APPENDIX F
QUALITY CONTROL SUMMARY REPORT

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ACRONYMS AND ABBREVIATIONS

BFB	Bromofluorobenzene
CCV	Continuing calibration verification
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRDL	Contract required detection limit
CRQL	Contract required quantitation limit
%D	Percent difference
DDT	Dichlorodiphenyltrichloroethane
DFTPP	Decafluorotriphenylphosphine
EPA	U.S. Environmental Protection Agency
GC/ECD	Gas chromatography with electron capture detector
GC/MS	Gas chromatography with mass spectroscopy
GPC	Gel-permeation chromatography
ICP	Inductively coupled plasma emission spectrometer
ICS	Interference check samples
ICV	Initial calibration verification
IDL	Instrument detection limit
LCS	Laboratory control sample
LUFT	Leaking underground fuel tank
MS	Matrix spike
MSD	Matrix spike duplicate
PAH	Polynuclear aromatic hydrocarbon
PARCC	Precision, accuracy, representativeness, completeness, and comparability
PCB	Polychlorinated biphenyl
QA/QC	Quality assurance and quality control
QAPP	Quality assurance project plan
QC	Quality control
QCSR	Quality control summary report
r	Correlation coefficient
%R	Percent recovery
RAGS	Risk Assessment Guidance for Superfund
RPD	Relative percent difference
RRF	Relative response factor
RRT	Relative retention time
%RSD	Percent relative standard deviation
SOW	Statement of work
STL	Severn Trent Laboratories
SVOC	Semivolatile organic compound
TPH	Total petroleum hydrocarbons
TtEMI	Tetra Tech EM Inc.
VOC	Volatile organic compound

1.0 INTRODUCTION

This quality control summary report (QCSR) summarizes the results of the chemical quality control (QC) data gathered during the remedial action for soils collected from August 11, 1998 through April 5, 2002 at Parcel B, Hunters Point Shipyard, San Francisco, California. The report consists of seven sections. Section 2.0 provides an overview of the data validation process. Sections 3.0 and 4.0 present the data validation methodology and the validated results for cursory and full validation, respectively. Section 5.0 summarizes the precision, accuracy, representativeness, completeness, and comparability (PARCC) evaluation. Section 6.0 presents conclusions regarding the overall evaluation of the chemical data. Section 7.0 contains references used in preparing this report. Tables follow Section 7.0.

2.0 VALIDATION METHODOLOGY

Data validation is the systematic process for reviewing and qualifying data against a set of criteria to verify that the chemical data are adequate for the intended use. This validation is accomplished by reviewing and evaluating all analytical data for the PARCC parameters. The laboratory analytical data were validated according to the procedures outlined in the U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review (EPA 1994a and 1999), EPA CLP National Functional Guidelines for Inorganic Data Review (EPA 1994b), Tetra Tech EM Inc. (TtEMI) Data Validation Statement of Work (SOW) (2001), and the associated analytical methods.

Data validation occurred in two stages: (1) a cursory review of the analytical reports and quality assurance and quality control (QA/QC) information for 100 percent of the chemical data and (2) a full review of the analytical reports, the QA/QC information, and the associated raw data for approximately 20 percent of the chemical data. The cursory review evaluated the effect of the most critical QA/QC information such as holding time, calibration requirements, and spiking accuracy of the data. The full review evaluated additional QA/QC criteria and used the raw data to verify calculations, analyte quantitation, and analyte identifications. At each stage of the validation, qualifiers were assigned to the results in the electronic database in accordance with EPA guidelines, the quality assurance project plan (QAPP), and the associated analytical methods.

The overall objective of data validation is to assure that the quality of the chemical data set is adequate for the intended use, as defined by the PARCC parameters in EPA guidance (EPA 1997). PARCC parameters were assessed by completing the following tasks:

- Reviewing precision and accuracy of laboratory QC data

- Reviewing precision and accuracy of field QC data
- Reviewing the overall analytical process, including holding time, calibration, analytical or matrix performance, and analyte identification and quantitation
- Assigning qualifiers to affected data when QA/QC criteria were not achieved
- Reviewing and summarizing implications of the frequency and severity of qualifiers in the validated data

A total of 4,800 samples, which included 4,628 soil samples, 138 equipment rinsate blanks, 32 trip blanks, and 2 source water blanks were collected from August 11, 1998 to April 5, 2002, and submitted to the laboratories. Samples for volatile organic compound (VOC), semivolatile organic compound (SVOC), pesticide/polychlorinated biphenyl (PCB), total petroleum hydrocarbons (TPH)-purgeable, TPH-extractable, metals, and cyanide analyses were submitted to Severn Trent Laboratories (STL) in Colchester, Vermont; Curtis and Tompkins Laboratories in Berkeley, California; and Applied Chemistry and Physics Laboratory in Chino, California. Although STL is located in Vermont, it is certified by the State of California to perform the analyses requested. The chemical analytical program included the following analyses and methods:

- VOCs by EPA SW-846 method 8260B (EPA 1996) with EnCore® samplers
- SVOCs by EPA SW-846 method 8270 (EPA 1996) with cleanup method EPA 3640A (EPA 1996)
- Polynuclear aromatic hydrocarbons (PAH) by modified EPA SW-846 method 8270 (EPA 1996) with cleanup method EPA 3630C (EPA 1996)
- CLP pesticides (EPA 1994c)
- PCBs by EPA SW-846 method 8082 (EPA 1996)
- CLP metals (EPA 1995)
- TPH-purgeables by State of California Leaking Underground Fuel Tank (LUFT) Field Manual (State of California 1989) and EPA method 8015A (EPA 1996)
- TPH-extractables by State of California LUFT Field Manual (State of California 1989) and EPA method 8015A (EPA 1996)
- Total cyanide by EPA SW-846 method 9010A (EPA 1996)

Sample containers, holding time, and preservation requirements are listed in Table F-1.

3.0 CURSORY REVIEW

Cursory review of the analytical reports for CLP organic, inorganic, and non-CLP methods included evaluating the following parameters, as applicable: holding time, initial and continuing calibrations,

laboratory and field blanks, accuracy, laboratory precision, analytical or matrix performance, and overall assessment of the data. Cursory review components and the results of each specific review are discussed in Sections 3.1 through 3.6 of this appendix. Section 3.7 discusses results that were reported below the contract required quantitation limit (CRQL) or contract required detection limit (CRDL). Tables that summarize the data validation findings follow Section 7.0 of this appendix. Only qualified or rejected data are included in these tables.

3.1 HOLDING TIME

One objective of data validation is to assess the validity of the chemical data set based on compliance with required technical holding time for each applicable analytical method. Technical holding time is defined as the maximum time allowable between sample collection and, as applicable, sample extraction, preparation, or analysis. The Clean Water Act of 1984 (40 Code of Federal Regulations [CFR] 136) established technical requirements for holding times and preservation. For methods not covered by 40 CFR 136, the holding times used for validation purposes were either recommended in the specific analytical methods, such as CLP, or were specified in the QAPP (TtEMI and Morrison Knudsen Corporation [MK] 1999 and TtEMI 2001a). Table F-2 summarizes all applicable technical holding time requirements by analysis type and matrix and includes criteria for estimating and rejecting analytical results if holding times are exceeded.

3.1.1 Organic Analyses

For organic analyses, samples extracted, prepared, or analyzed outside the specified holding times were qualified as estimated for detected and nondetected results (J5/UJ5). Table F-3 shows that several samples for PAH analysis were analyzed outside the specified holding time. In addition, two samples for PCB and TPH-extractable analyses and one sample for TPH-purgeable analysis also were analyzed outside their holding time. Of all site data analyzed by organic methods, less than 1 percent were analyzed outside the required holding time. No data were rejected because holding time was exceeded. The low frequency of holding time exceedances contributes to the high technical quality of the data.

3.1.2 Inorganic Analyses

For inorganic analyses, two samples were analyzed for mercury outside the required holding time. Of all site data analyzed by inorganic methods, less than 1 percent were analyzed outside the required holding time. No data were rejected because holding time was exceeded. The low frequency of holding time exceedances contributes to the high technical quality of the data.

3.2 CALIBRATION

Laboratory instrument calibration requirements were established to assure that the analytical instruments could produce acceptable qualitative and quantitative data for all target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an analytical run while producing a linear curve. Continuing calibration demonstrates that the instrument is capable of repeating the performance established in the initial calibration (EPA 1994a, 1994b). Table F-4 summarizes all applicable calibration requirements by analysis and includes criteria for estimating or rejecting data when calibration requirements are not met.

3.2.1 Organic Analyses

For organic analyses, initial calibration review included evaluating percent relative standard deviation (RSD), relative response factors (RRF) and retention times. The % RSD indicates the analytical system's linearity over an established concentration range. The RRF identifies the sensitivity of the analytical system to a particular target analyte. Retention time reflects the analytical system's stability. Retention time stability is particularly important in pesticide and PCB analyses, for which positive compound identification is made when a peak falls within the specified retention time windows on two dissimilar columns. The continuing calibration review included an evaluation of percent difference (% D), RRFs, and retention times. The % D measures the analytical system's precision and is calculated by comparing the daily RRF with the RRF established in the initial calibration.

Samples that were analyzed when calibration requirements were not met were qualified as "J7" or "UJ7," indicating that the detected and nondetected results were estimated. Table F-5 summarizes site organic analytical data that were qualified because of calibration exceedances. Of all organic analytical data from this site, approximately 2 percent of the data were qualified as estimated and less than 1 percent were rejected because of calibration exceedances. The target compounds 2-methylnaphthalene (PAH) and Aroclor-1260 (PCB) were most frequently qualified for calibration deficiencies. The low frequency of data qualified or rejected for calibration deficiencies contributes to the high technical quality of the data.

3.2.2 Inorganic Analyses

For inorganic analyses, initial calibration review included evaluating criteria for the curve's correlation coefficient (r) and initial calibration verification (ICV) percent recoveries (%R). The ICV %R verifies that the analytical system is operating within the established calibration criteria at the beginning of an analytical run. Metal analytes are analyzed using an inductively coupled plasma emission spectrometer (ICP), which is inherently linear over a wide concentration range. Therefore, it does not require multipoint initial calibration standards, which are required for most other methods. The continuing calibration review included evaluation of the criteria for continuing calibration verification (CCV) %Rs.

The CCV %R verifies that the analytical system is operating within the established calibration throughout the analytical run.

No inorganic data were qualified because of calibration criteria exceedances. The absence of data qualified for calibration deficiencies contributes to the high technical quality of the data.

3.3 LABORATORY AND FIELD BLANKS

Laboratory and field blanks were analyzed to evaluate the existence and magnitude of contamination resulting from sample collection or laboratory activities (EPA 1994a, 1994b, 1999). Blanks prepared and analyzed in the laboratory consisted of calibration, method, and preparation blanks. Field blanks consisted of source water blanks, equipment rinsate blanks, and trip blanks. If a problem with any blank existed, all associated data were carefully evaluated to assess whether the sample data were affected. The purpose of each laboratory and field blank is found in Table F-6. At a minimum, calibration and/or preparation blanks were analyzed once every analytical period for each instrument. Method and preparation blanks were prepared at a frequency of 1 per preparation batch per matrix or every 20 samples, whichever was greater (EPA 1994c, 1995). Equipment rinsate blanks for a specified set of sample analyses were collected during the sampling event and were analyzed for the same target analytes as the samples collected. Source water blanks were collected for each new source of water used for the equipment rinsate blanks. Trip blanks were shipped with each cooler containing samples for VOC analyses. Since blank contamination does occur during the analytical process, EPA has established guidelines for the level of contamination that is permissible for valid analysis under the CLP, and the procedures for qualifying sample results as a function of blank contamination during the data validation process. All qualifications made to the data because of laboratory or field blank contamination are summarized in Table F-7.

3.3.1 Organic Analyses

When laboratory blank contamination was identified, sample results were compared with an action level of 5 times the highest level found in an associated laboratory blank. Only detected results of less than this action level for the laboratory blank contaminant were considered nondetected at the level of the original result or the CRQL, whichever was higher (EPA 1994a, 1999). The data were qualified as “U1,” indicating that the results were nondetected and reflected a quantitation limit that may have been raised because of low-level laboratory blank contamination.

