Exposure Duration (years)	ED	1	a	25	b	30	b	6	b	30	b	6	b
Exposure Duration (years) - Age-Adjusted	$ED_{age-adj}$	NA		NA		24	l	6	l	24	l	6	l
Body Weight (kg)	BW	70	b	70	b	70	b	15	b	70	b	15	b
Averaging Time for Carcinogens (days)	AT_c	25,550		25,550		25,550		25,550		25,550		25,550	
Averaging Time (chronic) for Noncarcinogens (days)	AT_{nc}	365		9,125		8,760		2,190		8,760		2,190	

TABLE L-8
Exposure Assumptions
Pier 70 Master Plan Area
San Francisco, California

Notes:
NA = Not applicable; NC = Not calculated

m^3 = cubic meters; mg = milligram; kg = kilogram; cm^2 = square centimeters; cm^3 = cubic centimeters

[a] RWQCB-SF Bay (2008).

[b] Cal/EPA (2005).

[c] Recommended inhalation rates for moderate activity levels for adults and children (Table 5-23, USEPA 1997).

[d] USEPA (1991).

[e] ENVIRON assumed a recreational park user would be at the park for approximately two hours per visit.

[f] USEPA (2002).

[g] Cal/EPA (2000).

[h] ENVIRON assumed an ingestion rate of 0.057 liters (approximately two ounces) of water every day of exposure for the construction worker based on professional judgment.

[i] For the construction worker, it was conservatively assumed that the frequency of direct contact with groundwater would not exceed 50% of the days spent on-site.

[j] ENVIRON conservatively assumed that a worker would be working in a deep trench for approximately one hour during the work day.

[k] Assumes three visits to recreational area per week, 52 weeks per year.

[l] For carcinogens, the 30 year residential and park visitor exposure duration is divided into 6 years of exposure as a 15-kg child and 24 years of exposure as a 70 kg adult.

Sources:

California Environmental Protection Agency (Cal/EPA). 2005. Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties. *Appendix 1. Sacramento, California. January.*

California Environmental Protection Agency (Cal/EPA). 2000. Guidance of the Dermal Exposure Pathway. Memorandum to Human and Ecological Risk Division. January 7 (Draft).

Regional Water Quality Control Board - San Francisco Bay Region (RWQCB-SF). 2008. Screening for Environmental Concerns at Sites with Contaminated Soils and Ground Water. Interim Final. Revised Version. May.

United States Environmental Protection Agency (USEPA). 1997. Exposure Factors Handbook. Volume I - General Factors. EPA/600/P-95/002Fa. August.

United States Environmental Protection Agency (USEPA). 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors". Office of Solid Waste and Emergency Response (OSWER). OSWER Directive 9285.6-03. March 25.

United States Environmental Protection Agency (USEPA). 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Office of Emergency and Remedial Response. OSWER 9355.4-24. December.

TABLE L-9
Dermal Absorption Fraction from Soil
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Absorption Factor (unitless)	Source
Volatile Organic Compounds (VOCs)		
Acetone	0	a
Benzene	0	a
2-Butanone	0	a
Butylbenzene	0	a
Carbon Disulfide	0	a
Carbon Tetrachloride	0	a
Chloroform	0	a
Chloromethane	0	a
Cyclohexane	0	a
p-Cymene	0	a
1,2-Dichloroethane	0	a
trans-1,3-Dichloropropene	0	a
Ethylbenzene	0	a
2-Hexanone	0	a
Methyl Acetate	0	a
4-Methyl-2-pentanone	0	a
Methylcyclohexane	0	a
Methylene Chloride	0	a
n-Propylbenzene	0	a
Tetrachloroethene	0	a
Toluene	0	a
1,1,1-Trichloroethane	0	a
Trichloroethene	0	a
Trichlorofluoromethane	0	a
1,2,4-Trimethylbenzene	0	a
Vinyl Acetate	0	a
m,p-Xylene	0	a
o-Xylene	0	a
Xylenes (total)	0	a
Semi-Volatile Organic Compounds (SVOCs)		
Acenaphthene	0	a
Acenaphthylene	0	a
Anthracene	0	a
Benzo(a)anthracene	0.13	b,c
Benzo(a)pyrene	0.13	b

TABLE L-9
Dermal Absorption Fraction from Soil
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Absorption Factor (unitless)	Source
Benzo(b)fluoranthene	0.13	b,c
Benzo(g,h,i)perylene	0.13	b,c
Benzo(k)fluoranthene	0.13	b,c
bis(2-Ethylhexyl)phthalate	0.1	a
Butylbenzylphthalate	0.1	a
Chrysene	0.13	b,c
Dibenz(a,h)anthracene	0.13	b,c
Fluoranthene	0.13	b,c
Fluorene	0	a
Indeno(1,2,3-cd)pyrene	0.13	b,c
2-Methylnaphthalene	0	a
Naphthalene	0	a
Phenanthrene	0	a
Pyrene	0.13	b,c
Pesticides/Polychlorinated Biphenyls		
Aroclor 1254	0.14	b
Aroclor 1260	0.14	b
gamma-Chlordane	0.04	b
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.002	b
Endosulfan I	0.1	a
Heptachlor epoxide	0.05	b,d
beta-Hexachlorocyclohexane	0.04	a,e
Metals		
Aluminum	0	a
Antimony	0.01	b
Arsenic	0.04	b
Barium	0.01	b
Beryllium	0.01	b
Cadmium	0.001	b
Chromium (total)	0.01	b
Chromium VI	0.01	b
Cobalt	0.01	b
Copper	0.01	b
Cyanide (total)	0	a
Iron	0	a
Lead	0.01	b

TABLE L-9
Dermal Absorption Fraction from Soil
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Absorption Factor (unitless)	Source
Manganese	0	a
Mercury	0.1	b
Molybdenum	0.01	b
Nickel	0.0002	b
Selenium	0.01	b
Silver	0.01	b
Thallium	0.01	b
Tin	0.01	b
Vanadium	0.01	b
Zinc	0.01	b
Total Petroleum Hydrocarbons (TPH)		
Aliphatic C5-C6	0	a,f
Aliphatic >C6-C8	0	a,f
Aliphatic >C8-C10	0	a,f
Aliphatic >C10-C12	0	a,f
Aliphatic >C12-C16	0.1	a,f
Aliphatic >C16-C21	0.1	a,f
Aliphatic >C21-C34	0.1	a,f
Aromatic >C8-C10	0	a,f
Aromatic >C10-C12	0	a,f
Aromatic >C12-C16	0	a,f
Aromatic >C16-C21	0	a,f
Aromatic >C21-C34	0.13	a,f

TABLE L-9
Dermal Absorption Fraction from Soil
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Absorption Factor (unitless)	Source

Notes:

[a] USEPA (2004). A chemical is defined as volatile for the purposes of assigning dermal absorption factors, if its molecular weight is below 200 gram per mole and the Henry's is constant greater than 10^{-5} atmosphere-cubic meter per mole (atm-m^3/mol), except for polycyclic aromatic hydrocarbons. The recommended default value of 0.1 was used for semi-volatile organic compounds.

[b] Cal/EPA (2005).

[c] Value for benzo(a)pyrene used to evaluate nonvolatile polycyclic aromatic hydrocarbons.

[d] Value for lindane used as a surrogate.

[e] Value for Heptachlor used as surrogate.

[f] Nonvolatile aliphatic fractions are classified as semivolatile chemicals, and the nonvolatile aromatic fraction, >C21-C34, is classified as a PAH.

Source:

California Environmental Protection Agency (Cal/EPA). 2005. *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties.* Appendix 1. Sacramento, California. January.

United States Environmental Protection Agency (USEPA). 2004. *Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual. Part E, Supplemental Guidance for Dermal Risk Assessment - Final. EPA/540/R/99/005. Washington, D.C. July.*

TABLE L-10
Dermal Permeability Constants
Pier 70 Master Plan Area
San Francisco, California

Chemical	Molecular Weight	log K_{ow}		K_p (cm/hr)		τ_{event} (hr/event)	B	
Volatile Organic Compounds (VOCs)								
Acetone	58.08	-0.24	a	5.20E-04	b	0.22	0.0	c
Benzene	78.11	2.13	d	1.50E-02	d	0.29	0.1	d
Bromobenzene	157.01	2.99	e	1.97E-02	b	0.80	0.1	c
2-Butanone	72.11	0.29	d	9.60E-04	d	0.27	0.0	d
sec-Butylbenzene	134.22	4.57	e	2.91E-01	b	0.59	1.3	c
tert-Butylbenzene	134.22	4.11	e	1.45E-01	b	0.59	0.6	c
Carbon Disulfide	76.13	2.24	d	1.70E-02	d	0.30	0.1	d
Chloroform	119.38	1.97	d	6.80E-03	d,f	0.50	0.0	d,f
Chloromethane	50.49	0.91	d	3.30E-03	d,f	0.20	0.0	d,f
Cumene	120.19	3.7	a	9.31E-02	b	0.49	0.4	c
p-Cymene	134.22	4.10	e	1.43E-01	b	0.59	0.6	c
1,1-Dichloroethane	98.96	1.79	d	6.70E-03	d,f	0.38	0.0	d,f
1,1-Dichloroethene	96.94	2.13	d	1.20E-02	d,f	0.37	0.0	d,f
Ethylbenzene	106.17	3.15	d	4.90E-02	d	0.42	0.2	d
Methyl tert-butyl ether	88.15	0.94	e	2.12E-03	b	0.33	0.0	c
Methylene Chloride	84.93	1.25	d	3.50E-03	d,f	0.32	0.0	d,f
n-Propylbenzene	120.19	3.69	e	9.17E-02	b	0.49	0.4	c
Toluene	92.14	2.73	d	3.10E-02	d	0.35	0.1	d
1,2,4-Trimethylbenzene	120.20	3.63	e	8.37E-02	b	0.49	0.4	c
m,p-Xylene	106.17	3.2	d,h	5.30E-02	d,h	0.42	0.2	d,h
o-Xylene	106.17	3.2	d,h	5.30E-02	d,h	0.42	0.2	d,h
Xylenes (total)	106.17	3.2	d,h	5.30E-02	d,h	0.42	0.2	d,h
Semi-Volatile Organic Compounds (SVOC								
Acenaphthene	154.21	3.9	a	8.14E-02	b	0.77	0.4	c
Acenaphthylene	152.19	4.1	a	1.13E-01	b	0.75	0.5	c
Anthracene	178.20	4.5	a	1.49E-01	b	1.04	0.8	c
Benzo(a)anthracene	228.30	5.66	d	4.70E-01	d,g	2.03	2.8	d,g
Benzo(a)pyrene	250.00	6.1	d	7.00E-01	d,g	2.69	4.3	d,g
Benzo(b)fluoranthene	252.32	6.12	d	7.00E-01	d,g	2.77	4.3	d,g
Benzo(g,h,i)perylene	276.30	6.6	a	1.02E+00	b	3.70	6.5	c
Benzo(k)fluoranthene	252.30	6.11	e	6.60E-01	b	2.72	4.0	c
bis(2-Ethylhexyl)phthalate	391.00	5.11	d	2.50E-02	d	16.64	0.2	d
Chrysene	228.30	5.66	d	4.70E-01	d,g	2.03	2.8	d,g
Dibenz(a,h)anthracene	278.40	6.84	d	1.50E+00	d,g	3.88	9.7	d,g
Fluoranthene	202.30	4.95	d	2.20E-01	d,g	1.45	1.2	d,g
Fluorene	166.22	4.2	a	1.10E-01	b	0.90	0.5	c
Indeno(1,2,3-cd)pyrene	276.30	6.58	d	1.00E+00	d,g	3.78	6.7	d,g
Naphthalene	128.18	3.3	d	4.70E-02	d	0.56	0.2	d
4-Nitrophenol	139.10	1.91	d	4.80E-03	d	0.64	0.0	d
Phenanthrene	178.23	4.46	d	1.40E-01	d,g	1.06	0.7	d,g
Pyrene	202.26	4.88	e	1.94E-01	b	1.43	1.1	c
Metals								
Aluminum	NA	----		1.00E-03	d,i	----	----	
Antimony	NA	----		1.00E-03	d,i	----	----	
Arsenic	NA	----		1.00E-03	d,i	----	----	

TABLE L-10
Dermal Permeability Constants
Pier 70 Master Plan Area
San Francisco, California

Chemical	Molecular Weight	log K_{ow}		K_p (cm/hr)		τ_{event} (hr/event)	B	
Barium	NA	----		1.00E-03	d,i	----	----	
Beryllium	NA	----		1.00E-03	d,i	----	----	
Boron	NA	----		1.00E-03	d,i	----	----	
Cadmium	NA	----		1.00E-03	d	----	----	
Chromium (total)	NA	----		2.00E-03	d	----	----	
Cobalt	NA	----		4.00E-04	d	----	----	
Copper	NA	----		1.00E-03	d,i	----	----	
Cyanide (total)	NA	----		1.00E-03	d,i	----	----	
Iron	NA	----		1.00E-03	d,i	----	----	
Lead	NA	----		1.00E-04	d	----	----	
Manganese	NA	----		1.00E-03	d,i	----	----	
Mercury	NA	----		1.00E-03	d	----	----	
Molybdenum	NA	----		1.00E-03	d,i	----	----	
Nickel	NA	----		2.00E-04	d	----	----	
Selenium	NA	----		1.00E-03	d,i	----	----	
Silver	NA	----		6.00E-04	d	----	----	
Thallium	NA	----		1.00E-03	d,i	----	----	
Vanadium	NA	----		1.00E-03	d,i	----	----	
Zinc	NA	----		6.00E-04	d	----	----	
Total Petroleum Hydrocarbons (TPH)								
Aliphatic C5-C6	81.00	2.9	j	4.41E-02	b	0.30	0.2	c
Aliphatic >C6-C8	100.00	3.6	j	9.68E-02	b	0.38	0.4	c
Aliphatic >C8-C10	130.00	4.4	j	2.48E-01	b	0.56	1.1	c
Aliphatic >C10-C12	160.00	5.3	j	6.34E-01	b	0.83	3.1	c
Aliphatic >C12-C16	200.00	6.6	j	2.57E+00	b	1.38	14.0	c
Aliphatic >C16-C21	270.00	8.6	j	2.30E+01	b	3.41	145.6	c
Aliphatic >C21-C35	400.00	9.8	j	2.53E+01	b	18.25	194.4	c
Aromatic >C8-C10	120.00	3.2	j	4.15E-02	b	0.49	0.2	c
Aromatic >C10-C12	130.00	3.4	j	4.90E-02	b	0.56	0.2	c
Aromatic >C12-C16	150.00	3.7	j	5.89E-02	b	0.73	0.3	c
Aromatic >C16-C21	190.00	4.1	j	7.34E-02	b	1.22	0.4	c
Aromatic >C21-C35	240.00	5.0	j	1.45E-01	b	2.32	0.9	c

TABLE L-10
Dermal Permeability Constants
Pier 70 Master Plan Area
San Francisco, California

Chemical	Molecular Weight	log K_{ow}	K_p (cm/hr)	τ_{event} (hr/event)	B

Notes:
NA = Not applicable.
cm/hr = centimeters / hour
hr/event = hour per event

[a] USEPA 1996.

[b] Derived K_p value using K_{ow} values following USEPA (2004) guidelines. The equation used to calculate the K_p value is as follows: $\log K_p = -2.80 + 0.66 \log K_{ow} - 0.0056MW$ where: K_{ow} = Octanol/water partition coefficient; and MW = Molecular weight.

[c] Derived τ_{event} and B values following USEPA (2004) guidelines. The equations used are as follows:
$\tau_{event} = 0.105 \times 10^{(0.0056MW)}$ where: MW = Molecular weight.
$B = K_p \times (MW)^{1/2} / 2.6$ where: K_p = Permeability coefficient (cm/hour); and MW = Molecular weight.

[d] USEPA 2004.

[e] USEPA 2008.

[f] The K_p correlation tends to underestimate permeability coefficients for halogenated organic chemicals (USEPA 2004).

[g] The chemical has been determined to be outside the effective prediction domain (USEPA 2004)

[h] m-Xylene was used as a surrogate.

[i] Default dermal permeability coefficient for inorganic compounds (USEPA 2004).

[j] Kow calculated from Koc using the average of the following relationships from Table 4 in TPHWG 1997:
Log Koc = 0.544 log Kow + 1.377
Log Koc = 0.937 log Kow - 0.006
Log Koc = 1.00 log Kow - 0.21
Log Koc = 0.63 log Kow
Log Koc = 0.989 log Kow - 0.346
where: Koc = organic carbon partition coefficient and Kow = octanol/water partition coefficient

Sources:
Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG). 1997. *Selection of Representative TPH Fractions Based on Fate and Transport Considerations.* July.
United States Environmental Protection Agency (USEPA). 1996. *Superfund Chemical Data Matrix.* Office of Emergency and Remedial Response. Washington, D.C. EPA/540/R-96/028. June.
United States Environmental Protection Agency (USEPA). 2004. *Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual. Part E, Supplemental Guidance for Dermal Risk Assessment. Interim. EPA/540/R/99/005. Washington, D.C. July.*
United States Environmental Protection Agency (USEPA). 2008. *EpiSuite Database.* Office of Pollution Prevention Toxics.

TABLE L-11
Intake Factors[a]
Pier 70 Master Plan Area
San Francisco, California

Exposure Pathway	Potentially Exposed Populations					
	Construction Worker	Commercial Worker	Adult Recreational Park User (age-adj)[b]	Child Recreational Park User[b]	Adult Resident (age-adj) [b]	Child Resident [b]
Carcinogenic						
Soil Gas						
Inhalation of Vapors (RfC) [c]	3.26E-03	8.15E-02	1.22E-02	3.05E-03	3.29E-01	8.22E-02
Soil						
Inhalation of Soil Particulates ([mg/m^3]/[mg/kg])	2.25E-09	6.20E-11	9.28E-12	2.32E-12	2.50E-10	6.25E-11
Ingestion of Soil (kg/kg-day)	4.61E-08	3.49E-07	2.09E-07	4.88E-07	4.70E-07	1.10E-06
Dermal Contact with Soil (kg/kg-day) [d]	1.38E-07	2.31E-06	8.35E-07	1.37E-06	1.87E-06	3.07E-06
Groundwater						
Inhalation of Groundwater Vapors - subsurface (RfC) [c]	3.26E-03	8.15E-02	1.22E-02	3.05E-03	3.29E-01	8.22E-02
Ingestion of Groundwater (L/kg-day)	3.98E-06	NC	NC	NC	NC	NC
Dermal Contact with Groundwater (L/kg-day) / (cm/event) [e]	2.31E-04	NC	NC	NC	NC	NC
Noncarcinogenic						
Soil Gas						
Inhalation of Vapors (RfC) [c]	2.28E-01	2.28E-01	3.56E-02	3.56E-02	9.59E-01	9.59E-01
Soil						
Inhalation of Soil Particulates ([mg/m^3]/[mg/kg])	1.58E-07	1.74E-10	2.71E-11	2.71E-11	7.29E-10	7.29E-10
Ingestion of Soil (kg/kg-day)	3.23E-06	9.78E-07	6.11E-07	5.70E-06	1.37E-06	1.28E-05
Dermal Contact with Soil (kg/kg-day) [d]	9.69E-06	6.46E-06	2.44E-06	1.60E-05	5.47E-06	3.58E-05
Groundwater						
Inhalation of Groundwater Vapors - subsurface (RfC) [c]	2.28E-01	2.28E-01	3.56E-02	3.56E-02	9.59E-01	9.59E-01
Ingestion of Groundwater (L/kg-day)	2.79E-04	NC	NC	NC	NC	NC
Dermal Contact with Groundwater (L/kg-day) / (cm/event) [e]	1.61E-02	NC	NC	NC	NC	NC

TABLE L-11
Intake Factors[a]
Pier 70 Master Plan Area
San Francisco, California

Notes:
NC = Not calculated kg = kilogram L = liter RfC = Reference concentration

[a] The values listed in this table are media specific intake factors (e.g., kg soil / kg body weight per day).

[b] For carcinogens, the 30 year residential and recreational exposure durations are divided into six years of exposure as a child and 24 years of exposure as an adult for the age-adjusted scenario. The intake factors associated with the six years of exposure as a child and 24 years of exposure as an adult are summed to calculate the intake factor for the age-adjusted residential and recreational scenarios.

[c] To calculate chemical specific soil gas or groundwater intake factors via inhalation, multiply listed value by chemical specific soil gas-to-air, soil gas-to-air, or soil-to-air transfer coefficient listed in Tables L-14 and L-15, respectively.

[d] To calculate chemical specific intake factors via dermal contact with soil, multiply listed value by chemical specific dermal absorption fraction listed in Table L-9.

[e] To calculate chemical specific intake factors via dermal contact with water, multiply listed value by chemical specific dermal permeability constant and the exposure time (see Tables L-8 and L-10).

TABLE L-12
Physical/Chemical Properties of Volatile Chemicals[a]
Pier 70 Master Plan Area
San Francisco, California

Chemical	Molecular Weight MW (g/mol)	Organic Carbon Partition Coefficient, K_{oc} (cm^3/g)	Diffusivity in Air, D_a (cm^2/s)	Diffusivity in Water, D_w (cm^2/s)	Pure Component Water Solubility, S (mg/L)	Henry's Law Constant at 25° C H (atm-m^3/mol)	Normal Boiling Point, T_B (^oK)	Critical Temperature, T_C (^oK)	Enthalpy of Vaporization at the Normal Boiling Point, ΔHv,b (cal/mol)	Source Notes
Volatile Organic Compounds (VOCs)										
Acetone	58.08	5.75E-01	1.24E-01	1.14E-05	1.00E+06	3.87E-05	329.20	508.10	6955.00	(b)
Benzene	78.11	5.89E+01	8.80E-02	9.80E-06	1.79E+03	5.54E-03	353.24	562.16	7342.00	(b)
Bromobenzene	157.01	2.68E+02	5.40E-02	9.30E-06	4.46E+02	2.47E-03	156.00	----	----	(b)
2-Butanone	72.11	2.30E+00	8.08E-02	9.80E-06	2.23E+05	5.58E-05	352.50	536.78	7480.70	(b)
Butylbenzene	134.22	1.11E+03	5.70E-02	8.12E-06	2.00E+00	1.31E-02	456.46	660.50	9289.93	(b)
sec-Butylbenzene	134.22	9.66E+02	5.70E-02	8.12E-06	3.94E+00	1.39E-02	446.50	679.00	88730.00	(b)
tert-Butylbenzene	134.22	1.00E+03	5.70E-02	8.12E-06	2.95E+01	1.32E-02	169.10	----	----	(c)
Carbon Disulfide	76.13	4.57E+01	1.04E-01	1.00E-05	1.19E+03	3.02E-02	319.00	552.00	6391.00	(b)
Carbon Tetrachloride	153.82	1.74E+02	7.80E-02	8.80E-06	7.93E+02	3.03E-02	349.90	556.60	7127.00	(b)
Chloroform	119.38	3.98E+01	1.04E-01	1.00E-05	7.92E+03	3.66E-03	334.32	536.40	6988.00	(b)
Chloromethane	50.49	2.12E+00	1.26E-01	6.50E-06	5.33E+03	8.80E-03	249.00	416.25	5114.60	(b)
Cumene	120.19	4.89E+02	6.50E-02	7.10E-06	6.13E+01	1.46E-02	425.56	631.10	10335.30	(b)
Cyclohexane	84.16	1.66E+02	8.00E-02	9.10E-06	5.50E+01	1.50E-01	80.70	----	----	(b)
p-Cymene	134.22	1.12E+03	5.70E-02	8.12E-06	2.34E+01	1.10E-02	176.50	----	----	(c)
Dichlorodifluoromethane	120.92	4.57E+02	6.65E-02	9.92E-06	2.80E+02	3.42E-01	243.20	384.95	9421.36	(b)
1,1-Dichloroethane	98.96	3.16E+01	7.42E-02	1.05E-05	5.06E+03	5.61E-03	330.55	523.00	6895.00	(b)
1,2-Dichloroethane	98.96	1.74E+01	1.04E-01	9.90E-06	8.52E+03	9.77E-04	356.65	561.00	7643.00	(b)
1,1-Dichloroethene	96.94	5.89E+01	9.00E-02	1.04E-05	2.25E+03	2.60E-02	304.75	576.05	6247.00	(b)
trans-1,3-Dichloropropene	110.97	7.22E+01	7.82E-02	8.73E-06	2.80E+03	3.55E-03	112.00	----	-----	(d)
1,1-Difluoroethane	66.05	3.50E+01	1.00E-01	1.20E-05	3.20E+03	2.03E-02	-24.90	----	----	(b)
Ethanol	46.07	1.05E+00	1.60E-01	1.60E-05	1.00E+06	5.00E-06	78.20	----	----	(e)
Ethylbenzene	106.17	3.63E+02	7.50E-02	7.80E-06	1.69E+02	7.86E-03	409.34	617.20	8501.00	(b)
4-Ethyltoluene	120.20	7.16E+02	6.50E-02	7.10E-06	7.45E+01	5.01E-03	162.00	----	----	(f)
2-Hexanone	100.16	1.50E+01	7.50E-02	7.80E-06	1.72E+04	9.32E-05	400.75	----	----	(g)
Methyl Acetate	74.09	3.26E+00	1.04E-01	1.00E-05	2.00E+03	1.18E-04	329.80	506.70	7260.08	(b)
Methyl tert-butyl ether	88.15	7.26E+00	1.02E-01	1.05E-05	5.10E+04	6.23E-04	328.30	497.10	6677.66	(b)
4-Methyl-2-pentanone	100.16	9.06E+00	7.50E-02	7.80E-06	1.90E+04	1.38E-04	389.50	571.00	8243.11	(b)
Methylcyclohexane	98.21	7.85E+01	7.35E-02	8.52E-06	1.40E+01	1.03E-01	373.90	572.20	7473.53	(b)
Methylene Chloride	84.93	1.17E+01	1.01E-01	1.17E-05	1.30E+04	2.18E-03	313.00	510.00	6706.00	(b)
n-Propylbenzene	120.19	5.62E+02	6.01E-02	7.83E-06	6.00E+01	1.07E-02	432.20	630.00	9123.00	(b)
Tetrachloroethene	165.83	1.55E+02	7.20E-02	8.20E-06	2.00E+02	1.84E-02	394.40	620.20	8288.00	(b)
Toluene	92.14	1.82E+02	8.70E-02	8.60E-06	5.26E+02	6.62E-03	383.78	591.79	7930.00	(b)
1,1,1-Trichloroethane	133.40	1.10E+02	7.80E-02	8.80E-06	1.33E+03	1.72E-02	347.24	545.00	7136.00	(b)
Trichloroethene	131.39	1.66E+02	7.90E-02	9.10E-06	1.47E+03	1.03E-02	360.36	544.20	7505.00	(b)
Trichlorofluoromethane	137.36	4.97E+02	8.70E-02	9.70E-06	1.10E+03	9.68E-02	296.70	471.00	5998.90	(b)
1,2,4-Trimethylbenzene	120.20	1.35E+03	6.06E-02	7.92E-06	5.70E+01	6.14E-03	442.30	649.17	9368.80	(b)
1,3,5-Trimethylbenzene	120.20	1.35E+03	6.02E-02	8.67E-06	2.00E+00	5.87E-03	437.89	637.25	9321.00	(b)
Vinyl Acetate	86.09	5.25E+00	8.50E-02	9.20E-06	2.00E+04	5.10E-04	345.65	519.13	7800.00	(b)
m,p-Xylene	106.17	3.89E+02	7.69E-02	8.44E-06	1.85E+02	7.64E-03	411.52	616.20	8525.00	(b)
o-Xylene	106.17	3.63E+02	8.70E-02	1.00E-05	1.78E+02	5.18E-03	417.60	630.30	8661.00	(b)
Xylenes (total)	106.17	3.89E+02	7.69E-02	8.44E-06	1.85E+02	7.64E-03	411.52	616.20	8525.00	(h)
Semi-Volatile Organic Compounds (SVOCs)										
Acenaphthene	154.21	7.08E+03	4.21E-02	7.69E-06	3.57E+00	1.55E-04	550.54	803.15	12155.00	(b)
Acenaphthylene	152.19	5.03E+03	4.21E-02	7.69E-06	1.61E+01	1.14E-04	553.20	999.00	----	(i)
Anthracene	178.20	2.35E+04	3.24E-02	7.74E-06	4.34E-02	6.50E-05	555.00	999.00	----	(j)
Benzo(a)anthracene	228.30	----	----	----	----	----	----	----	----	
Benzo(a)pyrene	250.00	----	----	----	----	----	----	----	----	

TABLE L-12
Physical/Chemical Properties of Volatile Chemicals[a]
Pier 70 Master Plan Area
San Francisco, California

Chemical	Molecular Weight MW (g/mol)	Organic Carbon Partition Coefficient, K_{oc} (cm^3/g)	Diffusivity in Air, D_a (cm^2/s)	Diffusivity in Water, D_w (cm^2/s)	Pure Component Water Solubility, S (mg/L)	Henry's Law Constant at 25° C H (atm-m^3/mol)	Normal Boiling Point, T_B (^oK)	Critical Temperature, T_C (^oK)	Enthalpy of Vaporization at the Normal Boiling Point, ΔHv,b (cal/mol)	Source Notes
Benzo(b)fluoranthene	252.32	1.23E+06	2.26E-02	5.56E-06	1.50E-03	1.11E-04	715.90	969.27	17000.00	(b)
Benzo(g,h,i)perylene	276.30	----	----	----	----	----	----	----	----	
Benzo(k)fluoranthene	252.30	----	----	----	----	----	----	----	----	
bis(2-Ethylhexyl)phthalate	391.00	----	----	----	----	----	----	----	----	
Butylbenzylphthalate	312.37	----	----	----	----	----	----	----	----	
Chrysene	228.30	3.98E+05	2.48E-02	6.21E-06	6.30E-03	9.44E-05	714.15	979.00	16455.00	(b)
Dibenz(a,h)anthracene	278.40	----	----	----	----	----	----	----	----	
Fluoranthene	202.30	----	----	----	----	----	----	----	----	
Fluorene	166.22	1.38E+04	3.63E-02	7.88E-06	1.98E+00	6.34E-05	570.44	870.00	12666.00	(b)
Indeno(1,2,3-cd)pyrene	276.30	----	----	----	----	----	----	----	----	
2-Methylnaphthalene	142.21	2.81E+03	5.22E-02	7.75E-06	2.46E+01	5.17E-04	514.26	761.00	12600.00	(b)
Naphthalene	128.18	2.00E+03	5.90E-02	7.50E-06	3.10E+01	4.82E-04	491.14	748.40	10373.00	(b)
4-Nitrophenol	139.10	2.91E+02	----	----	1.16E+04	4.15E-10	279.00	----	----	(b)
Phenanthrene	178.23	1.67E+04	3.24E-02	7.74E-06	1.15E+00	4.23E-05	513.00	999.00	----	(k)
Pyrene	202.26	1.05E+05	2.72E-02	7.24E-06	1.35E+00	1.10E-05	667.95	936.00	14370.00	(b)
Pesticides/Polychlorinated Biphenyls										
Aroclor 1254	327.00	----	----	----	----	----	----	----	----	
Aroclor 1260	----	----	----	----	----	----	----	----	----	
gamma-Chlordane	409.78	----	----	----	----	----	----	----	----	(b)
2,3,7,8-Tetrachlorodibenzo-p-dioxin	322.00	----	----	----	----	----	----	----	----	
Endosulfan I	407.00	----	----	----	----	----	----	----	----	
Heptachlor epoxide	389.30	----	----	----	----	----	----	----	----	
beta-Hexachlorocyclohexane	290.83	----	----	----	----	----	----	----	----	
Metals										
Aluminum	----	----	----	----	----	----	----	----	----	
Antimony	----	----	----	----	----	----	----	----	----	
Arsenic	----	----	----	----	----	----	----	----	----	
Barium	----	----	----	----	----	----	----	----	----	
Beryllium	----	----	----	----	----	----	----	----	----	
Boron	----	----	----	----	----	----	----	----	----	
Cadmium	----	----	----	----	----	----	----	----	----	
Chromium (total)	----	----	----	----	----	----	----	----	----	
Chromium VI	----	----	----	----	----	----	----	----	----	
Cobalt	----	----	----	----	----	----	----	----	----	
Copper	----	----	----	----	----	----	----	----	----	
Cyanide (total)	----	----	----	----	----	----	----	----	----	
Iron	----	----	----	----	----	----	----	----	----	
Lead	----	----	----	----	----	----	----	----	----	
Manganese	----	----	----	----	----	----	----	----	----	
Mercury	200.59	5.20E+01	3.07E-02	6.30E-06	2.00E+01	1.07E-02	629.88	1750.00	14127.00	(b)
Molybdenum	----	----	----	----	----	----	----	----	----	
Nickel	----	----	----	----	----	----	----	----	----	
Selenium	----	----	----	----	----	----	----	----	----	
Silver	----	----	----	----	----	----	----	----	----	
Thallium	----	----	----	----	----	----	----	----	----	
Tin	----	----	----	----	----	----	----	----	----	
Vanadium	----	----	----	----	----	----	----	----	----	
Zinc	----	----	----	----	----	----	----	----	----	
Total Petroleum Hydrocarbons (TPH)										

TABLE L-12
Physical/Chemical Properties of Volatile Chemicals[a]
Pier 70 Master Plan Area
San Francisco, California

Chemical	Molecular Weight MW (g/mol)	Organic Carbon Partition Coefficient, K_{oc} (cm^3/g)	Diffusivity in Air, D_a (cm^2/s)	Diffusivity in Water, D_w (cm^2/s)	Pure Component Water Solubility, S (mg/L)	Henry's Law Constant at 25° C H (atm-m^3/mol)	Normal Boiling Point, T_B (^oK)	Critical Temperature, T_C (^oK)	Enthalpy of Vaporization at the Normal Boiling Point, ΔHv,b (cal/mol)	Source Notes
Aliphatic C5-C6	81.00	7.94E+02	1.00E-01	1.00E-05	3.60E+01	7.94E-01	----	----	----	(n)
Aliphatic >C6-C8	100.00	3.98E+03	1.00E-01	1.00E-05	5.40E+00	1.20E+00	----	----	----	(n)
Aliphatic >C8-C10	130.00	3.16E+04	1.00E-01	1.00E-05	4.30E-01	1.92E+00	----	----	----	(n)
Aliphatic >C10-C12	160.00	2.51E+05	1.00E-01	1.00E-05	3.40E-02	2.89E+00	----	----	----	(n)
Aliphatic >C12-C16	200.00	5.01E+06	1.00E-01	1.00E-05	7.60E-04	1.25E+01	----	----	----	(n)
Aliphatic >C16-C21	270.00	6.31E+08	1.00E-01	1.00E-05	2.50E-06	1.18E+02	----	----	----	(n)
Aliphatic >C21-C35	400.00	1.07E+10	1.00E-01	1.00E-05	1.50E-11	2.41E+03	----	----	----	(n)
Aromatic >C8-C10	120.00	1.58E+03	1.00E-01	1.00E-05	6.50E+01	6.59E-03	----	----	----	(n)
Aromatic >C10-C12	130.00	2.51E+03	1.00E-01	1.00E-05	2.50E+01	8.29E-03	----	----	----	(n)
Aromatic >C12-C16	150.00	5.01E+03	1.00E-01	1.00E-05	5.80E+00	2.37E-03	----	----	----	(n)
Aromatic >C16-C21	190.00	1.58E+04	1.00E-01	1.00E-05	6.50E-01	2.41E-04	----	----	----	(n)
Aromatic >C21-C35	240.00	1.26E+05	1.00E-01	1.00E-05	6.60E-03	1.61E-05	----	----	----	(n)

Notes:
atm-m^3/mol = atmosphere-cubic meter per mole
cm^3/g = cubic centimeter/gram
cm^2/s = square centimeter/second
g/mol = gram/mole
mg/L = milligrams/Liter
^oK = degrees Kelvin
cal/mol = calories per mole

[a] Volatile compounds defined by USEPA (1991) as chemicals with molecular weights below 200 g/mol and Henry's constant greater than 10^{-5} atm-m^3/mol or any chemicals detected in soil gas.
[b] USEPA (2004a).
[c] Tert-Butylbenzene and p-Cymene: K_{oc} (modeled), S (experimental), and H (experimental) are from EPISuite (USEPA 2008). Butylbenzene was used as a surrogate for D_a and D_w.
[d] trans-1,3-Dichloropropene: K_{oc} (modeled), S (experimental), and H (experimental) are from EPISuite (USEPA 2008). 1,2-Dichloropropane was used as a surrogate for D_a and D_w.
[e] Ethanol: K_{oc} (modeled), S (experimental), and H (experimental) are from EPISuite (USEPA 2008). Methanol was used as a surrogate for D_a and D_w.
[f] 4-Ethyltoluene: K_{oc} (modeled), S (experimental), and H (experimental) are from EPISuite (USEPA 2008). Cumene was used as a surrogate for D_a and D_w.
[g] 2-Hexanone: K_{oc} (modeled), S (experimental), and H (experimental) are from EPISuite (USEPA 2008). Ethylbenzene was used as a surrogate for D_a and D_w.
[h] para-Xylene used as a surrogate for total xylenes.
[i] Acenaphthylene: K_{oc} (modeled), S (experimental), and H (experimental) are from EPISuite (USEPA 2008). Acenaphthene was used as a surrogate for D_a and D_w.
[j] Values are from the Region 9 PRGs (USEPA 2004b).
[k] Phenanthrene: K_{oc} (modeled), S (experimental), and H (experimental) are from EPISuite (USEPA 2008). Anthracene was used as a surrogate for D_a and D_w.
[l] CalEPA (2008).
[m] Values are from MADEP (2002).
[n] All properties from TPHCWG (1997).

Sources:
California Environmental Protection Agency (CalEPA). 2008. *Draft Interim Guidance: Evaluating Human Health Risks from Total Petroleum Hydrocarbons (TPH).* April 29.
United States Environmental Protection Agency (USEPA). 1991. *Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part B: Development of Risk-Based Preliminary Remediation Goals*). Office of Emergency and Remedial Response. Publication 9285.7-01B. December.
United States Environmental Protection Agency (USEPA). 2004a. *User's Guide for Evaluating Subsurface Vapor Intrusion Into Buildings*. Office of Emergency and Remedial Response. February 22.

TABLE L-13
Modeling Parameters for Groundwater and Soil Gas
Pier 70 Master Plan Area
San Francisco, California

Parameter	Symbol	Value	Units	Notes
Vadose Zone Parameters				
Depth to groundwater	L_{WT}	3	meters	T&R Work Plan p 13, depth ranges from 8 - 12 feet onsite
Depth of shallow construction trench	L_{trench}	0.5	meters	Shallow trench depth is just above shallowest sample
Soil gas sampling depths	L_S	0.6	meters	Min sample depth with detections is 2 feet
Soil/groundwater temperature	T	15.6	Celsius	From Appendix D of DTSC VI guidance. 60 deg F
Soil Parameters for J&E Groundwater and Soil Gas Model				
USCS Soil type above water table		Sand		
USCS soil type in Horizon A [a]		Sand	--	
Thickness	h_A	0.1	meters	Sand per CHHSL guidance AppB p B12
Bulk density	ρ_b^A	1.66	gram/centimeter^3	Sand per CHHSL guidance AppB p B13
Total porosity	n^A	0.375	unitless	Sand per CHHSL guidance AppB p B14
Water content	θ_w^A	0.0535	unitless	Sand per CHHSL guidance AppB p B15
Surface Barrier Parameters - Indoor Air Scenarios				
Residential Scenario				
Depth to Bottom of Foundation	L_F	15	centimeters	Default value - slab-on-grade (USEPA 2004)
Foundation crack ratio	η	5.00E-03	unitless	Default value (CalEPA 2005)
Foundation thickness	L_{crack}	10	centimeters	Default value (USEPA 2004)
Average vapor flow rate into building	Q_{soil}	5	liters/minute	Default value (USEPA 2004)
Pressure Differential	ΔP	40	(gram/ centimeter-second^2)	Default value (USEPA 2004)
Commerical Scenario				
Depth to Bottom of Foundation	L_F	15	centimeters	Default value - slab-on-grade (USEPA 2004)
Foundation crack ratio	η	5.00E-03	unitless	Default value (CalEPA 2005)
Foundation thickness	L_{crack}	10	centimeters	Default value (USEPA 2004)
Average vapor flow rate into building	Q_{soil}	5	liters/minute	Default value (USEPA 2004)
Pressure Differential	ΔP	40	(gram/ centimeter-second^2)	Default value (USEPA 2004)
Air Dispersion Parameters				
Residential Indoor Scenario				
Air exchange rate	ER	0.5	1/hour	Default value (CalEPA 2005)
Length of building	L_B	10	meters	Default value (USEPA 2004)
Width of building	L_W	10	meters	Default value (USEPA 2004)
Mixing height of building	H_B	2.44	meters	Default value - slab-on-grade (USEPA 2004)
Commercial Indoor Scenario				
Air exchange rate	ER	1	1/hour	Default value (CalEPA 2005)
Length of building	L_B	10	meters	Default value (USEPA 2004)
Width of building	L_W	10	meters	Default value (USEPA 2004)
Mixing height of building	H_B	3	meters	Default value (USEPA 2004)
Outdoor Scenarios				
Outdoor air dispersion factor	Q/C	89.5	grams/meter^2-second per kilogram/meter^3	USEPA Soil Screening Guidance July 96, Exhibit 11 p 27

Notes:
USCS: Unified Soil Classification System
[a] Horizons A and B not used in outdoor scenarios

Sources:
United States Environmental Protection Agency (USEPA). 2002. *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December.
United States Environmental Protection Agency (USEPA). 2004. *User's Guide for Evaluating Subsurface Vapor Intrusion Into Buildings* Office of Emergency and Remedial Response. February 22.

TABLE L-14
Estimated Soil Gas-to-Air Transfer Factors[a]
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas-to-Air Transfer (Attenuation) Factors (ug/L) / (ug/L)			
	2-foot sample depth			
	Indoor		Outdoor	
	Commercial Worker	Adult/Child Resident[b]	Construction Worker in Trench	Adult/Child Recreational[b]
Volatile Organic Compounds (VOCs)				
Acetone	5.17E-04	1.27E-03	2.25E-03	5.00E-05
Benzene	4.14E-04	1.02E-03	1.60E-03	3.55E-05
2-Butanone	4.11E-04	1.01E-03	1.47E-03	3.26E-05
Carbon Disulfide	4.54E-04	1.12E-03	1.89E-03	4.20E-05
Chloroform	4.55E-04	1.12E-03	1.89E-03	4.20E-05
Dichlorodifluoromethane	3.47E-04	8.54E-04	1.21E-03	2.68E-05
1,1-Difluoroethane	4.45E-04	1.09E-03	1.82E-03	4.03E-05
Ethanol	6.49E-04	1.60E-03	2.91E-03	6.46E-05
Ethylbenzene	3.75E-04	9.23E-04	1.36E-03	3.03E-05
4-Ethyltoluene	3.42E-04	8.42E-04	1.18E-03	2.62E-05
Tetrachloroethene	3.66E-04	8.99E-04	1.31E-03	2.91E-05
Toluene	4.11E-04	1.01E-03	1.58E-03	3.51E-05
1,1,1-Trichloroethane	3.85E-04	9.46E-04	1.42E-03	3.15E-05
Trichloroethene	3.88E-04	9.53E-04	1.43E-03	3.19E-05
Trichlorofluoromethane	4.11E-04	1.01E-03	1.58E-03	3.51E-05
1,2,4-Trimethylbenzene	3.27E-04	8.04E-04	1.10E-03	2.45E-05
1,3,5-Trimethylbenzene	3.25E-04	8.00E-04	1.09E-03	2.43E-05
Vinyl Acetate	4.07E-04	1.00E-03	1.54E-03	3.43E-05
m,p-Xylene	3.81E-04	9.37E-04	1.40E-03	3.10E-05
o-Xylene	4.11E-04	1.01E-03	1.58E-03	3.51E-05
Semi-Volatile Organic Compounds (SVOCs)				
Naphthalene	3.23E-04	7.95E-04	1.07E-03	2.38E-05
Total Petroleum Hydrocarbons (TPH)				
Aliphatic C5-C6	4.45E-04	1.09E-03	1.82E-03	4.03E-05
Aliphatic >C6-C8	4.45E-04	1.09E-03	1.82E-03	4.03E-05
Aliphatic >C8-C10	4.45E-04	1.09E-03	1.82E-03	4.03E-05
Aliphatic >C10-C12	4.45E-04	1.09E-03	1.82E-03	4.03E-05
Aromatic >C8-C10	4.45E-04	1.09E-03	1.82E-03	4.03E-05
Aromatic >C10-C12	4.45E-04	1.09E-03	1.82E-03	4.03E-05
Aromatic >C12-C16	4.45E-04	1.09E-03	1.82E-03	4.03E-05
Aromatic >C16-C21	4.47E-04	1.10E-03	1.82E-03	4.03E-05
TPH-Gasoline	NA	NA	NA	NA

Notes:

NA = Not applicable. Chemical is not volatile as defined by USEPA (1991). The chemical has a molecular weight greater than 200 g/mol and/or a Henry's constant less than 10-5 atm-m^3/mol.

(ug/L)/(ug/L) = (microgram per liter) per (microgram per liter)

[a] Calculated using the Johnson and Ettinger Model.

[b] Adult, Child, and Age-Adjusted Residents and Recreational receptors have the same transfer factor as the model assumes steady-state transport.

TABLE L-15
Estimated Groundwater-to-Air Transfer Factors
Pier 70 Master Plan Area
San Francisco, California

Chemical	Transfer Factors (mg/m^3) / (mg/L)				
	Subsurface Groundwater				
	Indoor [a]		Outdoor [b]		
	Commercial Worker	Adult/Child Resident [c]	Construction Worker (shallow Trench)	Construction Worker (Deep Trench)	Adult/Child Recreational [c]
Volatile Organic Compounds (VOCs)					
Acetone	2.96E-04	7.28E-04	6.64E-06	1.12E-05	5.00E-06
Benzene	2.50E-02	6.15E-02	4.15E-04	5.62E-04	3.44E-04
Bromobenzene	1.14E-02	2.81E-02	1.79E-04	2.42E-04	1.48E-04
2-Butanone	2.91E-04	7.16E-04	5.87E-06	9.85E-06	4.44E-06
sec-Butylbenzene	2.37E-04	5.82E-04	4.56E-06	7.79E-06	3.42E-06
tert-Butylbenzene	6.37E-02	1.57E-01	9.95E-04	1.34E-03	8.25E-04
Carbon Disulfide	1.69E-01	4.15E-01	2.88E-03	3.89E-03	2.39E-03
Chloroform	1.96E-02	4.81E-02	3.36E-04	4.54E-04	2.78E-04
Chloromethane	6.37E-02	1.57E-01	1.13E-03	1.53E-03	9.39E-04
Cumene	3.97E-02	9.76E-02	6.30E-04	8.50E-04	5.22E-04
p-Cymene	5.31E-02	1.31E-01	8.30E-04	1.12E-03	6.87E-04
1,1-Dichloroethane	2.28E-02	5.60E-02	3.69E-04	4.98E-04	3.05E-04
1,1-Dichloroethene	1.31E-01	3.23E-01	2.18E-03	2.95E-03	1.81E-03
Ethylbenzene	2.77E-02	6.81E-02	4.49E-04	6.07E-04	3.72E-04
Methyl tert-butyl ether	3.41E-03	8.39E-03	5.94E-05	8.15E-05	4.88E-05
Methylene Chloride	1.18E-02	2.90E-02	2.02E-04	2.73E-04	1.67E-04
n-Propylbenzene	2.90E-02	7.14E-02	4.57E-04	6.17E-04	3.78E-04
Toluene	2.80E-02	6.88E-02	4.64E-04	6.27E-04	3.84E-04
1,2,4-Trimethylbenzene	1.66E-02	4.08E-02	2.62E-04	3.54E-04	2.17E-04
m,p-Xylene	2.74E-02	6.74E-02	4.46E-04	6.02E-04	3.69E-04
o-Xylene	2.04E-02	5.03E-02	3.40E-04	4.59E-04	2.81E-04
Xylenes (total)	2.74E-02	6.74E-02	4.46E-04	6.02E-04	3.69E-04
Semi-Volatile Organic Compounds (SVOCs)					
Acenaphthene	2.95E-04	7.26E-04	5.27E-06	8.55E-06	4.04E-06
Acenaphthylene	4.87E-04	1.20E-03	8.19E-06	1.23E-05	6.46E-06
Anthracene	2.47E-04	6.06E-04	4.43E-06	7.53E-06	3.33E-06
Fluorene	1.27E-04	3.13E-04	2.59E-06	5.56E-06	1.81E-06
Naphthalene	1.25E-03	3.08E-03	2.04E-05	2.86E-05	1.66E-05
Phenanthrene	1.73E-04	4.26E-04	3.30E-06	6.23E-06	2.39E-06
Total Petroleum Hydrocarbons (TPH)					
Aliphatic C5-C6	4.14E+00	1.02E+01	7.01E-02	9.46E-02	5.81E-02
Aliphatic >C6-C8	9.37E+00	2.30E+01	1.59E-01	2.14E-01	1.32E-01
Aliphatic >C8-C10	1.50E+01	3.68E+01	2.54E-01	3.43E-01	2.11E-01
Aliphatic >C10-C12	2.25E+01	5.53E+01	3.81E-01	5.14E-01	3.16E-01
Aromatic >C8-C10	5.14E-02	1.26E-01	8.72E-04	1.18E-03	7.22E-04
Aromatic >C10-C12	6.47E-02	1.59E-01	1.10E-03	1.48E-03	9.09E-04
Aromatic >C12-C16	1.85E-02	4.55E-02	3.15E-04	4.26E-04	2.61E-04
Aromatic >C16-C21	1.96E-03	4.82E-03	3.45E-05	4.78E-05	2.82E-05

Notes:

(mg/m^3)/(mg/L) = (milligrams per cubic meter) per (milligrams per Liter)

NV = Not volatile Chemical is not volatile as defined by USEPA (1991). The chemical has a molecular weight greater than 200 g/mol and/or a Henry's constant less than 10-5 atm-m^3/mol.

[a] Calculated using the Johnson and Ettinger Model.

[b] Calculated using the Johnson and Ettinger Model modified for outdoor air.

[c] Adult, child, and age-adjusted resident and recreational receptors have the same transfer factor as the model assumes steady-state transport.

Source:

United States Environmental Protection Agency (USEPA). 1991. Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, (Part B, Development of Risk-based Preliminary Remediation Goals), Interim. EPA/540/R/92/003 December.

TABLE L-16
Carcinogenic and Noncarcinogenic Toxicity Values
Pier 70 Master Plan Area
San Francisco, California

Chemical	Toxicity Values							
	Carcinogenic Toxicity Values				Noncarcinogenic Toxicity Values			
	Unit Risk ($(ug/m^3)^{-1}$)		Oral CSF $(mg/kg\text{-}day)^{-1}$		RfC (ug/m^3)		Oral RfD (mg/kg-day)	
Volatile Organic Compounds (VOCs)								
Acetone	----	----	----	----	3.10E+04	ATSDR	9.00E-01	IRIS
Benzene	2.90E-05	CalEPA 2009a	1.00E-01	CalEPA 2009a	6.00E+01	CalEPA 2008	4.00E-03	IRIS
Bromobenzene	----	----	----	----	6.00E+01	PPRTV	2.00E-02	PPRTV
2-Butanone	----	----	----	----	5.00E+03	IRIS	6.00E-01	IRIS
Butylbenzene	----	----	----	----	3.00E+02 a	CalEPA 2008	8.00E-02 a	IRIS
sec-Butylbenzene	----	----	----	----	3.00E+02 a	CalEPA 2008	8.00E-02 a	IRIS
tert-Butylbenzene	----	----	----	----	3.00E+02 a	CalEPA 2008	8.00E-02 a	IRIS
Carbon Disulfide	----	----	----	----	8.00E+02	CalEPA 2008	1.00E-01	IRIS
Carbon Tetrachloride	4.20E-05	CalEPA 2009a	1.50E-01	CalEPA 2009a	4.00E+01	CalEPA 2008	4.00E-03	IRIS
Chloroform	5.30E-06	CalEPA 2009a	3.10E-02	CalEPA 2009a	3.00E+02	CalEPA 2008	1.00E-02	IRIS
Chloromethane	----	----	----	----	9.00E+01	IRIS	----	----
Cumene	----	----	----	----	4.00E+02	IRIS	1.00E-01	IRIS
Cyclohexane	----	----	----	----	6.00E+03	IRIS	----	----
p-Cymene	----	----	----	----	4.00E+02 b	IRIS	1.00E-01 b	IRIS
Dichlorodifluoromethane	----	----	----	----	2.00E+02	HEAST	2.00E-01	IRIS
1,1-Dichloroethane	1.60E-06	CalEPA 2009a	5.70E-03	CalEPA 2009a	----	----	2.00E-01	PPRTV
1,2-Dichloroethane	2.10E-05	CalEPA 2009a	4.70E-02	CalEPA 2009a	4.00E+02	CalEPA 2008	2.00E-02	PPRTV
1,1-Dichloroethene	----	----	----	----	7.00E+01	CalEPA 2008	5.00E-02	IRIS
trans-1,3-Dichloropropene	----	----	----	----	2.00E+01 c	IRIS	3.00E-02 c	IRIS
1,1-Difluoroethane	----	----	----	----	4.00E+04	IRIS	----	----
Ethanol	----	----	----	----	7.00E+03 d	CalEPA 2008	----	----
Ethylbenzene	2.50E-06	CalEPA 2009a	1.10E-02	CalEPA 2009a	2.00E+03	CalEPA 2008	1.00E-01	IRIS
4-Ethyltoluene	----	----	----	----	4.00E+02 b	IRIS	1.00E-01 b	IRIS
2-Hexanone	----	----	----	----	5.00E+03 e	IRIS	6.00E-01 e	IRIS
Methyl Acetate	----	----	----	----	----	----	1.00E+00	HEAST
Methyl tert-butyl ether	2.60E-07	CalEPA 2009a	1.80E-03	CalEPA 2009a	8.00E+03	CalEPA 2008	----	----
4-Methyl-2-pentanone	----	----	----	----	3.00E+03	IRIS	8.00E-02	HEAST
Methylcyclohexane	----	----	----	----	6.00E+03 f	IRIS	----	----
Methylene Chloride	1.00E-06	CalEPA 2009a	1.40E-02	CalEPA 2009a	4.00E+02	CalEPA 2008	6.00E-02	IRIS
n-Propylbenzene	----	----	----	----	3.00E+02 a	CalEPA 2008	8.00E-02 a	IRIS
Tetrachloroethene	5.90E-06	CalEPA 2009a	5.40E-01	CalEPA 2009a	3.50E+01	CalEPA 2008	1.00E-02	IRIS
Toluene	----	----	----	----	3.00E+02	CalEPA 2008	8.00E-02	IRIS
1,1,1-Trichloroethane	----	----	----	----	1.00E+03	CalEPA 2008	2.00E+00	IRIS
Trichloroethene	2.00E-06	CalEPA 2009a	5.90E-03	CalEPA 2009a	6.00E+02	CalEPA 2008	----	----
Trichlorofluoromethane	----	----	----	----	7.00E+02	HEAST	3.00E-01	IRIS
1,2,4-Trimethylbenzene	----	----	----	----	7.00E+00	PPRTV	----	----
1,3,5-Trimethylbenzene	----	----	----	----	7.00E+00 g	PPRTV	1.00E-02	PPRTV
Vinyl Acetate	----	----	----	----	2.00E+02	CalEPA 2008	1.00E+00	HEAST
m,p-Xylene	----	----	----	----	7.00E+02	CalEPA 2008	2.00E-01	IRIS
o-Xylene	----	----	----	----	7.00E+02	CalEPA 2008	2.00E-01	IRIS
Xylenes (total)	----	----	----	----	7.00E+02	CalEPA 2008	2.00E-01	IRIS

TABLE L-16
Carcinogenic and Noncarcinogenic Toxicity Values
Pier 70 Master Plan Area
San Francisco, California

Chemical	Toxicity Values							
	Carcinogenic Toxicity Values				Noncarcinogenic Toxicity Values			
	Unit Risk ($ug/m^3)^{-1}$		Oral CSF $(mg/kg\text{-}day)^{-1}$		RfC (ug/m^3)		Oral RfD (mg/kg-day)	
Semi-Volatile Organic Compounds (SVOCs)								
Acenaphthene	----	----	----	----	----	----	6.00E-02	IRIS
Acenaphthylene	----	----	----	----	9.00E+00 h	CalEPA 2008	2.00E-02 h	IRIS
Anthracene	----	----	----	----	----	----	3.00E-01	IRIS
Benzo(a)anthracene	1.10E-04	CalEPA 2009a	1.20E+00	CalEPA 2009a	----	----	----	----
Benzo(a)pyrene	1.10E-03	CalEPA 2009a	1.20E+01	CalEPA 2009a	----	----	----	----
Benzo(b)fluoranthene	1.10E-04	CalEPA 2009a	1.20E+00	CalEPA 2009a	----	----	----	----
Benzo(g,h,i)perylene	----	----	----	----	9.00E+00 h	CalEPA 2008	2.00E-02 h	IRIS
Benzo(k)fluoranthene	1.10E-04	CalEPA 2009a	1.20E+00	CalEPA 2009a	----	----	----	----
bis(2-Ethylhexyl)phthalate	2.40E-06	CalEPA 2009a	3.00E-03	CalEPA 2009a	----	----	2.00E-02	IRIS
Butylbenzylphthalate	----	----	1.90E-03	PPRTV	----	----	2.00E-01	IRIS
Chrysene	1.10E-05	CalEPA 2009a	1.20E-01	CalEPA 2009a	----	----	----	----
Dibenz(a,h)anthracene	1.20E-03	CalEPA 2009a	4.10E+00	CalEPA 2009a	----	----	----	----
Fluoranthene	----	----	----	----	----	----	4.00E-02	IRIS
Fluorene	----	----	----	----	----	----	4.00E-02	IRIS
Indeno(1,2,3-cd)pyrene	1.10E-04	CalEPA 2009a	1.20E+00	CalEPA 2009a	----	----	----	----
2-Methylnaphthalene	----	----	----	----	----	----	4.00E-03	IRIS
Naphthalene	3.40E-05	CalEPA 2009a	----	----	9.00E+00	CalEPA 2008	2.00E-02	IRIS
4-Nitrophenol	----	----	----	----	----	----	2.00E-03 i	IRIS
Phenanthrene	----	----	----	----	9.00E+00 h	CalEPA 2008	2.00E-02 h	IRIS
Pyrene	----	----	----	----	----	----	3.00E-02	IRIS
Pesticides/Polychlorinated Biphenyls								
Aroclor 1254	5.71E-04	IRIS	2.00E+00	IRIS	----	----	2.00E-05	IRIS
Aroclor 1260	5.71E-04	IRIS	2.00E+00	IRIS	----	----	----	----
gamma-Chlordane	----	----	----	----	7.00E-01 j	IRIS	5.00E-04 j	IRIS
2,3,7,8-Tetrachlorodibenzo-p-dioxin	3.80E+01	CalEPA 2009a	1.30E+05	CalEPA 2009a	4.00E-05	CalEPA 2008	1.00E-09	ATSDR
Endosulfan I	----	----	----	----	----	----	6.00E-03 k	IRIS
Heptachlor epoxide	1.60E-03	CalEPA 2009a	5.50E+00	CalEPA 2009a	----	----	1.30E-05	IRIS
beta-Hexachlorocyclohexane	4.30E-04	CalEPA 2009a	1.50E+00	CalEPA 2009a	----	----	----	----
Metals								
Aluminum	----	----	----	----	5.00E+00	PPRTV	1.00E+00	PPRTV
Antimony	----	----	----	----	----	----	4.00E-04	IRIS
Arsenic	3.30E-03	CalEPA 2009a	1.50E+00	CalEPA 2009a	1.50E-02	CalEPA 2008	3.00E-04	IRIS
Barium	----	----	----	----	5.00E-01	HEAST	2.00E-01	IRIS
Beryllium	2.40E-03	CalEPA 2009a	----	----	7.00E-03	CalEPA 2008	2.00E-03	IRIS
Boron	----	----	----	----	2.00E+01	HEAST	2.00E-01	IRIS
Cadmium	4.20E-03	CalEPA 2009a	----	----	2.00E-02	CalEPA 2008	5.00E-04	IRIS
Chromium (total)	----	----	----	----	----	----	1.50E+00 l	IRIS
Chromium VI	1.50E-01	CalEPA 2009a	----	----	2.00E-01	CalEPA 2008	3.00E-03	IRIS
Cobalt	9.00E-03	PPRTV	----	----	6.00E-03	PPRTV	3.00E-04	PPRTV
Copper	----	----	----	----	----	----	4.00E-02	HEAST

TABLE L-16
Carcinogenic and Noncarcinogenic Toxicity Values
Pier 70 Master Plan Area
San Francisco, California

Chemical	Toxicity Values							
	Carcinogenic Toxicity Values				Noncarcinogenic Toxicity Values			
	Unit Risk $(ug/m^3)^{-1}$		Oral CSF $(mg/kg\text{-}day)^{-1}$		RfC (ug/m^3)		Oral RfD (mg/kg-day)	
Cyanide (total)	----	----	----	----	----	----	2.00E-02	IRIS
Iron	----	----	----	----	----	----	7.00E-01	PPRTV
Lead	1.20E-05	CalEPA 2009a	8.50E-03	CalEPA 2009a	----	----	----	----
Manganese	----	----	----	----	9.00E-02	CalEPA 2008	1.40E-01	IRIS
Mercury	----	----	----	----	3.00E-02	CalEPA 2008	3.00E-04 m	IRIS
Molybdenum	----	----	----	----	----	----	5.00E-03	IRIS
Nickel	2.60E-04	CalEPA 2009a	----	----	5.00E-02	CalEPA 2008	2.00E-02 o	IRIS
Selenium	----	----	----	----	2.00E+01	CalEPA 2008	5.00E-03	IRIS
Silver	----	----	----	----	----	----	5.00E-03	IRIS
Thallium	----	----	----	----	----	----	1.35E-05 p	Cal/EPA 1999
Tin	----	----	----	----	----	----	6.00E-01	HEAST
Vanadium	----	----	----	----	----	----	5.00E-03	PPRTV
Zinc	----	----	----	----	----	----	3.00E-01	IRIS
Total Petroleum Hydrocarbons (TPH)								
Aliphatic C5-C6	----	----	----	----	1.84E+04	TPHCWG	5.00E+00	TPHCWG
Aliphatic >C6-C8	----	----	----	----	1.84E+04	TPHCWG	5.00E+00	TPHCWG
Aliphatic >C8-C10	----	----	----	----	1.00E+03	TPHCWG	1.00E-01	TPHCWG
Aliphatic >C10-C12	----	----	----	----	1.00E+03	TPHCWG	1.00E-01	TPHCWG
Aliphatic >C12-C16	----	----	----	----	1.00E+03	TPHCWG	1.00E-01	TPHCWG
Aliphatic >C16-C21	----	----	----	----	----	----	2.00E+00	TPHCWG
Aliphatic >C21-C35	----	----	----	----	----	----	2.00E+00	TPHCWG
Aromatic >C8-C10	----	----	----	----	2.00E+02	TPHCWG	4.00E-02	TPHCWG
Aromatic >C10-C12	----	----	----	----	2.00E+02	TPHCWG	4.00E-02	TPHCWG
Aromatic >C12-C16	----	----	----	----	2.00E+02	TPHCWG	4.00E-02	TPHCWG
Aromatic >C16-C21	----	----	----	----	----	----	3.00E-02	TPHCWG
Aromatic >C21-C35	----	----	----	----	----	----	3.00E-02	TPHCWG

TABLE L-16
Carcinogenic and Noncarcinogenic Toxicity Values
Pier 70 Master Plan Area
San Francisco, California

Chemical	Toxicity Values			
	Carcinogenic Toxicity Values		Noncarcinogenic Toxicity Values	
	Unit Risk $(ug/m^3)^{-1}$	Oral CSF $(mg/kg\text{-}day)^{-1}$	RfC (ug/m^3)	Oral RfD (mg/kg-day)

Notes:
---- = No cancer slope factor or noncancer reference dose available
ATSDR = Agency for Toxic Substances and Disease Registry (ATSDR 2
CalEPA = California Environmental Protection Agency
HEAST = Health Effects Assessment Summary Tables (USEPA 1997)
IRIS = Integrated Risk Information System (USEPA 2010a)
PPRTV = Provisional Peer Reviewed Toxicity Values (cited in USEPA 2010b)
TPHCWG = Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG 1997 and 1999)
ug/m^3 = micrograms per cubic meter
mg/kg-day = milligram per kilogram per day
CSF = Cancer slope factor
RfD = Reference dose
RfC = Reference concentration

[a] Toluene used as a surrogate for butylbenzene, sec-butylbenzene, tert-butylbenzene, and n-propylbenzene.
[b] Cumene used as a surrogate for p-cymene and 4-ethyltoluene.
[c] Total 1,3-Dichloropropene used as a surrogate for trans-1,3-dichloropropene.
[d] Isopropanol used as a surrogate for ethanol.
[e] 2-Butanone used as a surrogate for 2-hexanone.
[f] Cyclohexane used as a surrogate methylcyclohexane.
[g] 1,2,4-Trimethylbenzene used as a surrogate for 1,3,5-trimethylbenzene for RfC only in the absence of an available toxicity value.
[h] Naphthalene used as a surrogate for acenaphthalene, benzo (g,h,i) perylene, and phenanthrene.
[i] 2,4-Dinitrophenol used as a surrogate for 4-nitrophenol.
[j] Chlordane used as a surrogate for gamma-chlordane.
[k] Endosulfan was used as a surrogate for endosulfan I, endosulfan II, endosulfan sulfate.
[l] Chromium (III) used to evaluate total chromium.
[m] Oral RfD is for mercuric chloride.
[n] Inhalation CSF is for nickel refinery dust.
[o] Oral RfD is for nickel soluble salts.
[p] CalEPA 1999. Oral RfD obtained from the derivation of the public health goal (PHG) for thallium in drinking water.

Sources:

Agency for Toxic Substances and Disease Registry (ATSDR). 2009. *Minimal Risk Levels. December* .
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TABLE L-17
Assumed Composition of TPH-gasoline, TPH-diesel, and TPH-residual
Pier 70 Master Plan Area
San Francisco, California

Petroleum Hydrocarbon Fraction	TPH-Gasoline [a] (% mass)	TPH-Diesel [a] (% mass)	TPH-Residual [b] (% mass)
Aliphatic C5-C6	9.2%	0.1%	----
Aliphatic >C6-C8	27.5%	0.1%	----
Aliphatic >C8-C10	12%	1.1%	----
Aliphatic >C10-C12	1.3%	6%	----
Aliphatic >C12-C16 [c]	----	30%	----
Aliphatic >C16-C21 [c]	----	37%	----
Aliphatic >C21-C35 [c]	----	----	----
Aromatic >C8-C10	22%	0.1%	----
Aromatic >C10-C12	1.4%	0.6%	----
Aromatic >C12-C16	----	3.2%	----
Aromatic >C16-C21	----	18.8%	----
Aromatic >C21-C35 [c]	----	3.2%	100%
Benzene	0.8%	----	----
Toluene	9.8%	----	----
Ethylbenzene	3%	----	----
Total Xylenes	13%	----	----

Notes:
TPH = Total petroleum hydrocarbons

[a] Based on weathered gasoline and weathered diesel compositions reported in Park and San Juan (2000).

[b] Based on a conservative assumption.

[c] Considered non-volatile and not included in the calculation of the groundwater or soil gas RBTCs.

Sources:
Park, H.S. and C. San Juan. 2000. A Method for Assessing Leaching Potential for Petroleum Hydrocarbons Release Sites: Multiphase and Multisubstance Equilibrium Partitioning. Soil and Sediment Contamination 9(6):611-632.

