TIER II INVESTIGATION – REPORT OF FINDINGS
BELAUSTEGUI PARK
BATTLE MOUNTAIN, NEVADA

Prepared by:

KLEINFELDER

4875 Longley Lane, Suite 100
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February 14, 2003

For:

Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, Nevada 89706-0851

BROWNFIELDS
Nevada's Land Recycling Program

KLEINFELDER
An employee owned company

February 14, 2003
File: 15562.04

Ms. Connie Lewis
Nevada Brownfields Coordinator
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, Nevada 89706-0851

SUBJECT: Tier II Investigation – Report of Findings
Belaustegui Park
Battle Mountain, Nevada

Dear Connie:

Kleinfelder is pleased to submit this Tier II Investigation Report of Findings for Belaustegui Park, Battle Mountain, Nevada.

In general, the findings of the Tier II Investigation document the presence of petroleum compounds in soil and groundwater at the subject site. The analytical results also indicate that barium is present in soil at elevated concentrations. The following report documents the field investigation activities, soil and groundwater analytical results, discussion of results, conclusions, and recommendations. Based on the available analytical results, the intended use of the property and discussions with the Nevada Division of Environmental Protection, we conclude that additional investigation activities do not appear to be warranted. However, due to the limited available data we recommend the installation of a "cap" and the use of a deed restriction/notification, or additional assessment.

If you have any questions or require additional information, please do not hesitate to call either of the undersigned at (775) 689-7800.

Respectfully Submitted,

KLEINFELDER, INC.

Joshua P. Fortmann, C.E.M.
Environmental Geologist

Fax:
Kent Zenobia, P.E., DEE, C.E.M.
Chief Environmental Engineer

cc: Ms. Deborah Hinze, Community Development Specialist, Lander County

15562.04/REN3R031

A Report Prepared For:

Ms. Connie Lewis
Nevada Brownfields Coordinator
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, Nevada 89706-0851

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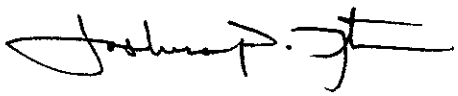
BELAUSTEGUI PARK
BATTLE MOUNTAIN, NEVADA

Kleinfelder, Inc. Job No. 15562.04

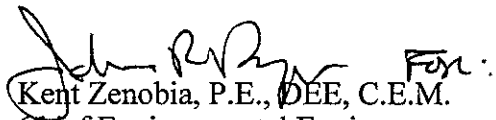
Prepared By:



Joshua P. Fortmann, C.E.M. #1730, Exp. 6/21/04
Environmental Geologist

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable Federal, State and local statutes, regulations, and ordinances.

Reviewed by:



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February 14, 2003

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BATTLE MOUNTAIN, NEVADA

1.0 INTRODUCTION

1.1 Project Information

Kleinfelder, Inc. (Kleinfelder) performed a Tier II Investigation at Belaustegui Park (Site) in Battle Mountain, Nevada in accordance with the approved Sampling and Analysis Plan (SAP) dated July 17, 2002. The fieldwork was performed from August 26 through September 3, 2002. This work was performed following a Phase I ESA that identified the potential for the presence of VOCs, TPH, and barium in Site soil and VOCs and TPH in Site groundwater.

1.2 Project Objectives

The objective of this investigation, as stated in the approved Sampling and Analysis Plan (SAP), was to obtain sufficient data to assess the potential soil and groundwater impacts at the Site, and to evaluate if remedial action is necessary. To achieve this goal, the Site was assessed to evaluate the soil for VOCs, TPH, and barium and the groundwater for VOCs and TPH.

1.3 Scope of Services

The scope of services included the following tasks:

- Preparation of Workplan, SAP and Health and Safety Plan;
- Obtain monitoring well permits, mark sampling locations and notify Underground Service Alert (USA);
- Install ten soil borings and three groundwater monitoring wells, collect soil and groundwater samples and manage investigation derived waste (IDW);
- Coordinate community outreach; and
- Prepare a report of findings.

1.4 Soil and Groundwater Investigation

1.4.1 Pre-field Activities

Prior to drilling, Kleinfelder marked the Site boundaries with white marking paint. Kleinfelder notified Underground Service Alert (USA) at least 48 hours prior to drilling for utility clearance. Utility location marks were visually observed and photographed prior to drilling (Plate 5). Monitoring well and boring locations were moved as necessary to avoid underground utilities, (Plates 3 and 4). The drilling subcontractor, Boart Longyear of Dayton, Nevada (Boart) a certified well driller, submitted Notices of Intent and Affidavits of Intent to Abandon with the State of Nevada Department of Water Resources.

1.4.2 Site Safety Procedures

A safety meeting was held onsite prior to drilling activities. Kleinfelder and Boart Longyear employees attended the meeting and reviewed the Health and Safety Plan (HASP). Kleinfelder and Boart Longyear employees signed an information verification following the safety meeting, Appendix B. In addition to information included in the HASP, the parties present at the safety meeting observed auto, truck and motorcycle traffic on dirt roads and trails on the Site. It was determined that extra attention should be paid to traffic awareness at the Site, as well as dust inhalation. The HASP includes barium as a potential chemical hazard in Site soil, so dust control was employed in the immediate drill area using water to minimize dust generation.

2.0 BACKGROUND

2.1 Site Description

The Site is located in the northeast quarter of the northwest quarter of Section 20, Township 32 North, Range 45 East of the Mount Diablo Baseline and Meridian. The geographic location of the Site is shown on Figure 1. The general layout of the Site is shown on Figure 2. The site is currently undeveloped and no records of onsite development have been found or reported.

The Site occupies approximately 0.494 acres in a commercial area. The Site is generally bordered by Front Street (Highway 40) on the south and by improved dirt roads on the north and east sides.

2.2 Operational History

According to the Lander County application for assistance under the Brownfields Program, the Site remains vacant and undeveloped land. Ownership has included the State of Nevada, the Belaustegui family and Lander County. The referenced SRK report indicates that an aerial photograph taken in 1954 showed the Site as vacant land. Two additional photographs dated 1973 and 1984 do not show significant development on the Site.

A loading ramp area was formerly located adjacent to the rail tracks to the south of the Site that is believed to have been used to transfer barite (a principle ore of barium, as barium sulfate). Former automobile service stations and a transfer facility for a chemical company were reportedly located adjacent to the Site.

2.3 Previous Investigations

The referenced Phase I ESA, performed by SRK Consulting, identified environmental concerns on adjacent properties with recommendations for further investigation, including:

- Chemical facility with known discharge within 0.5-mile radius of site;

- Numerous auto service facilities with underground storage tanks (UST) and leaking USTs within a 0.5 mile radius of the Site; and
- A barite loadout facility formerly located adjacent to the Site.

The referenced Phase I ESA was prepared for the NDEP.

2.4 Geological Information

The Site soil is mapped as the Reese silt loam (Natural Resource Conservation Service, 1992). The soil to nine inches below ground surface (bgs) is a very friable, strongly alkaline, saline and sodic silty loam. The soil from nine to sixty inches bgs is a friable, strongly alkaline, moderately saline, and moderately sodic stratified silt loam to silty clay loam. The static water level in the vicinity of the Site ranges from six to ten feet below ground surface (bgs) based on data from the Nevada Division of Water Resources Well Log Database.

3.0 SITE INVESTIGATION

3.1 Soil Sampling

On August 26 through 28, 2002, Kleinfelder observed and logged the installation of thirteen soil borings, three of which were completed as monitoring wells. Boring logs are included in Appendix A. Blow count information is not included in all boring logs due to hammer malfunctions and subsequent potential blow count inaccuracy. Boart provided hollow-stem auger drilling services.

3.1.1 Barium Soil Sample Collection

On August 26 through 28, 2002, Kleinfelder observed the installation of ten soil borings (B-1 to B-10). Two soil samples were collected from each of the ten soil borings for total and TCLP barium analysis. The soil boring locations and sample depth were selected using a random number generator. Plate 3 shows the soil boring locations. The soil samples were collected by advancing a decontaminated split-spoon sampler, lined with brass tubes, to the selected depth. The brass tubes were sealed with plastic caps, labeled, and placed in an iced cooler.

3.1.2 VOC Soil Sample Collection

On August 27, 2002, Kleinfelder observed the installation of three soil borings that were completed as groundwater monitoring wells (MW-1, MW-2, and MW-3), see Plate 2. Soil samples were collected at five-foot intervals during drilling activities, using a split-spoon sampler. Immediately following opening of the sampler, each of the soil samples was screened for VOCs using a photo-ionization detector (PID). None of the soil samples contained VOCs detectable to the PID, see Appendix B. The soil samples for VOC analysis were then collected using the Encore sampling device. A "soil core" was collected from the end of the brass sleeve, and capped, using the Encore sampling device. The brass sleeve containing the sample for TPH analysis was then sealed using teflon sheets and plastic caps. All soil samples were labeled and placed in an iced cooler.

The soil sample collected at a depth of five feet from each soil boring was submitted for TPH and VOC analysis. The five-foot deep samples were selected for analysis based on the depth to water at the Site, which ranged from approximately 5 to 8 feet below ground surface (bgs). The depth to water and saturated ten-foot deep soil samples indicate that the five-foot deep samples best represent the capillary fringe depth at the Site.

3.1.3 Quality Control Sampling

Duplicate soil samples and equipment (rinsate) blanks were collected during soil sampling activities. One rinsate blank was collected each day that equipment was decontaminated in the field. A total of three rinsate blanks were collected; two for total barium analysis and one for TPH and VOC analysis. One duplicate soil sample was collected from MW-3 and submitted for analysis for TPH and VOCs. Two duplicate soil samples were collected from B-2 and B-3 for total and TCLP barium analysis. Due to low volume soil sample recovery at B-1, a quality control duplicate was collected at B-3, not B-1, as originally stated in the SAP.

3.1.4 Analytes of Concern for Soil

The soil samples collected from the ten shallow soil borings were submitted for analysis for total barium by EPA Method 700 and TCLP barium by EPA Method 1311.

The samples collected from the three deep borings were submitted analysis for VOCs by SW846 Method 8260B and for TPH by SW846 Method 8015B (gasoline and diesel range organics).

3.2 Groundwater Sampling

On August 27, 2002, Kleinfelder observed the installation of three soil borings that were completed as monitoring wells (MW-1 to MW-3) (see Plate 2). Boring logs and monitoring well construction information are included in Appendix A. Boart provided hollow-stem auger drilling services.

3.2.1 Monitoring Well Construction

On August 27, 2002 Kleinfelder observed the installation of three soil borings that were completed as monitoring wells (MW-1, MW-2 and MW-3). Table 1 includes monitoring well construction data. The monitoring wells were constructed of 2-inch diameter, schedule 40 PVC

with ten feet of 0.010-inch factory slotted screen and five feet of blank casing. The annular space around the screened interval was filled with silica sand to approximately two feet above the well screen, and sealed with a minimum two foot thick bentonite pellet plug above the sand pack. The remainder of the annular space was filled with a cement/bentonite slurry to the ground surface. A threaded cap was placed at the bottom of the well screen section, and a protective steel christy box was placed in the cement slurry at the top of the well. A pressure cap and lock was used to seal the casing at each wellhead. Monitoring well construction details are included in the boring logs. A photograph of the completed MW-1 wellhead is shown in Photograph 4, Plate 5.

On August 27 and 28, 2002, Kleinfelder performed development activities at each of the monitoring wells. Monitoring well development logs are included in Appendix B. Monitoring well development included bailing and pumping the wells to remove sediment and improve water clarity. On August 28, 2002, Kleinfelder performed a relative elevation survey on the north side on the top of well casing at each monitoring well. A mark was placed on the well casing at the survey location for depth to water measurements. Table 1 includes monitoring well elevation data.

3.2.2 Groundwater Sample Collection

On September 3, 2002, Kleinfelder collected groundwater samples from the three monitoring wells. Prior to sample collection depth to water was measured to within 1/100th of a foot at each well. Three to five well casing volumes were purged from each of the wells using a disposable bailer. During purging, pH, electrical conductivity and temperature measurements were collected on monitoring well sample records, see Appendix B. Following stabilization of the parameters, samples were collected using a new, disposable bailer. Groundwater samples were sealed, labeled, and placed in an iced cooler.

3.2.3 Quality Control Sampling

One field blank was collected during sampling activities, and submitted for TPH and VOC analysis. One duplicate water sample was collected at MW-3 and submitted for TPH and VOC analysis.

3.2.4 Analytes of Concern for Groundwater

The groundwater samples were submitted for analysis for VOCs by SWEPA Method 8260B and for TPH by SWEPA Method 8015B.

3.2.5 Geological and Hydrogeological Information

Soils encountered during drilling included silty and clayey sands, sand with occasional gravel and rare cobbles. Flowing sands were encountered from approximately ten to fifteen feet bgs in MW-3. Groundwater was encountered during drilling at depths ranging from 6 to 8 feet bgs. Table 1 presents relative groundwater elevation data. The groundwater flow direction was calculated as northeast at a gradient of 0.0013 feet/foot. Plate 4 shows the approximate groundwater flow direction and groundwater relative elevation isocountours. Slug tests were not performed, but monitoring wells were observed to bail dry during development and sampling activities.

4.0 RESULTS

4.1 Laboratory Analyses

Soil sample analytical results for total and TCLP barium analysis are summarized in Table 2. Soil sample analytical results for TPH and VOCs are summarized in Table 3. Groundwater analytical results are summarized in Table 4. Copies of the analytical data are included as Appendix C.

4.2 Project Data Quality Objectives

The data collected for this project was definitive data. Definitive data are the result of quantitating organic and inorganic compounds using EPA procedures. The data met the established QA criteria and is therefore suitable for use in subsequent risk assessment, site characterization, alternative evaluation, engineering design, and Remedial Action Plan reporting.

4.2.1 Data Quality Objectives

Based on the analytical results the primary analytes of concern at the site are barium and TPH-DRO. The data collected during this Tier II Investigation will be used to make risk based assessments regarding the suitability of the Site to be developed into a public park. The applicable action levels for barium and TPH-DRO are those levels implemented by the NDEP for TPH in soil, free product on groundwater, and the EPA Federal Drinking Water Standards. The TCLP barium action level for groundwater is 100 mg/l. The action levels for this project are summarized in Tables 5 and 6.

The data collected during this investigation met QA criteria, as described below, and therefore meet the project DQO.

4.2.2 Data Quality Indicators (DQI)

The effectiveness of the QA program is measured by the quality of data generated by the laboratory. Data quality is judged in terms of its Precision, Accuracy, Representativeness, Completeness, and Comparability (PARCC) parameters, as described in the following section.

Precision

Precision is a measure of the reproducibility of analyses under a given set of conditions. Precision can be assessed by replicate measurements of duplicate control samples, reference materials, or environmental samples.

The comparison of precision was measured by the calculating the Relative Percent Difference (RPD) between field and Laboratory Fortified Matrix (LFM) initial and duplicate QC samples. The RPD between the two duplicate samples may be used to estimate precision, and was calculated as follows:

$$RPD = \frac{|D1 - D2|}{(D1 + D2)/2} \times 100$$

Where:

RPD = *relative percent difference*
D1 = *first sample value*
D2 = *second sample value (duplicate)*

The RPD were calculated by the EPA laboratory for water samples analyzed for TPH-GRO, TPH-DRO, and total barium, and for soil samples analyzed for TPH-DRO, TPH-GRO, total barium, and TCLP barium. The calculated RPD for LFM and LFM duplicates are within QC limits.

The RPD for the soil samples and QC duplicates collected from B-2 and B-3 and analyzed for total barium were 43.0% and 94.1%, respectively. These RPD indicate a level of precision that is most likely a result of soil sample matrix variation. The RPD for the soil samples and QC duplicates collected from B-2 and B-3 and analyzed for TCLP barium were both 0.0%, since the QC duplicate sample concentrations were equal to initial sample concentrations. The RPD for

the soil samples and QC duplicates collected from MW-3 and analyzed for TPH was 92.0%. This RPD indicates a level of precision that is most likely a result of soil sample matrix variation. VOCs were not detected in the soil samples collected from MW-3. The RPD for the groundwater sample and QC duplicate collected from MW-3 was 2.6%. This indicates good precision for groundwater samples.

Accuracy

Accuracy is a determination of how close the measurement is to the true value. Accuracy can be assessed using laboratory control samples, standard reference materials, or spiked environmental samples. QC limits were met for all QC samples except as described below. The laboratory monitored accuracy by comparing LCS results with control limits established at plus or minus three standard deviation units from the mean of historical LCS results. The accuracy of the data submitted for this project was assessed by calculating the percent recovery of laboratory control samples, and LCS, as well as additional QA/QC data, that did not fall within control limits are summarized below.

The following is information included in the "QA/QC and Analytical Comments" section of the analytical results for soil samples analyzed for VOCs. The analytical results are included in Appendix C. The initial calibration analytes bromomethane and acetone exceeded QC limits. The reported values for the compound in samples and method blanks are estimated. LCS dichlorodifluoromethane exceeded QC limits, and values for the compound in samples were flagged as estimates. No soil samples contained reportable concentrations of VOCs. Surrogate recovery, and re-analysis recovery, for bromofluorobenzene were not within QC limits. This compound is associated with the internal standard, chlorobenzene-d5, and the quantitation limits of all analytes associated with this internal standard were flagged as estimates. No soil samples had reportable concentrations of VOCs. The continuing calibration compound dichlorodifluoromethane exceeded QC limits, so reported values for the compound samples and associated method blanks were flagged as estimated. No target analytes were detected in the method blanks associated with these samples.

The following is information included in the "QA/QC and Analytical Comments" section of the analytical results for groundwater samples analyzed for TPH-DRO. The original extraction from sample MW3-GW-2 revealed low surrogate recoveries. The re-extraction, beyond holding time, was within the QC limits, so the QL for the sample is estimated. The surrogate n-Hexacosane

did not meet QC limits. The detected result for this analyte in the sample MW3-GW-1, is estimated.

The following is information included in the "QA/QC and Analytical Comments" section of the analytical results for groundwater samples analyzed for VOCs. The LCS, dichlorodifluoromethane exceeded QC limits, so the reported values for the compound in samples and associated method blank were flagged as estimated. No groundwater samples contained reportable concentrations of VOCs.

Representativeness

Representativeness is a qualitative parameter that reflects the extent to which a given sample is characteristic of a given population at a specific location or under a given environmental condition. Representativeness is best satisfied by making certain that sampling locations are selected properly, a sufficient number of samples are collected, and an appropriate sampling technique is employed. Variations at a sampling point were evaluated based on the results of field duplicates.

Sampling locations, number of samples collected and appropriate sampling techniques were employed as specified in the approved SAP. Variation at sampling points, based on the field duplicate sample results, was observed for soil samples. This appears to be a result of soil sample matrix variation, and does not appear to indicate a poor representativeness of the soil samples. Only slight variation was observed in water samples which indicates good representativeness of the water samples.

Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared with the amount that was expected to be obtained under normal conditions. To be considered complete, the data set must contain all analytical results and data specified for the project. In addition, all data were compared to project requirements to ensure that specifications were met. Completeness was evaluated by comparing the project objectives to the quality and quantity of the data collected to determine if any deficiencies exist. Missing data can result from any number of circumstances ranging from sample acquisition and accessibility problems to sample breakage and rejection of analytical data because of quality control deficiencies. Completeness was quantitatively assessed as the percent of controlled QC parameters that are

within limits. The minimum requirement for completeness for all QC parameters, except holding times, is 80%. The requirement for holding times is 100%.

The percent completeness for each set of samples was calculated as follows:

$$Completeness = \frac{valid\ data\ obtained}{total\ data\ analyzed} \times 100\%$$

Valid data is defined as those data points that are not qualified as rejected. No data were rejected, so the percent completeness for all QC parameters, except hold time, is 100%. None of the soil samples, for VOC analysis, were analyzed within the 48-hour hold time. The samples were received by the lab within hold time, but not analyzed or extracted within hold time. Soil sample hold time for VOC analysis was exceeded by a range of 1 to 13 hours. The laboratory did not deem the data invalid, and none of the soil samples contained a reportable concentration of VOCs.

Comparability

Comparability expresses the confidence with which one data set can be compared to another data set measuring the same property. To ensure comparability, field procedures were standardized and field operations adhered to procedures outlined in the SAP. Laboratory data comparability was assured by use of established and approved analytical methods, consistency in the basis of analysis (wet weight, volume, etc.), and consistency in reporting units (ppm, ppb, etc.).

Sensitivity

Assuring the validity of quantitative measurements at low concentrations is an extremely difficult technical problem. With regulatory reporting requirements and enforceable concentrations dropping over time, the validity of any given measurement becomes even more important. The consequences of false positive or false negative data can be significant.

The laboratory reported results below the QL as "estimated" because, by definition, the reliability of the data at that level is questionable. The required detection limits for the different analytes of concern and the action levels are listed in Tables 5 and 6.

4.2.3 Data Review and Validation

The QA Manager supervised data quality assessment tasks. Kleinfelder evaluated and documented measurement data to monitor consistency with DQOs, to quantitatively assess data quality, and to identify potential limitations to data use.

Kleinfelder reviewed field and analytical laboratory data generated for this project as described below. Chain of custody documentation met QC requirements. Holding time compliance was met for all samples except soil samples for VOC analysis, see "Completeness" portion of section 4.2.2. Laboratory batch QC frequency met QC requirements. Results of batch and field QC analyses met QC requirements, with the exceptions described in the "Accuracy" portion of section 4.2.2. The analytical sample results do not appear to have been influenced by outlier QC sample results. After reviewing the QC data that did not fall within QC limits and the analytical results, the assessment is that the project DQOs were met.

EPA Region 9 laboratory system (contract laboratory operating under the EPA quality assurance program) generated all laboratory data. Regularly scheduled analyses of known duplicates, standards, and spiked samples are routine aspects of data reduction, validation, and reporting procedures.

All data produced by the EPA Region 9 laboratory system was reviewed using the tiered approach. All petroleum hydrocarbon data was reviewed using Tier 1A. VOC and barium data was reviewed using Tier 1B. 10% of all data was reviewed using Tier 3. The data reviewed, using Tier 3, was randomly selected by the QA office. The results of the Tier review, and data validation are pending.

4.3 Soil Sample Results

4.3.1 Barium Results

A total of 22 soil samples were submitted for total and TCLP barium analysis. The soil samples contained total barium at concentrations ranging from 80 mg/Kg to 6900 mg/Kg. None of the soil samples contained TCLP barium above the quantitation limit (QL), but four samples contained a reported TCLP barium concentration of 2 mg/L. The laboratory reports data results that have a concentration of at least half of the QL as estimated.

4.3.2 Petroleum Compound Results

A total of four soil samples were analyzed for TPH and VOCs. None of the soil samples contained a reportable concentration of VOCs. None of the soil samples for VOCs were analyzed or extracted within the 48-hour hold time, so VOC compounds are reported as estimated. The laboratory did receive the samples within hold time (see Chain of Custody Appendix C). Three of the soil samples contained a reportable concentration of TPH in the range of motor oil. One soil sample collected from MW-1 at a depth of 5 feet bgs contained TPH at a concentration of 20 mg/Kg, which is equal to the quantitation limit. One initial and one QC duplicate soil sample both collected from MW-3 at a depth of five feet bgs, contained TPH at concentrations of 740 and 2000 mg/Kg, respectively.

4.3.3 Quality Control Results

Two quality control duplicate soil samples for total and TCLP barium analysis were collected, one each from borings B-2 and B-3. The reported concentrations at B-2 and B-3 were 3100 mg/Kg total barium, 2 mg/L TCLP barium and 540 mg/Kg total barium, <4 mg/L TCLP barium, respectively.

One quality control duplicate soil sample for TPH and VOC analysis was collected from MW-3. The sample did not contain a reportable concentration of any VOCs, and contained 2,000 mg/Kg TPH, in the range of motor oil.

4.4 Groundwater Sample Results

A total of four groundwater samples were submitted for analysis for TPH and VOCs. None of the groundwater samples contained a reportable concentration of VOCs. Two groundwater samples contained TPH in the range of motor oil. One initial and one QC duplicate groundwater sample both collected from MW-3, contained TPH at concentrations of 900 and 1000 µg/L, respectively.

4.4.1 Quality Control Sample Results

One field blank and one rinseate blank were collected and analyzed for TPH and VOCs. The samples did not contain a reportable concentration of TPH or VOCs.

Two rinseate blanks were collected for total barium analysis. The samples, RB-W-1 and RB-W-2, contained barium at concentrations of 20 µg/L and 40 µg/L, respectively.

5.0 DISCUSSION

5.1 Soil Sample Results

5.1.1 Barium Results

Nevada does not have an Action Level for barium in soil, so the data was compared to the EPA Region 9 Preliminary Remediation Goal (PRG) for residential use (Appendix D). Since the Site will be redeveloped as a park, the residential PRG was deemed applicable. The PRG for barium is 5400 mg/Kg. The barium concentration in the sample collected from B-9 at a depth of 0 feet bgs (6,900 mg/Kg) exceeds the PRG. This is the only sample to exceed the PRG, but several other soil samples appear to show elevated barium concentrations.

In general, total barium concentrations in soil appear to decrease with depth, with the exception of soil boring B-1. This increase in total barium concentration at depth, at B-1, may be a result of fill placement over barium-impacted soil.

None of the soil samples contained TCLP barium in excess of the Nevada action level of 100 mg/L. Total barium is present in soil, but no TCLP data were reported to be greater than the QL of 4 mg/L. The reported TCLP barium results of 2 mg/L for soil samples collected from B-2 and B-3 appear to correlate with the high total barium concentration in the soil samples, and are estimated values. The EPA laboratory calculated RPD for LFM and LFM duplicates as within the established QC limits. The ATSDR report, included in Appendix E, states "barium compounds that do not dissolve well in water are generally not harmful".

The following is a screening-level health risk evaluation of barium concentrations detected in soil. The barium analytical results were assumed to be normally distributed and presented the following statistical characteristics:

Average concentration (mg/kg): 1,176
Minimum concentration (mg/kg): 80

Maximum concentration (mg/kg): 6,900
95UCL[1] (mg/kg): 1,982

The EPA Region 9 PRG for barium is 5,400 mg/kg. The PRG is based on a residential exposure scenario and accounts for exposure by soil ingestion, dermal contact, and inhalation of fugitive dust. The PRG is also based on a target hazard quotient of 1.0, which is the target noncancer hazard most often promulgated in state and federal environmental regulations. The hazard quotient is the ratio of an estimated exposure dose and the reference dose published by EPA. The reference dose is an estimate of the dose that is expected to be without adverse health effects in an exposed population, including sensitive subgroups (e.g., children, the elderly, and the infirm). Therefore, when the estimated dose is less than the reference dose, adverse health effects are not expected to occur in an exposed population.

Soil concentrations of barium can be directly compared to the PRG to develop a noncancer hazard quotient and, because the PRG accounts for the most significant exposure pathways, the noncancer hazard quotient calculated in this way is highly conservative and health protective.

The noncancer hazard quotient based on the 95UCL concentration and the PRG is:

HQ = 95UCL/PRG

HQ = (1,982 mg/kg)/(5,400 mg/kg)

HQ = 0.367

The noncancer hazard quotient for barium detected in the soil at the Site is well below the target noncancer hazard of 1.0. The target hazard quotient is also not exceeded if only samples collected from depths of less than 3 feet are used to calculate the 95 UCL:

HQ = (3,894 mg/kg)/(5,400 mg/kg)

HQ = 0.721

[1] 95UCL, 95th percentile upper confidence limit on the average concentration. By definition, only five percent of the samples from a given population could exceed the 95UCL. The 95UCL provides a useful upper bound estimate of the soil concentrations to which receptors may be exposed.

Kleinfelder concludes that the residual barium present in the soil at the Site does not pose an unacceptable health hazard. Further investigation or remediation is not necessary, however, potential exposures at the location of the maximum barium concentration (B9-S-0-1; 6,900 mg/kg) should be reduced or eliminated because the PRG is exceeded at this location.

Based on the available analytical data, risk evaluation and discussions with the NDEP and Lander County, we recommend a "cap" be used as an institutional control. The objective of the "cap" will be to reduce potential inhalation exposure to dust that may contain an elevated concentration of barium, and ingestion exposure to barium impacted soil. The "cap" may consist of an impermeable cover such as concrete or asphalt of no minimum depth. Alternatively, the "cap" may consist of a minimum thickness of 12 inches of clean, imported fill. A deed restriction should be employed with either of the "cap" options to limit future Site use.

A combination of "cap" types will also meet the objective. For example, a portion of the Site may be paved as a parking area or sidewalk, and the remainder of the Site may be "capped" with soil and Site landscaping. Additionally, any future excavation activities at the Site should be designed to minimize potential worker exposure to barium in Site soil.

5.1.2 Petroleum Compound Results

The Nevada Action Level for TPH in soil is 100 mg/Kg. The motor oil range TPH concentration in the initial and quality control duplicate soil samples collected from MW-3 both exceed the Nevada Action Level for TPH in soil, at 740 mg/Kg and 2,000 mg/Kg, respectively. The soil sample collected from MW-1 contained motor oil range TPH at a concentration of 20 mg/Kg. Based on the available results, discussion with the NDEP and the intended use of the Site, additional investigation activities are not warranted.

5.1.3 Quality Control Results

Two quality control duplicate soil samples for total and TCLP barium analysis were collected, one each from borings B-2 and B-3. The variability of the total and TCLP barium analytical results for the duplicate soil samples does not appear to be a result of field methodology. The variability of the results may be due to soil sample matrix variability.

One quality control duplicate soil sample for TPH and VOC analysis was collected from MW-3. The sample did not contain a reportable concentration of VOCs. The variability of the TPH

analytical results for the duplicate soil samples does not appear to be a result of field methodology. The variability of the results may be due to soil sample matrix variability.