EPA (1994a, 1999) has identified some compounds, including acetone, 2-butanone, methylene chloride, and phthalates as common laboratory contaminants. These compounds were qualified as “U4” in all samples and field blanks that contained levels less than 5 times the reporting limit for those compounds (EPA 1994a, 1999), indicating that the result is considered nondetected.

After laboratory blank contamination was assessed, field blanks were evaluated. Where field blank contamination was identified, sample results were compared with an action level of 5 times the highest level found in the associated field blank, except for common laboratory contaminants, which were compared to an action level of 10 times the highest level found in the associated field blank. Only detected results less than the action level for the field blank contaminant were considered nondetected either at the level of the original result or the CRQL, whichever was higher (EPA 1994a, 1999). The data were qualified as "U2," indicating that the results were considered nondetected and reflecting a quantitation limit that may have been raised because of low-level field blank contamination.

Table F-7 summarizes site analytical data qualified because of laboratory, common, or field blank contamination. Of all organic analytical data from this site, less than 1 percent of the data were qualified as nondetected because of laboratory blank contamination or common laboratory contamination. No qualifications were made to organic data because of field blank contamination. The small percentage of samples affected by laboratory contamination and the absence of samples affected by field blank contamination indicates that the laboratory and field equipment decontamination procedures were effective.

3.3.2 Inorganic Analyses

When laboratory blank contamination was identified, sample results were compared with an action level of 5 times the highest level found in an associated laboratory blank. Only detected results of less than this action level for the laboratory blank contaminant were considered nondetected at the level detected (EPA 1994b). The data were qualified as "U1," indicating that the results were nondetected at the concentration found in the sample.

In addition to laboratory blank contamination, in some cases, negative drift greater than the instrument detection limit (IDL) was observed in laboratory blanks. Detected and nondetected results for these analytes were qualified as "J1" or "UJ1" in all associated samples and field blanks that contained levels less than 5 times the absolute blank value greater than the IDL for those compounds (EPA 1994b), indicating that the result is considered estimated.

After laboratory blank contamination was assessed, field blanks were evaluated. Where field blank contamination was identified, sample results were compared with an action level of 5 times the highest level found in the associated field blank. Only detected results less than the action level for the field blank contaminant were considered nondetected at the level detected (EPA 1994b). The data were qualified as "U2," indicating that the results were considered nondetected.

Table F-7 summarizes site analytical data qualified because of laboratory or field blank contamination. Of all inorganic analytical data from this site, approximately 8 percent of the data were qualified as nondetected because of laboratory blank contamination or negative drift and less than 1 percent were qualified because of field blank contamination. These percentages indicate that the majority of blank problems originated in the laboratory. Arsenic and beryllium were the target analytes most frequently affected by laboratory blank contamination, and mercury was most frequently affected by laboratory blank negative drift. The small percentage of samples affected by field blank contamination indicates that the field equipment decontamination procedures were effective.

3.4 ACCURACY

One objective of data validation was to assess the accuracy of the chemical data set. Laboratory accuracy was evaluated using recoveries of surrogate spikes, matrix spikes (MS), and laboratory control samples (LCS) or blank spikes. Table F-8 summarizes all applicable accuracy requirements by analysis and includes the criteria for estimating or rejecting analytical results when accuracy requirements are not met.

3.4.1 Organic Analyses

For organic analyses, laboratory accuracy was assessed by evaluating surrogate spike, MS, and LCS recoveries. Organic data affected by surrogate, matrix or blank spike problems were qualified as "J3" or "UJ3," indicating that the results were estimated for either detected or nondetected results. Samples affected by surrogate, MS, or LCS accuracy problems are summarized in Table F-9. Of all organic data from this site, approximately 12 percent were qualified as estimated because of MS or LCS accuracy problems. Polynuclear aromatic hydrocarbons (SVOCs) were most frequently affected by poor accuracy; however, the QC criteria specified in the QAPP (TtEMI and MK 1999; TtEMI 2001a) were the same as for routine PAH analyses and did not take into account the silica gel cleanup process used before sample analysis. The data collected from this project indicate that QC limits of 50 to 150 percent would have been more appropriate for this method than the QC limits of 60 to 140 percent specified in the QAPP. In most cases, sample results were qualified only when both the MS and LCS recoveries exceeded criteria. No data were rejected because of accuracy exceedances. The low frequency of data qualified for accuracy deficiencies contributes to the high technical quality of the data.

3.4.2 Inorganic Analyses

For inorganic analyses, laboratory accuracy was assessed by evaluating MS and LCS recoveries. Inorganic data affected by matrix or blank spike problems were qualified as "J3" or "UJ3," indicating that the results were estimated for either detected or nondetected results. Nondetected sample results were

rejected "R2" when spike recoveries were below 30 percent. Sample results affected by accuracy problems are summarized in Table F-9. Of all inorganic analytical data from this site, 18.6 percent of the data were qualified as estimated because of accuracy exceedances, and less than 1 percent were rejected because of accuracy exceedances. Antimony and thallium were most frequently affected by poor accuracy associated with MS samples. The low frequency of data qualified or rejected for accuracy deficiencies contributes to the high technical quality of the data.

3.5 PRECISION

Another objective of data validation was to assess the precision found for the chemical data set. Precision is expressed as the relative percent difference (RPD) between duplicate results. Laboratory precision was measured by evaluating MS/matrix spike duplicate (MSD) RPDs (for organic methods), matrix duplicate pairs (for inorganic methods), and field duplicates. Table F-8 summarizes all applicable precision requirements by analysis and includes the criteria for estimating results when precision requirements are not met. Data were not rejected based on duplicate precision criteria exceedances, and data were not qualified based on field duplicate precision exceedances.

3.5.1 Organic Analyses

Organic data affected by MS/MSD RPDs outside the QC limits were qualified as "J3" or "UJ3," indicating that both detected and nondetected results were estimated. Sample results qualified for precision exceedances alone cannot be isolated from those qualified "J3" or UJ3" because of accuracy problems, due to this limitation of the flagging convention. Sample results affected by field duplicate precision problems are summarized in Table F-10. For field duplicates, PAHs most frequently exhibited high RPDs (greater than 50 percent) for several of the field duplicate sets, indicating a heterogeneous sample matrix. The absence of data qualified for precision deficiencies contributes to the high technical quality of the data.

3.5.2 Inorganic Analyses

Inorganic data affected by sample duplicate RPDs outside the QC limits were qualified as "J2," indicating that detected results were estimated. Sample results affected by precision problems are summarized in Table F-11. Of all inorganic analytical data from this site, 14.4 percent of the data were qualified as estimated because of precision exceedances. No data were rejected because of precision exceedances. Sample results affected by field duplicate precision problems are summarized in Table F-10. For field duplicates, in some cases, copper exhibited high RPDs (greater than 50 percent); however, this target analyte frequently exhibited poor accuracy in MS/MSD samples, indicating heterogeneous sample matrix.

The low frequency of data qualified for precision deficiencies contributes to the high technical quality of the data.

3.6 ANALYTICAL AND MATRIX PERFORMANCE

In addition to data quality requirements discussed, further laboratory QA/QC criteria were evaluated in the cursory review. These additional criteria were primarily concerned with analytical and matrix performance; they are summarized in Table F-12 for organic analyses and Table F-13 for inorganic analyses.

3.6.1 Organic Analyses

For CLP VOC, PAH, and SVOC analyses, internal standards performance was evaluated. Internal standard performance criteria assure that gas chromatography and mass spectroscopy (GC/MS) sensitivity and response are stable during every analytical run. Matrix effects, however, frequently present unique problems in evaluating analytical performance, and internal standard performance may be affected by such matrix effects. Internal standard requirements are based on a comparison of the sample's internal standard area with the same internal standard area found in the daily calibration standard. Internal standard area counts in the sample must be within 50 to 150 percent, and internal standard retention times must not vary more than $\pm$ 30 seconds from the same internal standard in the associated daily calibration standard (EPA 1994a, 1999). Sample results affected by internal standard problems are summarized in Table F-14. Of all organic data from this site, approximately 3 percent were qualified because of internal standard exceedances, and less than 1 percent were rejected because of internal standard exceedances (internal standard count less than 10 percent of the reference standard). The low frequency of internal standard problems contributes to the high technical quality of the site data.

In addition to the analytical or matrix performance criteria outlined, some of the organic data were qualified with the general qualifier "J8," indicating that sample concentrations that were reported exceeded the calibration range, and should be considered estimated. These data are summarized in Table F-15. Of all organic analytical data from this site, less than 1 percent were qualified as estimated because of calibration range exceedances. Samples with calibration range exceedances were rerun at appropriate dilutions in most cases, depending on the amount of matrix interference present and the analyte concentrations.

3.6.2 Inorganic Analyses

For inorganic analyses, ICP serial dilutions were evaluated. The ICP serial dilution analysis can assess whether matrix interference exists and if the accuracy of the analytical data is affected. The criterion for

determining acceptability is a %D of less than 10 percent when the results of a 5-fold dilution are compared with the results from the undiluted sample. This criterion applies only when the concentration of the element in the undiluted sample is greater than 50 times the IDL.

Inorganic data affected by the above-mentioned criteria exceedances were qualified as "J4," indicating that detected results were estimated. Table F-16 summarizes site inorganic data qualified because of analytical or matrix performance criteria exceedances. Of all inorganic data from this site, approximately 8 percent were qualified as estimated because of serial dilution criteria exceedance.

3.7 RESULTS BELOW THE CRQL AND CRDL

The following sections discuss results that were reported below the CRQL or CRDL.

3.7.1 Organic Analyses

For organic analyses, the analytical instruments can make reliable qualitative identification of compounds at concentrations below the CRQL. Detected results below the CRQL are considered quantitatively uncertain. Sample results below the CRQL were reported by the laboratory with a "J" qualifier, and were subsequently also flagged as "J" during the data validation process, indicating that the detected results were estimated. Table F-17 summarizes organic site data qualified as estimated because results reported were below the CRQL. Of all organic analytical data, approximately 20 percent were qualified as estimated because detected results reported were below the CRQL.

3.7.2 Inorganic Analyses

For inorganic analyses, the analytical instruments can make reliable qualitative identification of compounds at concentrations below the CRDL. Detected results below the CRDL are considered quantitatively uncertain. Sample results below the CRDL were reported by the laboratory with a "B" qualifier, and were subsequently flagged as "J" during the data validation process, indicating that the detected results were estimated. Table F-18 summarizes inorganic site data qualified as estimated because results reported were below the CRDL. Of all inorganic analytical data, approximately 9 percent were qualified as estimated because detected results reported were below the CRDL.

4.0 FULL REVIEW

A full review was conducted on a random 15 percent of the chemical data. Twenty percent of HPS data are planned to undergo full validation; however, the percentage for this project is lower than 20 percent due to sample batching (for example, 2 [17 percent] rather than 3 [25 percent] samples out of a 12-sample

batch might be picked for full validation). Full review includes all of the elements of cursory review, previously presented in Section 3.0. Full review for CLP organic, CLP inorganic, and non-CLP methods included evaluating the following additional items, as applicable: method compliance, instrument performance check samples, cleanup performance check samples, system performance, ICP interference check samples, target analyte identification, analyte quantitation, detection and quantitation limit verification, and overall assessment of the data. Criteria for data qualification during the full review consisted of those in EPA guidelines, the TtEMI data validation SOW, and associated analytical methods. Sections 4.1 through 4.4 discuss the full review components and the results of each specific assessment.

4.1 ADDITIONAL ANALYTICAL AND MATRIX PERFORMANCE

In addition to cursory review data quality requirements discussed in Section 3.0, full review includes additional verification of the data relative to the established QA/QC criteria. The additional full review requirements are primarily concerned with analytical and matrix performance.