Table L-18
Dioxin and Furan Results in Soil
Pier 70 Master Plan Area
San Francisco, California

Chemical	Sample ID	P4SB-07		P4SB-07		P4SB-14		P4SB-14	
	Start Depth (feet):	1.5		4.5		1		4.5	
	End Depth (feet):	2		5		1.5		5	
	Sample Date:	3-Sep-09		3-Sep-09		14-Dec-09		14-Dec-09	
TEF Scheme:[1]	TEF_{WHO05}	Result	WHO05	Result	*WHO05*	Result	WHO05	Result	WHO05
(HpCDF)	0.01	1.34 J	*0.0134*	< 0.12	*0.0006*	< 3.9	*0.0195*	< 0.31	*0.00155*
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	0.01	3.93 J	*0.0393*	0.37 J	*0.0037*	43.1	*0.431*	0.89 J	*0.0089*
(HpCDF)	0.01	< 0.23	*0.00115*	< 0.21	*0.00105*	< 0.56	*0.0028*	0.15 J	*0.0015*
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.1	1.01 J	*0.101*	< 0.15	*0.0075*	1.46 J	*0.146*	< 0.18	*0.009*
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	0.1	< 0.59	*0.0295*	< 0.16	*0.008*	0.55 J	*0.055*	< 0.12	*0.006*
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.1	0.61 J	*0.061*	< 0.15	*0.0075*	0.77 J	*0.077*	0.15 J	*0.015*
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	0.1	0.93 J	*0.093*	< 0.14	*0.007*	1.59 J	*0.159*	< 0.11	*0.0055*
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.1	< 0.26	*0.013*	< 0.25	*0.0125*	< 0.31	*0.0155*	< 0.13	*0.0065*
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	0.1	0.98 J	*0.098*	< 0.16	*0.008*	1.61 J	*0.161*	< 0.11	*0.0055*
1,2,3,7,8-Pentachlorodibenzofuran	0.03	0.73 J	*0.0219*	< 0.16	*0.0024*	0.66 J	*0.0198*	0.21 J	*0.0063*
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	1	0.88 J	*0.88*	< 0.12	*0.06*	0.59 J	*0.59*	< 0.12	*0.06*
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.1	0.46 J	*0.046*	< 0.18	*0.009*	0.63 J	*0.063*	< 0.12	*0.006*
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.3	1.08 J	*0.324*	< 0.17	*0.0255*	1.00 J	*0.3*	0.22 J	*0.066*
2,3,7,8-Tetrachlorodibenzofuran	0.1	< 1.3	*0.065*	< 0.14	*0.007*	1.28 J	*0.128*	0.20 J	*0.02*
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1	< 0.2	*0.1*	< 0.15	*0.075*	< 0.27	*0.135*	0.17 J	*0.17*
Octachlorodibenzofuran	0.0003	1.54 J	*0.000462*	< 0.2	*0.000030*	9.26 J	*0.002778*	0.84 J	*0.000252*
Octachlorodibenzo-p-dioxin (OCDD)	0.0003	10.7 J	*0.00321*	< 1.2	*0.00018*	237	*0.0711*	5.45 J	*0.001635*
TEQ Concentrations[2]	--	--	***1.89***	--	***0.23***	--	**2.38**	--	**0.39**

Table L-18
Dioxin and Furan Results in Soil
Pier 70 Master Plan Area
San Francisco, California

Chemical	P4SB-15		P4SB-15		P4SB-13		P4SB-13	
	1		4.5		1		4.5	
	1.5		5		1.5		5	
	14-Dec-09		14-Dec-09		16-Dec-09		16-Dec-09	
TEF Scheme:[1]	**Result**	**WHO05**	**Result**	**WHO05**	**Result**	**WHO05**	**Result**	**WHO05**
(HpCDF)	< 3.0	*0.015*	< 0.21	*0.00105*	< 0.58	*0.0029*	< 0.5	*0.0025*
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	44.7	*0.447*	< 0.47	*0.00235*	0.57 J	*0.0057*	1.10 J	*0.011*
(HpCDF)	< 0.59	*0.00295*	< 0.17	*0.00085*	< 0.12	*0.0006*	< 0.13	*0.00065*
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.88 J	*0.088*	0.18 J	*0.018*	0.15 J	*0.015*	0.20 J	*0.02*
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	0.76 J	*0.076*	< 0.12	*0.006*	< 0.12	*0.006*	0.13 J	*0.013*
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.58 J	*0.058*	0.148 J	*0.014*	0.14 J	*0.014*	0.155 J	*0.015*
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	1.85 J	*0.185*	< 0.1	*0.005*	0.12 J	*0.012*	< 0.1	*0.005*
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	< 0.32	*0.016*	< 0.13	*0.0065*	< 0.13	*0.0065*	< 0.13	*0.0065*
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	2.13 J	*0.213*	< 0.11	*0.0055*	0.13 J	*0.013*	0.11 J	*0.011*
1,2,3,7,8-Pentachlorodibenzofuran	0.59 J	*0.0177*	0.21 J	*0.0063*	0.20 J	*0.006*	0.20 J	*0.006*
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	0.73 J	*0.73*	< 0.12	*0.06*	0.11 J	*0.11*	< 0.11	*0.055*
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.58 J	*0.058*	< 0.12	*0.006*	< 0.12	*0.006*	< 0.12	*0.006*
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.79 J	*0.237*	0.20 J	*0.06*	0.19 J	*0.057*	0.19 J	*0.057*
2,3,7,8-Tetrachlorodibenzofuran	1.04 J	*0.104*	0.19 J	*0.019*	< 0.15	*0.0075*	0.24 J	*0.024*
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.37 J	*0.37*	< 0.12	*0.06*	0.13 J	*0.13*	< 0.11	*0.055*
Octachlorodibenzofuran	4.61 J	*0.001383*	0.53 J	*0.000159*	0.51 J	*0.000153*	1.14 J	*0.000342*
Octachlorodibenzo-p-dioxin (OCDD)	252	*0.0756*	1.81 J	*0.000543*	2.96 J	*0.000888*	6.82 J	*0.002046*
TEQ Concentrations[2]	**--**	**2.69**	**--**	**0.27**	**--**	**0.39**	**--**	**0.29**

Table L-18
Dioxin and Furan Results in Soil
Pier 70 Master Plan Area
San Francisco, California

Notes:

All concentrations listed in picograms per gram (pg/g).

Toxic equivalent (TEQ) concentrations shown in italics.

[1] Toxic equivalent factors (TEFs) obtained from the California Environmental Protection Agency (2009).

[2] If a chemical was not detected, then one-half of the detection limit was used in the calculation of the TEQ concentrations.

WHO = World Health Organization

References:

California Environmental Protection Agency (Cal/EPA). 2009. Technical Support Document for Cancer Potency Factors, Apendix C, Use of the Toxicity Equivalency Factor (TEFWHO97 and TEFWHO05) Scheme for Estimating Toxicity of Mixtures of Dioxin-Like Chemicals. Draft. July

Table L-19a
Resident - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Volatile Organic Compounds (VOCs)										
Acetone	0.038	----	1.5E-06	----	----	----	2.2	----	3.3E-06	3.1E-05
Benzene	0.03	3.6E-07	4.9E-04	----	----	----	0.014	2.2E-09	4.8E-06	4.5E-05
Bromobenzene	----	----	----	----	----	----	----	----	----	----
2-Butanone	0.019	----	3.7E-06	----	----	----	0.57	----	1.3E-06	1.2E-05
Butylbenzene	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	0.018	----	2.5E-07	2.3E-06
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----
Chloroform	0.017	4.1E-08	6.1E-05	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	0.004	----	1.6E-05	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----
Ethanol	0.023	----	5.0E-06	----	----	----	----	----	----	----
Ethylbenzene	0.15	1.4E-07	6.6E-05	----	----	----	0.0019	3.3E-11	2.6E-08	2.4E-07
4-Ethyltoluene	0.068	----	1.4E-04	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	0.11	----	2.5E-07	2.3E-06
Methyl Acetate	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	0.13	----	2.2E-06	2.1E-05
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	0.014	3.1E-10	3.2E-07	3.0E-06
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	0.21	4.6E-07	5.2E-03	----	----	----	----	----	----	----

Table L-19a
Resident - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Toluene	0.44	----	1.4E-03	----	----	----	0.021	----	3.6E-07	3.4E-06
1,1,1-Trichloroethane	----	----	----	----	----	----	0.0018	----	1.2E-09	1.2E-08
Trichloroethene	0.026	2.0E-08	4.0E-05	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	0.15	----	1.7E-02	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	0.047	----	5.2E-03	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	0.0039	----	5.3E-09	5.0E-08
m,p-Xylene	0.5	----	6.4E-04	----	----	----	0.0028	----	1.9E-08	1.8E-07
o-Xylene	0.18	----	2.5E-04	----	----	----	0.0013	----	8.9E-09	8.3E-08
Xylenes (total)	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)										
Acenaphthene	----	----	----	----	----	----	----	----	----	----
Acenaphthylene	----	----	----	----	----	----	0.0078	----	5.3E-07	5.0E-06
Anthracene	----	----	----	----	----	----	0.21	----	9.6E-07	8.9E-06
Benzo(a)anthracene	----	----	----	----	----	----	0.6	**1.6E-06**	----	----
Benzo(a)pyrene	----	----	----	----	----	----	0.64	**1.7E-05**	----	----
Benzo(b)fluoranthene	----	----	----	----	----	----	1	**2.6E-06**	----	----
Benzo(g,h,i)perylene	----	----	----	----	----	----	0.46	----	4.8E-05	4.0E-04
Benzo(k)fluoranthene	----	----	----	----	----	----	0.37	9.8E-07	----	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	----	----	----	1.1	2.9E-07	----	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	0.0063	5.7E-08	----	----
Fluoranthene	----	----	----	----	----	----	1.3	----	6.8E-05	5.7E-04
Fluorene	----	----	----	----	----	----	----	----	----	----
Indeno(1,2,3-cd)pyrene	----	----	----	----	----	----	0.71	**1.9E-06**	----	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	----	----	----	0.0083	----	5.7E-07	5.3E-06
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	----	----	----	1.1	----	7.5E-05	7.0E-04
Pyrene	----	----	----	----	----	----	1.2	----	8.3E-05	7.0E-04

Table L-19a
Resident - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Pesticides/Polychlorinated Biphenyls										
Aroclor 1254	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----
Metals										
Aluminum	----	----	----	----	----	----	10800	----	1.6E-02	1.4E-01
Antimony	----	----	----	----	----	----	3.1	----	1.1E-02	1.0E-01
Arsenic	----	----	----	----	----	----	2	**5.3E-06**	1.1E-02	9.5E-02
Barium	----	----	----	----	----	----	147	----	1.3E-03	9.9E-03
Beryllium	----	----	----	----	----	----	0.32	2.4E-10	2.6E-04	2.1E-03
Boron	----	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	1.2	1.6E-09	3.3E-03	3.1E-02
Chromium (total)	----	----	----	----	----	----	111	----	1.1E-04	9.7E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	36.1	1.0E-07	1.8E-01	**1.6E+00**
Copper	----	----	----	----	----	----	163	----	5.8E-03	5.4E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	29000	----	5.7E-02	5.3E-01
Lead	----	----	----	----	----	----	191	**2.6E-06**	----	----
Manganese	----	----	----	----	----	----	22100	----	4.0E-01	**2.2E+00**
Mercury	----	----	----	----	----	----	0.24	----	1.5E-03	1.3E-02
Molybdenum	----	----	----	----	----	----	----	----	----	----
Nickel	----	----	----	----	----	----	187	1.5E-08	1.6E-02	1.2E-01
Selenium	----	----	----	----	----	----	15.9	----	4.5E-03	4.2E-02
Silver	----	----	----	----	----	----	5.6	----	1.6E-03	1.5E-02
Thallium	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	----

Table L-19a
Resident - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Vanadium	----	----	----	----	----	----	29.7	----	8.5E-03	7.8E-02
Zinc	----	----	----	----	----	----	600	----	2.8E-03	2.6E-02
Total Petroleum Hydrocarbons (TPH)										
TPH-Diesel	----	----	----	----	----	----	6.4	----	1.2E-04	1.1E-03
TPH-Gasoline	----	----	----	----	----	----	----	----	----	----
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	51	----	3.6E-03	3.0E-02
Total Cancer Risk:		**1.0E-06**	----	----	----	----	----	**3.2E-05**	----	----
Hazard Index:		----	3.0E-02	----	----	----	----	----	7.2E-01	**5.1E+00**

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram
The adult and child HQs are presented in the same column because the inhalation of volatiles was the only exposure pathway considered for soil gas and groundwater exposures. The methods used to calculate inhalation exposures produce equivalent results for both the child and adult. See report for discussion of methods used to estimate noncancer hazard quotients.

Table L-19b
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)									
Acetone	0.038	----	1.4E-07	----	----	----	2.2	----	2.4E-06
Benzene	0.03	2.9E-08	4.7E-05	----	----	----	0.014	4.9E-10	3.4E-06
Bromobenzene	----	----	----	----	----	----	----	----	----
2-Butanone	0.019	----	3.6E-07	----	----	----	0.57	----	9.3E-07
Butylbenzene	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	0.018	----	1.8E-07
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----
Chloroform	0.017	3.3E-09	5.9E-06	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	0.004	----	1.6E-06	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----
Ethanol	0.023	----	4.9E-07	----	----	----	----	----	----
Ethylbenzene	0.15	1.1E-08	6.4E-06	----	----	----	0.0019	7.3E-12	1.9E-08
4-Ethyltoluene	0.068	----	1.3E-05	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	0.11	----	1.8E-07
Methyl Acetate	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	0.13	----	1.6E-06
Methylcyclohexane	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	0.014	6.8E-11	2.3E-07
n-Propylbenzene	----	----	----	----	----	----	----	----	----
Tetrachloroethene	0.21	3.7E-08	5.0E-04	----	----	----	----	----	----
Toluene	0.44	----	1.4E-04	----	----	----	0.021	----	2.6E-07

Table L-19b
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
1,1,1-Trichloroethane	----	----	----	----	----	----	0.0018	----	8.8E-10
Trichloroethene	0.026	1.6E-09	3.8E-06	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	0.15	----	1.6E-03	----	----	----	----	----	----
1,3,5-Trimethylbenzene	0.047	----	5.0E-04	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	0.0039	----	3.8E-09
m,p-Xylene	0.5	----	6.2E-05	----	----	----	0.0028	----	1.4E-08
o-Xylene	0.18	----	2.4E-05	----	----	----	0.0013	----	6.4E-09
Xylenes (total)	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	----	----	----	----	----	----	----	----	----
Acenaphthylene	----	----	----	----	----	----	0.0078	----	3.8E-07
Anthracene	----	----	----	----	----	----	0.21	----	6.8E-07
Benzo(a)anthracene	----	----	----	----	----	----	0.6	4.7E-07	----
Benzo(a)pyrene	----	----	----	----	----	----	0.64	**5.0E-06**	----
Benzo(b)fluoranthene	----	----	----	----	----	----	1	7.8E-07	----
Benzo(g,h,i)perylene	----	----	----	----	----	----	0.46	----	4.2E-05
Benzo(k)fluoranthene	----	----	----	----	----	----	0.37	2.9E-07	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	----	----	----	1.1	8.6E-08	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	0.0063	1.7E-08	----
Fluoranthene	----	----	----	----	----	----	1.3	----	5.9E-05
Fluorene	----	----	----	----	----	----	----	----	----
Indeno(1,2,3-cd)pyrene	----	----	----	----	----	----	0.71	5.5E-07	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	----	----	----	0.0083	----	4.1E-07
4-Nitrophenol	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	----	----	----	1.1	----	5.4E-05
Pyrene	----	----	----	----	----	----	1.2	----	7.3E-05
Pesticides/Polychlorinated Biphenyls									
Aroclor 1254	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----

Table L-19b
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
gamma-Chlordane	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----
Metals									
Aluminum	----	----	----	----	----	----	10800	----	1.1E-02
Antimony	----	----	----	----	----	----	3.1	----	8.1E-03
Arsenic	----	----	----	----	----	----	2	**1.3E-06**	8.3E-03
Barium	----	----	----	----	----	----	147	----	8.2E-04
Beryllium	----	----	----	----	----	----	0.32	4.8E-11	1.7E-04
Boron	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	1.2	3.1E-10	2.4E-03
Chromium (total)	----	----	----	----	----	----	111	----	7.7E-05
Chromium VI	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	36.1	2.0E-08	1.3E-01
Copper	----	----	----	----	----	----	163	----	4.3E-03
Cyanide (total)	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	29000	----	4.1E-02
Lead	----	----	----	----	----	----	191	6.0E-07	----
Manganese	----	----	----	----	----	----	22100	----	2.0E-01
Mercury	----	----	----	----	----	----	0.24	----	1.3E-03
Molybdenum	----	----	----	----	----	----	----	----	----
Nickel	----	----	----	----	----	----	187	3.0E-09	9.8E-03
Selenium	----	----	----	----	----	----	15.9	----	3.3E-03
Silver	----	----	----	----	----	----	5.6	----	1.2E-03

Table L-19b
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Thallium	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	----	----	----	29.7	----	6.2E-03
Zinc	----	----	----	----	----	----	600	----	2.1E-03
Total Petroleum Hydrocarbons (TPH)									
Aliphatic C5-C6	----	----	----	----	----	----	----	----	----
Aliphatic >C6-C8	----	----	----	----	----	----	----	----	----
Aliphatic >C8-C10	----	----	----	----	----	----	----	----	----
Aliphatic >C10-C12	----	----	----	----	----	----	----	----	----
Aliphatic >C12-C16	----	----	----	----	----	----	----	----	----
Aliphatic >C16-C21	----	----	----	----	----	----	----	----	----
Aliphatic >C21-C35	----	----	----	----	----	----	----	----	----
Aromatic >C8-C10	----	----	----	----	----	----	----	----	----
Aromatic >C10-C12	----	----	----	----	----	----	----	----	----
Aromatic >C12-C16	----	----	----	----	----	----	----	----	----
Aromatic >C16-C21	----	----	----	----	----	----	----	----	----
Aromatic >C21-C35	----	----	----	----	----	----	----	----	----
TPH-Diesel	----	----	----	----	----	----	6.4	----	9.6E-05
TPH-Gasoline	----	----	----	----	----	----	----	----	----
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	51	----	7.6E-03
Total Cancer Risk:		8.3E-08	----	----	----	----	----	**9.1E-06**	----
Hazard Index:		----	2.9E-03	----	----	----	----	----	4.3E-01

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-19c
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	0.038	----	6.3E-07	----	----	----	----	----	----	2.2	----	7.9E-06
Benzene	0.03	4.5E-09	1.8E-04	----	----	----	----	----	----	0.014	6.5E-11	1.1E-05
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	0.019	----	1.3E-06	----	----	----	----	----	----	0.57	----	3.1E-06
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----	0.018	----	5.8E-07
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	0.017	5.5E-10	2.4E-05	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	0.004	----	5.5E-06	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	0.023	----	2.2E-06	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.15	1.7E-09	2.3E-05	----	----	----	----	----	----	0.0019	9.6E-13	6.1E-08
4-Ethyltoluene	0.068	----	4.6E-05	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	0.11	----	5.9E-07
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	0.13	----	5.2E-06
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	0.014	9.0E-12	7.5E-07
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	0.21	5.3E-09	1.8E-03	----	----	----	----	----	----	----	----	----
Toluene	0.44	----	5.3E-04	----	----	----	----	----	----	0.021	----	8.5E-07
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	0.0018	----	2.9E-09
Trichloroethene	0.026	2.4E-10	1.4E-05	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	0.15	----	5.4E-03	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	0.047	----	1.7E-03	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	0.0039	----	1.3E-08

Table L-19c
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	0.5	----	2.3E-04	----	----	----	----	----	----	0.0028	----	4.5E-08
o-Xylene	0.18	----	9.3E-05	----	----	----	----	----	----	0.0013	----	2.1E-08
Xylenes (total)	----	----	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	----	----	----	----	----	----	0.045	----	2.4E-06
Acenaphthylene	----	----	----	----	----	----	----	----	----	0.073	----	1.2E-05
Anthracene	----	----	----	----	----	----	----	----	----	0.09907	----	1.1E-06
Benzo(a)anthracene	----	----	----	----	----	----	----	----	----	0.235	1.8E-08	----
Benzo(a)pyrene	----	----	----	----	----	----	----	----	----	0.27	2.1E-07	----
Benzo(b)fluoranthene	----	----	----	----	----	----	----	----	----	0.4652	3.6E-08	----
Benzo(g,h,i)perylene	----	----	----	----	----	----	----	----	----	0.1932	----	4.7E-05
Benzo(k)fluoranthene	----	----	----	----	----	----	----	----	----	0.144	1.1E-08	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	----	----	----	----	----	----	0.4562	3.5E-09	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	----	----	----	0.035	9.3E-09	----
Fluoranthene	----	----	----	----	----	----	----	----	----	0.4836	----	5.4E-05
Fluorene	----	----	----	----	----	----	----	----	----	0.021	----	1.7E-06
Indeno(1,2,3-cd)pyrene	----	----	----	----	----	----	----	----	----	0.2647	2.0E-08	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	----	----	----	----	----	----	0.05894	----	9.5E-06
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	----	----	----	----	----	----	0.4156	----	6.7E-05
Pyrene	----	----	----	----	----	----	----	----	----	0.4553	----	6.8E-05
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	----	----	----	----	----	----	10800	----	3.8E-01
Antimony	----	----	----	----	----	----	----	----	----	3.1	----	2.6E-02
Arsenic	----	----	----	----	----	----	----	----	----	4	3.4E-07	9.0E-02
Barium	----	----	----	----	----	----	----	----	----	107.5	----	3.6E-02
Beryllium	----	----	----	----	----	----	----	----	----	0.272	1.5E-09	6.6E-03
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-19c
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 1
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	----	----	----	----	----	----	1.149	1.1E-08	1.6E-02
Chromium (total)	----	----	----	----	----	----	----	----	----	661.1	----	1.5E-03
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	----	----	----	52.84	**1.1E-06**	**2.0E+00**
Copper	----	----	----	----	----	----	----	----	----	156.4	----	1.3E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----	29000	----	1.3E-01
Lead	----	----	----	----	----	----	----	----	----	420.9	1.8E-07	----
Manganese	----	----	----	----	----	----	----	----	----	22100	----	**3.9E+01**
Mercury	----	----	----	----	----	----	----	----	----	1.14	----	2.2E-02
Molybdenum	----	----	----	----	----	----	----	----	----	----	----	----
Nickel	----	----	----	----	----	----	----	----	----	1148	6.7E-07	**3.8E+00**
Selenium	----	----	----	----	----	----	----	----	----	11.06	----	7.4E-03
Silver	----	----	----	----	----	----	----	----	----	5.6	----	3.7E-03
Thallium	----	----	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	----	----	----	----	----	----	27.72	----	1.8E-02
Zinc	----	----	----	----	----	----	----	----	----	1579	----	1.8E-02
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	----	----	----	----	----	----	89.37	----	3.9E-03
TPH-Gasoline	----	----	----	----	----	----	----	----	----	0.0863	----	3.2E-06
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	----	----	----	130.1	----	1.9E-02
Total Cancer Risk:		1.2E-08	----	----	----	----	----	----	----	----	**2.6E-06**	----
Hazard Index:		----	1.0E-02	----	----	----	----	----	----	----	----	**4.6E+01**

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-20a
Resident - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Volatile Organic Compounds (VOCs)										
Acetone	----	----	----	----	----	----	0.1208	----	1.8E-07	1.7E-06
Benzene	----	----	----	----	----	----	0.53	8.3E-08	1.8E-04	1.7E-03
Bromobenzene	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	0.031	----	7.1E-08	6.6E-07
Butylbenzene	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	0.3	----	1.5E-04	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	0.0088	6.5E-10	6.0E-07	5.6E-06
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	0.2	2.4E-09	1.4E-05	----	----	----	----
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----
Toluene	----	----	----	----	----	----	0.0072	----	1.2E-07	1.2E-06

Table L-20a
Resident - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	0.0016	1.5E-11	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----
m,p-Xylene	----	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	0.0086	----	5.9E-08	5.5E-07
Semi-Volatile Organic Compounds (SVOCs)										
Acenaphthene	----	----	----	0.2	----	----	----	----	----	----
Acenaphthylene	----	----	----	0.1	----	1.3E-05	----	----	----	----
Anthracene	----	----	----	0.3	----	----	----	----	----	----
Benzo(a)anthracene	----	----	----	0.3	----	----	0.1583	4.2E-07	----	----
Benzo(a)pyrene	----	----	----	0.3	----	----	0.39	**1.0E-05**	----	----
Benzo(b)fluoranthene	----	----	----	0.4	----	----	0.28	7.4E-07	----	----
Benzo(g,h,i)perylene	----	----	----	0.2	----	----	0.1967	----	2.0E-05	1.7E-04
Benzo(k)fluoranthene	----	----	----	0.1	----	----	0.13	3.4E-07	----	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.4	----	----	0.205	5.4E-08	----	----
Dibenz(a,h)anthracene	----	----	----	0.06	----	----	----	----	----	----
Fluoranthene	----	----	----	0.9	----	----	0.49	----	2.5E-05	2.1E-04
Fluorene	----	----	----	0.4	----	----	----	----	----	----
Indeno(1,2,3-cd)pyrene	----	----	----	0.2	----	----	0.57	**1.5E-06**	----	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.4	1.7E-08	1.3E-04	----	----	----	----
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.9	----	4.1E-05	0.35	----	2.4E-05	2.2E-04
Pyrene	----	----	----	0.8	----	----	0.425	----	2.9E-05	2.5E-04

Table L-20a
Resident - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Pesticides/Polychlorinated Biphenyls										
Aroclor 1254	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----
Metals										
Aluminum	----	----	----	----	----	----	15900	----	2.4E-02	2.1E-01
Antimony	----	----	----	0.49	----	----	7.824	----	2.8E-02	2.6E-01
Arsenic	----	----	----	4.7	----	----	3.853	**1.0E-05**	2.1E-02	1.8E-01
Barium	----	----	----	100	----	----	277.5	----	2.4E-03	1.9E-02
Beryllium	----	----	----	----	----	----	0.475	3.6E-10	3.9E-04	3.2E-03
Boron	----	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	2.4	3.1E-09	6.7E-03	6.2E-02
Chromium (total)	----	----	----	13.665	----	----	571.5	----	5.4E-04	5.0E-03
Chromium VI	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	16	----	----	55.78	1.6E-07	2.7E-01	**2.5E+00**
Copper	----	----	----	1.4	----	----	222.9	----	7.9E-03	7.3E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	45900	----	9.0E-02	8.4E-01
Lead	----	----	----	0.42	----	----	752.9	**1.0E-05**	----	----
Manganese	----	----	----	----	----	----	117000	----	**2.1E+00**	**1.2E+01**
Mercury	----	----	----	----	----	----	0.369	----	2.4E-03	2.0E-02
Molybdenum	----	----	----	5.1	----	----	0.38	----	1.1E-04	1.0E-03
Nickel	----	----	----	27	----	----	939.3	7.6E-08	7.8E-02	6.1E-01
Selenium	----	----	----	0.58	----	----	14.6	----	4.2E-03	3.8E-02
Silver	----	----	----	----	----	----	3.9	----	1.1E-03	1.0E-02
Thallium	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	----

Table L-20a
Resident - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	**Cancer Risk**	**Adult/Child HQ**	**EPC (ug/L)**	**Cancer Risk**	**Adult/Child HQ**	**EPC (mg/kg)**	**Cancer Risk**	**Adult HQ**	**Child HQ**
Vanadium	----	----	----	4.3	----	----	41.31	----	1.2E-02	1.1E-01
Zinc	----	----	----	10	----	----	318.3	----	1.5E-03	1.4E-02
Total Petroleum Hydrocarbons (TPH)										
TPH-Diesel	----	----	----	120	----	---- **[a]**	8.9	----	1.7E-04	1.5E-03
TPH-Gasoline	----	----	----	24.5	----	1.2E-01	0.05	----	7.8E-07	7.4E-06
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	516	----	3.7E-02	3.0E-01
Total Cancer Risk:		----	----	----	2.0E-08	----	----	**3.4E-05**	----	----
Hazard Index:		----	----	----	----	1.2E-01	----	----	**2.7E+00**	**1.7E+01**

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram
The adult and child HQs are presented in the same column because the inhalation of volatiles was the only exposure pathway considered for soil gas and groundwater exposures. The methods used to calculate inhalation exposures produce equivalent results for both the child and adult. See report for discussion of methods used to estimate noncancer hazard quotients.

Table L-20b
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)									
Acetone	----	----	----	----	----	----	0.1208	----	1.3E-07
Benzene	----	----	----	----	----	----	0.53	1.9E-08	1.3E-04
Bromobenzene	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	0.031	----	5.1E-08
Butylbenzene	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	0.3	----	1.4E-05	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	0.0088	1.4E-10	4.3E-07
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	0.2	1.9E-10	1.3E-06	----	----	----

Table L-20b
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
n-Propylbenzene	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----
Toluene	----	----	----	----	----	----	0.0072	----	8.8E-08
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	0.0016	3.3E-12	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----
m,p-Xylene	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	0.0086	----	4.2E-08
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	----	----	----	0.2	----	----	----	----	----
Acenaphthylene	----	----	----	0.1	----	1.2E-06	----	----	----
Anthracene	----	----	----	0.3	----	----	----	----	----
Benzo(a)anthracene	----	----	----	0.3	----	----	0.1583	1.2E-07	----
Benzo(a)pyrene	----	----	----	0.3	----	----	0.39	**3.0E-06**	----
Benzo(b)fluoranthene	----	----	----	0.4	----	----	0.28	2.2E-07	----
Benzo(g,h,i)perylene	----	----	----	0.2	----	----	0.1967	----	1.8E-05
Benzo(k)fluoranthene	----	----	----	0.1	----	----	0.13	1.0E-07	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.4	----	----	0.205	1.6E-08	----
Dibenz(a,h)anthracene	----	----	----	0.06	----	----	----	----	----
Fluoranthene	----	----	----	0.9	----	----	0.49	----	2.2E-05
Fluorene	----	----	----	0.4	----	----	----	----	----
Indeno(1,2,3-cd)pyrene	----	----	----	0.2	----	----	0.57	4.4E-07	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.4	1.4E-09	1.3E-05	----	----	----

Table L-20b
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
4-Nitrophenol	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.9	----	4.0E-06	0.35	----	1.7E-05
Pyrene	----	----	----	0.8	----	----	0.425	----	2.6E-05
Pesticides/Polychlorinated Biphenyls									
Aroclor 1254	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----
Metals									
Aluminum	----	----	----	----	----	----	15900	----	1.6E-02
Antimony	----	----	----	0.49	----	----	7.824	----	2.0E-02
Arsenic	----	----	----	4.7	----	----	3.853	**2.6E-06**	1.6E-02
Barium	----	----	----	100	----	----	277.5	----	1.5E-03
Beryllium	----	----	----	----	----	----	0.475	7.1E-11	2.6E-04
Boron	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	2.4	6.2E-10	4.7E-03
Chromium (total)	----	----	----	13.665	----	----	571.5	----	4.0E-04
Chromium VI	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	16	----	----	55.78	3.1E-08	2.0E-01
Copper	----	----	----	1.4	----	----	222.9	----	5.8E-03
Cyanide (total)	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	45900	----	6.4E-02
Lead	----	----	----	0.42	----	----	752.9	**2.4E-06**	----
Manganese	----	----	----	----	----	----	117000	----	**1.0E+00**
Mercury	----	----	----	----	----	----	0.369	----	2.0E-03
Molybdenum	----	----	----	5.1	----	----	0.38	----	7.9E-05
Nickel	----	----	----	27	----	----	939.3	1.5E-08	4.9E-02

Table L-20b
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	**Cancer Risk**	**HQ**	**EPC (ug/L)**	**Cancer Risk**	**HQ**	**EPC (mg/kg)**	**Cancer Risk**	**HQ**
Selenium	----	----	----	0.58	----	----	14.6	----	3.0E-03
Silver	----	----	----	----	----	----	3.9	----	8.1E-04
Thallium	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	4.3	----	----	41.31	----	8.6E-03
Zinc	----	----	----	10	----	----	318.3	----	1.1E-03
Total Petroleum Hydrocarbons (TPH)									
TPH-Diesel	----	----	----	120	----	**---- [a]**	8.9	----	1.3E-04
TPH-Gasoline	----	----	----	24.5	----	8.2E-04	0.05	----	5.6E-07
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	516	----	7.7E-02
Total Cancer Risk:	----	----	----	----	1.6E-09	----	----	**8.9E-06**	----
Hazard Index:	----	----	----	----	----	8.5E-04	----	----	**1.5E+00**

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-20c
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	----	----	----	----	----	----	----	----	----	0.1014	----	3.6E-07
Benzene	----	----	----	----	----	----	----	----	----	0.53	2.4E-09	4.3E-04
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----	0.031	----	1.7E-07
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	0.3	----	2.5E-07	0.3	----	2.5E-06	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	0.0088	1.9E-11	1.4E-06
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	0.2	1.3E-13	2.3E-08	0.2	1.5E-11	1.3E-06	0.0055	3.6E-12	3.0E-07
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Toluene	----	----	----	----	----	----	----	----	----	0.01	----	4.0E-07
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	0.0016	4.4E-13	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----

Table L-20c
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----	0.02	----	3.2E-07
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	0.2	----	----	0.2	----	1.2E-05	----	----	----
Acenaphthylene	----	----	----	0.1	----	2.1E-08	0.1	----	2.3E-05	0.0025	----	4.0E-07
Anthracene	----	----	----	0.3	----	----	0.3	----	7.1E-06	0.013	----	1.4E-07
Benzo(a)anthracene	----	----	----	0.3	----	----	0.3	1.6E-07	----	0.7352	5.7E-08	----
Benzo(a)pyrene	----	----	----	0.3	----	----	0.3	**2.6E-06**	----	1.977	**1.5E-06**	----
Benzo(b)fluoranthene	----	----	----	0.4	----	----	0.4	3.6E-07	----	1.629	1.3E-07	----
Benzo(g,h,i)perylene	----	----	----	0.2	----	----	0.2	----	8.8E-04	1.534	----	3.7E-04
Benzo(k)fluoranthene	----	----	----	0.1	----	----	0.1	8.4E-08	----	0.13	1.0E-08	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.4	----	----	0.4	2.1E-08	----	0.7482	5.8E-09	----
Dibenz(a,h)anthracene	----	----	----	0.06	----	----	0.06	4.6E-07	----	2.8	7.4E-07	----
Fluoranthene	----	----	----	0.9	----	----	0.9	----	2.7E-04	0.6994	----	7.8E-05
Fluorene	----	----	----	0.4	----	----	0.4	----	4.9E-05	0.0085	----	6.9E-07
Indeno(1,2,3-cd)pyrene	----	----	----	0.2	----	----	0.2	3.0E-07	----	1.354	1.0E-07	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.4	9.1E-13	2.1E-07	0.4	1.3E-12	3.7E-05	0.0065	----	1.0E-06
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.9	----	7.5E-08	0.9	----	3.0E-04	0.1333	----	2.2E-05
Pyrene	----	----	----	0.8	----	----	0.8	----	2.8E-04	0.9764	----	1.5E-04
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	----	----	----	----	----	----	15900	----	5.5E-01
Antimony	----	----	----	0.49	----	----	0.49	----	3.6E-04	6.333	----	5.3E-02
Arsenic	----	----	----	4.7	----	----	4.7	3.0E-08	4.6E-03	3.857	3.3E-07	8.7E-02
Barium	----	----	----	100	----	----	100	----	1.5E-04	248.5	----	8.2E-02
Beryllium	----	----	----	----	----	----	----	----	----	0.411	2.2E-09	9.9E-03
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-20c
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 3
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	----	----	----	----	----	----	0.662	6.3E-09	9.5E-03
Chromium (total)	----	----	----	13.665	----	----	13.665	----	2.8E-06	523.1	----	1.2E-03
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	16	----	----	16	----	1.5E-02	51.7	**1.0E-06**	**1.9E+00**
Copper	----	----	----	1.4	----	----	1.4	----	1.0E-05	230.5	----	1.9E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----	45900	----	2.1E-01
Lead	----	----	----	0.42	----	----	0.42	1.4E-11	----	687.4	3.0E-07	----
Manganese	----	----	----	----	----	----	----	----	----	117000	----	**2.1E+02**
Mercury	----	----	----	----	----	----	----	----	----	0.469	----	9.0E-03
Molybdenum	----	----	----	5.1	----	----	5.1	----	3.0E-04	0.72	----	4.8E-04
Nickel	----	----	----	27	----	----	27	----	3.8E-04	866.4	5.1E-07	**2.9E+00**
Selenium	----	----	----	0.58	----	----	0.58	----	3.4E-05	14.6	----	9.8E-03
Silver	----	----	----	----	----	----	----	----	----	3.9	----	2.6E-03
Thallium	----	----	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	4.3	----	----	4.3	----	2.5E-04	166.2	----	1.1E-01
Zinc	----	----	----	10	----	----	10	----	9.6E-06	283.3	----	3.1E-03
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	120	----	---- **[a]**	120	----	1.0E-01	75	----	3.3E-03
TPH-Gasoline	----	----	----	24.5	----	---- **[a]**	24.5	----	7.0E-04	0.074	----	2.7E-06
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	----	----	----	465.7	----	7.0E-02
Total Cancer Risk:		----	----	----	1.0E-12	----	----	**4.1E-06**	----	----	**4.8E-06**	----
Hazard Index:		----	----	----	----	5.7E-07	----	----	1.2E-01	----	----	**2.1E+02**

Notes:
[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-21a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 2
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)									
Acetone	0.022	----	8.4E-08	1.9	----	4.1E-09	0.2457	----	2.7E-07
Benzene	0.83	8.1E-07	1.3E-03	----	----	----	0.001152	4.0E-11	2.8E-07
Bromobenzene	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	0.03076	----	5.0E-08
Butylbenzene	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----
Carbon Disulfide	4.1	----	5.3E-04	----	----	----	0.0059	----	5.8E-08
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	0.0036	3.9E-11	3.5E-07
Chloromethane	----	----	----	----	----	----	0.0014	----	----
Cumene	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	0.001	----	----
p-Cymene	----	----	----	----	----	----	4.2	----	4.1E-05
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	0.011	----	3.6E-07
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.057	4.4E-09	2.4E-06	----	----	----	----	----	----
4-Ethyltoluene	0.022	----	4.3E-06	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	0.0008	----	1.3E-09
Methyl Acetate	----	----	----	----	----	----	0.004	----	3.9E-09
Methyl tert-butyl ether	----	----	----	0.1	7.2E-12	9.7E-09	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	0.002	----	2.4E-08
Methylcyclohexane	----	----	----	----	----	----	0.0004	----	----
Methylene Chloride	----	----	----	----	----	----	0.006089	3.0E-11	9.9E-08

Table L-21a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 2
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
n-Propylbenzene	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----
Toluene	1.2	----	3.8E-04	0.18	----	3.8E-06	0.008	----	9.8E-08
1,1,1-Trichloroethane	0.032	----	2.8E-06	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	0.0076	----	2.5E-08
1,2,4-Trimethylbenzene	0.066	----	7.0E-04	----	----	----	0.00085	----	----
1,3,5-Trimethylbenzene	0.018	----	1.9E-04	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----
m,p-Xylene	0.17	----	2.1E-05	----	----	----	0.00059	----	2.9E-09
o-Xylene	0.065	----	8.7E-06	0.19	----	1.3E-06	----	----	----
Xylenes (total)	----	----	----	0.27	----	2.4E-06	0.002	----	9.8E-09
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	----	----	----	0.3	----	----	0.15	----	2.4E-06
Acenaphthylene	----	----	----	0.4	----	4.9E-06	0.3384	----	1.7E-05
Anthracene	----	----	----	0.6	----	----	0.6159	----	2.0E-06
Benzo(a)anthracene	----	----	----	0.9	----	----	3.153	**2.5E-06**	----
Benzo(a)pyrene	----	----	----	1.2	----	----	5.701	**4.4E-05**	----
Benzo(b)fluoranthene	----	----	----	1.1	----	----	4.782	**3.7E-06**	----
Benzo(g,h,i)perylene	----	----	----	0.8	----	----	5.71	----	5.2E-04
Benzo(k)fluoranthene	----	----	----	0.3	----	----	2.407	**1.9E-06**	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	1	----	----	4.964	3.9E-07	----
Dibenz(a,h)anthracene	----	----	----	0.3	----	----	0.8996	**2.4E-06**	----
Fluoranthene	----	----	----	0.852	----	----	10.78	----	4.9E-04
Fluorene	----	----	----	0.253	----	----	0.07002	----	1.7E-06
Indeno(1,2,3-cd)pyrene	----	----	----	0.6	----	----	6.853	**5.3E-06**	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.9	3.1E-09	2.9E-05	0.1814	----	8.9E-06

Table L-21a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 2
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
4-Nitrophenol	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.868	----	3.8E-06	6.549	----	3.2E-04
Pyrene	----	----	----	1.338	----	----	11.058	----	6.7E-04
Pesticides/Polychlorinated Biphenyls									
Aroclor 1254	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	0.016	2.2E-08	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----
Metals									
Aluminum	----	----	----	36000	----	----	15465	----	1.6E-02
Antimony	----	----	----	0.85	----	----	12.69	----	3.3E-02
Arsenic	----	----	----	51.75	----	----	25.19	**1.7E-05**	1.0E-01
Barium	----	----	----	380	----	----	375.5	----	2.1E-03
Beryllium	----	----	----	0.62	----	----	0.543	8.1E-11	3.0E-04
Boron	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	1.937	5.0E-10	3.8E-03
Chromium (total)	----	----	----	2490	----	----	242.4	----	1.7E-04
Chromium VI	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	5.4	----	----	46.92	2.6E-08	1.6E-01
Copper	----	----	----	819.5	----	----	1380	----	3.6E-02
Cyanide (total)	----	----	----	30	----	----	----	----	----
Iron	----	----	----	----	----	----	85444	----	1.2E-01
Lead	----	----	----	10015	----	----	2292	**7.3E-06**	----
Manganese	----	----	----	----	----	----	46903	----	4.2E-01
Mercury	----	----	----	24900	----	----	21.2	----	1.1E-01
Molybdenum	----	----	----	14	----	----	1.1	----	2.3E-04
Nickel	----	----	----	10100	----	----	294.4	4.7E-09	1.5E-02

Table L-21a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 2
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Selenium	----	----	----	8.7	----	----	54.71	----	1.1E-02
Silver	----	----	----	5	----	----	17.56	----	3.7E-03
Thallium	----	----	----	----	----	----	3.8	----	2.9E-01
Tin	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	3	----	----	126.7	----	2.6E-02
Zinc	----	----	----	3885	----	----	1228	----	4.3E-03
Total Petroleum Hydrocarbons (TPH)									
TPH-Diesel	----	----	----	1100	----	---- **[a]**	155.4	----	2.3E-03
TPH-Gasoline	4.4	----	8.6E-04	27	----	9.0E-04	0.0755	----	8.5E-07
TPH-Residual (Oil and Grease)	----	----	----	67	----	---- **[a]**	2019	----	3.0E-01
Total Cancer Risk:	8.2E-07	----	----	3.1E-09	----	----	----	**8.5E-05**	----
Hazard Index:	----	4.0E-03	----	----	9.4E-04	----	----	----	**1.7E+00**

Notes:

[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.

Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.

EPC = Exposure point concentration

HQ = Hazard quotient

ug/L = microgram per liter

mg/kg = milligram per kilogram

Table L-21b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 2
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	0.022	----	3.6E-07	1.9	----	9.3E-11	1.9	----	6.1E-07	0.2036	----	7.3E-07
Benzene	0.83	1.3E-07	5.0E-03	----	----	----	----	----	----	0.001185	5.5E-12	9.6E-07
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----	0.02705	----	1.5E-07
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	4.1	----	2.2E-03	----	----	----	----	----	----	0.0059	----	1.9E-07
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	0.0036	5.1E-12	1.2E-06
Chloromethane	----	----	----	----	----	----	----	----	----	0.0014	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	0.001	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	4.2	----	1.4E-04
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	0.011	----	1.2E-06
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.057	6.3E-10	8.9E-06	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	0.022	----	1.5E-05	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	0.0008	----	4.3E-09
Methyl Acetate	----	----	----	----	----	----	----	----	----	0.004	----	1.3E-08
Methyl tert-butyl ether	----	----	----	0.1	5.0E-15	1.7E-10	0.1	8.7E-13	2.3E-10	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	0.002	----	8.1E-08
Methylcyclohexane	----	----	----	----	----	----	----	----	----	0.0004	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	0.008298	5.4E-12	4.5E-07
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Toluene	1.2	----	1.4E-03	0.18	----	6.4E-08	0.18	----	2.6E-06	0.008	----	3.2E-07
1,1,1-Trichloroethane	0.032	----	1.0E-05	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	0.0076	----	8.2E-08
1,2,4-Trimethylbenzene	0.066	----	2.4E-03	----	----	----	----	----	----	0.00085	----	----
1,3,5-Trimethylbenzene	0.018	----	6.4E-04	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----

Table L-21b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 2
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	0.17	----	7.7E-05	----	----	----	----	----	----	0.00059	----	9.5E-09
o-Xylene	0.065	----	3.3E-05	0.19	----	2.1E-08	0.19	----	1.7E-06	----	----	----
Xylenes (total)	----	----	----	0.27	----	3.9E-08	0.27	----	2.5E-06	0.002	----	3.2E-08
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	0.3	----	----	0.3	----	1.7E-05	1.237	----	6.7E-05
Acenaphthylene	----	----	----	0.4	----	8.3E-08	0.4	----	9.3E-05	0.2827	----	4.6E-05
Anthracene	----	----	----	0.6	----	----	0.6	----	1.4E-05	2.521	----	2.7E-05
Benzo(a)anthracene	----	----	----	0.9	----	----	0.9	4.7E-07	----	4.428	3.4E-07	----
Benzo(a)pyrene	----	----	----	1.2	----	----	1.2	**1.1E-05**	----	5.147	**4.0E-06**	----
Benzo(b)fluoranthene	----	----	----	1.1	----	----	1.1	9.9E-07	----	5.482	4.2E-07	----
Benzo(g,h,i)perylene	----	----	----	0.8	----	----	0.8	----	3.5E-03	4.878	----	1.2E-03
Benzo(k)fluoranthene	----	----	----	0.3	----	----	0.3	2.5E-07	----	2.575	2.0E-07	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	1	----	----	1	5.2E-08	----	6.084	4.7E-08	----
Dibenz(a,h)anthracene	----	----	----	0.3	----	----	0.3	**2.3E-06**	----	0.909	2.4E-07	----
Fluoranthene	----	----	----	0.852	----	----	0.852	----	2.6E-04	17.098	----	1.9E-03
Fluorene	----	----	----	0.253	----	----	0.253	----	3.1E-05	1.532	----	1.2E-04
Indeno(1,2,3-cd)pyrene	----	----	----	0.6	----	----	0.6	9.0E-07	----	4.558	3.5E-07	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.9	2.0E-12	4.7E-07	0.9	2.9E-12	8.4E-05	0.8158	----	1.3E-04
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.868	----	7.3E-08	0.868	----	2.9E-04	14.45	----	2.3E-03
Pyrene	----	----	----	1.338	----	----	1.338	----	4.7E-04	13.692	----	2.0E-03
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	0.016	2.1E-09	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	36000	----	----	36000	----	1.1E-02	15537	----	5.4E-01
Antimony	----	----	----	0.85	----	----	0.85	----	6.3E-04	10.6	----	8.8E-02
Arsenic	----	----	----	51.75	----	----	51.75	3.3E-07	5.1E-02	30.82	**2.6E-06**	7.0E-01
Barium	----	----	----	380	----	----	380	----	5.6E-04	362.8	----	1.2E-01
Beryllium	----	----	----	0.62	----	----	0.62	----	9.1E-05	0.502	2.7E-09	1.2E-02
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-21b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 2
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	----	----	----	----	----	----	4.022	3.8E-08	5.8E-02
Chromium (total)	----	----	----	2490	----	----	2490	----	5.2E-04	344.9	----	7.6E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	5.4	----	----	5.4	----	5.1E-03	43.58	8.8E-07	**1.6E+00**
Copper	----	----	----	819.5	----	----	819.5	----	6.0E-03	1990	----	1.7E-01
Cyanide (total)	----	----	----	30	----	----	30	----	4.4E-04	----	----	----
Iron	----	----	----	----	----	----	----	----	----	73413	----	3.4E-01
Lead	----	----	----	10015	----	----	10015	3.4E-07	----	1414	6.1E-07	----
Manganese	----	----	----	----	----	----	----	----	----	46534	----	**8.3E+01**
Mercury	----	----	----	24900	----	----	24900	----	**2.4E+01**	17.26	----	3.3E-01
Molybdenum	----	----	----	14	----	----	14	----	8.3E-04	2.1	----	1.4E-03
Nickel	----	----	----	10100	----	----	10100	----	1.4E-01	402.5	2.4E-07	**1.3E+00**
Selenium	----	----	----	8.7	----	----	8.7	----	5.1E-04	52.05	----	3.5E-02
Silver	----	----	----	5	----	----	5	----	2.9E-04	15.09	----	1.0E-02
Thallium	----	----	----	----	----	----	----	----	----	3.8	----	9.4E-01
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	3	----	----	3	----	1.8E-04	113.8	----	7.6E-02
Zinc	----	----	----	3885	----	----	3885	----	3.7E-03	2164	----	2.4E-02
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	1100	----	---- **[a]**	1100	----	9.2E-01	130.7	----	5.7E-03
TPH-Gasoline	4.4	----	3.4E-03	27	----	---- **[a]**	27	----	7.7E-04	0.163	----	6.0E-06
TPH-Residual (Oil and Grease)	----	----	----	67	----	---- **[a]**	67	----	2.2E-02	1062	----	1.6E-01
Total Cancer Risk:	1.3E-07	----	----	2.0E-12	----	**1.6E-05**	----	----	**1.0E-05**	----	----	
Hazard Index:	----	1.5E-02	----	----	7.5E-07	----	----	**2.6E+01**	----	----	**8.9E+01**	

Notes:
[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-22a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 4
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)									
Acetone	----	----	----	----	----	----	0.2498	----	2.7E-07
Benzene	0.093	9.1E-08	1.5E-04	150	**8.9E-06**	1.4E-02	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	0.046	----	7.5E-08
Butylbenzene	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	0.014	----	1.4E-07
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----
Ethanol	0.036	----	7.6E-07	----	----	----	----	----	----
Ethylbenzene	0.24	1.8E-08	1.0E-05	420	**2.4E-06**	1.3E-03	----	----	----
4-Ethyltoluene	0.087	----	1.7E-05	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	0.2	1.9E-10	1.3E-06	0.011	5.4E-11	1.8E-07

Table L-22a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 4
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
n-Propylbenzene	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----
Toluene	1	----	3.1E-04	600	----	1.3E-02	0.0012	----	1.5E-08
1,1,1-Trichloroethane	0.16	----	1.4E-05	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	0.2	----	2.1E-03	----	----	----	----	----	----
1,3,5-Trimethylbenzene	0.066	----	7.0E-04	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----
m,p-Xylene	0.65	----	8.1E-05	----	----	----	----	----	----
o-Xylene	0.26	----	3.5E-05	----	----	----	----	----	----
Xylenes (total)	----	----	----	1300	----	1.2E-02	----	----	----
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	----	----	----	----	----	----	0.12	----	2.0E-06
Acenaphthylene	----	----	----	0.05	----	6.2E-07	0.094	----	4.6E-06
Anthracene	----	----	----	0.04	----	----	0.1522	----	5.0E-07
Benzo(a)anthracene	----	----	----	0.2	----	----	0.8561	6.7E-07	----
Benzo(a)pyrene	----	----	----	0.2	----	----	1.947	**1.5E-05**	----
Benzo(b)fluoranthene	----	----	----	0.2	----	----	2.248	**1.8E-06**	----
Benzo(g,h,i)perylene	----	----	----	0.09	----	----	1.258	----	1.1E-04
Benzo(k)fluoranthene	----	----	----	0.09	----	----	2.5	**1.9E-06**	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.2	----	----	1.118	8.7E-08	----
Dibenz(a,h)anthracene	----	----	----	0.02	----	----	1.4	**3.7E-06**	----
Fluoranthene	----	----	----	0.3	----	----	0.8909	----	4.0E-05
Fluorene	----	----	----	----	----	----	0.0289	----	7.1E-07
Indeno(1,2,3-cd)pyrene	----	----	----	0.08	----	----	1.637	**1.3E-06**	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.1	3.5E-10	3.2E-06	0.2	----	9.8E-06

Table L-22a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 4
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
4-Nitrophenol	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.2	----	8.8E-07	0.3713	----	1.8E-05
Pyrene	----	----	----	0.3	----	----	0.8953	----	5.4E-05
Pesticides/Polychlorinated Biphenyls									
Aroclor 1254	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	0.039	5.2E-08	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	2.69463E-06	1.2E-07	2.7E-03
Endosulfan I	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----
Metals									
Aluminum	----	----	----	----	----	----	14300	----	1.4E-02
Antimony	----	----	----	----	----	----	3.8	----	9.9E-03
Arsenic	----	----	----	----	----	----	171.5	**1.1E-04**	7.1E-01
Barium	----	----	----	----	----	----	130.5	----	7.3E-04
Beryllium	----	----	----	----	----	----	0.435	6.5E-11	2.4E-04
Boron	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	2.241	5.8E-10	4.4E-03
Chromium (total)	----	----	----	----	----	----	385.3	----	2.7E-04
Chromium VI	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	32.96	1.8E-08	1.2E-01
Copper	----	----	----	----	----	----	987	----	2.6E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	92200	----	1.3E-01
Lead	----	----	----	----	----	----	128.3	4.1E-07	----
Manganese	----	----	----	----	----	----	32800	----	2.9E-01
Mercury	----	----	----	----	----	----	0.43	----	2.3E-03
Molybdenum	----	----	----	----	----	----	0.39	----	8.1E-05
Nickel	----	----	----	----	----	----	600.9	9.7E-09	3.2E-02

Table L-22a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 4
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Selenium	----	----	----	----	----	----	32.2	----	6.7E-03
Silver	----	----	----	----	----	----	0.35	----	7.3E-05
Thallium	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	----	----	----	103.3	----	2.2E-02
Zinc	----	----	----	----	----	----	305.7	----	1.1E-03
Total Petroleum Hydrocarbons (TPH)									
TPH-Diesel	----	----	----	41000	----	**---- [a]**	142.7	----	2.1E-03
TPH-Gasoline	----	----	----	9100	----	3.0E-01	8.331	----	9.4E-05
TPH-Residual (Oil and Grease)	----	----	----	51	----	**---- [a]**	584.4	----	8.7E-02
Total Cancer Risk:	1.1E-07	----	----	**1.1E-05**	----	----	**1.4E-04**	----	
Hazard Index:	----	3.4E-03	----	----	3.4E-01	----	----	1.5E+00	

Notes:

[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.

Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.

EPC = Exposure point concentration

HQ = Hazard quotient

ug/L = microgram per liter

mg/kg = milligram per kilogram

Table L-22b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 4
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	----	----	----	----	----	----	----	----	----	0.1015	----	3.6E-07
Benzene	0.093	1.4E-08	5.7E-04	150	5.9E-09	2.4E-04	150	1.5E-07	2.5E-02	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----	0.046	----	2.5E-07
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	0.014	----	4.5E-07
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	0.036	----	3.4E-06	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.24	2.7E-09	3.7E-05	420	1.5E-09	2.2E-05	420	1.1E-07	7.2E-03	0.22	1.1E-10	7.1E-06
4-Ethyltoluene	0.087	----	5.9E-05	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	0.2	1.3E-13	2.3E-08	0.2	1.5E-11	1.3E-06	0.011	7.1E-12	5.9E-07
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Toluene	1	----	1.2E-03	600	----	2.1E-04	600	----	8.7E-03	0.031	----	1.3E-06
1,1,1-Trichloroethane	0.16	----	5.2E-05	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	0.2	----	7.2E-03	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	0.066	----	2.4E-03	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----

Table L-22b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 4
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	0.65	----	3.0E-04	----	----	----	----	----	----	----	----	----
o-Xylene	0.26	----	1.3E-04	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	1300	----	1.9E-04	1300	----	1.2E-02	0.15	----	2.4E-06
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	----	----	----	----	----	----	0.1565	----	8.4E-06
Acenaphthylene	----	----	----	0.05	----	1.0E-08	0.05	----	1.2E-05	0.06697	----	1.1E-05
Anthracene	----	----	----	0.04	----	----	0.04	----	9.4E-07	0.3975	----	4.3E-06
Benzo(a)anthracene	----	----	----	0.2	----	----	0.2	1.0E-07	----	0.9473	7.3E-08	----
Benzo(a)pyrene	----	----	----	0.2	----	----	0.2	**1.8E-06**	----	1.083	8.4E-07	----
Benzo(b)fluoranthene	----	----	----	0.2	----	----	0.2	1.8E-07	----	1.426	1.1E-07	----
Benzo(g,h,i)perylene	----	----	----	0.09	----	----	0.09	----	4.0E-04	0.7348	----	1.8E-04
Benzo(k)fluoranthene	----	----	----	0.09	----	----	0.09	7.5E-08	----	0.5143	4.0E-08	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.2	----	----	0.2	1.0E-08	----	1.049	8.1E-09	----
Dibenz(a,h)anthracene	----	----	----	0.02	----	----	0.02	1.5E-07	----	0.2384	6.3E-08	----
Fluoranthene	----	----	----	0.3	----	----	0.3	----	9.1E-05	1.856	----	2.1E-04
Fluorene	----	----	----	----	----	----	----	----	----	0.1548	----	1.2E-05
Indeno(1,2,3-cd)pyrene	----	----	----	0.08	----	----	0.08	1.2E-07	----	0.6705	5.2E-08	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.1	2.3E-13	5.2E-08	0.1	3.2E-13	9.3E-06	0.09706	----	1.6E-05
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.2	----	1.7E-08	0.2	----	6.7E-05	1.547	----	2.5E-04
Pyrene	----	----	----	0.3	----	----	0.3	----	1.1E-04	1.622	----	2.4E-04
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	0.056	7.4E-09	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	0.00000174	1.1E-08	5.7E-03
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	----	----	----	----	----	----	14300	----	5.0E-01
Antimony	----	----	----	----	----	----	----	----	----	3.5	----	2.9E-02
Arsenic	----	----	----	----	----	----	----	----	----	101.2	**8.6E-06**	**2.3E+00**
Barium	----	----	----	----	----	----	----	----	----	192.5	----	6.4E-02
Beryllium	----	----	----	----	----	----	----	----	----	0.339	1.8E-09	8.2E-03
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-22b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 4
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	----	----	----	----	----	----	1.145	1.1E-08	1.6E-02
Chromium (total)	----	----	----	----	----	----	----	----	----	266.4	----	5.9E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	----	----	----	27.05	5.5E-07	**1.0E+00**
Copper	----	----	----	----	----	----	----	----	----	546.3	----	4.5E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----	92200	----	4.3E-01
Lead	----	----	----	----	----	----	----	----	----	116.8	5.0E-08	----
Manganese	----	----	----	----	----	----	----	----	----	32800	----	**5.8E+01**
Mercury	----	----	----	----	----	----	----	----	----	0.311	----	6.0E-03
Molybdenum	----	----	----	----	----	----	----	----	----	0.433	----	2.9E-04
Nickel	----	----	----	----	----	----	----	----	----	449.7	2.6E-07	**1.5E+00**
Selenium	----	----	----	----	----	----	----	----	----	9.558	----	6.4E-03
Silver	----	----	----	----	----	----	----	----	----	0.78	----	5.2E-04
Thallium	----	----	----	----	----	----	----	----	----	0.28	----	6.9E-02
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	----	----	----	----	----	----	80.35	----	5.3E-02
Zinc	----	----	----	----	----	----	----	----	----	317.3	----	3.5E-03
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	41000	----	---- **[a]**	41000	----	**3.4E+01**	392.3	----	1.7E-02
TPH-Gasoline	----	----	----	9100	----	---- **[a]**	9100	----	2.6E-01	3.666	----	1.4E-04
TPH-Residual (Oil and Grease)	----	----	----	51	----	---- **[a]**	51	----	1.7E-02	466.7	----	7.0E-02
Total Cancer Risk:	1.7E-08	----		----	7.4E-09	----	----	**2.7E-06**	----	----	**1.1E-05**	----
Hazard Index:	----	1.2E-02		----	----	6.6E-04	----	----	**3.4E+01**	----	----	**6.4E+01**

Notes:
[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-23a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 5
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)									
Acetone	----	----	----	----	----	----	0.025	----	2.7E-08
Benzene	----	----	----	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	0.0057	----	9.3E-09
Butylbenzene	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----

Table L-23a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 5
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
n-Propylbenzene	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----
Toluene	0.2	----	6.3E-05	----	----	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	0.004	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----
m,p-Xylene	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	0.0012	----	5.9E-09
Xylenes (total)	----	----	----	----	----	----	0.0023	----	1.1E-08
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	----	----	----	----	----	----	----	----	----
Acenaphthylene	----	----	----	----	----	----	0.0026	----	1.3E-07
Anthracene	----	----	----	----	----	----	0.003	----	9.8E-09
Benzo(a)anthracene	----	----	----	----	----	----	0.0115	9.0E-09	----
Benzo(a)pyrene	----	----	----	----	----	----	0.0185	1.4E-07	----
Benzo(b)fluoranthene	----	----	----	----	----	----	0.0252	2.0E-08	----
Benzo(g,h,i)perylene	----	----	----	----	----	----	0.0174	----	1.6E-06
Benzo(k)fluoranthene	----	----	----	----	----	----	0.0062	4.8E-09	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	----	----	----	0.04287	3.3E-09	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	0.005	1.3E-08	----
Fluoranthene	----	----	----	----	----	----	0.02354	----	1.1E-06
Fluorene	----	----	----	----	----	----	0.0014	----	3.4E-08
Indeno(1,2,3-cd)pyrene	----	----	----	----	----	----	0.013	1.0E-08	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	----	----	----	0.00536	----	2.6E-07

Table L-23a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 5
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
4-Nitrophenol	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	----	----	----	0.04145	----	2.0E-06
Pyrene	----	----	----	----	----	----	0.04933	----	3.0E-06
Pesticides/Polychlorinated Biphenyls									
Aroclor 1254	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	0.0036	----	8.9E-06
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	0.007	----	1.9E-06
Heptachlor epoxide	----	----	----	----	----	----	0.009	2.3E-08	9.0E-04
beta-Hexachlorocyclohexane	----	----	----	----	----	----	0.006	4.0E-09	----
Metals									
Aluminum	----	----	----	----	----	----	----	----	----
Antimony	----	----	----	----	----	----	0.11	----	2.9E-04
Arsenic	----	----	----	----	----	----	3.033	**2.0E-06**	1.3E-02
Barium	----	----	----	----	----	----	96	----	5.3E-04
Beryllium	----	----	----	----	----	----	0.31	4.6E-11	1.7E-04
Boron	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	0.306	8.0E-11	6.1E-04
Chromium (total)	----	----	----	----	----	----	215.1	----	1.5E-04
Chromium VI	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	32	1.8E-08	1.1E-01
Copper	----	----	----	----	----	----	90.67	----	2.4E-03
Cyanide (total)	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----
Lead	----	----	----	----	----	----	30.29	9.6E-08	----
Manganese	----	----	----	----	----	----	----	----	----
Mercury	----	----	----	----	----	----	0.175	----	9.5E-04
Molybdenum	----	----	----	----	----	----	1.6	----	3.3E-04
Nickel	----	----	----	----	----	----	122.7	2.0E-09	6.4E-03

Table L-23a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 5
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	**Cancer Risk**	**HQ**	**EPC (ug/L)**	**Cancer Risk**	**HQ**	**EPC (mg/kg)**	**Cancer Risk**	**HQ**
Selenium	----	----	----	----	----	----	0.076	----	1.6E-05
Silver	----	----	----	----	----	----	----	----	----
Thallium	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	----	----	----	100	----	2.1E-02
Zinc	----	----	----	----	----	----	64.86	----	2.3E-04
Total Petroleum Hydrocarbons (TPH)									
TPH-Diesel	----	----	----	----	----	----	483.9	----	7.2E-03
TPH-Gasoline	----	----	----	----	----	----	0.301	----	3.4E-06
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	399.1	----	6.0E-02
Total Cancer Risk:		----	----	----	----	----	----	**2.4E-06**	----
Hazard Index:		----	6.3E-05	----	----	----	----	----	2.3E-01

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-23b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 5
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	----	----	----	----	----	----	----	----	----	0.025	----	9.0E-08
Benzene	----	----	----	----	----	----	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----	0.0057	----	3.1E-08
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	----	----	----
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Toluene	0.2	----	2.4E-04	----	----	----	----	----	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----	0.004	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----

Table L-23b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 5
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----	0.0012	----	1.9E-08
Xylenes (total)	----	----	----	----	----	----	----	----	----	0.0023	----	3.7E-08
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	----	----	----	----	----	----	----	----	----
Acenaphthylene	----	----	----	----	----	----	----	----	----	0.0026	----	4.2E-07
Anthracene	----	----	----	----	----	----	----	----	----	0.003	----	3.2E-08
Benzo(a)anthracene	----	----	----	----	----	----	----	----	----	0.01	7.7E-10	----
Benzo(a)pyrene	----	----	----	----	----	----	----	----	----	0.01656	1.3E-08	----
Benzo(b)fluoranthene	----	----	----	----	----	----	----	----	----	0.0202	1.6E-09	----
Benzo(g,h,i)perylene	----	----	----	----	----	----	----	----	----	0.01714	----	4.1E-06
Benzo(k)fluoranthene	----	----	----	----	----	----	----	----	----	0.0062	4.8E-10	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	----	----	----	----	----	----	0.0261	2.0E-10	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	----	----	----	0.005	1.3E-09	----
Fluoranthene	----	----	----	----	----	----	----	----	----	0.01762	----	2.0E-06
Fluorene	----	----	----	----	----	----	----	----	----	0.0014	----	1.1E-07
Indeno(1,2,3-cd)pyrene	----	----	----	----	----	----	----	----	----	0.01017	7.9E-10	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	----	----	----	----	----	----	0.004625	----	7.5E-07
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	----	----	----	----	----	----	0.02651	----	4.3E-06
Pyrene	----	----	----	----	----	----	----	----	----	0.03345	----	5.0E-06
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	0.043	5.7E-09	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	0.0036	----	2.7E-05
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	0.007	----	4.9E-06
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	0.009	2.7E-09	2.6E-03
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	0.006	4.7E-10	----
Metals												
Aluminum	----	----	----	----	----	----	----	----	----	----	----	----
Antimony	----	----	----	----	----	----	----	----	----	0.43	----	3.6E-03
Arsenic	----	----	----	----	----	----	----	----	----	2.334	2.0E-07	5.3E-02
Barium	----	----	----	----	----	----	----	----	----	88.14	----	2.9E-02
Beryllium	----	----	----	----	----	----	----	----	----	0.224	1.2E-09	5.4E-03
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-23b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 5
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	----	----	----	----	----	----	0.332	3.1E-09	4.8E-03
Chromium (total)	----	----	----	----	----	----	----	----	----	391.9	----	8.7E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	----	----	----	28.5	5.8E-07	**1.1E+00**
Copper	----	----	----	----	----	----	----	----	----	82.3	----	6.8E-03
Cyanide (total)	----	----	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----	----	----	----
Lead	----	----	----	----	----	----	----	----	----	22.09	9.5E-09	----
Manganese	----	----	----	----	----	----	----	----	----	----	----	----
Mercury	----	----	----	----	----	----	----	----	----	0.136	----	2.6E-03
Molybdenum	----	----	----	----	----	----	----	----	----	0.901	----	6.0E-04
Nickel	----	----	----	----	----	----	----	----	----	593.8	3.5E-07	**2.0E+00**
Selenium	----	----	----	----	----	----	----	----	----	0.076	----	5.1E-05
Silver	----	----	----	----	----	----	----	----	----	0.21	----	1.4E-04
Thallium	----	----	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	----	----	----	----	----	----	86.29	----	5.7E-02
Zinc	----	----	----	----	----	----	----	----	----	58.42	----	6.5E-04
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	----	----	----	----	----	----	289.8	----	1.3E-02
TPH-Gasoline	----	----	----	----	----	----	----	----	----	0.204	----	7.6E-06
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	----	----	----	259.5	----	3.9E-02
Total Cancer Risk:		----	----		----	----		----	----	----	**1.2E-06**	----
Hazard Index:		----	2.4E-04		----	----		----	----	----	----	**3.2E+00**