5.2 Groundwater Sample Results

The Nevada Action Level for TPH in groundwater is one half inch of free product. Based on the analytical results, the groundwater in the vicinity of MW-3 is slightly impacted with TPH in the range of motor oil. The groundwater flow direction is to the northeast, and groundwater samples collected from MW-1 and MW-2 do not contain reportable concentrations of TPH. Based on the available information, we conclude that additional groundwater investigation activities are not warranted. However, if Site groundwater is to be used for any municipal purposes, including irrigation or drinking, production well siting, construction, and use need to comply with all applicable water quality standards.

5.3 Quality Control Sample Results

One field blank and one rinseate blank were collected and analyzed for TPH and VOCs. The samples did not contain a reportable concentration of TPH or VOCs. Two rinseate blanks were collected for total barium analysis. The samples, RB-W-1 and RB-W-2, contained barium at concentrations of 20 µg/L and 40 µg/L, respectively. Based on the TCLP barium results from the soil samples, the presence of barium in the rinseate blanks appears to be a result of incompletely deionized water used for rinseate.

6.0 DISPOSAL OF RESIDUAL MATERIALS

The waste soil and water generated during this project were contained in 55-gallon steel drums. Based on the analytical results, the soil and groundwater generated during from MW-3 will be disposed of as a non-hazardous waste. Other waste soil and groundwater can be disposed of as a non-hazardous waste or returned to the Site.

7.0 CONCLUSIONS

Based on the preceding discussion Kleinfelder makes the following conclusions:

- The Site soil has been impacted by barium in excess of the EPA residential PRG. Based on the available analytical data, risk assessment, discussions with the NDEP, and the intended use of the Site, further assessment is not warranted;

- Based on the analytical data, the barium compound present in soil does not appear to be readily soluble;

- The Site soil has been impacted by motor oil range TPH in the vicinity of MW-1 and MW-3. The TPH concentration in soil in the vicinity of MW-3 exceeds the Nevada Action Level of 100 mg/Kg. Based on the available data, discussions with the NDEP and the intended use of the Site, further assessment is not warranted; and

- The Site groundwater has been impacted in the vicinity of MW-3. The impact appears to be limited to the vicinity of MW-3 and does not warrant further assessment.

8.0 RECOMMENDATIONS

Based on the preceding conclusions, Kleinfelder makes the following recommendations to protect human health and the environment on this future park site:

- Install a "cap" consisting of an impermeable cover such as concrete or asphalt of no minimum depth and employ a deed restriction/notification, or;

- Install a "cap" consisting of a minimum 12-inch thick clean, import fill soil cover, and employ a deed restriction/notification. A combination of the impermeable cap and soil cap may be used as discussed in Section 5.1.1, or;

- Perform additional investigation activities and additional risk evaluation, based on additional data, to derive additional recommendations, and;

- Abandon the three monitoring wells at the Site in accordance with Nevada Administrative Code 534.4365.

9.0 REFERENCES

SRK Consulting, Phase I Environmental Site Assessment for Belaustegui Park, Battle Mountain, Nevada, June 2001.

Kleinfelder, Inc., Tier II Investigation-Sampling and Analysis Plan, Belaustegui Park, Battle Mountain, Nevada, July 17, 2002.

Agency for Toxic Substances and Disease Registry, ToxFAQs for Barium, CAS# 7440-39-3, September 1995.

Guilbert, John M., Park, Charles F. Jr., The Geology of Ore Deposits, Chapter 5, pgs 196-197, 1986.

LIST OF ACRONYMS AND ABBREVIATIONS

ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
DQO	Data Quality Objectives
DQI	Data Quality Indicators
ESA	Environmental Site Assessment
GC/MS	gas chromatography/mass spectrometry
HASP	Health and Safety Plan
IDW	Investigation Derived Waste
IRIS	Integrated Risk Information System
kg	kilogram
kg/L	kilograms per liter
FB	Field Blank
GW	Groundwater
LCS	Laboratory Control Spike
LFM	Laboratory Fortified Matrix
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MW	Monitoring Well
NDEP	Nevada Division of Environmental Protection
PRG	preliminary remediation goal
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RB	Rinseate Blank
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
QL	quantitation limit
SVOC	semivolatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbons
USA	Underground Service Alert
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
µg/L	micrograms per liter

TABLES

TABLE 1

MONITORING WELL CONSTRUCTION AND GROUNDWATER ELEVATION DATA
AUGUST 2002
BELAUSTEGUI PARK, BATTLE MOUNTAIN, NEVADA

Well Number	Date of Measurement	Diameter (inches)	Relative Wellhead Elevation (feet)	Total Well Depth (feet)	Depth to Water (feet)	Relative Static Water Elevation (feet)
MW-1	9-3-02	2	100.00	15.01	8.22	91.78
MW-2	9-3-02	2	97.15	15.40	5.20	91.95
MW-3	9-3-02	2	99.60	14.80	7.57	92.03

Notes: 1) All wells are Schedule 40 PVC, and have 10 feet of screen with 0.010-inch perforations.

2) An arbitrary elevation of 100.00 feet was established, for reference purposes, at MW-1.

TABLE 2

SOIL SAMPLE BARIUM ANALYTICAL RESULTS
BELAUSTEGUI PARK, BATTLE MOUNTAIN, NEVADA

Sample Number	Boring Number	Depth (feet)	Date	Barium (mg/Kg)	TCLP Barium (mg/L)
B1-S-2-1	1	2	8-26-02	200	2[2]
B1-S-5-2	1	5	8-26-02	3200	<4
B2-S-1-1	2	1	8-26-02	4800	2[2]
B2-S-1-2[1]	2	1	8-26-02	3100	2[2]
B2-S-4-3	2	4	8-26-02	220	<4
B3-S-1-1	3	1	8-27-02	1500	<4
B3-S-1-2[1]	3	1	8-27-02	540	<4
B3-S-5-3	3	5	8-27-02	480	<4
B4-S-3-1	4	3	8-28-02	870	<4
B4-S-4-2	4	4	8-28-02	170	<4
B5-S-3-1	5	3	8-28-02	180	<4
B5-S-4-3	5	4	8-28-02	100	<4
B6-S-2-1	6	2	8-28-02	120	<4
B6-S-4-2	6	4	8-28-02	160	<4
B7-S-3-1	7	3	8-28-02	130	<4
B7-S-5-2	7	5	8-28-02	80	<4
B8-S-2-1	8	2	8-28-02	150	<4
B8-S-3-2	8	3	8-28-02	160	<4
B9-S-0-1	9	0	8-28-02	6900[3]	2[2]
B9-S-3-2	9	3	8-28-02	190	<4
B10-S-1-1	10	1	8-28-02	2000	<4
B10-S-2-2	10	2	8-28-02	1900	<4
			EPA Method:	6010[4]	1311/200.7

Notes:

1) Quality Control samples
2) Result is estimated and reported below quantitation limit of 4 mg/L.
3) Exceeds EPA Region 9 residential Preliminary Remediation Goal (PRG) for barium of 5,400 mg/Kg
4) Quantitation limit is 10 mg/Kg

TABLE 3

SOIL SAMPLE PETROLEUM ANALYTICAL RESULTS
BELAUSTEGUI PARK, BATTLE MOUNTAIN, NEVADA

Sample Number	Boring Number	Depth (feet)	Date	VOC (µg/kg)	TPH-GRO (mg/kg)	TPH- DRO (Diesel) (mg/Kg)	TPH-DRO (Motor Oil) (mg/kg)
MW1-S-5-1	MW-1	5	8/27/02	ND[2]	ND	ND	20
MW2-S-5-1	MW-2	5	8/27/02	ND[2]	ND	ND	ND
MW3-S-5-1	MW-3	5	8/27/02	ND[2]	ND	ND	740
MW3-S-5-2[1]	MW-3	5	8/27/02	ND[2]	ND	ND	2000
EPA Method:				8260B	5030B, 5035, 8015B, 8021B	8015B, 3545	8015B, 3545

Notes:

1) Quality Control samples
2) Samples not analyzed or preserved within hold time, results are estimated

ND = Not detected at or above method quantitation limit
VOC = Volatile Organic Compound
TPH-DRO (Diesel) = Total petroleum hydrocarbons – diesel range organics
TPH-DRO (Motor Oil) = Total petroleum hydrocarbons – motor oil range organics
TPH-GRO = Total petroleum hydrocarbons – gasoline range organics

TABLE 4

GROUNDWATER SAMPLE ANALYTICAL RESULTS
BELAUSTEGUI PARK, BATTLE MOUNTAIN, NEVADA

Sample Number	Well Number	Date	Barium (µg/L)	VOC (µg/L)[2]	TPH-GRO (µg/L)	TPH-DRO (Diesel) (µg/L)	TPH-DRO (Motor Oil) (µg/L)
MW1-GW-1	MW-1	9-3-02	NA	ND	ND	ND	ND
MW2-GW-1	MW-2	9-3-02	NA	ND	ND	ND	ND
MW3-GW-1	MW-3	9-3-02	NA	ND	ND	ND[3]	900[3][4]
MW3-GW-2[1]	MW-3	9-3-02	NA	ND	ND	ND[3]	1000[3][5]
FB-W-1[1]	Field Blank	9-3-02	NA	ND	ND	ND	ND
RB-W-2[1]	Rinseate Blank	8-27-02	NA	ND	ND	ND	ND
RB-W-1[1]	Rinseate Blank	8-26-02	40	NA	NA	ND	NA
RB-W-3[1]	Rinseate Blank	8-28-02	20	NA	NA	ND	NA
EPA Method:			200.7[6]	524.2	5030B, 5035, 8015B, 8021B	8015B, 3520C	8015B, 3520C

1) Quality Control samples
2) Dichlorofluoromethane value estimated
3) Estimated analyte value
4) Reported analyte concentration is estimated and below quantitation limit but greater than half of the detection limit
5) Reported analyte concentration is estimated and equal to the quantitation limit
6) Quantitation limit is 4 mg/L

ND = Not detected at or above method quantitation limit
VOC = Volatile Organic Compound
TPH-DRO = Total petroleum hydrocarbons – diesel range organics
TPH-GRO = Total petroleum hydrocarbons – gasoline range organics
mg/L = milligrams per liter
µg/L = micrograms per liter

TABLE 5

QUANTITATION LIMITS AND ACTION LEVELS FOR
TOTAL PETROLEUM HYDROCARBONS BY GC (SWEPA 8015B)
BELAUSTEGUI PARK, BATTLE MOUNTAIN, NEVADA

Component of Concern	QL - Soil (mg/kg)	Action Level – Soil (mg/Kg)	QL – Water (µg/l)	Action Level – Water
TPH-DRO[2] (diesel)	5.0	100	200	0.5 inch free product
TPH-DRO[2] (motor oil)	20.0	100	1000	0.5 inch free product
TPH-GRO[2]	5.0	NA	50	0.5 inch free product

Note:

TPH-DRO = Total petroleum hydrocarbons – diesel range organics
TPH-GRO = Total petroleum hydrocarbons – gasoline range organics
QL – Quantitation Limits

TABLE 6

QUANTITATION LIMITS AND ACTION LEVELS FOR
VOLATILE ORGANIC COMPOUNDS BY GC/MS (SWEPA 8260B)
BELAUSTEGUI PARK, BATTLE MOUNTAIN, NEVADA

Compound	QL – Water (µg/L)	Action Level-Water (µg/L)	QL – Soil (µg/kg)	Action Level-Soil (µg/kg)
Dichlorodifluoromethane	1		10	
Chloromethane	1	-	10	2,600
Vinyl Chloride	0.5	2	10	35
Bromomethane	1	-	10	23,000
Chloroethane	1	-	10	-
Trichlorofluoromethane	1	-	10	1,300,000
1,1-Dichloroethene	1	7	10	80
1,1,2-Trichlorotrifluoroethane	1		NA	
Acetone	4	-	10	8,800,000
Methylene Chloride	1		NA	
Carbon Disulfide	NA	-	10	24,000
Dibromomethane	1		NA	
Dichloromethane	NA	5	10	18,000
Methyl t-butyl ether (MTBE)	1	20-200	10	
Trans-1,2-Dichloroethene	1	100	10	270,000
1,1-Dichloroethane	1	-	10	1,700,000
1,1-Dichloropropene	1		NA	
2,2-Dichloropropane	1		NA	
Ethyl t-butyl ether	NA		10	
cis-1,2-Dichloroethene	1	70	10	-
2-Butanone	4	-	10	27,000,000
Chloroform	1	80	10	530
1,2-Dichloroethane	0.5	5	10	550
Tert-amyl-methyl ether	NA		10	
1,1,1-Trichloroethane	1	200	10	3,000,000
Carbon Tetrachloride	0.5	5	10	500
Benzene	1	5	10	1,400
Trichloroethene	1	5	10	7,000
1,2-Dichloropropane	1	5	10	680
Bromochloromethane	1		10	
Bromodichloromethane	1	80	10	1,400
cis-1,3-Dichloropropene	0.5	-	10	550
Trans-1,3-dichloropropene	0.5	-	10	550
1,1,2-Trichloroethane	1	5	10	1,500

Notes: QL – Required Detection Limits

TABLE 6 Continued

Compound	QL – Water (µg/L)	Action Level-Water (µg/L)	QL – Soil (µg/kg)	Action Level-Soil (µg/kg)
Dibromochloromethane	1	80	10	23,000
4-Methyl-2-Pentanone	NA	-	10	-
Toluene	1	1000	10	880,000
Tetrachloroethene	1	5	10	17,000
1,3-Dichloropropane	1		10	
2-Hexanone	NA	-	10	-
1,2-Dibromoethane	1	-	10	20
Chlorobenzene	1	100	10	220,000
Ethylbenzene	1	700	10	230,000
m,p-Xylene	1	10000	10	320,000
o-Xylenes	1	10000	10	320,000
Styrene	1	100	10	680,000
Bromoform	1			
Isopropylbenzene	1		NA	
Bromobenzene	1			
1,1,1,2-Tetrachloroethane	1			
1,1,2,2-Tetrachloroethane	1	-	10	1,100
1,2,3-Trichloropropane	1		10	
n-Propylbenzene	1		NA	
2-Chlorotoluene	1		NA	
4-Chlorotoluene	1		NA	
1,3,5-Trimethylbenzene	1			
tert-Butylbenzene	1		NA	
1,2,4-Trimethylbenzene	1			
sec-Butylbenzene	1		NA	
1,3-Dichlorobenzene	1		10	
1,4-Dichlorobenzene	1		10	
p-Isopropyltoluene	1		NA	
1,2-Dichlorobenzene	1		10	
n-Butylbenzene	1		NA	
1,2-Dibromo-3-chloropropane	2		10	
1,2,4-Trichlorobenzene	1		NA	
Hexachlorobutadiene	1		NA	
Napthalene	1		NA	
1,2,3-Trichlorobenzene	1		NA	

Notes: QL – Required Detection Limits

TABLE 7

SUMMARY OF FIELD SAMPLING
BELAUSTEGUI PARK, BATTLE MOUNTAIN, NEVADA

Monitoring Well / Boring Number	Number of samples	Approximate sample depth	Sample matrix	Analytical Methods	No. QC duplicates, method	No. of rinsate blanks, method
MW1	3 (MW1-S-5-01) (MW1-S-10-02) (MW1-S-15-03) 1 (MW1-GW-1)	5, 10, 15 feet	Soil Groundwater	SWEPA 8015B – DRO/GRO SWEPA 8015B – DRO/GRO SWEPA 8260B		1 (RB-W-1) TPH-E 8015B DRO/GRO SWEPA 8260B
MW2	3 (MW2-S-5-04) (MW2-S-10-05) (MW2-S-15-06) 2 (MW2-GW-2)	5, 10, 15 feet	Soil Groundwater	SWEPA 8015B – DRO/GRO SWEPA 8015B – DRO/GRO SWEPA 8260B		
MW3	3 (MW3-S-5-07) (MW3-S-10-08) (MW3-S-15-09) 1 (MW3-GW-3)	5, 10, 15 feet	Soil Groundwater	SWEPA 8015B – DRO/GRO SWEPA 8015B – DRO/GRO SWEPA 8260B	1 (MW2-S-10-10) SWEPA 8015B – DRO/GRO SWEPA 8260B 1 (MW2-GW-4) SWEPA 8015B – DRO/GRO SWEPA 8260B	
B1	2 Samples depths to be selected randomly	Between 0-5 feet	Soil	Barium EPA 700 Barium TCLP		

Note: TPH-DRO – Total Petroleum Hydrocarbons – Diesel Range Organics

TABLE 7 Continued

Monitoring Well / Boring Number	Number of samples	Approximate sample depth	Sample matrix	Analytical Methods	No. QC duplicates, method	No. of rinsate blanks, Method
B2	2 Samples depths to be selected randomly	Between 0-5 feet	Soil	Barium EPA 700 Barium TCLP	1 Barium EPA 700 Barium TCLP	1 Barium EPA 700 Barium TCLP
B3	2 Samples depths to be selected randomly	Between 0-5 feet	Soil	Barium EPA 700 Barium TCLP	1 Barium EPA 700 Barium TCLP	
B4	2 Samples depths to be selected randomly	Between 0-5 feet	Soil	Barium EPA 700 Barium TCLP		
B5	2 Samples depths to be selected randomly	Between 0-5 feet	Soil	Barium EPA 700 Barium TCLP		
B6	2 Samples depths to be selected randomly	Between 0-5 feet	Soil	Barium EPA 700 Barium TCLP		
B7	2 Samples depths to be selected randomly	Between 0-5 feet	Soil	Barium EPA 700 Barium TCLP		

Note: TPH-DRO – Total Petroleum Hydrocarbons – Diesel Range Organics

TABLE 7 Continued

Monitoring Well / Boring Number	Number of samples	Approximate sample depth	Sample matrix	Analytical Methods	No. QC duplicates, method	No. of rinsate blanks, Method
B8	2 Samples depths to be selected randomly	Between 0-5 feet	Soil	Barium EPA 700 Barium TCLP		
B9	2 Samples depths to be selected randomly	Between 0-5 feet	Soil	Barium EPA 700 Barium TCLP		
B10	2 Samples depths to be selected randomly	Between 0-5 feet	Soil	Barium EPA 700 Barium TCLP		

Note: TPH-DRO – Total Petroleum Hydrocarbons – Diesel Range Organics

TABLE 8

SAMPLE CONTAINERS, ANALYTICAL METHODS, PRESERVATIVES, AND HOLDING TIMES
BELAUSTEGUI PARK, BATTLE MOUNTAIN, NEVADA

SOIL

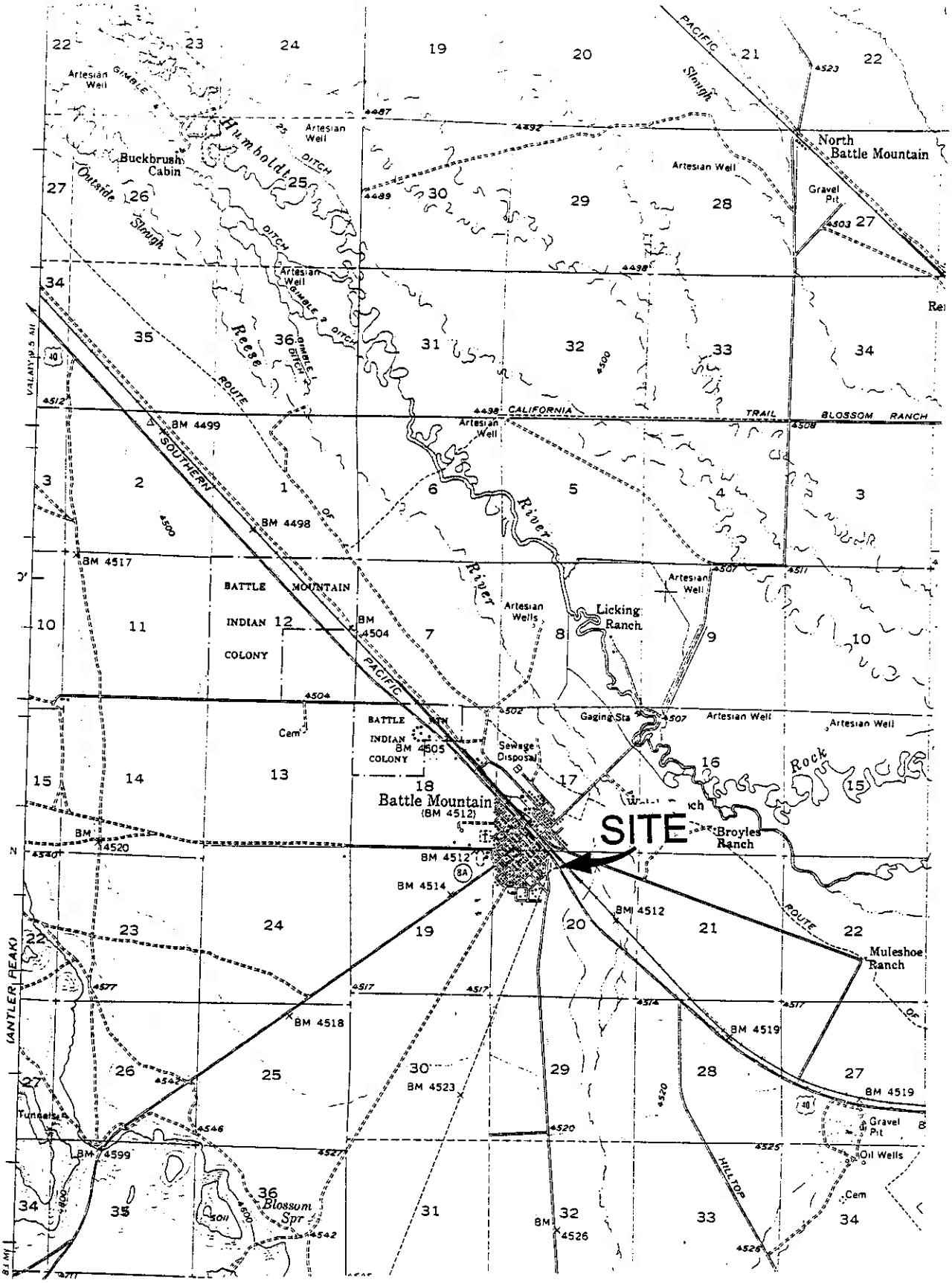
Analyte	Container	Analytical Method	Preservative	Holding Time
Soluble Barium	One brass liner filled completely.	TCLP Extraction by EPA 1311	Store at 4°C	6 months
Total Barium	One brass liner filled completely.	EPA 700	Store at 4°C	6 months
VOCs	One Encore sampler sealed in a ziploc bag.	SWEPA Method 8260	Store at 4°C	14 days
TPH-DRO & TPH-GRO	One brass liner filled completely.	SWEPA Method 8015B	Store at 4°C	14 days

GROUNDWATER

Analyte	Container	Analytical Method	Preservative	Holding Time
VOCs	Three 40-ml vials with Teflon lined septa, filled completely.	SWEPA Method 8260	HCl to pH <2 Store at 4°C	14 days
TPH-DRO	One 1-L amber glass bottle with Teflon-lined lids.	SWEPA Method 8015B	Store at 4°C	14 days
TPH-GRO	Three 40-ml vials with Teflon lined septa, filled completely.	SWEPA Method 8015B	Store at 4°C	14 days

Notes:
TPH-DRO = Total petroleum hydrocarbons – diesel range organics
TPH-GRO = Total petroleum hydrocarbons – gasoline range organics
VOC – Volatile Organic Compounds

PLATES



KLEINFELDER
4875 LONGLEY LANE, SUITE 100
RENO, NEVADA 89502
Tel. (775) 689-7800

SITE LOCATION MAP

BELAUSTEGUI PARK

BATTLE MOUNTAIN, NEVADA

PROJECT NO. 15562.01

PLATE

1

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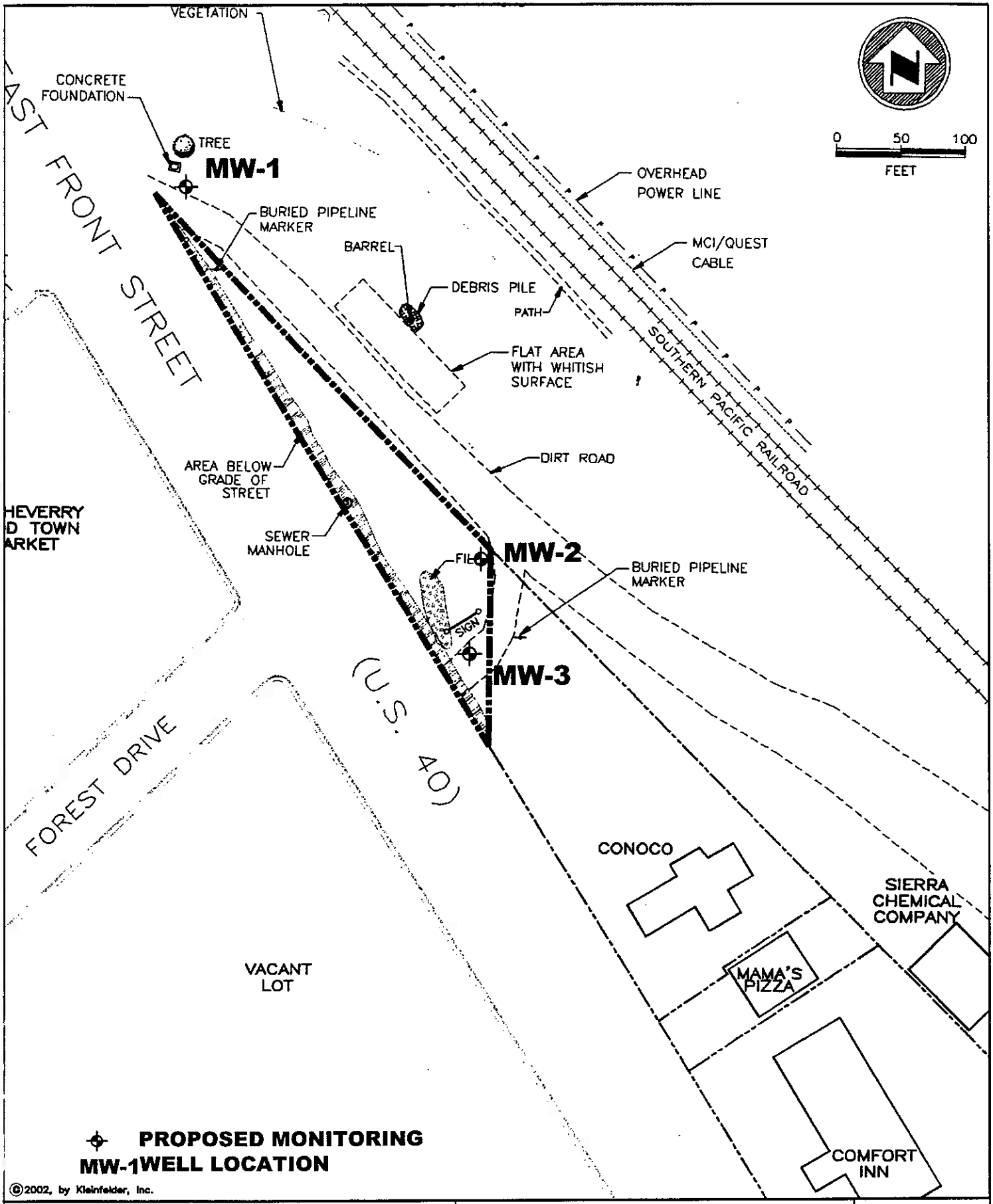

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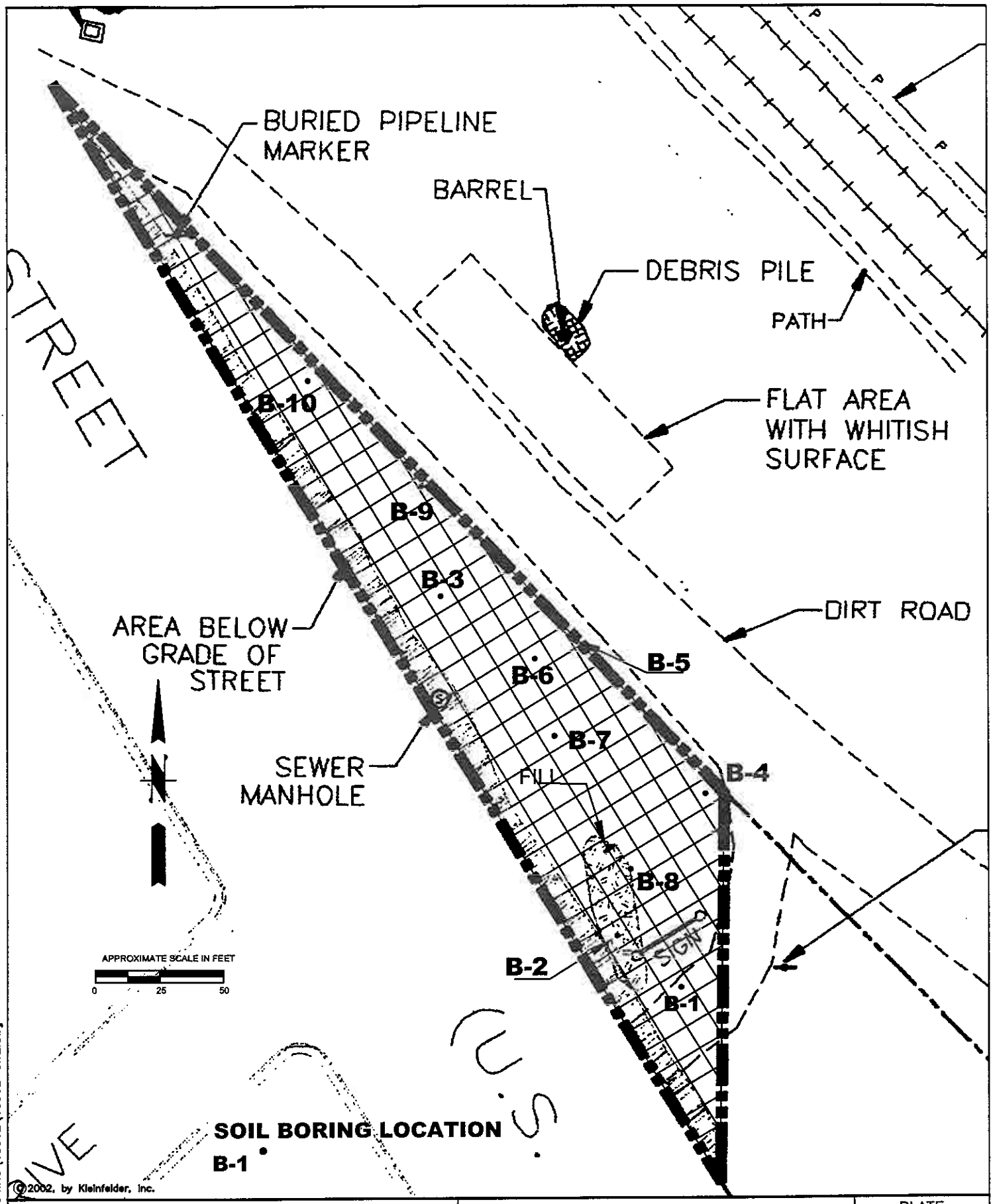
SITE VICINITY MAP SHOWING MONITORING WELL LOCATIONS