4.1.1 Organic Analyses

For organic analyses, the following requirements were evaluated, as applicable: instrument performance check samples and cleanup performance check samples for gel-permeation chromatography (GPC), as applicable to SVOCs and pesticides. Organic performance criteria are listed in Table F-12. For VOC and SVOC analyses, GC/MS instrument performance check samples were analyzed to confirm mass resolution, identification, and, to some degree, sensitivity. Specifically, minimum and maximum ion abundance requirements must be met for decafluorotriphenylphosphine (DFTPP) for SVOC analysis, and bromofluorobenzene (BFB) for VOC analysis. For pesticide and PCB analyses, gas chromatography and electron capture detector (GC/ECD) instrument performance check samples were analyzed to confirm adequate resolution and instrument sensitivity. Analytical requirements for the target analytes and surrogates include the criteria for RPD between the true and actual values, chromatographic resolution, and percent breakdown for 4,4'- dichlorodiphenyltrichloroethane (DDT) and endrin (EPA 1994c).

For VOC, pesticide and PCB analyses, cleanup check samples were analyzed to verify the recovery of the target analytes through the cleanup process. The GPC cleanup removes matrix interferences from sample extracts before analysis. These processes are checked by running a blank spike through the GPC column and calculating the %R. GPC is checked weekly (EPA 1994c).

Additionally, for PAH analysis, samples underwent a silica gel cleanup, using a modification to EPA SW-846 method 3630C (EPA 1996).

4.1.2 Inorganic Analyses

For inorganic analyses, ICP interference check samples (ICS) were evaluated. The ICP interference check verifies the validity of the laboratory's interelement and background correction factors. High levels of the elements aluminum, iron, calcium, and magnesium can affect sample results if the interelement and background correction factors have not been optimized. Incorrect correction factors may result in false positives, false negatives, or biased results. Data affected by these criteria were flagged "J9" or "UJ9," indicating both detected or nondetected results were estimated. Sample results affected by ICS problems are summarized in Table F-16. Of all inorganic analytical data from this site, less than 1 percent of the data were qualified as estimated because of ICS criteria exceedances. No data were rejected because of ICS criteria exceedances. The low frequency of data qualified for ICS problems contributes to the high technical quality of the data.

4.2 ANALYTE IDENTIFICATION

Qualitative criteria for analyte identification have been established to minimize analyte misidentification. A misidentification can be either a false positive result (reporting an analyte present when it is not) or a false negative result (not reporting an analyte that is present).

4.2.1 Organic Analyses

For VOC and SVOC analyses, identification was achieved by comparing the sample's mass spectra and retention time with the standard's mass spectra and retention time. For positive identification, the compound's mass spectra must meet the following criteria: contain all the standard's ions with relative intensities greater than 10 percent, agree within ± 20 percent of the standard ion's relative intensities, and not contain any unaccounted ions with relative intensities greater than 10 percent. In addition, the retention time must be within ± 0.06 relative retention time (RRT) units of the standard component retention time (EPA 1994a).

For pesticide/PCB analyses, positive identification was made when a peak fell within the specified retention time "windows" on two dissimilar columns. Surrogates and MS/MSDs also were carefully evaluated to identify retention time shifts. For detected results, single peak results were checked for quantitative agreement between the two columns by generating an RPD value. Detected results with RPDs greater than 50 and less than 100 percent were qualified as "J9," indicating that the results were estimated. Because matrix effects frequently present unique problems in analyte identification, results with RPDs greater than 100 percent were technically determined to be misidentified and qualified as "UJ9," indicating that the results were nondetected (TtEMI 2001b). Misidentified results below the

CRQL were raised to the quantitation limit and considered nondetected (U9). In some cases, professional judgment was used in qualifying results. Any such decisions were clearly identified and documented in the data validation reports.

For TPH-purgeables and TPH-extractables, positive identification was made when a response was recorded in the appropriate retention time window for the particular analysis. For TPH-purgeables and TPH-extractables, a more definitive fingerprinting of the chromatographic peak for the type of petroleum product was used to identify fuels. When the chromatographic peaks displayed a petroleum fuel product, such as gasoline, diesel, or motor oil, the data were qualified as "Y," indicating that the results were a petroleum fuel. When detection was made of a single peak or patterns that did not resemble typical fuel patterns, the data were qualified as "Z," indicating that the results did not represent a typical fuel pattern. Additionally, for greater accuracy of identification, the qualifiers "G" (pattern resembles gasoline), "D" (pattern resembles diesel), "M" (pattern resembles motor oil), "L" (pattern is in the lighter hydrocarbon end of the analyte's range in the standard), or "H" (pattern is in the heavier hydrocarbon end of the analyte's range in the standard) were used in later phases of the project.

For TPH-extractables, diesel and motor oil ranges overlap. When both are present in a sample, quantitation is performed by drawing a line from the valley between the two petroleum patterns to the baseline. The area of each pattern is then quantitated for the particular fuel that it best represents.

Table F-19 summarizes site data qualified because of analyte identification problems. Of all organic analytical data from this site, less than 1 percent of the data were qualified as estimated because of analyte identification problems. No organic data were rejected because of analyte identification problems. The low frequency of data qualified for identification problems contributes to the high technical quality of the data.

4.2.2 Inorganic Analyses

For CLP metals and other inorganic analyses, positive identification was made when the instrument registered a measurable response while operating under the method-specified analytical parameters. In these cases, the instrument's accuracy in analyte identification was indirectly verified by assessing the instrument's performance. None of the inorganic data from this site were qualified or rejected as a result of analyte identification problems.

4.3 ANALYTE QUANTITATION

For organic and inorganic analyses, all applicable raw data were reviewed to verify positive results and the reported detection or quantitation limits. Approximately 15 percent of the calculations were evaluated

and recalculated for verification of reported results. Raw data reviewed included, as applicable, the following: extraction and preparation logbooks, cleanup logbooks, spike and standard preparation logbooks, instrument printouts, strip chart recordings, chromatograms, and quantitation reports. The following data sources also were evaluated, as applicable: sample dilutions, concentrations, analytical split samples, and cleanup activities. Review of the raw data showed that the chemical analytical results from this site were correctly quantitated.

4.4 ANALYTE REPORTING LIMITS

The following sections discuss reporting limits for organic and inorganic analyses.

4.4.1 Organic Analyses

For organic analyses, analyte quantitation limits were raised by the dilution factor when samples required dilution for analysis. Sample dilution was necessary when high levels of an analyte were present, or when matrix problems occurred during sample extraction or analysis. Review of the site data set identified a very small number of organic analyses requiring dilution. Table F-20 summarizes the minimum, maximum, and average reporting limits for this site, as well as the reporting limit goals established in the QAPP (TtEMI and MK 1999; TtEMI 2001a).

4.4.2 Inorganic Analyses

For inorganic analyses, analyte detection limits for water samples were raised by the dilution factor when samples required dilution for analysis. Sample dilution was necessary when high levels of an analyte were present, or when matrix problems occurred during sample extraction or analysis. Review of the site data set identified a very small number of inorganic analyses requiring dilution. Table F-21 summarizes the minimum, maximum, and average reporting limits for this site, as well as the detection limit goals established in the QAPP (TtEMI and MK 1999; TtEMI 2001a).

5.0 PRECISION, ACCURACY, REPRESENTATIVENESS, COMPLETENESS AND COMPARABILITY EVALUATION SUMMARY

Data were validated by reviewing all analytical data for PARCC parameters. The following paragraphs discuss the overall data quality, including the PARCC parameters, as determined by the data validation.

5.1 PRECISION

Precision is a measure of the reproducibility of an experimental value without regard to a true or referenced value. The primary indicators of precision were the MS/MSD RPD for organic analyses, the

RPD between sample duplicate pairs for inorganic analyses, and the RPD between field duplicates for all analyses. In general, acceptable precision was found for MS/MSD and sample duplicate RPDs, indicating that the methods were consistently precise. In most cases, poor precision found between field duplicates for specific target analytes was associated with poor MS/MSD accuracy, which indicates a heterogeneous sample matrix.

5.2 ACCURACY

Accuracy assesses the proximity of an experimental value to a true or referenced value. The primary accuracy indicators were the recoveries of surrogate spikes, MS and LCS spikes. Accuracy is expressed as percent recovery. For all methods, accuracy was acceptable, indicating the methods were accurate.

5.3 REPRESENTATIVENESS

Representativeness refers to the ability of sample data to reflect true environmental conditions. Sample results were evaluated for representativeness by examining items related to the collection of samples, such as the chain-of-custody documentation, which included labeling of samples, collection dates, and the condition of the samples upon receipt at the laboratory. Laboratory procedures were also examined, including anomalies reported by the laboratory either upon receipt of the samples at the laboratory or during analytical processes, holding time of samples prior to analysis, calibration of laboratory instruments, adherence to the analytical methods, quantitation limits used for the samples, and completeness of data package documentation. Any item that adversely affected the representativeness of the sample result is documented in the data validation narrative.

Holding time criteria were exceeded for some samples. In most cases, holding time was exceeded due to sample reanalysis.

5.4 COMPLETENESS

Completeness is defined as the percentage of measurements that are considered to be valid. The validity of sample results is determined through the data validation process. All sample results that were rejected and any missing analyses were considered incomplete. Data that are qualified as estimated (J) or nondetected estimated (UJ) are considered valid and usable. Data that are qualified as rejected (R) are considered unusable.

Completeness is measured by the number of complete valid sample results divided by the total number of sample results. To calculate the total number of sample results, each compound or analyte for each

methodology is multiplied by the total number of samples analyzed. The completeness for this project was 99.8 percent.

5.5 COMPARABILITY

Comparability is a qualitative parameter that expresses the confidence with which one data set may be compared to another. Comparability of the data was achieved by the use of uniform sampling activities, standard methods of analysis, standard quantitation limits, and the standardized data validation procedures. The use of CLP protocol, specified and well-documented analyses, approved laboratories, and the standardized process of data review and validation give the site data a high degree of analytical comparability.

6.0 CONCLUSIONS FOR DATA QUALITY AND DATA USABILITY

Although some qualifiers were applied to the site data, a final review of the data set with respect to the EPA data quality parameters discussed in Section 5.0 indicates that the data are of overall good quality. The data meet all requirements of the PARCC data quality indicators as described in EPA (1997) guidance for QAPPs, and, therefore are usable for risk assessment. The overall assessment of the sampling program, QA/QC data, data review, and data validation results presented in Sections 3.0 and 4.0 is that the site data are of acceptable PARCC. All supporting documentation and data are available upon request, including cursory and full validation reports and the database that contains sample results.

EPA "Risk Assessment Guidance for Superfund" (RAGS) was used to evaluate the usability of the validated data (EPA 1989). Exhibit 5.5 in RAGS states that data qualified as estimated (J) based on data validation reports should be used in quantitative risk assessments. The guidance is specifically for human health risk assessments, which was the use of the remedial action data collected during this project. Because only a small amount of data were rejected (R), most data are considered usable for risk assessment purposes.

7.0 REFERENCES

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TABLE F-1

SAMPLE CONTAINER, HOLDING TIME, AND PRESERVATIVE REQUIREMENTS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Parameter	Method [a]	Matrix	Sample Container	Preservative	Holding Time [b]
Organic Analyses					
Volatile organic compounds	EPA 8260B	Soil	EnCore® Sampler[c]	Cool to 4±2°C, preserved in methanol at lab within 48 hours of sample collection	14 days
Semivolatile organic compounds	EPA 8270/ cleanup method EPA 3640A	Soil	8 oz. jar	Cool to 4±2°C	14 days/40days
Polynuclear aromatic hydrocarbons	EPA 8270/ cleanup method EPA 3630C	Soil	8 oz. jar	Cool to 4±2°C	14 days/40days
Organochlorine pesticides	CLP	Soil	8 oz. jar	Cool to 4±2°C	14 days/40days
Polychlorinated biphenyls	EPA 8082	Soil	8 oz. jar	Cool to 4±2°C	14 days/40days
Total petroleum hydrocarbons-purgeables	CA LUFT and EPA 8015B	Soil	8 oz. jar	Cool to 4±2°C	14 days
Total petroleum hydrocarbons-extractables	CA LUFT and EPA 8015B	Soil	8 oz. jar	Cool to 4±2°C	14 days/40days
Inorganic Analyses					
Metals	CLP	Soil	8 oz. jar	Cool to 4±2°C	Hg 28 days, all other metals 6 months
Cyanide	EPA 9010A	Soil	8 oz. jar	Cool to 4±2°C	14 days

Notes:

a Complete method references are presented in Section 2.0.
b "x" days/"y" days refer to the maximum number of days from sampling to extraction and the maximum number of days from extraction to analysis.
c Samples were collected in three EnCore® samplers plus a jar for percent solids determination.