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-24a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 6
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)									
Acetone	0.02	----	7.6E-08	6.9	----	1.5E-08	0.0042	----	4.6E-09
Benzene	0.024	2.3E-08	3.8E-05	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----
2-Butanone	0.0092	----	1.7E-07	----	----	----	0.0022	----	3.6E-09
Butylbenzene	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----
Carbon Disulfide	0.01	----	1.3E-06	0.2	----	9.6E-06	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	0.0053	----	2.1E-06	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	0.016	----	4.1E-08	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.01	7.7E-10	4.3E-07	----	----	----	----	----	----
4-Ethyltoluene	0.027	----	5.3E-06	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	0.0087	4.3E-11	1.4E-07

Table L-24a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 6
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
n-Propylbenzene	----	----	----	----	----	----	----	----	----
Tetrachloroethene	0.01	1.8E-09	2.4E-05	----	----	----	----	----	----
Toluene	0.026	----	8.1E-06	----	----	----	----	----	----
1,1,1-Trichloroethane	0.0077	----	6.8E-07	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	0.12	----	1.3E-03	----	----	----	----	----	----
1,3,5-Trimethylbenzene	0.042	----	4.5E-04	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----
m,p-Xylene	0.053	----	6.6E-06	----	----	----	----	----	----
o-Xylene	0.023	----	3.1E-06	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	----	----	----	----	----	----	----	----	----
Acenaphthylene	----	----	----	0.05	----	6.2E-07	0.015	----	7.3E-07
Anthracene	----	----	----	0.07	----	----	0.019	----	6.2E-08
Benzo(a)anthracene	----	----	----	0.1	----	----	0.073	5.7E-08	----
Benzo(a)pyrene	----	----	----	0.1	----	----	0.06066	4.7E-07	----
Benzo(b)fluoranthene	----	----	----	0.1	----	----	0.08426	6.6E-08	----
Benzo(g,h,i)perylene	----	----	----	0.09	----	----	0.031	----	2.8E-06
Benzo(k)fluoranthene	----	----	----	0.05	----	----	0.053	4.1E-08	----
bis(2-Ethylhexyl)phthalate	----	----	----	26	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.1	----	----	0.0657	5.1E-09	----
Dibenz(a,h)anthracene	----	----	----	0.02	----	----	0.01	2.7E-08	----
Fluoranthene	----	----	----	0.2	----	----	0.07778	----	3.5E-06
Fluorene	----	----	----	0.02	----	----	----	----	----
Indeno(1,2,3-cd)pyrene	----	----	----	0.07	----	----	0.027	2.1E-08	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.05	1.7E-10	1.6E-06	----	----	----

Table L-24a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 6
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
4-Nitrophenol	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.2	----	8.8E-07	0.068	----	3.3E-06
Pyrene	----	----	----	0.3	----	----	0.1145	----	6.9E-06
Pesticides/Polychlorinated Biphenyls									
Aroclor 1254	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	0.22	3.0E-07	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----
Metals									
Aluminum	----	----	----	400	----	----	----	----	----
Antimony	----	----	----	8.2	----	----	----	----	----
Arsenic	----	----	----	40	----	----	3.3	**2.2E-06**	1.4E-02
Barium	----	----	----	155	----	----	94	----	5.2E-04
Beryllium	----	----	----	----	----	----	0.25	3.7E-11	1.4E-04
Boron	----	----	----	400	----	----	----	----	----
Cadmium	----	----	----	----	----	----	0.43	1.1E-10	8.5E-04
Chromium (total)	----	----	----	----	----	----	107.2	----	7.5E-05
Chromium VI	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	4.7	----	----	25	1.4E-08	8.8E-02
Copper	----	----	----	50	----	----	69	----	1.8E-03
Cyanide (total)	----	----	----	20	----	----	----	----	----
Iron	----	----	----	27700	----	----	----	----	----
Lead	----	----	----	169.5	----	----	109.5	3.5E-07	----
Manganese	----	----	----	----	----	----	----	----	----
Mercury	----	----	----	1	----	----	0.18	----	9.8E-04
Molybdenum	----	----	----	52	----	----	1.1	----	2.3E-04
Nickel	----	----	----	8.7	----	----	87.2	1.4E-09	4.6E-03

Table L-24a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 6
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Selenium	----	----	----	----	----	----	----	----	----
Silver	----	----	----	----	----	----	3.4	----	7.1E-04
Thallium	----	----	----	100	----	----	0.94	----	7.3E-02
Tin	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	15	----	----	120	----	2.5E-02
Zinc	----	----	----	175	----	----	154	----	5.4E-04
Total Petroleum Hydrocarbons (TPH)									
TPH-Diesel	----	----	----	----	----	----	53.2	----	7.9E-04
TPH-Gasoline	----	----	----	31	----	1.0E-03	0.147	----	1.7E-06
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	520	----	7.8E-02
Total Cancer Risk:		2.6E-08	----	----	1.7E-10	----	----	**3.5E-06**	----
Hazard Index:		----	1.8E-03	----	----	1.0E-03	----	----	2.9E-01

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-24b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 6
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	0.02	----	3.3E-07	6.9	----	3.4E-10	6.9	----	2.2E-06	0.0151	----	5.4E-08
Benzene	0.024	3.6E-09	1.5E-04	----	----	----	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	0.0092	----	6.2E-07	----	----	----	----	----	----	0.0033	----	1.8E-08
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	0.01	----	5.4E-06	0.2	----	1.6E-07	0.2	----	1.6E-06	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	0.0053	----	7.3E-06	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	0.016	----	1.7E-07	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.01	1.1E-10	1.6E-06	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	0.027	----	1.8E-05	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	0.01315	8.5E-12	7.1E-07
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	0.01	2.5E-10	8.5E-05	----	----	----	----	----	----	----	----	----
Toluene	0.026	----	3.1E-05	----	----	----	----	----	----	0.0011	----	4.4E-08
1,1,1-Trichloroethane	0.0077	----	2.5E-06	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	0.12	----	4.3E-03	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	0.042	----	1.5E-03	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
m,p-Xylene	0.053	----	2.4E-05	----	----	----	----	----	----	----	----	----

Table L-24b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 6
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
o-Xylene	0.023	----	1.2E-05	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	----	----	----	----	----	----	0.0041	----	2.2E-07
Acenaphthylene	----	----	----	0.05	----	1.0E-08	0.05	----	1.2E-05	0.01829	----	3.0E-06
Anthracene	----	----	----	0.07	----	----	0.07	----	1.6E-06	0.351	----	3.8E-06
Benzo(a)anthracene	----	----	----	0.1	----	----	0.1	5.2E-08	----	0.9757	7.5E-08	----
Benzo(a)pyrene	----	----	----	0.1	----	----	0.1	8.8E-07	----	1.911	**1.5E-06**	----
Benzo(b)fluoranthene	----	----	----	0.1	----	----	0.1	9.0E-08	----	1.263	9.7E-08	----
Benzo(g,h,i)perylene	----	----	----	0.09	----	----	0.09	----	4.0E-04	0.7467	----	1.8E-04
Benzo(k)fluoranthene	----	----	----	0.05	----	----	0.05	4.2E-08	----	1.266	9.8E-08	----
bis(2-Ethylhexyl)phthalate	----	----	----	26	----	----	26	5.4E-09	6.3E-03	2.75	5.1E-10	5.8E-04
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	1.89	2.2E-10	4.0E-05
Chrysene	----	----	----	0.1	----	----	0.1	5.2E-09	----	0.9766	7.5E-09	----
Dibenz(a,h)anthracene	----	----	----	0.02	----	----	0.02	1.5E-07	----	0.136	3.6E-08	----
Fluoranthene	----	----	----	0.2	----	----	0.2	----	6.1E-05	1.246	----	1.4E-04
Fluorene	----	----	----	0.02	----	----	0.02	----	2.5E-06	0.014	----	1.1E-06
Indeno(1,2,3-cd)pyrene	----	----	----	0.07	----	----	0.07	1.0E-07	----	0.7255	5.6E-08	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.05	1.1E-13	2.6E-08	0.05	1.6E-13	4.7E-06	0.023	----	3.7E-06
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.2	----	1.7E-08	0.2	----	6.7E-05	0.5053	----	8.2E-05
Pyrene	----	----	----	0.3	----	----	0.3	----	1.1E-04	1.497	----	2.2E-04
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	0.22	2.9E-08	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	400	----	----	400	----	1.2E-04	----	----	----
Antimony	----	----	----	8.2	----	----	8.2	----	6.0E-03	18.37	----	1.5E-01
Arsenic	----	----	----	40	----	----	40	2.5E-07	3.9E-02	125.3	**1.1E-05**	**2.8E+00**
Barium	----	----	----	155	----	----	155	----	2.3E-04	162.3	----	5.4E-02
Beryllium	----	----	----	----	----	----	----	----	----	0.465	2.5E-09	1.1E-02
Boron	----	----	----	400	----	----	400	----	5.9E-04	----	----	----
Cadmium	----	----	----	----	----	----	----	----	----	1.691	1.6E-08	2.4E-02
Chromium (total)	----	----	----	----	----	----	----	----	----	106.2	----	2.4E-04

Table L-24b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 6
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	4.7	----	----	4.7	----	4.5E-03	39.45	8.0E-07	**1.5E+00**
Copper	----	----	----	50	----	----	50	----	3.7E-04	903.3	----	7.5E-02
Cyanide (total)	----	----	----	20	----	----	20	----	3.0E-04	1.1	----	1.8E-04
Iron	----	----	----	27700	----	----	27700	----	1.2E-02	----	----	----
Lead	----	----	----	169.5	----	----	169.5	5.8E-09	----	512.8	2.2E-07	----
Manganese	----	----	----	----	----	----	----	----	----	----	----	----
Mercury	----	----	----	1	----	----	1	----	9.8E-04	13.45	----	2.6E-01
Molybdenum	----	----	----	52	----	----	52	----	3.1E-03	6.481	----	4.3E-03
Nickel	----	----	----	8.7	----	----	8.7	----	1.2E-04	122.3	7.2E-08	4.1E-01
Selenium	----	----	----	----	----	----	----	----	----	40.83	----	2.7E-02
Silver	----	----	----	----	----	----	----	----	----	2.862	----	1.9E-03
Thallium	----	----	----	100	----	----	100	----	**2.2E+00**	87.28	----	**2.2E+01**
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	15	----	----	15	----	8.9E-04	92.18	----	6.1E-02
Zinc	----	----	----	175	----	----	175	----	1.7E-04	453.4	----	5.0E-03
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	----	----	----	----	----	----	314.6	----	1.4E-02
TPH-Gasoline	----	----	----	31	----	**---- [a]**	31	----	8.9E-04	3.523	----	1.3E-04
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	----	----	----	503.6	----	7.5E-02
Total Cancer Risk:	4.0E-09	----	----	----	1.1E-13	----	----	**1.6E-06**	----	----	**1.4E-05**	----
Hazard Index:	----	6.1E-03	----	----	----	2.2E-07	----	----	**2.3E+00**	----	----	**2.7E+01**

Notes:
[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-25a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 7
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)									
Acetone	----	----	----	----	----	----	----	----	----
Benzene	----	----	----	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----
Butylbenzene	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----

Table L-25a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 7
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
n-Propylbenzene	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----
Toluene	----	----	----	----	----	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----
m,p-Xylene	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	----	----	----	----	----	----	----	----	----
Acenaphthylene	----	----	----	----	----	----	----	----	----
Anthracene	----	----	----	----	----	----	----	----	----
Benzo(a)anthracene	----	----	----	----	----	----	----	----	----
Benzo(a)pyrene	----	----	----	----	----	----	----	----	----
Benzo(b)fluoranthene	----	----	----	----	----	----	----	----	----
Benzo(g,h,i)perylene	----	----	----	----	----	----	----	----	----
Benzo(k)fluoranthene	----	----	----	----	----	----	----	----	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	----	----	----	----	----	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	----	----	----
Fluoranthene	----	----	----	----	----	----	----	----	----
Fluorene	----	----	----	----	----	----	----	----	----
Indeno(1,2,3-cd)pyrene	----	----	----	----	----	----	----	----	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	----	----	----	----	----	----

Table L-25a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 7
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
4-Nitrophenol	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	----	----	----	----	----	----
Pyrene	----	----	----	----	----	----	----	----	----
Pesticides/Polychlorinated Biphenyls									
Aroclor 1254	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----
Metals									
Aluminum	----	----	----	----	----	----	----	----	----
Antimony	----	----	----	----	----	----	----	----	----
Arsenic	----	----	----	----	----	----	----	----	----
Barium	----	----	----	----	----	----	----	----	----
Beryllium	----	----	----	----	----	----	----	----	----
Boron	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	----	----	----
Chromium (total)	----	----	----	----	----	----	720	----	5.0E-04
Chromium VI	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	----	----	----
Copper	----	----	----	----	----	----	----	----	----
Cyanide (total)	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----
Lead	----	----	----	----	----	----	0.083	2.6E-10	----
Manganese	----	----	----	----	----	----	----	----	----
Mercury	----	----	----	----	----	----	----	----	----
Molybdenum	----	----	----	----	----	----	----	----	----
Nickel	----	----	----	----	----	----	2100	3.4E-08	1.1E-01

Table L-25a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 7
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Selenium	----	----	----	----	----	----	----	----	----
Silver	----	----	----	----	----	----	----	----	----
Thallium	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	----	----	----	----	----	----
Zinc	----	----	----	----	----	----	26	----	9.0E-05
Total Petroleum Hydrocarbons (TPH)									
TPH-Diesel	----	----	----	----	----	----	1.5	----	2.2E-05
TPH-Gasoline	----	----	----	----	----	----	0.17	----	1.9E-06
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	2.5	----	3.7E-04
Total Cancer Risk:		----	----	----	----	----	----	3.4E-08	----
Hazard Index:		----	----	----	----	----	----	----	1.1E-01

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-25b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 7
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	----	----	----	----	----	----	----	----	----	0.0027	----	9.7E-09
Benzene	----	----	----	----	----	----	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	0.0023	1.5E-12	1.2E-07
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Toluene	----	----	----	----	----	----	----	----	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----

Table L-25b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 7
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	----	----	----	----	----	----	----	----	----
Acenaphthylene	----	----	----	----	----	----	----	----	----	----	----	----
Anthracene	----	----	----	----	----	----	----	----	----	----	----	----
Benzo(a)anthracene	----	----	----	----	----	----	----	----	----	----	----	----
Benzo(a)pyrene	----	----	----	----	----	----	----	----	----	----	----	----
Benzo(b)fluoranthene	----	----	----	----	----	----	----	----	----	----	----	----
Benzo(g,h,i)perylene	----	----	----	----	----	----	----	----	----	----	----	----
Benzo(k)fluoranthene	----	----	----	----	----	----	----	----	----	----	----	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	----	----	----	----	----	----	----	----	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	----	----	----	----	----	----
Fluoranthene	----	----	----	----	----	----	----	----	----	----	----	----
Fluorene	----	----	----	----	----	----	----	----	----	----	----	----
Indeno(1,2,3-cd)pyrene	----	----	----	----	----	----	----	----	----	----	----	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	----	----	----	----	----	----	----	----	----
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	----	----	----	----	----	----	----	----	----
Pyrene	----	----	----	----	----	----	----	----	----	----	----	----
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	----	----	----	----	----	----	----	----	----
Antimony	----	----	----	----	----	----	----	----	----	0.15	----	1.2E-03
Arsenic	----	----	----	----	----	----	----	----	----	0.94	8.0E-08	2.1E-02
Barium	----	----	----	----	----	----	----	----	----	280	----	9.3E-02
Beryllium	----	----	----	----	----	----	----	----	----	0.68	3.7E-09	1.6E-02
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-25b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 7
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	----	----	----	----	----	----	0.19	1.8E-09	2.7E-03
Chromium (total)	----	----	----	----	----	----	----	----	----	1244	----	2.8E-03
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	----	----	----	110	**2.2E-06**	**4.1E+00**
Copper	----	----	----	----	----	----	----	----	----	54	----	4.5E-03
Cyanide (total)	----	----	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----	----	----	----
Lead	----	----	----	----	----	----	----	----	----	0.45	1.9E-10	----
Manganese	----	----	----	----	----	----	----	----	----	----	----	----
Mercury	----	----	----	----	----	----	----	----	----	0.0094	----	1.8E-04
Molybdenum	----	----	----	----	----	----	----	----	----	0.21	----	1.4E-04
Nickel	----	----	----	----	----	----	----	----	----	2100	**1.2E-06**	**7.0E+00**
Selenium	----	----	----	----	----	----	----	----	----	0.12	----	8.1E-05
Silver	----	----	----	----	----	----	----	----	----	----	----	----
Thallium	----	----	----	----	----	----	----	----	----	0.076	----	1.9E-02
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	----	----	----	----	----	----	180	----	1.2E-01
Zinc	----	----	----	----	----	----	----	----	----	76	----	8.4E-04
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	----	----	----	----	----	----	1.5	----	6.5E-05
TPH-Gasoline	----	----	----	----	----	----	----	----	----	0.17	----	6.3E-06
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	----	----	----	2.5	----	3.7E-04
Total Cancer Risk:		----	----	----	----	----	----	----	----	----	**3.5E-06**	----
Hazard Index:		----	----	----	----	----	----	----	----	----	----	**1.1E+01**

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-26a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 8
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)									
Acetone	----	----	----	1.8	----	3.9E-09	----	----	----
Benzene	----	----	----	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----
Butylbenzene	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	0.1	----	4.8E-06	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	0.1	8.5E-10	1.5E-06	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.78	6.0E-08	3.3E-05	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----

Table L-26a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 8
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
n-Propylbenzene	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----
Toluene	----	----	----	----	----	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----
m,p-Xylene	0.74	----	9.2E-05	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	----	----	----	----	----	----	----	----	----
Acenaphthylene	----	----	----	0.085	----	1.0E-06	----	----	----
Anthracene	----	----	----	0.2	----	----	----	----	----
Benzo(a)anthracene	----	----	----	----	----	----	----	----	----
Benzo(a)pyrene	----	----	----	----	----	----	----	----	----
Benzo(b)fluoranthene	----	----	----	----	----	----	----	----	----
Benzo(g,h,i)perylene	----	----	----	----	----	----	----	----	----
Benzo(k)fluoranthene	----	----	----	----	----	----	----	----	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	----	----	----	----	----	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	----	----	----
Fluoranthene	----	----	----	----	----	----	----	----	----
Fluorene	----	----	----	----	----	----	----	----	----
Indeno(1,2,3-cd)pyrene	----	----	----	----	----	----	----	----	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----
Naphthalene	0.44	3.9E-07	3.6E-03	----	----	----	----	----	----

Table L-26a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 8
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
4-Nitrophenol	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	----	----	----	----	----	----
Pyrene	----	----	----	0.05	----	----	----	----	----
Pesticides/Polychlorinated Biphenyls									
Aroclor 1254	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----
Metals									
Aluminum	----	----	----	----	----	----	----	----	----
Antimony	----	----	----	1.4	----	----	----	----	----
Arsenic	----	----	----	3.55	----	----	----	----	----
Barium	----	----	----	47	----	----	----	----	----
Beryllium	----	----	----	----	----	----	----	----	----
Boron	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	----	----	----
Chromium (total)	----	----	----	3.8	----	----	----	----	----
Chromium VI	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	1.9	----	----	----	----	----
Copper	----	----	----	17.65	----	----	----	----	----
Cyanide (total)	----	----	----	40	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----
Lead	----	----	----	3.9	----	----	----	----	----
Manganese	----	----	----	----	----	----	----	----	----
Mercury	----	----	----	----	----	----	----	----	----
Molybdenum	----	----	----	3.8	----	----	----	----	----
Nickel	----	----	----	4.1	----	----	----	----	----

Table L-26a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 8
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	**Cancer Risk**	**HQ**	**EPC (ug/L)**	**Cancer Risk**	**HQ**	**EPC (mg/kg)**	**Cancer Risk**	**HQ**
Selenium	----	----	----	0.48	----	----	----	----	----
Silver	----	----	----	----	----	----	----	----	----
Thallium	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	6.6	----	----	----	----	----
Zinc	----	----	----	22	----	----	----	----	----
Total Petroleum Hydrocarbons (TPH)									
TPH-Diesel	----	----	----	15	----	**---- [a]**	----	----	----
TPH-Gasoline	----	----	----	22.5	----	7.5E-04	----	----	----
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	----	----	----
Total Cancer Risk:		4.5E-07	----	----	8.5E-10	----	----	----	----
Hazard Index:		----	3.7E-03	----	----	7.6E-04	----	----	----

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-26b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 8
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	----	----	----	1.8	----	8.8E-11	1.8	----	5.8E-07	0.0035	----	1.3E-08
Benzene	----	----	----	----	----	----	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	0.1	----	8.2E-08	0.1	----	8.2E-07	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	0.1	5.8E-13	2.6E-08	0.1	2.3E-11	5.0E-06	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.78	8.7E-09	1.2E-04	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	----	----	----
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Toluene	----	----	----	----	----	----	----	----	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----

Table L-26b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 8
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	0.74	----	3.4E-04	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	----	----	----	----	----	----	----	----	----
Acenaphthylene	----	----	----	0.085	----	1.8E-08	0.085	----	2.0E-05	----	----	----
Anthracene	----	----	----	0.2	----	----	0.2	----	4.7E-06	----	----	----
Benzo(a)anthracene	----	----	----	----	----	----	----	----	----	----	----	----
Benzo(a)pyrene	----	----	----	----	----	----	----	----	----	----	----	----
Benzo(b)fluoranthene	----	----	----	----	----	----	----	----	----	----	----	----
Benzo(g,h,i)perylene	----	----	----	----	----	----	----	----	----	----	----	----
Benzo(k)fluoranthene	----	----	----	----	----	----	----	----	----	----	----	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	----	----	----	----	----	----	----	----	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	----	----	----	----	----	----
Fluoranthene	----	----	----	----	----	----	----	----	----	----	----	----
Fluorene	----	----	----	----	----	----	----	----	----	----	----	----
Indeno(1,2,3-cd)pyrene	----	----	----	----	----	----	----	----	----	----	----	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	0.44	5.2E-08	1.2E-02	----	----	----	----	----	----	----	----	----
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	----	----	----	----	----	----	----	----	----
Pyrene	----	----	----	0.05	----	----	0.05	----	1.8E-05	----	----	----
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	----	----	----	----	----	----	----	----	----
Antimony	----	----	----	1.4	----	----	1.4	----	1.0E-03	----	----	----
Arsenic	----	----	----	3.55	----	----	3.55	2.2E-08	3.5E-03	----	----	----
Barium	----	----	----	47	----	----	47	----	6.9E-05	----	----	----
Beryllium	----	----	----	----	----	----	----	----	----	----	----	----
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-26b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 8
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	----	----	----	----	----	----	0.19	1.8E-09	2.7E-03
Chromium (total)	----	----	----	3.8	----	----	3.8	----	7.9E-07	160	----	3.5E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	1.9	----	----	1.9	----	1.8E-03	----	----	----
Copper	----	----	----	17.65	----	----	17.65	----	1.3E-04	----	----	----
Cyanide (total)	----	----	----	40	----	----	40	----	5.9E-04	----	----	----
Iron	----	----	----	----	----	----	----	----	----	----	----	----
Lead	----	----	----	3.9	----	----	3.9	1.3E-10	----	0.36	1.6E-10	----
Manganese	----	----	----	----	----	----	----	----	----	----	----	----
Mercury	----	----	----	----	----	----	----	----	----	----	----	----
Molybdenum	----	----	----	3.8	----	----	3.8	----	2.2E-04	----	----	----
Nickel	----	----	----	4.1	----	----	4.1	----	5.8E-05	100	5.9E-08	3.3E-01
Selenium	----	----	----	0.48	----	----	0.48	----	2.8E-05	----	----	----
Silver	----	----	----	----	----	----	----	----	----	----	----	----
Thallium	----	----	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	6.6	----	----	6.6	----	3.9E-04	----	----	----
Zinc	----	----	----	22	----	----	22	----	2.1E-05	52	----	5.8E-04
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	15	----	---- **[a]**	15	----	1.3E-02	----	----	----
TPH-Gasoline	----	----	----	22.5	----	---- **[a]**	22.5	----	6.4E-04	----	----	----
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	----	----	----	0.77	----	1.1E-04
Total Cancer Risk:		6.1E-08	----	----	5.8E-13	----	----	2.3E-08	----	----	6.0E-08	----
Hazard Index:		----	1.2E-02	----	----	1.3E-07	----	----	2.1E-02	----	----	3.3E-01

Notes:
[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-27a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 9
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)									
Acetone	0.065	----	2.5E-07	4.38	----	9.5E-09	0.044	----	4.8E-08
Benzene	0.028	2.7E-08	4.4E-05	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----
2-Butanone	0.01	----	1.9E-07	1.1	----	1.5E-08	0.035	----	5.7E-08
Butylbenzene	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	0.6	----	----	----	----	----
tert-Butylbenzene	----	----	----	0.7	----	3.4E-05	----	----	----
Carbon Disulfide	----	----	----	1.6	----	7.7E-05	0.0008	----	7.8E-09
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	0.6	5.1E-09	8.9E-06	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	0.3	----	9.1E-06	----	----	----
Dichlorodifluoromethane	0.004	----	1.6E-06	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	31	9.2E-08	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	1	----	4.3E-04	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.19	1.5E-08	8.1E-06	----	----	----	----	----	----
4-Ethyltoluene	0.074	----	1.4E-05	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	0.007	----	8.6E-08
Methylcyclohexane	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	0.0194	9.5E-11	3.2E-07

Table L-27a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 9
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
n-Propylbenzene	----	----	----	----	----	----	----	----	----
Tetrachloroethene	0.039	6.9E-09	9.3E-05	----	----	----	0.001	1.9E-10	9.8E-08
Toluene	0.45	----	1.4E-04	----	----	----	----	----	----
1,1,1-Trichloroethane	0.36	----	3.2E-05	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	0.0006	1.2E-12	----
Trichlorofluoromethane	----	----	----	----	----	----	0.00284	----	9.3E-09
1,2,4-Trimethylbenzene	0.18	----	1.9E-03	0.4	----	2.2E-04	----	----	----
1,3,5-Trimethylbenzene	0.061	----	6.5E-04	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----
m,p-Xylene	0.61	----	7.6E-05	----	----	----	----	----	----
o-Xylene	0.25	----	3.3E-05	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	0.001	----	4.9E-09
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	----	----	----	4.355	----	----	0.05344	----	8.7E-07
Acenaphthylene	----	----	----	4.1	----	5.1E-05	0.7283	----	3.6E-05
Anthracene	----	----	----	2.303	----	----	0.1763	----	5.8E-07
Benzo(a)anthracene	----	----	----	3.839	----	----	0.7557	5.9E-07	----
Benzo(a)pyrene	----	----	----	2.8	----	----	0.6686	**5.2E-06**	----
Benzo(b)fluoranthene	----	----	----	3.638	----	----	0.76	5.9E-07	----
Benzo(g,h,i)perylene	----	----	----	1.842	----	----	0.7231	----	6.6E-05
Benzo(k)fluoranthene	----	----	----	2.5	----	----	0.2997	2.3E-07	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	7.792	----	----	0.6144	4.8E-08	----
Dibenz(a,h)anthracene	----	----	----	0.4	----	----	0.9103	**2.4E-06**	----
Fluoranthene	----	----	----	5.654	----	----	1.651	----	7.5E-05
Fluorene	----	----	----	3.109	----	----	0.1531	----	3.7E-06
Indeno(1,2,3-cd)pyrene	----	----	----	1.4	----	----	0.5666	4.4E-07	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	9.292	3.2E-08	3.0E-04	0.2519	----	1.2E-05

Table L-27a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 9
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
4-Nitrophenol	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	8.71	----	3.8E-05	1.063	----	5.2E-05
Pyrene	----	----	----	6.923	----	----	1.502	----	9.1E-05
Pesticides/Polychlorinated Biphenyls									
Aroclor 1254	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----
Metals									
Aluminum	----	----	----	----	----	----	17660	----	1.8E-02
Antimony	----	----	----	0.22	----	----	16.1	----	4.2E-02
Arsenic	----	----	----	14	----	----	12.13	**8.0E-06**	5.0E-02
Barium	----	----	----	1200	----	----	287.4	----	1.6E-03
Beryllium	----	----	----	----	----	----	0.712	1.1E-10	3.9E-04
Boron	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	16	----	----	3.14	8.2E-10	6.2E-03
Chromium (total)	----	----	----	7	----	----	198.6	----	1.4E-04
Chromium VI	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	59	----	----	26.82	1.5E-08	9.4E-02
Copper	----	----	----	26	----	----	1172	----	3.1E-02
Cyanide (total)	----	----	----	30	----	----	----	----	----
Iron	----	----	----	----	----	----	131420	----	1.8E-01
Lead	----	----	----	2.7	----	----	2056	**6.5E-06**	----
Manganese	----	----	----	----	----	----	16186	----	1.4E-01
Mercury	----	----	----	0.066	----	----	3.259	----	1.8E-02
Molybdenum	----	----	----	3.9	----	----	----	----	----
Nickel	----	----	----	69	----	----	330.3	5.3E-09	1.7E-02

Table L-27a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 9
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Selenium	----	----	----	----	----	----	54.2	----	1.1E-02
Silver	----	----	----	----	----	----	0.07	----	1.5E-05
Thallium	----	----	----	----	----	----	4.62	----	3.6E-01
Tin	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	1.8	----	----	59.32	----	1.2E-02
Zinc	----	----	----	3100	----	----	698	----	2.4E-03
Total Petroleum Hydrocarbons (TPH)									
TPH-Diesel	----	----	----	83140	----	---- **[a]**	750	----	1.1E-02
TPH-Gasoline	----	----	----	3077	----	1.0E-01	0.35	----	3.9E-06
TPH-Residual (Oil and Grease)	----	----	----	64770	----	---- **[a]**	5710	----	8.5E-01
Total Cancer Risk:	4.9E-08	----	----	1.3E-07	----	----	----	**2.4E-05**	----
Hazard Index:	----	3.0E-03	----	----	1.0E-01	----	----	----	**1.9E+00**

Notes:

[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.

Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.

EPC = Exposure point concentration

HQ = Hazard quotient

ug/L = microgram per liter

mg/kg = milligram per kilogram

Table L-27b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 9
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	0.065	----	1.1E-06	4.38	----	2.1E-10	4.38	----	1.4E-06	0.04817	----	1.7E-07
Benzene	0.028	4.2E-09	1.7E-04	----	----	----	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	0.01	----	6.7E-07	1.1	----	3.0E-10	1.1	----	5.6E-07	0.045	----	2.4E-07
Butylbenzene	----	----	----	----	----	----	----	----	----	0.0059	----	2.4E-07
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	0.7	----	5.3E-07	0.7	----	4.7E-05	----	----	----
Carbon Disulfide	----	----	----	1.6	----	1.3E-06	1.6	----	1.3E-05	0.0057	----	1.8E-07
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	0.0049	3.4E-11	4.0E-06
Chloroform	----	----	----	0.6	3.5E-12	1.5E-07	0.6	1.4E-10	3.0E-05	0.0045	6.4E-12	1.5E-06
Chloromethane	----	----	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	0.3	----	1.4E-07	0.3	----	1.6E-05	----	----	----
Dichlorodifluoromethane	0.004	----	5.5E-06	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	31	6.0E-11	----	31	1.3E-09	7.3E-05	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	1	----	7.1E-06	1	----	2.2E-05	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.19	2.1E-09	3.0E-05	----	----	----	----	----	----	0.0081	4.1E-12	2.6E-07
4-Ethyltoluene	0.074	----	5.0E-05	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	0.007	----	2.8E-07
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	0.01221	7.9E-12	6.6E-07
n-Propylbenzene	----	----	----	----	----	----	----	----	----	0.0071	----	2.9E-07
Tetrachloroethene	0.039	9.8E-10	3.3E-04	----	----	----	----	----	----	0.001	2.5E-11	3.2E-07
Toluene	0.45	----	5.4E-04	----	----	----	----	----	----	0.009	----	3.6E-07
1,1,1-Trichloroethane	0.36	----	1.2E-04	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	0.0006	1.6E-13	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	0.003133	----	3.4E-08
1,2,4-Trimethylbenzene	0.18	----	6.5E-03	0.4	----	3.4E-06	0.4	----	4.6E-06	----	----	----
1,3,5-Trimethylbenzene	0.061	----	2.2E-03	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----

Table L-27b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 9
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	0.61	----	2.8E-04	----	----	----	----	----	----	----	----	----
o-Xylene	0.25	----	1.3E-04	----	----	----	----	----	----	0.0036	----	5.8E-08
Xylenes (total)	----	----	----	----	----	----	----	----	----	0.0061	----	9.8E-08
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	4.355	----	----	4.355	----	2.5E-04	0.08489	----	4.6E-06
Acenaphthylene	----	----	----	4.1	----	8.5E-07	4.1	----	9.5E-04	0.2989	----	4.8E-05
Anthracene	----	----	----	2.303	----	----	2.303	----	5.4E-05	0.4064	----	4.4E-06
Benzo(a)anthracene	----	----	----	3.839	----	----	3.839	**2.0E-06**	----	0.9838	7.6E-08	----
Benzo(a)pyrene	----	----	----	2.8	----	----	2.8	**2.5E-05**	----	1.047	8.1E-07	----
Benzo(b)fluoranthene	----	----	----	3.638	----	----	3.638	**3.3E-06**	----	1.325	1.0E-07	----
Benzo(g,h,i)perylene	----	----	----	1.842	----	----	1.842	----	8.1E-03	0.7243	----	1.8E-04
Benzo(k)fluoranthene	----	----	----	2.5	----	----	2.5	**2.1E-06**	----	0.4394	3.4E-08	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	7.792	----	----	7.792	4.0E-07	----	0.9813	7.6E-09	----
Dibenz(a,h)anthracene	----	----	----	0.4	----	----	0.4	**3.1E-06**	----	0.4722	1.3E-07	----
Fluoranthene	----	----	----	5.654	----	----	5.654	----	1.7E-03	2.371	----	2.7E-04
Fluorene	----	----	----	3.109	----	----	3.109	----	3.8E-04	0.1397	----	1.1E-05
Indeno(1,2,3-cd)pyrene	----	----	----	1.4	----	----	1.4	**2.1E-06**	----	0.6883	5.3E-08	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	0.2	----	1.6E-04
Naphthalene	----	----	----	9.292	2.1E-11	4.8E-06	9.292	2.9E-11	8.7E-04	0.7407	----	1.2E-04
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	8.71	----	7.3E-07	8.71	----	2.9E-03	1.734	----	2.8E-04
Pyrene	----	----	----	6.923	----	----	6.923	----	2.5E-03	2.098	----	3.1E-04
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	0.039	5.2E-09	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	----	----	----	----	----	----	17786	----	6.2E-01
Antimony	----	----	----	0.22	----	----	0.22	----	1.6E-04	10.31	----	8.6E-02
Arsenic	----	----	----	14	----	----	14	8.9E-08	1.4E-02	18.27	**1.6E-06**	4.1E-01
Barium	----	----	----	1200	----	----	1200	----	1.8E-03	328.5	----	1.1E-01
Beryllium	----	----	----	----	----	----	----	----	----	0.471	2.5E-09	1.1E-02
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-27b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Parcel 9
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	16	----	----	16	----	9.4E-03	1.779	1.7E-08	2.6E-02
Chromium (total)	----	----	----	7	----	----	7	----	1.5E-06	136.8	----	3.0E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	59	----	----	59	----	5.6E-02	24.18	4.9E-07	9.0E-01
Copper	----	----	----	26	----	----	26	----	1.9E-04	654.3	----	5.4E-02
Cyanide (total)	----	----	----	30	----	----	30	----	4.4E-04	----	----	----
Iron	----	----	----	----	----	----	----	----	----	132840	----	6.1E-01
Lead	----	----	----	2.7	----	----	2.7	9.2E-11	----	1061	4.6E-07	----
Manganese	----	----	----	----	----	----	----	----	----	16186	----	**2.9E+01**
Mercury	----	----	----	0.066	----	----	0.066	----	6.5E-05	3.672	----	7.1E-02
Molybdenum	----	----	----	3.9	----	----	3.9	----	2.3E-04	3.95	----	2.6E-03
Nickel	----	----	----	69	----	----	69	----	9.7E-04	222.7	1.3E-07	7.4E-01
Selenium	----	----	----	----	----	----	----	----	----	73.6	----	5.0E-02
Silver	----	----	----	----	----	----	----	----	----	2.9	----	1.9E-03
Thallium	----	----	----	----	----	----	----	----	----	55.8	----	**1.4E+01**
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	1.8	----	----	1.8	----	1.1E-04	83.53	----	5.6E-02
Zinc	----	----	----	3100	----	----	3100	----	3.0E-03	617.8	----	6.8E-03
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	83140	----	---- **[a]**	83140	----	**6.9E+01**	1592	----	6.9E-02
TPH-Gasoline	----	----	----	3077	----	---- **[a]**	3077	----	8.8E-02	7.26	----	2.7E-04
TPH-Residual (Oil and Grease)	----	----	----	64770	----	---- **[a]**	64770	----	**2.2E+01**	2381	----	3.6E-01
Total Cancer Risk:	7.3E-09	----	----	----	8.4E-11	----	----	**3.8E-05**	----	----	**3.9E-06**	----
Hazard Index:	----	1.0E-02	----	----	----	1.9E-05	----	----	**9.1E+01**	----	----	**4.7E+01**

Notes:
[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-28a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates

MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)									
Acetone	0.064	----	2.4E-07	----	----	----	----	----	----
Benzene	0.027	2.6E-08	4.2E-05	14	8.3E-07	1.3E-03	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----
2-Butanone	0.025	----	4.7E-07	----	----	----	----	----	----
Butylbenzene	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----
Ethanol	0.033	----	7.0E-07	----	----	----	----	----	----
Ethylbenzene	0.032	2.4E-09	1.4E-06	17	9.6E-08	5.4E-05	----	----	----
4-Ethyltoluene	0.03	----	5.9E-06	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----

Table L-28a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates

MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Methylene Chloride	----	----	----	0.2	1.9E-10	1.3E-06	----	----	----
n-Propylbenzene	----	----	----	----	----	----	----	----	----
Tetrachloroethene	0.21	3.7E-08	5.0E-04	----	----	----	----	----	----
Toluene	0.083	----	2.6E-05	10	----	2.1E-04	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	0.048	----	6.4E-06	----	----	----	----	----	----
1,2,4-Trimethylbenzene	0.14	----	1.5E-03	----	----	----	----	----	----
1,3,5-Trimethylbenzene	0.042	----	4.5E-04	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----
m,p-Xylene	0.12	----	1.5E-05	----	----	----	----	----	----
o-Xylene	0.059	----	7.9E-06	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	----	----	----	4.73	----	----	0.39	----	6.4E-06
Acenaphthylene	----	----	----	4	----	4.9E-05	1.2	----	5.9E-05
Anthracene	----	----	----	0.43	----	----	1.868	----	6.1E-06
Benzo(a)anthracene	----	----	----	0.2	----	----	4.4	**3.4E-06**	----
Benzo(a)pyrene	----	----	----	0.1	----	----	4.58	**3.6E-05**	----
Benzo(b)fluoranthene	----	----	----	0.1	----	----	4.02	**3.1E-06**	----
Benzo(g,h,i)perylene	----	----	----	0.04	----	----	2.244	----	2.0E-04
Benzo(k)fluoranthene	----	----	----	0.03	----	----	1.624	**1.3E-06**	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.18	----	----	4.56	3.6E-07	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	0.842	**2.2E-06**	----
Fluoranthene	----	----	----	3.2	----	----	7.14	----	3.2E-04
Fluorene	----	----	----	0.755	----	----	1.1	----	2.7E-05
Indeno(1,2,3-cd)pyrene	----	----	----	0.03	----	----	2.24	**1.7E-06**	----

Table L-28a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates

MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	36.925	1.3E-07	1.2E-03	0.31	----	1.5E-05
4-Nitrophenol	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	10.005	----	4.4E-05	4.2	----	2.1E-04
Pyrene	----	----	----	7.31	----	----	8.52	----	5.2E-04
Pesticides/Polychlorinated Biphenyls									
Aroclor 1254	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----
Metals									
Aluminum	----	----	----	----	----	----	----	----	----
Antimony	----	----	----	----	----	----	7.9	----	2.1E-02
Arsenic	----	----	----	20	----	----	21.2	**1.4E-05**	8.8E-02
Barium	----	----	----	----	----	----	220	----	1.2E-03
Beryllium	----	----	----	----	----	----	0.24	3.6E-11	1.3E-04
Boron	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	1.638	4.3E-10	3.2E-03
Chromium (total)	----	----	----	----	----	----	162	----	1.1E-04
Chromium VI	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	19.4	1.1E-08	6.8E-02
Copper	----	----	----	2.4	----	----	402	----	1.0E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----
Lead	----	----	----	----	----	----	1110	**3.5E-06**	----
Manganese	----	----	----	1000000	----	----	----	----	----

Table L-28a
Commercial Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates

MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil		
	EPC (ug/L)	**Cancer Risk**	**HQ**	**EPC (ug/L)**	**Cancer Risk**	**HQ**	**EPC (mg/kg)**	**Cancer Risk**	**HQ**
Mercury	----	----	----	----	----	----	12.24	----	6.6E-02
Molybdenum	----	----	----	----	----	----	3.8	----	7.9E-04
Nickel	----	----	----	----	----	----	182.8	2.9E-09	9.6E-03
Selenium	----	----	----	----	----	----	----	----	----
Silver	----	----	----	----	----	----	1	----	2.1E-04
Thallium	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	----	----	----	53	----	1.1E-02
Zinc	----	----	----	13	----	----	796	----	2.8E-03
Total Petroleum Hydrocarbons (TPH)									
TPH-Diesel	----	----	----	290	----	---- **[a]**	200	----	3.0E-03
TPH-Gasoline	----	----	----	35	----	1.2E-03	0.4	----	4.5E-06
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	620	----	9.3E-02
Total Cancer Risk:		6.6E-08	----	----	**1.1E-06**	----	----	**6.5E-05**	----
Hazard Index:		----	2.5E-03	----	----	4.0E-03	----	----	3.8E-01

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-28b
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Volatile Organic Compounds (VOCs)										
Acetone	0.064	----	3.7E-09	----	----	----	----	----	----	----
Benzene	0.027	4.2E-10	5.7E-07	14	2.1E-09	2.9E-06	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----	----
2-Butanone	0.025	----	5.8E-09	----	----	----	----	----	----	----
Butylbenzene	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----
Ethanol	0.033	----	1.1E-08	----	----	----	----	----	----	----
Ethylbenzene	0.032	3.7E-11	1.7E-08	17	2.4E-10	1.1E-07	----	----	----	----
4-Ethyltoluene	0.030	----	7.0E-08	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	0.2	5.1E-13	3.0E-09	----	----	----	----
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	0.21	5.5E-10	6.2E-06	----	----	----	----	----	----	----

Table L-28b
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Toluene	0.083	----	3.5E-07	10	----	4.6E-07	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	0.048	----	8.6E-08	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	0.14	----	1.7E-05	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	0.042	----	5.2E-06	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----
m,p-Xylene	0.12	----	1.9E-07	----	----	----	----	----	----	----
o-Xylene	0.059	----	1.1E-07	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)										
Acenaphthene	----	----	----	4.73	----	----	0.39	----	4.0E-06	3.7E-05
Acenaphthylene	----	----	----	4	----	1.0E-07	1.2	----	3.7E-05	3.4E-04
Anthracene	----	----	----	0.43	----	----	1.868	----	3.8E-06	3.5E-05
Benzo(a)anthracene	----	----	----	0.2	----	----	4.4	**5.2E-06**	----	----
Benzo(a)pyrene	----	----	----	0.1	----	----	4.58	**5.4E-05**	----	----
Benzo(b)fluoranthene	----	----	----	0.1	----	----	4.02	**4.7E-06**	----	----
Benzo(g,h,i)perylene	----	----	----	0.04	----	----	2.244	----	1.0E-04	8.7E-04
Benzo(k)fluoranthene	----	----	----	0.03	----	----	1.624	**1.9E-06**	----	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.18	----	----	4.56	5.4E-07	----	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	0.842	**3.4E-06**	----	----
Fluoranthene	----	----	----	3.2	----	----	7.14	----	1.7E-04	1.4E-03
Fluorene	----	----	----	0.755	----	----	1.1	----	1.7E-05	1.6E-04
Indeno(1,2,3-cd)pyrene	----	----	----	0.03	----	----	2.24	**2.6E-06**	----	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	36.925	3.2E-10	2.4E-06	0.31	----	9.5E-06	8.8E-05
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	10.005	----	9.5E-08	4.2	----	1.3E-04	1.2E-03
Pyrene	----	----	----	7.31	----	----	8.52	----	2.6E-04	2.2E-03

Table L-28b
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Pesticides/Polychlorinated Biphenyls										
Aroclor 1254	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----
Metals										
Aluminum	----	----	----	----	----	----	----	----	----	----
Antimony	----	----	----	----	----	----	7.9	----	1.3E-02	1.2E-01
Arsenic	----	----	----	20	----	----	21.2	**2.5E-05**	5.0E-02	4.5E-01
Barium	----	----	----	----	----	----	220	----	7.1E-04	6.5E-03
Beryllium	----	----	----	----	----	----	0.24	6.7E-12	7.7E-05	7.0E-04
Boron	----	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	1.638	8.0E-11	2.0E-03	1.9E-02
Chromium (total)	----	----	----	----	----	----	162	----	6.9E-05	6.3E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	19.4	2.0E-09	4.1E-02	3.8E-01
Copper	----	----	----	2.4	----	----	402	----	6.4E-03	5.9E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----	----
Lead	----	----	----	----	----	----	1110	**6.8E-06**	----	----
Manganese	----	----	----	1000000	----	----	----	----	----	----
Mercury	----	----	----	----	----	----	12.24	----	3.5E-02	3.0E-01
Molybdenum	----	----	----	----	----	----	3.8	----	4.8E-04	4.5E-03
Nickel	----	----	----	----	----	----	182.8	5.5E-10	5.7E-03	5.2E-02
Selenium	----	----	----	----	----	----	----	----	----	----
Silver	----	----	----	----	----	----	1	----	1.3E-04	1.2E-03
Thallium	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	----

Table L-28b
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	**Cancer Risk**	**Adult/Child HQ**	**EPC (ug/L)**	**Cancer Risk**	**Adult/Child HQ**	**EPC (mg/kg)**	**Cancer Risk**	**Adult HQ**	**Child HQ**
Vanadium	----	----	----	----	----	----	53	----	6.7E-03	6.2E-02
Zinc	----	----	----	13	----	----	796	----	1.7E-03	1.6E-02
Total Petroleum Hydrocarbons (TPH)										
TPH-Diesel	----	----	----	290	----	---- **[a]**	200	----	1.7E-03	1.5E-02
TPH-Gasoline	----	----	----	35	----	---- **[a]**	0.4	----	2.9E-06	2.7E-05
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	620	----	1.9E-02	1.6E-01
Total Cancer Risk:		1.0E-09	----	----	2.7E-09	----	----	**1.0E-04**	----	----
Hazard Index:		----	3.0E-05	----	----	6.1E-06	----	----	1.8E-01	**1.6E+00**

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram
The adult and child HQs are presented in the same column because the inhalation of volatiles was the only exposure pathway considered for soil gas and groundwater exposures. The methods used to calculate inhalation exposures produce equivalent results for both the child and adult. See report for discussion of methods used to estimate noncancer hazard quotients.

Table L-28c
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	0.064	----	1.1E-06	----	----	----	----	----	----	0.0069	----	2.5E-08
Benzene	0.027	4.1E-09	1.6E-04	14	5.5E-10	2.2E-05	14	1.4E-08	2.3E-03	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	0.025	----	1.7E-06	----	----	----	----	----	----	----	----	----
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----	0.0012	----	3.9E-08
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	0.033	----	3.1E-06	----	----	----	----	----	----	----	----	----
Ethylbenzene	0.032	3.6E-10	5.0E-06	17	6.2E-11	8.7E-07	17	4.6E-09	2.9E-04	----	----	----
4-Ethyltoluene	0.03	----	2.0E-05	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	0.2	1.3E-13	2.3E-08	0.2	1.5E-11	1.3E-06	----	----	----
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	0.21	5.3E-09	1.8E-03	----	----	----	----	----	----	----	----	----
Toluene	0.083	----	1.0E-04	10	----	3.5E-06	10	----	1.4E-04	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	0.048	----	2.5E-05	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	0.14	----	5.0E-03	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	0.042	----	1.5E-03	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----

Table L-28c
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	0.12	----	5.5E-05	----	----	----	----	----	----	----	----	----
o-Xylene	0.059	----	3.0E-05	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	4.73	----	----	4.73	----	2.7E-04	60.818	----	3.3E-03
Acenaphthylene	----	----	----	4	----	8.3E-07	4	----	9.3E-04	37.58	----	6.1E-03
Anthracene	----	----	----	0.43	----	----	0.43	----	1.0E-05	200.51	----	2.2E-03
Benzo(a)anthracene	----	----	----	0.2	----	----	0.2	1.0E-07	----	194.267	**1.5E-05**	----
Benzo(a)pyrene	----	----	----	0.1	----	----	0.1	8.8E-07	----	257.542	**2.0E-04**	----
Benzo(b)fluoranthene	----	----	----	0.1	----	----	0.1	9.0E-08	----	237.181	**1.8E-05**	----
Benzo(g,h,i)perylene	----	----	----	0.04	----	----	0.04	----	1.8E-04	107.768	----	2.6E-02
Benzo(k)fluoranthene	----	----	----	0.03	----	----	0.03	2.5E-08	----	55.147	**4.3E-06**	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.18	----	----	0.18	9.3E-09	----	212.357	**1.6E-06**	----
Dibenz(a,h)anthracene	----	----	----	----	----	----	----	----	----	12.855	**3.4E-06**	----
Fluoranthene	----	----	----	3.2	----	----	3.2	----	9.7E-04	623.81	----	7.0E-02
Fluorene	----	----	----	0.755	----	----	0.755	----	9.3E-05	42.238	----	3.4E-03
Indeno(1,2,3-cd)pyrene	----	----	----	0.03	----	----	0.03	4.5E-08	----	91.838	**7.1E-06**	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	36.925	8.4E-11	1.9E-05	36.925	1.2E-10	3.4E-03	136.248	----	2.2E-02
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	10.005	----	8.4E-07	10.005	----	3.4E-03	582.992	----	9.4E-02
Pyrene	----	----	----	7.31	----	----	7.31	----	2.6E-03	895.137	----	1.3E-01
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	----	----	----	----	----	----	----	----	----
Antimony	----	----	----	----	----	----	----	----	----	7.033	----	5.8E-02
Arsenic	----	----	----	20	----	----	20	1.3E-07	2.0E-02	24.42	**2.1E-06**	5.5E-01
Barium	----	----	----	----	----	----	----	----	----	141.2	----	4.7E-02
Beryllium	----	----	----	----	----	----	----	----	----	0.407	2.2E-09	9.8E-03
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-28c
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
MGP Investigation Area
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	----	----	----	----	----	----	1.283	1.2E-08	1.8E-02
Chromium (total)	----	----	----	----	----	----	----	----	----	150.1	----	3.3E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	----	----	----	----	----	----	19.68	4.0E-07	7.3E-01
Copper	----	----	----	2.4	----	----	2.4	----	1.8E-05	361.4	----	3.0E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----	----	----	----
Lead	----	----	----	----	----	----	----	----	----	676.7	2.9E-07	----
Manganese	----	----	----	1000000	----	----	1000000	----	**2.1E+00**	----	----	----
Mercury	----	----	----	----	----	----	----	----	----	7.403	----	1.4E-01
Molybdenum	----	----	----	----	----	----	----	----	----	2.367	----	1.6E-03
Nickel	----	----	----	----	----	----	----	----	----	190.3	1.1E-07	6.3E-01
Selenium	----	----	----	----	----	----	----	----	----	10.71	----	7.2E-03
Silver	----	----	----	----	----	----	----	----	----	1.02	----	6.8E-04
Thallium	----	----	----	----	----	----	----	----	----	70.5	----	**1.7E+01**
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	----	----	----	----	----	----	73	----	4.9E-02
Zinc	----	----	----	13	----	----	13	----	1.3E-05	527.1	----	5.8E-03
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	290	----	---- **[a]**	290	----	2.4E-01	4410	----	1.9E-01
TPH-Gasoline	----	----	----	35	----	---- **[a]**	35	----	1.0E-03	50.41	----	1.9E-03
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	----	----	----	2482	----	3.7E-01
Total Cancer Risk:	9.7E-09	----	----	7.0E-10	----	----	**1.3E-06**	----	2.5E-04	----	----	
Hazard Index:	----	8.7E-03	----	----	4.7E-05	----	----	**2.4E+00**	----	----	**2.1E+01**	

Notes:
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-29a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Crane Cove Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Volatile Organic Compounds (VOCs)										
Acetone	----	----	----	----	----	----	0.1824	----	1.2E-07	1.2E-06
Benzene	----	----	----	0.9	1.4E-10	1.8E-07	0.00158	1.1E-10	2.4E-07	2.3E-06
Bromobenzene	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	0.01846	----	1.9E-08	1.8E-07
Butylbenzene	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	0.2	----	2.0E-08	----	----	----	----
Carbon Disulfide	----	----	----	0.1	----	1.1E-08	0.004004	----	2.4E-08	2.3E-07
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	0.00042	9.1E-12	2.6E-08	2.4E-07
Chloromethane	----	----	----	----	----	----	0.0055	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	5.26	----	3.2E-07	0.013	----	7.9E-08	7.4E-07
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	0.0047	----	3.6E-08	3.3E-07
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	0.6	1.5E-12	8.9E-09	0.003352	3.3E-11	3.4E-08	3.2E-07
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----

Table L-29a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Crane Cove Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Toluene	----	----	----	----	----	----	0.006177	----	4.7E-08	4.4E-07
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	0.0057	----	1.2E-08	1.1E-07
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----
m,p-Xylene	----	----	----	----	----	----	0.0031	----	9.5E-09	8.8E-08
o-Xylene	----	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)										
Acenaphthene	----	----	----	0.475	----	----	0.096	----	9.8E-07	9.1E-06
Acenaphthylene	----	----	----	0.115	----	2.9E-09	0.063	----	1.9E-06	1.8E-05
Anthracene	----	----	----	0.2	----	----	0.1663	----	3.4E-07	3.2E-06
Benzo(a)anthracene	----	----	----	0.1	----	----	0.6258	7.4E-07	----	----
Benzo(a)pyrene	----	----	----	0.1	----	----	0.9488	**1.1E-05**	----	----
Benzo(b)fluoranthene	----	----	----	0.2	----	----	0.9865	**1.2E-06**	----	----
Benzo(g,h,i)perylene	----	----	----	0.1	----	----	0.4734	----	2.2E-05	1.8E-04
Benzo(k)fluoranthene	----	----	----	0.05	----	----	0.5548	6.6E-07	----	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.2	----	----	0.6759	8.0E-08	----	----
Dibenz(a,h)anthracene	----	----	----	0.03	----	----	0.09264	3.7E-07	----	----
Fluoranthene	----	----	----	0.2	----	----	1.604	----	3.7E-05	3.1E-04
Fluorene	----	----	----	0.55	----	----	0.07792	----	1.2E-06	1.1E-05
Indeno(1,2,3-cd)pyrene	----	----	----	0.09	----	----	0.8087	9.6E-07	----	----
2-Methylnaphthalene	----	----	----	----	----	----	0.064	----	9.8E-06	9.1E-05
Naphthalene	----	----	----	1.333	1.2E-11	8.8E-08	0.09667	----	3.0E-06	2.8E-05
4-Nitrophenol	----	----	----	69.4	----	----	----	----	----	----
Phenanthrene	----	----	----	0.783	----	7.4E-09	1.129	----	3.4E-05	3.2E-04
Pyrene	----	----	----	0.3	----	----	1.783	----	5.5E-05	4.6E-04

Table L-29a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Crane Cove Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Pesticides/Polychlorinated Biphenyls										
Aroclor 1254	----	----	----	----	----	----	1.5	**3.0E-06**	7.1E-02	5.9E-01
Aroclor 1260	----	----	----	----	----	----	3.73	**7.5E-06**	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----
Metals										
Aluminum	----	----	----	42500	----	----	12287	----	7.6E-03	7.0E-02
Antimony	----	----	----	3.2	----	----	5.54	----	8.8E-03	8.1E-02
Arsenic	----	----	----	41	----	----	20.56	**2.4E-05**	4.9E-02	4.3E-01
Barium	----	----	----	410	----	----	314.7	----	1.0E-03	9.2E-03
Beryllium	----	----	----	----	----	----	0.513	1.4E-11	1.6E-04	1.5E-03
Boron	----	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	50.4	----	----	0.918	4.5E-11	1.1E-03	1.0E-02
Chromium (total)	----	----	----	608	----	----	249.3	----	1.1E-04	9.7E-04
Chromium VI	----	----	----	----	----	----	4.6	8.0E-09	9.7E-04	9.0E-03
Cobalt	----	----	----	77	----	----	42.95	4.5E-09	9.1E-02	8.4E-01
Copper	----	----	----	1670	----	----	1299	----	2.1E-02	1.9E-01
Cyanide (total)	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	104075	----	9.1E-02	8.5E-01
Lead	----	----	----	1780	----	----	359.9	**2.2E-06**	----	----
Manganese	----	----	----	----	----	----	29446	----	1.4E-01	**1.2E+00**
Mercury	----	----	----	9820	----	----	2.592	----	7.4E-03	6.3E-02
Molybdenum	----	----	----	110	----	----	170	----	2.2E-02	2.0E-01
Nickel	----	----	----	1940	----	----	231.6	7.0E-10	7.2E-03	6.6E-02
Selenium	----	----	----	3.4	----	----	32.97	----	4.2E-03	3.9E-02
Silver	----	----	----	----	----	----	4.852	----	6.2E-04	5.7E-03
Thallium	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	8.5	----	9.0E-06	8.3E-05

Table L-29a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Crane Cove Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	**Cancer Risk**	**Adult/Child HQ**	**EPC (ug/L)**	**Cancer Risk**	**Adult/Child HQ**	**EPC (mg/kg)**	**Cancer Risk**	**Adult HQ**	**Child HQ**
Vanadium	----	----	----	3.9	----	----	41.52	----	5.3E-03	4.9E-02
Zinc	----	----	----	8240	----	----	948.7	----	2.0E-03	1.9E-02
Total Petroleum Hydrocarbons (TPH)										
TPH-Diesel	----	----	----	495	----	---- **[a]**	77.29	----	6.4E-04	5.9E-03
TPH-Gasoline	----	----	----	82	----	---- **[a]**	0.3	----	2.1E-06	2.0E-05
TPH-Residual (Oil and Grease)	----	----	----	1100	----	---- **[a]**	473.7	----	1.5E-02	1.2E-01
Total Cancer Risk:		----	----	----	1.5E-10	----	----	**5.2E-05**	----	----
Hazard Index:		----	----	----	----	6.4E-07	----	----	5.4E-01	**4.9E+00**

Notes:

[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.

Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.

EPC = Exposure point concentration

HQ = Hazard quotient

ug/L = microgram per liter

mg/kg = milligram per kilogram

The adult and child HQs are presented in the same column because the inhalation of volatiles was the only exposure pathway considered for soil gas and groundwater exposures. The methods used to calculate inhalation exposures produce equivalent results for both the child and adult. See report for discussion of methods used to estimate noncancer hazard quotients.

Table L-29b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Crane Cove Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	----	----	----	----	----	----	----	----	----	0.1779	----	6.4E-07
Benzene	----	----	----	0.9	3.5E-11	1.4E-06	0.9	8.9E-10	1.5E-04	0.001592	7.3E-12	1.3E-06
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----	0.01736	----	9.3E-08
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	0.2	----	1.5E-07	0.2	----	1.3E-05	----	----	----
Carbon Disulfide	----	----	----	0.1	----	8.2E-08	0.1	----	8.2E-07	0.003993	----	1.3E-07
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	0.00042	6.0E-13	1.4E-07
Chloromethane	----	----	----	----	----	----	----	----	----	0.0055	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	5.26	----	2.5E-06	5.26	----	2.8E-04	0.013	----	4.2E-07
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	0.0047	----	1.9E-07
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	0.6	3.9E-13	6.9E-08	0.6	4.5E-11	3.8E-06	0.003303	2.1E-12	1.8E-07
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Toluene	----	----	----	----	----	----	----	----	----	0.006231	----	2.5E-07
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	0.0057	----	6.1E-08
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----

Table L-29b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Crane Cove Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	----	----	----	----	----	----	----	----	----	0.0031	----	5.0E-08
o-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	0.475	----	----	0.475	----	2.7E-05	0.07367	----	4.0E-06
Acenaphthylene	----	----	----	0.115	----	2.4E-08	0.115	----	2.7E-05	0.04631	----	7.5E-06
Anthracene	----	----	----	0.2	----	----	0.2	----	4.7E-06	0.1453	----	1.6E-06
Benzo(a)anthracene	----	----	----	0.1	----	----	0.1	5.2E-08	----	0.5427	4.2E-08	----
Benzo(a)pyrene	----	----	----	0.1	----	----	0.1	8.8E-07	----	0.7769	6.0E-07	----
Benzo(b)fluoranthene	----	----	----	0.2	----	----	0.2	1.8E-07	----	0.7986	6.2E-08	----
Benzo(g,h,i)perylene	----	----	----	0.1	----	----	0.1	----	4.4E-04	0.3876	----	9.4E-05
Benzo(k)fluoranthene	----	----	----	0.05	----	----	0.05	4.2E-08	----	0.4486	3.5E-08	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.2	----	----	0.2	1.0E-08	----	0.6002	4.6E-09	----
Dibenz(a,h)anthracene	----	----	----	0.03	----	----	0.03	2.3E-07	----	0.06543	1.7E-08	----
Fluoranthene	----	----	----	0.2	----	----	0.2	----	6.1E-05	1.358	----	1.5E-04
Fluorene	----	----	----	0.55	----	----	0.55	----	6.8E-05	0.09016	----	7.3E-06
Indeno(1,2,3-cd)pyrene	----	----	----	0.09	----	----	0.09	1.3E-07	----	0.6574	5.1E-08	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	0.16	----	1.3E-04
Naphthalene	----	----	----	1.333	3.0E-12	6.9E-07	1.333	4.2E-12	1.2E-04	0.01938	----	3.1E-06
4-Nitrophenol	----	----	----	69.4	----	----	69.4	----	1.6E-02	----	----	----
Phenanthrene	----	----	----	0.783	----	6.5E-08	0.783	----	2.6E-04	0.9919	----	1.6E-04
Pyrene	----	----	----	0.3	----	----	0.3	----	1.1E-04	1.473	----	2.2E-04
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	1.093	1.4E-07	2.5E-01
Aroclor 1260	----	----	----	----	----	----	----	----	----	2.568	3.4E-07	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	42500	----	----	42500	----	1.3E-02	12236	----	4.3E-01
Antimony	----	----	----	3.2	----	----	3.2	----	2.4E-03	5.658	----	4.7E-02
Arsenic	----	----	----	41	----	----	41	2.6E-07	4.0E-02	17.49	**1.5E-06**	3.9E-01
Barium	----	----	----	410	----	----	410	----	6.0E-04	260.1	----	8.6E-02
Beryllium	----	----	----	----	----	----	----	----	----	0.505	2.7E-09	1.2E-02
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-29b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Crane Cove Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	50.4	----	----	50.4	----	3.0E-02	0.843	8.0E-09	1.2E-02
Chromium (total)	----	----	----	608	----	----	608	----	1.3E-04	224.8	----	5.0E-04
Chromium VI	----	----	----	----	----	----	----	----	----	4.6	**1.6E-06**	8.7E-03
Cobalt	----	----	----	77	----	----	77	----	7.3E-02	32.37	6.6E-07	**1.2E+00**
Copper	----	----	----	1670	----	----	1670	----	1.2E-02	1149	----	9.6E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----	113425	----	5.2E-01
Lead	----	----	----	1780	----	----	1780	6.1E-08	----	462.3	2.0E-07	----
Manganese	----	----	----	----	----	----	----	----	----	29737	----	**5.3E+01**
Mercury	----	----	----	9820	----	----	9820	----	**9.7E+00**	2.447	----	4.7E-02
Molybdenum	----	----	----	110	----	----	110	----	6.5E-03	170	----	1.1E-01
Nickel	----	----	----	1940	----	----	1940	----	2.7E-02	259.2	1.5E-07	8.6E-01
Selenium	----	----	----	3.4	----	----	3.4	----	2.0E-04	28.01	----	1.9E-02
Silver	----	----	----	----	----	----	----	----	----	3.864	----	2.6E-03
Thallium	----	----	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	11	----	----
Vanadium	----	----	----	3.9	----	----	3.9	----	2.3E-04	37.42	----	2.5E-02
Zinc	----	----	----	8240	----	----	8240	----	7.9E-03	839.1	----	9.3E-03
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	495	----	---- **[a]**	495	----	4.1E-01	203.4	----	8.8E-03
TPH-Gasoline	----	----	----	82	----	---- **[a]**	82	----	2.3E-03	1.345	----	5.0E-05
TPH-Residual (Oil and Grease)	----	----	----	1100	----	---- **[a]**	1100	----	3.7E-01	429.9	----	6.4E-02
Total Cancer Risk:		----	----	----	3.9E-11	----	----	**1.9E-06**	----	----	**5.4E-06**	----
Hazard Index:		----	----	----	----	5.0E-06	----	----	**1.1E+01**	----	----	**5.7E+01**

Notes:
[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-30a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Central Plaza Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Volatile Organic Compounds (VOCs)										
Acetone	----	----	----	----	----	----	----	----	----	----
Benzene	----	----	----	----	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----	----
Butylbenzene	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	----	----	----	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	----
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----

Table L-30a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Central Plaza Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Toluene	----	----	----	----	----	----	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----
m,p-Xylene	----	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)										
Acenaphthene	----	----	----	0.5	----	----	0.027	----	2.7E-07	2.6E-06
Acenaphthylene	----	----	----	0.1	----	2.6E-09	0.021	----	6.4E-07	6.0E-06
Anthracene	----	----	----	0.3	----	----	0.065	----	1.3E-07	1.2E-06
Benzo(a)anthracene	----	----	----	0.5	----	----	0.17	2.0E-07	----	----
Benzo(a)pyrene	----	----	----	0.5	----	----	0.23	**2.7E-06**	----	----
Benzo(b)fluoranthene	----	----	----	0.5	----	----	0.27	3.2E-07	----	----
Benzo(g,h,i)perylene	----	----	----	0.3	----	----	0.19	----	8.8E-06	7.4E-05
Benzo(k)fluoranthene	----	----	----	0.2	----	----	0.082	9.7E-08	----	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.6	----	----	0.2	2.4E-08	----	----
Dibenz(a,h)anthracene	----	----	----	0.05	----	----	0.054	2.2E-07	----	----
Fluoranthene	----	----	----	0.8	----	----	0.3	----	7.0E-06	5.8E-05
Fluorene	----	----	----	0.4	----	----	0.048	----	7.3E-07	6.8E-06
Indeno(1,2,3-cd)pyrene	----	----	----	0.3	----	----	0.19	2.2E-07	----	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.9	7.8E-12	5.9E-08	0.014	----	4.3E-07	4.0E-06
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.5	----	4.7E-09	0.26	----	7.9E-06	7.4E-05
Pyrene	----	----	----	0.8	----	----	0.33	----	1.0E-05	8.6E-05

Table L-30a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Central Plaza Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Pesticides/Polychlorinated Biphenyls										
Aroclor 1254	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----
Metals										
Aluminum	----	----	----	----	----	----	4580	----	2.8E-03	2.6E-02
Antimony	----	----	----	1.7	----	----	----	----	----	----
Arsenic	----	----	----	125	----	----	11	**1.3E-05**	2.6E-02	2.3E-01
Barium	----	----	----	63	----	----	26.1	----	8.4E-05	7.7E-04
Beryllium	----	----	----	----	----	----	0.25	7.0E-12	8.0E-05	7.3E-04
Boron	----	----	----	----	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	0.97	4.7E-11	1.2E-03	1.1E-02
Chromium (total)	----	----	----	1	----	----	120	----	5.1E-05	4.7E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	0.41	----	----	21	2.2E-09	4.5E-02	4.1E-01
Copper	----	----	----	1.7	----	----	260	----	4.1E-03	3.8E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	12400	----	1.1E-02	1.0E-01
Lead	----	----	----	1.2	----	----	87	5.3E-07	----	----
Manganese	----	----	----	----	----	----	2510	----	1.2E-02	1.0E-01
Mercury	----	----	----	----	----	----	0.26	----	7.4E-04	6.3E-03
Molybdenum	----	----	----	1.9	----	----	----	----	----	----
Nickel	----	----	----	31	----	----	130	3.9E-10	4.0E-03	3.7E-02
Selenium	----	----	----	0.19	----	----	5.9	----	7.5E-04	6.9E-03
Silver	----	----	----	----	----	----	----	----	----	----
Thallium	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	----

Table L-30a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Central Plaza Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Vanadium	----	----	----	1.7	----	----	27.7	----	3.5E-03	3.2E-02
Zinc	----	----	----	83	----	----	230	----	4.9E-04	4.5E-03
Total Petroleum Hydrocarbons (TPH)										
TPH-Diesel	----	----	----	8200	----	**---- [a]**	100	----	8.3E-04	7.7E-03
TPH-Gasoline	----	----	----	75	----	**---- [a]**	1.1	----	7.9E-06	7.3E-05
TPH-Residual (Oil and Grease)	----	----	----	8200	----	**---- [a]**	360	----	1.1E-02	9.2E-02
Total Cancer Risk:		----	----	----	7.8E-12	----	----	**1.7E-05**	----	----
Hazard Index:		----	----	----	----	6.7E-08	----	----	1.2E-01	1.1E+00

Notes:

[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.

Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.

EPC = Exposure point concentration

HQ = Hazard quotient

ug/L = microgram per liter

mg/kg = milligram per kilogram

The adult and child HQs are presented in the same column because the inhalation of volatiles was the only exposure pathway considered for soil gas and groundwater exposures. The methods used to calculate inhalation exposures produce equivalent results for both the child and adult. See report for discussion of methods used to estimate noncancer hazard quotients.

Table L-30b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Central Plaza Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	----	----	----	----	----	----	----	----	----	0.009	----	3.2E-08
Benzene	----	----	----	----	----	----	----	----	----	----	----	----
Bromobenzene	----	----	----	----	----	----	----	----	----	----	----	----
2-Butanone	----	----	----	----	----	----	----	----	----	0.0025	----	1.3E-08
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	----	----	----	----	----	----	----	----	----
Cumene	----	----	----	----	----	----	----	----	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	----	----	----	----	----	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	----	----	----	----	----	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	----	----	----
n-Propylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Tetrachloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Toluene	----	----	----	----	----	----	----	----	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----

Table L-30b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Central Plaza Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	----	----	----	----	----	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	0.5	----	----	0.5	----	2.9E-05	0.1929	----	1.0E-05
Acenaphthylene	----	----	----	0.1	----	2.1E-08	0.1	----	2.3E-05	0.166	----	2.7E-05
Anthracene	----	----	----	0.3	----	----	0.3	----	7.1E-06	0.2701	----	2.9E-06
Benzo(a)anthracene	----	----	----	0.5	----	----	0.5	2.6E-07	----	0.6551	5.1E-08	----
Benzo(a)pyrene	----	----	----	0.5	----	----	0.5	**4.4E-06**	----	1.135	8.8E-07	----
Benzo(b)fluoranthene	----	----	----	0.5	----	----	0.5	4.5E-07	----	1.223	9.4E-08	----
Benzo(g,h,i)perylene	----	----	----	0.3	----	----	0.3	----	1.3E-03	0.3162	----	7.6E-05
Benzo(k)fluoranthene	----	----	----	0.2	----	----	0.2	1.7E-07	----	0.2917	2.3E-08	----
bis(2-Ethylhexyl)phthalate	----	----	----	----	----	----	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.6	----	----	0.6	3.1E-08	----	0.8229	6.4E-09	----
Dibenz(a,h)anthracene	----	----	----	0.05	----	----	0.05	3.9E-07	----	0.1204	3.2E-08	----
Fluoranthene	----	----	----	0.8	----	----	0.8	----	2.4E-04	1.235	----	1.4E-04
Fluorene	----	----	----	0.4	----	----	0.4	----	4.9E-05	0.1354	----	1.1E-05
Indeno(1,2,3-cd)pyrene	----	----	----	0.3	----	----	0.3	4.5E-07	----	0.3352	2.6E-08	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	0.9	2.0E-12	4.7E-07	0.9	2.9E-12	8.4E-05	0.1178	----	1.9E-05
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.5	----	4.2E-08	0.5	----	1.7E-04	1.076	----	1.7E-04
Pyrene	----	----	----	0.8	----	----	0.8	----	2.8E-04	1.55	----	2.3E-04
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	----	----	----	----	----	----	4580	----	1.6E-01
Antimony	----	----	----	1.7	----	----	1.7	----	1.3E-03	----	----	----
Arsenic	----	----	----	125	----	----	125	7.9E-07	1.2E-01	20.32	**1.7E-06**	4.6E-01
Barium	----	----	----	63	----	----	63	----	9.3E-05	120	----	4.0E-02
Beryllium	----	----	----	----	----	----	----	----	----	0.25	1.4E-09	6.0E-03
Boron	----	----	----	----	----	----	----	----	----	----	----	----

Table L-30b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Central Plaza Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	----	----	----	----	----	----	2.502	2.4E-08	3.6E-02
Chromium (total)	----	----	----	1	----	----	1	----	2.1E-07	76.3	----	1.7E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	0.41	----	----	0.41	----	3.9E-04	35.83	7.3E-07	**1.3E+00**
Copper	----	----	----	1.7	----	----	1.7	----	1.3E-05	293.5	----	2.4E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	----	----	----	----	----	----	12400	----	5.7E-02
Lead	----	----	----	1.2	----	----	1.2	4.1E-11	----	504.8	2.2E-07	----
Manganese	----	----	----	----	----	----	----	----	----	2510	----	**4.5E+00**
Mercury	----	----	----	----	----	----	----	----	----	7.3	----	1.4E-01
Molybdenum	----	----	----	1.9	----	----	1.9	----	1.1E-04	1.7	----	1.1E-03
Nickel	----	----	----	31	----	----	31	----	4.4E-04	95.3	5.6E-08	3.2E-01
Selenium	----	----	----	0.19	----	----	0.19	----	1.1E-05	5.9	----	4.0E-03
Silver	----	----	----	----	----	----	----	----	----	----	----	----
Thallium	----	----	----	----	----	----	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	1.7	----	----	1.7	----	1.0E-04	73	----	4.9E-02
Zinc	----	----	----	83	----	----	83	----	8.0E-05	847.9	----	9.4E-03
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	8200	----	**---- [a]**	8200	----	**6.8E+00**	1245	----	5.4E-02
TPH-Gasoline	----	----	----	75	----	**---- [a]**	75	----	2.1E-03	5.834	----	2.2E-04
TPH-Residual (Oil and Grease)	----	----	----	8200	----	**---- [a]**	8200	----	**2.7E+00**	1176	----	1.8E-01
Total Cancer Risk:		----	----	----	2.0E-12	----	----	**6.9E-06**	----	----	**3.9E-06**	----
Hazard Index:		----	----	----	----	5.3E-07	----	----	**9.7E+00**	----	----	**7.3E+00**

Notes:
[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

Table L-31a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Slipways Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Volatile Organic Compounds (VOCs)										
Acetone	0.045	----	2.6E-09	4.2	----	2.4E-11	----	----	----	----
Benzene	----	----	----	2.6	4.0E-10	5.3E-07	----	----	----	----
Bromobenzene	----	----	----	0.3	----	2.6E-08	----	----	----	----
2-Butanone	0.014	----	3.3E-09	----	----	----	----	----	----	----
Butylbenzene	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene	----	----	----	0.2	----	8.1E-11	----	----	----	----
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	0.3	----	1.1E-07	----	----	----	----
Cumene	----	----	----	0.7	----	3.3E-08	----	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	1.3	----	8.0E-08	----	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	1.3	1.8E-11	8.6E-09	----	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	0.3	5.8E-14	6.5E-11	----	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	----
n-Propylbenzene	----	----	----	1.8	----	8.1E-08	----	----	----	----
Tetrachloroethene	0.0098	2.6E-11	2.9E-07	----	----	----	----	----	----	----

Table L-31a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Slipways Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Toluene	----	----	----	----	----	----	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	0.7	----	7.7E-07	----	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	0.016	----	9.8E-08	----	----	----	----	----	----	----
m,p-Xylene	----	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	1.1	----	2.1E-08	----	----	----	----
Semi-Volatile Organic Compounds (SVOCs)										
Acenaphthene	----	----	----	----	----	----	0.062	----	6.3E-07	5.9E-06
Acenaphthylene	----	----	----	0.1	----	2.6E-09	0.031	----	9.5E-07	8.8E-06
Anthracene	----	----	----	0.1	----	----	0.18	----	3.7E-07	3.4E-06
Benzo(a)anthracene	----	----	----	0.6	----	----	0.59	7.0E-07	----	----
Benzo(a)pyrene	----	----	----	0.7	----	----	0.95	**1.1E-05**	----	----
Benzo(b)fluoranthene	----	----	----	0.9	----	----	1.4	**1.7E-06**	----	----
Benzo(g,h,i)perylene	----	----	----	0.4	----	----	1.3	----	6.0E-05	5.1E-04
Benzo(k)fluoranthene	----	----	----	0.3	----	----	0.41	4.8E-07	----	----
bis(2-Ethylhexyl)phthalate	----	----	----	21	----	----	----	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.6	----	----	0.68	8.0E-08	----	----
Dibenz(a,h)anthracene	----	----	----	0.1	----	----	0.38	**1.5E-06**	----	----
Fluoranthene	----	----	----	0.8	----	----	1	----	2.3E-05	1.9E-04
Fluorene	----	----	----	0.06	----	----	0.069	----	1.1E-06	9.8E-06
Indeno(1,2,3-cd)pyrene	----	----	----	0.4	----	----	1	**1.2E-06**	----	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	2.4	2.1E-11	1.6E-07	0.023	----	7.0E-07	6.6E-06
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.4	----	3.8E-09	0.63	----	1.9E-05	1.8E-04
Pyrene	----	----	----	0.8	----	----	1.1	----	3.4E-05	2.9E-04

Table L-31a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Slipways Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Pesticides/Polychlorinated Biphenyls										
Aroclor 1254	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----
Metals										
Aluminum	----	----	----	1200	----	----	----	----	----	----
Antimony	----	----	----	140	----	----	5.7	----	9.0E-03	8.3E-02
Arsenic	----	----	----	67	----	----	7.5	**8.8E-06**	1.8E-02	1.6E-01
Barium	----	----	----	995	----	----	230	----	7.4E-04	6.7E-03
Beryllium	----	----	----	----	----	----	0.16	4.5E-12	5.1E-05	4.7E-04
Boron	----	----	----	2750	----	----	----	----	----	----
Cadmium	----	----	----	----	----	----	1.1	5.4E-11	1.4E-03	1.3E-02
Chromium (total)	----	----	----	155	----	----	220	----	9.3E-05	8.6E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	40	----	----	30	3.1E-09	6.4E-02	5.9E-01
Copper	----	----	----	855	----	----	660	----	1.0E-02	9.7E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	46800	----	----	----	----	----	----
Lead	----	----	----	1035	----	----	430	**2.6E-06**	----	----
Manganese	----	----	----	----	----	----	----	----	----	----
Mercury	----	----	----	8	----	----	11	----	3.1E-02	2.7E-01
Molybdenum	----	----	----	45	----	----	2.8	----	3.6E-04	3.3E-03
Nickel	----	----	----	250	----	----	350	1.1E-09	1.1E-02	1.0E-01
Selenium	----	----	----	----	----	----	0.46	----	5.8E-05	5.4E-04
Silver	----	----	----	20	----	----	0.58	----	7.4E-05	6.8E-04
Thallium	----	----	----	400	----	----	----	----	----	----
Tin	----	----	----	----	----	----	----	----	----	----

Table L-31a
Recreational Park User - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Slipways Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater			Soil			
	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (ug/L)	Cancer Risk	Adult/Child HQ	EPC (mg/kg)	Cancer Risk	Adult HQ	Child HQ
Vanadium	----	----	----	110	----	----	25	----	3.2E-03	2.9E-02
Zinc	----	----	----	1950	----	----	1100	----	2.3E-03	2.1E-02
Total Petroleum Hydrocarbons (TPH)										
TPH-Diesel	----	----	----	36	----	---- **[a]**	83	----	6.9E-04	6.4E-03
TPH-Gasoline	----	----	----	21	----	---- **[a]**	0.56	----	4.0E-06	3.7E-05
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	650	----	2.0E-02	1.7E-01
Total Cancer Risk:		2.6E-11	----	----	4.4E-10	----	----	**2.8E-05**	----	----
Hazard Index:		----	3.9E-07	----	----	1.8E-06	----	----	1.7E-01	**1.5E+00**

Notes:

[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.

Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.

EPC = Exposure point concentration

HQ = Hazard quotient

ug/L = microgram per liter

mg/kg = milligram per kilogram

The adult and child HQs are presented in the same column because the inhalation of volatiles was the only exposure pathway considered for soil gas and groundwater exposures. The methods used to calculate inhalation exposures produce equivalent results for both the child and adult. See report for discussion of methods used to estimate noncancer hazard quotients.

Table L-31b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Slipways Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Volatile Organic Compounds (VOCs)												
Acetone	0.045	----	7.5E-07	4.2	----	2.1E-10	4.2	----	1.4E-06	0.0023	----	8.3E-09
Benzene	----	----	----	2.6	1.0E-10	4.1E-06	2.6	2.6E-09	4.3E-04	----	----	----
Bromobenzene	----	----	----	0.3	----	2.0E-07	0.3	----	1.6E-05	----	----	----
2-Butanone	0.014	----	9.4E-07	----	----	----	----	----	----	----	----	----
Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
sec-Butylbenzene												
tert-Butylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Disulfide	----	----	----	----	----	----	----	----	----	----	----	----
Carbon Tetrachloride	----	----	----	----	----	----	----	----	----	----	----	----
Chloroform	----	----	----	----	----	----	----	----	----	----	----	----
Chloromethane	----	----	----	0.3	----	8.6E-07	0.3	----	1.2E-06	----	----	----
Cumene	----	----	----	0.7	----	2.5E-07	0.7	----	2.3E-05	----	----	----
Cyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
p-Cymene	----	----	----	1.3	----	6.2E-07	1.3	----	6.8E-05	----	----	----
Dichlorodifluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2-Dichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Dichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
trans-1,3-Dichloropropene	----	----	----	----	----	----	----	----	----	----	----	----
1,1-Difluoroethane	----	----	----	----	----	----	----	----	----	----	----	----
Ethanol	----	----	----	----	----	----	----	----	----	----	----	----
Ethylbenzene	----	----	----	1.3	4.8E-12	6.7E-08	1.3	3.5E-10	2.2E-05	----	----	----
4-Ethyltoluene	----	----	----	----	----	----	----	----	----	----	----	----
2-Hexanone	----	----	----	----	----	----	----	----	----	----	----	----
Methyl Acetate	----	----	----	----	----	----	----	----	----	----	----	----
Methyl tert-butyl ether	----	----	----	0.3	1.5E-14	5.1E-10	0.3	2.6E-12	7.0E-10	----	----	----
4-Methyl-2-pentanone	----	----	----	----	----	----	----	----	----	----	----	----
Methylcyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Methylene Chloride	----	----	----	----	----	----	----	----	----	----	----	----
n-Propylbenzene	----	----	----	1.8	----	6.3E-07	1.8	----	7.2E-05	----	----	----
Tetrachloroethene	0.0098	2.5E-10	8.4E-05	----	----	----	----	----	----	----	----	----
Toluene	----	----	----	----	----	----	----	----	----	----	----	----
1,1,1-Trichloroethane	----	----	----	----	----	----	----	----	----	----	----	----
Trichloroethene	----	----	----	----	----	----	----	----	----	----	----	----
Trichlorofluoromethane	----	----	----	----	----	----	----	----	----	----	----	----
1,2,4-Trimethylbenzene	----	----	----	0.7	----	6.0E-06	0.7	----	8.1E-06	----	----	----
1,3,5-Trimethylbenzene	----	----	----	----	----	----	----	----	----	----	----	----
Vinyl Acetate	0.016	----	2.8E-05	----	----	----	----	----	----	----	----	----

Table L-31b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Slipways Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
m,p-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
o-Xylene	----	----	----	----	----	----	----	----	----	----	----	----
Xylenes (total)	----	----	----	1.1	----	1.6E-07	1.1	----	1.0E-05	----	----	----
Semi-Volatile Organic Compounds (SVOCs)												
Acenaphthene	----	----	----	----	----	----	----	----	----	0.086	----	4.6E-06
Acenaphthylene	----	----	----	0.1	----	2.1E-08	0.1	----	2.3E-05	0.0603	----	9.7E-06
Anthracene	----	----	----	0.1	----	----	0.1	----	2.4E-06	0.1328	----	1.4E-06
Benzo(a)anthracene	----	----	----	0.6	----	----	0.6	3.1E-07	----	0.5355	4.1E-08	----
Benzo(a)pyrene	----	----	----	0.7	----	----	0.7	**6.2E-06**	----	0.5609	4.3E-07	----
Benzo(b)fluoranthene	----	----	----	0.9	----	----	0.9	8.1E-07	----	0.6238	4.8E-08	----
Benzo(g,h,i)perylene	----	----	----	0.4	----	----	0.4	----	1.8E-03	0.3468	----	8.4E-05
Benzo(k)fluoranthene	----	----	----	0.3	----	----	0.3	2.5E-07	----	0.3925	3.0E-08	----
bis(2-Ethylhexyl)phthalate	----	----	----	21	----	----	21	4.3E-09	5.1E-03	----	----	----
Butylbenzylphthalate	----	----	----	----	----	----	----	----	----	----	----	----
Chrysene	----	----	----	0.6	----	----	0.6	3.1E-08	----	0.5496	4.2E-09	----
Dibenz(a,h)anthracene	----	----	----	0.1	----	----	0.1	7.7E-07	----	0.1155	3.1E-08	----
Fluoranthene	----	----	----	0.8	----	----	0.8	----	2.4E-04	1.084	----	1.2E-04
Fluorene	----	----	----	0.06	----	----	0.06	----	7.4E-06	0.0846	----	6.8E-06
Indeno(1,2,3-cd)pyrene	----	----	----	0.4	----	----	0.4	6.0E-07	----	0.3029	2.3E-08	----
2-Methylnaphthalene	----	----	----	----	----	----	----	----	----	----	----	----
Naphthalene	----	----	----	2.4	5.4E-12	1.2E-06	2.4	7.6E-12	2.2E-04	0.01757	----	2.8E-06
4-Nitrophenol	----	----	----	----	----	----	----	----	----	----	----	----
Phenanthrene	----	----	----	0.4	----	3.3E-08	0.4	----	1.3E-04	0.7176	----	1.2E-04
Pyrene	----	----	----	0.8	----	----	0.8	----	2.8E-04	1.058	----	1.6E-04
Pesticides/Polychlorinated Biphenyls												
Aroclor 1254	----	----	----	----	----	----	----	----	----	----	----	----
Aroclor 1260	----	----	----	----	----	----	----	----	----	----	----	----
gamma-Chlordane	----	----	----	----	----	----	----	----	----	----	----	----
2,3,7,8-Tetrachlorodibenzo-p-dioxin	----	----	----	----	----	----	----	----	----	----	----	----
Endosulfan I	----	----	----	----	----	----	----	----	----	----	----	----
Heptachlor epoxide	----	----	----	----	----	----	----	----	----	----	----	----
beta-Hexachlorocyclohexane	----	----	----	----	----	----	----	----	----	----	----	----
Metals												
Aluminum	----	----	----	1200	----	----	1200	----	3.5E-04	----	----	----
Antimony	----	----	----	140	----	----	140	----	1.0E-01	9.919	----	8.2E-02
Arsenic	----	----	----	67	----	----	67	4.2E-07	6.6E-02	21.42	**1.8E-06**	4.8E-01
Barium	----	----	----	995	----	----	995	----	1.5E-03	265.6	----	8.8E-02
Beryllium	----	----	----	----	----	----	----	----	----	0.248	1.3E-09	6.0E-03
Boron	----	----	----	2750	----	----	2750	----	4.1E-03	----	----	----

Table L-31b
Construction Worker - Excess Lifetime Cancer Risk and Noncancer Hazard Estimates
Slipways Park
Pier 70 Master Plan Area
San Francisco, California

Chemical	Soil Gas			Groundwater (Dry Trench)			Groundwater (Wet Trench)			Soil		
	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (ug/L)	Cancer Risk	HQ	EPC (mg/kg)	Cancer Risk	HQ
Cadmium	----	----	----	----	----	----	----	----	----	1.236	1.2E-08	1.8E-02
Chromium (total)	----	----	----	155	----	----	155	----	3.2E-05	137.4	----	3.0E-04
Chromium VI	----	----	----	----	----	----	----	----	----	----	----	----
Cobalt	----	----	----	40	----	----	40	----	3.8E-02	15.79	3.2E-07	5.9E-01
Copper	----	----	----	855	----	----	855	----	6.3E-03	305	----	2.5E-02
Cyanide (total)	----	----	----	----	----	----	----	----	----	----	----	----
Iron	----	----	----	46800	----	----	46800	----	2.0E-02	----	----	----
Lead	----	----	----	1035	----	----	1035	3.5E-08	----	265	1.1E-07	----
Manganese	----	----	----	----	----	----	----	----	----	----	----	----
Mercury	----	----	----	8	----	----	8	----	7.9E-03	4.072	----	7.8E-02
Molybdenum	----	----	----	45	----	----	45	----	2.7E-03	2.438	----	1.6E-03
Nickel	----	----	----	250	----	----	250	----	3.5E-03	167.4	9.8E-08	5.5E-01
Selenium	----	----	----	----	----	----	----	----	----	12.35	----	8.3E-03
Silver	----	----	----	20	----	----	20	----	1.2E-03	2.119	----	1.4E-03
Thallium	----	----	----	400	----	----	400	----	**8.7E+00**	33.04	----	**8.1E+00**
Tin	----	----	----	----	----	----	----	----	----	----	----	----
Vanadium	----	----	----	110	----	----	110	----	6.5E-03	43.69	----	2.9E-02
Zinc	----	----	----	1950	----	----	1950	----	1.9E-03	676.3	----	7.5E-03
Total Petroleum Hydrocarbons (TPH)												
TPH-Diesel	----	----	----	36	----	---- [a]	36	----	3.0E-02	83.12	----	3.6E-03
TPH-Gasoline	----	----	----	21	----	---- [a]	21	----	6.0E-04	0.157	----	5.8E-06
TPH-Residual (Oil and Grease)	----	----	----	----	----	----	----	----	----	530.6	----	7.9E-02
Total Cancer Risk:	2.5E-10	----	----	----	1.1E-10	----	----	**9.4E-06**	----	----	**3.0E-06**	----
Hazard Index:	----	1.1E-04	----	----	1.4E-05	----	----	**9.0E+00**	----	----	**1.0E+01**	

Notes:
[a] RBTC is listed as Unlimited and quantification of a hazard quotient (HQ) is not possible. The HQ is less than 1 even when the dissolved concentrations of all hydrocarbon fractions are at their maximum levels.
Bold entries identify cancer risk greater than one in a million or a hazard quotient or index greater than one.
EPC = Exposure point concentration
HQ = Hazard quotient
ug/L = microgram per liter
mg/kg = milligram per kilogram

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APPENDIX M

Ecological Screening Level Risk Assessment Tables and Figures (on CD-ROM)

Table M-1
Wildlife Species Observed
Pier 70 Environmental Site Investigation

Common Name	Scientific Name	August Site Visit	December Site Visit
Harbor Seal	*Phoca vitulina*		Few
California Sea Lion	*Zalophus calinornicus*		Few
Domestic Cat	*Felis catus*		Many
Western Grebe	*Aechmophorus occidentalis*		Common
California Brown Pelicans	*Pelecanus occidentalis californicus*	Common	Common
Double-Crested Cormorants	*Phalacrocorax auritus*	Abundant	Common
Bufflehead	*Bucephala albeola*		Many
Ruddy Duck	*Oxyura jamaicensis*		Few
Greater Scaup	*Aythya marila*		Many
Surf Scoter	*Melanitta perspicillata*		Many
Harlequin Duck	*Histrionicus histrionicus*		Few
California Gull	*Larus californicus*	Few	
Heermann's Gull	*Larus heermanni*	Few	Few
Herring Gull	*Larus argentatus*	Few	Common
Ring-billed Gull	*Larus delawarensis*		Few
Black Oystercatcher	*Haematopus bachmani*	Few	
Least Sandpiper	*Calidris mauri*		Few
Spotted Sandpiper	*Actitus macularia*		Few
Belted Kingfisher	*Megaceryle alcyon*		Few
Rock Pigeon	*Columba livia*	Common	Common
Common Raven	*Corvus corax*	Few	Few
Black Phoebe	*Sayornis nigricans*		Few
Yellow-Rumped Warbler	*Dendroica coronata*		Many
European Starling	*Sturnus vulgaris*		Few
House Finch	*Carpodacus mexicanus*		Many
American Goldfinch	*Carduelis tristis*		Few

Table M-2
List of Potential Special Status Species

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Invertebrate-Chelicerate	*Banksula incredula*	incredible harvestman	None	None			Known only from the type locality, San Bruno Mountain, San Mateo County.	Found within a Franciscan sandstone talus slope.
Invertebrate-Chelicerate	*Microcina leei*	Lee's micro-blind harvestman	None	None			Xeric habitats in the San Francisco Bay region.	Found beneath sandstone rocks in open oak grassland.
Invertebrate-Chelicerate	*Microcina tiburona*	Tiburon micro-blind harvestman	None	None			Open hilly grassland habitat in areas of serpentine bedrock.	Found on the undersides of serpentine rocks near permanent springs.
Invertebrate-Crustacean	*Caecidotea tomalensis*	Tomales isopod	None	None			Inhabits localized fresh-water ponds or streams with still or near-still water in several bay area counties.	
Invertebrate-Insect	*Callophrys mossii bayensis*	San Bruno elfin butterfly	Endangered	None			Coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County.	Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium*.
Invertebrate-Insect	*Cicindela hirticollis gravida*	sandy beach tiger beetle	None	None			Inhabits areas adjacent to non-brackish water along the coast of California from San Francisco Bay to northern Mexico.	Clean, dry, light-colored sand in the upper zone. Subterranean larvae prefer moist sand not affected by wave action.
Invertebrate-Insect	*Danaus plexippus*	monarch butterfly	None	None			Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico.	Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.
Invertebrate-Insect	*Dufourea stagei*	Stage's dufourine bee	None	None			Species is a ground-nesting bee.	
Invertebrate-Insect	*Euphydryas editha bayensis*	Bay checkerspot butterfly	Threatened	None			Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco bay.	*Plantago erecta* is the primary host plant; *Orthocarpus densiflorus* & *O. purpurscens* are the secondary host plants.
Invertebrate-Insect	*Hydroporus leechi*	Leech's skyline diving beetle	None	None			Aquatic.	
Invertebrate-Insect	*Incisalia mossii bayensis*	San Bruno elfin butterfly	Endangered	None			Coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County.	Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is Sedum spathulifolium.

[1] Habitat information from Rarefind Version 3.1.1 unless otherwise noted.
[2] Habitat information from Natureserve.com.

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Invertebrate-Insect	*Ischnura gemina*	San Francisco forktail damselfly	None	None			Endemic to the San Francisco Bay area.	Small, marshy ponds and ditches with emergent and floating aquatic vegetation.
Invertebrate-Insect	*Lichnanthe ursina*	bumblebee scarab beetle	None	None			Inhabits coastal sand dunes from Sonoma County south to San Mateo county.	Usually flies close to sand surface near the crest of the dunes.
Invertebrate-Insect	*Plebejus icarioides missionensis*	Mission blue butterfly	Endangered	None			Inhabits grasslands of the San Francisco peninsula.	Three larval host plants: *Lupinus albifrons*, *L. variicolor*, and *L. formosus*, of which *L. albifrons* is favored.
Invertebrate-Insect	*Speyeria callippe callippe*	callippe silverspot butterfly	Endangered	None			Restricted to the northern coastal scrub of the San Francisco peninsula.	Host plant is *Viola pedunculata*. Most adults found on east-facing slopes; males congregate on hilltops in search of females.
Invertebrate-Insect	*Speyeria zerene myrtleae*	Myrtle's silverspot butterfly	Endangered	None			Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; extirpated from coastal San Mateo County.	Larval foodplant thought to be *Viola adunca*.
Invertebrate-Insect	*Trachusa gummifera*	A leaf-cutter bee	None	None			No information.	
Invertebrate-Mollusk	*Haliotes cracherodii*	black abalone	Endangered	None			Mid to low rocky intertidal areas.	
Invertebrate-Mollusk	*Haliotes sorenseni*	white abolone	Endangered	None			Rocky pinnacles and deep reefs in southern California; especially those off the Channel Islands.	Live at depths of at least 80 feet to over 200 feet.
Invertebrate-Mollusk	*Helminthoglypta nickliniana bridgesi*	Bridges' coast range shoulderband	None	None			Inhabits open hillsides of Alameda and Contra Costa Counties.	Tends to colonize under tall grasses and weeds.
Invertebrate-Mollusk	*Pomatiopsis binneyi*	robust walker	None	None			Freshwater[2]	
Invertebrate-Mollusk	*Tryonia imitator*	mimic tryonia (=California brackishwater snail)	None	None			Inhabits coastal lagoons, estuaries and salt marshes, from Sonoma County south to San Diego County.	Found only in permanently submerged areas in a variety of sediment types; able to withstand a wide range of salinities.
Invertebrate-Mollusk	*Vespericola marinensis*	Marin hesperian	None	None			Found in moist spots in coastal brushfield and chaparral vegetation in Marin County.	Under leaves of cow-parship, around spring seeps, in leafmold along streams, in alder woods & mixed evergreen forest.
Vertebrate-Amphibian	*Ambystoma californiense*	California tiger salamander	Threatened	Candidate Endangered	Species of Concern		Central Valley dps federally listed as threatened. Santa Barbara & Sonoma Counties dps federally listed as endangered.	Need underground refuges, especially ground squirrel burrows & vernal pools or other seasonal water sources for breeding

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Vertebrate-Amphibian	*Rana boylii*	foothill yellow-legged frog	None	None	Species of Concern		Partly-shaded, shallow streams & riffles with a rocky substrate in a variety of habitats.	Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.
Vertebrate-Amphibian	*Rana draytonii*	California red-legged frog	Threatened	None	Species of Concern		Lowlands & foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation.	Requires 11-20 weeks of permanent water for larval development. Must have access to aestivation habitat.
Vertebrate-Bird	*Accipiter cooperii*	Cooper's hawk	None	None			Woodland, chiefly of open, interrupted or marginal type.	Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.
Vertebrate-Bird	*Ardea alba*	great egret	None	None			Colonial nester in large trees.	Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.
Vertebrate-Bird	*Ardea herodias*	great blue heron	None	None			Colonial nester in tall trees, cliff sides, and sequestered spots on marshes.	Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.
Vertebrate-Bird	*Asio flammeus*	short-eared owl	None	None	Species of Concern		Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields.	Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.
Vertebrate-Bird	*Athene cunicularia*	burrowing owl	None	None	Species of Concern		Open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation.	Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.
Vertebrate-Bird	*Brachyramphus marmoratus*	marbled murrelet	Threatened	Endangered			Feeds near-shore; nests inland along coast from Eureka to Oregon border & from Half Moon Bay to Santa Cruz.	Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir.
Vertebrate-Bird	*Charadrius alexandrinus nivosus*	western snowy plover	Threatened	None	Species of Concern		Sandy beaches, salt pond levees & shores of large alkali lakes.	Needs sandy, gravelly or friable soils for nesting.
Vertebrate-Bird	*Circus cyaneus*	northern harrier	None	None	Species of Concern		Coastal salt & fresh-water marsh. Nest & forage in grasslands, from salt grass in desert sink to mountain cienagas.	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.
Vertebrate-Bird	*Phoebastria albatrus*	short-tailed albatross	Endangered	None			Pelagic marine[2].	Nests on the ground on small oceanic islands; on volcanic ash slopes with sparse vegetation

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Vertebrate-Bird	*Egretta thula*	snowy egret	None	None			Colonial nester, with nest sites situated in protected beds of dense tules.	Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.
Vertebrate-Bird	*Elanus leucurus*	white-tailed kite	None	None			Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.
Vertebrate-Bird	*Geothlypis trichas sinuosa*	saltmarsh common yellowthroat	None	None	Species of Concern		Resident of the San Francisco Bay region, in fresh and salt water marshes.	Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.
Vertebrate-Bird	*Hydroprogne caspia*	Caspian tern	None	None			Nests on sandy or gravely beaches and shell banks in small colonies inland and along the coast.	Inland fresh-water lakes and marshes; also, brackish or salt waters of estuaries and bays.
Vertebrate-Bird	*Laterallus jamaicensis coturniculus*	California black rail	None	Threatened			Inhabits freshwater marshes, wet meadows & shallow margins of saltwater marshes bordering larger bays.	Needs water depths of about 1 inch that does not fluctuate during the year & dense vegetation for nesting habitat.
Vertebrate-Bird	*Melospiza melodia pusillula*	Alameda song sparrow	None	None	Species of Concern		Resident of salt marshes bordering south arm of San Francisco Bay.	Inhabits salicornia marshes; nests low in grindelia bushes (high enough to escape high tides) and in salicornia.
Vertebrate-Bird	*Melospiza melodia samuelis*	San Pablo song sparrow	None	None	Species of Concern		Resident of salt marshes along the north side of San Francisco and San Pablo Bays.	Inhabits tidal sloughs in the salicornia marshes; nests in grindelia bordering slough channels.
Vertebrate-Bird	*Nycticorax nycticorax*	black-crowned night heron	None	None			Colonial nester, usually in trees, occasionally in tule patches.	Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.
Vertebrate-Bird	*Pelecanus occidentalis californicus*	California brown pelican	Endangered	Endangered			Colonial nester on coastal islands just outside the surf line.	Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators.
Vertebrate-Bird	*Phalacrocorax auritus*	double-crested cormorant	None	None			Colonial nester on coastal cliffs, offshore islands, & along lake margins in the interior of the state.	Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.
Vertebrate-Bird	*Rallus longirostris obsoletus*	California clapper rail	Endangered	Endangered			Salt-water & brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay.	Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Vertebrate-Bird	*Riparia riparia*	bank swallow	None	Threatened			Colonial nester; nests primarily in riparian and other lowland habitats west of the desert.	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.
Vertebrate-Bird	*Sternula antillarum browni*	California least tern	Endangered	Endangered			Nests along the coast from San Francisco Bay south to northern Baja California.	Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, land fills, or paved areas.
Vertebrate-Bird	*Strix occidentalis caurina*	northern spotted owl	Threatened	None			Old-growth forests or mixed stands of old-growth & mature trees. Occasionally in younger forests w/patches of big trees.	High, multistory canopy dominated by big trees, many trees w/cavities or broken tops, woody debris & space under canopy.
Vertebrate-Bird	*Xanthocephalus xanthocephalus*	yellow-headed blackbird	None	None	Species of Concern		Nests in freshwater emergent wetlands with dense vegetation & deep water. Often along borders of lakes or ponds.	Nests only where large insects such as Odonata are abundant, nesting timed with maximum emergence of aquatic insects.
Vertebrate-Fish	*Acipenser medirostris*	green sturgeon	Threatened	None	Species of Concern		These are the most marine species of sturgeon. Abundance increases northward of Point Conception. Spawns in the Sacramento River	Spawns at temps between 8-14 C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.
Vertebrate-Fish	*Archoplites interruptus*	Sacramento perch	None	None	Species of Concern		Historically found in the sloughs, slow-moving rivers, and lakes of the Central Valley.	Prefers warm water. Aquatic vegetation is essential for young. Tolerates wide range of physio-chemical water conditions.
Vertebrate-Fish	*Eucyclogobius newberryi*	tidewater goby	Endangered	None	Species of Concern		Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego Co. to the mouth of the Smith River.	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water & high oxygen levels.
Vertebrate-Fish	*Hypomesus transpacificus*	delta smelt	Threatened	Threatened			Sacramento-San Joaquin delta. Seasonally in Suisun Bay, Carquinez Strait & San Pablo Bay.	Seldom found at salinities > 10 ppt. Most often at salinities < 2ppt.
Vertebrate-Fish	*Mylopharodon conocephalus*	hardhead	None	None	Species of Concern		Low to mid-elevation streams in the Sacramento-San Joaquin drainage. Also present in the Russian River.	Clear, deep pools with sand-gravel-boulder bottoms & slow water velocity. Not found where exotic centrarchids predominate

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Vertebrate-Fish	*Oncorhynchus kisutch*	coho salmon - central California coast ESU	Endangered	Endangered			Federal listing = pops between Punta Gorda & San Lorenzo River. State listing = pops south of Punta Gorda.	Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water & sufficient dissolved oxygen.
Vertebrate-Fish	*Oncorhynchus mykiss*	Central California Coastal steelhead; Central Valley steelhead	Threatened	None			From Russian River, south to Soquel Creek & to, but not including, Pajaro River. Also San Francisco & San Pablo Bay basins. Populations in the Sacramento and San Joaquin Rivers and their tributaries.	
Vertebrate-Fish	*Oncorhynchus tshawytscha*	California coastal chinook salmon; Central Valley spring-run chinook salmon; winter-run chinook salmon, Sacramento River	Endangered	Endangered			Federal listing refers to wild spawned, coastal, spring & fall runs between Redwood Creek, Humboldt Co & Russian River, some populations spawning in the Sacramento & San Joaquin Rivers and their tributaries. Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams.	Requires clean, cold water over gravel beds with water temperatures between 6 & 14 c for spawning.
Vertebrate-Mammal	*Antrozous pallidus*	pallid bat	None	None	Species of Concern		Deserts, grasslands, shrublands, woodlands & forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.
Vertebrate-Mammal	*Arctocephalus townsendi*	Guadalupe fur seal	Threatened	Threatened			Breeds on Isla de Guadalupe off of Mexico, occasionally found on San Miguel, San Nicolas, & San Clemente Islands.	Prefers shallow, nearshore island water, with cool & sheltered rocky areas for haul-outs.
Vertebrate-Mammal	*Balaenoptera borealis*	sei whale					Pelagic marine[2].	Generally in deep water; along edge of continental shelf and in open ocean.
Vertebrate-Mammal	*Balaenoptera musculus*	blue whale					Pelagic marine[2].	Mainly pelagic; generally prefers cold waters and open seas.
Vertebrate-Mammal	*Balaenoptera physalus*	finback whale					Pelagic marine[2].	Pelagic; usually found in largest numbers 25 miles or more from shore.

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Vertebrate-Mammal	*Enhydra lutris nereis*	southern sea otter	Threatened	None			Nearshore marine environments from about Ano Nuevo, San Mateo Co. to Point Sal, Santa Barbara Co.	Needs canopies of giant kelp & bull kelp for rafting & feeding. Prefers rocky substrates with abundant invertebrates.
Vertebrate-Mammal	*Eubalaena glacialis*	right whale					Near shore, pelagic marine[2].	Inhabits nearshore and offshore waters.
Vertebrate-Mammal	*Eumetopias jubatus*	Steller sea-lion	Threatened	None			Breeds on Ano Nuevo, San Miguel & Farallon Islands, Pt. St. George, & Sugarloaf. Hauls-out on islands & rocks.	Needs haul-out & breeding sites with unrestricted access to water, near aquatic food supply & with no human disturbance.
Vertebrate-Mammal	*Lasionycteris noctivagans*	silver-haired bat	None	None			Primarily a coastal & montane forest dweller feeding over streams, ponds & open brushy areas.	Roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes & rarely under rocks. Needs drinking water.
Vertebrate-Mammal	*Lasiurus blossevillii*	western red bat	None	None	Species of Concern		Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests.	Prefers habitat edges & mosaics with trees that are protected from above & open below with open areas for foraging.
Vertebrate-Mammal	*Lasiurus cinereus*	hoary bat	None	None			Prefers open habitats or habitat mosaics, with access to trees for cover & open areas or habitat edges for feeding.	Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.
Vertebrate-Mammal	*Microtus californicus sanpabloensis*	San Pablo vole	None	None	Species of Concern		Saltmarshes of San Pablo Creek, on the south shore of San Pablo Bay.	Constructs burrow in soft soil. Feeds on grasses, sedges and herbs. Forms a network of runways leading from the burrow
Vertebrate-Mammal	*Nyctinomops macrotis*	big free-tailed bat	None	None	Species of Concern		Low-lying arid areas in southern California.	Need high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.
Vertebrate-Mammal	*Physeter catodon*	sperm whale					Abyssal, pelagic marine[2].	Pelagic, prefers deep water, sometimes around islands or in shallow shelf waters.
Vertebrate-Mammal	*Reithrodontomys raviventris*	salt-marsh harvest mouse	Endangered	Endangered			Only in the saline emergent wetlands of San Francisco Bay and its tributaries.	Pickleweed is primary habitat. Do not burrow, build loosely organized nests. Require higher areas for flood escape.
Vertebrate-Mammal	*Scapanus latimanus insularis*	Angel Island mole	None	None			Known only from Angel Island in San Francisco Bay.	Need friable soils for burrowing.

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Vertebrate-Mammal	*Scapanus latimanus parvus*	Alameda Island mole	None	None	Species of Concern		Only known from Alameda Island. Found in a variety of habitats, especially annual & perennial grasslands.	Prefers moist, friable soils. Avoids flooded soils.
Vertebrate-Mammal	*Sorex vagrans halicoetes*	salt-marsh wandering shrew	None	None	Species of Concern		Salt marshes of the south arm of San Francisco Bay.	Medium high marsh 6-8 ft above sea level where abundant driftwood is scattered among salicornia.
Vertebrate-Mammal	*Taxidea taxus*	American badger	None	None	Species of Concern		Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils & open, uncultivated ground. Preys on burrowing rodents. Digs burrows.
Vertebrate-Mammal	*Zapus trinotatus orarius*	Point Reyes jumping mouse	None	None	Species of Concern		Primarily in bunch grass marshes on the uplands of Point Reyes. Also present in coastal scrub, grassland, and meadows.	Eats mainly grass seeds w/ some insects & fruit taken. Builds grassy nests on ground under vegetation, burrows in winter
Vertebrate-Reptile	*Actinemys marmorata*	western pond turtle	None	None	Species of Concern		A thoroughly aquatic turtle of ponds, marshes, rivers, streams & irrigation ditches with aquatic vegetation.	Need basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg-laying.
Vertebrate-Reptile	*Actinemys marmorata marmorata*	northwestern pond turtle	None	None	Species of Concern		Associated with permanent or nearly permanent water in a wide variety of habitats.	Requires basking sites. Nests sites may be found up to 0.5 km from water.
Vertebrate-Reptile	*Caretta caretta*	loggerhead turtle	Threatened				Marine Habitat(s): Near shore, pelagic. Estuarine Habitat(s): Bay/sound, lagoon, river mouth/tidal river, tidal flat/shore[2].	Open sea to more than 500 miles from shore. Nesting occurs usually on open sandy beaches above high-tide mark, seaward of well-developed dunes.
Vertebrate-Reptile	*Chelonia mydas*	green turtle	Threatened	None			Marine.	Completely herbivorous; needs adequate supply of seagrasses and algae.
Vertebrate-Reptile	*Dermochelys coriacea*	leatherback turtle	Endangered				Marine Habitat(s): Near shore, pelagic. Estuarine Habitat(s): Bay/sound[2].	Marine; open ocean, often near edge of continental shelf; also seas, gulfs, bays, and estuaries. Nests on sloping sandy beaches backed up by vegetation, often near deep water and rough seas.

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Vertebrate-Reptile	*Lepidochelys olivacea*	olive (=Pacific) ridley sea turtle	Endangered				Marine Habitat(s): Near shore, pelagic. Estuarine Habitat(s): Bay/sound, tidal flat/shore[2].	Tropical and subtropical waters, ranging from protected, shallow, marine and estuarine waters, including bays and lagoons, to offshore areas well beyond the continental shelf. Nesting occurs on upper beaches.
Vertebrate-Reptile	*Masticophis lateralis euryxanthus*	Alameda whipsnake	Threatened	Threatened			Restricted to valley-foothill hardwood habitat of the coast ranges between vicinity of Monterey and N. San Francisco Bay.	Inhabits south-facing slopes and ravines where shrubs form a vegetative mosaic with oak trees and grasses.
Vertebrate-Reptile	*Thamnophis sirtalis tetrataenia*	San Francisco garter snake	Endangered	Endangered			Vicinity of freshwater marshes, ponds and slow moving streams in San Mateo County & extreme northern Santa Cruz County.	Prefers dense cover & water depths of at least one foot. Upland areas near water are also very important.
Plant	*Arabis aculeolata*	Waldo rock-cress	None	None		2.2	Broad-leafed upland forest, lower montane coniferous forest, upper montane coniferous forest.	Serpentine slopes and ridges. 410-1800m.
Plant	*Centromadia parryi ssp. parryi*	pappose tarplant	None	None		1B.2	Coastal prairie, meadows and seeps, coastal salt marsh, valley and foothill grassland.	Vernally mesic, often alkaline sites. 2-420m.
Plant	*Chorizanthe valida*	Sonoma spineflower	Endangered	Endangered		1B.1	Coastal prairie.	Sandy soil. 10-50m.
Plant	*Equisetum palustre*	marsh horsetail	None	None		3	Marshes and swamps.	45-1000m.
Plant	*Gilia capitata ssp. tomentosa*	woolly-headed gilia	None	None		1B.1	Coastal bluff scrub.	Rocky outcrops on the coast. 15-155m.
Plant	*Lessingia hololeuca*	woolly-headed lessingia	None	None		3	Coastal scrub, lower montane coniferous forest, valley and foothill grassland.	Clay, serpentine; roadsides, fields. 15-300m.
Plant	*Meconella oregana*	Oregon meconella	None	None		1B.1	Coastal prairie, coastal scrub.	Open, moist places. 250-500m.
Plant	*Micropus amphibolus*	Mt. Diablo cottonweed	None	None		3.2	Valley and foothill grassland, cismontane woodland, broad-leafed upland forest.	Bare, grassy or rocky slopes. 50-800m.
Plant	*Navarretia leucocephala ssp. bakeri*	Baker's navarretia	None	None		1B.1	Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest.	Vernal pools and swales; adobe or alkaline soils. 5-950m.
Plant	*Streptanthus albidus ssp. peramoenus*	most beautiful jewel-flower	None	None		1B.2	Chaparral, valley and foothill grassland, cismontane woodland.	Serpentine outcrops, on ridges and slopes. 120-730m.

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Plant	*Triquetrella californica*	coastal triquetrella	None	None		1B.2	Coastal bluff scrub, coastal scrub.	Moss growing on soil. 10-100m.
Plant Broad-leaf	*Amorpha californica var. napensis*	Napa false indigo	None	None		1B.2	Broadleafed upland forest, chaparral, cismontane woodland.	Openings in forest or woodland or in chaparral. 150-2000m
Plant Broad-leaf	*Amsinckia lunaris*	bent-flowered fiddleneck	None	None		1B.2	Cismontane woodland, valley and foothill grassland.	50-500m.
Plant Broad-leaf	*Arctostaphylos hookeri ssp. franciscana*	Franciscan manzanita	None	None		1A	Chaparral.	Serpentine outcrops in chaparral. 60-300m.
Plant Broad-leaf	*Arctostaphylos hookeri ssp. montana*	Mt. Tamalpais manzanita	None	None		1B.3	Chaparral, valley and foothill grassland.	Serpentine slopes in chaparral and grassland. 160-760m.
Plant Broad-leaf	*Arctostaphylos hookeri ssp. ravenii*	Presidio manzanita	Endangered	Endangered		1B.1	Chaparral, coastal prairie, coastal scrub.	Open, rocky serpentine slopes. 20-215m.
Plant Broad-leaf	*Arctostaphylos imbricata*	San Bruno Mountain manzanita	None	Endangered		1B.1	Chaparral, coastal scrub.	Mostly known from a few sandstone outcrops in chaparral. 275-365m.
Plant Broad-leaf	*Arctostaphylos montaraensis*	Montara manzanita	None	None		1B.2	Chaparral, coastal scrub.	Slopes and ridges. 150-500m.
Plant Broad-leaf	*Arctostaphylos pacifica*	Pacific manzanita	None	Endangered		1B.2	Coastal scrub.	
Plant Broad-leaf	*Arctostaphylos pallida*	pallid manzanita	Threatened	Endangered		1B.1	Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub.	Grows on uplifted marine terraces on siliceous shale or thin chert. May require fire. 185-465m.
Plant Broad-leaf	*Arctostaphylos virgata*	Marin manzanita	None	None		1B.2	Broadleafed upland forest, closed-cone coniferous forest, chaparral, north coast coniferous forest.	Only known from about 20 eos in marin county. On sandstone or granitic soil. 60-700m.
Plant Broad-leaf	*Arenaria paludicola*	marsh sandwort	Endangered	Endangered		1B.1	Marshes and swamps.	Growing up through dense mats of *Typha, Juncus, Scirpus,* etc. In freshwater marsh. 10-170m.
Plant Broad-leaf	*Astragalus tener var. tener*	alkali milk-vetch	None	None		1B.2	Alkali playa, valley and foothill grassland, vernal pools.	Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 1-170m.
Plant Broad-leaf	*Atriplex joaquiniana*	San Joaquin spearscale	None	None		1B.2	Chenopod scrub, alkali meadow, valley and foothill grassland.	In seasonal alkali wetlands or alkali sink scrub with *Distichlis spicata, Frankenia,* etc. 1-250m.
Plant Broad-leaf	*Boschniakia hookeri*	small groundcone	None	None		2.3	North coast coniferous forest.	Open woods, shrubby places, generally on *Gaultheria shallon*. 90-885m.
Plant Broad-leaf	*California macrophylla*	round-leaved filaree	None	None		1B.1	Cismontane woodland, valley and foothill grassland.	Clay soils. 15-1200m.

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Plant Broad-leaf	*Calystegia purpurata ssp. saxicola*	coastal bluff morning-glory	None	None		1B.2	Coastal dunes, coastal scrub.	15-105m.
Plant Broad-leaf	*Castilleja affinis ssp. neglecta*	Tiburon paintbrush	Endangered	Threatened		1B.2	Valley and foothill grassland.	Rocky serpentine sites. 75-400m.
Plant Broad-leaf	*Chorizanthe cuspidata var. cuspidata*	San Francisco Bay spineflower	None	None		1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub.	Closely related to *C. pungens*. Sandy soil on terraces and slopes. 5-550m.
Plant Broad-leaf	*Chorizanthe robusta var. robusta*	robust spineflower	Endangered	None		1B.1	Cismontane woodland, coastal dunes, coastal scrub.	Sandy terraces and bluffs or in loose sand. 3-120m.
Plant Broad-leaf	*Cirsium andrewsii*	Franciscan thistle	None	None		1B.2	Coastal bluff scrub, broadleaved upland forest, coastal scrub.	Sometimes serpentine seeps. 0-135m.
Plant Broad-leaf	*Cirsium hydrophilum var. vaseyi*	Mt. Tamalpais thistle	None	None		1B.2	Broad-leafed upland forest, chaparral.	Serpentine seeps and streams in chaparral and woodland. 265-620m.
Plant Broad-leaf	*Cirsium occidentale var. compactum*	compact cobwebby thistle	None	None		1B.2	Chaparral, coastal dunes, coastal prairie, coastal scrub.	On dunes and on clay in chaparral; also in grassland. 5-155m.
Plant Broad-leaf	*Clarkia franciscana*	Presidio clarkia	Endangered	Endangered		1B.1	Coastal scrub, valley and foothill grassland.	Serpentine outcrops in grassland or scrub. 20-335m.
Plant Broad-leaf	*Collinsia corymbosa*	round-headed Chinese-houses	None	None		1B.2	Coastal dunes, coastal prairie.	Dunes and coastal prairie. 10-30m.
Plant Broad-leaf	*Collinsia multicolor*	San Francisco collinsia	None	None		1B.2	Closed-cone coniferous forest, coastal scrub.	On decomposed shale (mudstone) mixed with humus. 30-250m.
Plant Broad-leaf	*Cordylanthus maritimus ssp. palustris*	Point Reyes bird's-beak	None	None		1B.2	Coastal salt marsh.	Usually in coastal salt marsh with *Salicornia*, *Distichlis*, *Jaumea*, *Spartina*, etc. 0-15m.
Plant Broad-leaf	*Dirca occidentalis*	western leatherwood	None	None		1B.2	Broad-leafed upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, n coast coniferous forest, riparian forest, riparian woodland.	On brushy slopes, mesic sites; mostly in mixed evergreen & foothill woodland communities. 30-550m.
Plant Broad-leaf	*Eriogonum luteolum var. caninum*	Tiburon buckwheat	None	None		1B.2	Chaparral, valley and foothill grassland, cismontane woodland, coastal prairie.	Serpentine soils; sandy to gravelly sites. 0-700m.
Plant Broad-leaf	*Gilia capitata ssp. chamissonis*	blue coast gilia	None	None		1B.1	Coastal dunes, coastal scrub.	2-200m.
Plant Broad-leaf	*Gilia millefoliata*	dark-eyed gilia	None	None		1B.2	Coastal dunes.	2-20m.
Plant Broad-leaf	*Grindelia hirsutula var. maritima*	San Francisco gumplant	None	None		1B.2	Coastal scrub, coastal bluff scrub, valley and foothill grassland.	Sandy or serpentine slopes, sea bluffs. 15-400m.

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Plant Broad-leaf	*Helianthella castanea*	Diablo helianthella	None	None		1B.2	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley & foothill grassland.	Usually in chaparral/oak woodland interface in rocky, azonal soils. Often in partial shade. 25-1150m.
Plant Broad-leaf	*Hemizonia congesta ssp. congesta*	seaside tarplant	None	None		1B.2	Coastal scrub, valley and foothill grassland.	Grassy valleys and hills, often in fallow fields. 25-200m.
Plant Broad-leaf	*Hesperevax sparsiflora var. brevifolia*	short-leaved evax	None	None		1B.2	Coastal bluff scrub, coastal dunes.	Sandy bluffs and flats. 0-200m.
Plant Broad-leaf	*Hesperolinon congestum*	Marin western flax	Threatened	Threatened		1B.1	Chaparral, valley and foothill grassland.	In serpentine barrens and in serpentine grassland and chaparral. 30-365m.
Plant Broad-leaf	*Hoita strobilina*	Loma Prieta hoita	None	None		1B.1	Chaparral, cismontane woodland, riparian woodland.	Serpentine; mesic sites.
Plant Broad-leaf	*Holocarpha macradenia*	Santa Cruz tarplant	Threatened	Endangered		1B.1	Coastal prairie, valley and foothill grassland.	Light, sandy soil or sandy clay; often with nonnatives. 10-260m.
Plant Broad-leaf	*Horkelia cuneata ssp. sericea*	Kellogg's horkelia	None	None		1B.1	Closed-cone coniferous forest, coastal scrub, chaparral.	Old dunes, coastal sandhills; openings. 10-200m.
Plant Broad-leaf	*Horkelia tenuiloba*	thin-lobed horkelia	None	None		1B.2	Coastal scrub, chaparral.	Sandy soils; mesic openings. 45-500m.
Plant Broad-leaf	*Layia carnosa*	beach layia	Endangered	Endangered		1B.1	Coastal dunes. Hugely reduced in range along California's North Coast dunes.	On sparsely vegetated, semi-stabilized dunes, usually behind foredunes. 0-75m.
Plant Broad-leaf	*Leptosiphon rosaceus*	rose leptosiphon	None	None		1B.1	Coastal bluff scrub.	0-100m.
Plant Broad-leaf	*Lessingia germanorum*	San Francisco lessingia	Endangered	Endangered		1B.1	Coastal scrub.	From remnant dunes. Open sandy soils relatively free of competing plants. 20-125m.
Plant Broad-leaf	*Lessingia micradenia var. micradenia*	Tamalpais lessingia	None	None		1B.2	Chaparral, valley and foothill grassland.	Usually on serpentine, in serpentine grassland or serpentine chaparral. Often on roadsides. 100-305m.
Plant Broad-leaf	*Malacothamnus arcuatus*	arcuate bush-mallow	None	None		1B.2	Chaparral.	Gravelly alluvium. 80-355m.
Plant Broad-leaf	*Microseris paludosa*	marsh microseris	None	None		1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland.	5-300m.
Plant Broad-leaf	*Monardella villosa ssp. globosa*	robust monardella	None	None		1B.2	Broad-leaved upland forest, chaparral, cismontane woodland, valley and foothill grassland.	Openings. 30-300m.

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Plant Broad-leaf	*Navarretia rosulata*	Marin County navarretia	None	None		1B.2	Closed-cone coniferous forest, chaparral.	Dry, open rocky places; can occur on serpentine. 200-635m.
Plant Broad-leaf	*Pentachaeta bellidiflora*	white-rayed pentachaeta	Endangered	Endangered		1B.1	Valley and foothill grassland.	Open dry rocky slopes and grassy areas, often on soils derived from serpentine bedrock. 35-620m.
Plant Broad-leaf	*Plagiobothrys chorisianus var. chorisianus*	Choris' popcorn-flower	None	None		1B.2	Chaparral, coastal scrub, coastal prairie.	Mesic sites. 15-100m.
Plant Broad-leaf	*Plagiobothrys diffusus*	San Francisco popcorn-flower	None	Endangered		1B.1	Valley and foothill grassland, coastal prairie.	Historically from grassy slopes with marine influence. 60-485m.
Plant Broad-leaf	*Plagiobothrys glaber*	hairless popcorn-flower	None	None		1A	Meadows and seeps, marshes and swamps.	Coastal salt marshes and alkaline meadows. 5-180m.
Plant Broad-leaf	*Polemonium carneum*	Oregon polemonium	None	None		2.2	Coastal prairie, coastal scrub, lower montane coniferous forest.	0-1830m.
Plant Broad-leaf	*Polygonum marinense*	Marin knotweed	None	None		3.1	Marshes and swamps.	Coastal salt marshes and brackish marshes. 0-10m.
Plant Broad-leaf	*Quercus parvula var. tamalpaisensis*	Tamalpais oak	None	None		1B.3	Lower montane coniferous forest.	100-750m.
Plant Broad-leaf	*Sanicula maritima*	adobe sanicle	None	Rare		1B.1	Meadows and seeps, valley and foothill grassland, chaparral, coastal prairie.	Moist clay or ultramafic soils. 30-240m.
Plant Broad-leaf	*Sidalcea calycosa ssp. rhizomata*	Point Reyes checkerbloom	None	None		1B.2	Marshes and swamps.	Freshwater marshes near the coast. 5-75(245)m.
Plant Broad-leaf	*Sidalcea hickmanii ssp. viridis*	Marin checkerbloom	None	None		1B.3	Chaparral.	Serpentine or volcanic soils; sometimes appears after burns. 0-430m.
Plant Broad-leaf	*Silene verecunda ssp. verecunda*	San Francisco campion	None	None		1B.2	Coastal scrub, valley and foothill grassland, coastal bluff scrub, chaparral, coastal prairie.	Often on mudstone or shale; one site on serpentine. 30-645m.
Plant Broad-leaf	*Stebbinsoseris decipiens*	Santa Cruz microseris	None	None		1B.2	Broad-leafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub.	Open areas in loose or disturbed soil, usu. Derived from sandstone, shale or serpentine, on seaward slopes. 10-500m.
Plant Broad-leaf	*Streptanthus batrachopus*	Tamalpais jewel-flower	None	None		1B.3	Closed-cone coniferous forest, chaparral.	Talus serpentine outcrops. 410-650m.
Plant Broad-leaf	*Streptanthus glandulosus ssp. pulchellus*	Mount Tamalpais bristly jewel-flower	None	None		1B.2	Chaparral, valley and foothill grassland. .	Serpentine slopes. 150-800m.
Plant Broad-leaf	*Streptanthus niger*	Tiburon jewel-flower	Endangered	Endangered		1B.1	Valley and foothill grassland.	Shallow, rocky serpentine slopes. 30-150m.
Plant Broad-leaf	*Suaeda californica*	California seablite	Endangered	None		1B.1	Marshes and swamps.	Margins of coastal salt marshes. 0-5m.

Table M-2 (Continued)

Group	Scientific Name	Common Name	Federal List	California List	CDFG	CNPS	General Habitat Requirements[1]	Microhabitat
Plant Broad-leaf	*Symphyotrichum lentum*	Suisun Marsh aster	None	None		1B.2	Marshes and swamps (brackish and freshwater).	Most often seen along sloughs with *Phragmites*, *Scirpus*, blackberry, *Typha*, etc. 0-3m.
Plant Broad-leaf	*Trifolium amoenum*	showy rancheria clover	Endangered	None		1B.1	Valley and foothill grassland, coastal bluff scrub.	Sometimes on serpentine soil, open sunny sites, swales. Most recently sited on roadside and eroding cliff face. 5-560m.
Plant Broad-leaf	*Trifolium depauperatum var. hydrophilum*	saline clover	None	None		1B.2	Marshes and swamps, valley and foothill grassland, vernal pools.	Mesic, alkaline sites. 0-300m.
Plant Broad-leaf	*Triphysaria floribunda*	San Francisco owl's-clover	None	None		1B.2	Coastal prairie, valley and foothill grassland.	On serpentine and nonserpentine substrate (such as at Pt. Reyes). 10-160m.
Plant Monocot	*Calochortus tiburonensis*	Tiburon mariposa-lily	Threatened	Threatened		1B.1	Valley and foothill grassland.	On open, rocky, slopes in serpentine grassland. 50-150m.
Plant Monocot	*Carex comosa*	bristly sedge	None	None		2.1	Marshes and swamps.	Lake margins, wet places; site below sea level is on a delta island. -5-1005m.
Plant Monocot	*Fritillaria lanceolata var. tristulis*	Marin checker lily	None	None		1B.1	Coastal bluff scrub, coastal scrub, coastal prairie.	Occurrences reported from canyons and riparian areas as well as rock outcrops; often on serpentine. 30-300m.
Plant Monocot	*Fritillaria liliacea*	fragrant fritillary	None	None		1B.2	Coastal scrub, valley and foothill grassland, coastal prairie.	Often on serpentine; various soils reported though usually clay, in grassland. 3-410m.
Plant Monocot	*Pleuropogon hooverianus*	North Coast semaphore grass	None	Threatened		1B.1	Broadleafed upland forest, meadows and seeps, north coast coniferous forest.	Wet grassy, usually shady areas, sometimes freshwater marsh; associated with forest environments; 10-1150m.
Plant Nonvascular	*Fissidens pauperculus*	minute pocket moss	None	None		1B.2	North Coast coniferous forest.	Moss growing on damp soil along the coast. 10-100m.

Table M-3
Special Status Species that Could Occur
Pier 70 Environmental Site Investigation

Group	Scientific Name	Common Name	Federal List	California List	Global Rank	State Rank	General Habitat Requirements[1]	Microhabitat
Invertebrate-Insect	Dufourea stagei	Penninsula solitary bee[2]	None	None	Critically Imperiled?	Critically Imperiled?	Species is a ground-nesting bee.	
Vertebrate-Bird	Hydroprogne caspia	Caspian tern[3]	None	None	Secure	Apparently Secure	Nests on sandy or gravely beaches and shell banks in small colonies inland and along the coast.	Inland fresh-water lakes and marshes; also, brackish or salt waters of estuaries and bays.
Vertebrate-Bird	Pelecanus occidentalis californicus	California brown pelican	Endangered	Endangered	Vulnerable	Critically Imperiled	Colonial nester on coastal islands just outside the surf line.	Nests on coastal islands of small to moderate size which afford immunity from attack by ground dwelling predators.
Vertebrate-Bird	Phalacrocorax auritus	double-crested cormorant[3]	None	None	Secure	Vulnerable	Colonial nester on coastal cliffs, offshore islands, & along lake margins in the interior of the state.	Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.

Notes:
[1] - Habitat information from Rarefind Version 3.1.1 unless otherwise noted.
[2] - The Pennisula solitary bee is included here because no information on range or more specific habitat information could be found that would confirm or refute its potential to be on-site.
[3] - These species are listed because their nesting habitat is at risk, but the species as a whole is not at risk.

Table M-4
Ecological Screening levels for Inorganic Contaminants
Pier 70 Environmental Site Investigation

	Ecological Screening Levels[1]	
	Marine Water (µg/L)	**Soil (mg/kg)**
Antimony	500	20
Arsenic	0.14	20
Barium	1000	750
Beryllium	0.53	4
Boron	1.6	1.6
Cadmium	9.3	12
Chromium	180	0.4[a]
Chromium VI	NA[b]	8
Cobalt	3	40
Copper	3.1	230
Lead	5.6	200
Molybdenum	240	40
Nickel	8.2	150
Selenium	71	10
Silver	0.19	20
Thallium	4	1.0[a]
Total Cyanide	1	ND[3]
Total Mercury (elemental Hg)[2]	0.025	10
Vanadium	19	200
Zinc	81	600

Notes:

[1] All screening levels are from SFBRWQCB 2008 (Table F for Marine screening levels and Table A-2 for Soil Screening levels), except where noted.

[a] Chromium and thallium soil screening levels are not available from the SFBRWQCB. Values from the Savannah River National Laboratory are used (Friday 2005).

[b] Groundwater samples were not analyzed for Chromium VI.

[2] Screening levels for Total Mercury are not available. The screening level for elemental mercury is used in its place.

[3] Total Cyanide was not detected in any soil samples used in the analysis.

Table M-5
Ecological Screening Levels for PAHs
Pier 70 Environmental Site Investigation

	Ecological Screening Levels[1]	
	Marine Water (µg/L)	**Soil (mg/kg)**
2-Methylnaphthalene	10	1
Acenaphthene	20	20
Acenaphthylene	30	6823
Anthracene	0.73	40
Benzo(a)-anthracene	0.027	40
Benzo(a)-pyrene	0.014	40
Benzo(b)-fluoranthene	0.029	40
Benzo(g,h,i)-perylrene	0.1	40
Benzo(k)-fluoranthene	0.049	40
Chrysene	0.049	40
Dibenzo(a,h)-anthracene	0.049	18.43
Fluoranthene	8	40
Fluorene	30	30
Indeno(1,2,3-cd)-pyrene	0.048	40
Naphthalene	21	40
Phenanthrene	4.6	40
Pyrene	2	0.1[a]

Notes:

[1] All screening levels are from RWQCB 2008 (Table F for Marine screening levels and Table A-2 for Soil Screening levels), except where noted.

[a] A pyrene soil screening level is not available from the RWQCB. A value from the Savannah River National Laboratory is used (Friday 2005).

[2] No estuarine screening level is available for 1-methylnaphthalene from the RWQCB. Since no 1-methylnaphthalene was identified in groundwater, no effort was made to develop a project specific estuarine screening level.

[3] Soil screening levels for are not available from the RWQCB, soil screening levels are from US EPA Region 5 RCRA Ecological Screening Levels, August 2003b.

Table M-6
Ecological Screening Levels for Dioxins, Furans and PCBs
Pier 70 Environmental Site Investigation

	Ecological Screening Levels	
	Marine Water (µg/L)	**Soil[1] (mg/kg)**
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	ND	0.0000002
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ND	0.00004
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	ND	0.0000002
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ND	0.00004
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	ND	0.0000002
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	ND	0.0000002
1,2,3,7,8-Pentachlorodibenzofuran	ND	0.00004
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	ND	0.0000002
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ND	0.00004
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ND	0.00004
2,3,7,8-Tetrachlorodibenzofuran	ND	0.00004
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ND	0.0000002
Heptachlorodibenzofurans (HpCDF), Total	ND	0.00004
Heptachlorodibenzo-p-dioxins (HpCDD), Total	ND	0.0000002
Hexachlorodibenzofurans (HxCDF), Total	ND	0.00004
Hexachlorodibenzo-p-dioxins (HxCDD), Total	ND	0.0000002
Octachlorodibenzofuran	ND	0.00004
Octachlorodibenzo-p-dioxin (OCDD)	ND	0.0000002
Pentachlorodibenzofurans (PeCDF), Total	ND	0.00004
Pentachlorodibenzo-p-dioxin (PeCDD), Total	ND	0.0000002
Tetrachlorodibenzo-p-dioxins (TCDD), Total	ND	0.0000002
Aroclor 1254	ND	0.00025[a]
Aroclor 1260	ND	0.00014[a]

Notes:

[1] No screening levels are available from SFBRWQCB 2008. The dioxin and furan soil screening levels are all from US EPA Region 5 RCRA Ecological Screening Levels, August 2003b.