BELAUSTEGUI PARK

BATTLE MOUNTAIN, NEVADA

PLATE 2

PROJECT NO. 15562.01



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PROJECT NO. 15562.01

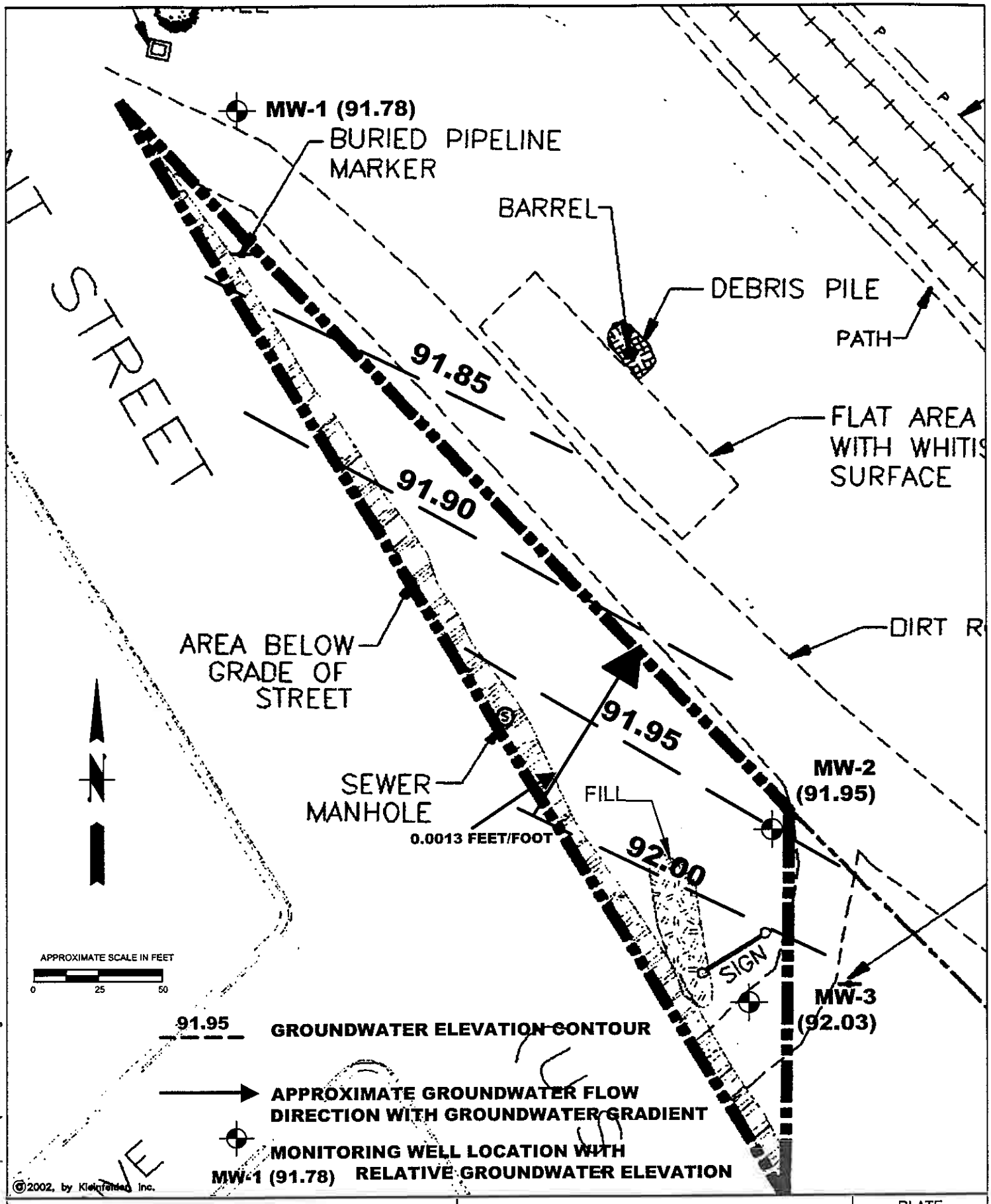
MONITORING WELL AND SOIL BORING LOCATION MAP

BELAUSTEGUI PARK

BATTLE MOUNTAIN, NEVADA

PLATE

3



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PROJECT NO. 15562.01

GROUNDWATER ELEVATION MAP

BELAUSTEGUI PARK

BATTLE MOUNTAIN, NEVADA

PLATE

4

Photo 1: View of Site facing southeast from northwest corner. Highway 40 located to right, and utility marks in foreground.

Photo 2: Drilling activities in progress at MW-3.

KLEINFELDER
An employee-owned company

PHOTOGRAPHS

Nevada Division of Environmental Protection
Belaustegui Park
Battle Mountain, Nevada

PLATE
5

PROJECT NO.: 15562.04

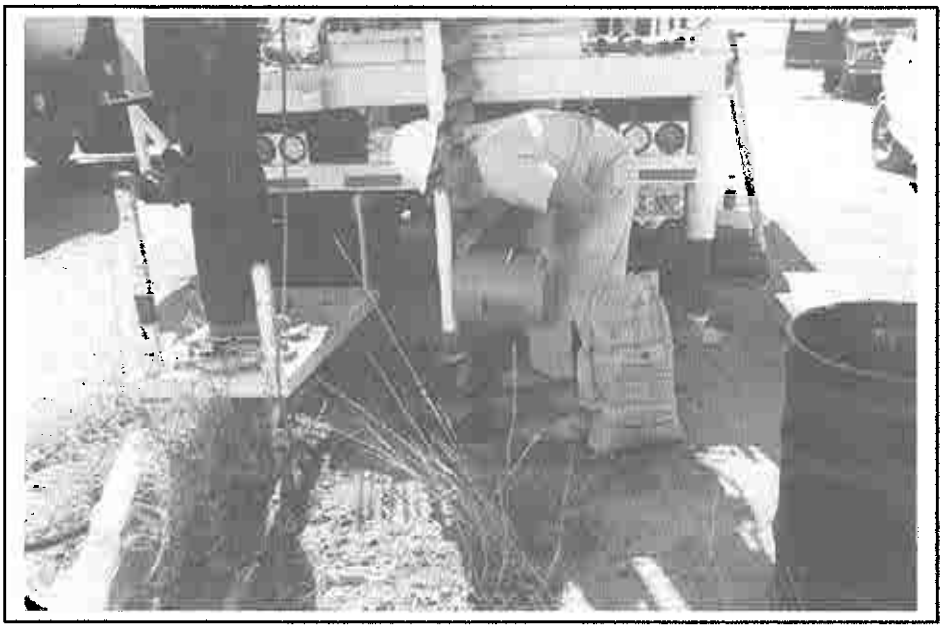

Photo 3: Monitoring well MW-3 construction activity. Installation of gravel pack ongoing.

Photo 4: Completed monitoring well MW-1, near northwest corner Site. Drum contains investigation derived waste, soil cuttings.

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PHOTOGRAPHS

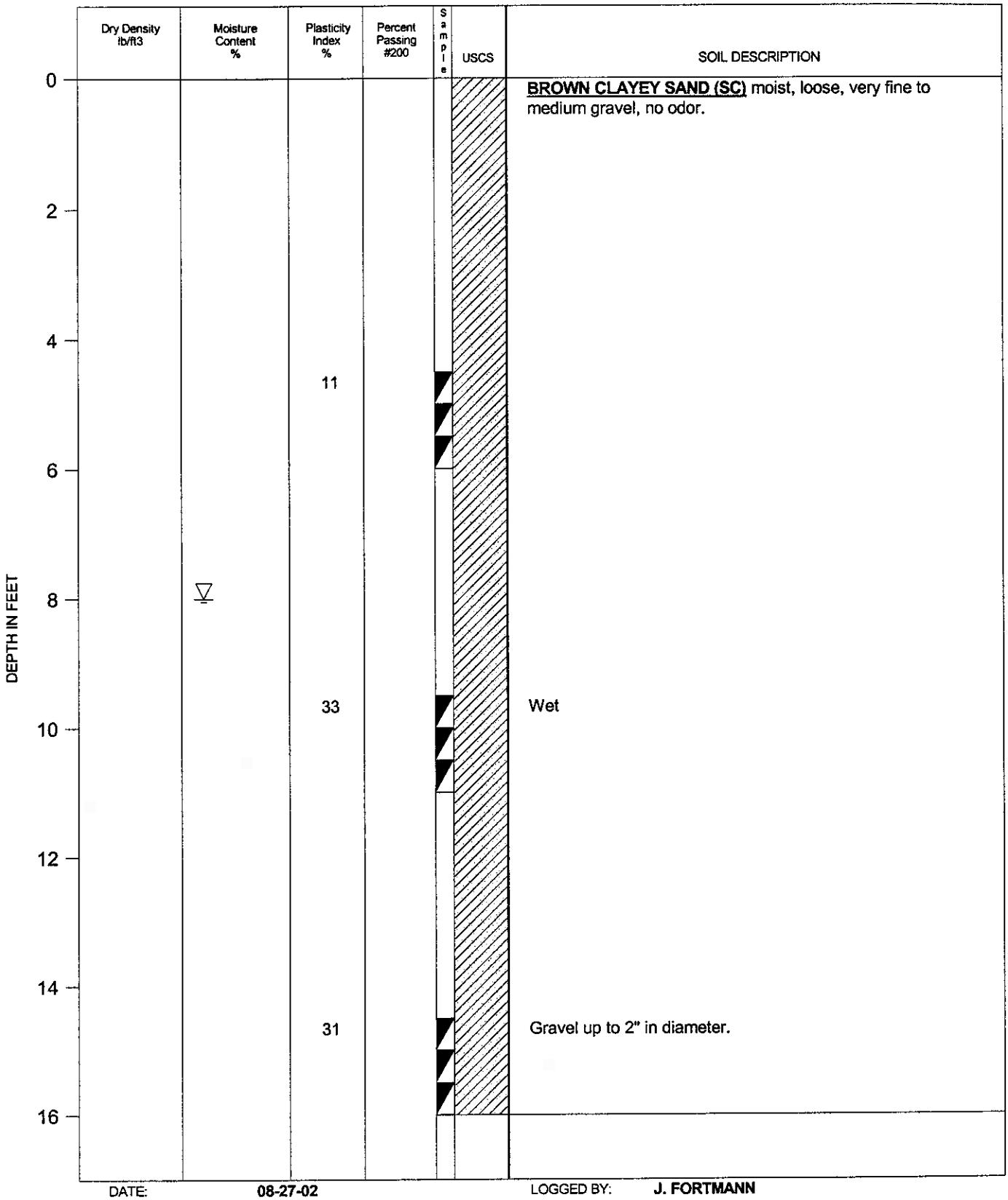
Nevada Division of Environmental Protection
Belaustegui Park
Battle Mountain, Nevada

PROJECT NO.: 15562.04

PLATE
6

APPENDIX A

Boring Logs



DATE: 08-27-02
TOTAL DEPTH: 16.0 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

KLEINFELDER

BELAUSTEGUI PARK

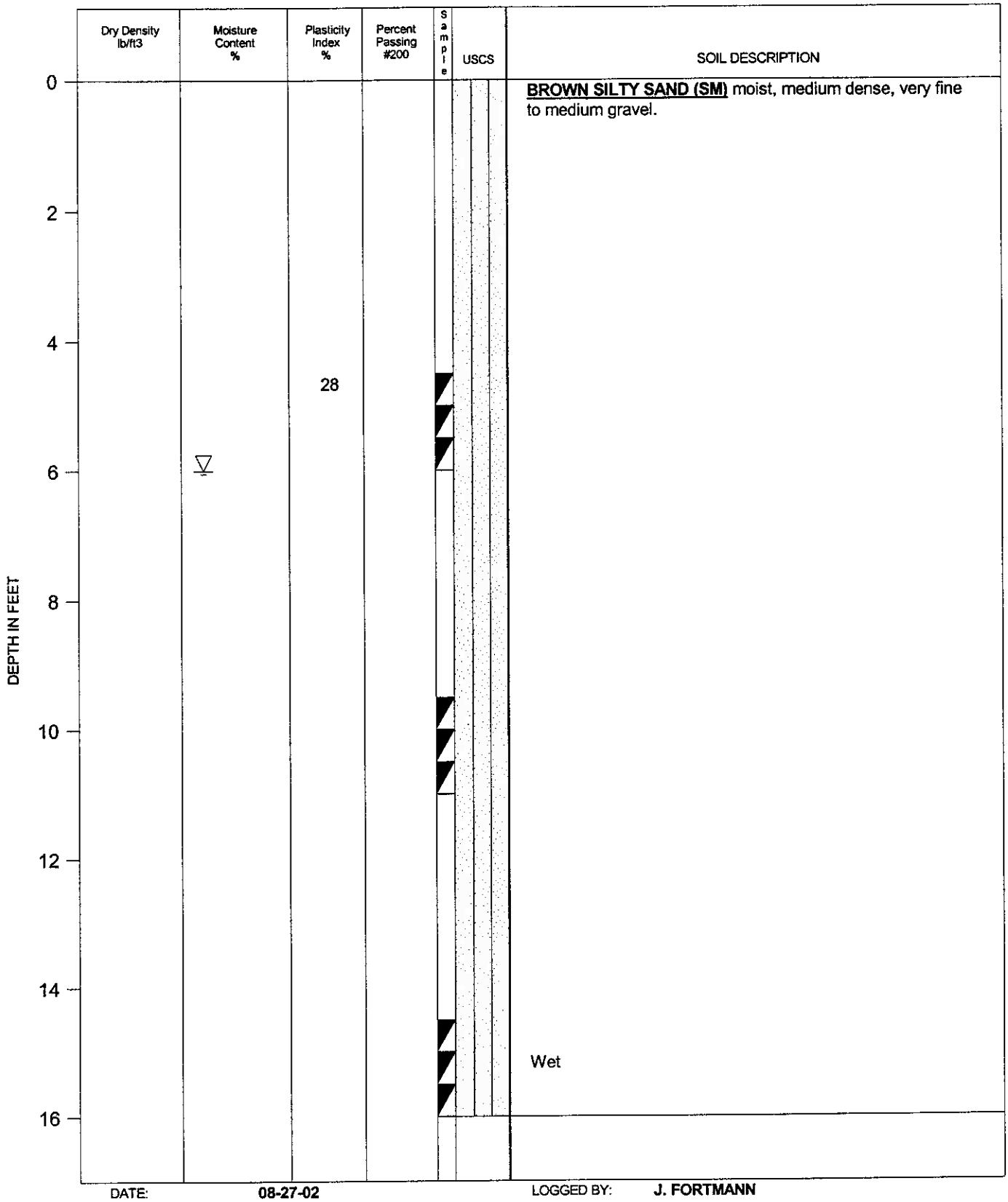
BATTLE MOUNTAIN, NEVADA

LOG OF MW-1

PROJECT NO. 15562.01

PLATE

1



DATE: **08-27-02**
TOTAL DEPTH: **16.0 feet**

LOGGED BY: **J. FORTMANN**
EQUIPMENT: **CME 75 AUGER**

KLEINFELDER

BELAUSTEGUI PARK

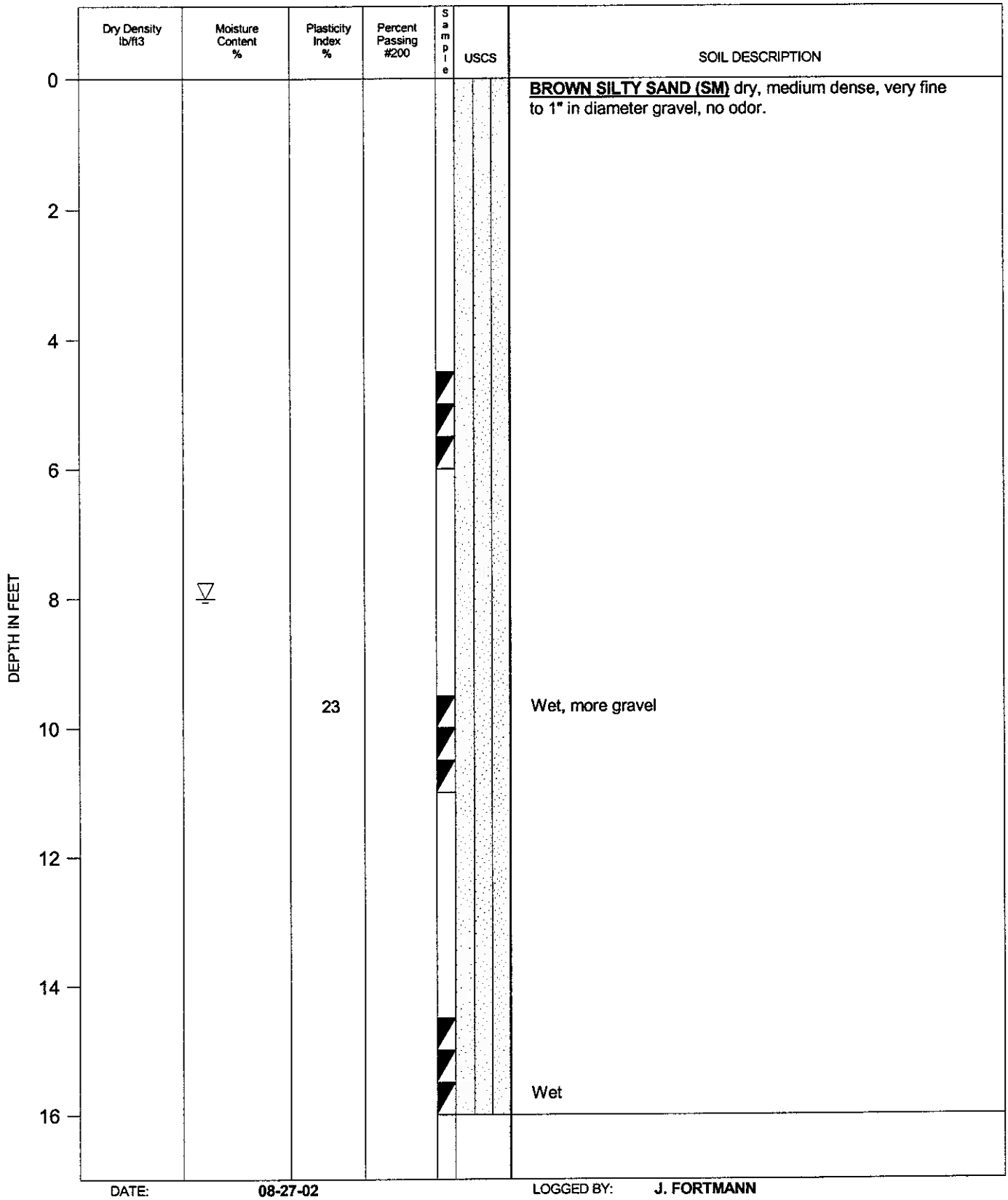
BATTLE MOUNTAIN, NEVADA

LOG OF MW-2

PROJECT NO. 15562.01

PLATE

2



DATE: **08-27-02**
TOTAL DEPTH: **16.0 feet**

LOGGED BY: **J. FORTMANN**
EQUIPMENT: **CME 75 AUGER**

KLEINFELDER

BELAUSTEGUI PARK

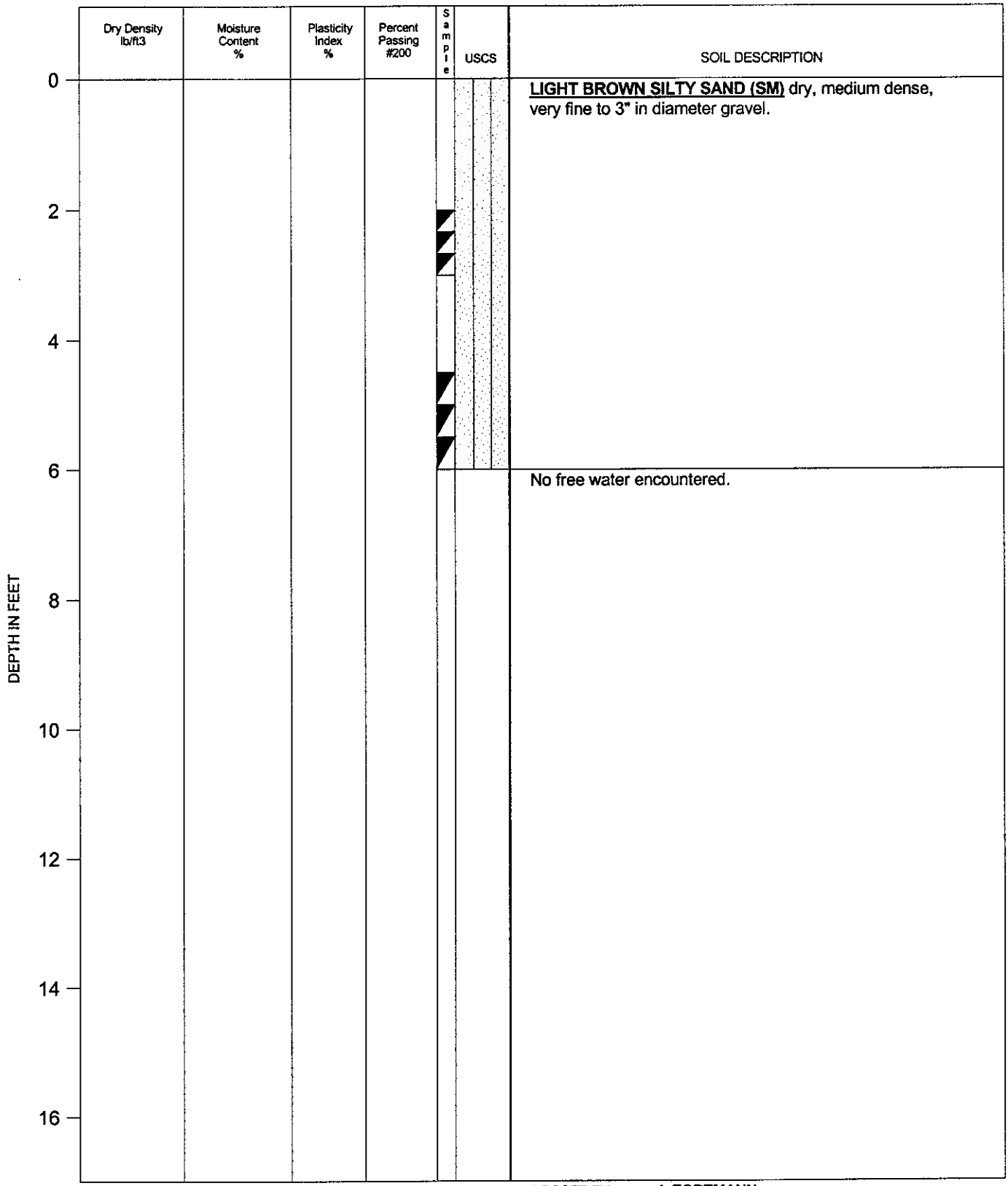
BATTLE MOUNTAIN, NEVADA

LOG OF MW-3

PROJECT NO. 15562.01

PLATE

3



DATE: 08-26-02
TOTAL DEPTH: 6.0 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

KLEINFELDER

BELAUSTEGUI PARK

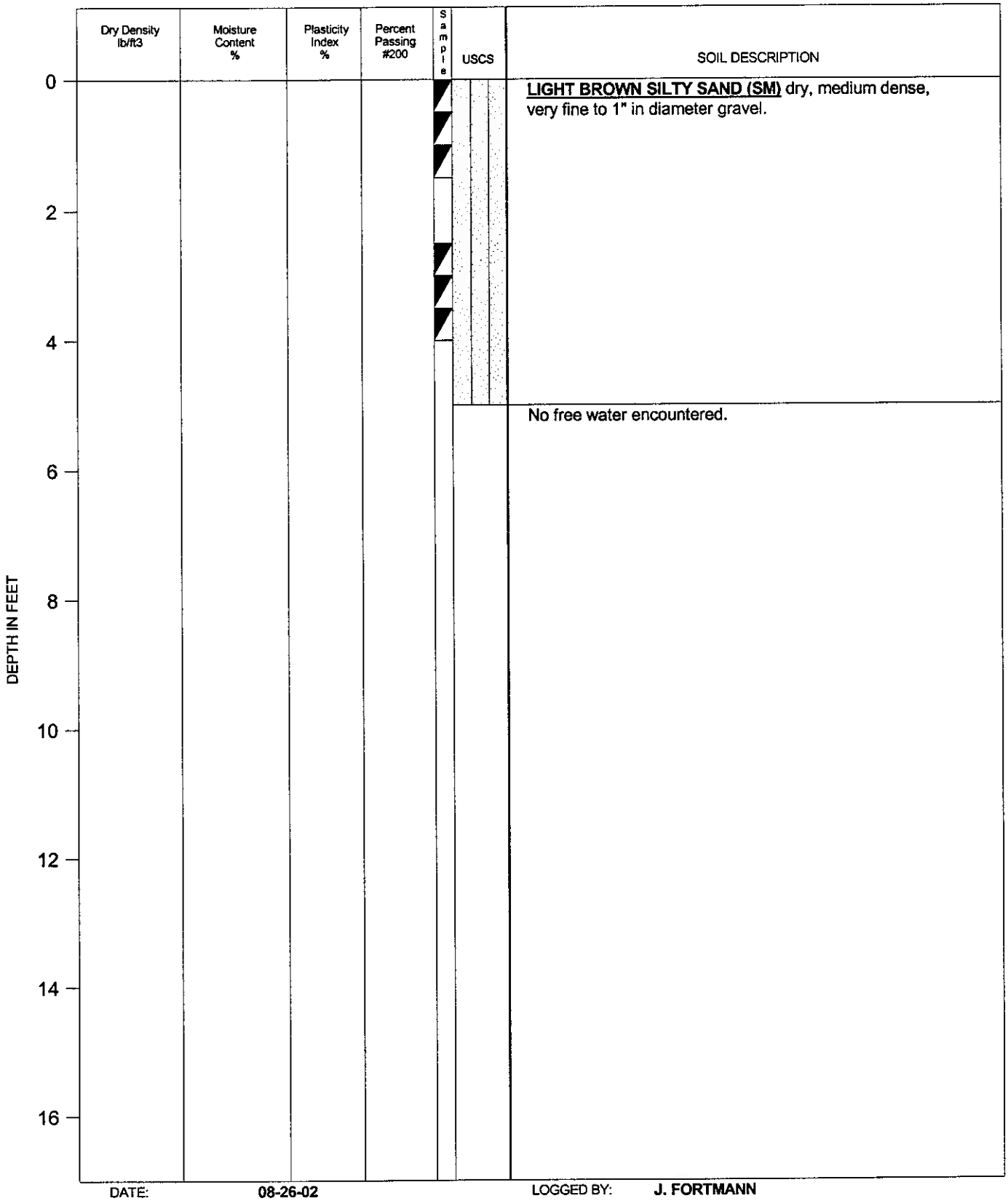
BATTLE MOUNTAIN, NEVADA

LOG OF B-1

PROJECT NO. 15562.01

PLATE

4



DATE: 08-26-02
TOTAL DEPTH: 5.0 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