CA LUFT LUFT Field Manual (State of California 1989)
CLP Contract laboratory program
EPA U.S. Environmental Protection Agency
Hg Mercury
LUFT Leaking underground fuel tank
oz Ounce

TABLE F-2

HOLDING TIME REQUIREMENTS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Holding Time [a] Requirement	All Estimated Data (J5)	Data Qualified as "J5" (Estimated) and Nondetected Data Qualified as "R1" (Rejected)
Volatile organic compounds, and total petroleum hydrocarbons-purgeables	Soil	Analysis in 14 days	Exceeded by ≤ 28 days	Exceeded by > 28 days
Semivolatiles, PAHs, pesticides and PCBs, and total petroleum hydrocarbons-extractables	Soil	Extraction in 14 days Analysis in 40 days[b]	Exceeded by ≤ 14 days (E) Exceeded by ≤ 80 days (A)	Exceeded by 14 days (E) Exceeded by > 80 days (A)
Metals	Soil	Analysis in 6 months	Exceeded by ≤ 360 days	Exceeded by > 360 days
Mercury	Soil	Analysis in 28 days	Exceeded by ≤ 56 days	Exceeded by > 56 days
Cyanide	Soil	Analysis in 14 days	Exceeded by ≤ 28 days	Exceeded by > 28 days

Notes:

a Holding times are specified from the date of sample collection
b From date of extraction

A Analysis
E Extraction
PCB Polychlorinated biphenyls
PAH Polynuclear aromatic hydrocarbons

Source: 40 CFR 136; EPA 1994a and 1994b; TtEMI 2001b; and the specified analytical methods

TABLE F-3

DATA QUALIFICATION: ORGANIC HOLDING TIME EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J5)	Number (Percent) of Analytes Rejected (R1)
Polynuclear Aromatic Hydrocarbons				
2-Methylnaphthalene	Soil	779	7	0
Acenaphthene	Soil	792	7	0
Acenaphthylene	Soil	792	7	0
Anthracene	Soil	792	7	0
Benzo(a)Anthracene	Soil	1776	21	0
Benzo(a)Pyrene	Soil	1859	29	0
Benzo(b)Fluoranthene	Soil	1873	28	0
Benzo(g,h,i)Perylene	Soil	792	7	0
Benzo(k)Fluoranthene	Soil	1745	20	0
Chrysene	Soil	1467	19	0
Dibenz(a,h)Anthracene	Soil	1315	14	0
Fluoranthene	Soil	792	7	0
Fluorene	Soil	792	7	0
Indeno(1,2,3-cd)Pyrene	Soil	1468	15	0
Naphthalene	Soil	792	7	0
Phenanthrene	Soil	792	7	0
Pyrene	Soil	792	7	0
Pesticides/polychlorinated biphenyls				
Aroclor-1260	Soil	1538	2	0
TPH-Extractables				
Diesel Range Organics	Soil	788	2	0
TPH-Purgeables				
Gasoline Range Organics	Soil	315	1	0
Organic Total:		**42,031**	**221 (0.5 %)**	**0 (0.0 %)**
Total Metals				
Mercury	Soil	653	2	0
Inorganic Total:		**11,551**	**2 (0.02 %)**	**0 (0.0 %)**
Total:		**53,582**	**223 (0.4 %)**	**0 (0.0 %)**

Note:

TPH Total petroleum hydrocarbons

TABLE F-4

CALIBRATION REQUIREMENTS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Calibration Requirements	Detected Data Qualified as "J7" (Estimated)	Detected Data Qualified as "J7" (Estimated) and Nondetected Data Qualified as "R7" (Rejected)
VOCs and SVOCs	IC: %RSD ≤ 30.0% CC: %D ≤ ± 25.0%	IC: %RSD > 30.0% CC: %D > ± 25.0%	RRF < 0.05
Pesticides and PCBs	IC: %RSD ≤ 20.0%[a] PEM/CC: %D ≤ ± 25.0%	IC: %RSD > 20.0%[a] PEM/CC: %D > ± 25.0%	NA
Metals	IC: r ≥ 0.995 ICV/CCV: 90-110%	IC: r < 0.995 ICV/CCV: > 110% ICV/CCV: < 90%	NA
Mercury, Cyanide	IC: r ≥ 0.995 ICV/CCV: 80-120%	IC: r < 0.995 ICV/CCV: > 120% ICV/CCV: < 80%	NA
TPH-purgeables and TPH-extractables	IC: %RSD ≤ 20.0% CC: %D ≤ ± 15.0%	IC: %RSD > 20.0% CC: %D > ± 15.0%	NA

Notes:

a Initial calibration criteria applies to single peak pesticides only.

CC Continuing calibration
CCV Continuing calibration verification
%D Percent difference
IC Initial calibration
%RSD Relative standard deviation
ICV Instrument calibration verification
NA Not applicable
PCB Polychlorinated biphenyl
PEM Performance evaluation mixture
r Correlation coefficient
RRF Relative response factor
SVOC Semivolatile organic compound
TPH Total petroleum hydrocarbons
VOC Volatile organic compound

TABLE F-5

DATA QUALIFICATION: ORGANIC CALIBRATION EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J7)	Number (Percent) of Analytes Rejected (R7)
Polynuclear Aromatic Hydrocarbons				
2-Methylnaphthalene	Soil	779	127	0
Acenaphthylene	Soil	792	1	0
Benzo(b)Fluoranthene	Soil	1873	24	0
Benzo(g,h,i)Perylene	Soil	792	37	0
Benzo(k)Fluoranthene	Soil	1745	21	0
Dibenz(a,h)Anthracene	Soil	1315	13	0
Fluorene	Soil	792	10	0
Indeno(1,2,3-cd)Pyrene	Soil	1468	33	0
Pyrene	Soil	792	10	0
Pesticides/polychlorinated biphenyls				
4,4'-Dichlorodiphenyldichloroethane	Soil	215	1	0
Aroclor-1016	Soil	294	14	0
Aroclor-1242	Soil	340	7	0
Aroclor-1254	Soil	457	25	0
Aroclor-1260	Soil	1538	152	0
Endosulfan Sulfate	Soil	184	13	0
Endrin Aldehyde	Soil	184	13	0
Heptachlor	Soil	187	1	0
Heptachlor Epoxide	Soil	184	1	0
SVOCs				
2,4-Dinitrophenol	Soil	24	7	0
2-Chloronaphthalene	Soil	24	1	0
2-Methylnaphthalene	Soil	397	17	0
3,3'-Dichlorobenzidine	Soil	24	6	0
3-Nitroaniline	Soil	24	3	0
4,6-Dinitro-2-Methylphenol	Soil	24	4	0
4-Nitroaniline	Soil	24	7	0
4-Nitrophenol	Soil	24	3	0
Benzidine	Soil	1	1	0
Benzo(g,h,i)Perylene	Soil	397	56	0
Benzo(k)Fluoranthene	Soil	402	7	0
Bis(2-Ethylhexyl)Phthalate	Soil	489	6	0
Di-N-Octylphthalate	Soil	24	2	0
Dibenz(a,h)Anthracene	Soil	401	13	0
Hexachlorobutadiene	Soil	24	3	0
Indeno(1,2,3-cd)Pyrene	Soil	409	17	0
N-Nitroso-Di-N-Propylamine	Soil	397	27	0
N-Nitrosodiphenylamine	Soil	397	15	0
Pentachlorophenol	Soil	397	9	0
Phenol	Soil	397	2	0

TABLE F-5 (Continued)

DATA QUALIFICATION: ORGANIC CALIBRATION EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J7)	Number (Percent) of Analytes Rejected (R7)
Pyrene	Soil	397	11	0
Pyridine	Soil	21	1	0
TPH-Extractables				
Diesel Range Organics	Soil	788	1	0
Motor Oil Range Organics	Soil	514	32	0
TPH-Purgeables				
Gasoline Range Organics	Soil	315	53	0
VOCs				
2-Butanone	Soil	31	12	0
2-Hexanone	Soil	26	2	0
4-Methyl-2-Pentanone	Soil	26	5	0
Acetone	Soil	26	14	7
Bromomethane	Soil	26	1	0
Vinyl Chloride	Soil	128	3	0
Organic Total:		**42,031**	**844 (2.0 %)**	**7 (0.01 %)**

Notes:

SVOC Semivolatile organic compound
TPH Total petroleum hydrocarbons
VOC Volatile organic compound

TABLE F-6

BLANK REQUIREMENTS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Blank Type	Purpose of Blank
Calibration Blank	Evaluate analytical instruments for possible laboratory contamination
Method and Preparation Blank	Evaluate extraction or preparation procedures for possible laboratory contamination
Equipment Rinsate Blank	Evaluate decontamination procedures as a possible cause for field contamination
Trip Blank	Evaluate if shipping the samples introduces contamination for volatiles analyses
Source Water Blank	Evaluate source water used in equipment decontamination procedures for possible contamination

TABLE F-7

DATA QUALIFICATION: BLANK EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Nondetcted or Estimated (U1/U2/U4/UJ1/J1)	Reason
SVOCs				
Bis(2-Ethylhexyl)Phthalate	Soil	489	230	CLC
Butylbenzylphthalate	Soil	24	1	
Diethylphthalate	Soil	397	12	
VOCs				
Acetone	Soil	210	5	CLC
2-Butanone	Soil	31	5	
Methylene Chloride	Soil	26	1	
Toluene	Soil	31	1	Lab Blank Cont.
Organic Total:		**42,031**	**254 (0.6 %)**	
Total Metals				
Antimony	Soil	288	9	Lab Blank Cont.
Arsenic	Soil	871	151	
Beryllium	Soil	694	161	
Cadmium	Soil	264	11	
Copper	Soil	1902	11	
Lead	Soil	1902	21	
Mercury	Soil	653	6	
Molybdenum	Soil	197	58	
Selenium	Soil	217	23	
Silver	Soil	217	48	
Sodium	Soil	217	36	
Thallium	Soil	217	4	
Zinc	Soil	1448	9	
Antimony	Soil	288	18	Neg. Drift
Arsenic	Soil	871	64	
Beryllium	Soil	699	66	
Cadmium	Soil	264	21	
Copper	Soil	1902	4	
Lead	Soil	1137	4	
Mercury	Soil	653	106	
Molybdenum	Soil	217	21	
Selenium	Soil	217	72	
Silver	Soil	217	37	
Sodium	Soil	217	11	
Zinc	Soil	1448	1	
Arsenic	Soil	871	1	Field Blank Cont.
Cadmium	Soil	264	1	
Copper	Soil	1902	9	
Inorganic Total:		**11,551**	**984 (8.5 %)**	
Total:		**53,582**	**1238 (31 %)**	

Notes:

CLC Common laboratory contamination
Cont. Contamination
SVOC Semivolatile organic compound
VOC Volatile organic compound