[a] These screening levels were developed using toxic reference values based on systemic effects in rats from ATSDR Toxicological Profile for PCBs, November 2000.

Table M-7
Ecological Screening Levels for Volatile Organic Compounds
Pier 70 Environmental Site Investigation

	Ecological Screening Levels[1]	
	Marine Water (µg/L)	**Soil (mg/kg)**
1,1-Dichloroethane	47	ND[2]
1,2,4-Trimethylbenzene	43.5[a]	5[d]
Acetone	1,500	2.5[e]
Benzene	71	0.26[e]
Bis (2-Ethylhexyl) phthalate	5.9	0.93[e]
Butyl benzyl phthalate	9.0[b]	0.24[e]
Chloroform	470	0.02
Chloromethane	3200	77[f]
Ethyl Benzene	30	0.03
m,p-Xylenes	No Tox[3]	16
Methyl ethyl ketone	8,400	89.6[e]
Methyl isobutyl ketone	170	13
Methylene Chloride	1,600	4.0[e]
o-Xylene	13[c]	35[g]
p-Isoproplytoluene	10,000	2.75[h]
Toluene	40	5.4[e]
Total Xylenes	100	0.05
Trichlorofluoromethane	ND	16.4[e]

Notes:

[1] All screening levels are from RWQCB 2008 (Table F for Marine screening levels and Table A-2 for Soil Screening levels), except where noted.

[a] This screening level was developed using 1/100 LC_{50} in scud (*Elasmopus pectinicrus*) from US EPA's online ECOTOX database (http://cfpub.epa.gov/ecotox/).

[b] This screening level was developed 1/100 LC_{50} in Opossum shrimp (*Americamysis bahia*) from US EPA's online ECOTOX database (http://cfpub.epa.gov/ecotox/).

[c] This screening level was developed using 1/100 LC_{50} in Bay shrimp (*Crangon franciscorum*) from US EPA's online ECOTOX database (http://cfpub.epa.gov/ecotox/).

[d] This screening level was developed using a toxic reference value based on mortality in rats taken from EPA Chemical Summary for 1,2,4-Trimethylbenzene, August 1994.

[e] These screening levels are from US EPA Region 5 RCRA Ecological Screening Levels, August 2003b .

[f] This screening level was developed using a toxic reference value based on acute toxicity in rats taken from ATSDR Toxicological Profile for Chloromethane, December 1998.

[g] This screening level was developed using a toxic reference value based on body weight impacts in rats taken from ATSDR Toxicological Profile for Xylenes, August 2007.

[h] This screening level was developed using a toxic reference value based on acute toxicity in rats taken from HSDB.

[2] None detected.

[3] Estuarine or soil screening levels for are not available from the RWQCB, and no literature toxicity values could be found for development of a project specific screening level.

Table M-8
Ecological Screening Levels for TPH
Pier 70 Environmental Site Investigation

	Ecological Screening Levels[1]	
	Estuarine Water (µg/L)	**Soil (mg/kg)**
TPHd (g)	210	20 [2]
TPHd (mo)	210	200 [3]
TPHg	210	20
TPHmo	210	200

Notes:

[1] All screening levels are from RWQCB 2008 (Table F for Marine screening levels and Table A-2 for Soil Screening levels).

[2] No screening levels are available, and no toxicity data are available. The screening level for TPHg is used.

[3] No screening levels are available, and no toxicity data are available. The screening level for TPHmo is used.

Table M-9
Exceedance of Ecological Screening Levels for Inorganic Contaminants
Pier 70 Environmental Site Investigation

	Surface Soils		Burrowing Soils		Groundwater (Dissolved)	
	Open Areas[1]	Developed Areas[2]	Open Areas	Developed Areas	Open Areas	Developed Areas
Antimony	Yes	Yes	Yes	Yes	No	No
Arsenic	Yes	Yes	Yes	Yes	100X	100X
Barium	Yes	No	Yes	No	No	1X
Beryllium	No	No	No	No	No	No
Boron	NA[3]	NA	NA	NA	NA	NA
Cadmium	No	No	No	Yes	No	1X
Chromium	Yes	Yes	Yes	Yes	No	No
Chromium VI	No	No	No	No	ND	ND
Cobalt	Yes	Yes	Yes	Yes	10X	10X
Copper	Yes	Yes	Yes	Yes	1X	10X
Lead	Yes	Yes	Yes	Yes	1X	1X
Molybdenum	No	No	No	No	No	No
Nickel	Yes	Yes	Yes	Yes	1X	1X
Selenium	Yes	Yes	Yes	Yes	No	No
Silver	Yes	Yes	Yes	Yes	1X	No
Thallium	Yes	Yes	Yes	Yes	No	No
Total Cyanide	ND[4]	ND	ND	ND	10X	10X
Total Mercury	Yes	Yes	Yes	Yes	No	1X
Vanadium	No	Yes	No	Yes	No	No
Zinc	Yes	Yes	Yes	Yes	1X	10X

Notes:

[1] Those areas designated as “Open Areas” are those areas anticipated to be used as open space once the site is redeveloped. These areas include Central Plaza Park, Crane Cove Park and Slipway Park.

[2] Those areas designated as “Developed Areas” are those areas anticipated to have buildings or pavement once the site is redeveloped. These areas include the remainder of the site outside of Central Plaza Park, Crane Cove Park and Slipway Park.

[3] NA = Not Analyzed in that sample matrix

[4] ND = Not Detected in that sample matrix, although it could have been detected in deeper samples.

Table M-10
Exceedances of Ecological Screening Levels for PAHs
Pier 70 Environmental Site Investigation

	Surface Soils		Burrowing Soils		Groundwater	
	Open Areas[1]	Developed Areas[2]	Open Areas	Developed Areas	Open Areas	Developed Areas
2-Methylnaphthalene	No	No	No	No	ND	ND
Acenaphthene	No	No	No	No	No	No
Acenaphthylene	No	No	No	No	No	No
Anthracene	No	No	No	No	No	1X
Benzo(a)-anthracene	No	No	No	No	10X	100X
Benzo(a)-pyrene	No	No	No	No	10X	100X
Benzo(b)-fluoranthene	No	No	No	No	10X	100X
Benzo(g,h,i)-perylene	No	No	No	No	1X	10X
Benzo(k)-fluoranthene	No	No	No	No	1X	10X
Chrysene	No	No	No	No	10X	100X
Dibenzo(a,h)-anthracene	No	No	No	No	1X	1X
Fluoranthene	No	No	No	No	No	1X
Fluorene	No	No	No	No	No	No
Indeno(1,2,3-cd)-pyrene	No	No	No	No	1X	10X
Naphthalene	No	No	No	No	No	1X
Phenanthrene	No	No	No	No	No	1X
Pyrene	Yes	Yes	Yes	Yes	1X	1X

Notes:

[1] Those areas designated as “Open Areas” are those areas anticipated to be used as open space once the site is redeveloped. These areas include Central Plaza Park, Crane Cove Park and Slipway Park.

[2] Those areas designated as “Developed Areas” are those areas anticipated to have buildings or pavement once the site is redeveloped. These areas include the remainder of the site outside of Central Plaza Park, Crane Cove Park and Slipway Park.

Table M-11
Exceedances of Ecological Screening Levels for Dioxins, Furans and PCBs
Pier 70 Environmental Site Investigation

	Surface Soils		Burrowing Soils		Groundwater	
	Open Areas[1]	Developed Areas[2]	Open Areas	Developed Areas	Open Areas	Developed Areas
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	No	Yes	No	Yes	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	No	No	No	No	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	No	Yes	No	Yes	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	No	No	No	No	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	No	Yes	No	Yes	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	No	Yes	No	Yes	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	No	No	No	No	NA	NA
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	No	Yes	No	Yes	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	No	No	No	No	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	No	No	No	No	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	No	No	No	No	NA	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	No	Yes	No	Yes	NA	NA
Heptachlorodibenzofurans (HpCDF), Total	No	No	No	No	NA	NA
Heptachlorodibenzo-p-dioxins (HpCDD), Total	No	Yes	No	Yes	NA	NA
Hexachlorodibenzofurans (HxCDF), Total	No	No	No	No	NA	NA
Hexachlorodibenzo-p-dioxins (HxCDD), Total	No	Yes	No	Yes	NA	NA
Octachlorodibenzofuran	No	No	No	No	NA	NA
Octachlorodibenzo-p-dioxin (OCDD)	No	Yes	No	Yes	NA	NA
Pentachlorodibenzofurans (PeCDF), Total	No	No	No	No	NA	NA
Pentachlorodibenzo-p-dioxin (PeCDD), Total	No	Yes	No	Yes	NA	NA
Tetrachlorodibenzo-p-dioxins (TCDD), Total	No	Yes	No	Yes	NA	NA
Aroclor 1254	Yes	No	Yes	No	ND	ND
Aroclor 1260	Yes	Yes	Yes	Yes	ND	ND

Notes:
[1] Those areas designated as "Open Areas" are those areas anticipated to be used as open space once the site is redeveloped. These areas include Central Plaza Park Crane Cove Park and Slipway Park.
[2] Those areas designated as "Developed Areas" are those areas anticipated to have buildings or pavement once the site is redeveloped. These areas include the remainder of the site outside of Central Plaza Park, Crane Cove Park and Slipway Park.

Table M-12
Exceedances of Ecological Screening Levels for Organic Compounds
Pier 70 Environmental Site Investigation

	Surface Soils		Burrowing Soils		Groundwater	
	Open Areas[1]	Developed Areas[2]	Open Areas	Developed Areas	Open Areas	Developed Areas
1,1-Dichloroethane	ND	ND	ND	ND	No	No
1,2,4-Trimethylbenzene	No	No	No	No	No	No
Acetone	No	No	No	No	No	No
Benzene	No	No	No	No	No	No
Bis (2-Ethylhexyl) phthalate	No	No	No	No	No	No
Butyl benzyl phthalate	No	No	No	No	ND	ND
Chloroform	No	No	No	No	No	No
Chloromethane	No	No	No	No	No	No
Ethyl Benzene	No	No	No	No	No	No
m,p-Xylenes	No	No	No	No	No	No
Methyl ethyl ketone	No	No	No	No	No	No
Methyl isobutyl ketone	No	No	No	No	ND	ND
Methylene Chloride	No	No	No	No	No	No
o-Xylene	No	No	No	No	No	No
p-Isoproplytoluene	No	No	No	No	No	No
Toluene	No	No	No	No	No	No
Total Xylenes	No	No	No	No	No	No
Trichlorofluoromethane	No	No	No	No	ND	ND

Notes:

[1] Those areas designated as “Open Areas” are those areas anticipated to be used as open space once the site is redeveloped. These areas include Central Plaza Park, Crane Cove Park and Slipway Park.

[2] Those areas designated as “Developed Areas” are those areas anticipated to have buildings or pavement once the site is redeveloped. These areas include the remainder of the site outside of Central Plaza Park, Crane Cove Park and Slipway Park.

Table M-13
Exceedances of Ecological Screening Levels for Petroleum Products
Pier 70 Environmental Site Investigation

	Surface Soils		Burrowing Soils		Groundwater	
	Open Areas[1]	**Developed Areas[2]**	**Open Areas**	**Developed Areas**	**Open Areas**	**Developed Areas**
TPHd (g)	Yes	Yes	Yes	Yes		
TPHd (mo)	Yes	Yes	Yes	Yes	1X	100X
TPHg	No	Yes	No	Yes	1X ADJ	10X
TPHmo	Yes	Yes	Yes	Yes	1X	100X

Notes:

[1] Those areas designated as "Open Areas" are those areas anticipated to be used as open space once the site is redeveloped. These areas include Central Plaza Park, Crane Cove Park and Slipway Park.

[2] Those areas designated as "Developed Areas" are those areas anticipated to have buildings or pavement once the site is redeveloped. These areas include the remainder of the site outside of Central Plaza Park, Crane Cove Park and Slipway Park.

Table M-14
Calculations for creating project-specific ecological soil screening levels

Constituent	Units	C_s (mg/kg dw)	K_{oc}	C_w (ppm)	Terrestrial IUF	C_{TI} (mg/kg dw)	Aquatic IUF	C_{AI} (mg/kg dw)	K_{ow}	VUF (mg veg. dw/ mg soil dw)	Cv (mg/kg dw)
Aroclor 1254	mg/kg	0.00025	407380	6.14E-10	15048.73	15.04873	15048.73	3.69E-05	3162277	0.006776	1.69E-06
Aroclor 1260	mg/kg	0.00014	2630268	5.32E-11	26497.2	14.83843	26497.2	5.64E-06	6309573	0.004546	6.36E-07
1,2,4-Trimethylbenzene	mg/kg	5	472	0.010593	89.09306	1781.861	89.09306	3.775129	6026	0.253013	1.265066
chloromethane	mg/kg	77	42	1.833333	0.397525	122.4376	0.397525	2.915181	8.13	11.53367	888.0929
o-Xylene	mg/kg	35	128.8	0.271739	25.65729	3592.02	25.65729	27.88835	1318	0.6091	21.31851
p-Isopropyltoluene	mg/kg	2.75	4050	0.000679	162.8894	1791.783	162.8894	0.442416	12589	0.165274	0.454504

Table M-14 (Continued)

								Proportion of Diet					
Constituent	MUF (mg/kg dw)	C_m (mg/kg dw)	HUF (mg/kg dw)	C_h (mg/kg dw)	FUF (mg/mg water)	Cf (mg/kg dw)	Terrestrial Inverts.	Aquatic Inverts.	Veg.	Sm Mammals	Herps	Fish
Aroclor 1254	NA	817.367	NA	817.367	13955.38	8.56E-06	0.277	0.193	0.412	0.045	0.053	0.019
Aroclor 1260	NA	805.9445	NA	805.9445	9399.232	5E-07	0.277	0.193	0.412	0. 045	0.053	0. 019
1,2,4-Trimethylbenzene	NA	96890.27	NA	96890.27	447.0118	4.735294	0.277	0.193	0.412	0. 045	0.053	0. 019
chloromethane	NA	83129.57	NA	83129.57	1.10199	2.020315	0.277	0.193	0.412	0. 045	0.053	0. 019
o-Xylene	NA	196936.2	NA	196936.2	112.8118	30.65539	0.277	0.193	0.412	0. 045	0.053	0. 019
p-Isopropyltoluene	NA	97359.33	NA	97359.33	866.3246	0.588245	0.277	0.193	0.412	0. 045	0.053	0. 019

Table M-14 (Continued)

Constituent	BW (kg)	IR (g/day)	FIR (g dw/g bw-day)	WI (L/day)	NWI (g/g day)	IRS (% of diet dw)	AUF	EEdiet (mg/kg bw-day)	EEsoil (mg/kg bw-day)	EEwater (mg/kg bw-day)	EEtotal (mg/kg bw-day)
Aroclor 1254	6.5	320.0978	0.049246	0.533651	0.0821	0.094	1	4.150556	1.16E-06	5.04E-11	4.150557
Aroclor 1260	6.5	320.0978	0.049246	0.533651	0.0821	0.094	1	4.092553	6.48E-07	4.37E-12	4.092553
1,2,4-Trimethylbenzene	6.5	320.0978	0.049246	0.533651	0.0821	0.094	1	492.0434	0.023146	0.00087	492.0674
chloromethane	6.5	320.0978	0.049246	0.533651	0.0821	0.094	1	420.9349	0.356441	0.150517	421.4419
o-Xylene	6.5	320.0978	0.049246	0.533651	0.0821	0.094	1	1000.299	0.162019	0.02231	1000.483
p-Isopropyltoluene	6.5	320.0978	0.049246	0.533651	0.0821	0.094	1	494.3908	0.01273	5.57E-05	494.4036

Table M-14 (Continued)

Constituent	TRV (mg/kg-day)	RQ	Source of TRV
Aroclor 1254	4.3	0.965246	TRV based on systemic effects in rats from ATSDR Toxicological Profile for PCBs November 2000
Aroclor 1260	4.1	0.998184	TRV based on systemic effects in rats from ATSDR Toxicological Profile for PCBs November 2000
1,2,4-Trimethylbenzene	500	0.984135	TRV based on mortality in rats from EPA Chemical Summary for 1,2,4-Trimethylbenzene August 1994
chloromethane	420	1.003433	TRV based on acute toxicity in rats from ATSDR Toxicological Profile for chloromethane December 1998
o-Xylene	1000	1.000483	TRV based on body weight impacts in rats from ATSDR Toxicological Profile for Xylenes August 2007
p-Isopropyltoluene	475	1.04085	TRV based on acute toxicity in rats from HSDB

Where:

dw = dry weight.

C_s = Soil conc. (mg/kg dw); becomes soil screening level

K_d= dissociation constant

K_{ow}= Octanol/water partitioning coefficient

C_w = Water concentration (ppm); calculated by soil concentration/ dissociation constant

Terrestrial IUF = Invertebrate uptake factor; log BCF = 0.819*log K_{ow} - 1.146 (from EPA's media to receptor BCFs and results in wet weight concentration)

Aquatic IUF = Invertebrate uptake factor; log BCF = 0.819*log K_{ow} - 1.146 (from EPA's media to receptor BCFs and results in wet weight concentration)

C_{TI} = Terrestrial Invertebrate concentration (mg/kg dw); (C_s * Terr. IUF)/0.25 [dividing by 0.25 converts to dry weight]

C_{AI} = Aquatic Invertebrate concentration (mg/kg dw); (C_w * Terr. IUF)/0.25 [dividing by 0.25 converts to dry weight]

VUF = Vegetation uptake factor; log BCF = 1.588 - 0.578*log K_{ow} (from EPA's media to receptor BCFs and results in dry weight concentration)

Cv = Conc. in vegetation (mg/kg dw). (=Cs * VUF)

MUF = Mammal uptake factor; no standard equation is available. Used deer mouse body burden from soils with the same contaminant concentration

C_m = Conc. In small mammals (mg/kg dw). (deer mouse EEtotal / mouse moisture content [68% from Sample et al 1998] referece below)

HUF = Herp uptake factor; no standard equation is available. Used deer mouse body burden from soils with the same contaminant concentration

C_h = Conc. In herps (mg/kg dw). (=concentration in small mammals)

FUF= Fish uptake factor; log BCF = 0.91*log K_{ow} - 1.975*(6.8E-07*K_{ow} + 1.0) - 0.786 (from EPA's media to receptor BCFs and results in dry weight concentration)

C_f = Conc. In fish (mg/kg dw). (=Cw * FUF)/0.25

Percent diet = data from EPA 1993, Wildlife Exposure Factors handbook

BW = Body weight (kg)

IR = Ingestion rate; calculated from EPA 1993: all mammals equation FI (g/day) = 0.235 Wt(g)^ 0.822

Table M-14 (Continued)

FIR = Food intake rate (g/g-day); IR / Body weight (g)

WI = Water intake rate (L/day), calculated from EPA 1993 all mammals equation: WI (L/day) = 0.099 * (Wt (kg))^ 0.90

NWI = Normalized water intake rate (g/g-day), = WI / Body weight (kg)

IR_S = Soil ingestion rate (% of diet; dry weight); from Beyer et al. raccoons consume about 9.4% of diet as soil

AUF = Area use factor, Assume 100% of time on site

EE_{diet} = Estimated exposure via diet (mg chem/kg bw-day). (=((CE * % Earthworm) + (CV * % Vegetation)) * FIR * AUF)

EE_{soil} = Estimated exposure via incidental soil ingestion (mg chem/kg bw-day). ('=Cs * FIR * IRS * AUF)

EE_{water} = Estimated exposure via water ingestion (mg chem/kg bw-day). ('=Cw * NWI * AUF)

EE_{total} = Estimated total exposure (mg chem/kg bw-day). (= EEdiet + EE total)

TRV = Toxicity reference value (mg chem/kg bw-day); N/A = TRV not available. Value for BaP used for BaA.

Table M-15
Samples used in assessment for exposure of ecological receptors to inorganic constituents in surface soils, from no more than 6ft in depth

	Concentration (mg/kg)										
	Antimony	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Chromium VI**	**Cobalt**	**Copper**	**Lead**	**Mercury**
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**	**10**
B-01-EE2000	3.8	1.8	83.2	0.24	ND	**510**	ND	**45.8**	193	**778**	1.93
B-01-ERM	ND	ND	ND	ND	ND	ND	ND	ND	**350**	120	ND
B-01-GR	5.2	**63.1**	104	0.8	0.7	**48.3**	ND	35.7	137	13.3	7.3
B-02-EE2000	0.38	**25.2**	463	1	0.77	**180**	ND	**48.4**	**2090**	60	0.017
B-02-ERM	ND	15	ND	ND	ND	ND	ND	ND	**260**	**370**	4.5
B-02-GR	10.3	**53.8**	97.6	0.7	1.5	**99.1**	ND	28.1	200	**326**	**10**
B-03-EE2000	ND	**29.3**	291	0.44	0.099	**452**	ND	30.2	**1060**	**208**	0.45
B-03-ERM	ND	10	ND	ND	ND	ND	ND	ND	**940**	**1800**	ND
B-03-GR	10.5	14.9	126	0.2	1.1	**23.5**	ND	5.4	80.5	102	3.2
B-04-EE2000	1.8	**34.6**	161	0.28	ND	**93.9**	ND	12.1	**352**	169	0.44
B-04-GR	9.1	**63.2**	161	0.5	1.4	**30.9**	ND	39.1	**397**	142	**14.4**
B-05-EE2000	0.21	**41.3**	267	0.23	ND	**242**	ND	18.8	**654**	**303**	0.33
B-05-GR	5.4	**69.8**	210	0.4	1.1	**89.4**	ND	31.2	220	**329**	8.6
B-06-EE2000	2.2	18.8	391	0.8	1.6	**191**	ND	**49.9**	**1760**	**529**	0.13
B-06-GR	10.1	**56.8**	289	0.5	2.3	**44.6**	ND	32.4	188	**936**	**18.9**
CCSB-01	ND	ND	ND	ND	0.85	**420**	ND	ND	ND	5.3	ND
CCSB-02	ND	ND	ND	ND	2.2	**100**	ND	ND	ND	**310**	ND
CCSB-04	ND	4.9	ND	ND	0.82	**29**	ND	15	19	29	0.099
CCSB-05	ND	6.4	ND	ND	2	**1000**	1.1	34	**480**	**300**	1.1
CCSS-06	ND	4	ND	ND	1.8	**80**	ND	17	160	**290**	0.7
CCSS-07	ND	17	ND	ND	1.1	**210**	4.6	11	**390**	**420**	0.49
CCTP-01	ND	13	ND	ND	0.38	**600**	ND	20	**800**	**550**	ND
CPSB-01	ND	ND	ND	ND	ND	**8**	ND	ND	ND	**220**	ND

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg)										
	Antimony	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Chromium VI**	**Cobalt**	**Copper**	**Lead**	**Mercury**
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**	**10**
CPSB-02	ND	ND	ND	ND	0.12	**84**	ND	ND	ND	32	ND
CPSB-03	ND	**28**	120	0.15	0.95	**39**	ND	**51**	200	**400**	**13**
CPSB-04A	ND	11	ND	ND	0.1	**120**	ND	21	**260**	87	0.24
CPSB-04B	ND	4.8	ND	ND	0.97	**73**	ND	13	73	37	0.26
G-04-EE2000	4.2	6	191	0.27	1.8	**144**	ND	15	**1600**	**478**	**13.4**
G-05-EE2000	6.4	10.5	382	0.85	0.82	**149**	ND	29.2	**1410**	**349**	0.38
G-06-EE2000	1	7.1	93.2	0.13	ND	**36.5**	ND	7.7	**529**	83	0.314
G-07-EE2000	11.5	**38.2**	435	0.75	0.29	**286**	ND	39.5	**2100**	**277**	0.39
G-08-EE2000	6.7	**24.6**	435	0.81	0.95	**244**	ND	34.9	**3470**	**295**	5.3
G-09-EE2000	14.5	**107**	674	0.73	0.74	**383**	ND	**46.4**	**2410**	**380**	0.22
G-10-EE2000	7.6	**21.1**	350	0.92	ND	**138**	ND	36.7	**2680**	120	0.23
G-11-EE2000	8.3	ND	278	0.31	0.86	**590**	ND	28.9	**6670**	**391**	0.76
G-12-EE2000	9.3	**24.1**	365	0.65	ND	**470**	ND	33.9	**2050**	**237**	0.61
G-13-EE2000	7.1	19	341	0.71	0.73	**237**	ND	28.6	**1290**	112	0.28
G-15-EE2000	0.8	**54.5**	317	0.026	ND	**103**	ND	19.9	**930**	151	0.131
G-17-EE2000	1.7	**44**	415	0.22	ND	**199**	ND	22.1	**811**	179	0.0533
G-18-EE2000	2.5	6.1	77.8	0.25	ND	**204**	ND	15	**282**	65.5	0.0914
G-19-EE2000	1.7	2.2	28.9	0.14	ND	**29.9**	ND	3.5	224	145	0.218
G-20-EE2000	1.4	3.9	117	0.25	ND	**126**	ND	12	**791**	69.1	0.638
G-22-EE2000	1.3	ND	127	0.28	ND	**25.2**	ND	**271**	71	10	0.0482
G-23-EE2000	2.3	ND	168	0.32	1.8	**119**	ND	19.5	175	**401**	1
G-24-EE2000	2.9	3.4	158	0.45	1.9	**106**	ND	16.4	171	**205**	0.73
G-25-EE2000	2.3	2	94.4	0.21	1.2	**49.6**	ND	36.1	142	191	0.152
G-26-EE2000	3.1	ND	147	0.32	0.36	**111**	ND	19	163	129	0.24
G-27-EE2000	1.2	ND	49.3	0.2	ND	**14.2**	ND	6.1	76	61.2	0.061
G-28-EE2000	2.3	3.3	122	0.42	0.24	**94.8**	ND	12.8	46.5	84.3	0.37
G-29-EE2000	1.8	ND	98.6	0.31	0.086	**42.2**	ND	9.1	88.4	**438**	0.75
G-30-EE2000	6.7	11.4	231	0.26	1.9	**347**	ND	29.6	**394**	**816**	2.7
G-31-EE2000	4.4	2	120	0.32	ND	**273**	ND	**40**	**328**	**217**	0.38
G-32-EE2000	5.1	10	367	0.61	ND	**521**	ND	28.4	**588**	**778**	2.3

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg)										
	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium VI	Cobalt	Copper	Lead	Mercury
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**	**10**
G-33-EE2000	10.6	3.2	**1210**	0.24	0.54	**261**	ND	29.5	**909**	**1400**	1.3
G-33-EE2004	6.1	5.5	187	0.6	2.4	**59.8**	ND	12.7	213	**210**	1.3
G-34-EE2000	**23.9**	**28.6**	227	0.35	0.46	**625**	ND	34	**530**	**615**	9.7
G-34-EE2004	10.8	7.6	200	0.16	4.3	**152**	ND	21.4	**326**	**1510**	6.3
G-35-EE2000	6	**57.4**	686	0.54	1.6	**327**	ND	24.5	**1890**	**1320**	**86.8**
G-35-EE2004	4.8	4.8	70.2	0.49	1.2	**35.7**	ND	12.9	90.9	100	1.1
G-36-EE2000	10.2	**29.7**	413	1	1.1	**345**	ND	**40.7**	**3580**	**532**	0.73
G-36-EE2004	**21.2**	18	322	0.31	6.2	**98.2**	ND	27.9	**344**	**4810**	5.5
G-37-EE2000	0.99	ND	66.7	0.18	ND	**18.1**	ND	12	19.9	10.2	0.046
G-37-EE2004	3.9	3.2	217	0.33	1.3	**50.2**	ND	9.8	138	61	0.11
G-38-EE2000	**29.8**	16	195	0.57	1.2	**238**	ND	33.7	**1000**	**1230**	0.59
G-38-EE2004	9.9	**21.3**	89	0.23	2.9	**41.8**	ND	18.8	**438**	**246**	0.75
G-39-EE2000	10.9	**53.1**	419	0.48	5.4	**202**	ND	21.6	**2630**	**1050**	1.7
G-39-EE2004	2.7	4.2	86.4	0.25	1	**72.9**	ND	11	**393**	149	0.35
G-40-EE2000	4.1	8.6	117	0.23	0.64	**71.8**	ND	29	**599**	**1180**	2.4
G-40-EE2004	6.8	9.3	76.1	0.99	2.7	**75.5**	ND	16	116	89.8	0.13
G-41-EE2000	3.8	ND	40.6	0.42	ND	**253**	ND	**112**	32.5	5.8	0.064
G-43-EE2000	ND	5.1	50.4	1	ND	**40.2**	ND	22.4	50	40	0.115
G-44-EE2000	7.7	ND	73	0.24	ND	**481**	ND	**49.8**	102	**317**	0.322
G-45-EE2000	2	ND	171	0.44	ND	**467**	ND	**49**	51.3	92.5	0.136
G-46-EE2000	3	6.1	129	0.32	ND	**266**	ND	**112**	**382**	**281**	0.417
G-47-EE2000	3.8	**448**	150	0.42	0.91	**139**	ND	20.8	**282**	**231**	1
G-48-EE2000	2.5	**461**	133	0.58	0.36	**252**	ND	32	**236**	191	0.55
G-49-EE2000	ND	3.9	26.1	0.25	ND	**36.4**	ND	5.5	11	43.1	0.072
GW-01	2.6	11.2	83.8	0.2	ND	**5**	ND	4.3	44.9	48.2	1.5
GW-03	18.5	**53.7**	387	0.3	1.8	**16.6**	ND	4.8	39.7	124	2.1
GW-04	7.2	**29.6**	107	0.2	0.8	**55.4**	ND	7.3	**323**	129	9.2
P1SB-02	ND	ND	ND	ND	0.65	**41**	ND	ND	ND	83	ND
P1SB-03	ND	ND	ND	ND	1.9	**88**	ND	ND	ND	**890**	ND
P1SB-04	ND	4	47	0.082	1.2	**900**	ND	**52**	190	**200**	1.8
P2SB-01	ND	ND	ND	ND	1.9	**85**	ND	ND	ND	**2800**	ND

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg)										
	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium VI	Cobalt	Copper	Lead	Mercury
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**	**10**
P2SB-03	10	14	61	0.18	3.3	**56**	ND	15	**2100**	**260**	0.1
P2SB-05	ND	ND	ND	ND	0.13	**480**	ND	ND	ND	7.7	ND
P2SB-06	2.2	4.5	630	0.29	2.6	**270**	ND	27	**1600**	**1600**	0.34
P2SB-07	ND	ND	ND	ND	0.086	**22**	ND	ND	ND	110	ND
P2SB-08	ND	ND	ND	ND	0.9	**68**	ND	ND	ND	**330**	ND
P2SB-09	ND	ND	ND	ND	2.7	**120**	ND	ND	ND	**9600**	ND
P2SB-10	ND	7	ND	ND	1.7	**57**	ND	16	140	130	0.15
P3SB-01	ND	2.8	18	0.15	0.29	**63**	ND	6.5	5.8	9.9	0.0058
P3SB-02	ND	3.9	98	0.24	0.22	**300**	ND	28	79	45	0.099
P4SB-01	ND	0.18	460	0.1	0.31	**110**	ND	26	100	15	0.19
P4SB-03	ND	ND	ND	ND	0.084	**120**	ND	ND	ND	8.2	ND
P4SB-04	ND	7.6	110	0.16	0.041	**27**	ND	5.2	160	120	0.17
P4SB-05	ND	1.9	140	0.22	0.073	**330**	ND	39	55	9.3	0.035
P4SB-06	ND	3.9	92	0.27	0.64	**51**	ND	9.8	180	120	0.2
P4SB-07	ND	4.3	63	0.18	1.2	**680**	ND	**56**	30	6.4	0.065
P4SB-08	ND	ND	71	0.19	0.2	**91**	ND	29	79	1	ND
P4SB-10	ND	ND	ND	ND	0.83	**920**	ND	ND	ND	0.72	ND
P4SB-11	ND	ND	ND	ND	ND	**92**	ND	ND	ND	0.22	ND
P4SB-12	ND	**33**	ND	ND	5.8	**51**	ND	33	**2500**	**300**	0.7
P4SB-13	ND	ND	ND	ND	0.62	**83**	ND	20	49	0.8	0.013
P4SB-14	ND	3.8	ND	ND	0.91	**34**	ND	9.8	40	16	0.054
P4SB-15	ND	1.5	ND	ND	0.87	**89**	ND	16	57	16	0.052
P4SB-16	ND	3.8	ND	ND	0.56	**27**	ND	8.6	40	17	0.042
P4TP-AEW-01S	1.4	8.1	140	0.34	0.37	**190**	ND	18	**240**	140	0.31
P4TP-AEW-02B	ND	7.7	61	0.43	0.14	**25**	ND	10	75	56	0.13
P4TP-AEW-03S	3.2	11	370	0.3	2.6	**61**	ND	14	**390**	**450**	ND
P4TP-AEW-04B	3.5	13	130	0.32	2.2	**41**	ND	10	**310**	**410**	0.71
P5SB-01	ND	2.3	87	0.05	0.16	**130**	ND	21	71	17	0.092
P5SB-02	ND	4.1	94	0.31	0.41	**44**	ND	11	29	55	0.12
P5SB-03	0.11	1.2	96	0.21	0.21	**130**	ND	27	82	9.8	0.23
P5SB-04	ND	ND	ND	ND	0.15	**52**	ND	ND	ND	15	ND

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg)										
	Antimony	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Chromium VI**	**Cobalt**	**Copper**	**Lead**	**Mercury**
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**	**10**
P5SB-05	ND	0.42	52	0.18	0.096	**250**	ND	37	53	0.13	ND
P5SS-06	ND	ND	ND	ND	0.44	**330**	ND	19	16	0.69	0.016
P5SS-07	ND	3.1	ND	ND	0.085	**36**	ND	16	60	8.5	0.09
P5SS-08	ND	1.6	ND	ND	ND	**95**	ND	39	130	8.7	ND
P6SB-01	**38**	**29**	86	0.31	ND	**24**	ND	**41**	**360**	**640**	**19**
P6SB-02	ND	3.3	94	0.25	0.43	**81**	ND	11	44	180	0.18
P6SB-03	1.3	ND	36	0.21	0.19	**88**	ND	29	74	6.2	0.16
P6SB-05	ND	ND	ND	ND	0.36	**93**	ND	ND	ND	3.7	ND
P6SB-06	ND	ND	ND	ND	ND	**83**	ND	ND	ND	ND	ND
P6SB-07	ND	ND	ND	ND	ND	**240**	ND	ND	ND	12	ND
P6SB-08	ND	0.17	25	0.15	ND	**120**	ND	25	69	0.39	0.15
P6SS-11	ND	ND	ND	ND	0.085	**92**	ND	ND	ND	13	ND
P7SB-01	ND	ND	ND	ND	ND	**720**	ND	ND	ND	0.083	ND
P7SB-02	0.15	0.94	280	0.68	0.081	**18**	ND	28	38	0.45	ND
P8SB-01	ND	ND	ND	ND	0.17	**110**	ND	ND	ND	0.36	ND
P8SB-02	ND	18	ND	ND	0.29	**200**	ND	23	**400**	**1700**	2.4
P9SB-01	ND	ND	120	0.21	0.025	**110**	ND	33	150	1.2	0.058
P9SB-04	ND	1.1	480	0.09	ND	**130**	ND	24	98	32	0.025
P9SB-05	ND	10	590	0.27	2.6	**74**	ND	15	**1200**	**2800**	7.6
P9SB-06	ND	3.3	44	0.21	0.15	**38**	ND	4.2	15	50	0.017
P9SB-07	ND	2.6	ND	ND	1.1	**250**	ND	25	130	120	0.2
P9SB-08	ND	4	ND	ND	1.1	**86**	ND	14	91	120	0.25
P9SB-09A	ND	6.2	ND	ND	1.4	**320**	ND	32	140	140	0.38
P9SB-09B	ND	5.3	ND	ND	1.1	**150**	ND	22	180	**290**	2.6
P9SB-10	ND	3.3	ND	ND	0.69	**190**	ND	21	41	13	0.081
SB-01-TT	ND	ND	230	ND	0.54	**140**	ND	16	**660**	**250**	1.5
SB-02-TT	ND	ND	57	ND	ND	**19**	ND	8.4	59	84	0.49
SB-03-TT	ND	ND	ND	ND	ND	**580**	ND	**67**	8.4	3.8	ND
SB-04-TT	ND	ND	ND	ND	ND	**1200**	ND	**72**	10	3.9	ND
SB-05-TT	3.2	ND	43	ND	ND	**540**	ND	**41**	15	38	ND
SB-06-TT	4.5	3.8	150	ND	ND	**380**	ND	**46**	**660**	55	0.094

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg)										
	Antimony	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Chromium VI**	**Cobalt**	**Copper**	**Lead**	**Mercury**
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**	**10**
SB-07-TT	**27**	3.1	380	ND	0.69	**170**	ND	25	220	**330**	0.43
SB-08-TT	ND	ND	640	0.64	ND	**73**	ND	20	64	20	ND
SB-09-TT	2.5	2.8	600	ND	2.4	**200**	ND	26	**270**	**2300**	0.96
SB-10-TT	ND	3.4	520	ND	ND	**77**	ND	33	69	11	ND
SB-11-TT	ND	ND	230	ND	0.53	**340**	ND	33	60	**2200**	0.64
SB-12-TT	ND	ND	19	ND	ND	**610**	ND	**49**	40	81	0.086
SB-13-TT	ND	ND	7.9	ND	ND	**890**	ND	**72**	15	55	ND
SB-14-TT	ND	ND	ND	ND	ND	**1100**	ND	**80**	20	6.1	ND
SPSB-01	ND	ND	ND	ND	0.44	**33**	ND	ND	ND	15	ND
SPSB-02	ND	ND	ND	ND	0.32	**86**	ND	ND	ND	140	ND
SPSB-03	ND	ND	ND	ND	0.62	**460**	ND	ND	ND	50	ND
SPSB-04	ND	9.7	83	0.26	0.41	**90**	ND	25	140	110	2.2
SPSB-05	2.3	9.5	110	0.24	0.24	**23**	ND	11	100	120	3.6
SPSS-05	ND	ND	ND	ND	ND	**220**	ND	30	92	14	ND
SPSS-06	ND	ND	ND	ND	0.63	**130**	ND	ND	ND	**430**	ND
SPSS-07	ND	3.6	ND	ND	0.19	**79**	ND	13	**280**	140	1.8
SPSS-08	ND	7.1	ND	ND	1.1	**140**	ND	14	**300**	120	4.8
SPTP-01	ND	4.1	210	0.15	0.97	**34**	ND	3.7	100	**580**	0.43
SPTP-02	2.8	7.8	220	0.28	1.4	**44**	ND	5.6	220	**200**	1.3
SPTP-03	18	7.2	220	0.091	0.73	**22**	ND	3.1	120	**290**	0.21
SPTP-04	ND	12	65	0.15	0.46	**84**	ND	9.7	**350**	170	3.3
SPTP-06	ND	4.1	75	0.13	1	**26**	ND	2.1	76	120	0.55
TGU-16	7.9	16	220	0.24	1.6	**42**	ND	4.8	**290**	**280**	0.74
TGU-18	7.8	9.7	130	0.19	2.1	**150**	ND	17	**470**	**270**	**18**
TGU-23	1.2	**27**	170	0.14	0.79	**110**	ND	20	210	170	2.2
TGU-24	5.7	7.5	230	0.16	1.1	**78**	ND	6.9	**660**	**250**	**11**
TP-01	ND	ND	150	ND	ND	**18**	ND	7.2	18	7.6	0.13
TP-02	ND	3.4	170	ND	ND	**27**	ND	11	24	26	0.22
TP-03	ND	4.4	99	ND	ND	**31**	ND	7.4	120	94	0.57
TP-04	ND	4	120	ND	ND	**46**	ND	6.7	140	90	0.15
TP-05	7.6	**20**	81	ND	1.8	**180**	ND	5.6	**2700**	**850**	**17**

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg)										
	Antimony	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Chromium VI**	**Cobalt**	**Copper**	**Lead**	**Mercury**
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**	**10**
TP-06	6.8	8.2	94	ND	ND	**140**	ND	7.6	**570**	**260**	2.8
TP-07	16	19	330	ND	ND	**200**	ND	30	**1200**	**210**	0.15
TP-08	7.3	10	150	ND	ND	**95**	ND	14	**780**	**260**	1.5
TP-09	8.8	14	150	ND	1	**170**	ND	11	**820**	**480**	2.4
TP-10	ND	4.4	160	ND	1.6	**140**	ND	5.1	46	13	0.48
TP-11	ND	6.8	65	ND	ND	**62**	ND	8	**370**	170	2.4
TP-12	ND	3.2	84	ND	ND	**36**	ND	13	37	72	0.31

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg						
	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**40**	**150**	**10**	**20**	**1.0**	**200**	**600**
B-01-EE2000	ND	**757**	**20.9**	ND	ND	32.2	**810**
B-01-ERM	ND	**500**	ND	ND	ND	ND	ND
B-01-GR	2.4	57.3	**21.8**	1.3	**96.6**	98.8	111
B-02-EE2000	ND	86.8	**42.8**	0.45	ND	77.2	**1270**
B-02-ERM	ND	130	ND	ND	ND	ND	ND
B-02-GR	3.5	109	**31.5**	2.5	**70.5**	76.6	224
B-03-EE2000	ND	**273**	**23.7**	0.32	ND	32.2	**869**
B-03-ERM	ND	110	ND	ND	ND	ND	**1200**
B-03-GR	1.9	28	7.5	1.1	**18.8**	17.2	**664**
B-04-EE2000	ND	**184**	7.2	ND	ND	34.7	438
B-04-GR	6.7	112	**73.6**	2.9	**221**	46.5	585
B-05-EE2000	ND	109	**19.4**	0.35	ND	7.6	377
B-05-GR	3.7	115	**43**	1.2	**83.7**	67.2	**1020**
B-06-EE2000	ND	107	**36.5**	0.75	ND	73.1	**2300**
B-06-GR	5.6	80.9	**103**	1.9	**203**	56.8	**853**
CCSB-01	ND	**1100**	ND	ND	ND	ND	65
CCSB-02	ND	90	ND	ND	ND	ND	**610**
CCSB-04	ND	42	ND	ND	ND	ND	71
CCSB-05	ND	**1200**	ND	ND	ND	ND	**1000**
CCSS-06	ND	**220**	ND	ND	ND	ND	430
CCSS-07	ND	130	ND	ND	ND	ND	**660**
CCTP-01	ND	**240**	ND	ND	ND	36	**1000**
CPSB-01	ND	8.7	ND	ND	ND	ND	10
CPSB-02	ND	50	ND	ND	ND	ND	75
CPSB-03	1.7	75	ND	ND	ND	72	96
CPSB-04A	ND	130	ND	ND	ND	ND	230
CPSB-04B	ND	94	ND	ND	ND	ND	120
G-04-EE2000	ND	97.7	**38.1**	ND	ND	30.9	**1350**
G-05-EE2000	ND	87.6	**65.9**	ND	ND	80.3	**1500**
G-06-EE2000	ND	24.1	5.1	ND	ND	7.3	274

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg						
	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**40**	**150**	**10**	**20**	**1.0**	**200**	**600**
G-07-EE2000	ND	**238**	**58.5**	ND	ND	54.3	**1250**
G-08-EE2000	ND	**153**	**54.2**	1.3	ND	73.2	**1880**
G-09-EE2000	ND	**164**	**74.1**	ND	ND	32.1	**2000**
G-10-EE2000	ND	71.2	**54.2**	ND	ND	67.3	**1240**
G-11-EE2000	ND	**378**	**112**	ND	ND	68	**2960**
G-12-EE2000	ND	**324**	**51.1**	ND	ND	45.8	**1340**
G-13-EE2000	ND	130	**26.1**	ND	ND	70	**625**
G-15-EE2000	ND	30.8	**12.5**	0.56	ND	2.7	470
G-17-EE2000	ND	89.6	**15.7**	0.47	ND	1	536
G-18-EE2000	ND	**309**	6.8	ND	ND	19.4	241
G-19-EE2000	ND	9.7	ND	0.28	ND	9.5	506
G-20-EE2000	ND	58.3	5.6	ND	ND	19.3	445
G-22-EE2000	ND	37.4	8.6	**59.2**	ND	20	86
G-23-EE2000	ND	**270**	**39.9**	ND	ND	49.8	**942**
G-24-EE2000	ND	**150**	**16.7**	ND	ND	41.5	401
G-25-EE2000	ND	79.1	6.4	5.6	ND	25.1	**600**
G-26-EE2000	ND	**187**	**15.9**	ND	ND	25.4	265
G-27-EE2000	ND	21.3	6.1	ND	ND	29.7	58.3
G-28-EE2000	ND	137	**10.4**	ND	ND	35.6	151
G-29-EE2000	ND	49.2	9.9	ND	ND	24.6	101
G-30-EE2000	ND	**467**	**43.2**	ND	ND	28.3	**1320**
G-31-EE2000	ND	**447**	**32.5**	4	ND	34.4	213
G-32-EE2000	ND	**369**	**68.8**	0.85	ND	46.5	**949**
G-33-EE2000	ND	**200**	**117**	1.3	ND	47	**1660**
G-33-EE2004	ND	68	ND	0.07	**3.2**	53.7	302
G-34-EE2000	ND	**498**	**62.7**	1.1	ND	39.9	**1900**
G-34-EE2004	ND	**252**	ND	ND	**3.8**	41	**1110**
G-35-EE2000	ND	**253**	**33.1**	ND	ND	49.5	**2370**
G-35-EE2004	ND	39.2	ND	ND	**2.6**	43.4	135
G-36-EE2000	ND	**397**	**90.9**	ND	ND	**388**	**2260**
G-36-EE2004	ND	**170**	ND	ND	**6.3**	43.6	**633**

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg						
	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**40**	**150**	**10**	**20**	**1.0**	**200**	**600**
G-37-EE2000	ND	25.4	**10.3**	ND	ND	15.6	37.1
G-37-EE2004	ND	39.6	ND	ND	**2.5**	62.9	115
G-38-EE2000	ND	**382**	**75.5**	1.4	ND	52.2	**901**
G-38-EE2004	ND	**177**	ND	ND	**3.8**	52.8	295
G-39-EE2000	ND	**194**	**39**	0.6	ND	66.2	**2680**
G-39-EE2004	ND	60.1	ND	ND	**2.2**	40.3	156
G-40-EE2000	ND	**158**	**47.8**	**72.1**	ND	60.1	596
G-40-EE2004	ND	55.7	ND	0.16	**2.9**	55.7	131
G-41-EE2000	ND	**735**	**35.5**	9.1	ND	31.8	52.3
G-43-EE2000	ND	52.8	**13.3**	0.82	ND	42.1	114
G-44-EE2000	ND	**977**	9.6	0.46	ND	30.4	247
G-45-EE2000	ND	**881**	**14**	3.9	ND	32.8	82.8
G-46-EE2000	ND	**592**	**14.6**	ND	ND	31.5	324
G-47-EE2000	ND	**191**	**27.9**	ND	ND	39.9	571
G-48-EE2000	ND	**401**	**32.2**	ND	ND	44.4	391
G-49-EE2000	ND	23.4	5.9	ND	ND	27.7	39.6
GW-01	1.1	19.6	9	0.5	**14.1**	6.5	292
GW-03	1.3	21.3	**10.1**	0.5	**20.2**	12.7	**700**
GW-04	2.5	37	**13**	0.9	**28.4**	20	477
P1SB-02	ND	38	ND	ND	ND	ND	130
P1SB-03	ND	110	ND	ND	ND	ND	440
P1SB-04	ND	**1200**	ND	ND	ND	29	420
P2SB-01	ND	140	ND	ND	ND	ND	**710**
P2SB-03	1.1	50	ND	0.65	ND	50	**1400**
P2SB-05	ND	**1100**	ND	ND	ND	ND	35
P2SB-06	2.1	**380**	ND	0.42	ND	58	**1400**
P2SB-07	ND	38	ND	ND	ND	ND	97
P2SB-08	ND	110	ND	ND	ND	ND	360
P2SB-09	ND	**380**	ND	ND	ND	ND	**1300**
P2SB-10	ND	82	ND	ND	ND	ND	240
P3SB-01	0.38	60	ND	0.12	ND	36	23

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg						
	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**40**	**150**	**10**	**20**	**1.0**	**200**	**600**
P3SB-02	0.25	**340**	ND	ND	ND	55	100
P4SB-01	ND	**160**	ND	0.16	ND	50	150
P4SB-03	ND	**200**	ND	ND	ND	ND	52
P4SB-04	0.59	43	ND	0.11	0.28	11	69
P4SB-05	0.15	**590**	ND	ND	ND	50	51
P4SB-06	0.39	44	ND	ND	ND	45	270
P4SB-07	0.17	**1200**	2.5	ND	ND	38	190
P4SB-08	0.28	46	ND	0.35	ND	160	47
P4SB-10	ND	**1400**	ND	ND	ND	ND	10
P4SB-11	ND	41	ND	ND	ND	ND	32
P4SB-12	ND	93	ND	ND	ND	ND	**620**
P4SB-13	ND	44	ND	ND	ND	ND	34
P4SB-14	ND	41	ND	ND	ND	ND	64
P4SB-15	ND	59	ND	ND	ND	ND	86
P4SB-16	ND	46	ND	ND	ND	ND	76
P4TP-AEW-01S	ND	**210**	0.17	0.78	ND	31	200
P4TP-AEW-02B	ND	36	0.7	ND	ND	28	200
P4TP-AEW-03S	ND	78	1.1	ND	ND	45	**1100**
P4TP-AEW-04B	ND	56	1.8	ND	ND	35	**1100**
P5SB-01	0.25	96	ND	0.21	ND	67	64
P5SB-02	1.6	41	ND	ND	ND	44	48
P5SB-03	0.27	75	0.076	ND	ND	100	70
P5SB-04	ND	41	ND	ND	ND	ND	35
P5SB-05	0.11	140	ND	ND	ND	93	55
P5SS-06	ND	**180**	ND	ND	ND	ND	47
P5SS-07	ND	52	ND	ND	ND	ND	80
P5SS-08	ND	59	ND	ND	ND	ND	57
P6SB-01	2.5	64	ND	6.3	ND	40	**710**
P6SB-02	1.1	110	ND	3.4	0.94	37	200
P6SB-03	0.66	46	ND	ND	ND	120	55
P6SB-05	ND	46	ND	ND	ND	ND	140

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg						
	Molybdenum	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
Screening Levels	**40**	**150**	**10**	**20**	**1.0**	**200**	**600**
P6SB-06	ND	40	ND	ND	ND	ND	56
P6SB-07	ND	**330**	ND	ND	ND	ND	67
P6SB-08	0.17	77	ND	ND	ND	120	54
P6SS-11	ND	60	ND	ND	ND	ND	90
P7SB-01	ND	**2100**	ND	ND	ND	ND	26
P7SB-02	0.21	140	ND	ND	0.056	180	76
P8SB-01	ND	65	ND	ND	ND	ND	52
P8SB-02	ND	**260**	ND	ND	ND	ND	350
P9SB-01	0.15	92	ND	ND	ND	150	230
P9SB-04	0.19	120	ND	ND	ND	77	120
P9SB-05	1	**160**	ND	ND	ND	130	**1900**
P9SB-06	0.44	28	ND	ND	ND	22	38
P9SB-07	ND	**380**	ND	ND	ND	ND	170
P9SB-08	ND	130	ND	ND	ND	ND	170
P9SB-09A	ND	**620**	ND	ND	ND	ND	350
P9SB-09B	ND	**260**	ND	ND	ND	ND	170
P9SB-10	ND	**210**	ND	ND	ND	ND	50
SB-01-TT	ND	**280**	ND	ND	ND	27	270
SB-02-TT	ND	30	ND	ND	ND	24	81
SB-03-TT	ND	**1300**	ND	ND	ND	**710**	27
SB-04-TT	ND	**1600**	ND	ND	ND	29	30
SB-05-TT	ND	**850**	ND	ND	ND	30	67
SB-06-TT	ND	**620**	ND	ND	ND	61	490
SB-07-TT	ND	**320**	ND	ND	ND	46	310
SB-08-TT	ND	110	ND	ND	ND	55	110
SB-09-TT	ND	**480**	ND	ND	ND	48	**850**
SB-10-TT	ND	**150**	ND	ND	ND	37	70
SB-11-TT	ND	**590**	ND	ND	ND	33	500
SB-12-TT	ND	**1100**	ND	ND	ND	28	78
SB-13-TT	ND	**1600**	ND	ND	ND	22	35
SB-14-TT	ND	**1800**	ND	ND	ND	37	33

Table M-15 Surface Soil Inorganic Constituents (Continued)

	Concentration (mg/kg						
	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**40**	**150**	**10**	**20**	**1.0**	**200**	**600**
SPSB-01	ND	25	ND	0.069	ND	ND	83
SPSB-02	ND	110	ND	ND	ND	ND	180
SPSB-03	ND	**610**	ND	ND	ND	ND	45
SPSB-04	0.69	81	6.7	ND	ND	100	210
SPSB-05	1.2	34	0.16	ND	0.03	22	100
SPSS-05	ND	**350**	ND	ND	ND	ND	53
SPSS-06	ND	26	ND	ND	ND	ND	**1100**
SPSS-07	ND	59	ND	ND	ND	ND	240
SPSS-08	ND	100	ND	ND	ND	ND	380
SPTP-01	0.98	20	ND	0.41	ND	27	410
SPTP-02	3.5	27	ND	5.4	ND	29	350
SPTP-03	0.23	18	ND	0.48	ND	34	360
SPTP-04	2.5	37	3.4	0.55	ND	50	**710**
SPTP-06	0.59	9.1	ND	1.2	0.6	10	**1700**
TGU-16	1.1	34	ND	1	ND	27	300
TGU-18	3.8	100	ND	0.26	ND	53	**1100**
TGU-23	0.53	130	ND	ND	ND	42	270
TGU-24	2.8	36	0.46	0.58	ND	25	**850**
TP-01	ND	28	ND	1	ND	26	43
TP-02	ND	49	ND	1.2	ND	31	58
TP-03	ND	47	ND	ND	ND	14	230
TP-04	ND	30	ND	ND	ND	16	220
TP-05	ND	41	ND	ND	ND	12	**1400**
TP-06	ND	50	ND	ND	ND	18	**980**
TP-07	ND	**170**	ND	ND	ND	85	550
TP-08	ND	44	ND	ND	ND	38	**760**
TP-09	ND	83	ND	ND	ND	29	**770**
TP-10	ND	65	ND	ND	ND	68	100
TP-11	ND	52	ND	ND	ND	22	260
TP-12	ND	64	ND	ND	ND	24	73

Table M-16
Samples used in assessment for exposure of ecological receptors to PAH's in surface soils, from no more than 6ft in depth

	Concentration (mg/kg)									
	2-Methyl-naphthalene	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (g,h,i) perylene	Benzo (k) fluoranthene	Chrysene
Screening Levels	**1.0**	**20**	**682**	**40**	**40**	**40**	**40**	**40**	**40**	**40**
CCSB-01	ND	ND	ND	ND	ND	ND	0.0011	0.001	ND	ND
CCSB-02	ND	ND	ND	0.065	0.18	0.18	0.29	0.11	ND	0.36
CCSB-03	ND	0.016	0.0079	0.022	0.044	0.046	0.059	0.023	0.02	0.053
CCSB-04	ND	ND	ND	ND	ND	0.0011	0.0018	0.0015	ND	0.0015
CCSB-05	ND	0.033	0.039	0.1	0.35	0.42	0.58	0.29	0.17	0.38
CCSS-06	ND	ND	ND	0.063	0.31	0.45	0.58	0.4	0.18	0.38
CCSS-07	ND	0.037	0.063	0.072	0.36	0.42	0.55	0.27	0.17	0.39
CPSB-01	ND	ND	ND	0.033	0.11	0.09	0.17	0.026	0.032	0.21
CPSB-02	ND	0.0024	0.029	0.027	0.15	0.17	0.21	0.081	0.067	0.19
CPSB-03	ND	0.0088	0.021	0.039	0.14	0.13	0.17	0.12	0.053	0.17
CPSB-04A	ND	0.027	0.021	0.065	0.17	0.23	0.27	0.19	0.082	0.2
CPSB-04B	ND	ND	ND	0.0086	0.02	0.02	0.04	0.018	0.0084	0.038
P1SB-02	ND	ND	0.0078	ND	0.017	0.025	0.028	0.026	0.011	0.031
P1SB-03	ND	ND	0.073	0.042	0.19	0.24	0.29	0.12	0.11	0.23
P1SB-04	ND	0.045	ND	0.026	0.063	0.077	0.092	0.051	0.032	0.073
P2SB-01	ND	0.15	0.13	0.64	3.2	3.7	5.2	1.9	1.8	3.4
P2SB-03	ND	ND	0.0012	0.0016	0.0068	0.0062	0.011	0.0039	ND	0.014
P2SB-05	ND	ND	0.025	0.02	0.026	0.035	0.051	0.056	0.012	0.051
P2SB-06	ND	0.01	0.028	0.045	0.17	0.29	0.29	0.16	0.085	0.17
P2SB-07	ND	0.003	0.011	0.018	0.064	0.051	0.076	0.032	0.02	0.091
P2SB-08	ND	ND	ND	0.064	0.24	0.24	0.39	0.17	0.12	0.37
P2SB-09	ND	0.1	0.07	0.37	1.1	0.97	1.3	0.54	0.43	1.1

Table M-16 Surface Soil PAH's (Continued)

Screening Levels	Concentration (mg/kg)									
	2-Methyl-naphthalene	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (g,h,i) perylene	Benzo (k) fluoranthene	Chrysene
	1.0	20	682	40	40	40	40	40	40	40
P2SB-10	ND	ND	ND	ND	0.31	0.43	0.48	0.44	ND	0.61
P3SB-01	ND	ND	ND	ND	0.0014	0.0027	0.0028	0.0015	ND	0.0029
P3SB-02	ND	ND	ND	0.013	0.017	0.021	0.028	0.012	0.0091	0.027
P4SB-01	ND	0.013	0.01	0.045	0.13	0.16	0.22	0.1	0.069	0.14
P4SB-03	ND	ND	ND	ND	0.0013	ND	0.0031	0.0013	ND	0.0027
P4SB-04	ND	1.2	0.43	3.1	6.6	5.6	6.3	2.7	2.5	6.5
P4SB-05	ND	ND	0.0017	0.0036	0.019	0.019	0.022	0.01	0.0081	0.019
P4SB-06	ND	0.12	ND	0.18	3.1	5.1	8	4.5	2.5	3.8
P4SB-07	ND	ND	ND	0.0025	0.0012	ND	0.0052	0.0039	ND	0.0058
P4SB-08	ND	ND	ND	ND	ND	ND	0.02	ND	ND	0.026
P4SB-09	ND	ND	ND	ND	0.0066	0.011	0.018	0.0094	ND	0.03
P4SB-12	ND	ND	0.094	0.13	0.42	0.46	0.63	0.23	0.17	0.61
P4SB-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.087
P4SB-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14
P4SB-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.31
P4TP-AEW-01S	0.0083	0.0087	0.025	0.09	0.083	0.098	0.065	0.031	0.13	0.0083
P4TP-AEW-02B	0.012	0.0055	0.04	0.087	0.084	0.12	0.065	0.04	0.1	0.012
P4TP-AEW-03S	0.0022	0.0089	0.015	0.048	0.055	0.082	0.037	0.025	0.063	0.0022
P4TP-AEW-04B	0.0044	0.025	0.025	0.11	0.15	0.2	0.14	0.073	0.16	0.0044
P5SB-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0059
P5SB-02	ND	ND	ND	0.0017	0.01	0.016	0.018	0.017	0.0062	0.012
P5SB-03	ND	ND	ND	ND	ND	ND	0.029	ND	ND	0.078
P5SB-04	ND	ND	ND	ND	0.013	0.021	0.029	0.018	ND	0.025

Table M-16 Surface Soil PAH's (Continued)

	Concentration (mg/kg)									
	2-Methyl-naphthalene	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (g,h,i) perylene	Benzo (k) fluoranthene	Chrysene
Screening Levels	**1.0**	**20**	**682**	**40**	**40**	**40**	**40**	**40**	**40**	**40**
P5SB-05	ND	ND	0.0026	0.003	0.0062	0.0088	0.0084	0.0066	0.0026	0.0066
P5SS-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0013
P5SS-08	ND	ND	ND	ND	0.0045	0.006	0.0062	0.0082	ND	0.0099
P6SB-01	ND	0.0041	0.038	0.049	0.2	0.23	0.25	0.15	0.074	0.23
P6SB-02	ND	ND	0.015	0.019	0.073	0.094	0.13	0.037	0.053	0.098
P6SB-03	ND	ND	0.0011	0.0011	0.0042	0.0053	0.0076	0.0053	0.0025	0.0064
P6SB-05	ND	ND	ND	ND	ND	0.0013	0.0023	0.0016	ND	0.0015
P6SB-07	ND	0.0017	0.007	0.01	0.066	0.11	0.11	0.068	0.034	0.08
P6SB-08	ND	ND	ND	ND	0.021	0.028	0.037	0.025	ND	0.033
P6SS-11	ND	ND	ND	ND	ND	0.02	0.029	0.022	ND	0.035
P8SB-02	ND	0.39	1.2	2.7	6.6	6.5	5.8	2.8	2.5	6.7
P9SB-01	ND	ND	ND	ND	0.0011	0.0011	0.0016	0.0012	ND	0.0012
P9SB-02	ND	ND	0.0012	0.0022	0.0039	0.0038	0.006	0.0032	0.0012	0.0072
P9SB-04	ND	ND	ND	ND	0.031	0.037	0.055	0.047	ND	0.037
P9SB-05	ND	0.42	0.16	2.7	6.2	6.8	8.7	3.9	2.8	6.4
P9SB-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P9SB-07	ND	0.03	0.13	0.19	0.51	0.77	0.81	0.97	0.29	0.66
P9SB-08	ND	0.078	0.14	0.27	0.62	0.77	0.72	0.76	0.27	0.73
P9SB-09A	ND	ND	ND	ND	0.028	0.031	0.06	0.035	0.015	0.087
P9SB-09B	ND	0.025	0.14	0.23	0.54	0.73	0.79	0.72	0.22	0.83
P9SB-10	ND	0.0032	0.0017	0.011	0.0088	0.0081	0.011	0.0072	0.0028	0.014
P9SB-11	ND	0.0037	0.0012	0.0051	0.0095	0.01	0.02	0.016	0.0054	0.015
P9SB-12	ND	0.022	0.01	0.019	0.043	0.054	0.065	0.041	0.021	0.049
P9SB-13	ND	0.0067	0.042	0.043	0.33	0.38	0.49	0.24	0.13	0.39

Table M-16 Surface Soil PAH's (Continued)

	Concentration (mg/kg)									
	2-Methyl-naphthalene	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (g,h,i) perylene	Benzo (k) fluoranthene	Chrysene
Screening Levels	**1.0**	**20**	**682**	**40**	**40**	**40**	**40**	**40**	**40**	**40**
P9SB-14	ND	0.014	0.063	0.068	0.18	0.26	0.33	0.16	0.09	0.21
SPSB-01	ND	ND	ND	ND	0.0051	0.0066	0.0097	0.0072	0.0031	0.0066
SPSB-02	ND	ND	ND	0.2	0.27	0.31	0.4	0.15	0.18	0.34
SPSB-03	ND	ND	0.0038	0.0044	0.026	0.033	0.036	0.036	0.011	0.036
SPSB-04	ND	0.0063	0.11	0.33	0.82	0.86	0.81	0.6	0.28	0.81
SPSB-05	ND	0.015	0.37	0.32	1.3	1.5	1.5	1.5	0.39	1.3
SPSS-05	ND	ND	ND	0.0019	0.0073	0.0094	0.011	0.0094	0.003	0.0091
SPSS-06	ND	ND	ND	ND	0.51	0.95	1.4	1.3	0.41	0.68
SPSS-07	ND	ND	ND	ND	0.18	0.16	0.25	0.11	0.091	0.23
SPSS-08	ND	ND	0.047	0.041	0.2	0.27	0.33	0.21	0.11	0.25
SPTP-01	ND	ND	0.012	0.016	0.05	0.065	0.084	0.039	0.033	0.064
SPTP-02	ND	ND	ND	0.052	0.26	0.29	0.43	0.22	0.15	0.29
SPTP-03	ND	ND	ND	0.045	ND	0.066	0.067	0.18	ND	0.034
SPTP-04	ND	ND	ND	0.37	1	1.1	1.6	0.75	0.5	1.1
SPTP-06	ND	0.015	ND	0.04	0.14	0.2	0.27	0.18	0.095	0.16
TGU-16	ND	ND	ND	0.14	0.28	0.3	0.37	0.22	ND	0.38
TGU-18	ND	0.23	1.2	1.2	3.5	3.9	3.2	2.6	0.95	3.7
TGU-23	ND	0.12	0.55	0.62	1.8	2.1	2.1	1.8	0.51	2
TGU-24	ND	0.062	0.031	0.18	0.59	0.65	0.95	0.47	0.32	0.65

Table M-16 Surface Soil PAHs (Continued)

	Concentration (mg/kg)						
Screening Levels	**Dibenzo (a,h) anthracene** **18.4**	**Fluoranthene** **40**	**Fluorene** **30**	**Indeno (1,2,3-cd) pyrene** **40**	**Naphthalene** **40**	**Phenanthrene** **40**	**Pyrene** **0.1**
CCSB-01	ND	ND	ND	ND	ND	ND	0.0012
CCSB-02	ND	0.33	ND	0.069	0.14	0.5	**0.44**
CCSB-03	0.0069	0.077	0.03	0.021	0.007	0.092	**0.11**
CCSB-04	ND	ND	ND	ND	ND	ND	ND
CCSB-05	0.087	0.58	0.029	0.27	0.024	0.36	**0.64**
CCSS-06	0.098	0.44	ND	0.28	ND	0.24	**0.56**
CCSS-07	0.071	0.62	0.023	0.25	0.013	0.25	**0.77**
CPSB-01	0.019	0.079	0.0074	0.021	0.085	0.26	**0.11**
CPSB-02	0.03	0.17	0.0055	0.086	0.015	0.13	**0.2**
CPSB-03	0.037	0.19	0.015	0.11	0.017	0.18	**0.24**
CPSB-04A	0.054	0.3	0.048	0.19	0.014	0.26	**0.33**
CPSB-04B	ND	0.029	0.011	0.011	0.0059	0.035	0.042
P1SB-02	0.0063	0.022	ND	0.014	0.0068	0.015	0.038
P1SB-03	0.035	0.3	0.021	0.097	0.039	0.22	**0.38**
P1SB-04	0.016	0.12	0.018	0.042	0.15	0.12	**0.12**
P2SB-01	0.69	5.9	0.15	1.8	0.14	3.4	**4.9**
P2SB-03	0.0012	0.014	ND	0.003	0.0039	0.018	0.018
P2SB-05	0.011	0.035	0.0067	0.033	0.011	0.069	0.045
P2SB-06	0.051	0.2	0.009	0.15	0.019	0.13	**0.22**
P2SB-07	0.013	0.097	0.0054	0.032	0.03	0.12	**0.11**
P2SB-08	0.058	0.42	ND	0.15	0.2	0.32	**0.43**
P2SB-09	0.15	2.1	0.082	0.5	0.17	1.5	**2.1**
P2SB-10	ND	0.77	ND	0.32	ND	0.47	**0.93**

Table M-16 Surface Soil PAHs (Continued)