KLEINFELDER

BELAUSTEGUI PARK

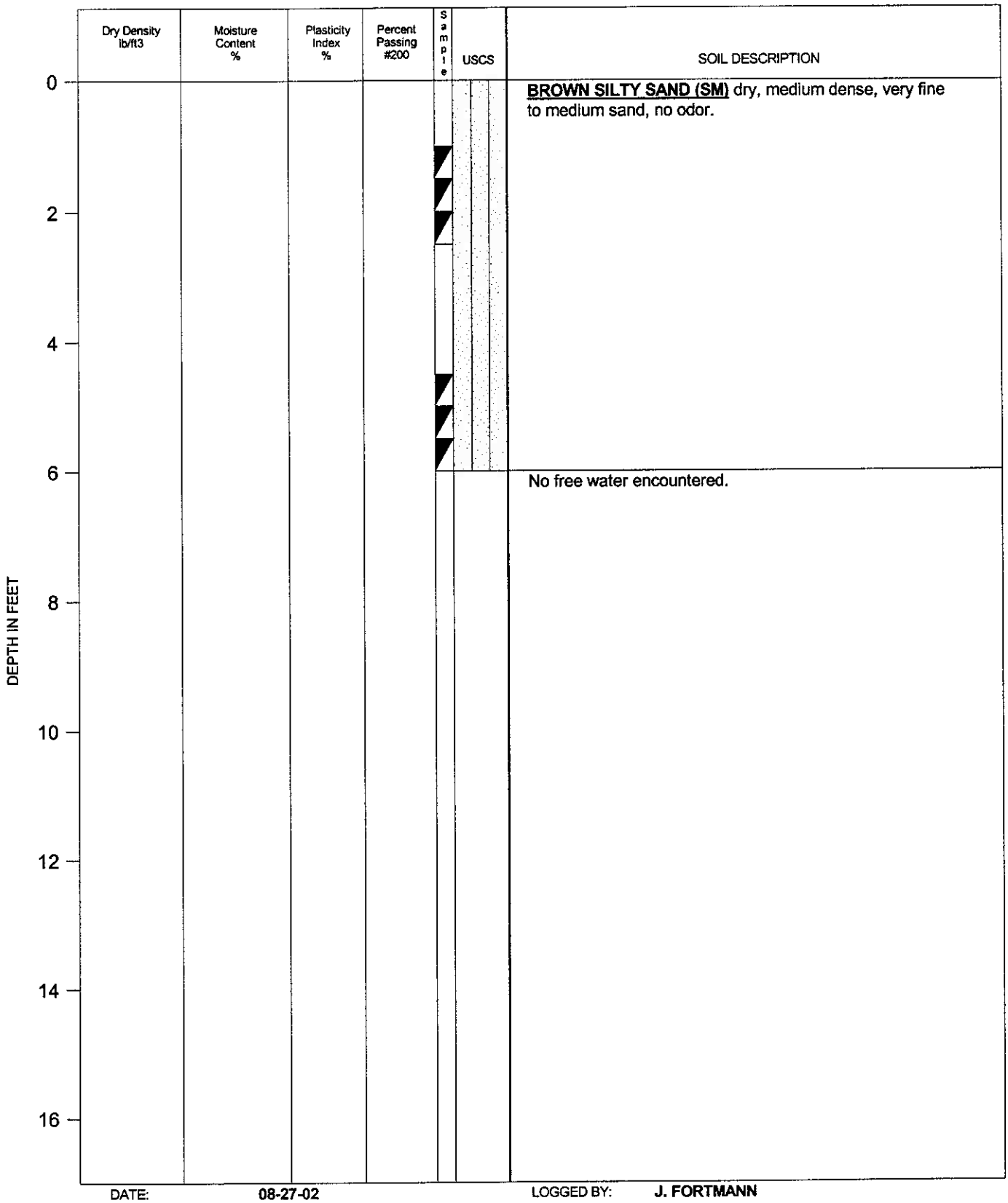
BATTLE MOUNTAIN, NEVADA

LOG OF B-2

PROJECT NO. 15562.01

PLATE

5



DATE: 08-27-02
TOTAL DEPTH: 6.0 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

KLEINFELDER

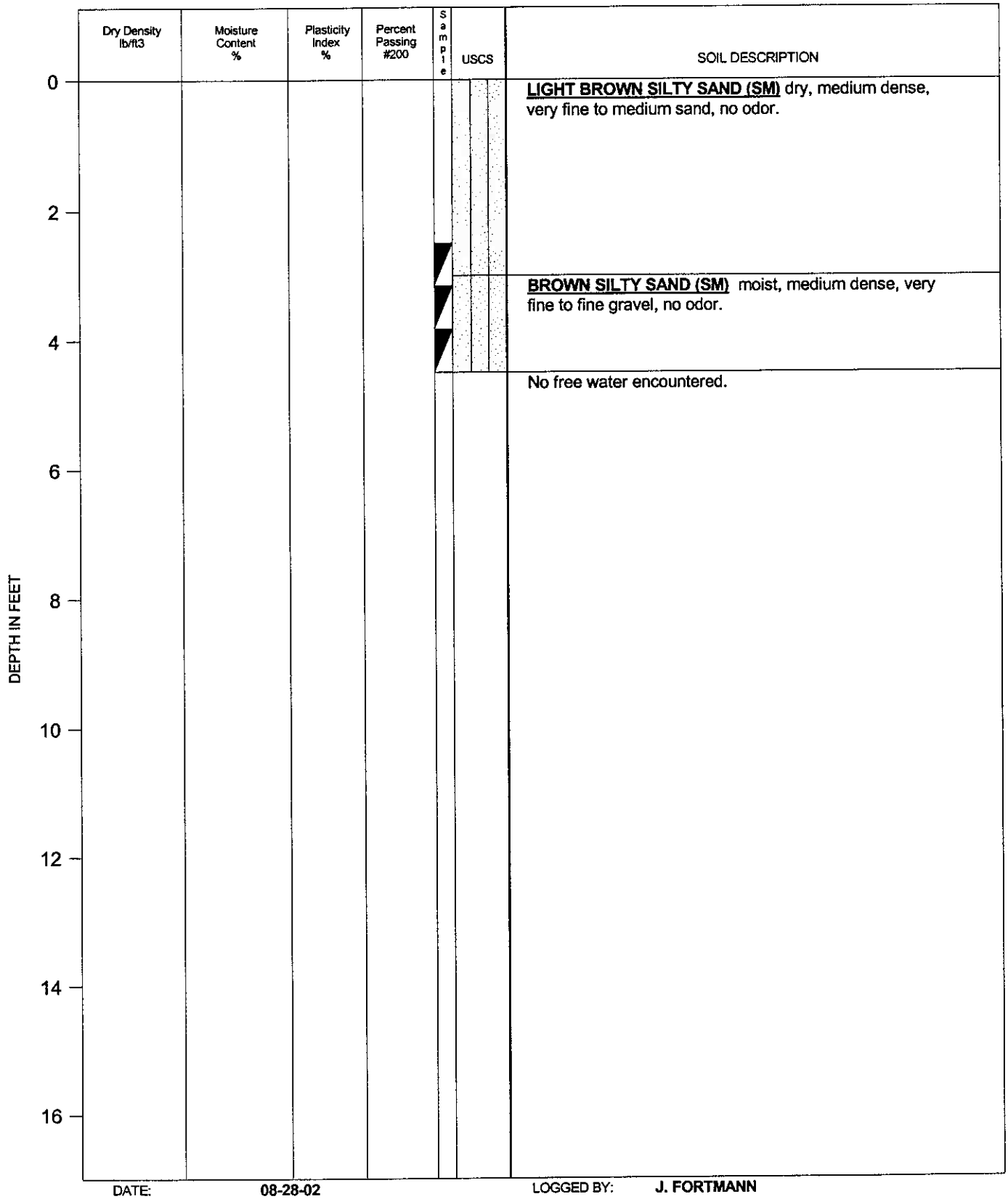
BELAUSTEGUI PARK

BATTLE MOUNTAIN, NEVADA

LOG OF B-3

PLATE

6



DATE: 08-28-02
TOTAL DEPTH: 4.5 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

KLEINFELDER

BELAUSTEGUI PARK

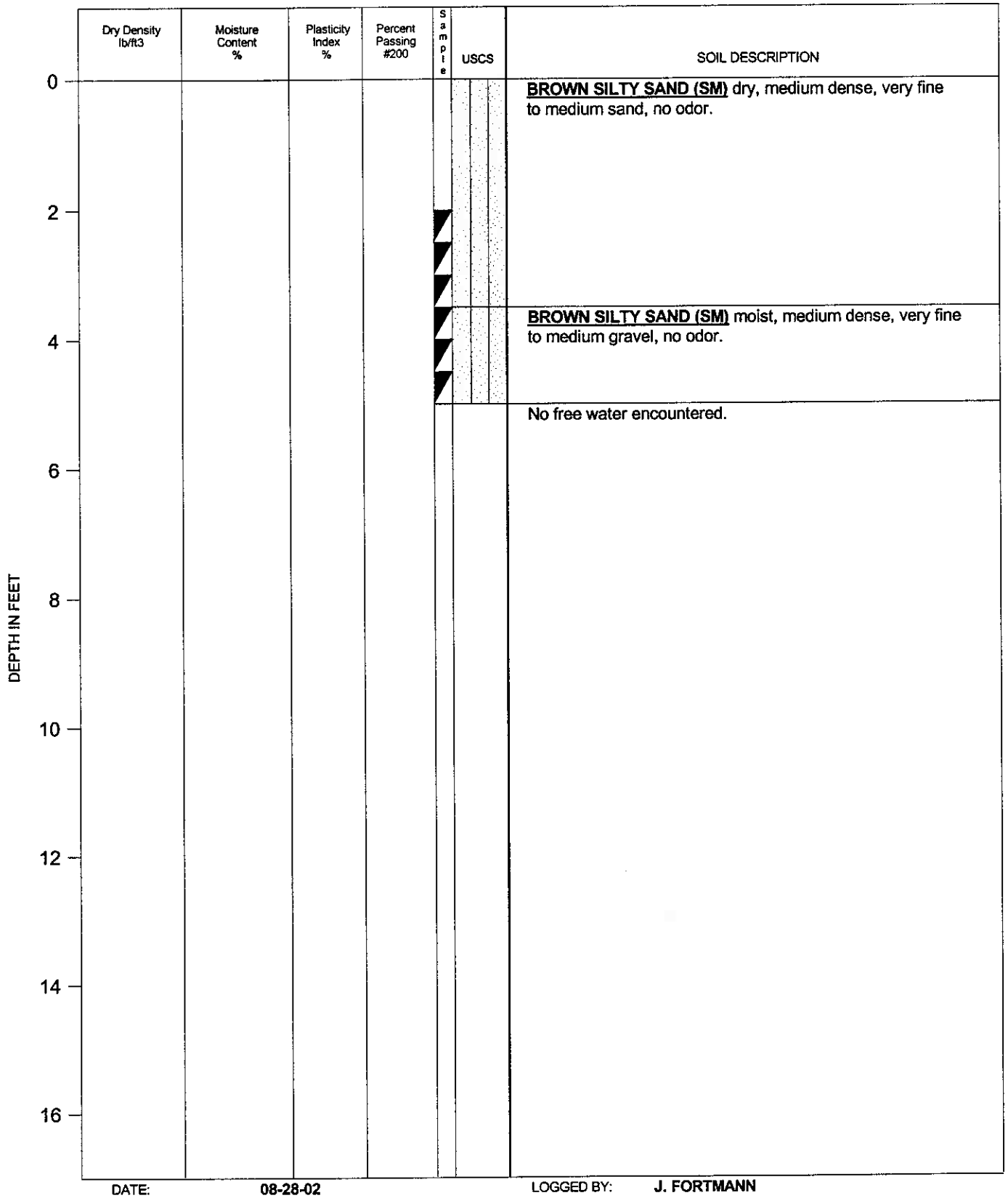
BATTLE MOUNTAIN, NEVADA

LOG OF B-4

PROJECT NO. 15562.01

PLATE

7



DATE: 08-28-02
TOTAL DEPTH: 5.0 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

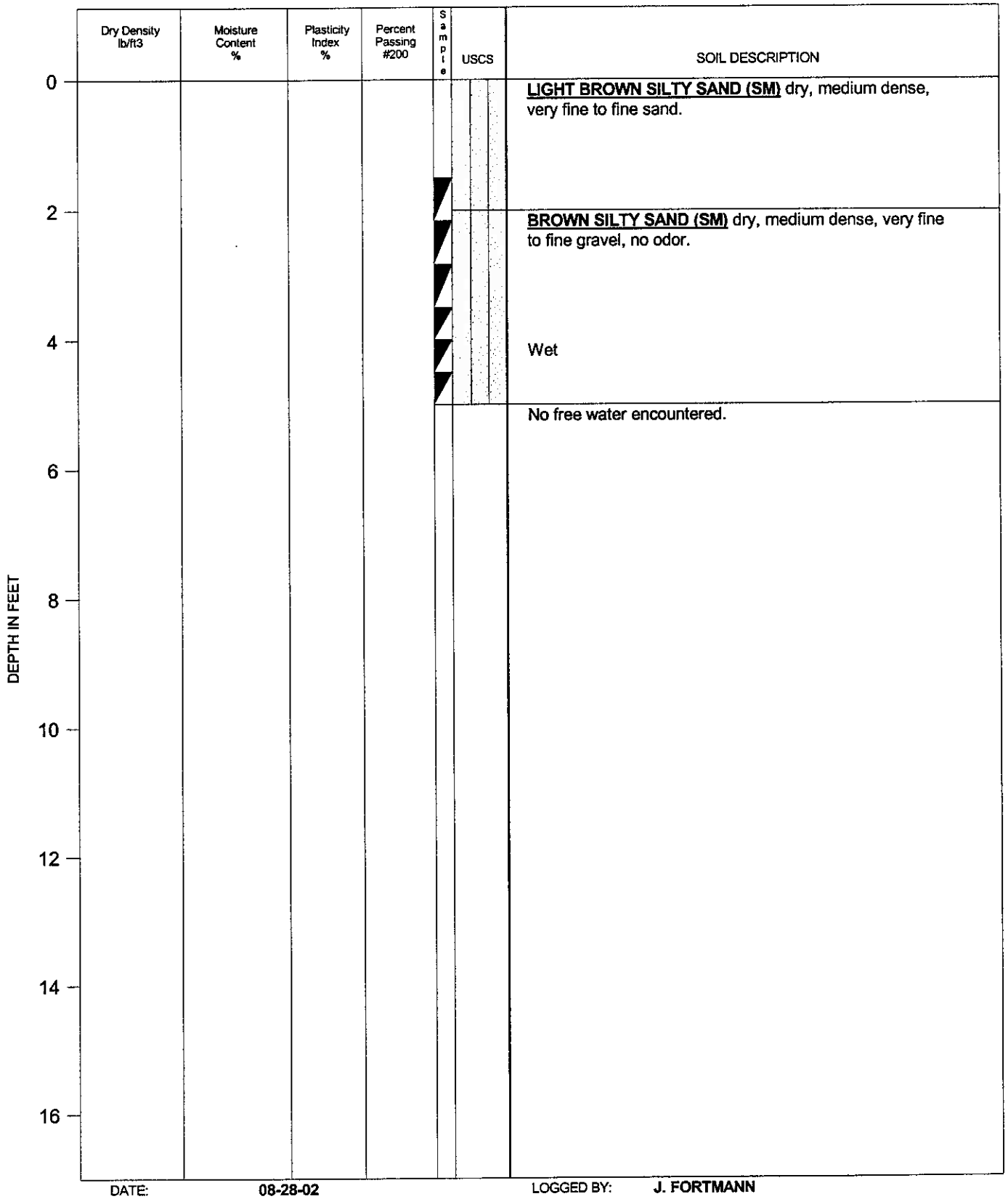
KLEINFELDER

BELAUSTEGUI PARK

BATTLE MOUNTAIN, NEVADA

PLATE

8



DATE: 08-28-02
TOTAL DEPTH: 5.0 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

KLEINFELDER

BELAUSTEGUI PARK

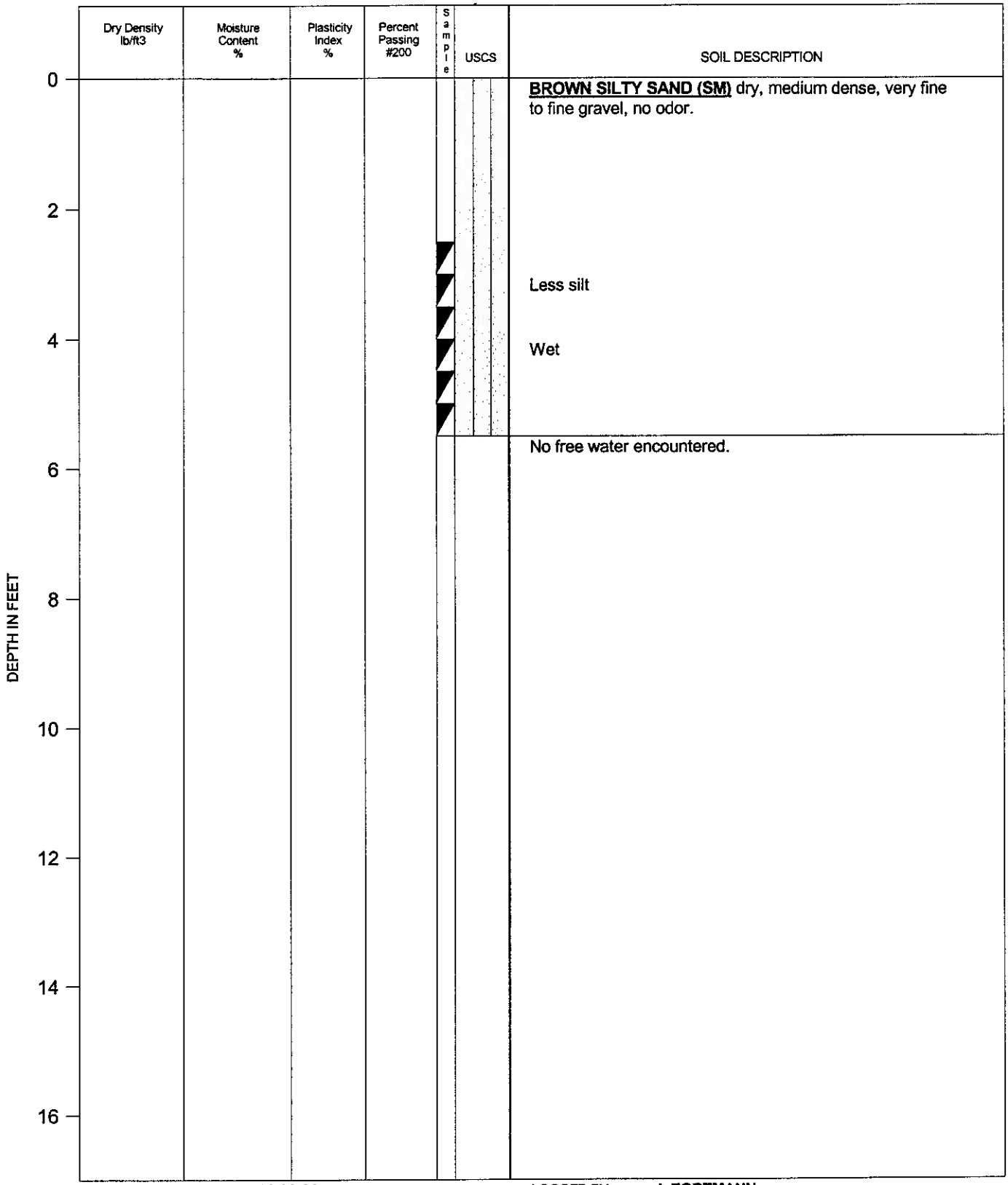
BATTLE MOUNTAIN, NEVADA

LOG OF B-6

PROJECT NO. 15562.01

PLATE

9



DATE: 08-28-02
TOTAL DEPTH: 5.5 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

KLEINFELDER

PROJECT NO. 15562.01

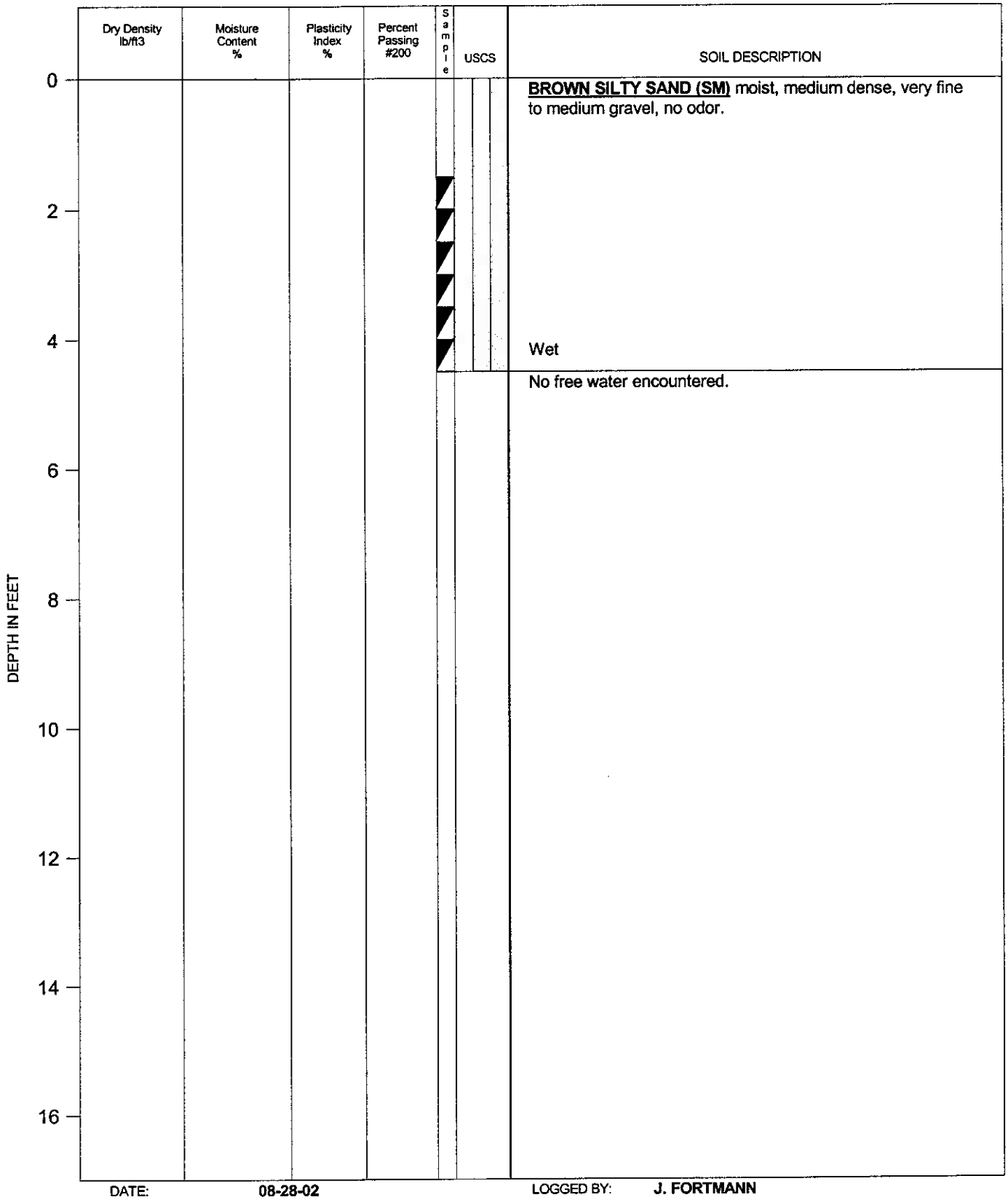
BELAUSTEGUI PARK

BATTLE MOUNTAIN, NEVADA

LOG OF B-7

PLATE

10



DATE: 08-28-02
TOTAL DEPTH: 4.5 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

KLEINFELDER

BELAUSTEGUI PARK

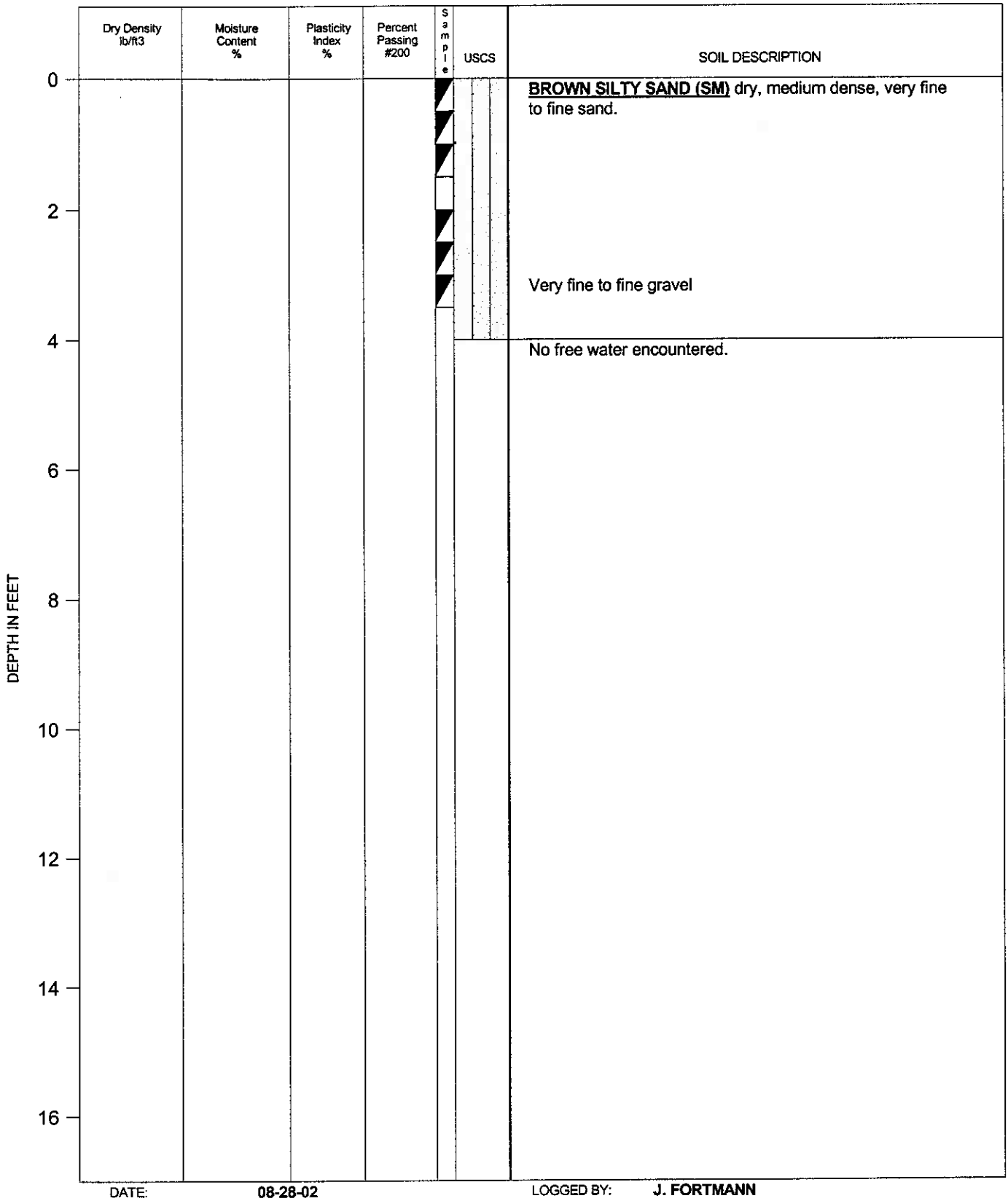
BATTLE MOUNTAIN, NEVADA

LOG OF B-8

PROJECT NO. 15562.01

PLATE

11



DATE: 08-28-02
TOTAL DEPTH: 4.0 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

KLEINFELDER

BELAUSTEGUI PARK

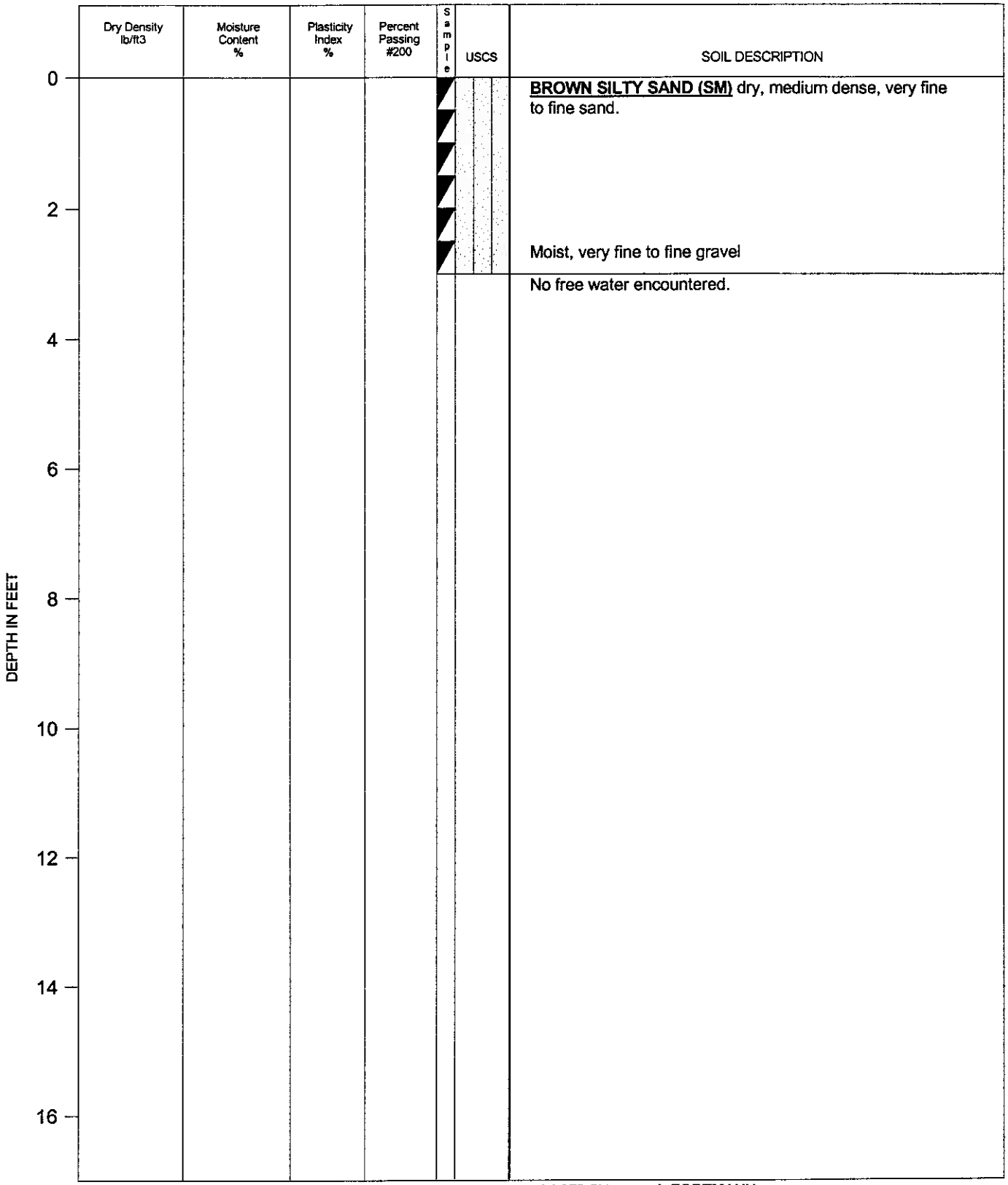
BATTLE MOUNTAIN, NEVADA

LOG OF B-9

PROJECT NO. 15562.01

PLATE

12



DATE: 08-28-02
TOTAL DEPTH: 3.0 feet

LOGGED BY: J. FORTMANN
EQUIPMENT: CME 75 AUGER

KLEINFELDER

PROJECT NO. 15562.01

BELAUSTEGUI PARK

BATTLE MOUNTAIN, NEVADA

LOG OF B-10

PLATE

13

APPENDIX B

Field Forms

KLEINFELDER

Daily Field Report (DFR)

Project Name BERLINSTEIN/ARK Project No. 15562.01 Date 8-26-02

Project Location BATTLE MTN, NV Time Arrived 1230

Contractor BOART LONGYEAR Technician Time Departed 1800

Weather SUNNY Travel Time

Earthwork Equipment Observed DRILL RIG Mileage

DFR Given to (or left at) DFR No. 1

Reviewed by Date Reviewed

Observations/Remarks:

1230 ARRIVE ONSITE

1250 DRILLERS ARRIVE ONSITE. ROBERT SOLOIS (DRILLER) AND SHAWNE MARTINEZ (HELPER) WITH BOART LONGYEAR

1300 START FILLING H_2O TANK.

1310 HEALTH AND SAFETY MEETING HELD. JOSH FORTMANN (KA) AND ROBERT AND SHAWNE IN ATTENDANCE.

1340 START BORING-1.

1350 DRILL RIG DOWN, REPAIRING AUTO-HAMMER.

1435 RESTART DRILLING B-1

1500 DRILL RIG DOWN, AUTO HAMMER BREAK. COTTER PIN IN HAMMER DRIVE CHAIN BROKEN.

1540 DRILL RIG REPAIRED, CONTINUE B-1.

1550 COMPLETE B-1. COLLECT RB-W-1 (RINSATE BLANK).

1600 MOB TO B-2.

1610 START DRILLING B-2

1615 DRILL RIG DOWN.

1725 DRILL RIG REPAIRED, CONTINUE DRILLING B-2.

1800 COMPLETE DRILLING B-2. DRILLER PERFORMING WORK ON DRILL RIG.

NOTE: Observations, pass/fail evaluations, and/or recommendations (if applicable) provided herein have not been reviewed by an engineer and, therefore, should be considered preliminary and subject to change.