TABLE F-8

ACCURACY AND PRECISION REQUIREMENTS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Analyte	Accuracy/Precision Requirements	Detected Data (J3 or J2)	Detected and Nondetected Data (J3 / UJ3)	Detected and Nondetected Data (J3 / R2)
Volatile Organic Compounds	Soil	**Matrix Spikes/Matrix Spike Duplicates**				
		1,1-Dichloroethene	59 – 172% / 22%	> 172%	< 59% / > 22%	
		Benzene	66 – 142% / 21%	> 142%	< 66% / > 21%	
		Chlorobenzene	60 – 133% / 21%	> 133%	< 60% / > 21%	
		Toluene	59 – 139% / 21%	>139%	< 59% / > 21%	
		Trichloroethene	62 – 137% / 24%	> 137%	< 62% / > 24%	
		Bromofluorobenzene (surr)	59 – 113% / NA	> 113%	< 59%	< 10%
		1,2-Dichloroethane-d4 (surr)	70 – 121% / NA	> 121%	< 70%	< 10%
		Toluene-d8 (surr)	84 – 138% / NA	> 138%	< 84%	< 10%
		Laboratory Control Samples				
		All compounds	75 – 125% / NA	> 125%	< 75%	NA
Semivolatile Organic Compounds / Polynuclear Aromatic Hydrocarbons	Soil	**Matrix Spikes/Matrix Spike Duplicates**				
		Phenol	26 – 90% / 35%	> 90%	< 26% / > 35%	
		2-Chlorophenol	25 - 102 / 50%	> 102%	< 25% / > 50%	
		1,4-Dichlorobenzene	28 - 104% / 27%	> 104%	< 28% / > 27%	
		N-Nitroso-di-N-propylamine	41 – 126% / 38%	> 126%	< 41% / > 38%	
		1,2,4-Trichlorobenzene	38 – 107% / 23%	> 107%	< 38% / > 23%	
		4-Chloro-3-methylphenol	26 – 103% / 33%	> 103%	< 26% / >33%	
		Acenaphthene	31 – 137% / 19%	> 137%	< 31% / > 19%	
		2,4-Dinitrotoluene	28 – 89% / 47%	> 89%	< 28% / > 47%	
		4-Nitrophenol	11 – 114% / 50%	> 114%	< 11% / > 50%	
		Pentachlorophenol	17 – 109% / 47%	> 109%	< 17% / > 47%	
		Pyrene	35 – 142% / 36%	> 142%	< 35% / > 36%	
		2-Fluorophenol (surr)	25 – 121% / NA	> 121%	< 25%	< 10%
		Phenol-d5 (surr)	24 – 113% / NA	> 113%	< 24%	< 10%
		2-Chlorophenol-d4(surr)	20 – 130% / NA	> 130%	< 20%	< 10%
		1,2-Dichlorobenzen-d4 (surr)	20 – 130% / NA	> 130%	< 20%	< 10%
		Nitrobenzene-d5 (surr)	23 – 120% / NA	> 120%	< 23%	< 10%
		2-Fluorobiphenyl (surr)	30 – 115% / NA	> 115%	< 30%	< 10%
		2,4,6-Tribromophenol (surr)	19 – 122% / NA	> 122%	< 19%	< 10%
		Terphenyl-d14 (surr)	18 – 137% / NA	> 137%	< 18%	< 10%
		Laboratory Control Samples				
		All compounds	60 – 140% / NA	> 140%	< 60%	NA

TABLE F-8 (Continued)

ACCURACY AND PRECISION REQUIREMENTS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Analyte	Accuracy/Precision Requirements	Detected Data (J3 or J2)	Detected and Nondetected Data (J3 / UJ3)	Detected and Nondetected Data (J3 / R2)
Pesticides/Polychlorinated Biphenyls	Soil	**Matrix Spikes/Matrix Spike Duplicates**				
		gamma-BHC (Lindane)	46 – 127% / 50%	> 127%	< 46% / > 50%	
		Heptachlor	35 – 130% / 31%	> 136%	< 35% / > 31%	
		Aldrin	34 – 132% / 43%	> 132%	< 34% / > 43%	
		Dieldrin	31 – 134% / 38%	> 134%	< 31% / > 38%	
		Endrin	42 – 139% / 45%	> 139%	< 42% / > 45%	
		4,4'-DDT	23 – 134% / 50%	> 134%	< 23% / > 50%	
		Tetrachloro-m-xylene (surr)	30 – 150% / NA	> 150%	< 30% / NA	< 10%
		Decachlorobiphenyl (surr)	30 – 150% / NA	> 150%	< 30% / NA	< 10%
		Laboratory Control Samples				
		All target analytes	60 – 140% / NA	> 140%	< 60%	NA
TPH-Purgeables	Soil	**Matrix Spikes/Matrix Spike Duplicates**				
		Gasoline	70 – 130% / 30%	> 130%	< 70%	NA
		Bromofluorobenzene (surr)	75 – 125% / NA	> 125%	< 75%	< 10%
		Laboratory Control Samples				
		Gasoline	75 – 125% / NA	> 125%	< 75%	NA
TPH-Extractables	Soil	**Matrix Spikes/Matrix Spike Duplicates**				
		Diesel / Motor Oil	50 – 150% / 50%	> 150%	< 50%	NA
		o-Terphenyl (surr)	60 – 140% / NA	> 140%	< 60%	< 10%
		Laboratory Control Samples				
		Diesel / Motor oil	60 – 140% / NA	> 140%	< 60%	NA
Metals / Cyanide	Soil	**Matrix Spikes**				
		All target analytes	75 – 125% / 35%	> 125%	31 - 75% / 35%	< 30%
		Sample Duplicates				
		All target analytes	> 5X CRDL	> 20%	> 20%	NA
		Laboratory Control Samples	< 5X CRDL	> ± CRDL	> ± CRDL	
		All target analytes	80 – 120% / NA	> 120%	< 80%	NA

TABLE F-8 (Continued)

ACCURACY AND PRECISION REQUIREMENTS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Analyte	Accuracy/Precision Requirements	Detected Data (J3 or J2)	Detected and Nondetected Data (J3 / UJ3)	Detected and Nondetected Data (J3 / R2)
All Methods	Soil	**Field Duplicates**	NA / 35%	NA	NA	NA

Notes:

BHC Benzene hexachloride
CRDL Contract required detection limit
NA Not applicable
Surr Surrogate
TPH Total petroleum hydrocarbons

Source: EPA 1994c and 1995; TtEMI 2001b; and the specified analytical methods

TABLE F-9

DATA QUALIFICATION: ACCURACY EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J3)	Number (Percent) of Analytes Rejected (R2)
Polynuclear Aromatic Hydrocarbons				
2-Methylnaphthalene	Soil	779	246	0
Acenaphthene	Soil	792	134	0
Acenaphthylene	Soil	792	148	0
Anthracene	Soil	792	131	0
Benzo(a)Anthracene	Soil	1776	283	0
Benzo(a)Pyrene	Soil	1859	439	0
Benzo(b)Fluoranthene	Soil	1873	405	0
Benzo(g,h,i)Perylene	Soil	792	166	0
Benzo(k)Fluoranthene	Soil	1745	353	0
Bis(2-Ethylhexyl)Phthalate	Soil	19	12	0
Chrysene	Soil	1467	207	0
Dibenz(a,h)Anthracene	Soil	1315	397	0
Fluoranthene	Soil	792	114	0
Fluorene	Soil	792	144	0
Indeno(1,2,3-cd)Pyrene	Soil	1468	304	0
Naphthalene	Soil	792	192	0
Phenanthrene	Soil	792	148	0
Pyrene	Soil	792	76	0
Pesticides/Polychlorinated Biphenyls				
4,4'-Dichlorodiphenyldichloroethane	Soil	215	3	0
4,4'-Dichlorodiphenyldichloroethene	Soil	277	2	0
4,4'-Dichlorodiphenyltrichloroethane	Soil	287	12	0
Aldrin	Soil	203	34	0
Alpha-Chlordane	Soil	272	3	0
Aroclor-1254	Soil	457	1	0
Aroclor-1260	Soil	1538	54	0
Dieldrin	Soil	187	1	0
Endrin	Soil	187	14	0
Gamma-BHC (Lindane)	Soil	187	34	0
Gamma-Chlordane	Soil	273	3	0
Heptachlor	Soil	187	15	0
Semivolatile Organic Compounds				
1,2,4-Trichlorobenzene	Soil	24	3	0
1,4-Dichlorobenzene	Soil	24	3	0
2,4-Dichlorophenol	Soil	24	1	0
2,4-Dimethylphenol	Soil	397	99	0
2-Methylnaphthalene	Soil	397	18	0
3,3'-Dichlorobenzidine	Soil	24	1	0
3-Nitroaniline	Soil	24	1	0
4-Chloroaniline	Soil	24	1	0
4-Nitroaniline	Soil	24	1	0

TABLE F-9 (Continued)

DATA QUALIFICATION: ACCURACY EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J3)	Number (Percent) of Analytes Rejected (R2)
Acenaphthene	Soil	397	20	0
Acenaphthylene	Soil	397	20	0
Anthracene	Soil	397	16	0
Benzo(a)Anthracene	Soil	399	17	0
Benzo(a)Pyrene	Soil	409	27	0
Benzo(b)Fluoranthene	Soil	409	27	0
Benzo(g,h,i)Perylene	Soil	397	101	0
Benzo(k)Fluoranthene	Soil	402	22	0
Bis(2-Ethylhexyl)Phthalate	Soil	489	51	0
Carbazole	Soil	397	7	0
Chrysene	Soil	397	18	0
Dibenz(a,h)Anthracene	Soil	401	100	0
Dibenzofuran	Soil	397	16	0
Diethylphthalate	Soil	397	16	0
Fluoranthene	Soil	397	13	0
Fluorene	Soil	397	17	0
Indeno(1,2,3-cd)Pyrene	Soil	409	95	0
Isophorone	Soil	24	1	0
N-Nitroso-Di-N-Propylamine	Soil	397	46	0
N-Nitrosodiphenylamine	Soil	397	17	0
Naphthalene	Soil	397	17	0
Pentachlorophenol	Soil	397	150	0
Phenanthrene	Soil	397	11	0
Phenol	Soil	397	66	0
Pyrene	Soil	397	34	0
Pyridine	Soil	21	1	0
TPH-Extractables				
Diesel Range Organics	Soil	788	20	0
Motor Oil Range Organics	Soil	514	7	0
Diesel Range Organics	Soil	3	1	0
TPH-Purgeables				
Gasoline Range Organics	Soil	315	69	0
Volatiles				
1,1-Dichloroethene	Soil	128	3	0
1,2-Dichloroethene (Total)	Soil	104	2	0
Benzene	Soil	59	1	0
Tetrachloroethene	Soil	60	2	0
Trichloroethene	Soil	174	7	0
Vinyl Chloride	Soil	128	2	0
Organic Total:		**42,031**	**5,243 (12.4 %)**	**0 (0.0 %)**
Total Metals				
Antimony	Soil	288	260	9

TABLE F-9 (Continued)

DATA QUALIFICATION: ACCURACY EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J3)	Number (Percent) of Analytes Rejected (R2)
Arsenic	Soil	871	175	0
Barium	Soil	222	22	0
Beryllium	Soil	694	6	0
Cadmium	Soil	264	14	0
Calcium	Soil	217	5	0
Chromium	Soil	217	78	0
Cobalt	Soil	217	18	0
Copper	Soil	1902	379	0
Lead	Soil	1137	188	0
Manganese	Soil	999	116	0
Mercury	Soil	653	107	0
Molybdenum	Soil	197	6	0
Nickel	Soil	226	76	0
Potassium	Soil	217	109	0
Selenium	Soil	217	69	0
Silver	Soil	217	15	3
Sodium	Soil	217	45	1
Thallium	Soil	217	94	46
Vanadium	Soil	217	3	0
Zinc	Soil	1448	367	0
Inorganic Total:		**11,551**	**2,152 (18.6 %)**	**59 (0.5 %)**
Total:		**53,582**	**7,395 (13.8 %)**	**59 (0.8 %)**

Notes:

BHC Benzene hexachloride
TPH Total petroleum hydrocarbons

TABLE F-10

FIELD DUPLICATE PRECISION EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Number Of Analytes Reported	Number of RPDs > 50%	Minimum RPD (%)	Maximum RPD (%)
Polynuclear Aromatic Hydrocarbons					
2-Methylnaphthalene	Soil	779	2	74	87
Acenaphthene	Soil	792	3	52	97
Acenaphthylene	Soil	792	2	69	84
Anthracene	Soil	792	2	98	98
Benzo(a)Anthracene	Soil	1776	14	57	155
Benzo(a)Pyrene	Soil	1859	13	51	154
Benzo(b)Fluoranthene	Soil	1873	16	56	182
Benzo(g,h,i)Perylene	Soil	792	5	64	116
Benzo(k)Fluoranthene	Soil	1745	9	56	167
Chrysene	Soil	1467	16	51	169
Dibenz(a,h)Anthracene	Soil	1315	2	81	116
Fluoranthene	Soil	792	15	51	180
Fluorene	Soil	792	3	52	87
Indeno(1,2,3-cd)Pyrene	Soil	1468	10	52	126
Naphthalene	Soil	792	1	99	99
Phenanthrene	Soil	792	7	63	143
Pyrene	Soil	792	17	51	158
Pesticides/Polychlorinated Biphenyls					
4,4'-Dichlorodiphenyltrichloroethane	Soil	284	2	60	86
Aroclor-1260	Soil	182	2	54	188
Dieldrin	Soil	184	1	59	59
Endrin Ketone	Soil	181	1	67	67
Semivolatile Organic Compounds					
2-Methylnaphthalene	Soil	377	1	73	73
Acenaphthene	Soil	377	1	84	84
Benzo(a)Anthracene	Soil	379	4	55	81
Benzo(a)Pyrene	Soil	389	4	57	134
Benzo(b)Fluoranthene	Soil	389	3	53	75
Benzo(g,h,i)Perylene	Soil	377	2	73	83
Benzo(k)Fluoranthene	Soil	382	1	131	131
Bis(2-Ethylhexyl)Phthalate	Soil	469	4	81	161
Chrysene	Soil	377	5	52	144
Fluoranthene	Soil	377	6	53	158
Fluorene	Soil	377	1	78	78
Indeno(1,2,3-cd)Pyrene	Soil	389	1	53	53
Phenanthrene	Soil	377	5	54	87
Pyrene	Soil	377	9	53	139
Organic Total:		**42,031**	**190 (0.4 %)**		
Total Metals					
Antimony	Soil	268	3	82	156
Arsenic	Soil	851	3	70	187
Barium	Soil	202	2	76	99

TABLE F-10 (Continued)

FIELD DUPLICATE PRECISION EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Number Of Analytes Reported	Number of RPDs > 50%	Minimum RPD (%)	Maximum RPD (%)
Beryllium	Soil	674	2	59	109
Cadmium	Soil	218	1	51	51
Calcium	Soil	217	1	52	52
Chromium	Soil	197	2	54	63
Copper	Soil	1856	23	52	175
Lead	Soil	1083	14	51	188
Magnesium	Soil	206	2	74	88
Manganese	Soil	979	4	68	2800
Mercury	Soil	633	9	60	153
Molybdenum	Soil	197	1	76	76
Nickel	Soil	206	2	76	117
Silver	Soil	197	1	96	96
Sodium	Soil	197	2	64	86
Zinc	Soil	1428	15	51	122
Inorganic Total:		**11,551**	**87 (0.8 %)**		
Total:		**53,582**	**277 (0.5 %)**		

Note:

RPD Relative percent difference

TABLE F-11

DATA QUALIFICATION: PRECISION EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Type of Duplicate	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J2)
Total Metals				
Antimony	Matrix Duplicate	Soil	288	20
Arsenic	Matrix Duplicate	Soil	871	28
Barium	Matrix Duplicate	Soil	222	30
Calcium	Matrix Duplicate	Soil	217	23
Chromium	Matrix Duplicate	Soil	217	60
Cobalt	Matrix Duplicate	Soil	217	9
Copper	Matrix Duplicate	Soil	1902	404
Lead	Matrix Duplicate	Soil	1137	384
Magnesium	Matrix Duplicate	Soil	217	71
Manganese	Matrix Duplicate	Soil	999	350
Mercury	Matrix Duplicate	Soil	653	54
Nickel	Matrix Duplicate	Soil	226	50
Zinc	Matrix Duplicate	Soil	1448	186
Inorganic Total:			**11,551**	**1,669 (14.4 %)**

TABLE F-12

ANALYTICAL AND MATRIX PERFORMANCE REQUIREMENTS FOR ORGANIC ANALYSIS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Performance Requirements	Detected Data (J0)	Detected and Nondetected Data (J0/UJ0 or J7/ UJ7)	Detected and Nondetected Data (J0/R0 or J7/R7)
Volatile Organic Compounds, Semivolatile Organic Compounds, PAHs	Sample IS: 50 – 150%	Sample IS > 150%	Sample IS < 50%	Sample IS < 10%
	IPCS: meet all m/z criteria for volatiles[a] and semivolatiles[b]	NA	Criteria met for critical abundances, but not noncritical abundances [a,b]	Criteria not met for all critical abundances [a,b]
Pesticides/Polychlorinated Biphenyls	RCM and PEM: meet all criteria[c]	NA	PEM %D: > ± 25%	RCM %res: < 60% PEM %res: < 90% PEM RT: . mRT ± 0.05 PEM % breakdown: > 20% for each PEM % breakdown: > 30% for both[d]
	GPC %R: 80-110%[e]	GPC %R: > 110% [e]	GPC %R: < 80% [e]	NA

Notes:

a Bromofluorobenzene (BFB)
m/z 50: 8.0-40.0% of m/z 95
m/z 75: 30.0-66.0% of m/z 95
m/z 95: base peak, 100%
m/z 96: 5.0-9.0% of m/z 95
m/z 173: < 2.0% of m/z 174
m/z 174: 50.0-120.0% of m/z 95
m/z 175: 4.0-9.0% of m/z 174
m/z 176: 93.0-101.0% of m/z 174
m/z 177: 5.0-9.0% of m/z 176

b Decafluorotriphenylphosphine (DFTPP)
m/z 51: 30.0-80.0% of m/z 198
m/z 68: < 2.0% of m/z 69
m/z 69: Present
m/z 70: < 2.0% of m/z 69
m/z 127: 25.0-75.0% of m/z 198
m/z 197: < 1.0% of m/z 198
m/z 198: base peak, 100%
m/z 199: 5.0-9.0% of m/z 198
m/z 275: 10.0-30.0 of m/z 198
m/z 365: > 0.75% of m/z 198
m/z 441: present but < m/z 443
m/z 442: 40.0-110.0% of m/z 198
m/z 443: 15.0-24.0% of m/z 442

c RCM % res: >/= 60.0%
PEM % res: >/= 90%
PEM % res: >/= 90%
PEM RT: =mRT ± 0.05 min.
PEM %D: ± 25%
PEM %break: < 20% (4,4'-DDT or endrin)
PEM %break: < 30% (4,4'-DDT and endrin)

d Only affected nondetected data are qualified (e.g. unresolved or degraded compounds)

e Applies to cleanup performance check samples

GPC Gel Permeation Chromatography
IPCS Instrument performance check sample
IS Internal standard
mRT Mean retention time
m/z Mass ratio of the specific ion to the base peak
NA Not applicable
PAH Polynuclear aromatic hydrocarbon
PEM Performance evaluation mixture
%R Percent recovery
RCM Resolution check mixture
%res Percent resolution
%D Percent difference
RT Retention time
%break %breakdown

TABLE F-13

ANALYTICAL AND MATRIX PERFORMANCE REQUIREMENTS FOR INORGANIC ANALYSIS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Performance Requirements	Detected and Nondetected Data (J4 / UJ4)
Metals	ICP Serial Dilution %D <= 10%	%D > 10%

Notes:

%D Percent difference
ICP Inductively coupled plasma emission spectroscopy

Source: EPA 1994b and 1995; TtEMI 2001b, and the specified analytical methods

TABLE F-14

DATA QUALIFICATION: ORGANIC INTERNAL STANDARD EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J0)	Number (Percent) of Analytes Rejected (R0)
Polynuclear Aromatic Hydrocarbons				
2-Methylnaphthalene	Soil	779	2	0
Acenaphthene	Soil	792	3	0
Acenaphthylene	Soil	792	1	0
Anthracene	Soil	792	2	1
Benzo(a)Anthracene	Soil	1776	109	1
Benzo(a)Pyrene	Soil	1859	208	0
Benzo(b)Fluoranthene	Soil	1873	139	0
Benzo(g,h,i)Perylene	Soil	792	26	0
Benzo(k)Fluoranthene	Soil	1745	109	0
Bis(2-Ethylhexyl)Phthalate	Soil	19	12	0
Chrysene	Soil	1467	100	1
Dibenz(a,h)Anthracene	Soil	1315	75	0
Fluoranthene	Soil	792	4	1
Fluorene	Soil	792	1	0
Indeno(1,2,3-cd)Pyrene	Soil	1468	104	1
Naphthalene	Soil	792	1	0
Phenanthrene	Soil	792	6	0
Pyrene	Soil	792	13	1
Semivolatile Organic Compounds				
2-Methylnaphthalene	Soil	397	2	0
Anthracene	Soil	397	2	0
Benzo(a)Anthracene	Soil	399	24	0
Benzo(a)Pyrene	Soil	409	49	3
Benzo(b)Fluoranthene	Soil	409	29	3
Benzo(g,h,i)Perylene	Soil	397	33	3
Benzo(k)Fluoranthene	Soil	402	17	3
Bis(2-Ethylhexyl)Phthalate	Soil	489	40	0
Chrysene	Soil	397	32	0
Dibenz(a,h)Anthracene	Soil	401	12	3
Dibenzofuran	Soil	397	2	0
Fluoranthene	Soil	397	6	0
Fluorene	Soil	397	2	0
Indeno(1,2,3-cd)Pyrene	Soil	409	37	3
Phenanthrene	Soil	397	7	0
Pyrene	Soil	397	29	0
Volatile Organic Compounds				
Trichloroethene	Soil	174	5	0
Organic Total:		**42,031**	**1,243 (3.0 %)**	**24 (0.06 %)**

TABLE F-15

DATA QUALIFICATION: ORGANIC CALIBRATION RANGE EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J8)
Polynuclear Aromatic Hydrocarbons			
Benzo(a)Anthracene	Soil	1776	5
Benzo(a)Pyrene	Soil	1859	8
Benzo(b)Fluoranthene	Soil	1873	20
Benzo(k)Fluoranthene	Soil	1745	4
Bis(2-Ethylhexyl)Phthalate	Soil	19	3
Chrysene	Soil	1467	8
Fluoranthene	Soil	792	2
Phenanthrene	Soil	792	1
Pyrene	Soil	792	1
Pesticides/Polychlorinated Biphenyls			
Aroclor-1242	Soil	340	2
Aroclor-1260	Soil	1538	6
4,4'-Dichlorodiphenyldichloroethane	Soil	215	1
4,4'-Dichlorodiphenyldichloroethene	Soil	277	2
4,4'-Dichlorodiphenyltrichloroethane	Soil	287	1
Semivolatile Organic Compounds			
Bis(2-Ethylhexyl)Phthalate	Soil	489	7
Total Petroleum Hydrocarbon-Extractables			
Diesel Range Organics	Soil	788	6
Motor Oil Range Organics	Soil	514	19
Total Petroleum Hydrocarbon-Purgeables			
Gasoline Range Organics	Soil	315	1
Semivolatile Organic Compounds			
Tetrachloroethene	Soil	60	1
Trichloroethene	Soil	174	5
Organic Total:		**42,031**	**103 (0.2 %)**

TABLE F-16

DATA QUALIFICATION: INORGANIC ANALYTICAL AND MATRIX PERFORMANCE EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J4/J9)	Number (Percent) of Analytes Rejected
Total Metals				
Aluminum	Soil	248	3	0
Arsenic	Soil	871	2	0
Barium	Soil	222	4	0
Calcium	Soil	217	6	0
Chromium	Soil	217	4	0
Cobalt	Soil	217	3	0
Copper	Soil	1902	312	0
Lead	Soil	1137	166	0
Magnesium	Soil	226	3	0
Manganese	Soil	999	156	0
Nickel	Soil	226	4	0
Vanadium	Soil	217	13	0
Zinc	Soil	1448	246	0
Inorganic Total:		**11,551**	**922 (8.4 %)**	**0 (0.0 %)**