	Concentration (mg/kg)						
	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene
Screening Levels	**18.4**	**40**	**30**	**40**	**40**	**40**	**0.1**
P3SB-01	ND	0.0018	ND	ND	ND	0.0015	0.003
P3SB-02	0.0051	0.033	0.0085	0.011	0.0065	0.041	0.033
P4SB-01	0.034	0.25	0.011	0.099	0.026	0.17	**0.23**
P4SB-03	ND	0.0022	0.0011	ND	ND	0.0044	0.0028
P4SB-04	0.97	14	1.2	2.7	0.56	12	**12**
P4SB-05	0.0037	0.024	0.0016	0.009	0.0025	0.016	0.026
P4SB-06	1.4	3.1	0.063	4.1	0.13	0.96	**3**
P4SB-07	ND	0.0035	0.0037	0.002	ND	0.007	0.0042
P4SB-08	ND	ND	ND	ND	ND	0.01	0.011
P4SB-09	ND	0.0098	0.0074	ND	ND	0.025	0.015
P4SB-12	0.074	0.67	0.031	0.23	0.2	0.67	**0.8**
P4SB-14	ND	ND	ND	ND	ND	ND	ND
P4SB-15	ND	ND	ND	ND	ND	0.17	0.092
P4SB-16	ND	ND	ND	ND	ND	ND	ND
P4TP-AEW-01S	0.02	0.12	0.015	0.051	0.019	0.13	**0.18**
P4TP-AEW-02B	0.019	0.16	0.016	0.053	0.011	0.13	**0.17**
P4TP-AEW-03S	0.011	0.079	0.0069	0.033	0.018	0.07	0.099
P4TP-AEW-04B	0.032	0.16	0.011	0.11	0.035	0.14	**0.26**
P5SB-01	ND	0.0044	ND	ND	ND	0.0059	0.0057
P5SB-02	0.0042	0.014	ND	0.013	0.0024	0.011	0.015
P5SB-03	ND	0.03	ND	ND	ND	0.07	0.079
P5SB-04	0.005	0.021	ND	0.013	0.0083	0.02	0.029
P5SB-05	ND	0.017	0.0014	0.005	ND	0.015	0.021
P5SS-06	ND	ND	ND	ND	0.0021	ND	ND

Table M-16 Surface Soil PAHs (Continued)

	Concentration (mg/kg)						
	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene
Screening Levels	**18.4**	**40**	**30**	**40**	**40**	**40**	**0.1**
P5SS-08	ND	0.0067	ND	0.0037	0.0034	0.0077	0.011
P6SB-01	0.048	0.26	0.012	0.14	0.023	0.25	**0.31**
P6SB-02	0.01	0.12	ND	0.027	ND	0.068	**0.18**
P6SB-03	0.0015	0.0055	ND	0.0043	0.0011	0.0055	0.0059
P6SB-05	ND	0.0019	ND	0.0014	ND	0.0023	0.0024
P6SB-07	0.013	0.1	0.0025	0.055	0.0024	0.049	**0.12**
P6SB-08	ND	0.027	ND	0.018	ND	0.017	0.037
P6SS-11	ND	0.02	ND	ND	ND	ND	0.03
P8SB-02	1.1	10	1.1	3.1	0.31	5.7	**12**
P9SB-01	ND	0.0021	ND	ND	ND	0.0015	0.0023
P9SB-02	0.0012	0.0053	ND	0.0022	0.011	0.018	0.0061
P9SB-04	ND	0.046	ND	0.033	ND	0.034	0.052
P9SB-05	1.2	15	0.45	3.7	0.25	11	**13**
P9SB-06	ND	ND	ND	ND	0.0012	ND	ND
P9SB-07	0.12	1.6	0.052	0.69	0.053	1.1	**1.8**
P9SB-08	0.12	1.9	0.087	0.63	0.091	1.5	**1.9**
P9SB-09A	ND	0.11	ND	0.025	0.033	0.11	**0.16**
P9SB-09B	0.13	1.5	0.067	0.56	0.51	1.3	**1.5**
P9SB-10	0.0021	0.018	0.013	0.0055	0.0036	0.025	0.019
P9SB-11	0.0029	0.015	0.0082	0.011	0.0045	0.018	0.017
P9SB-12	0.0094	0.083	0.019	0.037	0.023	0.086	0.091
P9SB-13	0.075	0.43	0.01	0.25	0.037	0.2	**0.57**
P9SB-14	0.038	0.48	0.014	0.15	0.031	0.29	**0.5**
SPSB-01	ND	0.0081	ND	0.005	0.0037	0.0082	0.0084
SPSB-02	ND	0.68	ND	0.1	ND	0.77	**0.84**

Table M-16 Surface Soil PAHs (Continued)

	Concentration (mg/kg)						
	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene
Screening Levels	**18.4**	**40**	**30**	**40**	**40**	**40**	**0.1**
SPSB-03	0.0064	0.044	0.0014	0.027	0.0022	0.034	0.07
SPSB-04	0.14	1.6	0.048	0.49	0.039	0.83	**1.8**
SPSB-05	0.2	3.4	0.11	1.1	0.12	3.1	**4**
SPSS-05	0.0017	0.011	ND	0.0071	0.0013	0.0083	0.016
SPSS-06	0.38	0.57	ND	1	ND	0.18	**0.64**
SPSS-07	ND	0.27	ND	0.09	ND	0.16	**0.3**
SPSS-08	0.043	0.32	ND	0.17	ND	0.15	**0.44**
SPTP-01	0.0083	0.085	ND	0.024	0.009	0.064	**0.12**
SPTP-02	0.057	0.46	ND	0.19	ND	0.23	**0.44**
SPTP-03	ND	0.042	ND	0.078	ND	ND	0.048
SPTP-04	0.21	2	0.21	0.65	ND	1.4	**1.7**
SPTP-06	0.048	0.23	ND	0.15	ND	0.14	**0.23**
TGU-16	ND	0.6	ND	0.18	ND	0.62	**0.63**
TGU-18	0.67	7.5	0.39	2.2	0.28	4	**8.8**
TGU-23	0.34	4.1	0.27	1.4	0.24	3.2	**4.9**
TGU-24	0.12	1	0.069	0.46	0.023	0.63	**1.1**

Table M-17
Samples used in assessment for exposure of ecological receptors to Dioxins, Furans, PCB's in surface soils, from no more than 6ft in depth

	Concentration (mg/kg)								
Screening Levels	**Aroclor 1254 0.00025**	**Aroclor 1260 0.00014**	**1,2,3,4,6,7,8-Heptachloro-dibenzo-P-Dioxin 0.0000002**	**1,2,3,4,7,8-Hexachloro-dibenzofuran (HxCDF) 0.00004**	**1,2,3,4,7,8-Hexachloro-dibenzo-P-Dioxin 0.0000002**	**1,2,3,6,7,8-Hexachloro-dibenzofuran (HxCDF) 0.00004**	**1,2,3,6,7,8-Hexachloro-dibenzo-P-Dioxin 0.0000002**	**1,2,3,7,8-Pentachloro-dibenzofuran 0.00004**	**1,2,3,7,8-Pentachloro-dibenzo-P-Dioxin 0.0000002**
P2SB-03	ND	**0.016**	ND	ND	ND	ND	ND	ND	ND
P4SB-06	ND	**0.039**	ND	ND	ND	ND	ND	ND	ND
P4SB-07	ND	ND	**0.00000393**	0.00000101	ND	0.00000061	**0.00000093**	0.00000073	**0.00000088**
P4SB-08	ND	**0.0043**	ND	ND	ND	ND	ND	ND	ND
P4SB-13	ND	ND	**0.00000057**	0.00000015	ND	0.00000014	0.00000012	0.00000020	0.00000011
P4SB-14	ND	ND	**0.00004310**	0.00000146	**0.00000055**	0.00000077	**0.00000159**	0.00000066	**0.00000059**
P4SB-15	ND	ND	**0.00004470**	0.00000088	**0.00000076**	0.00000058	**0.00000185**	0.00000059	**0.00000073**
P4TP-AEW-02B	ND	**0.059**	ND	ND	ND	ND	ND	ND	ND
P4TP-AEW-04B	ND	**0.056**	ND	ND	ND	ND	ND	ND	ND
P5SB-01	ND	**0.043**	ND	ND	ND	ND	ND	ND	ND
P6SB-02	ND	**0.22**	ND	ND	ND	ND	ND	ND	ND
P6SB-08	ND	**0.0023**	ND	ND	ND	ND	ND	ND	ND
P9SB-06	ND	**0.039**	ND	ND	ND	ND	ND	ND	ND
TP-02	**0.31**	ND	ND	ND	ND	ND	ND	ND	ND
TP-03	**0.103**	ND	ND	ND	ND	ND	ND	ND	ND
TP-05	ND	**2.37**	ND	ND	ND	ND	ND	ND	ND
TP-06	ND	**2.62**	ND	ND	ND	ND	ND	ND	ND
TP-07	ND	**0.43**	ND	ND	ND	ND	ND	ND	ND
TP-08	ND	**3.81**	ND	ND	ND	ND	ND	ND	ND
TP-09	ND	**3.73**	ND	ND	ND	ND	ND	ND	ND
TP-10	**3.58**	ND	ND	ND	ND	ND	ND	ND	ND
TP-11	**1.5**	ND	ND	ND	ND	ND	ND	ND	ND

Table M-17 Surface Soils Dioxins, Furans, PCBs (Continued)

	Concentration (mg/kg)						
	2,3,4,6,7,8-Hexachloro-dibenzofuran (HxCDF)	2,3,4,7,8-Pentachloro-dibenzofuran (PeCDF)	2,3,7,8-Tetrachloro-dibenzofuran	2,3,7,8-Tetrachloro-dibenzo-p-dioxin (TCDD)	Heptachloro-dibenzofurans (HpCDF), Total	Heptachloro-dibenzo-p-dioxins (HpCDD), Total	Hexachloro-dibenzofurans (HxCDF), Total
Screening Levels	**0.00004**	**0.00004**	**0.00004**	**0.0000002**	**0.00004**	**0.0000002**	**0.00004**
P2SB-03	ND	ND	ND	ND	ND	ND	ND
P4SB-06	ND	ND	ND	ND	ND	ND	ND
P4SB-07	0.00000046	0.00000108	ND	ND	0.00000134	**0.00000732**	0.00000567
P4SB-08	ND	ND	ND	ND	ND	ND	ND
P4SB-13	ND	0.00000019	ND	0.00000013	ND	**0.00000096**	0.00000029
P4SB-14	0.00000063	0.00000100	0.00000128	ND	0.00000582	**0.00007800**	0.00001000
P4SB-15	0.00000058	0.00000079	0.00000104	**0.00000037**	0.00000281	**0.00007970**	0.00000695
P4TP-AEW-02B	ND	ND	ND	ND	ND	ND	ND
P4TP-AEW-04B	ND	ND	ND	ND	ND	ND	ND
P5SB-01	ND	ND	ND	ND	ND	ND	ND
P6SB-02	ND	ND	ND	ND	ND	ND	ND
P6SB-08	ND	ND	ND	ND	ND	ND	ND
P9SB-06	ND	ND	ND	ND	ND	ND	ND
TP-02	ND	ND	ND	ND	ND	ND	ND
TP-03	ND	ND	ND	ND	ND	ND	ND
TP-05	ND	ND	ND	ND	ND	ND	ND
TP-06	ND	ND	ND	ND	ND	ND	ND
TP-07	ND	ND	ND	ND	ND	ND	ND
TP-08	ND	ND	ND	ND	ND	ND	ND
TP-09	ND	ND	ND	ND	ND	ND	ND
TP-10	ND	ND	ND	ND	ND	ND	ND
TP-11	ND	ND	ND	ND	ND	ND	ND

Table M-17 Surface Soils Dioxins, Furans, PCBs (Continued)

	Concentration (mg/kg)					
Screening Levels	**Hexachloro-dibenzo-p-dioxins (HxCDD), Total 0.0000002**	**Octachloro-dibenzofuran 0.00004**	**Octachloro-dibenzo-p-dioxin (OCDD) 0.0000002**	**Pentachloro-dibenzofurans (PeCDF), Total 0.00004**	**Pentachloro-dibenzo-p-dioxin (PeCDD), Total 0.0000002**	**Tetrachloro-dibenzo-p-dioxins (TCDD), Total 0.0000002**
P2SB-03	ND	ND	ND	ND	ND	ND
P4SB-06	ND	ND	ND	ND	ND	ND
P4SB-07	**0.00000680**	0.00000154	**0.00001070**	0.00001220	**0.00001030**	**0.00000420**
P4SB-08	ND	ND	ND	ND	ND	ND
P4SB-13	**0.00000025**	0.00000051	**0.00000296**	0.00000039	ND	0.00000013
P4SB-14	**0.00001440**	0.00000926	**0.00023700**	0.00001470	**0.00000142**	**0.00000089**
P4SB-15	**0.00001690**	0.00000461	**0.00025200**	0.00001130	**0.00000122**	**0.00000122**
P4TP-AEW-02B	ND	ND	ND	ND	ND	ND
P4TP-AEW-04B	ND	ND	ND	ND	ND	ND
P5SB-01	ND	ND	ND	ND	ND	ND
P6SB-02	ND	ND	ND	ND	ND	ND
P6SB-08	ND	ND	ND	ND	ND	ND
P9SB-06	ND	ND	ND	ND	ND	ND
TP-02	ND	ND	ND	ND	ND	ND
TP-03	ND	ND	ND	ND	ND	ND
TP-05	ND	ND	ND	ND	ND	ND
TP-06	ND	ND	ND	ND	ND	ND
TP-07	ND	ND	ND	ND	ND	ND
TP-08	ND	ND	ND	ND	ND	ND
TP-09	ND	ND	ND	ND	ND	ND
TP-10	ND	ND	ND	ND	ND	ND
TP-11	ND	ND	ND	ND	ND	ND

Table M-18
Samples used in assessment for exposure of ecological receptors to organic constituents in surface soils, from no more than 6ft in depth

	Concentration (mg/kg)							
	1,2,4-Trimethylbenzene	Acetone	Benzene	Bis (2-Ethylhexyl) phthalate	Butyl benzyl phthalate	Chloroform	Chloromethane	Ethyl Benzene
Screening Levels	5	2.5	0.26	0.93	0.24	0.02	77	0.03
P2SB-03	ND	0.025	ND	ND	ND	ND	ND	ND
P2SB-06	ND	ND	ND	ND	ND	ND	ND	ND
P2SB-10	ND	0.0092	ND	ND	ND	ND	ND	ND
P4SB-01	ND	0.003	ND	ND	ND	ND	ND	ND
P4SB-05	ND	0.0027	ND	ND	ND	ND	ND	ND
P4SB-06	ND	0.0025	ND	ND	ND	ND	ND	ND
P4SB-07	ND	0.002	ND	ND	ND	ND	ND	ND
P4SB-08	ND	0.0058	ND	ND	ND	ND	ND	ND
P5SB-02	0.004	0.0055	ND	ND	ND	ND	ND	ND
P5SB-03	ND	0.025	ND	ND	ND	ND	ND	ND
P6SB-01	ND	0.0044	ND	ND	ND	ND	ND	ND
P6SB-02	ND	ND	ND	ND	ND	ND	ND	ND
P6SB-03	ND	ND	ND	ND	ND	ND	ND	ND
P6SB-08	ND	0.0042	ND	ND	ND	ND	ND	ND
P7SB-02	ND	0.0027	ND	ND	ND	ND	ND	ND
P9SB-01	ND	0.011	ND	ND	ND	ND	ND	ND
P9SB-04	ND	0.0026	ND	ND	ND	ND	ND	ND
P9SB-06	ND	0.027	ND	ND	ND	0.0045	ND	ND
SPSB-04	ND	0.0023	ND	ND	ND	ND	ND	ND

Table M-18 Surface Soil Organics (Continued)

	Concentration (mg/kg)								
	Methyl ethyl ketone	Methyl isobutyl ketone	Methylene Chloride	p-Isopropyltoluene	Toluene	Trichloro-fluoromethane	Xylene, o-	Xylenes, m,p-	Xylenes, Total
Screening Levels	**89.6**	**13**	**4.0**	**2.75**	**5.4**	**16.4**	**35**	**16**	**0.05**
P2SB-03	0.0076	ND	ND	ND	ND	ND	ND	ND	ND
P2SB-06	ND	ND	0.014	ND	ND	ND	ND	ND	ND
P2SB-10	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-01	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-05	ND	ND	0.0051	ND	ND	ND	ND	ND	ND
P4SB-06	ND	ND	0.011	ND	ND	ND	ND	ND	ND
P4SB-07	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-08	ND	ND	ND	ND	ND	ND	ND	ND	ND
P5SB-02	ND	ND	ND	ND	ND	ND	0.0012	ND	0.0023
P5SB-03	0.0057	ND	ND	ND	ND	ND	ND	ND	ND
P6SB-01	ND	ND	ND	ND	ND	ND	ND	ND	ND
P6SB-02	0.0022	ND	0.0087	ND	ND	ND	ND	ND	ND
P6SB-03	ND	ND	0.0079	ND	ND	ND	ND	ND	ND
P6SB-08	ND	ND	0.0029	ND	ND	ND	ND	ND	ND
P7SB-02	ND	ND	ND	ND	ND	ND	ND	ND	ND
P9SB-01	ND	ND	0.0022	ND	ND	ND	ND	ND	ND
P9SB-04	ND	ND	0.004	ND	ND	ND	ND	ND	ND
P9SB-06	0.0074	ND	0.002	ND	ND	ND	ND	ND	ND
SPSB-04	ND	ND	0.0042	ND	ND	ND	ND	ND	ND

Table M-19
Samples used in assessment for exposure of ecological receptors to TPH's in surface soils, from no more than 6 ft in depth

Screening Level	Concentration (mg/kg)			
	TPHd(g)	TPHd(mo)	TPHg	TPHmo
	20[1]	**200**	**20**	**200**
B-01-EE2000	ND	ND	ND	110
B-02-EE2000	ND	ND	ND	**220**
B-02-TT	**28**	28	ND	34
B-03-EE2000	ND	ND	ND	53
B-03-TT	7	7	ND	ND
B-04-EE2000	ND	ND	ND	45
B-06-EE2000	ND	ND	ND	**200**
CCSB-01	1.6	1.6	ND	4.6
CCSB-02	**600**	**600**	0.3	**1900**
CCSB-04	2.2	2.2	0.078	20
CCSB-05	**50**	50	0.072	180
CCSS-06	**60**	60	0.074	**330**
CCSS-07	**52**	52	0.073	**230**
CPSB-01	**240**	**240**	0.098	**220**
CPSB-02	17	17	0.09	25
CPSB-03	**20**	20	0.078	23
CPSB-04A	17	17	0.063	66
CPSB-04B	**100**	100	1.1	**360**
G-33-EE2000	ND	ND	ND	**330**
G-34-EE2000	ND	ND	ND	**620**
G-35-EE2000	ND	ND	ND	**250**
G-35-EE2004	ND	ND	ND	**7500**
G-36-EE2000	ND	ND	ND	**1400**
G-36-EE2004	ND	ND	ND	**6300**
G-37-EE2000	ND	ND	ND	**270**
G-37-EE2004	ND	ND	ND	**1800**
G-38-EE2000	ND	ND	ND	**830**
G-38-EE2004	ND	ND	ND	**6200**
G-39-EE2000	ND	ND	ND	**1800**
G-39-EE2004	ND	ND	ND	**2700**
G-40-EE2000	ND	ND	ND	**2600**
G-40-EE2004	ND	ND	ND	**890**
G-41-EE2000	ND	ND	ND	99

[1] No screening level was available for TPHd, so the screening levels of both THPg and TPHmo are used.

Table M-19 Surface Soil TPH's (Continued)

	Concentration (mg/kg)			
	TPHd(g)	TPHd(mo)	TPHg	TPHmo
Screening Level	**20**	**200**	**20**	**200**
G-43-EE2000	ND	ND	ND	170
G-44-EE2000	ND	ND	ND	**780**
G-46-EE2000	ND	ND	ND	120
P1SB-02	6.4	6.4	ND	51
P1SB-03	**150**	150	0.084	170
P1SB-04	**41**	41	0.053	190
P2SB-01	**410**	**410**	ND	**1600**
P2SB-03	**33**	33	0.055	100
P2SB-05	15	15	0.096	20
P2SB-06	11	11	0.1	30
P2SB-07	**46**	46	0.075	64
P2SB-08	**86**	86	0.077	**500**
P2SB-09	**68**	68	0.054	**280**
P3SB-01	8.9	8.9	0.05	53
P3SB-02	**75**	75	0.074	**620**
P4SB-01	15	15	0.073	120
P4SB-03	1.4	1.4	0.062	3.2
P4SB-04	**130**	130	0.076	**250**
P4SB-05	9.6	9.6	0.058	18
P4SB-06	**120**	120	0.075	**930**
P4SB-07	**20**	20	0.07	110
P4SB-08	**35**	35	0.069	**370**
P4SB-09	**25**	25	0.081	84
P4SB-10	0.58	0.58	0.06	6.3
P4SB-11	0.76	0.76	0.069	1.2
P4SB-12	**240**	**240**	0.18	**600**
P4SB-13	7.7	7.7	**33**	2.3
P4SB-14	**85**	85	0.053	**460**
P4SB-15	**220**	**220**	0.065	**690**
P4SB-16	**280**	**280**	0.35	**1200**
P4TP-AEW-01S	**57**	57	0.097	**220**
P4TP-AEW-02B	**32**	32	0.093	95
P4TP-AEW-03S	16	16	0.075	50
P4TP-AEW-04B	**36**	36	0.094	170
P5SB-01	**32**	32	0.08	**210**
P5SB-02	4.9	4.9	0.27	24
P5SB-03	**1100**	**1100**	0.13	**790**
P5SB-04	**34**	34	0.09	**200**
P5SB-05	0.14	0.14	0.093	ND
P5SS-06	1.3	1.3	0.11	11
P5SS-07	**53**	53	0.44	**310**
P5SS-08	14	14	ND	79
P6SB-01	**56**	56	ND	84
P6SB-02	**57**	57	0.062	**420**

Table M-19 Surface Soil TPH's (Continued)

	Concentration (mg/kg)			
	TPHd(g)	TPHd(mo)	TPHg	TPHmo
Screening Level	**20**	**200**	**20**	**200**
P6SB-03	**28**	28	0.065	140
P6SB-05	14	14	0.072	32
P6SB-06	0.22	0.22	0.053	ND
P6SB-07	**21**	21	0.18	190
P6SB-08	**65**	65	0.2	**310**
P6SS-11	**55**	55	0.062	**660**
P7SB-01	1.5	1.5	0.17	2.5
P7SB-02	0.33	0.33	0.098	ND
P8SB-01	0.2	0.2	0.052	ND
P8SB-02	**200**	**200**	0.073	**220**
P9SB-01	0.66	0.66	ND	3.1
P9SB-04	**49**	49	0.045	130
P9SB-05	**99**	99	0.072	**210**
P9SB-06	**33**	33	0.14	**1100**
P9SB-07	**64**	64	0.19	**350**
P9SB-08	**60**	60	0.28	**270**
P9SB-09A	**750**	**750**	0.35	**950**
SPSB-01	5.9	5.9	0.07	47
SPSB-02	**110**	110	0.15	**920**
SPSB-03	0.58	0.58	0.075	0.9
SPSB-04	**130**	130	0.066	**210**
SPSB-05	**57**	57	0.11	56
SPSS-05	**28**	28	0.077	41
SPSS-06	**83**	83	0.068	**650**
SPSS-07	**65**	65	0.56	**430**
SPSS-08	**87**	87	0.4	**620**
SPTP-01	**89**	89	0.054	**500**
SPTP-02	**48**	48	ND	**250**
SPTP-03	**33**	33	0.051	**240**
SPTP-04	**120**	120	0.075	**920**
SPTP-06	17	17	0.087	130
TGU-16	**120**	120	0.076	**590**
TP-02	ND	ND	ND	**304**
TP-03	ND	ND	ND	**323**
TP-04	ND	ND	ND	**2070**
TP-05	**22.3**	22.3	ND	**259**
TP-06	3.52	3.52	ND	67.6
TP-07	ND	ND	ND	4.21
TP-08	4.12	4.12	ND	52.8
TP-09	5.79	5.79	ND	117
TP-10	ND	ND	ND	100
TP-11	6.39	6.39	ND	120
TP-12	ND	ND	ND	146

Table M-20
Samples used in assessment for exposure of burrowing animals to inorganic constituents in soils, from no more than 10 ft in depth

	Concentration (mg/kg)									
	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium VI	Cobalt	Copper	Lead
Screening Level	20	20	750	4	12	0.4	8	40	230	200
B-01-EE2000	3.8	1.8	83.2	0.24	ND	**510**	ND	**45.8**	193	**778**
B-01-ERM	ND	ND	ND	ND	ND	ND	ND	ND	**350**	120
B-01-GR	5.2	**63.1**	104	0.8	0.7	**48.3**	ND	35.7	137	13.3
B-02-EE2000	0.38	**25.2**	463	1	0.77	**180**	ND	**48.4**	**2090**	60
B-02-ERM	ND	15	ND	ND	ND	ND	ND	ND	**260**	**370**
B-02-GR	10.3	**53.8**	97.6	0.7	1.5	**99.1**	ND	28.1	200	**326**
B-03-EE2000	ND	**29.3**	291	0.44	0.099	**452**	ND	30.2	**1060**	**208**
B-03-ERM	ND	10	ND	ND	ND	ND	ND	ND	**940**	**1800**
B-03-GR	10.5	14.9	126	0.2	1.1	**23.5**	ND	5.4	80.5	102
B-04-EE2000	1.8	**34.6**	161	0.28	ND	**93.9**	ND	12.1	**352**	169
B-04-GR	9.1	**63.2**	161	0.5	1.4	**30.9**	ND	39.1	**397**	142
B-05-EE2000	0.21	**41.3**	267	0.23	ND	**242**	ND	18.8	**654**	**303**
B-05-GR	5.4	**69.8**	210	0.4	1.1	**89.4**	ND	31.2	220	**329**
B-06-EE2000	2.2	18.8	391	0.8	1.6	**191**	ND	**49.9**	**1760**	**529**
B-06-GR	10.1	**56.8**	289	0.5	2.3	**44.6**	ND	32.4	188	**936**
CCSB-01	ND	ND	ND	ND	0.85	**420**	ND	ND	ND	5.3
CCSB-02	ND	ND	ND	ND	2.2	**100**	ND	ND	ND	**310**
CCSB-04	ND	4.9	ND	ND	0.82	**29**	ND	15	19	29
CCSB-05	ND	6.4	ND	ND	2	**1000**	1.1	34	**480**	**300**
CCSS-06	ND	4	ND	ND	1.8	**80**	ND	17	160	**290**
CCSS-07	ND	17	ND	ND	1.1	**210**	4.6	11	**390**	**420**
CCTP-01	ND	13	ND	ND	0.38	**600**	ND	20	**800**	**550**
CPSB-01	ND	ND	ND	ND	ND	**8**	ND	ND	ND	**220**

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

Location	Concentration (mg/kg)									
	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium VI	Cobalt	Copper	Lead
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**
CPSB-02	ND	ND	ND	ND	0.12	**84**	ND	ND	ND	32
CPSB-03	ND	**28**	120	0.15	0.95	**39**	ND	**51**	200	**400**
CPSB-04A	ND	11	ND	ND	0.1	**120**	ND	21	**260**	87
CPSB-04B	ND	4.8	ND	ND	0.97	**73**	ND	13	73	37
G-04-EE2000	4.2	6	191	0.27	1.8	**144**	ND	15	**1600**	**478**
G-05-EE2000	6.4	10.5	382	0.85	0.82	**149**	ND	29.2	**1410**	**349**
G-06-EE2000	1	7.1	93.2	0.13	ND	**36.5**	ND	7.7	**529**	83
G-07-EE2000	11.5	**38.2**	435	0.75	0.29	**286**	ND	39.5	**2100**	**277**
G-08-EE2000	6.7	**24.6**	435	0.81	0.95	**244**	ND	34.9	**3470**	**295**
G-09-EE2000	14.5	**107**	674	0.73	0.74	**383**	ND	**46.4**	**2410**	**380**
G-10-EE2000	7.6	**21.1**	350	0.92	ND	**138**	ND	36.7	**2680**	120
G-11-EE2000	8.3	ND	278	0.31	0.86	**590**	ND	28.9	**6670**	**391**
G-12-EE2000	9.3	**24.1**	365	0.65	ND	**470**	ND	33.9	**2050**	**237**
G-13-EE2000	7.1	19	341	0.71	0.73	**237**	ND	28.6	**1290**	112
G-15-EE2000	0.8	**54.5**	317	0.026	ND	**103**	ND	19.9	**930**	151
G-17-EE2000	1.7	**44**	415	0.22	ND	**199**	ND	22.1	**811**	179
G-18-EE2000	2.5	6.1	77.8	0.25	ND	**204**	ND	15	**282**	65.5
G-19-EE2000	1.7	2.2	28.9	0.14	ND	**29.9**	ND	3.5	224	145
G-20-EE2000	1.4	3.9	117	0.25	ND	**126**	ND	12	**791**	69.1
G-22-EE2000	1.3	ND	127	0.28	ND	**25.2**	ND	**271**	71	10
G-23-EE2000	2.3	ND	168	0.32	1.8	**119**	ND	19.5	175	**401**
G-24-EE2000	2.9	3.4	158	0.45	1.9	**106**	ND	16.4	171	**205**
G-25-EE2000	2.3	2	94.4	0.21	1.2	**49.6**	ND	36.1	142	191
G-26-EE2000	3.1	ND	147	0.32	0.36	**111**	ND	19	163	129
G-27-EE2000	1.2	ND	49.3	0.2	ND	**14.2**	ND	6.1	76	61.2
G-28-EE2000	2.3	3.3	122	0.42	0.24	**94.8**	ND	12.8	46.5	84.3
G-29-EE2000	1.8	ND	98.6	0.31	0.086	**42.2**	ND	9.1	88.4	**438**

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

Location	Concentration (mg/kg)									
	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium VI	Cobalt	Copper	Lead
Screening Level	20	20	750	4	12	0.4	8	40	230	200
G-30-EE2000	6.7	11.4	231	0.26	1.9	**347**	ND	29.6	**394**	**816**
G-31-EE2000	4.4	2	120	0.32	ND	**273**	ND	**40**	**328**	**217**
G-32-EE2000	5.1	10	367	0.61	ND	**521**	ND	28.4	**588**	**778**
G-33-EE2000	10.6	3.2	**1210**	0.24	0.54	**261**	ND	29.5	**909**	**1400**
G-33-EE2004	6.1	5.5	187	0.6	2.4	**59.8**	ND	12.7	213	**210**
G-34-EE2000	**23.9**	**28.6**	227	0.35	0.46	**625**	ND	34	**530**	**615**
G-34-EE2004	10.8	7.6	200	0.16	4.3	**152**	ND	21.4	**326**	**1510**
G-35-EE2000	6	**57.4**	686	0.54	1.6	**327**	ND	24.5	**1890**	**1320**
G-35-EE2004	4.8	4.8	70.2	0.49	1.2	**35.7**	ND	12.9	90.9	100
G-36-EE2000	10.2	**29.7**	413	1	1.1	**345**	ND	**40.7**	**3580**	**532**
G-36-EE2004	**21.2**	18	322	0.31	6.2	**98.2**	ND	27.9	**344**	**4810**
G-37-EE2000	0.99	ND	66.7	0.18	ND	**18.1**	ND	12	19.9	10.2
G-37-EE2004	3.9	3.2	217	0.33	1.3	**50.2**	ND	9.8	138	61
G-38-EE2000	**29.8**	16	195	0.57	1.2	**238**	ND	33.7	**1000**	**1230**
G-38-EE2004	9.9	**21.3**	89	0.23	2.9	**41.8**	ND	18.8	**438**	**246**
G-39-EE2000	10.9	**53.1**	419	0.48	5.4	**202**	ND	21.6	**2630**	**1050**
G-39-EE2004	2.7	4.2	86.4	0.25	1	**72.9**	ND	11	**393**	149
G-40-EE2000	4.1	8.6	117	0.23	0.64	**71.8**	ND	29	**599**	**1180**
G-40-EE2004	6.8	9.3	76.1	0.99	2.7	**75.5**	ND	16	116	89.8
G-41-EE2000	3.8	ND	40.6	0.42	ND	**253**	ND	**112**	32.5	5.8
G-43-EE2000	ND	5.1	50.4	1	ND	**40.2**	ND	22.4	50	40
G-44-EE2000	7.7	ND	73	0.24	ND	**481**	ND	**49.8**	102	**317**
G-45-EE2000	2	ND	171	0.44	ND	**467**	ND	**49**	51.3	92.5
G-46-EE2000	3	6.1	129	0.32	ND	**266**	ND	**112**	**382**	**281**
G-47-EE2000	3.8	**448**	150	0.42	0.91	**139**	ND	20.8	**282**	**231**
G-48-EE2000	2.5	**461**	133	0.58	0.36	**252**	ND	32	**236**	191
G-49-EE2000	ND	3.9	26.1	0.25	ND	**36.4**	ND	5.5	11	43.1

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

Location	Concentration (mg/kg)									
	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium VI	Cobalt	Copper	Lead
Screening Level	20	20	750	4	12	0.4	8	40	230	200
GW-01	2.6	11.2	83.8	0.2	ND	**5**	ND	4.3	44.9	48.2
GW-03	18.5	**53.7**	387	0.3	1.8	**16.6**	ND	4.8	39.7	124
GW-04	7.2	**29.6**	107	0.2	0.8	**55.4**	ND	7.3	**323**	129
P1SB-02	ND	ND	ND	ND	0.65	**41**	ND	ND	ND	83
P1SB-03	ND	ND	ND	ND	1.9	**88**	ND	ND	ND	**890**
P1SB-04	ND	4	47	0.082	1.2	**900**	ND	**52**	190	**200**
P2SB-01	ND	ND	ND	ND	1.9	**85**	ND	ND	ND	**2800**
P2SB-03	10	14	61	0.18	3.3	**56**	ND	15	**2100**	**260**
P2SB-05	ND	ND	ND	ND	0.13	**480**	ND	ND	ND	7.7
P2SB-06	2.2	4.5	630	0.29	2.6	**270**	ND	27	**1600**	**1600**
P2SB-07	ND	ND	ND	ND	0.086	**22**	ND	ND	ND	110
P2SB-08	ND	ND	ND	ND	0.9	**68**	ND	ND	ND	**330**
P2SB-09	ND	ND	ND	ND	2.7	**120**	ND	ND	ND	**9600**
P2SB-10	ND	7	ND	ND	1.7	**57**	ND	16	140	130
P3SB-01	ND	2.8	18	0.15	0.29	**63**	ND	6.5	5.8	9.9
P3SB-02	ND	3.9	98	0.24	0.22	**300**	ND	28	79	45
P4SB-01	ND	0.18	460	0.1	0.31	**110**	ND	26	100	15
P4SB-03	ND	ND	ND	ND	0.084	**120**	ND	ND	ND	8.2
P4SB-04	ND	7.6	110	0.16	0.041	**27**	ND	5.2	160	120
P4SB-05	ND	1.9	140	0.22	0.073	**330**	ND	39	55	9.3
P4SB-06	ND	3.9	92	0.27	0.64	**51**	ND	9.8	180	120
P4SB-07	ND	4.3	63	0.18	1.2	**680**	ND	**56**	30	6.4
P4SB-08	ND	ND	71	0.19	0.2	**91**	ND	29	79	1
P4SB-10	ND	ND	ND	ND	0.83	**920**	ND	ND	ND	0.72
P4SB-11	ND	ND	ND	ND	ND	**92**	ND	ND	ND	0.22
P4SB-12	ND	**33**	ND	ND	5.8	**51**	ND	33	**2500**	**300**
P4SB-13	ND	ND	ND	ND	0.62	**83**	ND	20	49	0.8

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

Location	Concentration (mg/kg)									
	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium VI	Cobalt	Copper	Lead
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**
P4SB-14	ND	3.8	ND	ND	0.91	**34**	ND	9.8	40	16
P4SB-15	ND	1.5	ND	ND	0.87	**89**	ND	16	57	16
P4SB-16	ND	3.8	ND	ND	0.56	**27**	ND	8.6	40	17
P4TP-AEW-01S	1.4	8.1	140	0.34	0.37	**190**	ND	18	**240**	140
P4TP-AEW-02B	ND	7.7	61	0.43	0.14	**25**	ND	10	75	56
P4TP-AEW-03S	3.2	11	370	0.3	2.6	**61**	ND	14	**390**	**450**
P4TP-AEW-04B	3.5	13	130	0.32	2.2	**41**	ND	10	**310**	**410**
P5SB-01	ND	2.3	87	0.05	0.16	**130**	ND	21	71	17
P5SB-02	ND	4.1	94	0.31	0.41	**44**	ND	11	29	55
P5SB-03	0.11	1.2	96	0.21	0.21	**130**	ND	27	82	9.8
P5SB-04	ND	ND	ND	ND	0.15	**52**	ND	ND	ND	15
P5SB-05	ND	0.42	52	0.18	0.096	**250**	ND	37	53	0.13
P5SS-06	ND	ND	ND	ND	0.44	**330**	ND	19	16	0.69
P5SS-07	ND	3.1	ND	ND	0.085	**36**	ND	16	60	8.5
P5SS-08	ND	1.6	ND	ND	ND	**95**	ND	39	130	8.7
P6SB-01	**38**	**29**	86	0.31	ND	**24**	ND	**41**	**360**	**640**
P6SB-02	ND	3.3	94	0.25	0.43	**81**	ND	11	44	180
P6SB-03	1.3	ND	36	0.21	0.19	**88**	ND	29	74	6.2
P6SB-05	ND	ND	ND	ND	0.36	**93**	ND	ND	ND	3.7
P6SB-06	ND	ND	ND	ND	ND	**83**	ND	ND	ND	ND
P6SB-07	ND	ND	ND	ND	ND	**240**	ND	ND	ND	12
P6SB-08	ND	0.17	25	0.15	ND	**120**	ND	25	69	0.39
P6SS-11	ND	ND	ND	ND	0.085	**92**	ND	ND	ND	13
P7SB-01	ND	ND	ND	ND	ND	**720**	ND	ND	ND	0.083
P7SB-02	0.15	0.94	280	0.68	0.081	**18**	ND	28	38	0.45
P8SB-01	ND	ND	ND	ND	0.17	**110**	ND	ND	ND	0.36
P8SB-02	ND	18	ND	ND	0.29	**200**	ND	23	**400**	**1700**

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

Location	Concentration (mg/kg)									
	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium VI	Cobalt	Copper	Lead
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**
P9SB-01	ND	ND	120	0.21	0.025	**110**	ND	33	150	1.2
P9SB-04	ND	1.1	480	0.09	ND	**130**	ND	24	98	32
P9SB-05	ND	10	590	0.27	2.6	**74**	ND	15	**1200**	**2800**
P9SB-06	ND	3.3	44	0.21	0.15	**38**	ND	4.2	15	50
P9SB-07	ND	2.6	ND	ND	1.1	**250**	ND	25	130	120
P9SB-08	ND	4	ND	ND	1.1	**86**	ND	14	91	120
P9SB-09A	ND	6.2	ND	ND	1.4	**320**	ND	32	140	140
P9SB-09B	ND	5.3	ND	ND	1.1	**150**	ND	22	180	**290**
P9SB-10	ND	3.3	ND	ND	0.69	**190**	ND	21	41	13
SB-01-TT	ND	ND	230	ND	0.54	**140**	ND	16	**660**	**250**
SB-02-TT	ND	ND	57	ND	ND	**19**	ND	8.4	59	84
SB-03-TT	ND	ND	ND	ND	ND	**580**	ND	**67**	8.4	3.8
SB-04-TT	ND	ND	ND	ND	ND	**1200**	ND	**72**	10	3.9
SB-05-TT	3.2	ND	43	ND	ND	**540**	ND	**41**	15	38
SB-06-TT	4.5	3.8	150	ND	ND	**380**	ND	**46**	**660**	55
SB-07-TT	**27**	3.1	380	ND	0.69	**170**	ND	25	220	**330**
SB-08-TT	ND	ND	640	0.64	ND	**73**	ND	20	64	20
SB-09-TT	2.5	2.8	600	ND	2.4	**200**	ND	26	**270**	**2300**
SB-10-TT	ND	3.4	520	ND	ND	**77**	ND	33	69	11
SB-11-TT	ND	ND	230	ND	0.53	**340**	ND	33	60	**2200**
SB-12-TT	ND	ND	19	ND	ND	**610**	ND	**49**	40	81
SB-13-TT	ND	ND	7.9	ND	ND	**890**	ND	**72**	15	55
SB-14-TT	ND	ND	ND	ND	ND	**1100**	ND	**80**	20	6.1
SPSB-01	ND	ND	ND	ND	0.44	**33**	ND	ND	ND	15
SPSB-02	ND	ND	ND	ND	0.32	**86**	ND	ND	ND	140
SPSB-03	ND	ND	ND	ND	0.62	**460**	ND	ND	ND	50
SPSB-04	ND	9.7	83	0.26	0.41	**90**	ND	25	140	110

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

Location	Concentration (mg/kg)									
	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium VI	Cobalt	Copper	Lead
Screening Level	**20**	**20**	**750**	**4**	**12**	**0.4**	**8**	**40**	**230**	**200**
SPSB-05	2.3	9.5	110	0.24	0.24	**23**	ND	11	100	120
SPSS-05	ND	ND	ND	ND	ND	**220**	ND	30	92	14
SPSS-06	ND	ND	ND	ND	0.63	**130**	ND	ND	ND	**430**
SPSS-07	ND	3.6	ND	ND	0.19	**79**	ND	13	**280**	140
SPSS-08	ND	7.1	ND	ND	1.1	**140**	ND	14	**300**	120
SPTP-01	ND	4.1	210	0.15	0.97	**34**	ND	3.7	100	**580**
SPTP-02	2.8	7.8	220	0.28	1.4	**44**	ND	5.6	220	**200**
SPTP-03	18	7.2	220	0.091	0.73	**22**	ND	3.1	120	**290**
SPTP-04	ND	12	65	0.15	0.46	**84**	ND	9.7	**350**	170
SPTP-06	ND	4.1	75	0.13	1	**26**	ND	2.1	76	120
TGU-16	7.9	16	220	0.24	1.6	**42**	ND	4.8	**290**	**280**
TGU-18	7.8	9.7	130	0.19	2.1	**150**	ND	17	**470**	**270**
TGU-23	1.2	**27**	170	0.14	0.79	**110**	ND	20	210	170
TGU-24	5.7	7.5	230	0.16	1.1	**78**	ND	6.9	**660**	**250**
TP-01	ND	ND	150	ND	ND	**18**	ND	7.2	18	7.6
TP-02	ND	3.4	170	ND	ND	**27**	ND	11	24	26
TP-03	ND	4.4	99	ND	ND	**31**	ND	7.4	120	94
TP-04	ND	4	120	ND	ND	**46**	ND	6.7	140	90
TP-05	7.6	**20**	81	ND	1.8	**180**	ND	5.6	**2700**	**850**
TP-06	6.8	8.2	94	ND	ND	**140**	ND	7.6	**570**	**260**
TP-07	16	19	330	ND	ND	**200**	ND	30	**1200**	**210**
TP-08	7.3	10	150	ND	ND	**95**	ND	14	**780**	**260**
TP-09	8.8	14	150	ND	1	**170**	ND	11	**820**	**480**
TP-10	ND	4.4	160	ND	1.6	**140**	ND	5.1	46	13
TP-11	ND	6.8	65	ND	ND	**62**	ND	8	**370**	170
TP-12	ND	3.2	84	ND	ND	**36**	ND	13	37	72

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

	Concentration (mg/kg)							
	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**10**	**40**	**150**	**10**	**20**	**1.0**	**1.0**	**200**
B-01-EE2000	1.93	ND	**757**	**20.9**	ND	ND	**32.2**	**810**
B-01-ERM	ND	ND	**500**	ND	ND	ND	ND	ND
B-01-GR	7.3	2.4	57.3	**21.8**	1.3	**96.6**	**98.8**	111
B-02-EE2000	0.017	ND	86.8	**42.8**	0.45	ND	**77.2**	**1270**
B-02-ERM	4.5	ND	130	ND	ND	ND	ND	ND
B-02-GR	**10**	3.5	109	**31.5**	2.5	**70.5**	**76.6**	**224**
B-03-EE2000	0.45	ND	**273**	**23.7**	0.32	ND	**32.2**	**869**
B-03-ERM	ND	ND	110	ND	ND	ND	ND	**1200**
B-03-GR	3.2	1.9	28	7.5	1.1	**18.8**	**17.2**	**664**
B-04-EE2000	0.44	ND	**184**	7.2	ND	ND	**34.7**	**438**
B-04-GR	**14.4**	6.7	112	**73.6**	2.9	**221**	**46.5**	**585**
B-05-EE2000	0.33	ND	109	**19.4**	0.35	ND	**7.6**	**377**
B-05-GR	8.6	3.7	115	**43**	1.2	**83.7**	**67.2**	**1020**
B-06-EE2000	0.13	ND	107	**36.5**	0.75	ND	**73.1**	**2300**
B-06-GR	**18.9**	5.6	80.9	**103**	1.9	**203**	**56.8**	**853**
CCSB-01	ND	ND	**1100**	ND	ND	ND	ND	65
CCSB-02	ND	ND	90	ND	ND	ND	ND	**610**
CCSB-04	0.099	ND	42	ND	ND	ND	ND	71
CCSB-05	1.1	ND	**1200**	ND	ND	ND	ND	**1000**
CCSS-06	0.7	ND	**220**	ND	ND	ND	ND	**430**
CCSS-07	0.49	ND	130	ND	ND	ND	ND	**660**
CCTP-01	ND	ND	**240**	ND	ND	ND	**36**	**1000**
CPSB-01	ND	ND	8.7	ND	ND	ND	ND	10
CPSB-02	ND	ND	50	ND	ND	ND	ND	75
CPSB-03	**13**	1.7	75	ND	ND	ND	**72**	96
CPSB-04A	0.24	ND	130	ND	ND	ND	ND	**230**

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

	Concentration (mg/kg)							
	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**10**	**40**	**150**	**10**	**20**	**1.0**	**1.0**	**200**
CPSB-04B	0.26	ND	94	ND	ND	ND	ND	120
G-04-EE2000	**13.4**	ND	97.7	**38.1**	ND	ND	**30.9**	**1350**
G-05-EE2000	0.38	ND	87.6	**65.9**	ND	ND	**80.3**	**1500**
G-06-EE2000	0.314	ND	24.1	5.1	ND	ND	**7.3**	**274**
G-07-EE2000	0.39	ND	**238**	**58.5**	ND	ND	**54.3**	**1250**
G-08-EE2000	5.3	ND	**153**	**54.2**	1.3	ND	**73.2**	**1880**
G-09-EE2000	0.22	ND	**164**	**74.1**	ND	ND	**32.1**	**2000**
G-10-EE2000	0.23	ND	71.2	**54.2**	ND	ND	**67.3**	**1240**
G-11-EE2000	0.76	ND	**378**	**112**	ND	ND	**68**	**2960**
G-12-EE2000	0.61	ND	**324**	**51.1**	ND	ND	**45.8**	**1340**
G-13-EE2000	0.28	ND	130	**26.1**	ND	ND	**70**	**625**
G-15-EE2000	0.131	ND	30.8	**12.5**	0.56	ND	**2.7**	**470**
G-17-EE2000	0.0533	ND	89.6	**15.7**	0.47	ND	**1**	**536**
G-18-EE2000	0.0914	ND	**309**	6.8	ND	ND	**19.4**	**241**
G-19-EE2000	0.218	ND	9.7	ND	0.28	ND	**9.5**	**506**
G-20-EE2000	0.638	ND	58.3	5.6	ND	ND	**19.3**	**445**
G-22-EE2000	0.0482	ND	37.4	8.6	**59.2**	ND	**20**	86
G-23-EE2000	1	ND	**270**	**39.9**	ND	ND	**49.8**	**942**
G-24-EE2000	0.73	ND	**150**	**16.7**	ND	ND	**41.5**	**401**
G-25-EE2000	0.152	ND	79.1	6.4	5.6	ND	**25.1**	**600**
G-26-EE2000	0.24	ND	**187**	**15.9**	ND	ND	**25.4**	**265**
G-27-EE2000	0.061	ND	21.3	6.1	ND	ND	**29.7**	58.3
G-28-EE2000	0.37	ND	137	**10.4**	ND	ND	**35.6**	151
G-29-EE2000	0.75	ND	49.2	9.9	ND	ND	**24.6**	101
G-30-EE2000	2.7	ND	**467**	**43.2**	ND	ND	**28.3**	**1320**
G-31-EE2000	0.38	ND	**447**	**32.5**	4	ND	**34.4**	**213**
G-32-EE2000	2.3	ND	**369**	**68.8**	0.85	ND	**46.5**	**949**

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

	Concentration (mg/kg)							
	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**10**	**40**	**150**	**10**	**20**	**1.0**	**1.0**	**200**
G-33-EE2000	1.3	ND	**200**	**117**	1.3	ND	**47**	**1660**
G-33-EE2004	1.3	ND	68	ND	0.07	**3.2**	**53.7**	**302**
G-34-EE2000	9.7	ND	**498**	**62.7**	1.1	ND	**39.9**	**1900**
G-34-EE2004	6.3	ND	**252**	ND	ND	**3.8**	**41**	**1110**
G-35-EE2000	**86.8**	ND	**253**	**33.1**	ND	ND	**49.5**	**2370**
G-35-EE2004	1.1	ND	39.2	ND	ND	**2.6**	**43.4**	135
G-36-EE2000	0.73	ND	**397**	**90.9**	ND	ND	**388**	**2260**
G-36-EE2004	5.5	ND	**170**	ND	ND	**6.3**	**43.6**	**633**
G-37-EE2000	0.046	ND	25.4	**10.3**	ND	ND	**15.6**	37.1
G-37-EE2004	0.11	ND	39.6	ND	ND	**2.5**	**62.9**	115
G-38-EE2000	0.59	ND	**382**	**75.5**	1.4	ND	**52.2**	**901**
G-38-EE2004	0.75	ND	**177**	ND	ND	**3.8**	**52.8**	**295**
G-39-EE2000	1.7	ND	**194**	**39**	0.6	ND	**66.2**	**2680**
G-39-EE2004	0.35	ND	60.1	ND	ND	**2.2**	**40.3**	156
G-40-EE2000	2.4	ND	**158**	**47.8**	**72.1**	ND	**60.1**	**596**
G-40-EE2004	0.13	ND	55.7	ND	0.16	**2.9**	**55.7**	131
G-41-EE2000	0.064	ND	**735**	**35.5**	9.1	ND	**31.8**	52.3
G-43-EE2000	0.115	ND	52.8	**13.3**	0.82	ND	**42.1**	114
G-44-EE2000	0.322	ND	**977**	9.6	0.46	ND	**30.4**	**247**
G-45-EE2000	0.136	ND	**881**	**14**	3.9	ND	**32.8**	82.8
G-46-EE2000	0.417	ND	**592**	**14.6**	ND	ND	**31.5**	**324**
G-47-EE2000	1	ND	**191**	**27.9**	ND	ND	**39.9**	**571**
G-48-EE2000	0.55	ND	**401**	**32.2**	ND	ND	**44.4**	**391**
G-49-EE2000	0.072	ND	23.4	5.9	ND	ND	**27.7**	39.6
GW-01	1.5	1.1	19.6	9	0.5	**14.1**	**6.5**	**292**
GW-03	2.1	1.3	21.3	**10.1**	0.5	**20.2**	**12.7**	**700**
GW-04	9.2	2.5	37	**13**	0.9	**28.4**	**20**	**477**

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

	Concentration (mg/kg)							
	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**10**	**40**	**150**	**10**	**20**	**1.0**	**1.0**	**200**
P1SB-02	ND	ND	38	ND	ND	ND	ND	130
P1SB-03	ND	ND	110	ND	ND	ND	ND	**440**
P1SB-04	1.8	ND	**1200**	ND	ND	ND	**29**	**420**
P2SB-01	ND	ND	140	ND	ND	ND	ND	**710**
P2SB-03	0.1	1.1	50	ND	0.65	ND	**50**	**1400**
P2SB-05	ND	ND	**1100**	ND	ND	ND	ND	35
P2SB-06	0.34	2.1	**380**	ND	0.42	ND	**58**	**1400**
P2SB-07	ND	ND	38	ND	ND	ND	ND	97
P2SB-08	ND	ND	110	ND	ND	ND	ND	**360**
P2SB-09	ND	ND	**380**	ND	ND	ND	ND	**1300**
P2SB-10	0.15	ND	82	ND	ND	ND	ND	**240**
P3SB-01	0.0058	0.38	60	ND	0.12	ND	**36**	23
P3SB-02	0.099	0.25	**340**	ND	ND	ND	**55**	100
P4SB-01	0.19	ND	**160**	ND	0.16	ND	**50**	150
P4SB-03	ND	ND	**200**	ND	ND	ND	ND	52
P4SB-04	0.17	0.59	43	ND	0.11	0.28	**11**	69
P4SB-05	0.035	0.15	**590**	ND	ND	ND	**50**	51
P4SB-06	0.2	0.39	44	ND	ND	ND	**45**	**270**
P4SB-07	0.065	0.17	**1200**	2.5	ND	ND	**38**	190
P4SB-08	ND	0.28	46	ND	0.35	ND	**160**	47
P4SB-10	ND	ND	**1400**	ND	ND	ND	ND	10
P4SB-11	ND	ND	41	ND	ND	ND	ND	32
P4SB-12	0.7	ND	93	ND	ND	ND	ND	**620**
P4SB-13	0.013	ND	44	ND	ND	ND	ND	34
P4SB-14	0.054	ND	41	ND	ND	ND	ND	64
P4SB-15	0.052	ND	59	ND	ND	ND	ND	86
P4SB-16	0.042	ND	46	ND	ND	ND	ND	76

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

	Concentration (mg/kg)							
	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**10**	**40**	**150**	**10**	**20**	**1.0**	**1.0**	**200**
P4TP-AEW-01S	0.31	ND	**210**	0.17	0.78	ND	**31**	**200**
P4TP-AEW-02B	0.13	ND	36	0.7	ND	ND	**28**	**200**
P4TP-AEW-03S	ND	ND	78	1.1	ND	ND	**45**	**1100**
P4TP-AEW-04B	0.71	ND	56	1.8	ND	ND	**35**	**1100**
P5SB-01	0.092	0.25	96	ND	0.21	ND	**67**	64
P5SB-02	0.12	1.6	41	ND	ND	ND	**44**	48
P5SB-03	0.23	0.27	75	0.076	ND	ND	**100**	70
P5SB-04	ND	ND	41	ND	ND	ND	ND	35
P5SB-05	ND	0.11	140	ND	ND	ND	**93**	55
P5SS-06	0.016	ND	**180**	ND	ND	ND	ND	47
P5SS-07	0.09	ND	52	ND	ND	ND	ND	80
P5SS-08	ND	ND	59	ND	ND	ND	ND	57
P6SB-01	**19**	2.5	64	ND	6.3	ND	**40**	**710**
P6SB-02	0.18	1.1	110	ND	3.4	0.94	**37**	**200**
P6SB-03	0.16	0.66	46	ND	ND	ND	**120**	55
P6SB-05	ND	ND	46	ND	ND	ND	ND	140
P6SB-06	ND	ND	40	ND	ND	ND	ND	56
P6SB-07	ND	ND	**330**	ND	ND	ND	ND	67
P6SB-08	0.15	0.17	77	ND	ND	ND	**120**	54
P6SS-11	ND	ND	60	ND	ND	ND	ND	90
P7SB-01	ND	ND	**2100**	ND	ND	ND	ND	26
P7SB-02	ND	0.21	140	ND	ND	0.056	**180**	76
P8SB-01	ND	ND	65	ND	ND	ND	ND	52
P8SB-02	2.4	ND	**260**	ND	ND	ND	ND	**350**
P9SB-01	0.058	0.15	92	ND	ND	ND	**150**	**230**
P9SB-04	0.025	0.19	120	ND	ND	ND	**77**	120
P9SB-05	7.6	1	**160**	ND	ND	ND	**130**	**1900**

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

	Concentration (mg/kg)							
	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**10**	**40**	**150**	**10**	**20**	**1.0**	**1.0**	**200**
P9SB-06	0.017	0.44	28	ND	ND	ND	**22**	38
P9SB-07	0.2	ND	**380**	ND	ND	ND	ND	170
P9SB-08	0.25	ND	130	ND	ND	ND	ND	170
P9SB-09A	0.38	ND	**620**	ND	ND	ND	ND	**350**
P9SB-09B	2.6	ND	**260**	ND	ND	ND	ND	170
P9SB-10	0.081	ND	**210**	ND	ND	ND	ND	50
SB-01-TT	1.5	ND	**280**	ND	ND	ND	**27**	**270**
SB-02-TT	0.49	ND	30	ND	ND	ND	**24**	81
SB-03-TT	ND	ND	**1300**	ND	ND	ND	**710**	27
SB-04-TT	ND	ND	**1600**	ND	ND	ND	**29**	30
SB-05-TT	ND	ND	**850**	ND	ND	ND	**30**	67
SB-06-TT	0.094	ND	**620**	ND	ND	ND	**61**	**490**
SB-07-TT	0.43	ND	**320**	ND	ND	ND	**46**	**310**
SB-08-TT	ND	ND	110	ND	ND	ND	**55**	110
SB-09-TT	0.96	ND	**480**	ND	ND	ND	**48**	**850**
SB-10-TT	ND	ND	**150**	ND	ND	ND	**37**	70
SB-11-TT	0.64	ND	**590**	ND	ND	ND	**33**	**500**
SB-12-TT	0.086	ND	**1100**	ND	ND	ND	**28**	78
SB-13-TT	ND	ND	**1600**	ND	ND	ND	**22**	35
SB-14-TT	ND	ND	**1800**	ND	ND	ND	**37**	33
SPSB-01	ND	ND	25	ND	0.069	ND	ND	83
SPSB-02	ND	ND	110	ND	ND	ND	ND	180
SPSB-03	ND	ND	**610**	ND	ND	ND	ND	45
SPSB-04	2.2	0.69	81	6.7	ND	ND	**100**	**210**
SPSB-05	3.6	1.2	34	0.16	ND	0.03	**22**	100
SPSS-05	ND	ND	**350**	ND	ND	ND	ND	53
SPSS-06	ND	ND	26	ND	ND	ND	ND	**1100**

Table M-20 Burrowing Animal Inorganic Constituents (Continued)

	Concentration (mg/kg)							
	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Screening Levels	**10**	**40**	**150**	**10**	**20**	**1.0**	**1.0**	**200**
SPSS-07	1.8	ND	59	ND	ND	ND	ND	**240**
SPSS-08	4.8	ND	100	ND	ND	ND	ND	**380**
SPTP-01	0.43	0.98	20	ND	0.41	ND	**27**	**410**
SPTP-02	1.3	3.5	27	ND	5.4	ND	**29**	**350**
SPTP-03	0.21	0.23	18	ND	0.48	ND	**34**	**360**
SPTP-04	3.3	2.5	37	3.4	0.55	ND	**50**	**710**
SPTP-06	0.55	0.59	9.1	ND	1.2	0.6	**10**	**1700**
TGU-16	0.74	1.1	34	ND	1	ND	**27**	**300**
TGU-18	**18**	3.8	100	ND	0.26	ND	**53**	**1100**
TGU-23	2.2	0.53	130	ND	ND	ND	**42**	**270**
TGU-24	**11**	2.8	36	0.46	0.58	ND	**25**	**850**
TP-01	0.13	ND	28	ND	1	ND	**26**	43
TP-02	0.22	ND	49	ND	1.2	ND	**31**	58
TP-03	0.57	ND	47	ND	ND	ND	**14**	**230**
TP-04	0.15	ND	30	ND	ND	ND	**16**	**220**
TP-05	**17**	ND	41	ND	ND	ND	**12**	**1400**
TP-06	2.8	ND	50	ND	ND	ND	**18**	**980**
TP-07	0.15	ND	**170**	ND	ND	ND	**85**	**550**
TP-08	1.5	ND	44	ND	ND	ND	**38**	**760**
TP-09	2.4	ND	83	ND	ND	ND	**29**	**770**
TP-10	0.48	ND	65	ND	ND	ND	**68**	100
TP-11	2.4	ND	52	ND	ND	ND	**22**	**260**
TP-12	0.31	ND	64	ND	ND	ND	**24**	73

Table M-21
Samples used in assessment for exposure of burrowing animals to PAH's in soils, from no more than 10 ft in depth

	Concentration (mg/kg)								
Screening Levels	**2-Methyl-naphthalene** **1.0**	**Acenaph-thene** **20**	**Acenaph-thylene** **682**	**Anthracene** **40**	**Benzo (a) anthracene** **40**	**Benzo (a) pyrene** **40**	**Benzo (b) fluoranthene** **40**	**Benzo (g,h,i) perylene** **40**	**Benzo (k) fluoranthene** **40**
CCSB-01	ND	ND	ND	ND	ND	ND	0.0011	0.001	ND
CCSB-02	ND	ND	ND	0.065	0.18	0.18	0.29	0.11	ND
CCSB-03	ND	0.016	0.0079	0.022	0.044	0.046	0.059	0.023	0.02
CCSB-04	ND	ND	ND	ND	ND	0.0011	0.0018	0.0015	ND
CCSB-05	ND	0.033	0.039	0.1	0.35	0.42	0.58	0.29	0.17
CCSS-06	ND	ND	ND	0.063	0.31	0.45	0.58	0.4	0.18
CCSS-07	ND	0.037	0.063	0.072	0.36	0.42	0.55	0.27	0.17
CPSB-01	ND	ND	ND	0.033	0.11	0.09	0.17	0.026	0.032
CPSB-02	ND	0.0024	0.029	0.027	0.15	0.17	0.21	0.081	0.067
CPSB-03	ND	0.0088	0.021	0.039	0.14	0.13	0.17	0.12	0.053
CPSB-04A	ND	0.027	0.021	0.065	0.17	0.23	0.27	0.19	0.082
CPSB-04B	ND	ND	ND	0.0086	0.02	0.02	0.04	0.018	0.0084
P1SB-02	ND	ND	0.0078	ND	0.017	0.025	0.028	0.026	0.011
P1SB-03	ND	ND	0.073	0.042	0.19	0.24	0.29	0.12	0.11
P1SB-04	ND	0.045	ND	0.026	0.063	0.077	0.092	0.051	0.032
P2SB-01	ND	0.15	0.13	0.64	3.2	3.7	5.2	1.9	1.8
P2SB-03	ND	ND	0.0012	0.0016	0.0068	0.0062	0.011	0.0039	ND
P2SB-05	ND	ND	0.025	0.02	0.026	0.035	0.051	0.056	0.012
P2SB-06	ND	0.01	0.028	0.045	0.17	0.29	0.29	0.16	0.085
P2SB-07	ND	0.0089	0.011	0.031	0.064	0.051	0.076	0.032	0.02
P2SB-08	ND	0.0094	0.0074	0.064	0.24	0.24	0.39	0.17	0.12
P2SB-09	ND	0.1	0.07	0.37	1.1	0.97	1.3	0.54	0.43

Table M-21 Burrowing Animal PAH's (Continued)

	Concentration (mg/kg)								
	2-Methyl-naphthalene	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (g,h,i) perylene	Benzo (k) fluoranthene
Screening Levels	**1.0**	**20**	**682**	**40**	**40**	**40**	**40**	**40**	**40**
P2SB-10	ND	0.0068	0.068	0.082	0.31	0.43	0.48	0.44	0.069
P3SB-01	ND	ND	0.0025	0.0023	0.014	0.02	0.023	0.013	ND
P3SB-02	ND	ND	ND	0.013	0.017	0.021	0.028	0.012	0.0091
P4SB-01	ND	0.013	0.01	0.045	0.13	0.16	0.22	0.1	0.069
P4SB-03	ND	ND	ND	ND	0.0013	ND	0.0031	0.0013	ND
P4SB-04	ND	1.2	0.43	3.1	6.6	5.6	6.3	2.7	2.5
P4SB-05	ND	ND	0.0017	0.0036	0.019	0.019	0.022	0.01	0.0081
P4SB-06	ND	0.12	ND	0.18	3.1	5.1	8	4.5	2.5
P4SB-07	ND	ND	ND	0.0025	0.0019	ND	0.0052	0.0039	ND
P4SB-08	ND	ND	ND	ND	ND	ND	0.02	ND	ND
P4SB-09	ND	ND	ND	ND	0.0066	0.011	0.018	0.0094	ND
P4SB-12	ND	ND	0.094	0.13	0.42	0.46	0.63	0.23	0.17
P4SB-14	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-15	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-16	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4TP-AEW-01S	ND	0.0083	0.0087	0.025	0.09	0.083	0.098	0.065	0.031
P4TP-AEW-02B	ND	0.012	0.0055	0.04	0.087	0.084	0.12	0.065	0.04
P4TP-AEW-03S	ND	0.0022	0.0089	0.015	0.048	0.055	0.082	0.037	0.025
P4TP-AEW-04B	ND	0.0044	0.025	0.025	0.11	0.15	0.2	0.14	0.073
P5SB-01	ND	ND	ND	ND	ND	ND	ND	ND	ND
P5SB-02	ND	ND	ND	0.0017	0.01	0.016	0.018	0.017	0.0062
P5SB-03	ND	ND	ND	ND	ND	ND	0.029	ND	ND
P5SB-04	ND	ND	ND	ND	0.013	0.021	0.029	0.018	ND
P5SB-05	ND	ND	0.0026	0.003	0.0062	0.0088	0.0084	0.0066	0.0026

Table M-21 Burrowing Animal PAH's (Continued)

	Concentration (mg/kg)								
	2-Methyl-naphthalene	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (g,h,i) perylene	Benzo (k) fluoranthene
Screening Levels	**1.0**	**20**	**682**	**40**	**40**	**40**	**40**	**40**	**40**
P5SS-06	ND	ND	ND	ND	ND	ND	ND	ND	ND
P5SS-08	ND	ND	ND	ND	0.0045	0.006	0.0062	0.0082	ND
P6SB-01	ND	0.0041	0.038	0.049	0.2	0.23	0.25	0.15	0.074
P6SB-02	ND	ND	0.015	0.019	0.073	0.094	0.13	0.037	0.053
P6SB-03	ND	ND	0.0011	0.0011	0.0042	0.0053	0.0076	0.0053	0.0025
P6SB-05	ND	ND	ND	ND	ND	0.0013	0.0023	0.0016	ND
P6SB-07	ND	0.0017	0.007	0.01	0.066	0.11	0.11	0.068	0.034
P6SB-08	ND	ND	ND	ND	0.021	0.028	0.037	0.025	ND
P6SS-11	ND	ND	ND	ND	ND	0.02	0.029	0.022	ND
P8SB-02	ND	4.2	1.2	7.7	9.8	7.2	8	2.8	3.4
P9SB-01	ND	ND	ND	ND	0.0011	0.0011	0.0016	0.0012	ND
P9SB-02	ND	ND	0.0012	0.0022	0.0039	0.0038	0.006	0.0032	0.0012
P9SB-04	ND	ND	ND	ND	0.031	0.037	0.055	0.047	ND
P9SB-05	ND	0.42	0.16	2.7	6.2	6.8	8.7	3.9	2.8
P9SB-06	ND	ND	ND	ND	ND	ND	ND	ND	ND
P9SB-07	ND	0.03	0.13	0.19	0.51	0.77	0.81	0.97	0.29
P9SB-08	ND	0.078	0.14	0.27	0.62	0.77	0.72	0.76	0.27
P9SB-09A	ND	0.22	ND	0.1	0.17	0.19	0.18	0.11	0.075
P9SB-09B	ND	0.025	0.14	0.23	0.54	0.73	0.79	0.72	0.22
P9SB-10	ND	0.0032	0.0017	0.011	0.0088	0.0081	0.011	0.0072	0.0028
P9SB-11	ND	0.0037	0.0012	0.0051	0.0095	0.01	0.02	0.016	0.0054
P9SB-12	ND	0.022	0.01	0.019	0.043	0.054	0.065	0.041	0.021
P9SB-13	ND	0.0067	0.042	0.043	0.33	0.38	0.49	0.24	0.13
P9SB-14	ND	0.014	0.063	0.068	0.18	0.26	0.33	0.16	0.09
SPSB-01	ND	ND	ND	ND	0.0051	0.0066	0.0097	0.0072	0.0031

Table M-21 Burrowing Animal PAH's (Continued)