Joshua P.

Kleinfelder Representative *Signature*

JOSHUA P. FORTMANN

Kleinfelder Representative *Print Name*

KLEINFELDER

Daily Field Report (DFR)

Project Name BELAUSTEGUI PARK Project No. 13362.01 Date 8-27-02

Project Location BATTLE MOUNTAIN, NV Time Arrived 0700

Contractor BOART LONGYEAR Technician _____ Time Departed 1850

Weather SUNNY Travel Time _____

Earthwork Equipment Observed DRILL RIG Mileage _____

DFR Given to (or left at) _____ DFR No. 2

Reviewed by _____ Date Reviewed _____

Observations/Remarks:

0700 ARRIVE ONSITE

0720 START DRILLING MW-2.

0800 COMPLETE DRILLING MW-2, TO 15' BGS. NO PID READINGS > 0 FOR ALL SOIL SAMPLES FROM MW-2.

0815 START DRILLING MW-1.

0910 COMPLETE DRILLING MW-1.

0925 START DRILLING MW-3. NO PID READINGS > 0 FOR ALL SOIL SAMPLES FROM MW-1.

1010 COMPLETE DRILLING MW-3. NO PID READINGS > 0 FOR ALL SOIL SAMPLES FROM MW-3.

1045 CONNIE LEWIS ARRIVES ONSITE. MW-3 CONSTRUCTION ONGOING.

1200 COMPLETE MW-3 CONSTRUCTION.

1210 START CONSTRUCTING MW-2 1215 CONNIE LEWIS DEPARTS SITE.

1300 COMPLETE CONSTRUCTING MW-2 1315 START CONSTRUCTING MW-1

1400 COMPLETE MW-1 CONSTRUCTION

1445 UPS PICKS UP SOIL SAMPLES.

1455 START BORING B-3.

1520 BORING 3 DRILLING ONGOING, SLOW DUE TO AUTO-HAMMER.

1525 DRILL RIG DOWN. START MW-1 DEVELOPMENT.

1800 DRILL RIG STILL DOWN. MW-1 DEVELOPMENT COMPLETE.

1850 DRILL RIG OPERATIONAL. CHRISTY BOXES INSTALLED AT MW-1, 2 + 3.

NOTE: Observations, pass/fail evaluations, and/or recommendations (if applicable) provided herein have not been reviewed by an engineer and, therefore, should be considered preliminary and subject to change.

Page ___ of ___

Kleinfelder Representative *Signature*

JOSHUA P. FORTMANN

Kleinfelder Representative *Print Name*

KLEINFELDER

Daily Field Report (DFR)

Project Name BELAUSTEGUI PARK Project No. 15562.01 Date 8-28-02

Project Location BATTLE MOUNTAIN, NV Time Arrived 0700

Contractor BOART LONGYEAR Technician Time Departed 1300

Weather SUNNY Travel Time

Earthwork Equipment Observed DRILL RIG Mileage

DFR Given to (or left at) DFR No. 3

Reviewed by Date Reviewed

Observations/Remarks:

0700 ARRIVE ONSITE.
0725 START BORING B-4.
0745 COMPLETE BORING B-4.
0750 START BORING B-5.
0807 COMPLETE DRILLING B-5.
0815 START BORING B-6.
0835 COMPLETE BORING B-6.
0845 START BORING B-7.
0905 COMPLETE B-7.
0910 START B-8.
0930 COMPLETE B-8.
0940 START B-9.
0950 COMPLETE B-9.
0955 START B-10.
1005 COMPLETE B-10.
1045 PERFORM WELL CASING ELEVATION SURVEY. DRILLERS DEPART SITE. START MW-2 WELL DEVELOPMENT.
12:15 COMPLETE MW-2 WELL DEVELOPMENT, START MW-3 DEVELOPMENT.
1245 COMPLETE MW-3 DEVELOPMENT.
1300 DEPART SITE.

NOTE: Observations, pass/fail evaluations, and/or recommendations (if applicable) provided herein have not been reviewed by an engineer and, therefore, should be considered preliminary and subject to change.

Kleinfelder Representative *Signature*

JOSHUA P. FORTMANN
Kleinfelder Representative *Print Name*

F-7A (9/97)

MONITORING WELL SAMPLE RECORD

Project Name: BELLINGHAM PARK

Project No.: 155201

Date: 9-3-02

Monitor Well No: MW-3

Observer(s): FORTMANN

Casing Diameter: 2"

Floating Product Thickness: NONE OBSERVED

Depth to Water Before Sampling: 7.57' at 1440 hrs. measured from: TOP OF CASING

Depth to Water After Sampling: _____ at _____ hrs. measured after _____ min. recovery.

Total Depth of Well: 14.80' from same monitor point as DTW.

TD-DTW = 7.23 feet of water.

Total gallons of water in one well volume = 1.18 gallons.

Bailer/pump depth _____. 4 volumes = 4.72 gallons.

Time	Totalizer Reading	Volume Purged (gals)	Actual Flow Rate (gpm	pH	T ~~(°C)~~	EC*	Color	Odor
1446		1		6.68	78.7°F	5670,5	BRN	ND
1450		2		7.40	73.9	5860	"	"
1451		3		7.57	72.4	5800	"	"
1453		4		7.60	71.4	5890	"	"
1455		4.75		7.55	69.2	5800	"	"

*EC = Specified Conductance in Micromhos/cm

Time Sampled:	1457					
Sample Number(s):	MW3-GW-1					
Purge Device:	BAILER					
Sample Device:	BAILER					

Weather: SUNNY, WINDY

Additional Notes: COLLECTED QC DUPLICATE AT 1457. COLLECTED FIELD BLANK AT 1517 (FB-W-1) (MW3-GW-2)

MONITORING WELL SAMPLE RECORD

Project Name: BELAUSEGUI PARK

Project No.: 15562.01

Date: 9-3-02

Monitor Well No: MW-1

Observer(s): FORTMANN

Casing Diameter: 2"

Floating Product Thickness: NONE OBSERVED

Depth to Water Before Sampling: 8.22' at 1358 hrs. measured from: TOP OF CASING

Depth to Water After Sampling: _____ at _____ hrs. measured after _____ min. recovery.

Total Depth of Well: 15.01 from same monitor point as DTW.

TD-DTW = 6.79 feet of water.

Total gallons of water in one well volume = 1.11 gallons.

Bailer/pump depth _____. 4 volumes = 4.44 gallons.

Time	Totalizer Reading	Volume Purged (gals)	Actual Flow Rate (gpm	pH	T (°C)	EC*	Color	Odor
1405		1		7.29	80.9°F	5690uS	CLDY	NA
1408		2		7.80	74.3	5760	"	"
1410		3		7.93	73.2	5710	"	"
1412		4.5		7.79	73.0	5670	"	"

*EC = Specified Conductance in Micromhos/cm

Time Sampled:	1415
Sample Number(s):	MW1-GW-1
Purge Device:	BAILER
Sample Device:	BAILER

Weather: SUNNY, WINDY

Additional Notes: _____

MONITORING WELL SAMPLE RECORD

Project Name: BELANSTEGNI PARK

Project No.: 15562.01

Date: 9-3-02

Monitor Well No: MW-2

Observer(s): FORTMANN

Casing Diameter: 2"

Floating Product Thickness: NONE OBSERVED

Depth to Water Before Sampling: 5.20' at 1228 hrs. measured from: TOP OF CASING,

Depth to Water After Sampling: _____ at _____ hrs. measured after _____ min. recovery.

Total Depth of Well: 15.40' from same monitor point as DTW.

TD-DTW = 10.2 feet of water.

Total gallons of water in one well volume = 1.66 gallons.

Bailer/pump depth _____. 4 volumes = 6.64 gallons.

Time	Totalizer Reading	Volume Purged (gals)	Actual Flow Rate (gpm	pH	T (°C)	EC*	Color	Odor
1301		2		7.18	80.6°F	5710 µS	BRN	ND
1315		4		7.85	78.8	5610	CLDY	ND
1319		5		8.20	73.6	5520	"	"
1331		6		8.24	74.5	5610	"	"

*EC = Specified Conductance in Micromhos/cm

Time Sampled:	1335
Sample Number(s):	MW2-GW-1
Purge Device:	BAILER
Sample Device:	BAILER

Weather: SUNNY, WINDY

Additional Notes: BAILED DRY AFTER ~ 3.6 GALLONS PURGED; AT 1304 ALLOW ~ 8 MIN RECHARGE. BAILED DRY AFTER ~5 GALLONS AT 1320

KLEINFELDER
SAMPLE CONTROL LOG

Project Name: BELMONTEGHI PARK, BATTLE MTN, NV

Project Number: 15562.01 Date: 8-26-02

Time	Date	Field Sample Number	Sample Location	Matrix (soil, water)	No. of Containers	Container Size	Material (glass, plastic)	Preserved/ Unpreserved (preservative)	Filtered/ Unfiltered	Notes
1402	8/26/02	RB-W-1	B-1	H_2O	1	1L	P	VP	UNF	EQUIPMENT RINSATE BLANK
1731	8/26/02	B2-S-1-1	B-2	~~SOIL~~ ~~H_2O~~ JAR	1	1BRASS	—	—	—	1' BGS
"	"	B2-S-1-2	"	"	"	"	"	"	"	DUPLICATE (QC) 1' BGS
1745	"	B2-S-4-3	"	"	"	"	—	—	—	4' BGS

Forms\215

KLEINFELDER
SAMPLE CONTROL LOG

Project Name: BELAUSTEGUI PARK

Project Number: 15562.01 Date: 8-27-02

Time	Date	Field Sample Number	Sample Location	Matrix (soil, water)	No. of Containers	Container Size	Material (glass, plastic)	Preserved/ Unpreserved (preservative)	Filtered/ Unfiltered	Notes
0730	8-27-02	MW2-S-5-1	MW-2	SOIL	1 BRASS 3 ENCORE	—	—	—	—	5' BGS NO ODOR, PID = 0
0745	8-27-02	MW2-S-10-2	"	"	1 BRASS	—	—	—	—	10' BGS No ODOR, PID = 0
0800	"	MW2-S-15-3	"	"	"	—	—	—	—	15' BGS No ODOR, PID = 0
0834	"	MW1-S-5-1	MW-1	"	1 BRASS 3 ENCORE	—	—	—	—	5' BGS No ODOR, PID = 0
0848	"	MW1-S-10-2	"	"	1 BRASS	—	—	—	—	10' BGS No ODOR, PID = 0
0855	"	MW1-S-15-3	"	"	"	—	—	—	—	15' BGS No ODOR, PID = 0
0935	"	MW3-S-5-1	MW-3	"	1 BRASS 3 ENCORE	—	—	—	—	5' BGS No ODOR, PID = 0
0946	"	MW3-S-10-2	"	"	1 BRASS	—	—	—	—	10' BGS No ODOR, PID = 0
0955	"	MW3-S-15-3	"	"	"	—	—	—	—	15' BGS No ODOR, PID = 0
0940	"	MW3-S-5-2	"	"	3 ENCORE	—	—	—	—	QC DUPLICATE
1501	"	B3-S-1-1	BORING 3	"	1 BRASS	—	—	—	—	1' BGS
1850	"	B3-S-5-2	"	"	"	—	—	—	—	5' BGS
1501	"	B3-S-1-2	"	"	"	—	—	—	—	1' BGS
0905	8-27-02	RB-W-2	MW-1	H_2O	3 VOA 2 L	40 ml 1 L	GLASS	3 HCl 2 VP	UNF	

Forms\215

KLEINFELDER
SAMPLE CONTROL LOG

Project Name: BELAUSTEGUI PARK

Project Number: 15562.01 Date: 8-28-02

Time	Date	Field Sample Number	Sample Location	Matrix (soil, water)	No. of Containers	Container Size	Material (glass, plastic)	Preserved/ Unpreserved (preservative)	Filtered/ Unfiltered	Notes
0732	8-28-02	B4-S-3-1	B-4	SOIL	1	SLEEVE	BRASS	—	—	3' BGS No odor
0735	"	B4-S-4-2	B-4	"	"	"	"	—	—	4' BGS No odor
0755	"	B5-S-3-1	B-5	"	"	"	"	—	—	3' BGS No odor
0800	"	B5-S-3-2	"	"	"	"	"	—	—	3' BGS No odor
0805	"	B5-S-4-3	"	"	"	"	"	—	—	4' BGS No odor
0825	"	B6-S-2-1	B-6	"	"	"	"	—	—	2' BGS No odor
0830	"	B6-S-4-2	"	"	"	"	"	—	—	4' BGS No odor
0850	"	B7-S-3-1	B-7	"	"	"	"	—	—	3' BGS No odor
0900	"	B7-S-5-2	B-7	"	"	"	"	—	—	5' BGS No odor
0920	"	B8-S-2-1	B-8	"	"	"	"	—	—	2' BGS No odor
0925	"	B8-S-3-2	B-8	"	"	"	"	—	—	3' BGS No odor
0940	"	B9-S-0-1	B-9	"	"	"	"	—	—	0' BGS No odor
0946	"	B9-S-3-2	B-9	"	"	"	"	—	—	3' BGS No odor
0958	"	B10-S-1-1	B-10	"	"	"	"	—	—	1' BGS No odor
~~1000~~	"	~~B10-S-2-2~~	"	"	"	"	"	—	—	~~2' BGS~~ duplicate JAF

Forms\215

KLEINFELDER
SAMPLE CONTROL LOG

Project Name: BELMONT PARK

Project Number: 15562-01 Date: 8-28-02

Time	Date	Field Sample Number	Sample Location	Matrix (soil,water)	No. of Containers	Container Size	Material (glass, plastic)	Preserved/ Unpreserved (preservative)	Filtered/ Unfiltered	Notes
1000	8/28/02	B10-S-2-2	B-10	SOIL	1	5 GMS	BRASS	—	—	2' BGS NO ODOR
0835	8/28/02	RB-W-3	B-6	H_2O	1	1L	PLASTIC	HP	UNF	

KLEINFELDER
SAMPLE CONTROL LOG

Project Name: BOLANDEGUI PARK

Project Number: 13562.01 Date: 9-3-02

Time	Date	Field Sample Number	Sample Location	Matrix (soil,water)	No. of Containers	Container Size	Material (glass, plastic)	Preserved/ Unpreserved (preservative)	Filtered/ Unfiltered	Notes
1317	9/3/02	FB-W-1	MW-3	H_2O	5	2 l 3 40ml	GLASS	3 HCl 2 UP	UNF	FIELD BLANK
1457	"	MW3-GW-2	MW-3	"	"	"	"	"	"	QC DUPLICATE

Forms\215

KLEINFELDER

WELL DEVELOPMENT LOG

Well # MW-1

Time	1832	1836	1844	1849	1855		
Gallons Purged	3.0	5.0	7.0	9.0	10.5		
Purge Rate							
pH	7.16	7.60	7.81	7.90	7.97		
Conductivity ~~(µmhos)~~ µS	525 µS	539	548	545	544		
Temperature ~~(°C)~~ °F	77.7°F	74.4	72.1	71.5	70.9		
Salinity (0/00)							
Water Level	STATIC 8.20'						
Dewatered	3 GALLONS	5 GALLONS	7 GAL	9 GAL			
Turbidity							
Color	BROWN	CLOUDY	CLOUDY	CLEAR	CLEAR		
Comments	NO ODOR	NO ODOR	CLARITY INCREASING, NO ODOR	NO ODOR	NO ODOR		

Project # 13562.01 Project Name B.PARK Total Depth 15.05'

Date 8/27/02 Initials JF Screen Interval 5-15'

KLEINFELDER

WELL DEVELOPMENT LOG

Well # MW-2

Time	1105	1121	1127	1137	1146	1158	1214
Gallons Purged	1	3.5	4.0	5.0	6.0	7.0	9.0
Purge Rate							
pH		6.98	7.88	8.14	8.22	8.25	8.26
Conductivity ~~(µmhos)~~ mS		5380 µS	5350	5340	5340	5370	5380
Temperature ~~(°C)~~ °F		74.9°F	72.1	71.7	71.8	71.4	73.6
Salinity (0/00)							
Water Level	STATIC 5.14'						
Dewatered	✓	✓	✓	✓	✓	✓	✓
Turbidity							
Color	BROWN	CLOUDY	CLOUDY	CLEAR	CLEAR	CLEAR	CLEAR
Comments	NO ODOR						

Project # 15562.01 Project Name B.PARK Total Depth 14.40'

Date 8/28/02 Initials JAF Screen Interval ~5-15'

KLEINFELDER

WELL DEVELOPMENT LOG

Well # MW-3

Time	1228	1232	1234	1235	1236	1245	1246
Gallons Purged	4.0	6.0	8.0	10.0	13.0	25.0	28.0
Purge Rate							
pH	6.89	7.66	7.76	8.06	7.97	8.26	8.18
Conductivity ~~(µmhos)~~ µS	4350µS	5140	5260	5620	5650	6220	6190
Temperature ~~(°C)~~ °F	74.9°F	71.3	71.0	70.9	70.7	71.5	71.1
Salinity (0/00)							
Water Level	STATIC 7.56						
Dewatered							
Turbidity							
Color	BROWN	BROWN	CLOUDY	CLOUDY	CLOUDY	CLEAR	CLEAR
Comments	NO ODOR						

Project # 15562.01 Project Name B. Park Total Depth 14.55'

Date 8/28/02 Initials JF Screen Interval ~5-15'

KLEINFELDER

PROJECT NO.	PROJECT NAME	NO. OF CON-TAINERS	TYPE OF CON-TAINERS	ANALYSIS: TOTAL 2A (7420)	TCLP 8A (1311)	TPH (8015M)	VOC (8260B)	RECEIVING LAB: EPA REGION 9 LABORATORY
15562.01	RELAY TRACK PARK							
L.P. NO. (P.O. NO.)	SAMPLERS: (Signature/Number)							INSTRUCTIONS/REMARKS

	DATE MM/DD/YY	SAMPLE I.D. TIME HH-MM-SS	SAMPLE I.D.	MATRIX	NO. OF CON-TAINERS	TYPE OF CON-TAINERS	TOTAL 2A (7420)	TCLP 8A (1311)	TPH (8015M)	VOC (8260B)	INSTRUCTIONS/REMARKS
1	8/21/02	0920	RB-S-2-1	SOIL	1		X	X			
2	8/21/02	0925	RB-S-2-2	SOIL	1		X	X			
3	8/21/02	0940	P9-S-0-1	SOIL	1		X	X			
4	8/21/02	0941	P9-S-2-2	SOIL	1		X	X			
5	8/21/02	0950	P10-S-1-1	SOIL	1		X	X			
6	8/21/02	1000	P10-S-2-2	SOIL	1		X	X			
7	~~8/21/02~~	~~0930~~									
8	8/21/02	1110	RB-W-1	WATER	1		X				
9	8/21/02	0905	RB-W-2	WATER	3			*	X	X	
10	8/21/02	0933	RB-W-3	WATER	1		X				
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	8/29/02 1310	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)

Instructions/Remarks:

CASE# R02590

Send Results To:

KLEINFELDER
3189 MILL STREET
RENO, NV 89502
(702) 323-7182

Attn:

M-60 White – Sampler Canary – Return Copy To Shipper Pink – Lab Copy

CHAIN OF CUSTODY

№ 1381

KLEINFELDER

PROJECT NO.	PROJECT NAME
15562.01	BELAUSTEGUI PARK

L.P. NO. (P.O. NO.)	SAMPLERS: (Signature/Number)

RECEIVING LAB: EPA REGION 9 LABORATORY

	DATE MM/DD/YY	SAMPLE I.D. TIME HH-MM-SS	SAMPLE I.D.	MATRIX	NO. OF CON-TAINERS	TYPE OF CON-TAINERS	ANALYSIS: TPH (8015B)	TOTAL Pb (7000)	TCLP Pb (1311)	INSTRUCTIONS/REMARKS
1	9/27/02	0730	MW2-S-5-1	SOIL	1		X			
2	9/27/02	0824	MW1-S-5-1	SOIL	1		X			
3	9/27/02	0935	MW3-S-5-1	SOIL	1		X			
4	9/27/02	0935	MW3-S-5-2	SOIL	1		X			
5	9/27/02	1501	B3-S-1-1	SOIL	1			X	X	
6	9/27/02	1501	B3-S-1-2	SOIL	1			X	X	
7	9/27/02	1850	B3-S-5-2	SOIL	1			X	X	
8	9/26/02	1731	B2-S-1-1	SOIL	1			X	X	
9	9/26/02	1721	B2-S-1-2	SOIL	1			X	X	
10	9/26/02	1745	B2-S-4-3	SOIL	1			X	X	
11	9/28/02	0732	B4-S-3-1	SOIL	1			X	X	
12	9/28/02	0735	B4-S-4-2	SOIL	1			X	X	
13	9/28/02	0755	B5-S-3-1	SOIL	1			X	X	
14	9/28/02	0805 JJF	B5-S-4-3	SOIL	1			X	X	
15	9/26/02	1550	B1-S-2-1	SOIL	1			X	X	
16	9/26/02	1556	B1-S-5-2	SOIL	1			X	X	
17	9/28/02	0825	B6-S-2-1	SOIL	1			X	X	
18	9/28/02	0830	B6-S-4-2	SOIL	1			X	X	
19	9/28/02	0850	B7-S-3-1	SOIL	1			X	X	
20	9/28/02	0900	B7-S-5-2	SOIL	1			X	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	9/27/02 1510	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)

Instructions/Remarks:

CASE # R02580

Send Results To:

KLEINFELDER
3189 MILL STREET
RENO, NV 89502
(702) 323-7182

Attn:

M-60 White – Sampler Canary – Return Copy To Shipper Pink – Lab Copy

CHAIN OF CUSTODY

№ 1380

KLEINFELDER

PROJECT NO.	PROJECT NAME
15362.01	RELAY STATION PARK

L.P. NO. (P.O. NO.):

SAMPLERS: (Signature/Number)

RECEIVING LAB: EPA REGION 9 LABORATORY

	DATE MM/DD/YY	SAMPLE I.D. TIME HH-MM-SS	SAMPLE I.D.	MATRIX	NO. OF CONTAINERS	TYPE OF CONTAINERS	ANALYSIS TPH (8015B)	VOC (8260B)	INSTRUCTIONS/REMARKS
1	9/3/02	1415	MW1-GW-1	WATER	A		X	X	
2	9/3/02	1335	MW2-GW-1	WATER	B		X	X	
3	9/3/02	1157	MW3-GW-1	WATER	B		X	X	
4	9/3/02	1157	MW3-GW-2	WATER	B		X	X	
5	9/3/02	1517	FB-W-1	WATER	B		X	X	
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	9/4/02 11:26	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)

Instructions/Remarks:

CASE # R02580

Send Results To:

KLEINFELDER
3189 MILL STREET
RENO, NV 89502
(702) 323-7182

Attn:

M-60 White – Sampler Canary – Return Copy To Shipper Pink – Lab Copy

CHAIN OF CUSTODY

№ 1382

APPENDIX C

Analytical Results and Chains of Custody

USEPA REGION 9 LABORATORY
REPORT NARRATIVE

CASE NUMBER: R02S80
SAMPLE DELIVERY GROUP (SDG): 02242B
PROGRAM: Superfund
DOCUMENT CONTROL #: B0101126-1983
ANALYSIS PERFORMED: Total Petroleum Hydrocarbons-Diesel Range Organics (TPH-DRO)
DATE : December 02, 2002

SAMPLE NUMBERS:

Client Sample No.	Laboratory Sample ID	Client Sample No.	Laboratory Sample ID
RB-W-2	AB36606	MW3-GW-1	AB36642
MW1-GW-1	AB36640	MW3-GW-2	AB36643
MW2-GW-1	AB36641	FB-W-1	AB36644

GENERAL COMMENTS

Six (6) water samples were received at the EPA Region 9 Laboratory on 08/30/02 and 09/05/02 from the Belavstegui Park site for determination of TPH-DRO.

The samples were analyzed for TPH-DRO in accordance with the Region 9 Laboratory SOP 385, *Extractable Petroleum Hydrocarbons by GC FID* based on EPA SW-846 Method 8015B, *Nonhalogenated Organics Using GC/FID*, Revision 2, December 1996 and Region 9 Laboratory SOP 275, *Extraction of Petroleum Hydrocarbons from Water Using Continuous Liquid-Liquid Extraction* based on EPA SW-846 Method 3520C, *Continuous Liquid-Liquid Extraction*, Revision 3, December 1996.

The laboratory chose a QC sample at random because none was designated by the field samplers on the chain-of-custody forms.

SAMPLE RECEIPT AND PRESERVATION

No shipping or preservation issues were encountered with these samples.

QA/QC AND ANALYTICAL COMMENTS

The following comments appear on the Summary of Analytical Results:

1. The sample listed below was extracted on 9/9/02. Results from the original extraction revealed low surrogate recoveries. The sample was re-extracted on 09/16/02 beyond holding time. Surrogate recoveries for the re-extraction were within the QC limits; therefore, quantitation limit for the sample is estimated and "J" flagged.

Sample ID	Lab ID	Date Collected	Holding Time Date	Date Extracted	Days Beyond
MW3-GW-2	AB36643	09/03/02	09/10/02	09/16/02	6

2. The surrogate listed below does not meet the QC limit. The sample was re-extracted on 09/16/02 and re-analyzed (data files: 255ZM007 and 263Z019). According to the extraction data sheet, this sample was dark in color after concentration. Low surrogate recoveries were noted for the re-extracted sample. Detected result for the analyte in the sample listed below is estimated and "J" flagged.

Sample ID	Lab ID	Surrogate	% Rec	QC Limit
MW3-GW-1	AB36642	n-Hexacosane	68	70 - 130

3. Results detected at concentrations below the quantitation limit (QL) but greater than or equal to one half the QL are reported with a "J" flag to indicate the uncertainty of quantitation at these levels.

The following QC results are associated with the samples in this SDG

QC limits were met for all initial calibration, CVs, QCS percent differences, surrogate percent recoveries, LFB percent recoveries, LFM/LFMD (QC sample: RB-W-2) percent recoveries and RPDs, and QLS percent differences.

All samples were analyzed within the 40 day extract holding time.

No target analytes were detected in the LRB associated with these samples.

Due to insufficient volume of sample, one sample container was divided to extract the MS/MSD.

Any questions in reference to this data package may be addressed to Ziyad Rajabi at (510) 412-2390.

GLOSSARY

Initial Calibration
The initial calibration demonstrates that the instrument has a linear calibration curve described by percent relative standard deviation (%RSD). The average calibration factors (CFs) determined in the initial calibration are used to quantitate analytes and surrogates.

Quality Control Standard (QCS)
The quality control standard is a mid-point calibration standard prepared from a source different than the calibration standards. The QCS is used to check the accuracy of the initial calibration standards.

Calibration Verification (CV)
The calibration verification checks the instrument performance daily by ensuring the instrument continues to meet the linear calibration curve as demonstrated by percent difference (%D).

Quantitation Limit Standard (QLS)
The quantitation limit standard is used to demonstrate low level quantitation performance for all target compounds.

Laboratory Reagent Blanks (LRBs)
A laboratory reagent blank is laboratory reagent water or baked sand with all reagents, surrogates, and internal standards added and carried through the same sample preparation and analytical procedures as the field samples. The LRB is used to determine the level of contamination introduced by the laboratory during extraction and analysis.

Surrogates
Surrogates are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. All samples are spiked with surrogate compounds prior to extraction. Surrogate percent recovery (%R) provides information about both the laboratory performance on individual samples and the possible effects of the sample matrix on the analytical results.

Laboratory Fortified Sample Matrix and Duplicate (LFM and LFMD) Analysis
Laboratory fortified sample matrix and duplicate analyses provide information about the effect of the sample matrix on sample preparation and measurement. Poor percent recovery (%R) results and large relative percent difference (RPD) between duplicates may indicate inconsistent laboratory technique, sample

nonhomogeneity in soils, or matrix effects which may interfere with analysis.