TABLE F-17

DATA QUALIFICATION: ORGANIC RESULTS BELOW THE REPORTING LIMIT
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J)
Polynuclear Aromatic Hydrocarbons			
2-Methylnaphthalene	Soil	779	149
Acenaphthene	Soil	792	115
Acenaphthylene	Soil	792	31
Anthracene	Soil	792	139
Benzo(a)Anthracene	Soil	1776	758
Benzo(a)Pyrene	Soil	1859	763
Benzo(b)Fluoranthene	Soil	1873	815
Benzo(g,h,i)Perylene	Soil	792	284
Benzo(k)Fluoranthene	Soil	1745	490
Chrysene	Soil	1467	739
Dibenz(a,h)Anthracene	Soil	1315	253
Fluoranthene	Soil	792	347
Fluorene	Soil	792	134
Indeno(1,2,3-cd)Pyrene	Soil	1468	479
Naphthalene	Soil	792	148
Phenanthrene	Soil	792	344
Pyrene	Soil	792	384
Pesticides/Polychlorinated Biphenyls			
Aroclor-1242	Soil	340	2
Aroclor-1248	Soil	294	1
Aroclor-1254	Soil	457	4
Aroclor-1260	Soil	1538	23
4,4'-Dichlorodiphenyldichloroethane	Soil	215	13
4,4'-Dichlorodiphenyldichloroethene	Soil	277	20
4,4'-Dichlorodiphenyltrichloroethane	Soil	287	32
Aldrin	Soil	203	1
Alpha-BHC	Soil	184	2
Alpha-Chlordane	Soil	272	11
Beta-BHC	Soil	184	12
Delta-BHC	Soil	184	3
Dieldrin	Soil	187	16
Endosulfan I	Soil	184	1
Endosulfan II	Soil	184	1
Endosulfan Sulfate	Soil	184	2
Endrin	Soil	187	11
Endrin Aldehyde	Soil	184	21
Endrin Ketone	Soil	184	19
Gamma-BHC (Lindane)	Soil	187	1
Gamma-Chlordane	Soil	273	13
Heptachlor	Soil	187	4
Heptachlor Epoxide	Soil	184	10
Methoxychlor	Soil	184	3

TABLE F-17 (Continued)

DATA QUALIFICATION: ORGANIC RESULTS BELOW THE REPORTING LIMIT
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J)
Semivolatile Organic Compounds			
2-Methylnaphthalene	Soil	397	45
Acenaphthene	Soil	397	32
Acenaphthylene	Soil	397	6
Anthracene	Soil	397	44
Benzo(a)Anthracene	Soil	399	158
Benzo(a)Pyrene	Soil	409	158
Benzo(b)Fluoranthene	Soil	409	154
Benzo(g,h,i)Perylene	Soil	397	115
Benzo(k)Fluoranthene	Soil	402	105
Bis(2-Ethylhexyl)Phthalate	Soil	489	39
Carbazole	Soil	397	16
Chrysene	Soil	397	194
Dibenz(a,h)Anthracene	Soil	401	37
Dibenzofuran	Soil	397	33
Fluoranthene	Soil	397	172
Fluorene	Soil	397	39
Indeno(1,2,3-cd)Pyrene	Soil	409	116
Naphthalene	Soil	397	44
Phenanthrene	Soil	397	176
Phenol	Soil	397	2
Pyrene	Soil	397	195
TPH-Extractables			
Diesel Range Organics	Soil	788	3
Motor Oil Range Organics	Soil	514	2
TPH-Purgeables			
Gasoline Range Organics	Soil	315	12
Volatile Organic Compounds			
1,1,2-Trichloro-1,2,2-Trifluoroethane	Soil	1	1
1,1-Dichloroethene	Soil	144	1
1,2-Dichloroethene (Total)	Soil	120	2
Benzene	Soil	59	2
Tetrachloroethene	Soil	60	6
Trichloroethene	Soil	190	16
Organic Total:		**42,031**	**8,523 (20 %)**

Notes:

BHC Benzene hexachloride
TPH Total petroleum hydrocarbons

TABLE F-18

DATA QUALIFICATION: INORGANIC RESULTS BELOW THE REPORTING LIMIT
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J)
Total Metals			
Antimony	Soil	288	203
Arsenic	Soil	871	54
Barium	Soil	222	8
Beryllium	Soil	694	316
Cadmium	Soil	264	117
Cobalt	Soil	217	3
Copper	Soil	1902	11
Lead	Soil	1137	1
Mercury	Soil	653	69
Molybdenum	Soil	197	17
Potassium	Soil	217	50
Selenium	Soil	217	15
Silver	Soil	217	50
Sodium	Soil	217	74
Inorganic Total:		**11,005**	**988 (9.0 %)**

TABLE F-19

DATA QUALIFICATION: ORGANIC COMPOUND IDENTIFICATION EXCEEDANCES
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analysis	Matrix	Number of Analytes Reported	Number (Percent) of Analytes Estimated (J9 / UJ9 / U9)
Polynuclear Aromatic Hydrocarbons			
Anthracene	Soil	792	2
Benzo(a)Anthracene	Soil	1776	6
Benzo(a)Pyrene	Soil	1859	6
Benzo(b)Fluoranthene	Soil	1873	6
Benzo(g,h,i)Perylene	Soil	792	6
Benzo(k)Fluoranthene	Soil	1745	6
Chrysene	Soil	1467	6
Dibenz(a,h)Anthracene	Soil	1315	6
Fluoranthene	Soil	792	2
Indeno(1,2,3-cd)Pyrene	Soil	1468	6
Phenanthrene	Soil	792	2
Pyrene	Soil	792	6
Pesticides/Polychlorinated Biphenyls			
4,4'-Dichlorodiphenyldichloroethane	Soil	215	27
4,4'-Dichlorodiphenyldichloroethene	Soil	277	14
4,4'-Dichlorodiphenyltrichloroethane	Soil	287	59
Aldrin	Soil	203	1
Alpha-BHC	Soil	184	2
Alpha-Chlordane	Soil	272	4
Aroclor-1242	Soil	340	1
Aroclor-1254	Soil	457	19
Aroclor-1260	Soil	1538	25
Beta-BHC	Soil	184	17
Delta-BHC	Soil	184	2
Dieldrin	Soil	187	19
Endosulfan I	Soil	184	2
Endosulfan II	Soil	184	2
Endosulfan Sulfate	Soil	184	2
Endrin	Soil	187	18
Endrin Aldehyde	Soil	184	19
Endrin Ketone	Soil	184	18
Heptachlor	Soil	187	4
Heptachlor Epoxide	Soil	184	16
Organic Total:		**42,031**	**331 (0.3 %)**

Note:

BHC Benzene hexachloride

TABLE F-20

DATA EVALUATION: ORGANIC REPORTING LIMITS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Minimum RL	Maximum RL	Average RL	Project Cleanup Goal*	Units
Polynuclear Aromatic Hydrocarbons							
2,4-Dimethylphenol	Soil	7	180	220	196	29,000	µg/kg
2-Methylnaphthalene	Soil	751	160	12,000	344	56,000	µg/kg
Acenaphthene	Soil	764	54	14,000	406	3,700,000	µg/kg
Acenaphthylene	Soil	764	54	14,000	394	3,700,000	µg/kg
Anthracene	Soil	764	54	14,000	406	22,000,000	µg/kg
Benzo(a)Anthracene	Soil	1,748	54	14,000	293	370	µg/kg
Benzo(a)Pyrene	Soil	1,831	54	14,000	259	330	µg/kg
Benzo(b)Fluoranthene	Soil	1,845	54	14,000	289	340	µg/kg
Benzo(g,h,i)Perylene	Soil	764	54	14,000	412	1,600,000	µg/kg
Benzo(k)Fluoranthene	Soil	1,717	54	14,000	294	340	µg/kg
Bis(2-Ethylhexyl)Phthalate	Soil	19	180	220	196	27,000	µg/kg
Carbazole	Soil	7	180	220	196	640	µg/kg
Chrysene	Soil	1,439	54	12,000	280	3,300	µg/kg
Dibenz(a,h)Anthracene	Soil	1,287	54	12,000	278	330	µg/kg
Dibenzofuran	Soil	7	180	220	196	290,000	µg/kg
Diethylphthalate	Soil	7	180	220	196	660,000	µg/kg
Fluoranthene	Soil	764	54	12,000	354	2,000,000	µg/kg
Fluorene	Soil	764	54	12,000	339	2,600,000	µg/kg
Indeno(1,2,3-cd)Pyrene	Soil	1,440	54	12,000	278	350	µg/kg
N-Nitroso-Di-N-Propylamine	Soil	13	180	360	203	330	µg/kg
N-Nitrosodiphenylamine	Soil	7	180	220	196	1,100	µg/kg
Naphthalene	Soil	764	54	12,000	344	56,000	µg/kg
Pentachlorophenol	Soil	7	880	1,100	977	2,600	µg/kg
Phenanthrene	Soil	764	54	12,000	356	15,000,000	µg/kg
Phenol	Soil	7	180	220	196	140,000	µg/kg
Pyrene	Soil	764	54	12,000	355	2,300,000	µg/kg
Pesticides/Polychlorinated Biphenyls							
Aroclor-1016	Soil	274	4	13,000	96	210	µg/kg
Aroclor-1221	Soil	274	4	26,000	187	210	µg/kg
Aroclor-1232	Soil	274	4	13,000	96	210	µg/kg
Aroclor-1242	Soil	320	1	13,000	130	210	µg/kg
Aroclor-1248	Soil	274	4	13,000	96	210	µg/kg
Aroclor-1254	Soil	437	4	9,600	80	210	µg/kg
Aroclor-1260	Soil	1,518	4	9,600	50	210	µg/kg
4,4'-Dichlorodiphenyldichloroethane	Soil	212	2	410	11	2,100	µg/kg
4,4'-Dichlorodiphenyldichloroethene	Soil	274	2	35	6	1,600	µg/kg
4,4'-Dichlorodiphenyltrichloroethane	Soil	284	2	170	7	1,200	µg/kg
Aldrin	Soil	200	1	36	2	24	µg/kg
Alpha-BHC	Soil	181	2	10	2		µg/kg
Alpha-Chlordane	Soil	269	2	36	3	320	µg/kg
Beta-BHC	Soil	181	2	10	2		µg/kg

TABLE F-20 (Continued)

DATA EVALUATION: ORGANIC REPORTING LIMITS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Minimum RL	Maximum RL	Average RL	Project Cleanup Goal*	Units
Delta-BHC	Soil	181	2	10	2		µg/kg
Dieldrin	Soil	184	3	71	5		µg/kg
Endosulfan I	Soil	181	2	10	2	17,000	µg/kg
Endosulfan II	Soil	181	3	19	4	15,000	µg/kg
Endosulfan Sulfate	Soil	181	3	19	4	16,000	µg/kg
Endrin	Soil	184	3	71	4		µg/kg
Endrin Aldehyde	Soil	181	3	170	5	17,000	µg/kg
Endrin Ketone	Soil	181	3	19	4	17,000	µg/kg
Gamma-BHC (Lindane)	Soil	184	2	36	2		µg/kg
Gamma-Chlordane	Soil	270	2	36	3	290	µg/kg
Heptachlor	Soil	184	2	36	2	65	µg/kg
Heptachlor Epoxide	Soil	181	2	10	2	1.7	µg/kg
Methoxychlor	Soil	181	17	96	20	280,000	µg/kg
Toxaphene	Soil	181	170	960	202		µg/kg
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	Soil	4	180	390	333	650,000	µg/kg
1,2-Dichlorobenzene	Soil	4	180	200	190	370,000	µg/kg
1,3-Dichlorobenzene	Soil	4	180	200	190		µg/kg
1,4-Dichlorobenzene	Soil	4	180	200	190	1,900	µg/kg
2,2'-Oxybis(1-Chloropropane)	Soil	4	180	390	333		µg/kg
2,4,5-Trichlorophenol	Soil	4	450	990	840		µg/kg
2,4,6-Trichlorophenol	Soil	4	180	390	333		µg/kg
2,4-Dichlorophenol	Soil	4	180	390	333		µg/kg
2,4-Dimethylphenol	Soil	377	170	23,000	832	29,000	µg/kg
2,4-Dinitrophenol	Soil	4	450	990	840		µg/kg
2,4-Dinitrotoluene	Soil	4	180	390	333		µg/kg
2,6-Dinitrotoluene	Soil	4	180	390	333		µg/kg
2-Chloronaphthalene	Soil	4	180	390	333		µg/kg
2-Chlorophenol	Soil	4	180	390	333		µg/kg
2-Methylnaphthalene	Soil	377	170	23,000	835	56,000	µg/kg
2-Methylphenol	Soil	4	180	390	333		µg/kg
2-Nitroaniline	Soil	4	450	990	840		µg/kg
2-Nitrophenol	Soil	4	180	390	333		µg/kg
3,3'-Dichlorobenzidine	Soil	4	180	390	333		µg/kg
3-Nitroaniline	Soil	4	450	990	840		µg/kg
4,6-Dinitro-2-Methylphenol	Soil	4	450	990	840		µg/kg
4-Bromophenyl-Phenylether	Soil	4	180	390	333		µg/kg
4-Chloro-3-Methylphenol	Soil	4	180	390	333		µg/kg
4-Chloroaniline	Soil	4	180	390	333		µg/kg
4-Chlorophenyl-Phenylether	Soil	4	180	390	333		µg/kg
4-Methylphenol	Soil	4	180	390	333		µg/kg
4-Nitroaniline	Soil	4	450	990	840		µg/kg