	Concentration (mg/kg)								
	2-Methyl-naphthalene	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (g,h,i) perylene	Benzo (k) fluoranthene
Screening Levels	**1.0**	**20**	**682**	**40**	**40**	**40**	**40**	**40**	**40**
SPSB-02	ND	ND	ND	0.2	0.27	0.31	0.4	0.15	0.18
SPSB-03	ND	ND	0.0038	0.0044	0.026	0.033	0.036	0.036	0.011
SPSB-04	ND	0.0063	0.11	0.33	0.82	0.86	0.81	0.6	0.28
SPSB-05	ND	0.015	0.37	0.32	1.3	1.5	1.5	1.5	0.39
SPSS-05	ND	ND	ND	0.0019	0.0073	0.0094	0.011	0.0094	0.003
SPSS-06	ND	ND	ND	ND	0.51	0.95	1.4	1.3	0.41
SPSS-07	ND	ND	ND	ND	0.18	0.16	0.25	0.11	0.091
SPSS-08	ND	ND	0.047	0.041	0.2	0.27	0.33	0.21	0.11
SPTP-01	ND	ND	0.041	0.041	0.15	0.2	0.27	0.086	0.089
SPTP-02	ND	ND	ND	0.052	0.26	0.29	0.43	0.22	0.15
SPTP-03	ND	0.086	0.069	0.19	0.6	0.86	1.2	0.7	0.37
SPTP-04	ND	ND	ND	0.37	1	1.1	1.6	0.75	0.5
SPTP-06	ND	0.015	ND	0.04	0.14	0.2	0.27	0.18	0.095
TGU-16	ND	ND	ND	0.14	0.28	0.3	0.37	0.22	ND
TGU-18	ND	0.23	1.2	1.2	3.5	3.9	3.2	2.6	0.95
TGU-23	ND	0.12	0.55	0.62	1.8	2.1	2.1	1.8	0.51
TGU-24	ND	0.062	0.031	0.18	0.59	0.65	0.95	0.47	0.32

Table M-21 Burrowing Animal PAH's (Continued)

	Concentration (mg/kg)							
Screening Levels	**Chrysene 40**	**Dibenzo (a,h) anthracene 18.4**	**Fluoranthene 40**	**Fluorene 30**	**Indeno(1,2,3-cd)pyrene 40**	**Naphthalene 40**	**Phenanthrene 40**	**Pyrene 0.1**
CCSB-01	ND	ND	ND	ND	ND	ND	ND	0.0012
CCSB-02	0.36	ND	0.33	ND	0.069	0.14	0.5	**0.44**
CCSB-03	0.053	0.0069	0.077	0.03	0.021	0.007	0.092	**0.11**
CCSB-04	0.0015	ND	ND	ND	ND	ND	ND	ND
CCSB-05	0.38	0.087	0.58	0.029	0.27	0.024	0.36	**0.64**
CCSS-06	0.38	0.098	0.44	ND	0.28	ND	0.24	**0.56**
CCSS-07	0.39	0.071	0.62	0.023	0.25	0.013	0.25	**0.77**
CPSB-01	0.21	0.019	0.079	0.0074	0.021	0.085	0.26	**0.11**
CPSB-02	0.19	0.03	0.17	0.0055	0.086	0.015	0.13	**0.2**
CPSB-03	0.17	0.037	0.19	0.015	0.11	0.017	0.18	**0.24**
CPSB-04A	0.2	0.054	0.3	0.048	0.19	0.014	0.26	**0.33**
CPSB-04B	0.038	ND	0.029	0.011	0.011	0.0059	0.035	0.042
P1SB-02	0.031	0.0063	0.022	ND	0.014	0.0068	0.015	0.038
P1SB-03	0.23	0.035	0.3	0.021	0.097	0.039	0.22	**0.38**
P1SB-04	0.073	0.016	0.12	0.018	0.042	0.15	0.12	**0.12**
P2SB-01	3.4	0.69	5.9	0.15	1.8	0.14	3.4	**4.9**
P2SB-03	0.014	0.0012	0.014	ND	0.003	0.0039	0.018	0.018
P2SB-05	0.051	0.011	0.035	0.0067	0.033	0.011	0.069	0.045
P2SB-06	0.17	0.051	0.2	0.009	0.15	0.019	0.13	**0.22**
P2SB-07	0.091	0.013	0.14	0.018	0.032	0.069	0.15	**0.11**
P2SB-08	0.37	0.058	0.42	0.025	0.15	0.2	0.32	**0.43**
P2SB-09	1.1	0.15	2.1	0.082	0.5	0.17	1.5	**2.1**
P2SB-10	0.61	0.04	0.77	0.028	0.32	0.05	0.47	**0.93**
P3SB-01	0.018	0.003	0.022	ND	0.011	0.0018	0.013	0.031
P3SB-02	0.027	0.0051	0.033	0.0085	0.011	0.0065	0.041	0.033
P4SB-01	0.14	0.034	0.25	0.011	0.099	0.026	0.17	**0.23**

Table M-21 Burrowing Animal PAH's (Continued)

	Concentration (mg/kg)							
Screening Levels	**Chrysene 40**	**Dibenzo (a,h) anthracene 18.4**	**Fluoranthene 40**	**Fluorene 30**	**Indeno(1,2,3-cd)pyrene 40**	**Naphthalene 40**	**Phenanthrene 40**	**Pyrene 0.1**
P4SB-03	0.0027	ND	0.0022	0.0011	ND	ND	0.0044	0.0028
P4SB-04	6.5	0.97	14	1.2	2.7	0.56	12	**12**
P4SB-05	0.019	0.0037	0.024	0.0016	0.009	0.0025	0.016	0.026
P4SB-06	3.8	1.4	3.1	0.063	4.1	0.13	0.96	**3**
P4SB-07	0.0058	ND	0.0042	0.0037	0.002	ND	0.007	0.0045
P4SB-08	0.026	ND	ND	ND	ND	ND	0.01	0.011
P4SB-09	0.03	0.0021	0.0098	0.019	0.0018	ND	0.025	0.015
P4SB-12	0.61	0.074	0.67	0.031	0.23	0.2	0.67	**0.8**
P4SB-14	0.087	ND	ND	ND	ND	ND	ND	ND
P4SB-15	0.14	ND	ND	ND	ND	ND	0.17	0.092
P4SB-16	0.31	ND	ND	ND	ND	ND	ND	ND
P4TP-AEW-01S	0.13	0.02	0.12	0.015	0.051	0.019	0.13	**0.18**
P4TP-AEW-02B	0.1	0.019	0.16	0.016	0.053	0.011	0.13	**0.17**
P4TP-AEW-03S	0.063	0.011	0.079	0.0069	0.033	0.018	0.07	0.099
P4TP-AEW-04B	0.16	0.032	0.16	0.011	0.11	0.035	0.14	**0.26**
P5SB-01	0.0059	ND	0.0044	ND	ND	ND	0.0059	0.0057
P5SB-02	0.012	0.0042	0.014	ND	0.013	0.0024	0.011	0.015
P5SB-03	0.078	ND	0.03	ND	ND	ND	0.07	0.079
P5SB-04	0.025	0.005	0.021	ND	0.013	0.0083	0.02	0.029
P5SB-05	0.0066	ND	0.017	0.0014	0.005	ND	0.015	0.021
P5SS-06	0.0013	ND	ND	ND	ND	0.0021	ND	ND
P5SS-08	0.0099	ND	0.0067	ND	0.0037	0.0034	0.0077	0.011
P6SB-01	0.23	0.048	0.26	0.012	0.14	0.023	0.25	**0.31**
P6SB-02	0.15	0.01	0.12	ND	0.027	ND	0.068	**0.18**
P6SB-03	0.0064	0.0015	0.0055	ND	0.0043	0.0011	0.0055	0.0059
P6SB-05	0.0015	ND	0.0019	ND	0.0014	ND	0.0023	0.0024
P6SB-07	0.08	0.013	0.1	0.0025	0.055	0.0024	0.049	**0.12**

Table M-21 Burrowing Animal PAH's (Continued)

	Concentration (mg/kg)							
Screening Levels	**Chrysene 40**	**Dibenzo (a,h) anthracene 18.4**	**Fluoranthene 40**	**Fluorene 30**	**Indeno(1,2,3-cd)pyrene 40**	**Naphthalene 40**	**Phenanthrene 40**	**Pyrene 0.1**
P6SB-08	0.033	ND	0.027	0.014	0.018	ND	0.017	0.04
P6SS-11	0.035	ND	0.02	ND	ND	ND	ND	0.03
P8SB-02	9	1.2	21	6.7	3.1	6.8	26	**19**
P9SB-01	0.0012	ND	0.0021	ND	ND	ND	0.0015	0.0023
P9SB-02	0.0072	0.0012	0.0053	ND	0.0022	0.011	0.018	0.0061
P9SB-04	0.037	ND	0.046	ND	0.033	ND	0.034	0.052
P9SB-05	6.4	1.2	15	0.45	3.7	0.25	11	**13**
P9SB-06	ND	ND	ND	ND	ND	0.0012	ND	ND
P9SB-07	0.66	0.12	1.6	0.052	0.69	0.053	1.1	**1.8**
P9SB-08	0.73	0.12	1.9	0.087	0.63	0.091	1.5	**1.9**
P9SB-09A	0.28	0.058	0.3	0.5	0.085	5.5	0.4	**0.41**
P9SB-09B	0.83	0.13	1.5	0.067	0.56	0.51	1.3	**1.5**
P9SB-10	0.014	0.0021	0.018	0.013	0.0055	0.0036	0.025	0.019
P9SB-11	0.015	0.0029	0.015	0.0082	0.011	0.0045	0.018	0.017
P9SB-12	0.049	0.0094	0.083	0.019	0.037	0.023	0.086	0.091
P9SB-13	0.39	0.075	0.43	0.01	0.25	0.037	0.2	**0.57**
P9SB-14	0.21	0.038	0.48	0.014	0.15	0.031	0.29	**0.5**
SPSB-01	0.0066	ND	0.0081	ND	0.005	0.0037	0.0082	0.0084
SPSB-02	0.34	ND	0.68	ND	0.1	ND	0.77	**0.84**
SPSB-03	0.036	0.0064	0.044	0.0014	0.027	0.0022	0.034	0.07
SPSB-04	0.81	0.14	1.6	0.048	0.49	0.039	0.83	**1.8**
SPSB-05	1.3	0.2	3.4	0.11	1.1	0.12	3.1	**4**
SPSS-05	0.0091	0.0017	0.011	ND	0.0071	0.0013	0.0083	0.016
SPSS-06	0.68	0.38	0.57	ND	1	ND	0.18	**0.64**
SPSS-07	0.23	ND	0.27	ND	0.09	ND	0.16	**0.3**
SPSS-08	0.25	0.043	0.32	ND	0.17	ND	0.15	**0.44**
SPTP-01	0.22	0.02	0.27	0.013	0.063	0.012	0.21	**0.47**

Table M-21 Burrowing Animal PAH's (Continued)

	Concentration (mg/kg)							
Screening Levels	**Chrysene 40**	**Dibenzo (a,h) anthracene 18.4**	**Fluoranthene 40**	**Fluorene 30**	**Indeno(1,2,3-cd)pyrene 40**	**Naphthalene 40**	**Phenanthrene 40**	**Pyrene 0.1**
SPTP-02	0.29	0.057	0.46	ND	0.19	ND	0.23	**0.44**
SPTP-03	0.7	0.2	1.1	0.081	0.65	ND	0.61	**0.9**
SPTP-04	1.1	0.21	2	0.21	0.65	ND	1.4	**1.7**
SPTP-06	0.16	0.048	0.23	ND	0.15	ND	0.14	**0.23**
TGU-16	0.38	ND	0.6	ND	0.18	ND	0.62	**0.63**
TGU-18	3.7	0.67	7.5	0.39	2.2	0.28	4	**8.8**
TGU-23	2	0.34	4.1	0.27	1.4	0.24	3.2	**4.9**
TGU-24	0.65	0.12	1	0.069	0.46	0.023	0.63	**1.1**

Table M-22
Samples used in assessment for exposure of burrowing animals to dioxins, furans, and PCB's in soils, from no more than 10 ft in depth

	Concentration (mg/kg)									
Screening Levels	**Aroclor 1254 0.00025**	**Aroclor 1260 0.00014**	**1,2,3,4,6,7,8-Heptachloro-dibenzofuran (HpCDF) 0.00004**	**1,2,3,4,6,7,8-Heptachloro-dibenzo-P-Dioxin 0.0000002**	**1,2,3,4,7,8,9-Heptachloro-dibenzofuran (HpCDF) 0.00004**	**1,2,3,4,7,8-Hexachloro-dibenzofuran (HxCDF) 0.00004**	**1,2,3,4,7,8-Hexachloro-dibenzo-P-Dioxin 0.0000002**	**1,2,3,6,7,8-Hexachloro-dibenzofuran (HxCDF) 0.00004**	**1,2,3,6,7,8-Hexachloro-dibenzo-P-Dioxin 0.0000002**	**1,2,3,7,8,9-Hexachloro-dibenzo-P-Dioxin 0.0000002**
CCSB-03	ND	**0.0140**	ND	ND	ND	ND	ND	ND	ND	ND
P2SB-03	ND	**0.0160**	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-06	ND	**0.0390**	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-07	ND	**0.0035**	0.00000134	**0.00000393**		0.00000101		0.00000061	**0.00000093**	**0.00000098**
P4SB-08	ND	**0.0043**	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-13	ND	ND	ND	**0.00000110**	ND	0.00000020	0.00000013	0.00000016	0.00000012	0.00000013
P4SB-14	ND	ND	ND	**0.00004310**	0.00000015	0.00000146	**0.00000055**	0.00000077	**0.00000159**	**0.00000161**
P4SB-15	ND	ND	ND	**0.00004470**	ND	0.00000088	**0.00000076**	0.00000058	**0.00000185**	**0.00000213**
P4TP-AEW-02B	ND	**0.059**	ND	ND	ND	ND	ND	ND	ND	ND
P4TP-AEW-04B	ND	**0.056**	ND	ND	ND	ND	ND	ND	ND	ND
P5SB-01	ND	**0.0430**	ND	ND	ND	ND	ND	ND	ND	ND
P6SB-02	ND	**0.2200**	ND	ND	ND	ND	ND	ND	ND	ND
P6SB-08	ND	**0.0023**	ND	ND	ND	ND	ND	ND	ND	ND
P9SB-06	ND	**0.0390**	ND	ND	ND	ND	ND	ND	ND	ND
TP-02	**0.3120**	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-03	**0.1030**	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-05	**0.1290**	**2.3700**	ND	ND	ND	ND	ND	ND	ND	ND
TP-06	**0.3420**	**2.6200**	ND	ND	ND	ND	ND	ND	ND	ND
TP-07	ND	**0.4300**	ND	ND	ND	ND	ND	ND	ND	ND
TP-08	ND	**3.8100**	ND	ND	ND	ND	ND	ND	ND	ND
TP-09	**3.6100**	**3.7300**	ND	ND	ND	ND	ND	ND	ND	ND
TP-10	**3.5800**	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-11	**1.5000**	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table M-22 Burrowing Animal Dioxins, Furans, and PCB's (Continued)

	Concentration (mg/kg)								
Screening Levels	**1,2,3,7,8-Pentachloro-dibenzofuran 0.00004**	**1,2,3,7,8-Pentachloro-dibenzo-P-Dioxin 0.0000002**	**2,3,4,6,7,8-Hexachloro-dibenzofuran (HxCDF) 0.00004**	**2,3,4,7,8-Pentachloro-dibenzofuran (PeCDF) 0.00004**	**2,3,7,8-Tetrachloro-dibenzofuran 0.00004**	**2,3,7,8-Tetrachloro-dibenzo-p-dioxin (TCDD) 0.0000002**	**Heptachloro-dibenzofurans (HpCDF), Total 0.00004**	**Heptachloro-dibenzo-p-dioxins (HpCDD), Total 0.0000002**	**Hexachloro-dibenzofurans (HxCDF), Total 0.00004**
CCSB-03	ND	ND	ND	ND	ND	ND	ND	ND	ND
P2SB-03	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-06	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-07	0.00000073	**0.00000088**	0.00000046	0.00000108	ND	ND	0.00000134	**0.00000732**	0.00000567
P4SB-08	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-13	0.00000020	0.00000011	ND	0.00000019	0.00000024	0.00000013	ND	**0.00000214**	0.00000160
P4SB-14	0.00000066	**0.00000059**	0.00000063	0.00000100	0.00000128	0.00000017	0.00000582	**0.00007800**	0.00001000
P4SB-15	0.00000059	**0.00000073**	0.00000058	0.00000079	0.00000104	**0.00000037**	0.00000281	**0.00007970**	0.00000695
P4TP-AEW-02B									
P4TP-AEW-04B									
P5SB-01	ND	ND	ND	ND	ND	ND	ND	ND	ND
P6SB-02	ND	ND	ND	ND	ND	ND	ND	ND	ND
P6SB-08	ND	ND	ND	ND	ND	ND	ND	ND	ND
P9SB-06	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-02	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-03	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-05	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-06	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-07	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-08	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-09	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-10	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-11	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table M-22 Burrowing Animal Dioxins, Furans, and PCB's (Continued)

	Concentration (mg/kg)					
	Hexachloro-dibenzo-p-dioxins (HxCDD), Total	Octachloro-dibenzofuran	Octachloro-dibenzo-p-dioxin (OCDD)	Pentachloro-dibenzofurans (PeCDF), Total	Pentachloro-dibenzo-p-dioxin (PeCDD), Total	Tetrachloro-dibenzo-p-dioxins (TCDD), Total
Screening Levels	**0.0000002**	**0.00004**	**0.0000002**	**0.00004**	**0.0000002**	**0.0000002**
CCSB-03	ND	ND	ND	ND	ND	ND
P2SB-03	ND	ND	ND	ND	ND	ND
P4SB-06	ND	ND	ND	ND	ND	ND
P4SB-07	**0.00000680**	0.00000154	**0.00001070**	0.00001220	**0.00001030**	**0.00000420**
P4SB-08	ND	ND	ND	ND	ND	ND
P4SB-13	**0.00000049**	0.00000114	**0.00000682**	0.00000224	ND	0.00000014
P4SB-14	**0.00001440**	0.00000926	**0.00023700**	0.00001470	**0.00000142**	**0.00000089**
P4SB-15	**0.00001690**	0.00000461	**0.00025200**	0.00001130	**0.00000122**	**0.00000122**
P4TP-AEW-02B						
P4TP-AEW-04B						
P5SB-01	ND	ND	ND	ND	ND	ND
P6SB-02	ND	ND	ND	ND	ND	ND
P6SB-08	ND	ND	ND	ND	ND	ND
P9SB-06	ND	ND	ND	ND	ND	ND
TP-02	ND	ND	ND	ND	ND	ND
TP-03	ND	ND	ND	ND	ND	ND
TP-05	ND	ND	ND	ND	ND	ND
TP-06	ND	ND	ND	ND	ND	ND
TP-07	ND	ND	ND	ND	ND	ND
TP-08	ND	ND	ND	ND	ND	ND
TP-09	ND	ND	ND	ND	ND	ND
TP-10	ND	ND	ND	ND	ND	ND
TP-11	ND	ND	ND	ND	ND	ND

Table M-23
Samples used in assessment for exposure of burrowing animals to organic constituents in soils, from no more than 10 ft in depth

	Concentration (mb/kg)										
	1,2,4-Trimethyl-benzene	Acetone	Benzene	Bis (2-Ethylhexyl) phthalate	Butyl benzyl phthalate	Chloroform	Chloro-methane	Ethyl Benzene	Methyl ethyl ketone	Methyl isobutyl ketone	Methylene Chloride
Screening Levels	**5**	**2.5**	**0.26**	**0.93**	**0.24**	**0.02**	**77**	**0.03**	**89.6**	**13**	**4.0**
CCSB-03	ND	0.03	ND	ND	ND	ND	ND	ND	0.0042	ND	ND
CPSB-03	ND	0.003	ND	ND	ND	ND	ND	ND	ND	ND	0.0046
P2SB-03	ND	0.025	ND	ND	ND	ND	ND	ND	0.0076	ND	ND
P2SB-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.014
P2SB-10	ND	0.0092	ND	ND	ND	ND	ND	ND	ND	ND	ND
P3SB-02	ND	0.0047	ND	ND	ND	ND	ND	ND	ND	ND	0.0055
P4SB-01	ND	0.003	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-05	ND	0.0027	ND	ND	ND	ND	ND	ND	ND	ND	0.0051
P4SB-06	ND	0.0025	ND	ND	ND	ND	ND	ND	ND	ND	0.011
P4SB-07	ND	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND
P4SB-08	ND	0.0058	ND	ND	ND	ND	ND	ND	ND	ND	0.0061
P5SB-02	0.004	0.0055	ND	ND	ND	ND	ND	ND	ND	ND	ND
P5SB-03	ND	0.025	ND	ND	ND	ND	ND	ND	0.0057	ND	ND
P6SB-01	ND	0.0044	ND	ND	ND	ND	ND	ND	ND	ND	ND
P6SB-02	ND	0.011	ND	ND	ND	ND	ND	ND	0.0022	ND	0.01
P6SB-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0079
P6SB-08	ND	0.031	ND	ND	ND	ND	ND	ND	0.0033	ND	0.0029
P7SB-02	ND	0.0027	ND	ND	ND	ND	ND	ND	ND	ND	ND
P9SB-01	ND	0.011	ND	ND	ND	ND	ND	ND	ND	ND	0.0022
P9SB-04	ND	0.0026	ND	ND	ND	ND	ND	ND	ND	ND	0.004
P9SB-05	ND	0.0032	ND	ND	ND	ND	ND	ND	ND	ND	0.0064
P9SB-06	ND	0.027	ND	ND	ND	0.0045	ND	ND	0.0074	ND	0.002
SPSB-04	ND	0.0023	ND	ND	ND	ND	ND	ND	ND	ND	0.0042

Table M-23 Burrowing Soil Animal Organic Constituents (Continued)

Locations	Concentration (mg/kg)					
	p-Isopropyltoluene	Toluene	Trichlorofluoromethane	Xylene, o-	Xylenes, m,p-	Xylenes, Total
Screening Levels	2.75	5.4	16.4	35	16	0.05
CCSB-03	0.0013	ND	ND	ND	ND	ND
CPSB-03	ND	ND	ND	ND	ND	ND
P2SB-03	ND	ND	ND	ND	ND	ND
P2SB-06	ND	ND	ND	ND	ND	ND
P2SB-10	ND	ND	ND	ND	ND	ND
P3SB-02	ND	ND	ND	ND	ND	ND
P4SB-01	ND	ND	ND	ND	ND	ND
P4SB-05	ND	ND	ND	ND	ND	ND
P4SB-06	ND	ND	ND	ND	ND	ND
P4SB-07	ND	ND	ND	ND	ND	ND
P4SB-08	ND	ND	ND	ND	ND	ND
P5SB-02	ND	ND	ND	0.0012	ND	0.0023
P5SB-03	ND	ND	ND	ND	ND	ND
P6SB-01	ND	ND	ND	ND	ND	ND
P6SB-02	ND	0.0011	ND	ND	ND	ND
P6SB-03	ND	ND	ND	ND	ND	ND
P6SB-08	ND	ND	ND	ND	ND	ND
P7SB-02	ND	ND	ND	ND	ND	ND
P9SB-01	ND	ND	ND	ND	ND	ND
P9SB-04	ND	ND	ND	ND	ND	ND
P9SB-05	ND	ND	ND	ND	ND	ND
P9SB-06	ND	ND	ND	ND	ND	ND
SPSB-04	ND	ND	ND	ND	ND	ND

Table M-24
Samples used in assessment for exposure of burrowing animals to TPH's in soils, from no more than 10 ft in depth

	Concentration (mg/kg)			
Screening Level	TPHd(g) 20 [1]	TPHd(mo) 200	TPHg 20	TPHmo 200
CCSB-01	1.6	1.6	ND	4.6
CCSB-02	**600**	**600**	0.3	**1900**
CCSB-03	**57**	57	4.1	64
CCSB-04	2.2	2.2	0.078	20
CCSB-05	**50**	50	0.072	180
CCSS-06	**60**	60	0.074	**330**
CCSS-07	**52**	52	0.073	**230**
CCTP-03	**2700**	**2700**	0.47	**3500**
CPSB-01	**240**	**240**	0.098	**220**
CPSB-02	17	17	0.09	25
CPSB-03	**20**	20	0.078	23
CPSB-04A	17	17	0.063	66
CPSB-04B	**100**	100	1.1	**360**
P1SB-02	6.4	6.4	ND	51
P1SB-03	**150**	150	0.084	170
P1SB-04	**41**	41	0.061	190
P2SB-01	**410**	**410**	ND	**1600**
P2SB-03	**33**	33	0.055	100
P2SB-05	15	15	0.096	20
P2SB-06	11	11	0.1	30
P2SB-07	**46**	46	0.075	64
P2SB-08	**86**	86	0.077	**500**
P2SB-09	**68**	68	0.054	**280**
P3SB-01	18	18	0.052	87
P3SB-02	**75**	75	0.074	**620**
P4SB-01	15	15	0.073	120
P4SB-03	1.4	1.4	0.062	3.2
P4SB-04	**130**	130	0.076	**250**
P4SB-05	9.6	9.6	0.058	18
P4SB-06	**120**	120	0.075	**930**
P4SB-07	**38**	38	0.11	**240**
P4SB-08	**35**	35	0.069	**370**
P4SB-09	**50**	50	0.091	84

[1] No screening level was available for TPHd, so the screening levels of both THPg and TPHmo are used.

Table M-24 Burrowing Soil Animal TPH's (Continued)

	Concentration (mg/kg)			
Screening Level	TPHd(g) 20[1]	TPHd(mo) 200	TPHg 20	TPHmo 200
P4SB-10	0.58	0.58	0.071	6.3
P4SB-11	0.76	0.76	0.069	1.2
P4SB-12	**240**	**240**	0.18	**600**
P4SB-13	7.7	7.7	**33**	2.3
P4SB-14	**85**	85	0.053	**460**
P4SB-15	**220**	**220**	0.065	**690**
P4SB-16	**280**	**280**	0.35	**1200**
P4TP-AEW-01S	**57**	57	0.097	**220**
P4TP-AEW-02B	**32**	32	0.093	95
P4TP-AEW-03S	16	16	0.075	50
P4TP-AEW-04B	**36**	36	0.094	170
P5SB-01	**32**	32	0.08	**210**
P5SB-02	4.9	4.9	0.27	24
P5SB-03	**1100**	**1100**	0.13	**790**
P5SB-04	**34**	34	0.11	**200**
P5SB-05	0.26	0.26	0.093	ND
P5SS-06	1.3	1.3	0.11	11
P5SS-07	**53**	53	0.44	**310**
P5SS-08	14	14	ND	79
P6SB-01	**56**	56	ND	84
P6SB-02	**75**	75	0.099	**800**
P6SB-03	**28**	28	0.065	140
P6SB-05	14	14	0.072	32
P6SB-06	3	3	0.053	7
P6SB-07	**21**	21	0.18	190
P6SB-08	**560**	**560**	17	**800**
P6SS-11	**55**	55	0.062	**660**
P7SB-01	1.5	1.5	0.17	2.5
P7SB-02	0.33	0.33	0.098	ND
P8SB-01	0.2	0.2	0.052	ND
P8SB-02	**2400**	**2400**	16	**1200**
P9SB-01	0.66	0.66	ND	3.1
P9SB-02	**24**	24	0.059	22
P9SB-04	**49**	49	0.045	130
P9SB-05	**99**	99	0.072	**210**
P9SB-06	**33**	33	0.14	**1100**
P9SB-07	**64**	64	0.19	**350**
P9SB-08	**60**	60	0.28	**270**
P9SB-09A	**750**	**750**	0.35	**950**
P9SB-11	18	18	0.062	11
P9SB-12	8.8	8.8	0.064	50
P9SB-13	**58**	58	0.057	180
SPSB-01	5.9	5.9	0.07	47

Table M-24 Burrowing Soil Animal TPH's (Continued)

	Concentration (mg/kg)			
	TPHd(g)	TPHd(mo)	TPHg	TPHmo
Screening Level	**20**[1]	**200**	**20**	**200**
SPSB-02	**110**	110	0.15	**920**
SPSB-03	0.58	0.58	0.075	0.9
SPSB-04	**130**	130	0.066	**210**
SPSB-05	**57**	57	0.11	56
SPSS-05	**28**	28	0.077	41
SPSS-06	**83**	83	0.068	**650**
SPSS-07	**65**	65	0.56	**430**
SPSS-08	**87**	87	0.4	**620**
SPTP-01	**120**	120	0.093	**590**
SPTP-02	**48**	48	ND	**250**
SPTP-03	**98**	98	0.052	**900**
SPTP-04	**120**	120	0.075	**920**
SPTP-06	17	17	0.087	130
TGU-16	**120**	120	0.076	**590**
TP-02	ND	ND	ND	**304**
TP-03	**23.5**	23.5	ND	**323**
TP-04	ND	ND	ND	**2070**
TP-05	**22.3**	22.3	ND	**259**
TP-06	**20.4**	20.4	ND	76.9
TP-07	12.8	12.8	ND	31.6
TP-08	**20**	20	0.36	**242**
TP-09	**21.2**	21.2	0.99	**247**
TP-10	ND	ND	ND	118
TP-11	16.1	16.1	ND	120
TP-12	ND	ND	ND	146

Table M-25
Samples used in assessment of risk to estuarine receptors from dissolved inorganic constituents in groundwater

	Concentration (µg/L)									
Solubility Screening Level	**Antimony Insoluble 30**	**Arsenic Insoluble 0.14**	**Barium Reacts w/water 1000**	**Beryllium insoluble 0.53**	**Cadmium insoluble 0.25**	**Chromium insoluble 180**	**Cobalt Insoluble 3.0**	**Copper Insoluble 3.1**	**Lead Insoluble 2.50**	**Mercury Insoluble 0.025**
CCMW-01	0.54	**4.4**	150	ND	ND	0.53	0.83	ND	**12**	ND
CCSB-03	3.2	ND	74	ND	ND	ND	1.4	**3.5**	**37**	ND
CCSB-04	ND	**15**	ND	ND	ND	4.5	77	**3.9**	ND	ND
CPMW-01	1.7	**120**	63	ND	ND	0.47	0.41	1.7	0.17	ND
CPSB-01	ND	ND	ND	ND	ND	1	ND	ND	1.2	ND
GB-01-TR	ND	ND	250	ND	ND	ND	ND	ND	ND	ND
GB-02-TR	ND	ND	410	ND	ND	ND	ND	ND	ND	ND
GB-03-TR	ND	ND	260	ND	ND	ND	ND	ND	ND	ND
GB-04-TR	ND	ND	110	ND	ND	ND	ND	ND	ND	ND
GB-05-TR	ND	ND	ND	ND	ND	50	ND	ND	ND	ND
P2MW-01	0.85	**4.7**	380	ND	ND	0.18	1.2	2	0.24	ND
P2SB-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P2SB-04	ND	ND	ND	ND	ND	ND	ND	ND	0.82	ND
P2SB-06	ND	**2.9**	120	**0.62**	ND	1.6	**5.4**	**10**	ND	ND
P2SB-10	ND	**4.3**	ND	ND	ND	ND	1.4	ND	ND	ND
P3MW-01	0.49	**4.2**	30	ND	ND	20	2.1	0.3	0.42	ND
P3SB-02	ND	**3.3**	100	ND	ND	ND	16	ND	ND	ND
P6SB-01	ND	ND	120	ND	ND	ND	**4.7**	**3.3**	1.3	ND
P6SB-02	8.2	**19**	100	ND	ND	ND	1.9	ND	1.8	**0.17**
P8MW-01	1.4	**4.8**	38	ND	ND	3.8	0.43	**33**	2	ND
P8SB-01	ND	ND	47	ND	ND	ND	1.9	**3.2**	**3.9**	ND
P9MW-01	0.22	**7.2**	510	ND	ND	0.18	1.2	**5**	0.26	ND
P9MW-02	ND	**6.6**	580	ND	ND	2.2	0.39	2.5	ND	ND
P9MW-03	ND	**10**	ND	ND	ND	1.4	11	ND	ND	ND
P9MW-04	ND	**12**	ND	ND	ND	ND	ND	ND	ND	ND
P9SB-04	ND	ND	**1200**	ND	ND	ND	ND	2.9	1.3	ND

solubilites from HSDB unless noted otherwise
Cobalt, Copper, Lead Solubility from NIOSH Pocket Guide to Chemical Hazards

Table M-25 Groundwater Dissolved Inorganic Constituents (Continued)

	Concentration (µg/L)									
Solubility Screening Level	**Antimony Insoluble** **30**	**Arsenic Insoluble** **0.14**	**Barium Reacts w/water** **1000**	**Beryllium insoluble** **0.53**	**Cadmium insoluble** **0.25**	**Chromium insoluble** **180**	**Cobalt Insoluble** **3.0**	**Copper Insoluble** **3.1**	**Lead Insoluble** **2.50**	**Mercury Insoluble** **0.025**
P9SB-06	ND	**1.9**	620	ND	ND	ND	**3.7**	1.8	**2.7**	ND
P9SB-07	ND	**9.6**	ND	ND	ND	2.9	**3.2**	**6.3**	ND	ND
P9SB-09A	ND	**8**	ND	ND	**16**	7	**59**	**26**	ND	ND
P9SB-09B	ND	**7.7**	ND	ND	ND	1.6	**7.9**	**8.1**	ND	ND
P9SB-10	ND	**14**	ND	ND	ND	ND	**6.8**	**4.1**	ND	ND
SPMW-01	0.23	**18**	130	ND	ND	0.54	**7.2**	**3.1**	0.18	ND
SPSB-04	ND	**11**	190	ND	ND	ND	**16**	**6.7**	**7.7**	ND
SPTP-05	ND	**9.8**	73	ND	ND	ND	ND	**5.3**	**5.8**	ND
TMW-28A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table M-25 Groundwater Dissolved Inorganic Constituents (Continued)

	Concentration (µg/L)						
Solubility Screening Level	**Molybdenum Insoluble 240**	**Nickel Insoluble 8.2**	**Selenium Insoluble 5.0**	**Silver Insoluble 0.19**	**Thallium Insoluble 4.0**	**Vanadium Insoluble 19**	**Zinc Insoluble 81**
CCMW-01	4.7	5.7	ND	ND	ND	2.5	9.2
CCSB-03	ND	2.6	3.4	ND	ND	3.9	ND
CCSB-04	ND	**61**	ND	ND	ND	ND	**100**
CPMW-01	1.9	1.2	0.19	ND	ND	1.7	9
CPSB-01	ND	**31**	ND	ND	ND	ND	**83**
GB-01-TR	ND	ND	ND	ND	ND	ND	ND
GB-02-TR	ND	ND	ND	ND	ND	ND	ND
GB-03-TR	110	ND	ND	ND	ND	ND	ND
GB-04-TR	ND	ND	ND	ND	ND	ND	64
GB-05-TR	ND	ND	ND	ND	ND	ND	ND
P2MW-01	1.9	2.8	0.33	ND	ND	0.53	7.3
P2SB-02	ND	**11**	ND	ND	ND	ND	24
P2SB-04	ND	**16**	ND	ND	ND	ND	18
P2SB-06	14	**33**	**8.7**	**5**	ND	3	19
P2SB-10	ND	4.9	ND	ND	ND	ND	6.8
P3MW-01	3.1	**10**	0.58	ND	ND	4.3	10
P3SB-02	5.1	**27**	ND	ND	ND	2.8	ND
P6SB-01	4.2	**8.7**	ND	ND	ND	ND	66
P6SB-02	52	5.9	ND	ND	ND	15	ND
P8MW-01	3.8	2.9	0.48	ND	ND	6.6	22
P8SB-01	ND	4.1	ND	ND	ND	1.2	8.4
P9MW-01	0.48	0.74	ND	ND	ND	1.8	13
P9MW-02	0.87	3.3	ND	ND	ND	0.18	51
P9MW-03	ND	**12**	ND	ND	ND	ND	ND
P9MW-04	ND	ND	ND	ND	ND	ND	63
P9SB-04	ND	ND	ND	ND	ND	ND	7.8
P9SB-06	3.9	**10**	ND	ND	ND	0.72	ND
P9SB-07	ND	5.1	ND	ND	ND	ND	ND
P9SB-09A	ND	**69**	ND	ND	ND	ND	**3100**

Table M-25 Groundwater Dissolved Inorganic Constituents (Continued)

	Concentration (µg/L)						
Solubility Screening Level	**Molybdenum Insoluble 240**	**Nickel Insoluble 8.2**	**Selenium Insoluble 5.0**	**Silver Insoluble 0.19**	**Thallium Insoluble 4.0**	**Vanadium Insoluble 19**	**Zinc Insoluble 81**
P9SB-09B	ND	7.9	ND	ND	ND	ND	23
P9SB-10	ND	**32**	ND	ND	ND	ND	12
SPMW-01	4	5.5	ND	ND	ND	0.63	17
SPSB-04	11	**12**	ND	ND	3.6	ND	15
SPTP-05	3.2	**9.3**	ND	ND	ND	ND	7.7
TMW-28A	ND	ND	ND	ND	ND	ND	13

Table M-26
Samples used in assessment of risk to estuarine receptors from total inorganic constituents in groundwater

	Concentration (µg/L)										
	Antimony	**Arsenic**	**Barium Reacts w/water**	**Boron**	**Chromium**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**
Solubility	**Insoluble**	**Insoluble**		**Insoluble**	**Insoluble**	**Insoluble**	**Insoluble**	**Insoluble**	**Insoluble**	**Insoluble**	**Insoluble**
Screening Level	**30**	**0.14**	**1000**	**1.6**	**180**	**3.0**	**3.1**	**2.5**	**0.025**	**240**	**8.2**
CCMW-01	ND	**7.5**	ND	ND	ND	1	ND	**15**	ND	ND	2.7
CPMW-01	ND	**130**	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW-01	ND	**40**	180	**400**	ND	ND	**70**	**330**	**1**	ND	ND
GW-02	**110**	**30**	170	**2370**	70	**30**	**40**	**220**	**1**	30	**200**
GW-03	**110**	**35**	300	**2490**	40	ND	**280**	**330**	**1**	20	**100**
GW-04	**140**	**100**	**1180**	**2750**	**200**	**40**	**920**	**1150**	**8**	50	**300**
GWDG3	ND	**2.4**	ND	ND	ND	ND	ND	**22**	ND	ND	2.3
GWDG4	ND	**3.3**	ND	ND	2.7	ND	ND	1.1	ND	ND	**8.5**
P2MW-01	ND	**4.1**	ND	ND	ND	ND	**10**	**29**	**0.37**	ND	ND
P3MW-01	ND	**5.2**	ND	ND	27	ND	2.5	ND	ND	ND	6.4
P8MW-01	ND	**4**	ND	ND	ND	ND	2.3	ND	ND	ND	1.7
P9MW-01	ND	**4.1**	ND	ND	2.5	1.7	4	ND	**0.066**	ND	2.5
P9MW-02	ND	**3.7**	ND	ND	1.8	1.2	2.9	ND	ND	ND	3.1
P9MW-03	ND	**3.9**	ND	ND	5.8	13	ND	ND	**0.042**	ND	**18**
P9MW-04	ND	**7.7**	ND	ND	4.1	1.8	2.3	ND	ND	ND	2.3
SPMW-01	ND	**20**	ND	ND	ND	2.8	2.7	ND	ND	ND	4
TMW-28A	ND	**18**	ND	ND	ND	ND	2.4	ND	ND	ND	ND

Table M-26 Groundwater Total Inorganic Constituents (Continued)

	Concentration (µg/L)			
Solubility Screening Level	**Silver Insoluble 0.19**	**Thallium Insoluble 4.0**	**Vanadium Insoluble 19**	**Zinc Insoluble 81**
CCMW-01	ND	ND	ND	20
CPMW-01	ND	ND	ND	ND
GW-01	ND	**100**	ND	**220**
GW-02	**10**	**300**	**40**	**380**
GW-03	**10**	**400**	**40**	**1420**
GW-04	**20**	**500**	**110**	**2190**
GWDG3	ND	ND	ND	ND
GWDG4	ND	ND	ND	ND
P2MW-01	ND	ND	ND	**100**
P3MW-01	ND	ND	ND	ND
P8MW-01	ND	ND	ND	ND
P9MW-01	ND	ND	ND	ND
P9MW-02	ND	ND	ND	ND
P9MW-03	ND	ND	ND	ND
P9MW-04	ND	ND	ND	ND
SPMW-01	ND	ND	ND	ND
TMW-28A	ND	ND	ND	ND

Table M-27
Samples used in assessment of risk to estuarine receptors from PAH's in groundwater

	Concentration (µg/L)								
	Acenaph-thene	**Acenaph-thylene**	**Anthracene**	**Benzo (a) anthracene**	**Benzo (a) pyrene**	**Benzo (b) fluoranthene**	**Benzo (g,h,i) perylene**	**Benzo (k) fluoranthene**	**Chrysene**
Solubility	**insoluble**	**16100**	**1290**	**9.4**	**1.6**	**1.2**	**0.4**	**0.8**	**1.89**
Screening Level	**20**	**30**	**0.730**	**0.027**	**0.014**	**0.029**	**0.100**	**0.049**	**0.049**
CCMW-01	0.4	0.2	0.2	ND	ND	ND	ND	ND	ND
CCSB-03	0.5	0.09	0.1	**0.06**	**0.04**	**0.05**	ND	0.03	**0.1**
CCSB-04	0.05	0.03	0.06	**0.1**	**0.1**	**0.2**	0.1	**0.05**	**0.2**
CPMW-01	0.1	ND	ND	**0.05**	**0.04**	**0.06**	0.02	ND	**0.07**
CPSB-01	0.09	0.1	0.3	**0.5**	**0.5**	**0.5**	**0.2**	**0.2**	**0.6**
CPSB-04B	0.5	0.1	0.3	**0.2**	**0.3**	**0.3**	**0.3**	**0.09**	**0.6**
GB-05-TR	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWDG3	0.2	0.07	ND	ND	ND	ND	ND	ND	ND
P2MW-01	0.2	ND	0.04	ND	ND	ND	ND	ND	ND
P2SB-02	ND	ND	ND	ND	ND	ND	ND	ND	ND
P2SB-04	ND	ND	0.02	ND	ND	**0.03**	0.02	ND	0.03
P2SB-10	0.3	0.4	0.6	**0.9**	**1.2**	**1.1**	**0.8**	**0.3**	**1**
P3MW-01	ND	ND	ND	ND	ND	ND	ND	ND	ND
P3SB-02	0.2	0.1	0.3	**0.3**	**0.3**	**0.4**	**0.2**	**0.1**	**0.4**
P4SB-12	ND	0.05	0.04	**0.2**	**0.2**	**0.2**	0.09	**0.09**	**0.2**
P6SB-01	ND	0.02	0.03	**0.08**	**0.09**	**0.1**	0.07	0.04	**0.1**
P6SB-02	ND	0.05	0.07	**0.1**	**0.1**	**0.1**	0.09	**0.05**	**0.1**
P8MW-01	ND	0.09	0.2	ND	ND	ND	ND	ND	ND
P8SB-01	ND	0.03	0.06	ND	ND	ND	ND	ND	ND
P9MW-01	ND	ND	0.02	ND	ND	ND	ND	ND	ND
P9MW-02	0.1	ND	0.02	ND	ND	ND	ND	ND	ND

Table M-27 Groundwater PAH's (Continued)

	Concentration (µg/L)								
	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (g,h,i) perylene	Benzo (k) fluoranthene	Chrysene
Solubility	**insoluble**	**16100**	**1290**	**9.4**	**1.6**	**1.2**	**0.4**	**0.8**	**1.89**
Screening Level	**20**	**30**	**0.730**	**0.027**	**0.014**	**0.029**	**0.100**	**0.049**	**0.049**
P9MW-03	0.8	0.08	0.2	0.02	ND	ND	ND	ND	ND
P9MW-04	ND	ND	0.02	ND	ND	ND	ND	ND	ND
P9SB-04	5.3	ND	ND	**4.2**	ND	**3.1**	**1.1**	ND	**13**
P9SB-06	8.2	4.1	**7.3**	**7.5**	ND	**8.6**	**3.8**	**2.5**	**17**
P9SB-07	ND	ND	ND	ND	ND	**0.08**	0.07	ND	ND
P9SB-09A	ND	ND	ND	**0.5**	**0.7**	**0.9**	**0.5**	ND	**1**
P9SB-09B	0.7	0.5	**0.9**	**1.7**	**1.9**	**2**	**1.3**	**0.7**	**2**
P9SB-10	1.8	ND	ND	ND	ND	ND	ND	ND	**1.8**
P9SB-11	6.4	ND	ND	ND	ND	**2.2**	ND	ND	**11**
P9SB-12	6	2.9	**3.1**	**3.3**	**2.8**	**2.9**	**1.5**	**1.4**	**3.4**
P9SB-13	ND	ND	ND	ND	ND	**3.1**	ND	ND	**5.3**
SPSB-04	ND	0.1	0.1	**0.6**	**0.7**	**0.9**	**0.4**	**0.3**	**0.6**
TMW-28A	0.3	0.3	0.09	ND	**0.1**	**0.1**	0.04	0.03	**0.06**

Table M-27 Groundwater PAH's (Continued)

	Concentration (µg/L)						
	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene
Solubility	**0.6**	**200**	**insoluble**	**62**	**31,000**	**1,150**	**135**
Screening Level	**0.049**	**8.0**	**3.9**	**0.048**	**21.0**	**4.6**	**2.0**
CCMW-01	ND	0.1	0.7	ND	0.1	0.6	0.1
CCSB-03	ND	0.2	0.5	ND	0.1	0.9	0.3
CCSB-04	0.03	0.2	0.09	**0.09**	0.1	0.3	0.3
CPMW-01	ND	0.1	ND	ND	0.03	ND	0.2
CPSB-01	**0.05**	0.8	0.1	**0.2**	0.3	0.4	0.8
CPSB-04B	ND	0.4	0.4	**0.3**	0.9	0.5	0.7
GB-05-TR	ND	ND	ND	ND	4.21	ND	ND
GWDG3	ND	0.2	ND	ND	0.03	0.02	0.2
P2MW-01	ND	0.04	0.03	ND	0.06	0.08	0.06
P2SB-02	ND	0.03	0.04	ND	ND	0.03	0.03
P2SB-04	ND	0.05	0.06	ND	0.03	0.07	0.05
P2SB-10	**0.3**	1.4	0.4	**0.6**	0.9	1.4	**2.2**
P3MW-01	ND	ND	ND	ND	ND	0.02	0.02
P3SB-02	**0.06**	0.9	0.4	**0.2**	0.4	0.9	0.8
P4SB-12	0.02	0.3	ND	**0.08**	0.1	0.2	0.3
P6SB-01	0.02	0.1	0.02	**0.06**	0.04	0.2	0.2
P6SB-02	ND	0.2	ND	**0.07**	0.05	0.2	0.3
P8MW-01	ND	ND	ND	ND	ND	ND	ND
P8SB-01	ND	ND	ND	ND	ND	ND	0.05
P9MW-01	ND	ND	0.09	ND	0.03	0.1	0.02
P9MW-02	ND	ND	ND	ND	ND	0.02	0.03
P9MW-03	ND	0.3	0.6	ND	2	1.3	0.2
P9MW-04	ND	ND	ND	ND	ND	0.02	ND
P9SB-04	ND	2.6	ND	ND	ND	ND	**6**

Table M-27 Groundwater PAH's (Continued)

	Concentration (µg/L)						
	Dibenzo (a,h) anthracene	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-cd) pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
Solubility	**0.6**	**200**	**insoluble**	**62**	**31,000**	**1,150**	**135**
Screening Level	**0.049**	**8.0**	**3.9**	**0.048**	**21.0**	**4.6**	**2.0**
P9SB-06	ND	**15**	**7.2**	ND	7.6	**23**	**17**
P9SB-07	ND	0.08	ND	ND	ND	ND	0.3
P9SB-09A	**0.2**	1	0.9	**0.4**	**26**	1.7	1.9
P9SB-09B	**0.3**	4.2	0.8	**1.1**	1.7	**4.8**	**5.2**
P9SB-10	ND	ND	ND	ND	ND	2.5	1.4
P9SB-11	ND	4.3	ND	ND	ND	**15**	**9.2**
P9SB-12	**0.4**	**8.7**	**6.9**	**1.4**	7.9	**15**	**7.8**
P9SB-13	ND	ND	ND	ND	ND	ND	**8.4**
SPSB-04	**0.1**	0.8	0.06	**0.4**	2.4	0.4	0.8
TMW-28A	ND	0.1	ND	0.03	0.3	0.02	**7.4**

Table M-28
Samples used in assessment of risk to estuarine receptors from organic constituents in groundwater

Location	Concentration (µg/L)								
	1,1-Dichloroethane	1,2,4-Trimethylbenzene	Acetone	Benzene	Bis (2-Ethylhexyl) phthalate	Chloroform	Chloro-methane	Ethyl Benzene	Methyl ethyl ketone
Solubility	**5,040,000**	**57,000**	**miscible**	**1,790,000**	**270**	**7,950,000**	**5,320,000**	**169,000**	**223,000,000**
Screening Level	**47.0**	**43.5**	**1500**	**46.0**	**5.9**	**470**	**1100**	**30.0**	**8400**
CCMW-01	ND	ND	ND	ND	ND	ND	ND	ND	ND
CCSB-03	ND	ND	12	ND	ND	ND	ND	ND	ND
GB-01-TR	ND	ND	ND	ND	ND	ND	ND	ND	ND
GB-05-TR	ND	ND	ND	0.9	ND	ND	ND	ND	ND
P2MW-01	ND	ND	1.5	ND	ND	ND	ND	ND	ND
P2SB-02	ND	ND	ND	ND	ND	ND	ND	ND	ND
P2SB-06	ND	ND	ND	ND	ND	ND	ND	ND	ND
P2SB-10	ND	ND	1.9	ND	ND	ND	ND	ND	ND
P3MW-01	ND	ND	ND	ND	ND	ND	ND	ND	ND
P3SB-02	ND	ND	4.6	ND	ND	ND	ND	ND	ND
P4SB-12	ND	ND	ND	ND	ND	ND	ND	ND	ND
P6SB-01	ND	ND	1.5	ND	ND	ND	ND	ND	ND
P6SB-02	ND	ND	6.9	ND	ND	ND	ND	ND	ND
P8MW-01	ND	ND	ND	ND	ND	0.1	ND	ND	ND
P8SB-01	ND	ND	1.8	ND	ND	ND	ND	ND	ND
P9MW-02	0.3	ND	1.2	ND	ND	ND	ND	ND	ND
P9MW-03	31	0.4	3.4	ND	ND	ND	ND	ND	1.1
P9SB-04	ND	ND	4.8	ND	ND	0.6	ND	ND	ND
P9SB-06	ND	ND	4.1	ND	ND	ND	ND	ND	ND
SPMW-01	ND	ND	ND	ND	ND	ND	ND	ND	ND
SPSB-04	ND	0.7	4.2	2.6	ND	ND	0.3	1.3	ND
TMW-28A	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table M-28 Groundwater Organic Constituents (Continued)

Location	Concentration (µg/L)						
	Methylene Chloride	p-Isopropyltoluene	Toluene	Total Cyanide	Xylene, o-	Xylenes, m,p-	Xylenes, Total
Solubility	**13,000,000**	**23,400**	**526,000**	**NA**	**178,000**	**NA**	**106,000**
Screening Level	**1600**	**10,000**	**40.0**	**1.0**	**13.0**	**NA**	**100**
CCMW-01	0.6	ND	ND	ND	ND	ND	ND
CCSB-03	ND	0.3	ND	ND	ND	ND	ND
GB-01-TR	ND	5.26	ND	ND	ND	ND	ND
GB-05-TR	ND	0.98	ND	ND	ND	ND	ND
P2MW-01	ND	ND	ND	ND	ND	ND	ND
P2SB-02	ND	ND	0.18	ND	0.19	ND	0.27
P2SB-06	ND	ND	ND	**30**	ND	ND	ND
P2SB-10	ND	ND	ND	ND	ND	ND	ND
P3MW-01	0.2	ND	ND	ND	ND	ND	ND
P3SB-02	ND	ND	ND	ND	ND	ND	ND
P4SB-12	0.2	ND	ND	ND	ND	ND	ND
P6SB-01	ND	ND	ND	**20**	ND	ND	ND
P6SB-02	ND	ND	ND	ND	ND	ND	ND
P8MW-01	ND	ND	ND	ND	ND	ND	ND
P8SB-01	ND	ND	ND	**40**	ND	ND	ND
P9MW-02	ND	ND	ND	ND	ND	ND	ND
P9MW-03	ND	0.3	ND	ND	ND	ND	ND
P9SB-04	ND	ND	ND	ND	ND	ND	ND
P9SB-06	ND	ND	ND	**30**	ND	ND	ND
SPMW-01	ND	1.3	ND	ND	ND	ND	ND
SPSB-04	ND	0.8	ND	ND	ND	ND	1.1
TMW-28A	0.2	ND	ND	ND	ND	ND	ND

Table M-29
Samples used in assessment of risk to estuarine receptors from TPH's in groundwater

	Concentration (µg/L)		
	TPHd	**TPHg**	**TPHmo**
Solubility	**200.00**	**Insoluble**	**Insoluble**
Screening Level	**210**	**210**	**210**
CCMW-01	140	48	ND
CCSB-03	**880**	82	**610**
CCSB-04	**990**	23	**1,100**
CPMW-01	150	40	160
CPSB-01	**410**	75	**440**
CPSB-04B	**8,200**	22	**8,200**
GB-05-TR	171	ND	**342**
GWDG3	30	42	ND
GWDG4	9	26	ND
P2MW-01	ND	28	ND
P2SB-02	12	28	ND
P2SB-04	ND	13	ND
P2SB-06	ND	30	ND
P2SB-10	47	15	67
P3MW-01	17	34	ND
P3SB-02	120	ND	ND
P4SB-12	160	27	51
P6SB-01	ND	31	ND
P6SB-02	ND	15	ND
P8MW-01	16	29	ND
P8SB-01	11	13	ND
P9MW-01	64	23	ND

Table M-29 Groundwater TPH's (Continued)

	Concentration (µg/L)		
	TPHd	**TPHg**	**TPHmo**
Solubility	**200.00**	**Insoluble**	**Insoluble**
Screening Level	**210**	**210**	**210**
P9MW-02	120	25	130
P9MW-03	44	22	ND
P9MW-04	17	15	ND
	85,000	**6,600**	**66,000**
P9SB-06	**120,000**	**3,300**	**98,000**
P9SB-07	**120,000**	**970**	**96,000**
P9SB-09A	**11,000**	**7,000**	**2,600**
P9SB-09B	**560**	18	**470**
P9SB-10	**13,000**	**480**	**12,000**
P9SB-11	**120,000**	**1,900**	**85,000**
P9SB-12	**1,200**	29	**1,100**
P9SB-13	**180,000**	**720**	**150,000**
SPMW-01	10	21	ND
SPSB-04	36	10	ND
TMW-28A	140	35	ND

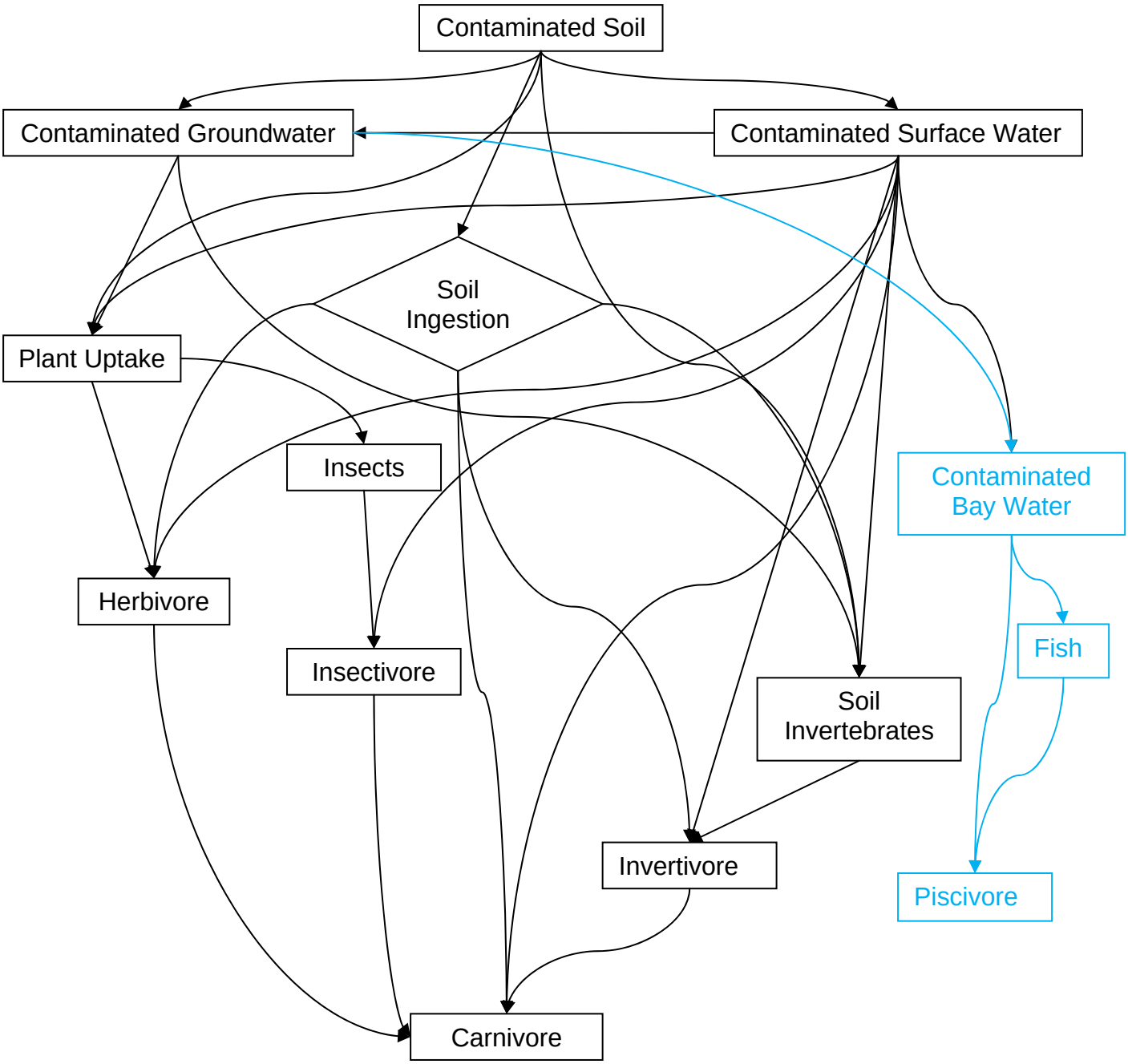


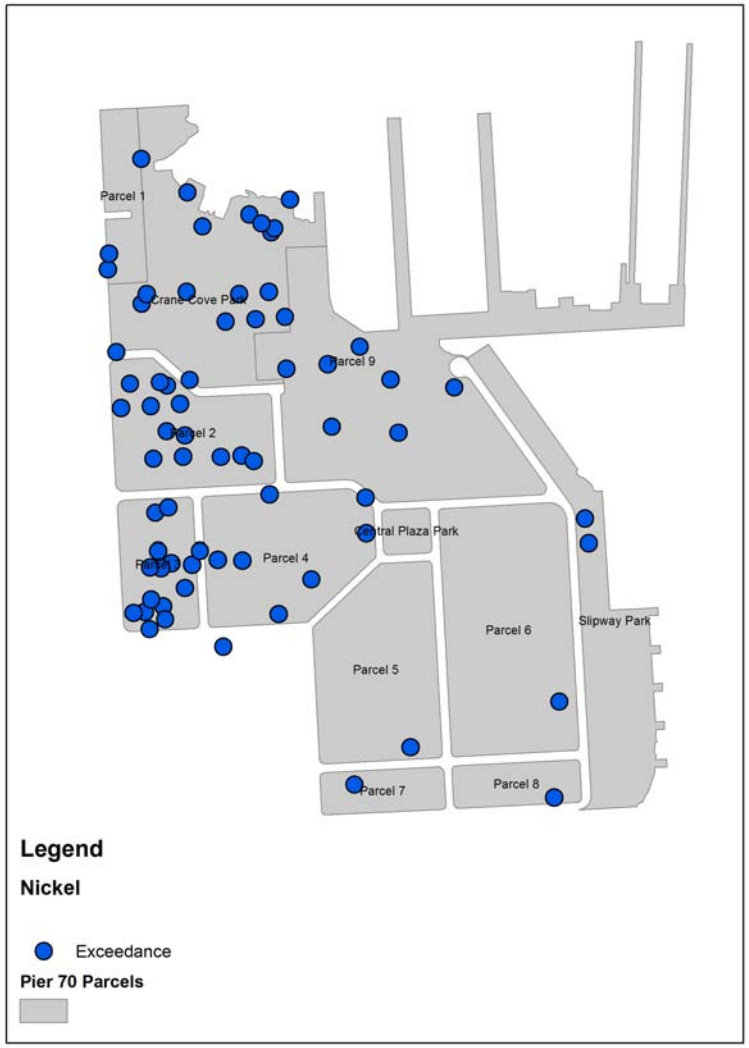
Figure M-1
Food Web

Figure M-2
Surface Soils—Inorganic Constituent Ecological Soil Screening Level Exceedances

Figure M-2
Surface Soils—Inorganic Constituent (Continued)

Figure M-2
Surface Soils—Inorganic Constituent (Continued)

Figure M-2
Surface Soils—Inorganic Constituent (Continued)



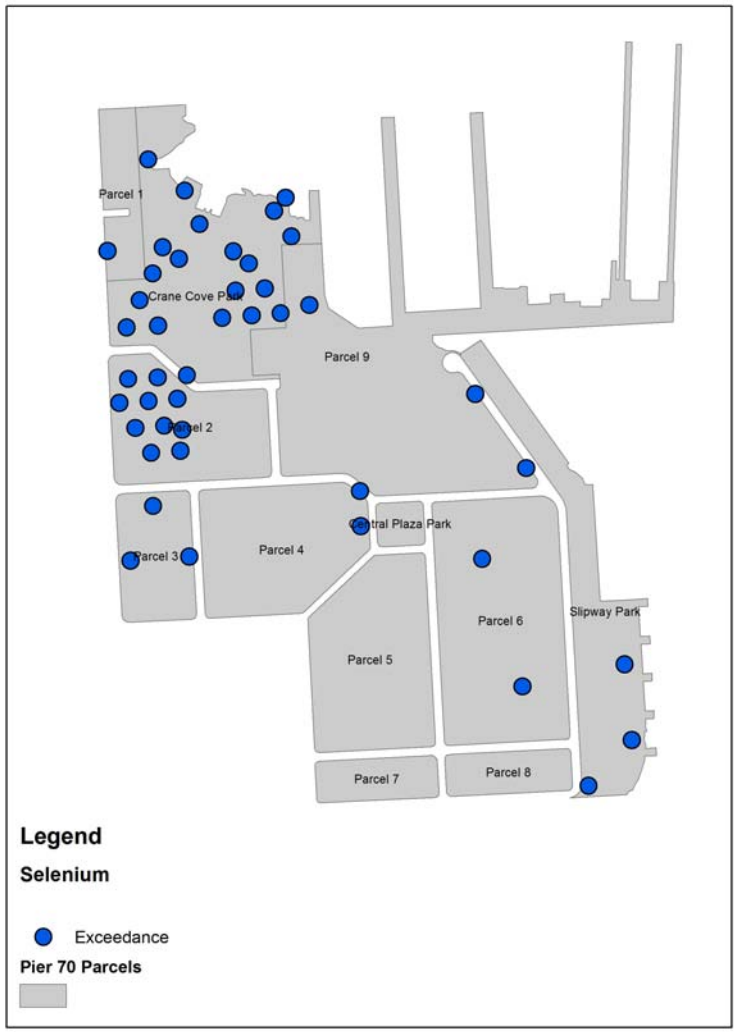
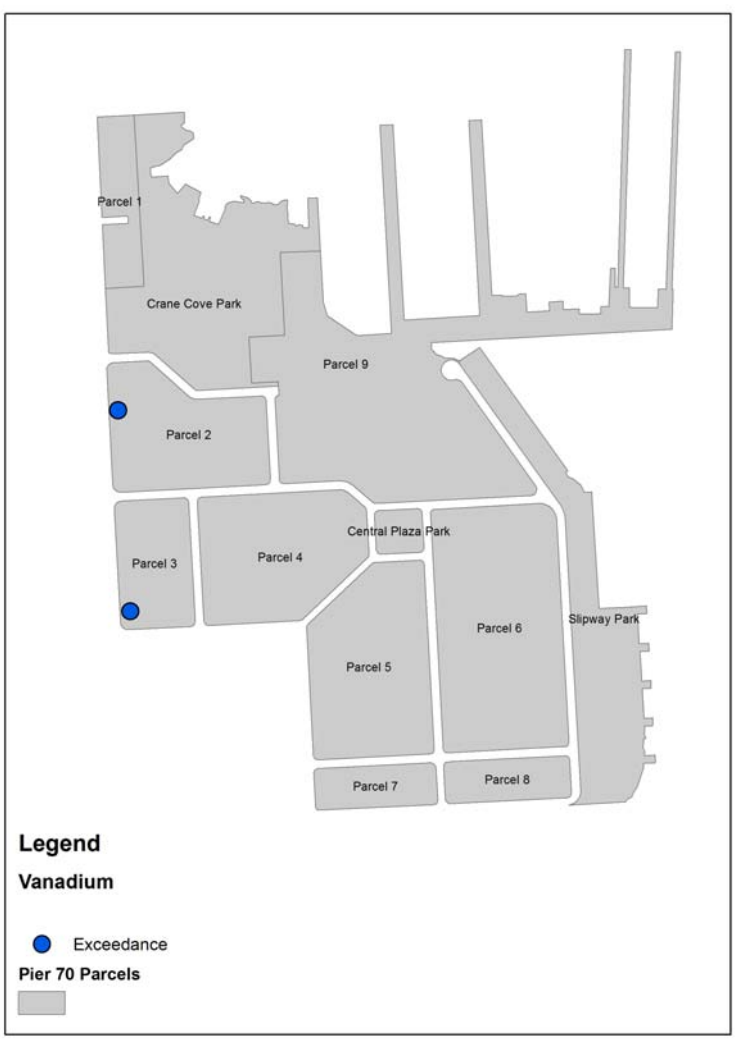


Figure M-2
Surface Soils—Inorganic Constituent (Continued)

Figure M-2
Surface Soils—Inorganic Constituent (Continued)



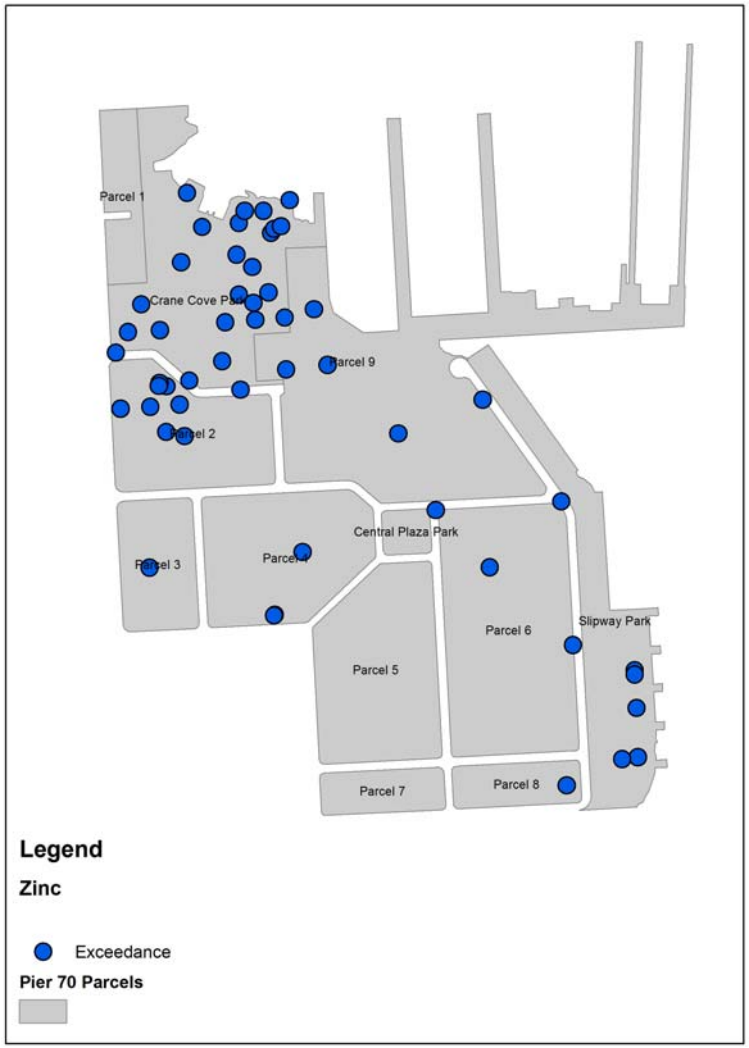


Figure M-2
Surface Soils—Inorganic Constituent (Continued)