Laboratory Fortified Blank (LFB) Analysis

A laboratory fortified blank is laboratory reagent water or baked sand with all reagents, surrogates, internal standards and representative target compounds added and carried through the same sample preparation and analytical procedures as the field samples. The LFB analyses provide information about the laboratory and method performance. Poor percent recovery (%R) results may indicate poor laboratory technique or poor method performance for a particular class of compounds.

Suffixes to Sample ID and Lab ID

The following suffixes may be attached to sample ID's and lab ID's to distinguish between different extraction samples or analytical runs: RE for reextraction, RA for reanalysis, and DL for dilution analysis.

DATA PACKAGE COMMENTS

The software places "m" flags on quantitation reports and enhanced chromatograms for non-manually integrated data whenever the software sums several peaks.

Sample components in the Oill range contributed to Diesel range quantitation in samples MW1-GW-1, MW3-GW-1and MW3-GW-2. Diesel quantitation were estimated to be between ½ the QL and the QL. Sample chromatograms did not display any discernable diesel hydrocarbon pattern; therefore, the samples diesel values were reported as non-detect.

Example calculations:

TPH-DRO concentration for sample TBS252 (LFB) using datafile 254Z008.D:

$$\text{Conc. } (\mu g/L) = \frac{A_x \times V_t \times DF \times 1{,}000 \text{ mL/L}}{RF \times V_o}$$

where:

- A_x = area sum response of the sample
- DF = dilution factor
- RF = mean response factor (area/concentration) from the initial calibration of 08/19/02 (Z081902A)
- V_o = volume of water extracted in mL
- V_t = volume of concentrated extract in mL

$$= \frac{1{,}432{,}287{,}091 \times 5\text{mL} \times 1 \times 1{,}000 \text{ mL/L}}{3{,}465{,}000 (ng^{-1}) \times 991.8 \text{ mL}}$$

$$= 2{,}083 \approx 2{,}100 \ \mu g/L$$

Surrogate % Recovery for sample AB39944 (FB-W-1) using datafile 254Z011.D:

$$\% \text{ Rec} = \frac{A_x \times 100}{RF \times S}$$

where:

- S = amount spiked (50 ug/mL)
- RF = mean response factor (area/concentration) from the initial calibration of 08/19/02 (Z081902A)

$$= \frac{154{,}274{,}693 \times 100}{3{,}322{,}000 \times 50}$$

=93 % recovery

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02242B
Date: 12/2/02
Analysis: 8015B
Matrix: water

Sample No.	FB-W-1			MW1-GW-1			MW2-GW-1			MW3-GW-1			MW3-GW-2		
Lab Sample ID	AB36644			AB36640			AB36641			AB36642			AB36643		
Date of Collection	9/3/02			9/3/02			9/3/02			9/3/02			9/3/02		
Units	ug/L			ug/L			ug/L			ug/L			ug/L		
Analyte	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt
TPH as Diesel	200	U		200	U		200	U		200	UJ	B	200	UJ	A
TPH as Motor Oil	1000	U		1000	U		1000	U		900	J	BC	1000	J	A

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02242B
Date: 12/2/02
Analysis: 8015B
Matrix: water

Sample No.	RB-W-2		
Lab Sample ID	AB36606		
Date of Collection	8/27/02		
Units	ug/L		
Analyte	Result	Q	Cmt
TPH as Diesel	200	U	
TPH as Motor Oil	1000	U	

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

The following QC results are associated with the samples in this SDG:

QC limits were met for all initial calibration %RSDs, CV %Ds, LFB percent recovery, LFM/LFMD (QC sample:# RB-W-2 and MW1-GW-1) percent recoveries and RPD, and QLS percent differences.

All samples were extracted and analyzed within the 14 day holding time.

No target analytes were detected in the LRBs and storage blank associated with these samples.

There was no storage blank for the sample that arrived on 8/30/02 because it was analyzed on the same day.

Any questions in reference to this data package may be addressed to Ziyad Rajabi at (510) 412-2390.

USEPA REGION 9 LABORATORY
REPORT NARRATIVE

CASE NUMBER:	**R02S80**
SAMPLE DELIVERY GROUP (SDG):	**02242B**
PROGRAM:	**Superfund**
DOCUMENT CONTROL #:	**B0101126-1999**
ANALYSIS PERFORMED:	**Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH-GRO)**
DATE :	**October 4, 2002**

SAMPLE NUMBERS:

Client Sample No	Laboratory Sample ID	Client Sample No	Laboratory Sample ID
RB-W-2	AB36606	MW3-GW-1	AB36642
MW1-GW-1	AB36640	MW3-GW-2	AB36643
MW2-GW-1	AB36641	FB-W-1	AB36644

GENERAL COMMENTS

Six (6) water samples were received at the EPA Region 9 Laboratory on 08/30/02 and 09/05/02 from the Belavstegui Park site for determination of TPH-GRO.

These samples were analyzed for TPH-GRO in accordance with the Region 9 Laboratory SOP 380, *Purgeable Aromatics and Hydrocarbons by GC PID/FID* based on EPA SW-846 Method 5030B, # 5035, 8015B, and 8021B *Nonhalogenated Organics Using GC/FID*, Revision 2, December 1996.

The laboratory chose a QC sample at random because none was designated by the field samplers on the chain-of-custody forms.

SAMPLE RECEIPT AND PRESERVATION

Vials containing sample RB-W-2 were labeled RBW-3 in the field. Sample RB-W-2 (AB36606) was not preserved in the field. No other shipping or preservation issues were encountered with these samples.

QA/QC AND ANALYTICAL COMMENTS

GLOSSARY

Initial Calibration
The initial calibration demonstrates that the instrument has a linear calibration curve described by percent relative standard deviation (%RSD). The average calibration factors (CFs) determined in the initial calibration are used to quantitate analytes and surrogates.

Quality Control Standard (QCS)
The quality control standard is a mid-point calibration standard prepared from a source different than the calibration standards. The QCS is used to check the accuracy of the initial calibration standards.

Calibration Verification (CV)
The calibration verification checks the instrument performance daily by ensuring the instrument continues to meet the linear calibration curve as demonstrated by percent difference (%D).

Quantitation Limit Standard (QLS)
The quantitation limit standard is used to demonstrate low level quantitation performance for all target compounds.

Laboratory Reagent Blanks (LRBs)
A laboratory reagent blank is laboratory reagent water or baked sand with all reagents, surrogates, and internal standards added and carried through the same sample preparation and analytical procedures as the field samples. The LRB is used to determine the level of contamination introduced by the laboratory during extraction and analysis.

Surrogates
Surrogates are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. All samples are spiked with surrogate compounds prior to extraction. Surrogate percent recovery (%R) provides information about both the laboratory performance on individual samples and the possible effects of the sample matrix on the analytical results.

Laboratory Fortified Sample Matrix and Duplicate (LFM and LFMD) Analysis
Laboratory fortified sample matrix and duplicate analyses provide information about the effect of the sample matrix on sample preparation and measurement. Poor percent recovery (%R) results and large relative percent difference (RPD) between duplicates may indicate inconsistent laboratory technique, sample nonhomogeneity in soils, or matrix effects which may interfere with analysis.

Laboratory Fortified Blank (LFB) Analysis
A laboratory fortified blank is laboratory reagent water or baked sand with all reagents, surrogates, internal standards and representative target compounds added and carried through the same sample preparation and analytical procedures as the field samples. The LFB analyses provide information about the laboratory and method performance. Poor percent recovery (%R)

results may indicate poor laboratory technique or poor method performance for a particular class of compounds.

Suffixes to Sample ID and Lab ID

The following suffixes may be attached to sample ID's and lab ID's to distinguish between different extraction samples or analytical runs: RE for reextraction, RA for reanalysis, and DL for dilution analysis.

DATA PACKAGE COMMENTS

The software places "m" flags on quantitation reports and enhanced chromatograms for non-manually integrated data whenever the software sums several peaks.

At EPA request, the laboratory initiated a minor deviation from SOP 380. The quant report has been modified to give result in concentration units rather then amount. This requires a modification in the equation to calculate result.

Example calculations:

TPH-GRO concentration for sample AB36606MS (RB-W-2) using datafile 242L008.D:

$$\text{Conc. } (\mu g/L) = \frac{A_x \times DF}{RF \times}$$

where:

A_x	= area sum response of the sample
DF	= dilution factor
RF	= mean response factor from the initial calibration of 08/19/02

$$= \frac{13{,}156{,}863 \times 1}{45{,}520}$$

$$= 289.0 \approx 290 \ \mu g/L$$

Surrogate % Recovery for sample AB36642 (MW3-GW-1) using datafile 249L012.D:

$$\% \text{ Rec} = \frac{A_x \times 100}{RF \times S}$$

where:

S	= amount spiked (125 ug/L)
RF	= mean response factor from the initial calibration of 08/19/02

$$= \frac{4{,}809{,}852 \times 100}{41{,}100 \times 125}$$

= 94 % recovery

EPA REGION 9 - LABORATORY - RICHMOND, CA

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02242B
Date: 9/12/02
Analysis: 8015B
Matrix: water

Sample No.	FB-W-1			MW1-GW-1			MW2-GW-1			MW3-GW-1			MW3-GW-2		
Lab Sample ID	AB36644			AB36640			AB36641			AB36642			AB36643		
Date of Collection	9/3/02			9/3/02			9/3/02			9/3/02			9/3/02		
Units	ug/L			ug/L			ug/L			ug/L			ug/L		
Analyte	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt
TPH as Gasoline	50	U		50	U		50	U		50	U		50	U	

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02242B
Date: 9/12/02
Analysis: 8015B
Matrix: water

Sample No.	RB-W-2		
Lab Sample ID	AB36606		
Date of Collection	8/27/02		
Units	ug/L		
Analyte	Result	Q	Cmt
TPH as Gasoline	50	U	

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

USEPA REGION 9 LABORATORY
REPORT NARRATIVE

CASE NUMBER: **R02S80**
SAMPLE DELIVERY GROUP: **02242B**
PROGRAM: **Superfund**
DOCUMENT CONTROL #: **B0101126-1998**
ANALYSIS PERFORMED: **524.2**
DATE: **October 4, 2002**
SAMPLE NUMBERS:

Sample ID	Laboratory Sample ID	Sample ID	Laboratory Sample ID
RB-W-2	AB36606	MW3-GW-1	AB36642
MW1-GW-1	AB36640	MW3-GW-2	AB36643
MW2-GW–1	AB36641	FB-W-1	AB36644

GENERAL COMMENTS

Six (6) water samples were received at the EPA Region 9 Laboratory on 08/30/02 and 09/05/02 from the Belavstegui Park Superfund site.

These samples were analyzed for volatile organics in accordance with the USEPA Region 9 Laboratory SOP 354, Volatile Organic Analysis (Reference Method 524.2).

SAMPLE RECEIPT AND PRESERVATION

Vials containing sample RB-W-2 were labeled RBW-3 in the field. No other issues related to shipping and preservation were encountered with these samples.

QA/QC AND ANALYTICAL COMMENTS

The following comments appear on the Summary of Analytical Results:

A The following LCS exceeded QC limits. Since the value is biased low, the reported values for the compound in samples and associated method blank should be considered as estimates and "J" flagged in the summary of results spreadsheet.

LCS File ID	Date	Analyte	% Rec	QC Limit
LWJ0905	09/05/02	Dichlorodifluoromethane	47	60 - 140

LWJ0906	09/06/02	Dichlorodifluoromethane	46	60 - 140

No target analytes were detected in the method blanks associated with these samples.

No target analytes were detected in the storage blanks associated with these samples.

All surrogate recoveries were within QC limits.

The accuracy and precision of the MS/MSD (QC Samples:MW1-GW-1, AB36640) were within QC limits.

All internal standard areas and retention times were within QC limits.

All samples were analyzed within the holding time.

RESULTS SUMMARY

The results can be found on the Summary of Results report.

Any questions in reference to this data package may be addressed to Ziyad Rajabi at (510) 412-2390.

Glossary

Method Blanks
A laboratory method blank is laboratory reagent water or sand with all reagents, surrogates, and internal standards added and carried through the same sample preparation and analytical procedures as the field samples. The laboratory method blank is used to determine the level of contamination introduced by the laboratory during analysis.

Storage Blanks
A storage blank is laboratory reagent water that is stored in the laboratory refrigerator for one week. All reagents, surrogates, and internal standards are added at the time of analysis and it is processed through the same sample preparation and analytical procedures as the other blanks. The storage blank is used to determine the level of contamination introduced by the laboratory during sample storage.

Surrogates
Surrogates are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. All samples are spiked with surrogate compounds prior to analysis. Surrogate percent recovery (%R) provides information about both the laboratory performance on individual samples and the possible effects of the sample matrix on the analytical results.

Matrix Spike and Spike Duplicate Analysis
Matrix spike sample and spike duplicate analyses provide information about the effect of the sample matrix on sample preparation and measurement. Poor percent recovery (%R) results and large relative percent difference (RPD) between duplicates may indicate inconsistent laboratory technique, sample nonhomogeneity in soils, or matrix effects which may interfere with analysis.

Internal Standards
Internal standards are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but not normally found in environmental samples. All samples are spiked with internal standard compounds prior to analysis. Internal standard recoveries and retention times provide information about both the instrument performance on individual samples and the possible effects of the sample matrix on the analytical results.

Laboratory Control Samples
Laboratory control samples (LCSs) are analyzed daily to demonstrate comparability of the continuing calibration standard. It is equivalent to the continuing calibration standard, but it is obtained from an independent source.

ANALYTICAL COMMENTS

Example calculation using data for benzene obtained for sample (MW1-GW-1MS7, AB36640MS), date file (02J1862.D) analyzed on 09/06/02:

Conc. ($\mu g/L$) $= A_x * AMT_{IS} * DF / (A_{IS} * RRF)$
$= 560977 * 5\ \mu g/L * 1 / (549447 * 1.171)$
$= 4.36\ \mu g/L$

where
A_x = area of the characteristic ion of the compound
AMT_{IS} = concentration of internal standard in $\mu g/L$ (5 $\mu g/L$ for 25-mL analyses)
DF = dilution factor
A_{IS} = area of the characteristic ion of the associated internal standard
RRF = analyte's relative response factor from the initial calibration

Instrument Calibration:

The initial calibration demonstrates that the instrument is capable of meeting the minimum relative response factors (RRFs) and has a linear calibration curve.

All analytes in the initial calibrations were within QC limits.

The continuing calibration checks the instrument performance daily.

All analytes in the contunuing calibration were within QC limits.

The quantitation limit standard is used to demonstrate low level quantitation performance for the following five analytes: (1) vinyl chloride, (2) carbon tetrachloride, (3) 1,2-dichloroethane, (4) cis-1,3-dichloropropene, and (5) trans-1,3-dichloropropene, in accordance with SOP requirements. This requirement is necessary to support the 0.5 µg/L quantitation limit for these analytes.

All low-level verification compounds and other analytes met QC specifications (50 - 150%) except the following:

Filename	Instrument	Date	Analyte	% Recovery
QWJ0905	HP5973J	09/05/02	Acetone	187
QWJ0906	HP5973J	09/06/02	Acetone	160

There were no detected results for these analytes associated with these QLS. Quantitation limits are not "J" flagged because the bias is positive.

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02242B
Date: 10/3/02
Analysis: 524.2
Matrix: water

Sample No.	FB-W-1			MW1-GW-1			MW2-GW-1			MW3-GW-1			MW3-GW-2		
Lab Sample ID	AB36644			AB36640			AB36641			AB36642			AB36643		
Date of Collection	9/3/02			9/3/02			9/3/02			9/3/02			9/3/02		
Units	ug/L			ug/L			ug/L			ug/L			ug/L		
Analyte	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt
Dichlorodifluoromethane	1	UJ	A	1	UJ	A	1	UJ	A	1	UJ	A	1	UJ	A
Chloromethane	1	U		1	U		1	U		1	U		1	U	
Vinyl chloride	0.5	U		0.5	U		0.5	U		0.5	U		0.5	U	
Bromomethane	1	U		1	U		1	U		1	U		1	U	
Chloroethane	1	U		1	U		1	U		1	U		1	U	
Trichlorofluoromethane	1	U		1	U		1	U		1	U		1	U	
1,1-Dichloroethene	1	U		1	U		1	U		1	U		1	U	
1,1,2-Trichlorotrifluoroethane	1	U		1	U		1	U		1	U		1	U	
Acetone	4	U		4	U		4	U		4	U		4	U	
Methylene Chloride	1	U		1	U		1	U		1	U		1	U	
trans-1,2-Dichloroethene	1	U		1	U		1	U		1	U		1	U	
Methyl t-butyl ether (MTBE)	1	U		1	U		1	U		1	U		1	U	
1,1-Dichloroethane	1	U		1	U		1	U		1	U		1	U	
2,2-Dichloropropane	1	U		1	U		1	U		1	U		1	U	
cis-1,2-Dichloroethene	1	U		1	U		1	U		1	U		1	U	
Bromochloromethane	1	U		1	U		1	U		1	U		1	U	
Chloroform	1	U		1	U		1	U		1	U		1	U	
1,1,1-Trichloroethane	1	U		1	U		1	U		1	U		1	U	
1,1-Dichloropropene	1	U		1	U		1	U		1	U		1	U	
2-Butanone	4	U		4	U		4	U		4	U		4	U	
Benzene	1	U		1	U		1	U		1	U		1	U	
1,2-Dichloroethane	0.5	U		0.5	U		0.5	U		0.5	U		0.5	U	
Carbon tetrachloride	0.5	U		0.5	U		0.5	U		0.5	U		0.5	U	
Trichloroethene	1	U		1	U		1	U		1	U		1	U	
1,2-Dichloropropane	1	U		1	U		1	U		1	U		1	U	
Dibromomethane	1	U		1	U		1	U		1	U		1	U	
Bromodichloromethane	1	U		1	U		1	U		1	U		1	U	
cis-1,3-Dichloropropene	0.5	U		0.5	U		0.5	U		0.5	U		0.5	U	
trans-1,3-Dichloropropene	0.5	U		0.5	U		0.5	U		0.5	U		0.5	U	
1,1,2-Trichloroethane	1	U		1	U		1	U		1	U		1	U	
Toluene	1	U		1	U		1	U		1	U		1	U	
Tetrachloroethene	1	U		1	U		1	U		1	U		1	U	
1,3-Dichloropropane	1	U		1	U		1	U		1	U		1	U	
Dibromochloromethane	1	U		1	U		1	U		1	U		1	U	

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02242B
Date: 10/3/02
Analysis: 524.2
Matrix: water

Sample No.	FB-W-1			MW1-GW-1			MW2-GW-1			MW3-GW-1			MW3-GW-2		
Lab Sample ID	AB36644			AB36640			AB36641			AB36642			AB36643		
Date of Collection	9/3/02			9/3/02			9/3/02			9/3/02			9/3/02		
Units	ug/L			ug/L			ug/L			ug/L			ug/L		
Analyte	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt
1,2-Dibromoethane (EDB)	1	U		1	U		1	U		1	U		1	U	
Chlorobenzene	1	U		1	U		1	U		1	U		1	U	
1,1,1,2-Tetrachloroethane	1	U		1	U		1	U		1	U		1	U	
Ethylbenzene	1	U		1	U		1	U		1	U		1	U	
m,p-Xylene	1	U		1	U		1	U		1	U		1	U	
o-Xylene	1	U		1	U		1	U		1	U		1	U	
Styrene	1	U		1	U		1	U		1	U		1	U	
Bromoform	1	U		1	U		1	U		1	U		1	U	
Isopropylbenzene	1	U		1	U		1	U		1	U		1	U	
Bromobenzene	1	U		1	U		1	U		1	U		1	U	
1,1,2,2-Tetrachloroethane	1	U		1	U		1	U		1	U		1	U	
1,2,3-Trichloropropane	1	U		1	U		1	U		1	U		1	U	
n-Propylbenzene	1	U		1	U		1	U		1	U		1	U	
2-Chlorotoluene	1	U		1	U		1	U		1	U		1	U	
4-Chlorotoluene	1	U		1	U		1	U		1	U		1	U	
1,3,5-Trimethylbenzene	1	U		1	U		1	U		1	U		1	U	
tert-Butylbenzene	1	U		1	U		1	U		1	U		1	U	
1,2,4-Trimethylbenzene	1	U		1	U		1	U		1	U		1	U	
sec-Butylbenzene	1	U		1	U		1	U		1	U		1	U	
1,3-Dichlorobenzene	1	U		1	U		1	U		1	U		1	U	
1,4-Dichlorobenzene	1	U		1	U		1	U		1	U		1	U	
p-Isopropyltoluene	1	U		1	U		1	U		1	U		1	U	
1,2-Dichlorobenzene	1	U		1	U		1	U		1	U		1	U	
n- Butylbenzene	1	U		1	U		1	U		1	U		1	U	
1,2-Dibromo-3-chloropropane	2	U		2	U		2	U		2	U		2	U	
1,2,4-Trichlorobenzene	1	U		1	U		1	U		1	U		1	U	
Hexachlorobutadiene	1	U		1	U		1	U		1	U		1	U	
Naphthalene	1	U		1	U		1	U		1	U		1	U	
1,2,3-Trichlorobenzene	1	U		1	U		1	U		1	U		1	U	

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02242B
Date: 10/3/02
Analysis: 524.2
Matrix: water

Sample No.	RB-W-2			METHOD BLANK 1			METHOD BLANK 2		
Lab Sample ID	AB36606			242BMWJ0905			242BMWJ0906		
Date of Collection	8/27/02			9/5/02			9/6/02		
Units	ug/L			ug/L			ug/L		
Analyte	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt
Dichlorodifluoromethane	1	UJ	A	1	UJ	A	1	UJ	A
Chloromethane	1	U		1	U		1	U	
Vinyl chloride	0.5	U		0.5	U		0.5	U	
Bromomethane	1	U		1	U		1	U	
Chloroethane	1	U		1	U		1	U	
Trichlorofluoromethane	1	U		1	U		1	U	
1,1-Dichloroethene	1	U		1	U		1	U	
1,1,2-Trichlorotrifluoroethane	1	U		1	U		1	U	
Acetone	4	U		4	U		4	U	
Methylene Chloride	1	U		1	U		1	U	
trans-1,2-Dichloroethene	1	U		1	U		1	U	
Methyl t-butyl ether (MTBE)	1	U		1	U		1	U	
1,1-Dichloroethane	1	U		1	U		1	U	
2,2-Dichloropropane	1	U		1	U		1	U	
cis-1,2-Dichloroethene	1	U		1	U		1	U	
Bromochloromethane	1	U		1	U		1	U	
Chloroform	1	U		1	U		1	U	
1,1,1-Trichloroethane	1	U		1	U		1	U	
1,1-Dichloropropene	1	U		1	U		1	U	
2-Butanone	4	U		4	U		4	U	
Benzene	1	U		1	U		1	U	
1,2-Dichloroethane	0.5	U		0.5	U		0.5	U	
Carbon tetrachloride	0.5	U		0.5	U		0.5	U	
Trichloroethene	1	U		1	U		1	U	
1,2-Dichloropropane	1	U		1	U		1	U	
Dibromomethane	1	U		1	U		1	U	
Bromodichloromethane	1	U		1	U		1	U	
cis-1,3-Dichloropropene	0.5	U		0.5	U		0.5	U	
trans-1,3-Dichloropropene	0.5	U		0.5	U		0.5	U	
1,1,2-Trichloroethane	1	U		1	U		1	U	
Toluene	1	U		1	U		1	U	
Tetrachloroethene	1	U		1	U		1	U	
1,3-Dichloropropane	1	U		1	U		1	U	
Dibromochloromethane	1	U		1	U		1	U	

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02242B
Date: 10/3/02
Analysis: 524.2
Matrix: water

Sample No.	RB-W-2			METHOD BLANK 1			METHOD BLANK 2		
Lab Sample ID	AB36606			242BMWJ0905			242BMWJ0906		
Date of Collection	8/27/02			9/5/02			9/6/02		
Units	ug/L			ug/L			ug/L		
Analyte	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt
1,2-Dibromoethane (EDB)	1	U		1	U		1	U	
Chlorobenzene	1	U		1	U		1	U	
1,1,1,2-Tetrachloroethane	1	U		1	U		1	U	
Ethylbenzene	1	U		1	U		1	U	
m,p-Xylene	1	U		1	U		1	U	
o-Xylene	1	U		1	U		1	U	
Styrene	1	U		1	U		1	U	
Bromoform	1	U		1	U		1	U	
Isopropylbenzene	1	U		1	U		1	U	
Bromobenzene	1	U		1	U		1	U	
1,1,2,2-Tetrachloroethane	1	U		1	U		1	U	
1,2,3-Trichloropropane	1	U		1	U		1	U	
n-Propylbenzene	1	U		1	U		1	U	
2-Chlorotoluene	1	U		1	U		1	U	
4-Chlorotoluene	1	U		1	U		1	U	
1,3,5-Trimethylbenzene	1	U		1	U		1	U	
tert-Butylbenzene	1	U		1	U		1	U	
1,2,4-Trimethylbenzene	1	U		1	U		1	U	
sec-Butylbenzene	1	U		1	U		1	U	
1,3-Dichlorobenzene	1	U		1	U		1	U	
1,4-Dichlorobenzene	1	U		1	U		1	U	
p-Isopropyltoluene	1	U		1	U		1	U	
1,2-Dichlorobenzene	1	U		1	U		1	U	
n- Butylbenzene	1	U		1	U		1	U	
1,2-Dibromo-3-chloropropane	2	U		2	U		2	U	
1,2,4-Trichlorobenzene	1	U		1	U		1	U	
Hexachlorobutadiene	1	U		1	U		1	U	
Naphthalene	1	U		1	U		1	U	
1,2,3-Trichlorobenzene	1	U		1	U		1	U	

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

USEPA REGION 9 LABORATORY
REPORT NARRATIVE

CASE NUMBER:	**R02S80**
SAMPLE DELIVERY GROUP (SDG):	**02240A**
PROGRAM:	**Superfund**
DOCUMENT CONTROL #:	**B0101126-1966**
ANALYSIS PERFORMED:	**Total Petroleum Hydrocarbons-Diesel Range Organics (TPH-DRO)**
DATE :	**September 27, 2002**

SAMPLE NUMBERS:

Client Sample No.	Laboratory Sample ID	Client Sample No.	Laboratory Sample ID
MW2-S-5-1	AB36547	MW3-S-5-1	AB36549
MW1-S-5-1	AB36548	MW3-S-5-2	AB36550

GENERAL COMMENTS

Four (4) soil samples were received at the EPA Region 9 Laboratory on 08/30/02 from the Belavstegui Park site for determination of TPH-DRO.

These samples were analyzed for TPH-DRO in accordance with the Region 9 Laboratory SOP 385, *Extractable Petroleum Hydrocarbons by GC FID* based on EPA SW-846 Method 8015B, *Nonhalogenated Organics Using GC/FID*, Revision 2, December 1996 and Region 9 Laboratory SOP 280, *Extraction of Petroleum Hydrocarbons in Soil Samples Using Pressurized Fluid Extraction* based on EPA SW-846 Method 3545, *Pressurized Fluid Extraction*, Revision 0, December 1996.

Results are reported on a dry-weight basis.

The laboratory chose a QC sample at random because none was designated by the field samplers on the chain-of-custody forms.

SAMPLE RECEIPT AND PRESERVATION

No shipping or preservation issues were encountered with these samples.

QA/QC AND ANALYTICAL COMMENTS

The following QC results are associated with the samples in this SDG:

QC limits were met for all initial calibration, CVs, QCS percent differences, surrogate percent recoveries, LFB percent recoveries, and QLS percent differences.

All samples were extracted within the 14 day holding time for soil samples and analyzed within the 40 day extract holding time.

No target analytes were detected in the LRBs associated with these samples.

Any questions in reference to this data package may be addressed to Ziyad Rajabi at (510) 412-2390.

GLOSSARY

Initial Calibration
The initial calibration demonstrates that the instrument has a linear calibration curve described by percent relative standard deviation (%RSD). The average calibration factors (CFs) determined in the initial calibration are used to quantitate analytes and surrogates.

Quality Control Standard (QCS)
The quality control standard is a mid-point calibration standard prepared from a source different than the calibration standards. The QCS is used to check the accuracy of the initial calibration standards.

Calibration Verification (CV)
The calibration verification checks the instrument performance daily by ensuring the instrument continues to meet the linear calibration curve as demonstrated by percent difference (%D).

Quantitation Limit Standard (QLS)
The quantitation limit standard is used to demonstrate low level quantitation performance for all target compounds.

Laboratory Reagent Blanks (LRBs)
A laboratory reagent blank is laboratory reagent water or baked sand with all reagents, surrogates, and internal standards added and carried through the same sample preparation and analytical procedures as the field samples. The LRB is used to determine the level of contamination introduced by the laboratory during extraction and analysis.

Surrogates
Surrogates are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. All samples are spiked with surrogate compounds prior to extraction. Surrogate percent recovery (%R) provides information about both the laboratory performance on individual samples and the possible effects of the sample matrix on the analytical results.

Laboratory Fortified Sample Matrix and Duplicate (LFM and LFMD) Analysis
Laboratory fortified sample matrix and duplicate analyses provide information about the effect of the sample matrix on sample preparation and measurement. Poor percent recovery (%R) results and large relative percent difference (RPD) between duplicates may indicate inconsistent laboratory technique, sample nonhomogeneity in soils, or matrix effects which may interfere with analysis.

Laboratory Fortified Blank (LFB) Analysis
A laboratory fortified blank is laboratory reagent water or baked sand with all reagents, surrogates, internal standards and representative target compounds added and carried through the same sample preparation and analytical procedures as the field samples. The LFB analyses provide information about the laboratory and method performance. Poor percent recovery (%R)

results may indicate poor laboratory technique or poor method performance for a particular class of compounds.

Suffixes to Sample ID and Lab ID

The following suffixes may be attached to sample ID's and lab ID's to distinguish between different extraction samples or analytical runs: RE for reextraction, RA for reanalysis, and DL for dilution analysis.

DATA PACKAGE COMMENTS

The software places "m" flags on quantitation reports and enhanced chromatograms for non-manually integrated data whenever the software sums several peaks, but does not place "m" flags on quantitation reports and enhanced chromatograms for manually integrated data from summed peaks.