TABLE F-20 (Continued)

DATA EVALUATION: ORGANIC REPORTING LIMITS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Minimum RL	Maximum RL	Average RL	Project Cleanup Goal*	Units
4-Nitrophenol	Soil	4	450	990	840		µg/kg
Acenaphthene	Soil	377	170	35,000	1,055	3,700,000	µg/kg
Acenaphthylene	Soil	377	170	35,000	1,054	3,700,000	µg/kg
Anthracene	Soil	377	170	35,000	1,054	22,000,000	µg/kg
Azobenzene	Soil	1	180	180	180		µg/kg
Benzidine	Soil	1	450	450	450		µg/kg
Benzo(a)Anthracene	Soil	379	170	35,000	1,060	370	µg/kg
Benzo(a)Pyrene	Soil	389	170	35,000	1,035	330	µg/kg
Benzo(b)Fluoranthene	Soil	389	170	35,000	1,035	340	µg/kg
Benzo(g,h,i)Perylene	Soil	377	170	35,000	1,053	1,600,000	µg/kg
Benzo(k)Fluoranthene	Soil	382	170	35,000	1,051	340	µg/kg
Benzoic Acid	Soil	1	450	450	450	2,200,000	µg/kg
Benzyl Alcohol	Soil	1	180	180	180		µg/kg
Bis(2-Chloroethoxy)Methane	Soil	4	180	390	333		µg/kg
Bis(2-Chloroethyl)Ether	Soil	4	180	390	333		µg/kg
Bis(2-Ethylhexyl)Phthalate	Soil	469	150	23,000	730	27,000	µg/kg
Butylbenzylphthalate	Soil	4	180	390	333		µg/kg
Carbazole	Soil	377	170	79,000	1,718	640	µg/kg
Chrysene	Soil	377	170	23,000	843	3,300	µg/kg
Di-N-Butylphthalate	Soil	4	180	390	333		µg/kg
Di-N-Octylphthalate	Soil	4	180	390	333		µg/kg
Dibenz(a,h)Anthracene	Soil	381	170	23,000	832	330	µg/kg
Dibenzofuran	Soil	377	170	23,000	834	290,000	µg/kg
Diethylphthalate	Soil	377	170	23,000	833	660,000	µg/kg
Dimethylphthalate	Soil	4	180	390	333		µg/kg
Fluoranthene	Soil	377	170	23,000	834	2,000,000	µg/kg
Fluorene	Soil	377	170	23,000	834	2,600,000	µg/kg
Hexachlorobenzene	Soil	4	180	390	333		µg/kg
Hexachlorobutadiene	Soil	4	180	390	333		µg/kg
Hexachlorocyclopentadiene	Soil	4	180	390	333		µg/kg
Hexachloroethane	Soil	4	180	390	333		µg/kg
Indeno(1,2,3-cd)Pyrene	Soil	389	170	23,000	819	350	µg/kg
Isophorone	Soil	4	180	390	333		µg/kg
N-Nitroso-Di-N-Propylamine	Soil	377	170	23,000	832	330	µg/kg
N-Nitrosodimethylamine	Soil	1	180	180	180		µg/kg
N-Nitrosodiphenylamine	Soil	377	170	29,000	956	1,100	µg/kg
Naphthalene	Soil	377	170	23,000	832	56,000	µg/kg
Nitrobenzene	Soil	4	180	390	333		µg/kg
Pentachlorophenol	Soil	377	450	120,000	3515	2,600	µg/kg
Phenanthrene	Soil	377	170	23,000	838	15,000,000	µg/kg
Phenol	Soil	377	170	23,000	832	140,000	µg/kg
Pyrene	Soil	377	170	23,000	846	2,300,000	µg/kg

TABLE F-20 (Continued)

DATA EVALUATION: ORGANIC REPORTING LIMITS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Minimum RL	Maximum RL	Average RL	Project Cleanup Goal*	Units
Pyridine	Soil	1	180	180	180		µg/kg
TPH-Extractables							
Diesel Range Organics	Soil	788	1	7,000	65		mg/kg
Motor Oil Range Organics	Soil	514	5	7,000	91		mg/kg
TPH-Purgeables							
Gasoline Range Organics	Soil	315	0.16	700	5		mg/kg
Volatile Organic Compounds							
1,1,1-Trichloroethane	Soil	14	9	650	126	770,000	µg/kg
1,1,2,2-Tetrachloroethane	Soil	9	11	650	190		µg/kg
1,1,2-Trichloro-1,2,2-Trifluoroethane	Soil	1	490	490	490		µg/kg
1,1,2-Trichloroethane	Soil	14	9	650	126	840	µg/kg
1,1-Dichloroethane	Soil	9	11	650	190		µg/kg
1,1-Dichloroethene	Soil	127	9	15,000	970	54	µg/kg
1,2,4-Trichlorobenzene	Soil	10	9	490	90	650,000	µg/kg
1,2-Dibromo-3-Chloropropane	Soil	1	490	490	490		µg/kg
1,2-Dibromoethane	Soil	1	490	490	490		µg/kg
1,2-Dichlorobenzene	Soil	10	9	490	90	370,000	µg/kg
1,2-Dichloroethane	Soil	14	9	650	126	350	µg/kg
1,2-Dichloroethene (Total)	Soil	120	9	15,000	1,022	43,000	µg/kg
1,2-Dichloropropane	Soil	9	11	650	190		µg/kg
1,3-Dichlorobenzene	Soil	5	490	490	490		µg/kg
1,4-Dichlorobenzene	Soil	10	9	490	90	1,900	µg/kg
2-Butanone	Soil	14	9	650	126	7,300,000	µg/kg
2-Hexanone	Soil	9	11	650	190		µg/kg
4-Methyl-2-Pentanone	Soil	9	11	650	190	790,000	µg/kg
Acetone	Soil	9	11	650	190		µg/kg
Benzene	Soil	42	9	1400	88	180	µg/kg
Bromodichloromethane	Soil	9	11	650	190		µg/kg
Bromoform	Soil	14	9	650	126	490	µg/kg
Bromomethane	Soil	9	11	650	190		µg/kg
Carbon Disulfide	Soil	14	9	650	126	360,000	µg/kg
Carbon Tetrachloride	Soil	14	9	650	126	86	µg/kg
Chlorobenzene	Soil	14	9	650	126	150,000	µg/kg
Chloroethane	Soil	9	11	650	190		µg/kg
Chloroform	Soil	14	9	650	126	240	µg/kg
Chloromethane	Soil	9	11	650	190		µg/kg
Cis-1,2-Dichloroethene	Soil	12	9	490	52	43,000	µg/kg
Cis-1,3-Dichloropropene	Soil	9	11	650	190		µg/kg
Cyclohexane	Soil	1	490	490	490		µg/kg
Dibromochloromethane	Soil	9	11	650	190		µg/kg
Dichlorodifluoromethane	Soil	1	490	490	490		µg/kg
Ethylbenzene	Soil	14	9	650	126	230,000	µg/kg

TABLE F-20 (Continued)

DATA EVALUATION: ORGANIC REPORTING LIMITS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Minimum RL	Maximum RL	Average RL	Project Cleanup Goal*	Units
Isopropylbenzene	Soil	1	490	490	490		µg/kg
Methyl Acetate	Soil	1	490	490	490		µg/kg
Methylcyclohexane	Soil	1	490	490	490		µg/kg
Methylene Chloride	Soil	9	11	650	190		µg/kg
Styrene	Soil	14	9	650	126	1,700,000	µg/kg
Tert-Butyl Methyl Ether	Soil	1	490	490	490		µg/kg
Tetrachloroethene	Soil	43	9	1,400	107	940	µg/kg
Toluene	Soil	14	9	650	126	520,000	µg/kg
Trans-1,2-Dichloroethene	Soil	12	9	490	52	63,000	µg/kg
Trans-1,3-Dichloropropene	Soil	9	11	650	190		µg/kg
Trichloroethene	Soil	173	9	15,000	1,109	1,700	µg/kg
Trichlorofluoromethane	Soil	1	490	490	490		µg/kg
Vinyl Chloride	Soil	127	9	15,000	970	22	µg/kg
Xylene (Total)	Soil	14	9	650	126	210,000	µg/kg

Notes:

µg/kg Micrograms per kilogram
BHC Benzene hexachloride
RL Reporting limit
TPH Total petroleum hydrocarbons

* Only target analytes for which screening criteria were established for the Parcel B remedial action are listed.

TABLE F-21

DATA EVALUATION: INORGANIC REPORTING LIMITS
PARCEL B CONSTRUCTION SUMMARY REPORT
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Analyte	Matrix	Number of Analytes Reported	Minimum RLs	Maximum RLs	Average RLs	Project Cleanup Level*	Units
General Chemistry							
Cyanide	Soil	6	1	1	1.00	2	mg/kg
Total Metals							
Aluminum	Soil	228	1	270	7.91	73,000	mg/kg
Antimony	Soil	268	0	4	0.71	10	mg/kg
Arsenic	Soil	851	0	2	0.75	11	mg/kg
Barium	Soil	202	0	27	1.33	2,700	mg/kg
Beryllium	Soil	674	0	0	0.00	140	mg/kg
Cadmium	Soil	218	0	0	0.00	3.5	mg/kg
Calcium	Soil	197	23	560	60.61		mg/kg
Chromium	Soil	197	0	1	0.10		mg/kg
Cobalt	Soil	197	0	1	0.12		mg/kg
Copper	Soil	1856	0	48	0.56	160	mg/kg
Iron	Soil	197	2	320	13.65		mg/kg
Lead	Soil	1083	0	448	0.52	220	mg/kg
Magnesium	Soil	206	25	1,600	88.45		mg/kg
Manganese	Soil	979	0	27	0.44	1,400	mg/kg
Mercury	Soil	633	0	11	0.08	2.3	mg/kg
Molybdenum	Soil	197	0	1	0.13	79	mg/kg
Nickel	Soil	206	0	1	0.11		mg/kg
Potassium	Soil	197	19	270	45.95		mg/kg
Selenium	Soil	197	0	9	0.32	140	mg/kg
Silver	Soil	197	0	1	0.07	51	mg/kg
Sodium	Soil	197	24	270	71.50		mg/kg
Thallium	Soil	197	0	98	2.58	6.1	mg/kg
Vanadium	Soil	197	0	1	0.16	450	mg/kg
Zinc	Soil	1428	0	95	0.91	370	mg/kg

Notes:

mg/kg Milligrams per kilogram
RL Reporting limit

* Only target analytes for which screening criteria were established for the Parcel B Remedial Action are listed.