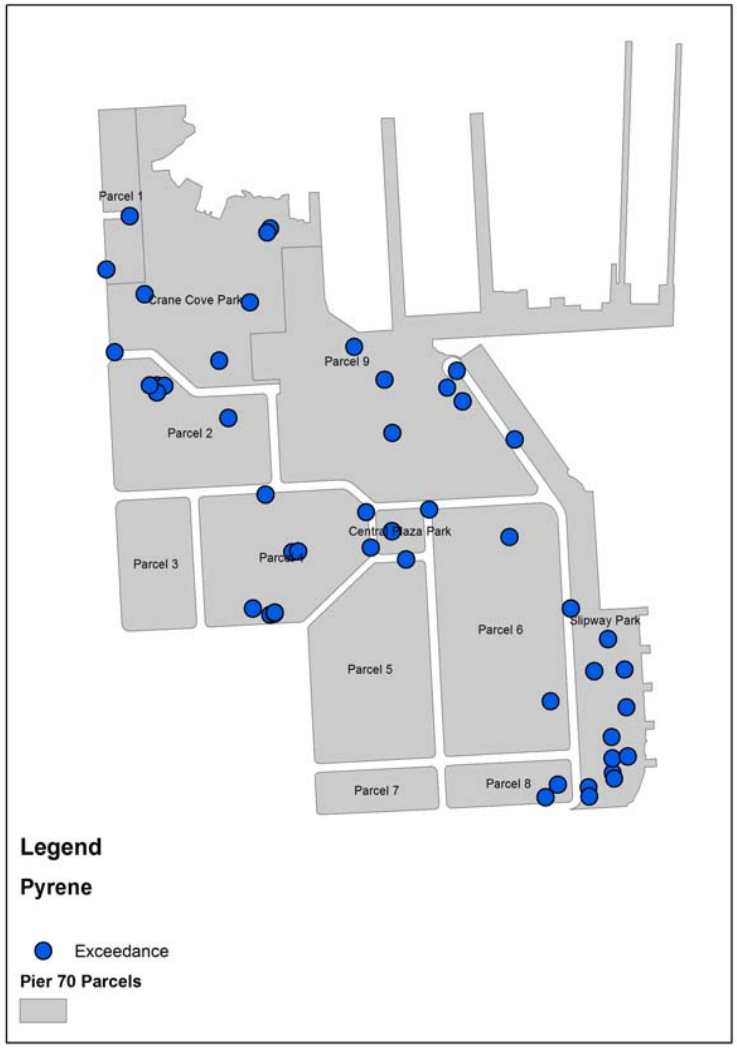
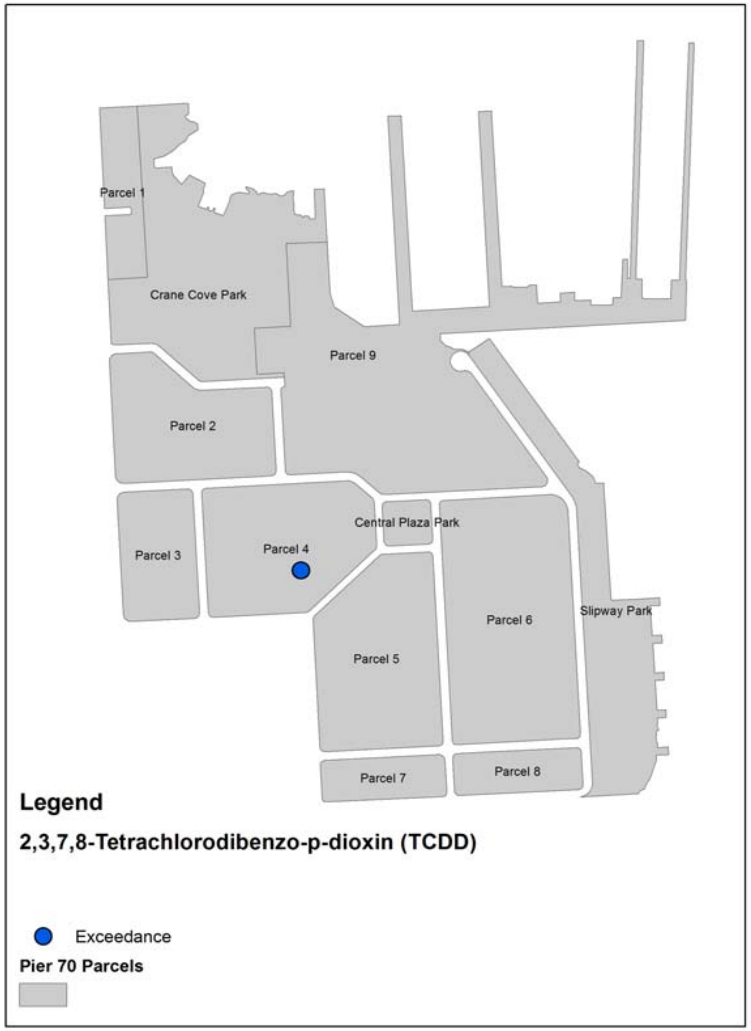


Figure M-3
Surface Soils—PAH Ecological Soil Screening Level Exceedances

Figure M-4
Surface Soils—Dioxin, Furan, and PCB Ecological Soil Screening Level Exceedances

Figure M-4
Surface Soils—Dioxin, Furan, and PCB (Continued)

Figure M-4
Surface Soils—Dioxin, Furan, and PCB (Continued)



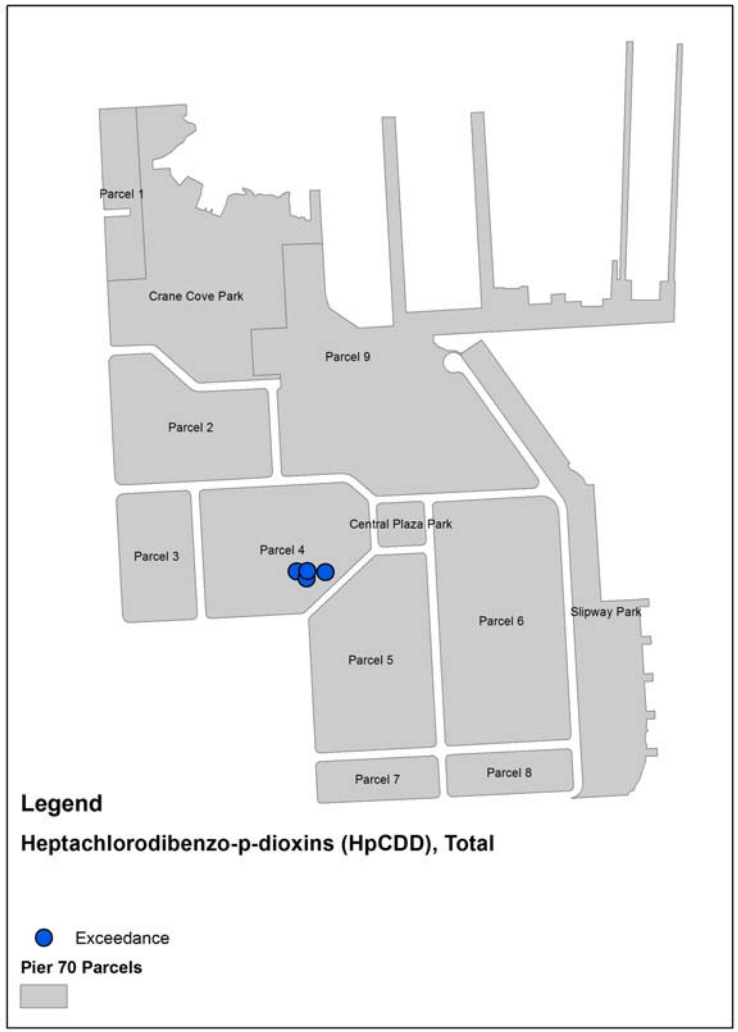
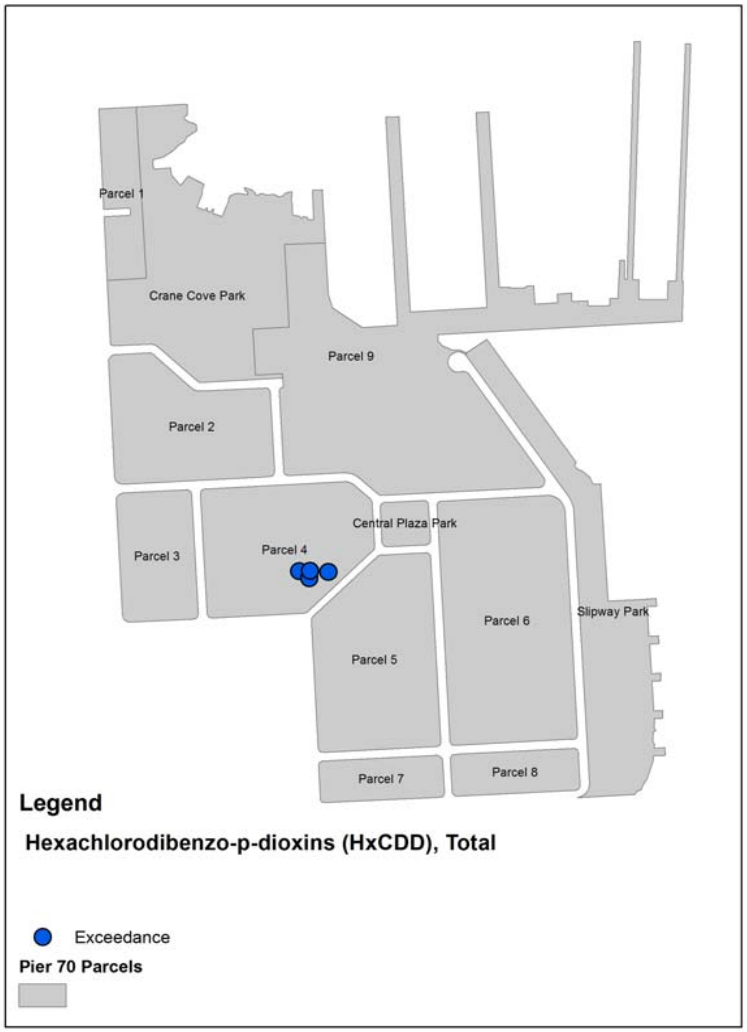


Figure M-4
Surface Soils—Dioxin, Furan, and PCB (Continued)



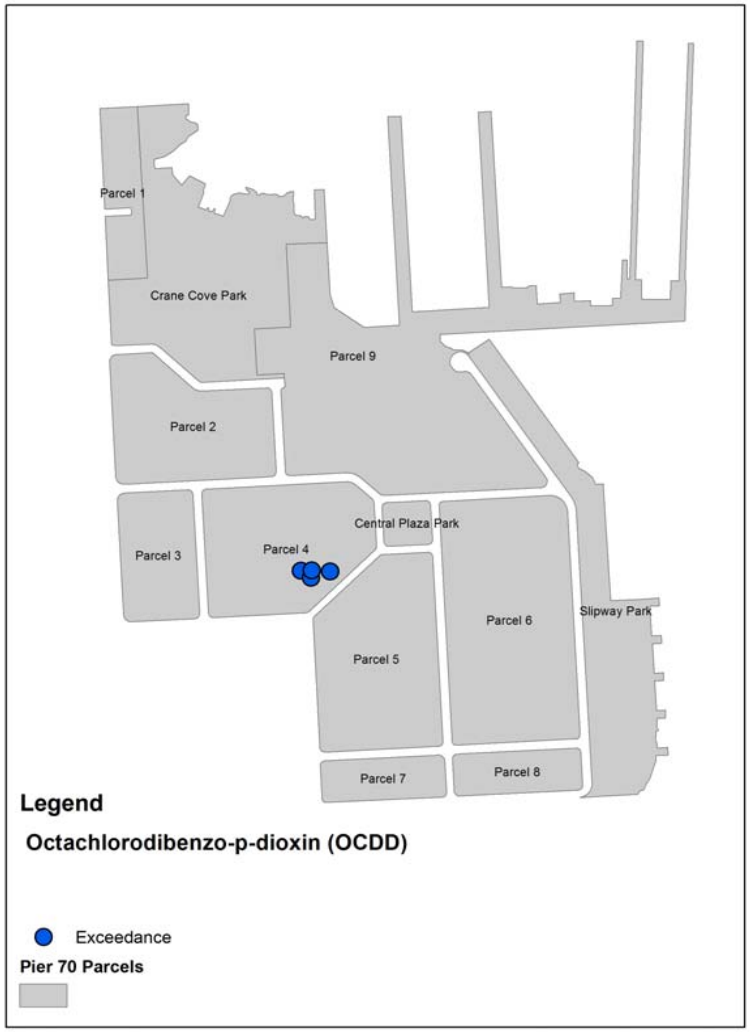


Figure M-4
Surface Soils—Dioxin, Furan, and PCB (Continued)

Figure M-4
Surface Soils—Dioxin, Furan, and PCB (Continued)

Figure M-5
Surface Soils—TPH Ecological Soil Screening Level Exceedances

Figure M-5
Surface Soils—TPH (Continued)

Figure M-6
Burrowing Animals—Inorganic Constituent Ecological Soil Screening Level Exceedances

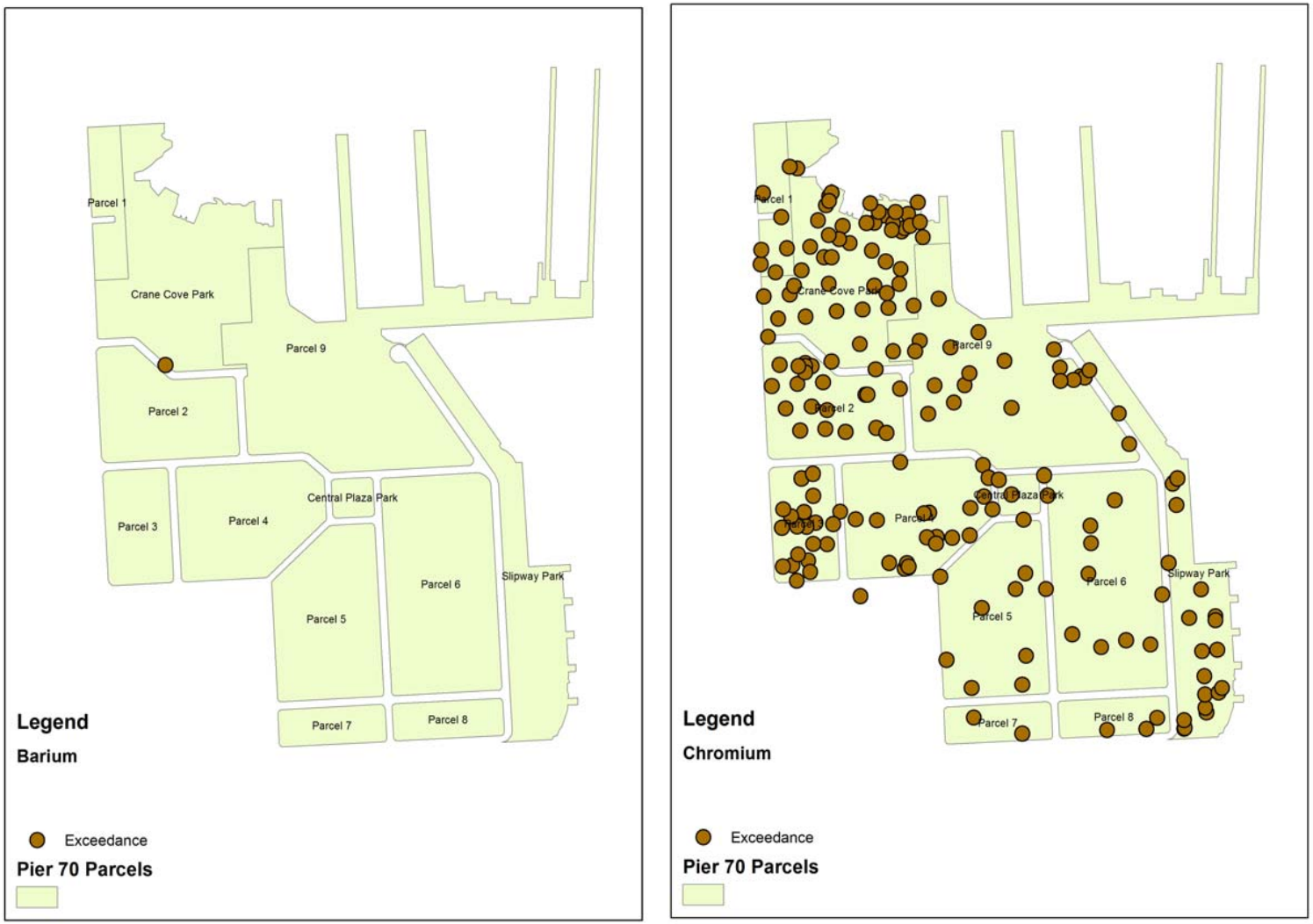


Figure M-6
Burrowing Animals—Inorganic Constituent (Continued)

Figure M-6
Burrowing Animals—Inorganic Constituent (Continued)

Figure M-6
Burrowing Animals—Inorganic Constituent (Continued)

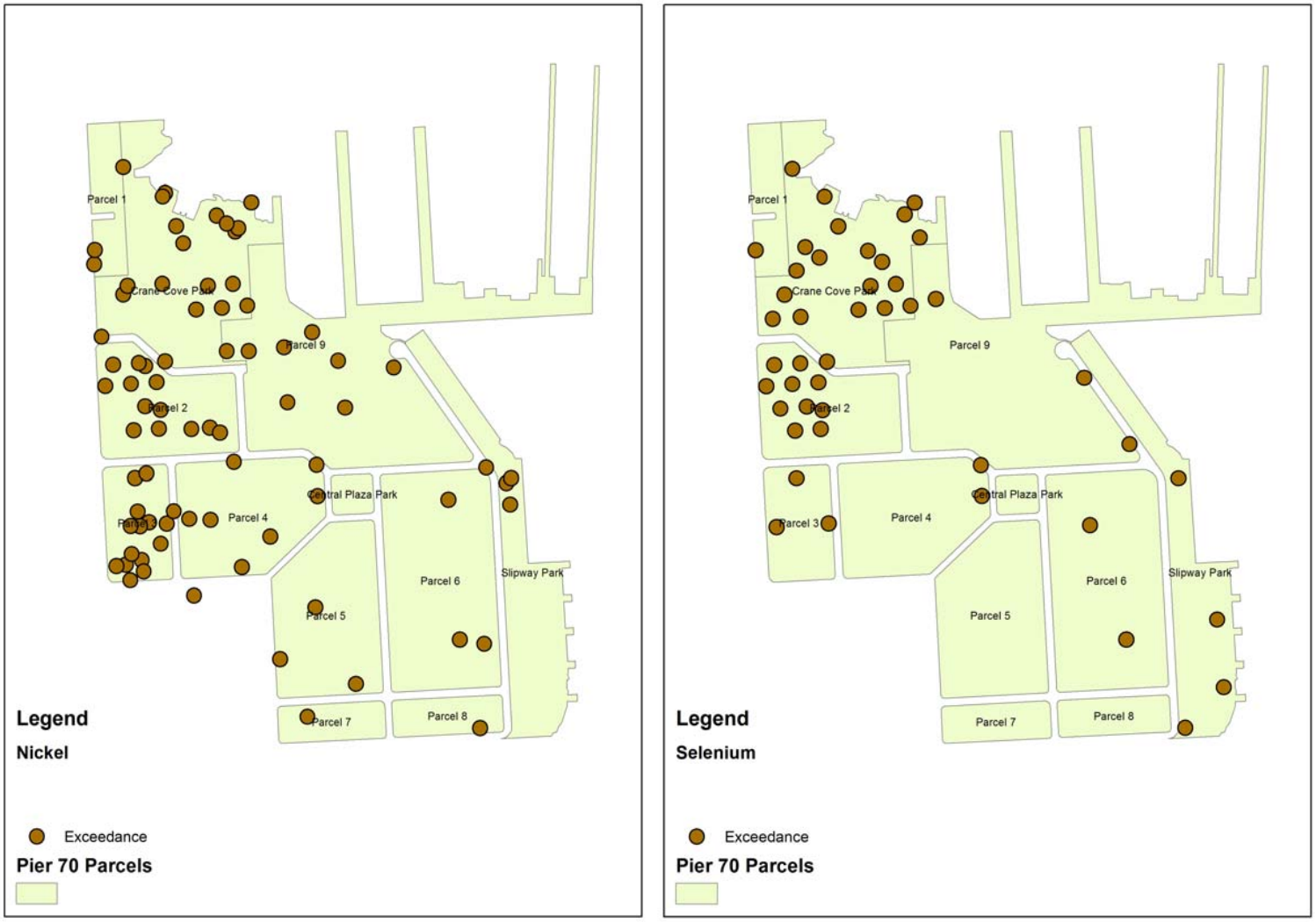


Figure M-6
Burrowing Animals—Inorganic Constituent (Continued)

Figure M-6
Burrowing Animals—Inorganic Constituent (Continued)

Figure M-6
Burrowing Animals—Inorganic Constituent (Continued)

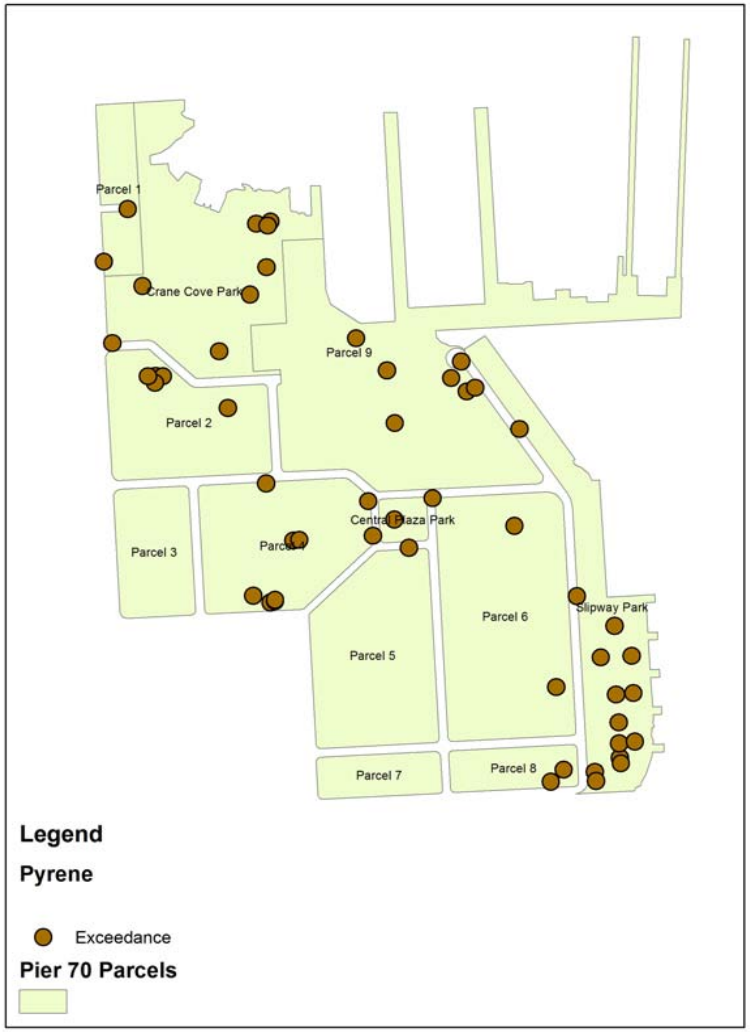
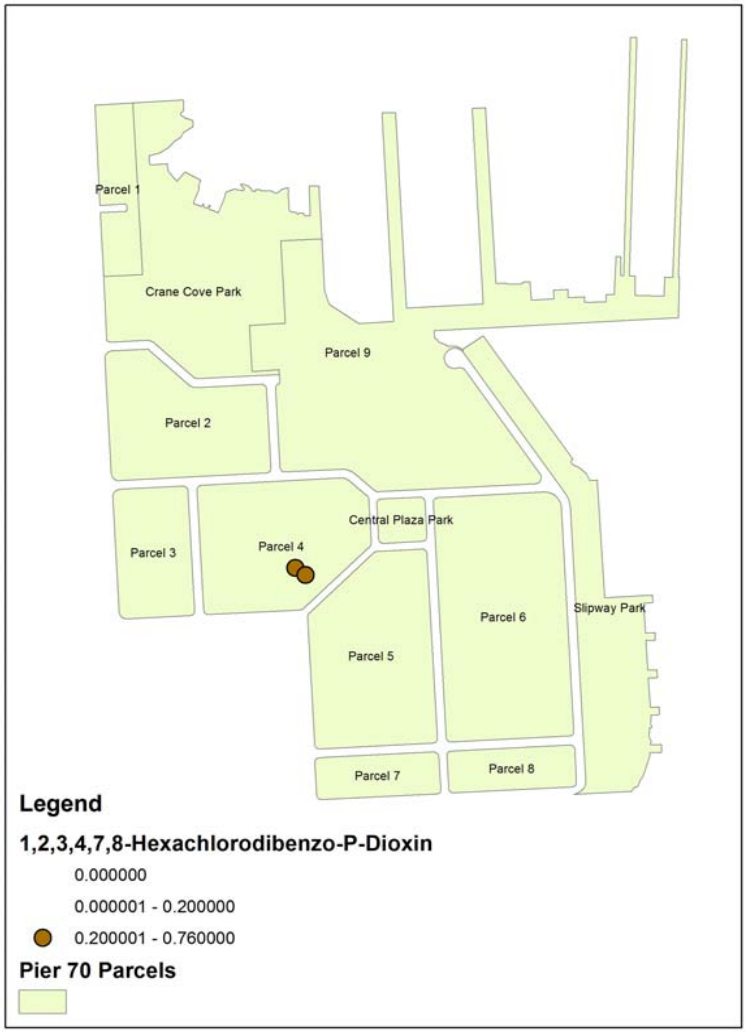


Figure M-7
Burrowing Animals—PAH Ecological Soil Screening Level Exceedances

Figure M-8
Burrowing Animals—Dioxin, Furan and PCB Ecological Soil Screening Level Exceedances



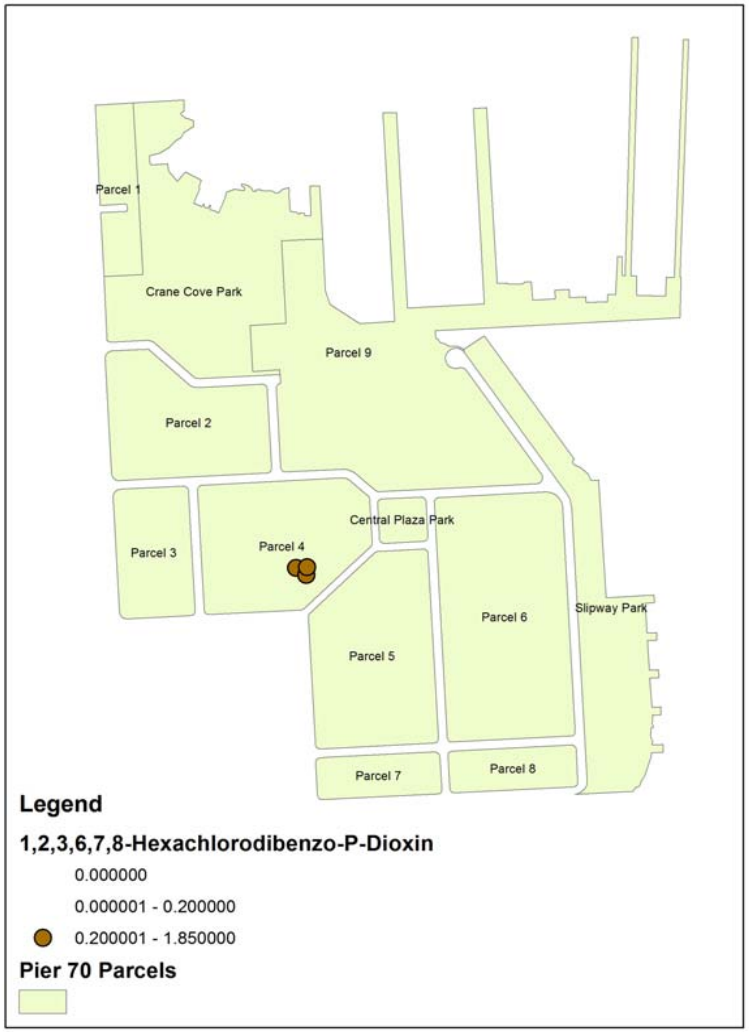
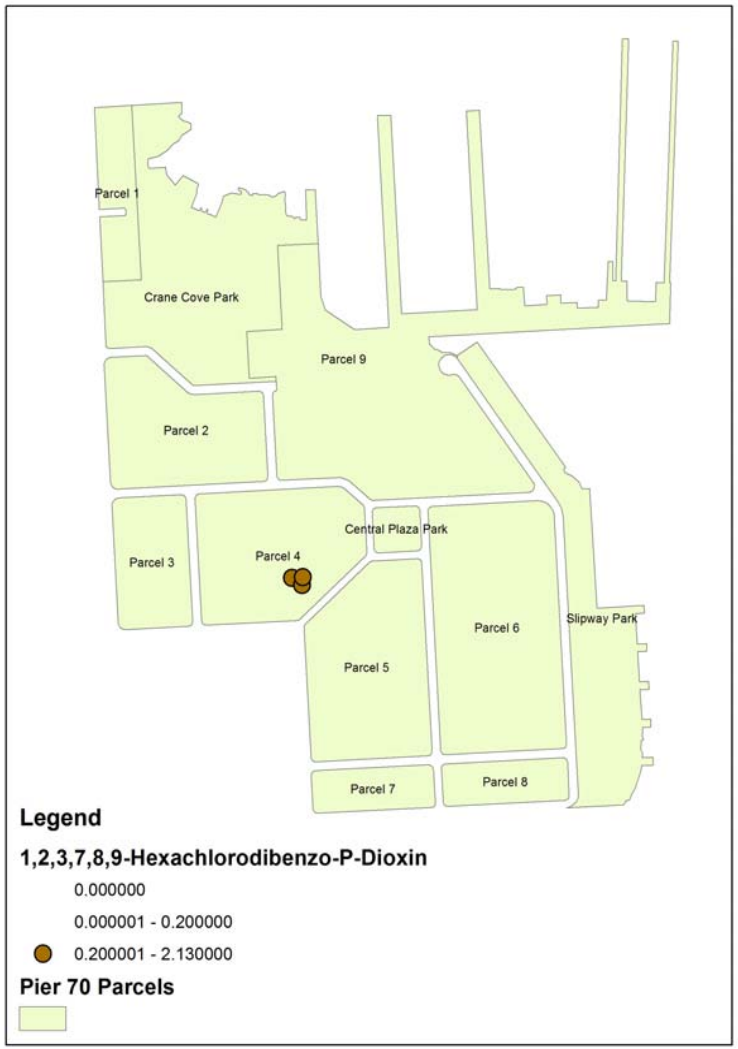


Figure M-8
Burrowing Animals—Dioxin, Furan and PCB (Continued)



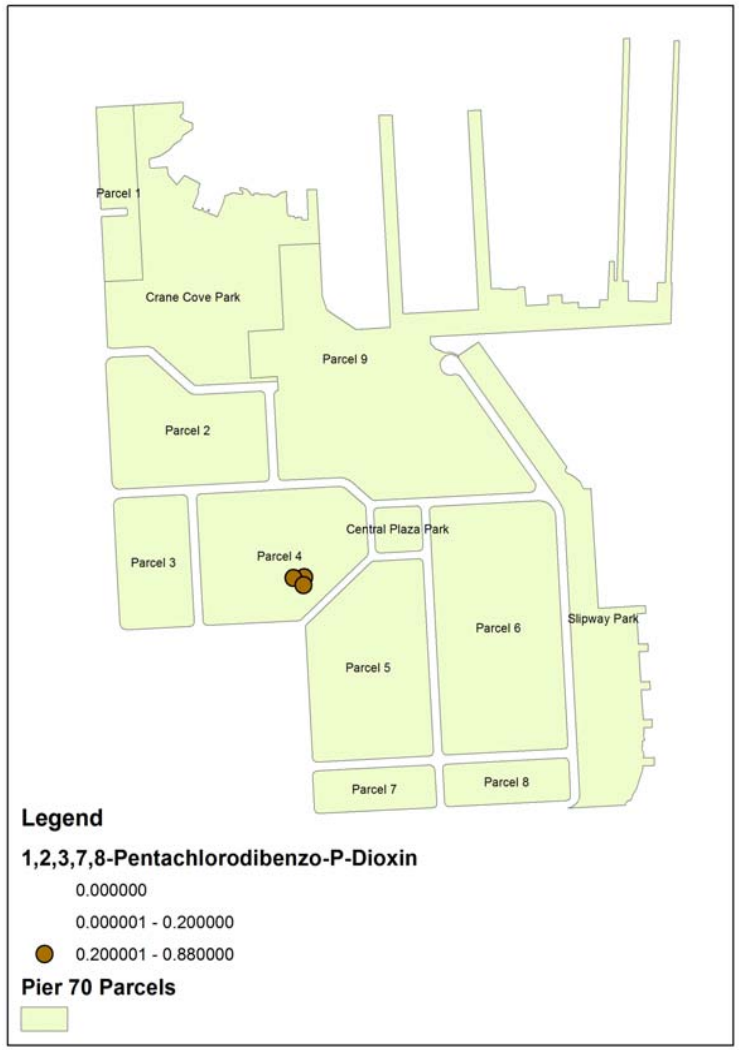
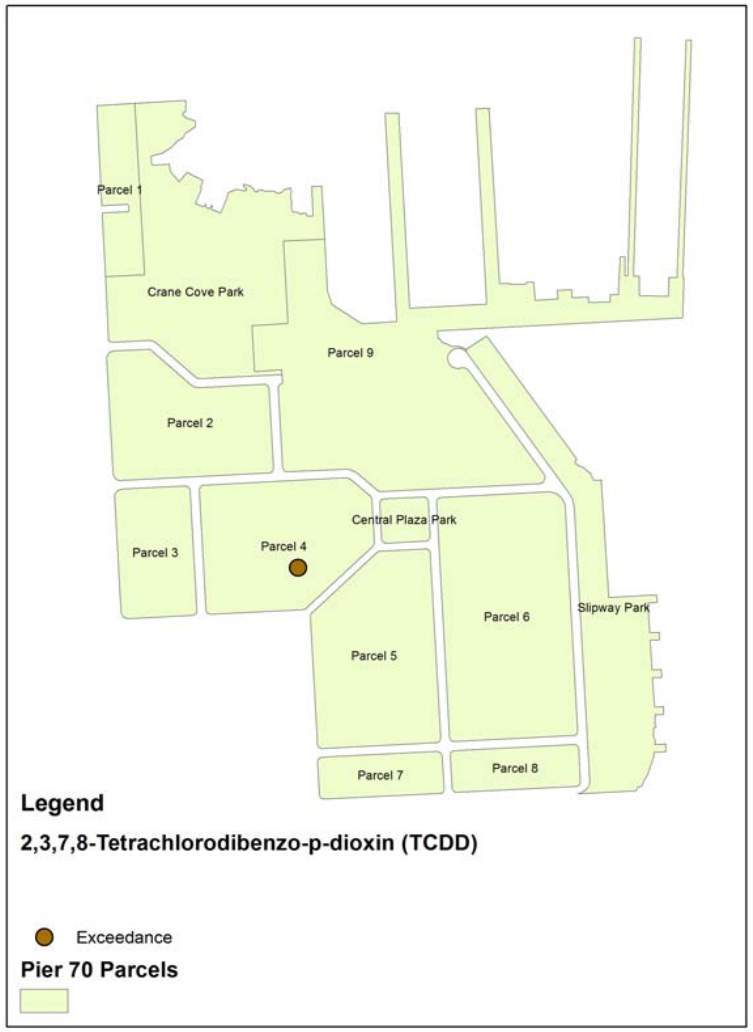


Figure M-8
Burrowing Animals—Dioxin, Furan and PCB (Continued)



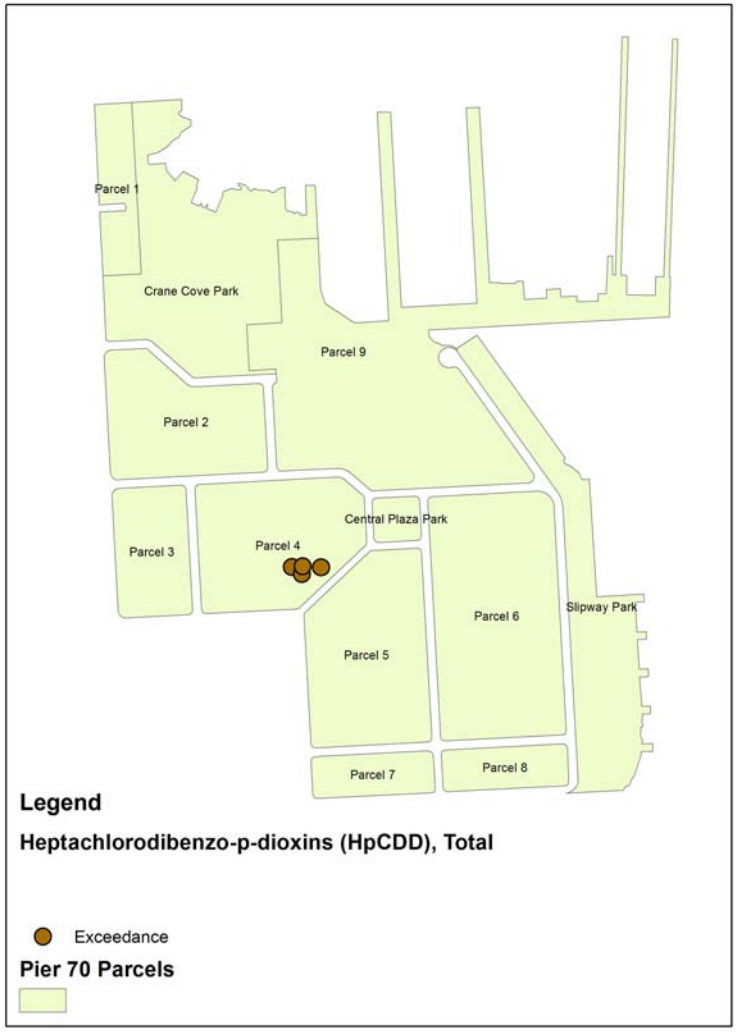


Figure M-8
Burrowing Animals—Dioxin, Furan and PCB (Continued)

Figure M-8
Burrowing Animals—Dioxin, Furan and PCB (Continued)

Figure M-8
Burrowing Animals—Dioxin, Furan and PCB (Continued)

Figure M-9
Burrowing Animals—TPH Ecological Soil Screening Level Exceedances

Figure M-9
Burrowing Animals—TPH (Continued)

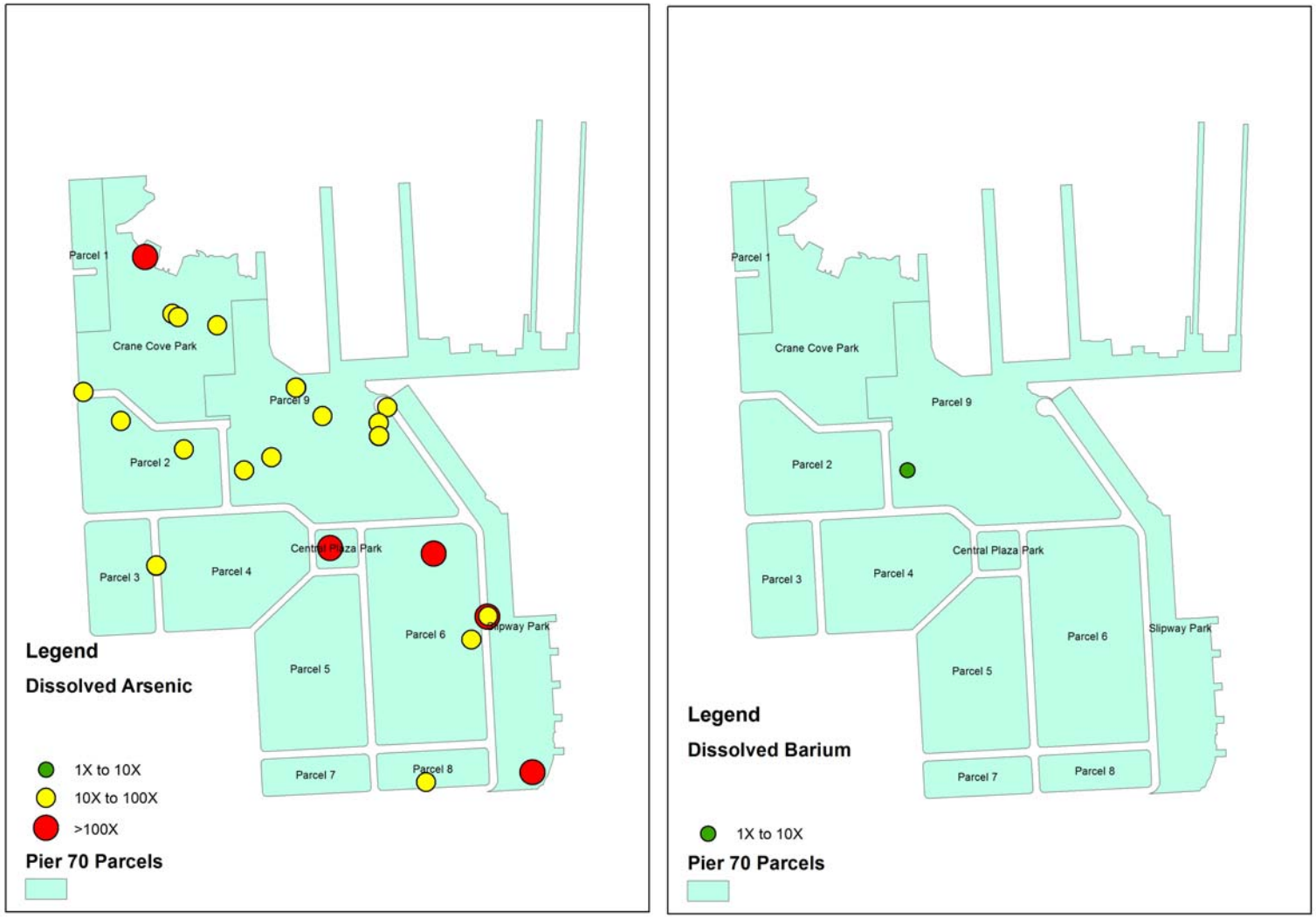


Figure M-10
Groundwater Dissolved Concentrations—Inorganic Constituent Marine Aquatic Life Screening Level Exceedances

Figure M-10
Groundwater Dissolved Concentrations—Inorganic Constituent (Continued)

Figure M-10
Groundwater Dissolved Concentrations—Inorganic Constituent (Continued)

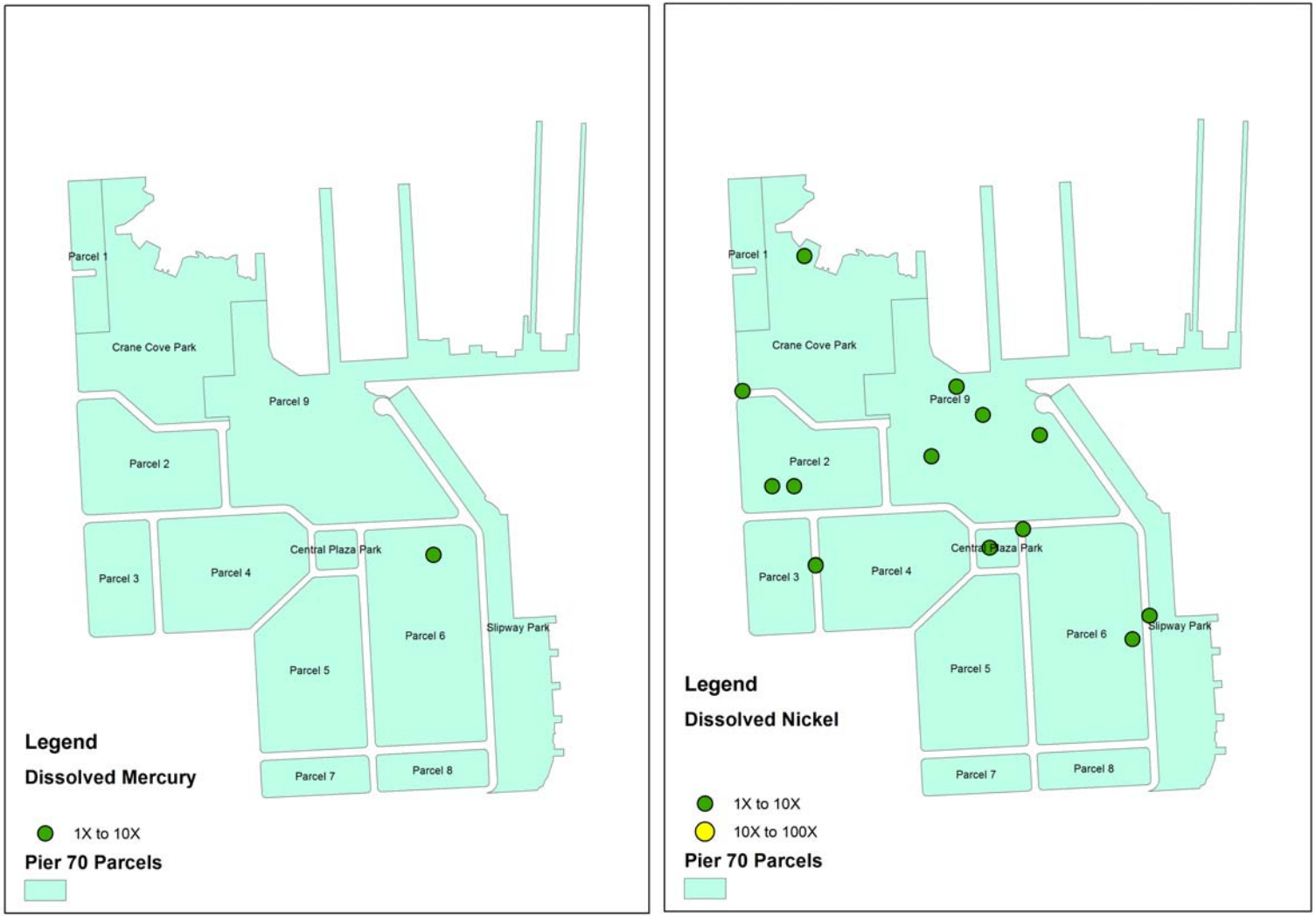


Figure M-10
Groundwater Dissolved Concentrations—Inorganic Constituent (Continued)

Figure M-10
Groundwater Dissolved Concentrations—Inorganic Constituent (Continued)

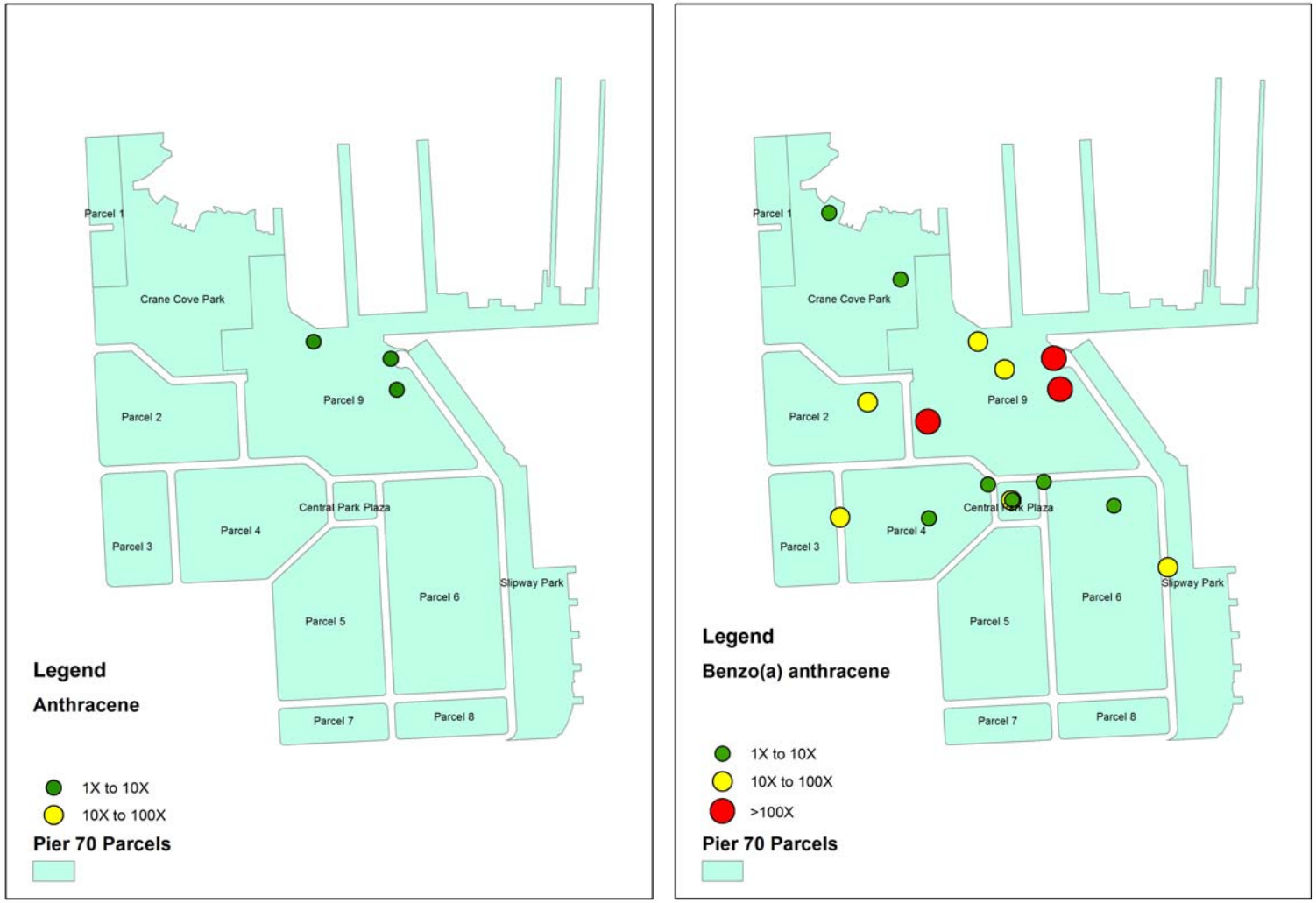


Figure M-11
Groundwater PAH Marine Aquatic Life Screening Level Exceedances

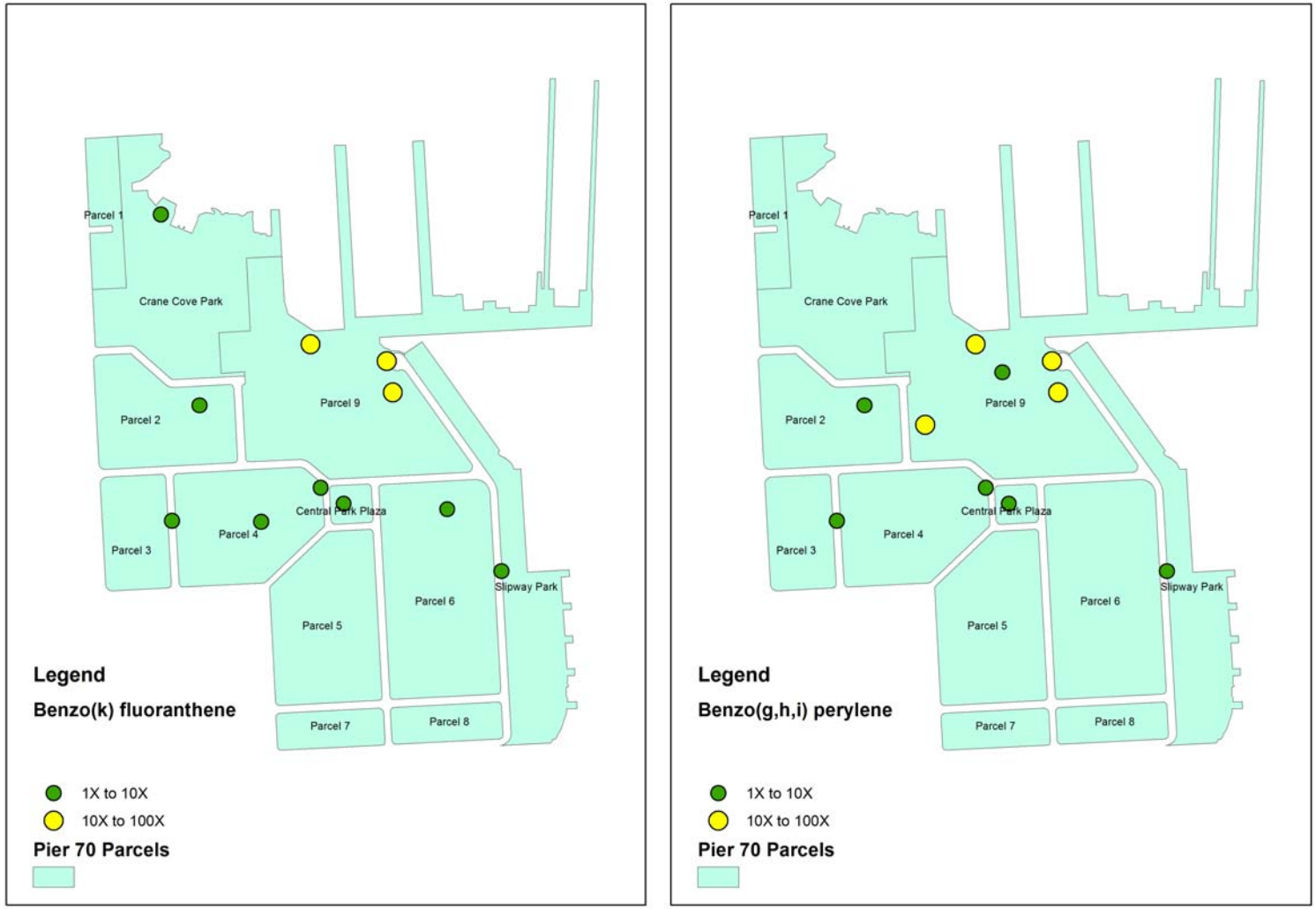


Figure M-11
Groundwater PAH (Continued)

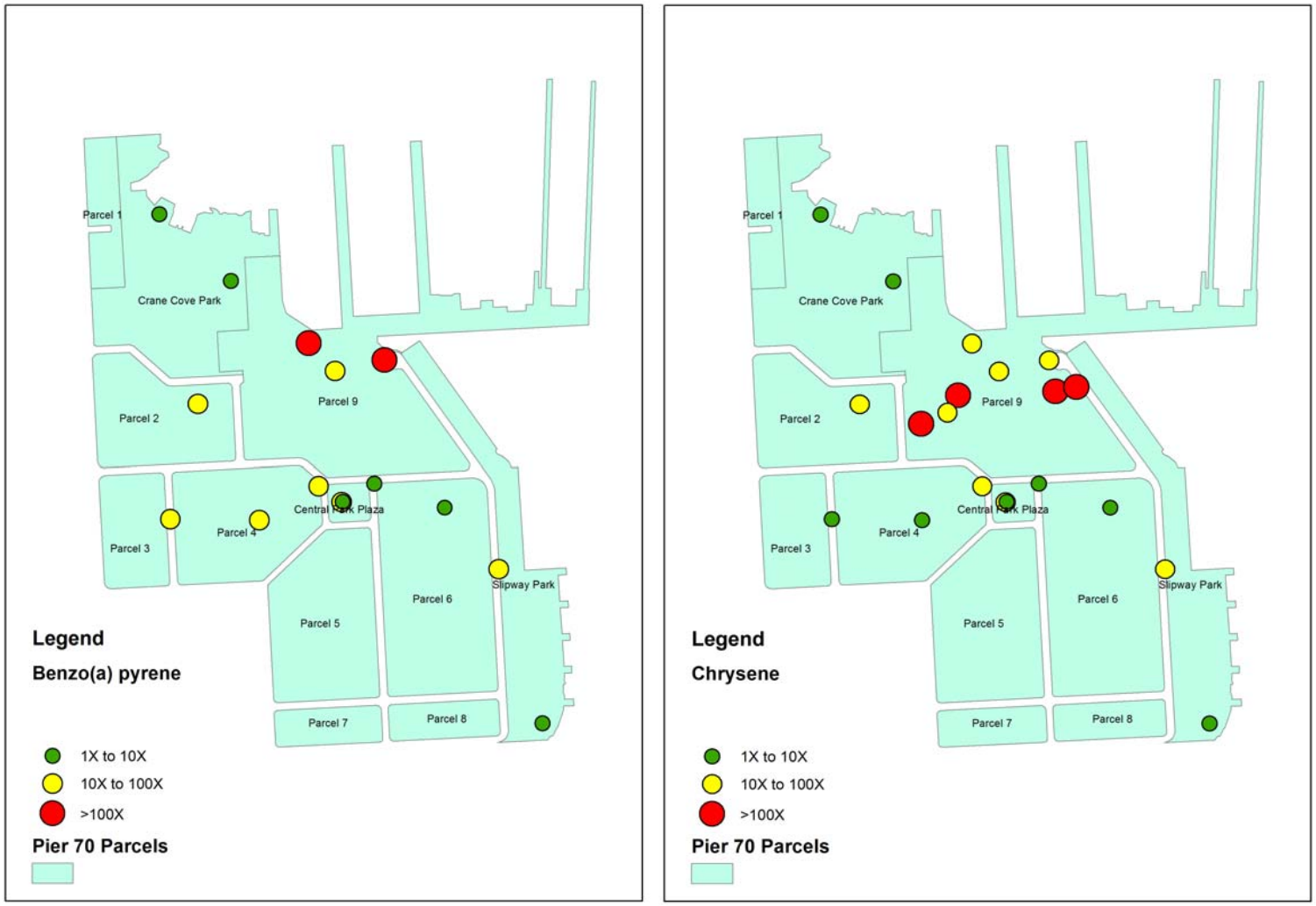


Figure M-11
Groundwater PAH (Continued)

Figure M-11
Groundwater PAH (Continued)

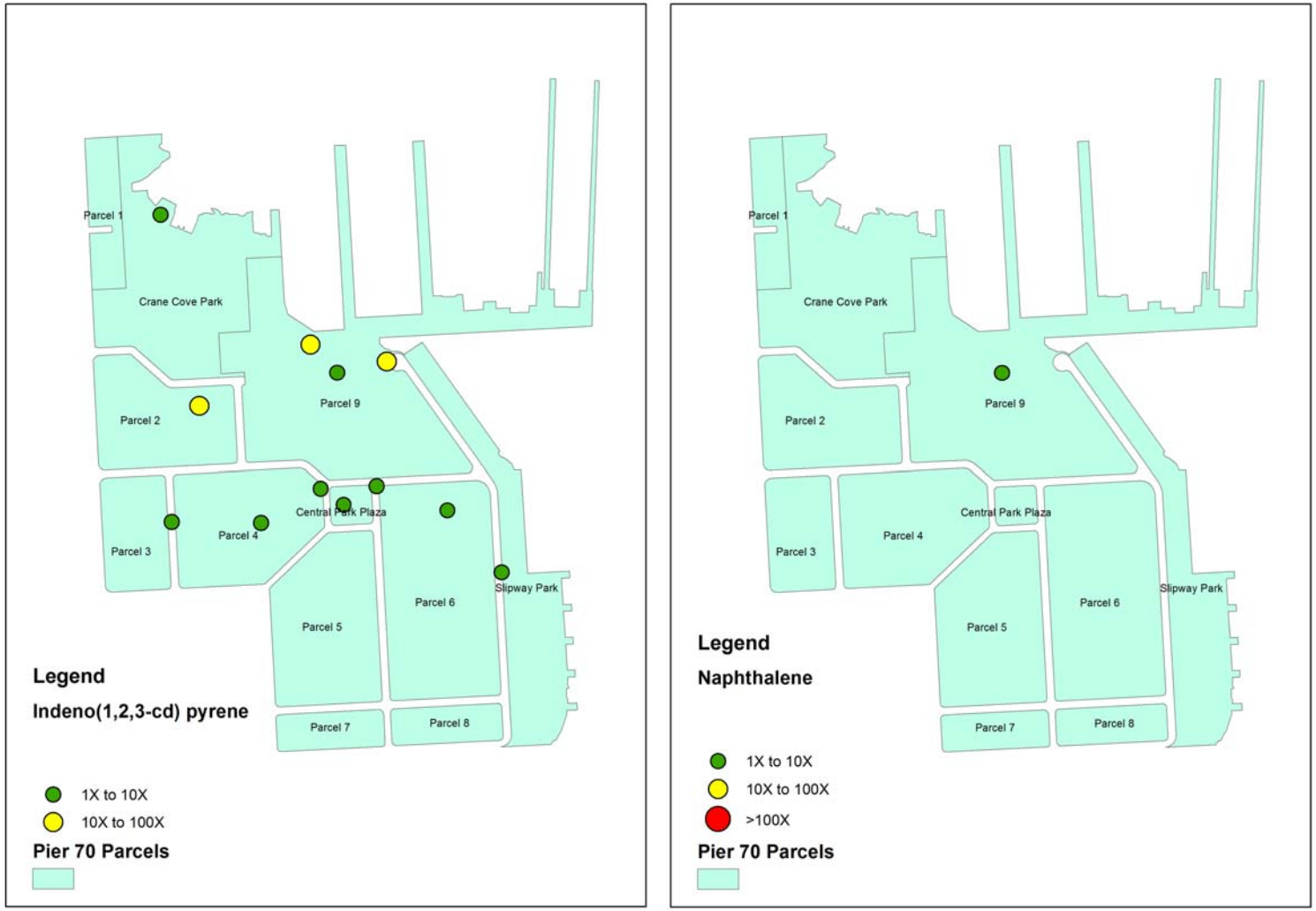


Figure M-11
Groundwater PAH (Continued)

Figure M-11
Groundwater PAH (Continued)

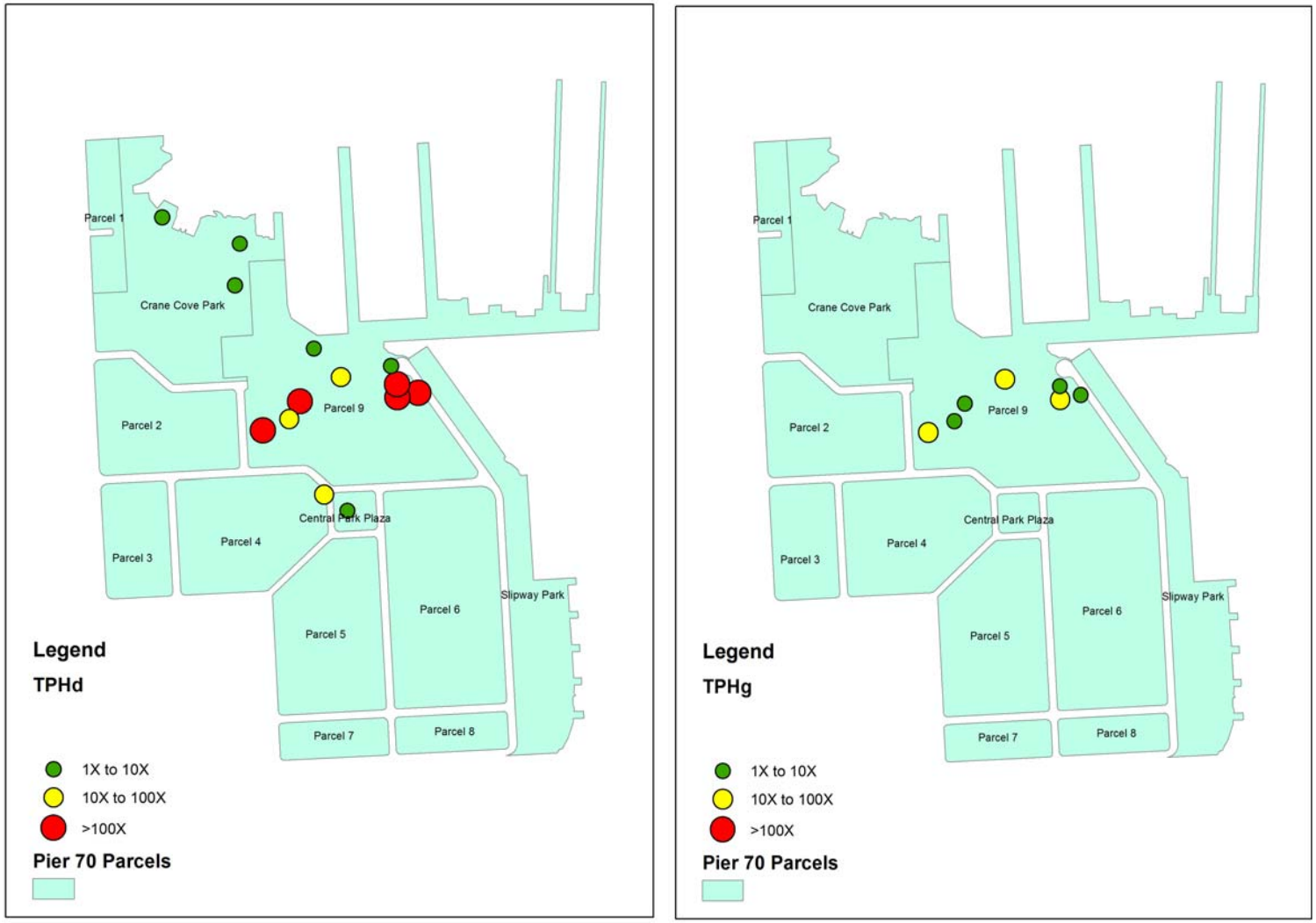


Figure M-12
Groundwater TPH Marine Aquatic Life Screening Level Exceedances

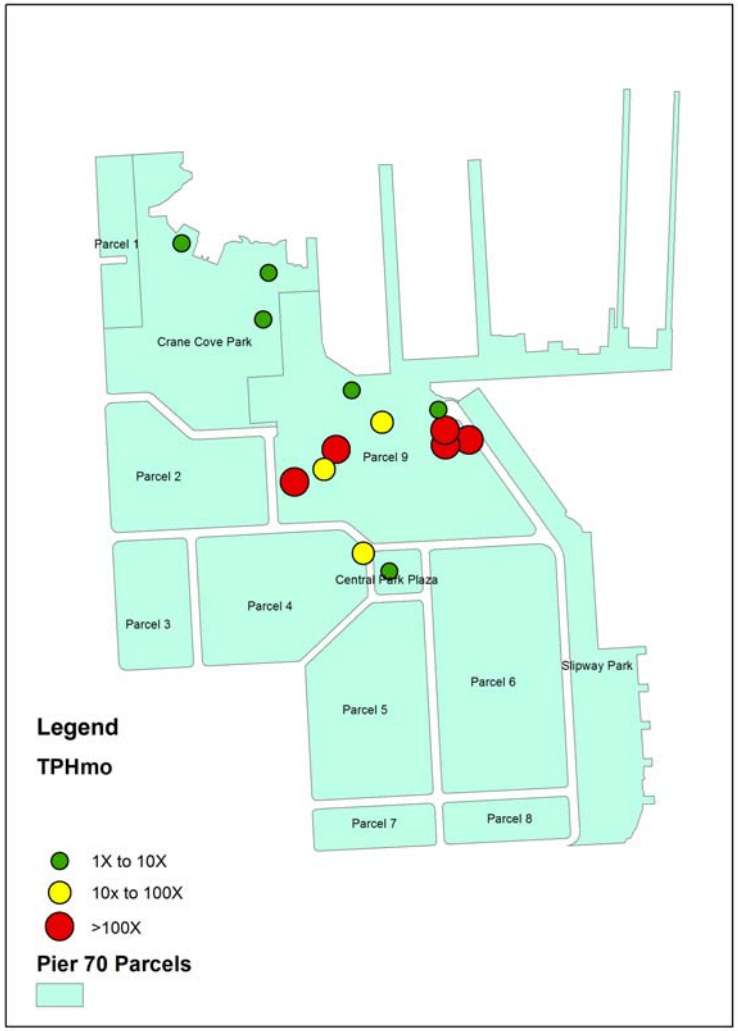


Figure M-12
Groundwater TPH (Continued)