Sample components in the Oil range contributed to Diesel range quantitation. SOP 385 quantitation criteria was applied; therefore, the quantitation limit for diesel was raised reported accordingly.

The quant report has been modified to give result in concentration units rather then amount. This requires a modification in the equation to calculate result.

Example calculations:

Oil concentration for sample AB36550 (MW3-S-5-2) using data file 254Z017.D:

$$\text{Conc. (mg/Kg)} = \frac{A_x \times V_t \times DF}{RF \times W \times D}$$

where:

- A_x = area sum response of the sample
- D = dry weight factor (Percent solids/100)
- W = weight of sample in grams
- RF = mean response factor from the initial calibration of 08/19/02
- V_t = volume of concentrated extract in mL
- DF = dilution factor

$$= \frac{14{,}058{,}320{,}836 \times 3\ \text{mL} \times 1}{3{,}332{,}000(\ \mu\text{g/mL})^{-1} \times 6.59\ \text{g} \times 0.95}$$

$= 2021 \approx 2000$ mg/Kg

Surrogate % Recovery for sample AB36548 (MW1-S-5-1) using data file 248F029.D:

$$\%\ \text{Rec} = \frac{A_x \times DF \times 100}{RF \times S}$$

where:

- S = amount spiked (50 µg/mL)
- RF = mean response factor from the initial calibration of 8/19/02

$$= \frac{139{,}713{,}273 \times 1 \times 100}{3{,}322{,}000\ (\mu\text{g/mL})^{-1} \times 50\ \mu\text{g/mL}} = 84\ \%\ \text{recovery}$$

EPA REGION 9 - LABORATORY - RICHMOND, CA

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02240A
Date: 9/27/02
Analysis: 8015B
Matrix: SOIL

Sample No.	MW1-S-5-1			MW2-S-5-1			MW3-S-5-1			MW3-S-5-2		
Lab Sample ID	AB36548			AB36547			AB36549			AB36550		
Date of Collection	8/27/02			8/27/02			8/27/02			8/27/02		
Location	89			92			91			95		
Units	mg/Kg			mg/Kg			mg/Kg			mg/Kg		
Analyte	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt
TPH as Diesel	6	U		5	U		50	U		150	U	
TPH as Motor Oil	20			20	U		740			2000		

Results are reported on a dry weight basis

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

USEPA REGION 9 LABORATORY
REPORT NARRATIVE

CASE NUMBER:	**R02S80**
SAMPLE DELIVERY GROUP (SDG):	**02240A**
PROGRAM:	**Superfund**
DOCUMENT CONTROL #:	**B0101126-1895**
ANALYSIS PERFORMED:	**Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH-GRO)**
DATE :	**September 11, 2002**

SAMPLE NUMBERS:

Client Sample No	Laboratory Sample ID	Client SampleNo	Laboratory Sample ID
MW2-S-5-1	AB36547	MW3-S-5-1	AB36549
MW1-S-5-1	AB36548	MW3-S-5-2	AB36550

GENERAL COMMENTS

Four (4) soil samples were received at the EPA Region 9 Laboratory on 08/28/02 from the Belavstegui Park site for determination of TPH-GRO.

These samples were analyzed for TPH-GRO in accordance with the Region 9 Laboratory SOP 380, *Purgeable Aromatics and Hydrocarbons by GC PID/FID* based on EPA SW-846 Method 5030B,5035, 8015B, and 8021B *Nonhalogenated Organics Using GC/FID*, Revision 2, December 1996.

Soil sample results are reported on a dry-weight basis.

SAMPLE RECEIPT AND PRESERVATION

No shipping or preservation issues were encountered with these samples.

QA/QC AND ANALYTICAL COMMENTS

The following QC results are associated with the samples in this SDG:

QC limits were met for all initial calibration %RSDs, CV %Ds, LFB percent recovery and QLS percent differences.

No target analytes were detected in the LRB associated with these samples.

MS/MSD QC samples were not processed because insufficient sample was received.

Any questions in reference to this data package may be addressed to Ziyad Rajabi at (510) 412-2390.

GLOSSARY

Initial Calibration
The initial calibration demonstrates that the instrument has a linear calibration curve described by percent relative standard deviation (%RSD). The average calibration factors (CFs) determined in the initial calibration are used to quantitate analytes and surrogates.

Quality Control Standard (QCS)
The quality control standard is a mid-point calibration standard prepared from a source different than the calibration standards. The QCS is used to check the accuracy of the initial calibration standards.

Calibration Verification (CV)
The calibration verification checks the instrument performance daily by ensuring the instrument continues to meet the linear calibration curve as demonstrated by percent difference (%D).

Quantitation Limit Standard (QLS)
The quantitation limit standard is used to demonstrate low level quantitation performance for all target compounds.

Laboratory Reagent Blanks (LRBs)
A laboratory reagent blank is laboratory reagent water or baked sand with all reagents, surrogates, and internal standards added and carried through the same sample preparation and analytical procedures as the field samples. The LRB is used to determine the level of contamination introduced by the laboratory during extraction and analysis.

Surrogates
Surrogates are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. All samples are spiked with surrogate compounds prior to extraction. Surrogate percent recovery (%R) provides information about both the laboratory performance on individual samples and the possible effects of the sample matrix on the analytical results.

Laboratory Fortified Sample Matrix and Duplicate (LFM and LFMD) Analysis
Laboratory fortified sample matrix and duplicate analyses provide information about the effect of the sample matrix on sample preparation and measurement. Poor percent recovery (%R) results and large relative percent difference (RPD) between duplicates may indicate inconsistent laboratory technique, sample nonhomogeneity in soils, or matrix effects which may interfere with analysis.

Laboratory Fortified Blank (LFB) Analysis
A laboratory fortified blank is laboratory reagent water or baked sand with all reagents, surrogates, internal standards and representative target compounds added and carried through the same sample preparation and analytical procedures as the field samples. The LFB analyses provide information about the laboratory and method performance. Poor percent recovery (%R)

results may indicate poor laboratory technique or poor method performance for a particular class of compounds.

Suffixes to Sample ID and Lab ID

The following suffixes may be attached to sample ID's and lab ID's to distinguish between different extraction samples or analytical runs: RE for reextraction, RA for reanalysis, and DL for dilution analysis.

DATA PACKAGE COMMENTS

The software places "m" flags on quantitation reports and enhanced chromatograms for non-manually integrated data whenever the software sums several peaks.

At EPA request, the laboratory initiated a minor deviation from SOP 380. The quant report has been modified to give result in concentration units rather then amount. This requires a modification in the equation to calculate result.

Example calculations:

TPH-GRO concentration for sample GBS241 (LFB) using data file 241L006.D:

$$\text{Conc. (mg/Kg, dry weight)} = \frac{A_x \times V_t \times DF \times V_p \times 1{,}000\ \mu L/mL}{RF \times W \times D \times V_i \times 1{,}000\ ng/\ \mu g}$$

where:

A_x	= area sum response of the sample
D	= dry weight factor (percent solids/100)
W	= weight of sample in grams
RF	= mean response factor (area/concentration) from the initial calibration of 08/19/02
V_t	= total volume of methanol extract in mL
DF	= dilution factor
V_i	= volume of extract injected in µL
V_p	= volume of extract purged in mL (5 mL)

$$= \frac{11{,}693{,}124 \times 10mL \times 5mL \times 1 \times 1{,}000\ \mu L/mL}{45{,}520(ng/mL) \times 5.0\ g \times 1 \times 100\ \mu L \times 1{,}000\ ng/\ \mu g}$$

$$= 25.69 \approx 26\ mg/Kg$$

Surrogate % Recovery for sample AB35020 (WCC-59-2) using data file 112L019.D:

$$\%\ Rec = \frac{A_x \times DF \times 100}{RF \times S}$$

where:

S	= amount spiked (125 ug/L)
RF	= mean response factor (area/concentration.) from the initial calibration of 04/05/01

$$= \frac{4{,}714{,}363 \times 100}{41{,}100 \times 125}$$

$$= 92\ \%\ recovery$$

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02240A
Date: 9/6/02
Analysis: 8015B
Matrix: SOIL

Sample No.	MW1-S-5-1			MW2-S-5-1			MW3-S-5-1			MW3-S-5-2		
Location	0			0			0			0		
Depth (feet)	0			0			0			0		
Lab Sample ID	AB36548			AB36547			AB36549			AB36550		
Date of Collection	8/27/02			8/27/02			8/27/02			8/27/02		
Units	mg/Kg			mg/Kg			mg/Kg			mg/Kg		
Analyte	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt
TPH as Gasoline	5	U		5	U		5	U		5	U	

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

USEPA REGION 9 LABORATORY
REPORT NARRATIVE

CASE NUMBER: **R02S80**
SAMPLE DELIVERY GROUP: **02240A**
PROGRAM: **Superfund**
DOCUMENT CONTROL #: **B0101126-1959**
ANALYSIS PERFORMED: **8260B**
DATE: **September 25, 2002**

SAMPLE NUMBERS:

Sample ID	Laboratory Sample ID	Sample ID	Laboratory Sample ID
MW2-S-5-1	AB36547	MW3-S-5-1	AB36549
MW1-S-5-1	AB36548	MW3-S-5-2	AB36550

GENERAL COMMENTS

Four (4) soil samples were received at the EPA Region 9 Laboratory on 08/28/02 from the Belavstegui Park Brownfields Superfund site.

These samples were analyzed for volatile organics in accordance with the USEPA Region 9 Laboratory SOP 305, Volatile Organics Analysis in soil.

SAMPLE RECEIPT AND PRESERVATION

No issues related to shipping and preservation were encountered with these samples.

QA/QC AND ANALYTICAL COMMENTS

The following comments appear on the Summary of Analytical Results:

A The following initial calibration analytes exceeded QC limits. The reported values for the compound in samples and associated method blanks should be considered as estimates and "J" flagged in the summary of results spreadsheet.

Instrument	Date	Analyte	Filename	Criteria	QC Limit	Result
HP5973H	08/29/02	Bromomethane	ISH0829	%RSD	20.5 %	23.2 %
HP5973H	08/29/02	Acetone	ISH0829	%RSD	20.5 %	37.9 %

B The following LCS exceeded QC limits. Since the recovery is biased low, the reported values for the compound in samples should be considered as estimates and "J" flagged in the summary of results spreadsheet.

LCS File ID	Date	Analyte	% Rec	QC Limit
LSH0829A	08/29/02	Dichlorodifluoromethane	50	60 - 140

C All surrogate recoveries were within QC limits except the following:

Sample ID	Laboratory Sample ID	Surrogate	Percent Recovery	QC Limit Percent Recovery
MW1-S-5-1	AB36548	Bromofluorobenzene	85	86 - 115

The sample was re-analyzed. Similar results were obtained for the re-analysis. Since the compound listed above is associated with internal standard, chlorobenzene-d5, the quantitation limits of all analytes associated with this internal standard should be estimated and "J" flagged in the summary of result spreadsheet.

D All soil samples were not analyzed or preserved within forty eight (48) hour holding time. The reported values for all analytes are estimated and "J" flagged in the summary of results spreadsheet.

Sample ID	Laboratory Sample ID	Date/time Collected	Date/time Analyzed	Holding Time (Hrs)	Elapsed Hours	Hours Beyond
MW2-S-5-1	AB36547	08/27/02 7:30am	08/29/02 8:57pm	48	61	13
MW1-S-5-1	AB36548	08/27/02 8:34am	08/29/02 8:28pm	48	60	12
MW3-S-5-1	AB36549	08/27/02 9:35am	08/29/02 10:10am	48	49	1
MW3-S-5-2	AB36550	08/27/02 9:40am	08/29/02 9:56pm	48	60	12

E The following continuing calibration analytes exceeded QC limits. The reported values for the compound in samples and associated method blanks should be considered as estimates and "J" flagged in the summary of results spreadsheet.

Instrument	Date	Analyte	Filename	Criteria	QC Limit	Result
HP5973H	08/30/02	Dichlorodifluoromethane	CWH0827	%D	30 %	-33 %

No target analytes were detected in the method blanks associated with these samples.

The accuracy and precision of the MS/MSD (QC Samples: MW2-S-5-1, AB36547) were within QC limits. Since there are not sufficient sample for MSD run. The sample (MW3-S-5-2, AB36550) was chosen based on similar matrix and analyzed for MSD result.

All internal standard areas and retention times were within QC limits.

RESULTS SUMMARY

The results can be found on the Summary of Results report.

Any questions in reference to this data package may be addressed to Ziyad Rajabi at (510) 412-2390.

Glossary

Method Blanks
A laboratory method blank is laboratory reagent water or sand with all reagents, surrogates, and internal standards added and carried through the same sample preparation and analytical procedures as the field samples. The laboratory method blank is used to determine the level of contamination introduced by the laboratory during analysis.

Storage Blanks
A storage blank is laboratory reagent water that is stored in the laboratory refrigerator for one week. All reagents, surrogates, and internal standards are added at the time of analysis and it is processed through the same sample preparation and analytical procedures as the other blanks. The storage blank is used to determine the level of contamination introduced by the laboratory during sample storage.

Surrogates
Surrogates are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. All samples are spiked with surrogate compounds prior to analysis. Surrogate percent recovery (%R) provides information about both the laboratory performance on individual samples and the possible effects of the sample matrix on the analytical results.

Matrix Spike and Spike Duplicate Analysis
Matrix spike sample and spike duplicate analyses provide information about the effect of the sample matrix on sample preparation and measurement. Poor percent recovery (%R) results and large relative percent difference (RPD) between duplicates may indicate inconsistent laboratory technique, sample nonhomogeneity in soils, or matrix effects which may interfere with analysis.

Internal Standards
Internal standards are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but not normally found in environmental samples.All samples are spiked with internal standard compounds prior to analysis.Internal standard recoveries and retention times provide information about both the instrument performance on individual samples and the possible effects of the sample matrix on the analytical results.

Laboratory Control Samples
Laboratory control samples (LCSs) are analyzed daily to demonstrate comparability of the continuing calibration standard. It is equivalent to the continuing calibration standard, but it is obtained from an independent source.

ANALYTICAL COMMENTS

Example calculation using data for benzene obtained for sample (MW2-S-5-1MS, AB36547MS), date file (02H1546.D) analyzed on 08/30/02:

$$\text{Conc. } (\mu g/Kg) = A_x * AMT_{IS} / (A_{IS} * RRF * W * D)$$
$$= 701867 * 250 \text{ ng} / (385655 * 1.852 * 4.85 * 0.92)$$
$$= 55.06 \ \mu g/kg \approx 60 \ \mu g/kg$$

where:
A_x = area of the characteristic ion of the compound
AMT_{IS} = amount of internal standard in ng (250 ng)
D = dry weight factor ((100 - %Moisture)/100)
W = weight of sample in grams
A_{IS} = area of the characteristic ion of the associated internal standard
RRF = analyte's relative response factor from

Instrument Calibration:

The initial calibration demonstrates that the instrument is capable of meeting the minimum relative response factors (RRFs) and has a linear calibration curve.

All analytes in the initial calibrations were within QC limits except as that sated in comment A.

The continuing calibration checks the instrument performance daily and produces the relative response factors (RRFs) for target analytes that are used for quantitation.

All analytes in the continuing calibration were within QC limits except as that stated in comment E.

The quantitation limit standard is used to demonstrate low level quantitation performance for the following five analytes: (1) vinyl chloride, (2) carbon tetrachloride, (3) 1,2-dichloroethane, (4) cis-1,3-dichloropropene, and (5) trans-1,3-dichloropropene, in accordance with SOP requirements. This requirement is necessary to support the 0.5 µg/L quantitation limit for these analytes.

All low-level verification compounds and other analytes met QC specifications (50 - 150%) except as noted in comment B.

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02240A
Date: 9/26/02
Analysis: 8260B
Matrix: SOIL

Sample No.	MW1-S-5-1			MW2-S-5-1			MW3-S-5-1			MW3-S-5-2		
Lab Sample ID	AB36548			AB36547			AB36549			AB36550		
Date of Collection	8/27/02			8/27/02			8/27/02			8/27/02		
Units	ug/Kg			ug/Kg			ug/Kg			ug/Kg		
Analyte	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt
Dichlorodifluoromethane	10	UJ	BD	10	UJ	BD	10	UJ	DE	10	UJ	BD
Chloromethane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Vinyl chloride	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Bromomethane	10	UJ	AD	10	UJ	AD	10	UJ	AD	10	UJ	AD
Chloroethane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Trichlorofluoromethane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
1,1-Dichloroethene	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Acetone	10	UJ	AD	10	UJ	AD	10	UJ	AD	10	UJ	AD
Carbon disulfide	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Dichloromethane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Methyl t-butyl ether (MTBE)	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
trans-1,2-Dichloroethene	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
1,1-Dichloroethane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Ethyl-t-butyl ether	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
cis-1,2-Dichloroethene	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
2-Butanone	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Chloroform	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
1,2-Dichloroethane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Tert-amyl-methyl ether	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
1,1,1-Trichloroethane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Carbon tetrachloride	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Benzene	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Trichloroethene	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
1,2-Dichloropropane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Bromodichloromethane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
cis-1,3-Dichloropropene	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
trans-1,3-Dichloropropene	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
1,1,2-Trichloroethane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
Dibromochloromethane	10	UJ	D	10	UJ	D	10	UJ	D	10	UJ	D
4-Methyl-2-pentanone	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D
Toluene	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D
Tetrachloroethene	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D
1,3-Dichloropropane	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D
2-Hexanone	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

SUMMARY OF ANALYTICAL RESULTS

Case: R02S80
Site: Belavstegui Park
SDG: 02240A
Date: 9/26/02
Analysis: 8260B
Matrix: SOIL

Sample No.	MW1-S-5-1			MW2-S-5-1			MW3-S-5-1			MW3-S-5-2					
Lab Sample ID	AB36548			AB36547			AB36549			AB36550					
Date of Collection	8/27/02			8/27/02			8/27/02			8/27/02					
Units	ug/Kg			ug/Kg			ug/Kg			ug/Kg					
Analyte	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt	Result	Q	Cmt			
1,2-Dibromoethane (EDB)	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
Chlorobenzene	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
Ethylbenzene	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
m,p-Xylene	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
o-Xylene	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
Styrene	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
Bromoform	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
1,1,2,2-Tetrachloroethane	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
1,2,3-Trichloropropane	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
1,3-Dichlorobenzene	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
1,4-Dichlorobenzene	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
1,2-Dichlorobenzene	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			
1,2-Dibromo-3-chloropropane	10	UJ	CD	10	UJ	D	10	UJ	D	10	UJ	D			

Cmt:Refer to corresponding section in the report narrative for each letter
N/A:Not Applicable
N/R:Not Reported
U:Parameter was analyzed, not detected. Value is quant. limit, adjusted for dilution, if any
J:Estimated

KLEINFELDER 02 R2E

PROJECT NO.	PROJECT NAME	NO. OF CON-TAINERS	TYPE OF CON-TAINERS	ANALYSIS: TPH (8015B)	ANALYSIS: VOC (8260B)	RECEIVING LAB: EPA REGION 9 LABORATORY
15562.01	BELAUSTEGUI PARK					INSTRUCTIONS/REMARKS
L.P. NO. (P.O. NO.)	SAMPLERS: (Signature/Number)					

	DATE MM/DD/YY	SAMPLE I.D. TIME HH-MM-SS	SAMPLE I.D.	MATRIX	NO. OF CON-TAINERS	TYPE OF CON-TAINERS	TPH (8015B)	VOC (8260B)
1	9/3/02	1415	MW1-GW-1	WATER	8		X	X
2	9/3/02	1335	MW2-GW-1	WATER	8		X	X
3	9/3/02	1457	MW3-GW-1	WATER	8		X	X
4	9/3/02	1457	MW3-GW-2	WATER	5		X	X
5	9/3/02	1517	FB-W-1	WATER	8		X	X
6								
7								
8								
9								
10								
11								
12								
13			TPH_E AND TPH_G FOR ALL SAMPLES					
14								
15								
16			CUST SEALS INTACT					
17			RECD @ 6°C					
18								
19								
20								

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To JOSH FORTMAN	From FRED C.
Co./Dept.	Co. EPA
Phone #	Phone # 510 412 2323
Fax # 775 689 7810	Fax # 510 412 2304

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	9/4/02 1426	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
	9/5/02 1056	

Instructions/Remarks:

CASE # R02580

3 COOLERS

Send Results To:

KLEINFELDER
3189 MILL STREET
RENO, NV 89502
(702) 323-7182

Attn:

M-60 White – Sampler Car Return Copy To Shipper Pink – Lab Copy

CHAIN OF CUSTODY

№ 1082

KLEINFELDER

02082801

PROJECT NO.	PROJECT NAME
15562.01	BELAUSTEGUI PARK

L.P. NO. (P.O. NO.) | SAMPLERS: (Signature/Number)

RECEIVING LAB: EPA REGION 9 LABORATORY

INSTRUCTIONS/REMARKS: CHAIN 1 OF 2

	DATE MM/DD/YY	SAMPLE I.D. TIME HH-MM-SS	SAMPLE I.D.	MATRIX	NO. OF CON-TAINERS	TYPE OF CON-TAINERS	ANALYSIS: TPH (8015 B)	TOTAL Pb (7000)	TCLP Pb (1311)
1	8/27/02	0730	MW2-S-5-1	SOIL	1		X		
2	8/27/02	0834	MW1-S-5-1	SOIL	1		X		
3	8/27/02	0935	MW3-S-5-1	SOIL	1		X		
4	8/27/02	0935	MW3-S-5-2	SOIL	1		X		
5	8/27/02	1501	B3-S-1-1	SOIL	1			X	X
6	8/27/02	1501	B3-S-1-2	SOIL	1			X	X
7	8/27/02	1850	B3-S-5-3	SOIL	1			X	X
8	8/26/02	1731	B2-S-1-1	SOIL	1			X	X
9	8/26/02	1731	B2-S-1-2	SOIL	1			X	X
10	8/26/02	1745	B2-S-4-3	SOIL	1			X	X
11	8/28/02	0732	B4-S-3-1	SOIL	1			X	X
12	8/28/02	0755	B4-S-4-2	SOIL	1			X	X
13	8/28/02	0755	B5-S-3-1	SOIL	1			X	X
14	8/28/02	0805 diff	B5-S-4-3	SOIL	1			X	X
15	8/26/02	1550	B1-S-2-1	SOIL	1			X	X
16	8/26/02	1556	B1-S-5-2	SOIL	1			X	X
17	8/28/02	0825	B6-S-2-1	SOIL	1			X	X
18	8/28/02	0830	B6-S-4-2	SOIL	1			X	X
19	8/28/02	0850	B7-S-3-1	SOIL	1			X	X
20	8/28/02	0900	B7-S-5-2	SOIL	1			X	X

LOGIN FILE 02082801

02240A

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	8/29/02 1510	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
		8/30/02 9:50

Instructions/Remarks:
CASE # R02580
CUS. SEALS INTACT
REC'D @ 3°C

Send Results To:
KLEINFELDER
3189 MILL STREET
RENO, NV 89502
(702) 323-7182
Attn:

M-60 White – Sampler Canary – Return Copy To Shipper Pink – Lab Copy

CHAIN OF CUSTODY

№ ..80

KLEINFELDER

PROJECT NO.	PROJECT NAME	RECEIVING LAB:
15562.01	BELANSTEGNI PARK	EPA REGION 9 LABORATORY
L.P. NO. (P.O. NO.)	SAMPLERS: (Signature/Number)	INSTRUCTIONS/REMARKS: CHAIN 2 OF 2

	DATE MM/DD/YY	SAMPLE I.D. TIME HH-MM-SS	SAMPLE I.D.	MATRIX	NO. OF CONTAINERS	TYPE OF CONTAINERS	ANALYSIS: TOTAL Ba (700)	TCLP Ba (1311)	TPH (8015B)	VOC (8260B)
1	8/28/02	0920	BB-S-2-1	SOIL	1		X	X		
2	8/28/02	0925	BB-S-3-2	SOIL	1		X	X		
3	8/28/02	0940	B9-S-0-1	SOIL	1		X	X		
4	8/28/02	0946	B9-S-3-2	SOIL	1		X	X		
5	8/28/02	0958	B10-S-1-1	SOIL	1		X	X		
6	8/28/02	1000	B10-S-2-2	SOIL	1		X	X		
7	~~8/26/02~~	~~RB-W-1~~								
8	8/26/02	1402	RB-W-1	WATER	1		X			
9	8/27/02	0905	RB-W-2	WATER	8			X	X	X
10	8/28/02	0835	RB-W-3	WATER	1		X			
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

02242A

VIALS MARKED ~~RBW-3 NOT~~ PER JOSH, & CHANGE LABELS

* RECD @ 5°C

02242B

02242 C/D = TC LEACHATE

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Josh	8/29/02 1510	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)

Instructions/Remarks:

CASE # R02580
CUST SEALS INTACT *
REC'D @ 3°C
8/30/02 9:50

Send Results To:

KLEINFELDER
3189 MILL STREET
RENO, NV 89502
(702) 323-7182

Attn:

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

CHAIN OF CUSTODY

No. 81

KLEINFELDER

02003401

PROJECT NO.	PROJECT NAME	NO. OF CONTAINERS	TYPE OF CONTAINERS	ANALYSIS 8260B
25562.01	BELAIRE-AZURE PARK			

RECEIVING LAB: US EPA Region 9 Laboratory

L.P. NO. (P.O. NO.):

SAMPLERS: (Signature/Number):

INSTRUCTIONS/REMARKS: SW8260A METHOD SAMPLES COLLECTED IN NV

	DATE MM/DD/YY	SAMPLE I.D. TIME HH-MM-SS	SAMPLE I.D.	MATRIX	NO. OF CONTAINERS	TYPE OF CONTAINERS	ANALYSIS 8260B
1	8/27/02	0730	MW2-S-5-1	SOIL	3	ENCORE	X
2	8/27/02	0834	MW1-S-5-1	SOIL	3	ENCORE	X
3	8/27/02	0935	MW3-S-5-1	SOIL	3	ENCORE	X
4	8/27/02	0940	MW3-S-5-2	SOIL	3	ENCORE	X
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	8/27/02 1415	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
	8/28/02 10:20	

Instructions/Remarks:

CASE #: R02580

SAMPLES RECD @ 1°C, SEALS INTACT LAB 8/28/02

Send Results To:

KLEINFELDER
3189 MILL STREET
RENO, NV 89502
(702) 323-7182

Attn:

M-60 White – Sampler Car Return Copy To Shipper Pink – Lab Copy

CHAIN OF CUSTODY

№ 1578

USEPA REGION 9 LABORATORY
REPORT NARRATIVE

CASE NUMBER: R02S80
SAMPLE DELIVERY GROUP: 02242A
PROGRAM: SUPERFUND
DOCUMENT CONTROL #: B0101126-1960
DATE: 09/26/02
ANALYSIS: METALS
SAMPLE NUMBERS:

SAMPLE ID	LABORATORY SAMPLE ID
B8-S-2-1	AB36599
B8-S-3-2	AB36600
B9-S-0-1	AB36601
B9-S-3-2	AB36602
B10-S-1-1	AB36603
B10-S-2-2	AB36604

GENERAL COMMENTS

Six soil samples were received from the Belavstegui Park Superfund project on 08/30/02.

All samples were analyzed for barium following method based on EPA Method 6010. All samples were analyzed within the required 180-day holding time. Results are reported in mg/Kg dry weight.

SAMPLE RECEIPT AND PRESERVATION

No shipping or preservation issues were encountered with these samples.

QC COMMENTS

No barium was detected in the LRB associated with this sample delivery group.

The LFM and LFM duplicate recoveries were within the 70-130% QC limits.

The relative percent difference (RPD) between the LFM and LFM duplicate for barium was within the 20 % QC limit.

The barium LFB recovery was within the 85-115% QC limits.

Questions concerning the data can be answered by Osell Salvador at (510) 412-2358.

GLOSSARY

Laboratory Reagent Blanks (LRB)
A laboratory reagent blank is laboratory reagent water or baked sand with all reagents added and carried through the same sample preparation and analytical procedures as the field samples. The laboratory reagent blank is used to determine the level of contamination introduced by the laboratory during analysis.

Laboratory Fortified Matrix (LFM) and Laboratory Fortified Matrix Duplicate (LFMD) Analysis
Laboratory fortified matrix and laboratory fortified matrix duplicate analyses provide information about the effect of the sample matrix on sample preparation and measurement. Poor percent recovery (%R) results and large relative percent difference (RPD) between duplicates may indicate inconsistent laboratory technique, sample nonhomogeneity in soils, or matrix effects which may interfere with analysis.

Laboratory Fortified Blank (LFB) Analysis
The laboratory fortified blank sample is laboratory reagent water or baked sand with a known concentration of the analytes of interest added by the laboratory with all reagents added and carried through the same sample preparation and analytical procedures as the field samples. Poor percent recovery (%R) results may indicate inconsistent laboratory technique.

Additional Comments: R02S80, SDG 02242A, Barium

ICP Calculation:

$$\text{Conc. (mg/Kg)} = \frac{\text{(ICP reading in mg/L) x (final volume of 0.2 L) x (dilution factor, if any)}}{\text{(weight in grams) x (1 Kg / 1000 grams) x (\% solids / 100)}}$$

USEPA REGION 9 LABORATORY
REPORT NARRATIVE

CASE NUMBER: R02S80
SAMPLE DELIVERY GROUP: 02240A
PROGRAM: SUPERFUND
DOCUMENT CONTROL #: B0101126-1958
DATE: 09/26/02
ANALYSIS: METALS
SAMPLE NUMBERS:

SAMPLE ID	LABORATORY SAMPLE ID
B3-S-1-1	AB36583
B3-S-1-2	AB36584
B3-S-5-3	AB36585
B2-S-1-1	AB36586
B2-S-1-2	AB36587
B2-S-4-3	AB36588
B4-S-3-1	AB36589
B4-S-4-2	AB36590
B5-S-3-1	AB36591
B5-S-4-3	AB36592
B1-S-2-1	AB36593
B1-S-5-2	AB36594
B6-S-2-1	AB36595
B6-S-4-2	AB36596
B7-S-3-1	AB36597
B7-S-5-2	AB36598

GENERAL COMMENTS

Sixteen soil samples were received from the Belavstegui Park Superfund project on 08/30/02.

All samples were analyzed for barium following method based on EPA Method 6010. All samples were analyzed within the required 180-day holding time. Results are reported in mg/Kg dry weight.

SAMPLE RECEIPT AND PRESERVATION

No shipping or preservation issues were encountered with these samples.

QC COMMENTS

No barium was detected in the LRB associated with this sample delivery group.

The LFM and LFM duplicate recoveries were within the 70-130% QC limits.

The relative percent difference (RPD) between the LFM and LFM duplicate for barium was within the 20% QC limit.

The barium LFB recovery was within the 85-115% QC limits.

Questions concerning the data can be answered by Osell Salvador at (510) 412-2358.

GLOSSARY

Laboratory Reagent Blanks (LRB)
A laboratory reagent blank is laboratory reagent water or baked sand with all reagents added and carried through the same sample preparation and analytical procedures as the field samples. The laboratory reagent blank is used to determine the level of contamination introduced by the laboratory during analysis.

Laboratory Fortified Matrix (LFM) and Laboratory Fortified Matrix Duplicate (LFMD) Analysis
Laboratory fortified matrix and laboratory fortified matrix duplicate analyses provide information about the effect of the sample matrix on sample preparation and measurement. Poor percent recovery (%R) results and large relative percent difference (RPD) between duplicates may indicate inconsistent laboratory technique, sample nonhomogeneity in soils, or matrix effects which may interfere with analysis.

Laboratory Fortified Blank (LFB) Analysis
The laboratory fortified blank sample is laboratory reagent water or baked sand with a known concentration of the analytes of interest added by the laboratory with all reagents added and carried through the same sample preparation and analytical procedures as the field samples. Poor percent recovery (%R) results may indicate inconsistent laboratory technique.

Additional Comments: R02S80, SDG 02240A, Barium

ICP Calculation:

$$\text{Conc. (mg/Kg)} = \frac{\text{(ICP reading in mg/L) x (final volume of 0.2 L) x (dilution factor, if any)}}{\text{(weight in grams) x (1 Kg / 1000 grams) x (\% solids / 100)}}$$

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02240A
Date: 09/26/02
Analysis: Metals
Matrix: Soil

Sample No.			B3-S-1-1			B3-S-1-2			B3-S-5-3			B2-S-1-1			B2-S-1-2		
Lab Sample I.D.			AB36583			AB36584			AB36585			AB36586			AB36587		
Collection Date			8/27/02			8/27/02			8/27/02			8/26/02			8/26/02		
Units			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com
Barium	7440-39-3	6010B	1500			540			480			4800			3100		
Solids, %	7732-18-5		90%			92%			85%			92%			95%		

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

EPA Regional Laboratory Richmond, CA
SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02240A
Date: 09/26/02
Analysis: Metals
Matrix: Soil

Sample No.			B2-S-4-3			B4-S-3-1			B4-S-4-2			B5-S-3-1			B5-S-4-3		
Lab Sample I.D.			AB36588			AB36589			AB36590			AB36591			AB36592		
Collection Date			8/26/02			8/28/02			8/28/02			8/28/02			8/28/02		
Units			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com
Barium	7440-39-3	6010B	220			870			170			180			100		
Solids, %	7732-18-5		88%			93%			93%			90%			93%		

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02240A
Date: 09/26/02
Analysis: Metals
Matrix: Soil

Sample No.			B1-S-2-1			B1-S-5-2			B6-S-2-1			B6-S-4-2			B7-S-3-1		
Lab Sample I.D.			AB36593			AB36594			AB36595			AB36596			AB36597		
Collection Date			8/26/02			8/26/02			8/28/02			8/28/02			8/28/02		
Units			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com
Barium	7440-39-3	6010B	200			3200			120			160			130		
Solids, %	7732-18-5		88%			87%			95%			90%			94%		

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02240A
Date: 09/26/02
Analysis: Metals
Matrix: Soil

Sample No.			B7-S-5-2			LRB			Method QL
Lab Sample I.D.			AB36598			Reagent Blank			
Collection Date			8/28/02						
Units			mg/kg			mg/kg			mg/kg
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	QL
Barium	7440-39-3	6010B	80			10 U			10
Solids, %	7732-18-5		91%			100%			

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

Regional Laboratory, Richmond, CA

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02242A
Date: 09/26/02
Analysis: Metals
Matrix: Soil

Sample No.			B8-S-2-1			B8-S-3-2			B9-S-0-1			B9-S-3-2			B10-S-1-1		
Lab Sample I.D.			AB36599			AB36600			AB36601			AB36602			AB36603		
Collection Date			8/28/02			8/28/02			8/28/02			8/28/02			8/28/02		
Units			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com
Barium	7440-39-3	6010B	150			160			6900			190			2000		
Solids, %	7732-18-5		94%			94%			94%			85%			97%		

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02242A
Date: 09/26/02
Analysis: Metals
Matrix: Soil

Sample No.			B10-S-2-2			LRB			Method QL
Lab Sample I.D.			AB36604			Reagent Blank			
Collection Date			8/28/02						
Units			mg/kg			mg/kg			mg/kg
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	QL
Barium	7440-39-3	6010B	1900			10 U			10
Solids, %	7732-18-5		92%			100%			N/A

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

USEPA REGION 9 LABORATORY
REPORT NARRATIVE

CASE NUMBER: R02S80
SAMPLE DELIVERY GROUP: 02242C / 02242D
PROGRAM: SUPERFUND
DOCUMENT CONTROL #: B0101126-1957
DATE: 09/26/02
ANALYSIS: METALS
SAMPLE NUMBERS:

SAMPLE ID	LABORATORY SAMPLE ID
B3-S-1-1 TC	AB36608
B3-S-1-2 TC	AB36609
B3-S-5-3 TC	AB36610
B2-S-1-1 TC	AB36611
B2-S-1-2 TC	AB36612
B2-S-4-3 TC	AB36613
B4-S-3-1 TC	AB36614
B4-S-4-2 TC	AB36615
B5-S-3-1 TC	AB36616
B5-S-4-3 TC	AB36617
B1-S-2-1 TC	AB36618
B1-S-5-2 TC	AB36619
B6-S-2-1 TC	AB36620
B6-S-4-2 TC	AB36621
B7-S-3-1 TC	AB36622
B7-S-5-2 TC	AB36623
B8-S-2-1 TC	AB36624
B8-S-3-2 TC	AB36625
B9-S-0-1 TC	AB36626
B9-S-3-2 TC	AB36627
B10-S-1-1 TC	AB36628
B10-S-2-2 TC	AB36629

GENERAL COMMENTS

Twenty-two soil samples were received from the Belavstegui Park Superfund project on 08/30/02.

The requested analyses were toxicity characteristic leaching procedure (TCLP) sample extraction by EPA Method 1311 followed by RCRA barium analyses by Region 9 Laboratory SOP #505 (EPA Method 200.7). Samples were extracted within the required 28-day holding time and were analyzed within the required 180-day holding time.

SAMPLE RECEIPT AND PRESERVATION

No shipping or preservation issues were encountered with these samples.

TCLP EXTRACTION COMMENTS

Examination of all samples showed no obvious liquid fraction and that the samples were considered 100% solid. Samples AB36608, AB36609, AB36611, AB36614, AB36615, AB36617, AB36620, AB36621, AB36622, AB36623, AB36624, AB36625, AB36626, AB36628 and AB36629 were extracted with extraction fluid #1. Samples AB36610, AB36612, AB36613, AB36616, AB36618, AB36619 and AB36627 were extracted with extraction fluid #2.

QC COMMENTS

The following comment appears on the Summary of Analytical Results:

1. All detected results less than the quantitation limit (QL) are estimated (J).

Barium is a common contaminant in the filter. The barium QL has been raised to 4 mg/L.

No analytes were detected in the LRBs associated with this sample delivery group.

All LFM and LFM duplicate recoveries were within the 70-130% QC limits.

The relative percent differences (RPDs) between the LFM and LFM duplicate for barium were within the 20 % QC limit.

The RPDs between the sample and sample duplicate for barium were within the 20% QC limit.

All LFB recoveries were within the 85-115% QC limits.

Questions concerning the data can be answered by Osell Salvador at (510) 412-2358.

GLOSSARY

Laboratory Reagent Blanks (LRB)
A laboratory reagent blank is laboratory reagent water or baked sand with all reagents added and carried through the same sample preparation and analytical procedures as the field samples. The laboratory reagent blank is used to determine the level of contamination introduced by the laboratory during analysis.

Laboratory Fortified Matrix (LFM) and Laboratory Fortified Matrix Duplicate (LFMD) Analysis
Laboratory fortified matrix and laboratory fortified matrix duplicate analyses provide information about the effect of the sample matrix on sample preparation and measurement. Poor percent recovery (%R) results and large relative percent difference (RPD) between duplicates may indicate inconsistent laboratory technique, sample nonhomogeneity in soils, or matrix effects which may interfere with analysis.

Laboratory Fortified Blank (LFB) Analysis
The laboratory fortified blank sample is laboratory reagent water or baked sand with a known concentration of the analytes of interest added by the laboratory with all reagents added and carried through the same sample preparation and analytical procedures as the field samples. Poor percent recovery (%R) results may indicate inconsistent laboratory technique.

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SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02242C / 02242D
Date: 09/26/02
Analysis: Metals
Matrix: TC Leachate

Sample No. / Lab Sample I.D. / Collection Date / Units			B3-S-1-1 TC AB36608 8/27/02 mg/L			B3-S-1-2 TC AB36609 8/27/02 mg/L			B3-S-5-3 TC AB36610 8/27/02 mg/L			B2-S-1-1 TC AB36611 8/26/02 mg/L			B2-S-1-2 TC AB36612 8/26/02 mg/L		
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com
Barium	7440-39-3	200.7	4 U			4 U			4 U			2	J	A	2	J	A

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

Regic abora Rich , CA

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02242C / 02242D
Date: 09/26/02
Analysis: Metals
Matrix: TC Leachate

Sample No.			B2-S-4-3 TC			B4-S-3-1 TC			B4-S-4-2 TC			B5-S-3-1 TC			B5-S-4-3 TC		
Lab Sample I.D.			AB36613			AB36614			AB36615			AB36616			AB36617		
Collection Date			8/26/02			8/28/02			8/28/02			8/28/02			8/28/02		
Units			mg/L			mg/L			mg/L			mg/L			mg/L		
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com
Barium	7440-39-3	200.7	4 U			4 U			4 U			4 U			4 U		

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02242C / 02242D
Date: 09/26/02
Analysis: Metals
Matrix: TC Leachate

Sample No.			B1-S-2-1 TC			B1-S-5-2 TC			B6-S-2-1 TC			B6-S-4-2 TC			B7-S-3-1 TC		
Lab Sample I.D.			AB36618			AB36619			AB36620			AB36621			AB36622		
Collection Date			8/26/02			8/26/02			8/28/02			8/28/02			8/28/02		
Units			mg/L			mg/L			mg/L			mg/L			mg/L		
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com
Barium	7440-39-3	200.7	2	J	A	4 U			4 U			4 U			4 U		

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

Regi... abora... Rich..., CA

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02242C / 02242D
Date: 09/26/02
Analysis: Metals
Matrix: TC Leachate

Sample No. / Lab Sample I.D. / Collection Date / Units			B7-S-5-2 TC AB36623 8/28/02 mg/L			B8-S-2-1 TC AB36624 8/28/02 mg/L			B8-S-3-2 TC AB36625 8/28/02 mg/L			B9-S-0-1 TC AB36626 8/28/02 mg/L			B9-S-3-2 TC AB36627 8/28/02 mg/L		
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com
Barium	7440-39-3	200.7	4 U			4 U			4 U			2	J	A	4 U		

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

tegio bora Richr , CA

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02242C/02242D
Date: 09/26/02
Analysis: Metals
Matrix: TC Leachate

Sample No.			B10-S-1-1 TC			B10-S-2-2 TC			LRB			Extract Blank 1			Extract Blank 2		
Lab Sample I.D.			AB36628			AB36629			Reagent Blank			Fluid #1			Fluid #2		
Collection Date			8/28/02			8/28/02											
Units			mg/L			mg/L			mg/L			mg/L			mg/L		
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com	Result	Q	Com
Barium	7440-39-3	200.7	4 U			4 U			4 U			4 U			4 U		

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

EPA Region 9 Laboratory - Richmond, CA
SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02242C/02242D
Date: 09/26/02
Analysis: Metals
Matrix: TC Leachate

Sample No. Lab Sample I.D. Collection Date Units			Extract Blank 3 Fluid #1 mg/L			Method QL mg/L	RCRA Limit mg/L
Analyte	CAS #	EPA Method	Result	Q	Com	QL	QL
Barium	7440-39-3	200.7	4 U			4	100

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02242C / 02242D
Date: 09/26/02
Analysis: Metals
Matrix: TC Leachate

Sample No. Lab Sample I.D. Collection Date Units			LRB Reagent Blank mg/L				Method QL mg/L
Analyte	CAS #	EPA Method	Result		Q	Com	QL
Barium	7440-39-3	200.7	4	U			4

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

USEPA REGION 9 LABORATORY
REPORT NARRATIVE

CASE NUMBER: R02S80
SAMPLE DELIVERY GROUP: 02242B
PROGRAM: SUPERFUND
DOCUMENT CONTROL #: B0101126-1953
DATE: 09/25/02
ANALYSIS: METALS
SAMPLE NUMBERS:

SAMPLE ID	LABORATORY SAMPLE ID
RB-W-1	AB36605
RB-W-3	AB36607

GENERAL COMMENTS

Two water samples were received from the Belavstegui Park Superfund project on 08/30/02.

The samples were analyzed for barium using Region 9 Laboratory SOP #505 (EPA Method 200.7). Both samples were analyzed within the 180-day holding time.

SAMPLE RECEIPT AND PRESERVATION

No shipping or preservation issues were encountered with these samples.

QC COMMENTS

No barium was detected in the LRB associated with this sample delivery group.

The LFM and LFM duplicate recoveries were within the 70-130% QC limits.

The RPD between the LFM and LFM duplicate was within the 20% QC limit.

The LFB recovery was within the 85-115% QC limits.

Questions concerning the data can be answered by Osell Salvador at (510) 412-2358.

GLOSSARY

Laboratory Reagent Blanks (LRB)
A laboratory reagent blank is laboratory reagent water or baked sand with all reagents added and carried through the same sample preparation and analytical procedures as the field samples. The laboratory reagent blank is used to determine the level of contamination introduced by the laboratory during analysis.

Laboratory Fortified Matrix (LFM) and Laboratory Fortified Matrix Duplicate (LFMD) Analysis
Laboratory fortified matrix and laboratory fortified matrix duplicate analyses provide information about the effect of the sample matrix on sample preparation and measurement. Poor percent recovery (%R) results and large relative percent difference (RPD) between duplicates may indicate inconsistent laboratory technique, sample nonhomogeneity in soils, or matrix effects which may interfere with analysis.

Laboratory Fortified Blank (LFB) Analysis
The laboratory fortified blank sample is laboratory reagent water or baked sand with a known concentration of the analytes of interest added by the laboratory with all reagents added and carried through the same sample preparation and analytical procedures as the field samples. Poor percent recovery (%R) results may indicate inconsistent laboratory technique.

SUMMARY OF ANALYTICAL RESULTS

Site: Belavstegui Park
Case: R02S80
SDG: 02242B
Date: 09/25/02
Analysis: Metals
Matrix: Water

Sample No. / Lab Sample I.D. / Collection Date / Units			RB-W-1 AB36605 8/26/02 ug/L			RB-W-3 AB36607 8/28/02 ug/L			LRB Reagent Blank ug/L			Method QL ug/L
Analyte	CAS #	EPA Method	Result	Q	Com	Result	Q	Com	Result	Q	Com	QL
Barium	7440-39-3	200.7	40			20			10 U			10

Com - Comments refer to the corresponding section in the report narrative for each letter.

N/A - Not Applicable.

N/R - Not Required.

Q - Refer to data qualifiers.

U - Parameter analyzed, but not detected; associated value is quantitation limit, adjusted for dilution.

J - The associated value is an estimated quantity.

APPENDIX D

EPA Region 9 PRG Table

U.S. Environmental Protection Agency

Region 9: Superfund

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Preliminary Remediation Goals: What's New in 2002

October 1, 2002

The PRGs table contains over 600 preliminary remediation goals (PRGs) for contaminants in soil, air, and tap water. Region 9 PRGs are risk-based concentrations that are intended to assist risk assessors and others in initial screening-level evaluations of environmental measurements. As their name implies, Region 9 PRGs may also be viewed as preliminary cleanup goals for an individual chemical, but in this context, they are best viewed as dynamic and subject to change because they are generic and based on direct contact exposures which may not address site-specific conditions and/or indirect exposure pathways at sites (See Exhibit 1-1 in "Region 9 PRGs Table Users Guide/Technical Background Document").

Also for planning purposes, these human health based PRGs should always be considered in conjunction with ARAR-based PRGs (e.g. MCLs), ecological benchmarks, and "background" conditions before establishing a final cleanup level for a particular site.

We view risk-based PRGs as "evergreen". Ongoing changes to the PRGs reflect continuing improvements in our scientific knowledge base and state-of-the-art approaches to risk assessment. In the new Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (Supplemental SSL Guidance, EPA 2001a), two different soil ingestion rates are assumed for nonconstruction workers: 100 mg/day is assumed for outdoor workers whereas 50 mg/day is assumed for indoor workers. The default value of 100 mg/day for outdoor workers is also recommended by EPA's Technical Review Workgroup for Lead (TRW), and it reflects increased exposures to soils for outdoor workers relative to their indoor counterparts. For more on this, please see Section 4.1 of the "Region 9 PRGs Table Users Guide/Technical Background Document" or refer to the Supplemental SSL Guidance.

Because the Region 9 PRGs are generic and intended for screening sites early in the investigation process (often before site-specific information is available), we have chosen to use the 100 mg/day soil ingestion (i.e. outdoor worker) assumption to calculate industrial soil PRGs. Please note that previous issues of the Region 9 PRGs table assumed 50 mg/day soil ingestion rate for workers. This change in soil ingestion rates is reflected in a somewhat lower (more stringent) industrial soils PRG for many contaminants. The appropriateness of this assumption for a particular site may be evaluated when additional information becomes available regarding site conditions or site development. In addition to changes in exposure factor assumptions, several chemicals have new or revised toxicity values that results in changes to the PRG calculations.

To facilitate the user's review, chemicals with new and revised toxicological criteria are presented in bold in the 2002 table and also listed here for convenience: acetonitrile, benzyl chloride, boron, bromate, 1,3-butadiene, 1-butanol, butylbenzenes, cacodylic acid, cadmium (California State value), chloroform, chloronitrobenzenes, chrysene (California State value), cobalt, 1,2-dibromo-3-chloropropane (California State value), 1,1-dichloroethylene, diethylene glycol ethers, diethylformamide, dinitrobenzenes, di-n-octyl phthalate, diphenyl sulfone, ethylbenzene, HCH, hexachlorocyclopentadiene, kepone, lead (California State value), MTBE, 2-nitroaniline, carcinogenic PAHs, perchlorate, polychlorinated terphenyls, benzo(k)fluoranthene (California State value), propylbenzene, propylene glycol, quinoline, tetrachloroethylene, tetrahydrofuran, thiocyanate, 1,1,1-trichloroethane, trichloroethylene, 2,4,6-trichlorophenol, 1,2,3-trichloropropane, triphenylphosphine oxide, tris(2-chloroethyl) phosphate, vinyl chloride, and xylene.

Also in this update to the "Region 9 PRGs Table User's Guide/Technical Background Document", we have added a brief discussion of special case chemicals for which an alternate approach was applied in the derivation of the Region 9 PRGs (Section 2.3). Increasingly, chemical-specific approaches are being used that do not lend themselves to a single PRG model. Special case chemicals that are discussed include: cadmium, chromium 6, lead, manganese, nitrate/nitrite, thallium, and vinyl chloride.

Finally, it should be recognized by all that use the PRGs table that not all PRG values in the table are "created equal". For some chemicals, a robust data set exists upon which the toxicological criteria are based whereas for others, there may be relatively few studies that form the basis of the PRG calculation. Also, PRGs for some chemicals are based on withdrawn toxicity values or route extrapolated values. Withdrawn and route-extrapolated numbers are shown in the table because we still need to deal with these contaminants during the long delays before replacement numbers are ready. Please consult with your toxicologist or agency risk assessor to best address potential uncertainties associated with chemical-specific PRGs, especially if the chemical is a risk driver at your site.

As with any risk-based tool, there exists the potential for misuse. We try to highlight potential problems in Section 3.8. However, it should be noted that the use of PRGs at a particular site becomes the responsibility of the user. It is recommended that the user verify the numbers with an agency toxicologist or risk assessor because the toxicity / exposure information in the table may contain errors or default assumptions that need to be refined based on further evaluation. If you find an error please contact Stan Smucker via e-mail at smucker.stan@epa.gov.

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS h=HEAST n=NCEA x=Withdrawn o=Other EPA Source r=Route-extrapolation ca=Cancer PRG nc=Noncancer PRG ca* (where: nc < 100X ca) ca**(where: nc < 10X ca)
+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
8.7E-03	i	4.0E-03	i	8.7E-03	r	4.0E-03	r	0	0.10	30560-19-1	Acephate	5.6E+01	ca**	2.0E+02	ca*	7.7E-01	ca*	7.7E+00	ca*		
				7.7E-03	i	2.6E-03	i	1		75-07-0	Acetaldehyde	1.1E+01	ca**	2.3E+01	ca**	8.7E-01	ca*	1.7E+00	ca		
		2.0E-02	i			2.0E-02	r	0	0.10	34256-82-1	Acetochlor	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.0E-01	i			1.0E-01	r	1		67-64-1	Acetone	1.6E+03	nc	6.0E+03	nc	3.7E+02	nc	6.1E+02	nc	1.6E+01	8.0E-01
		8.0E-04	h			8.0E-04	r	0	0.10	75-86-5	Acetone cyanohydrin	4.9E+01	nc	4.9E+02	nc	2.9E+00	nc	2.9E+01	nc		
		1.7E-02	r			1.7E-02	i	1		75-05-8	Acetonitrile	4.2E+02	nc	1.8E+03	nc	6.2E+01	nc	1.0E+02	nc		
		2.0E-02	h			5.7E-06	i	1		107-02-8	Acrolein	1.0E-01	nc	3.4E-01	nc	2.1E-02	nc	4.2E-02	nc		
4.5E+00	i	2.0E-04	i	4.5E+00	i	2.0E-04	r	0	0.10	79-06-1	Acrylamide	1.1E-01	ca	3.8E-01	ca	1.5E-03	ca	1.5E-02	ca		
		5.0E-01	i			2.9E-04	i	0	0.10	79-10-7	Acrylic acid	2.9E+04	nc	1.0E+05	max	1.0E+00	nc	1.8E+04	nc		
5.4E-01	i	1.0E-03	h	2.4E-01	i	5.7E-04	i	1		107-13-1	Acrylonitrile	2.1E-01	ca*	4.9E-01	ca*	2.8E-02	ca*	3.9E-02	ca*		
8.1E-02	h	1.0E-02	i	8.0E-02	r	1.0E-02	r	0	0.10	15972-60-8	Alachlor	6.0E+00	ca	2.1E+01	ca	8.4E-02	ca	8.4E-01	ca		
		1.5E-01	i			1.5E-01	r	0	0.10	1596-84-5	Alar	9.2E+03	nc	9.2E+04	nc	5.5E+02	nc	5.5E+03	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	116-06-3	Aldicarb	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	1646-88-4	Aldicarb sulfone	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
1.7E+01	i	3.0E-05	i	1.7E+01	i	3.0E-05	r	0	0.10	309-00-2	Aldrin	2.9E-02	ca*	1.0E-01	ca	3.9E-04	ca	4.0E-03	ca	5.0E-01	2.0E-02
		2.5E-01	i			2.5E-01	r	0	0.10	74223-64-6	Ally	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	107-18-6	Allyl alcohol	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		5.0E-02	h			2.9E-04	i	0	0.10	107-05-1	Allyl chloride	3.0E+03	nc	3.0E+04	nc	1.0E+00	nc	1.8E+03	nc		
		1.0E+00	n			1.4E-03	n	0		7429-90-5	Aluminum	7.6E+04	nc	1.0E+05	max	5.1E+00	nc	3.6E+04	nc		
		4.0E-04	i					0		20859-73-8	Aluminum phosphide	3.1E+01	nc	4.1E+02	nc			1.5E+01	nc		
		3.0E-04	i			3.0E-04	r	0	0.10	67485-29-4	Amdro	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
		9.0E-03	i			9.0E-03	r	0	0.10	834-12-8	Ametryn	5.5E+02	nc	5.5E+03	nc	3.3E+01	nc	3.3E+02	nc		
		7.0E-02	h			7.0E-02	r	0	0.10	591-27-5	m-Aminophenol	4.3E+03	nc	4.3E+04	nc	2.6E+02	nc	2.6E+03	nc		
		2.0E-05	h			2.0E-05	r	0	0.10	504-24-5	4-Aminopyridine	1.2E+00	nc	1.2E+01	nc	7.3E-02	nc	7.3E-01	nc		
		2.5E-03	i			2.5E-03	r	0	0.10	33089-61-1	Amitraz	1.5E+02	nc	1.5E+03	nc	9.1E+00	nc	9.1E+01	nc		
						2.9E-02	i			7664-41-7	Ammonia					1.0E+02	nc				
		2.0E-01	i					0	0.10	7773-06-0	Ammonium sulfamate	1.2E+04	nc	1.0E+05	max			7.3E+03	nc		
5.7E-03	i	7.0E-03	n	5.7E-03	r	2.9E-04	i	0	0.10	62-53-3	Aniline	8.5E+01	ca**	3.0E+02	ca*	1.0E+00	nc	1.2E+01	ca*		
		4.0E-04	i					0		7440-36-0	Antimony and compounds	3.1E+01	nc	4.1E+02	nc			1.5E+01	nc	5.0E+00	3.0E-01
		5.0E-04	h					0		1314-60-9	Antimony pentoxide	3.9E+01	nc	5.1E+02	nc			1.8E+01	nc		
		9.0E-04	h					0		28300-74-5	Antimony potassium tartrate	7.0E+01	nc	9.2E+02	nc			3.3E+01	nc		
		4.0E-04	h					0		1332-81-6	Antimony tetroxide	3.1E+01	nc	4.1E+02	nc			1.5E+01	nc		
		4.0E-04	h			5.7E-05	i	0		1309-64-4	Antimony trioxide	3.1E+01	nc	4.1E+02	nc	2.1E-01	nc	1.5E+01	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	74115-24-5	Apollo	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
2.5E-02	i	5.0E-02	h	2.5E-02	i	5.0E-02	r	0	0.10	140-57-8	Aramite	1.9E+01	ca	6.9E+01	ca	2.7E-01	ca	2.7E+00	ca		
		3.0E-04	i					0	0.03	7440-38-2	Arsenic (noncancer endpoint)	2.2E+01	nc	2.6E+02	nc						

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, Inhalation i=IRIS h=HEAST n=NCEA x=Withdrawn o=Other EPA Source r=Route-extrapolation ca=Cancer PRG nc=Noncancer PRG ca* (where: nc < 100X ca) ca**(where: nc < 10X ca)
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SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
1.5E+00	i	3.0E-04	i	1.5E+01	i			0	0.03	7440-38-2	Arsenic (cancer endpoint)	3.9E-01	ca*	1.6E+00	ca	4.5E-04	ca	4.5E-02	ca	2.9E+01	1.0E+00
						1.4E-05	i	0		7784-42-1	Arsine (see arsenic for cancer endpoint)					5.2E-02	nc				
		9.0E-03	i			9.0E-03	r		0.10	76578-12-6	Assure	5.5E+02	nc	5.5E+03	nc	3.3E+01	nc	3.3E+02	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	3337-71-1	Asulam	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
2.2E-01	h	3.5E-02	h	2.2E-01	r	3.5E-02	r	0	0.10	1912-24-9	Atrazine	2.2E+00	ca	7.8E+00	ca	3.1E-02	ca	3.0E-01	ca		
		4.0E-04	i			4.0E-04	r	0	0.10	71751-41-2	Avermectin B1	2.4E+01	nc	2.5E+02	nc	1.5E+00	nc	1.5E+01	nc		
1.1E-01	i			1.1E-01	i			0	0.10	103-33-3	Azobenzene	4.4E+00	ca	1.6E+01	ca	6.2E-02	ca	6.1E-01	ca		
		7.0E-02	i			1.4E-04	h	0		7440-39-3	Barium and compounds	5.4E+03	nc	6.7E+04	nc	5.2E-01	nc	2.6E+03	nc	1.6E+03	8.2E+01
		4.0E-03	i			4.0E-03	r	0	0.10	114-26-1	Baygon	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		3.0E-02	i			3.0E-02	r	0	0.10	43121-43-3	Bayleton	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	68359-37-5	Baythroid	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		3.0E-01	i			3.0E-01	r	0	0.10	1861-40-1	Benefin	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	17804-35-2	Benomyl	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		3.0E-02	i			3.0E-02	r	0	0.10	25057-89-0	Bentazon	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	100-52-7	Benzaldehyde	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
5.5E-02	i	3.0E-03	n	2.9E-02	i	1.7E-03	n	1		71-43-2	Benzene	6.0E-01	ca*	1.3E+00	ca*	2.3E-01	ca*	3.4E-01	ca*	3.0E-02	2.0E-03
2.3E+02	i	3.0E-03	i	2.3E+02	i	3.0E-03	r	0	0.10	92-87-5	Benzidine	2.1E-03	ca	7.5E-03	ca	2.9E-05	ca	2.9E-04	ca		
		4.0E+00	i			4.0E+00	r	0	0.10	65-85-0	Benzoic acid	1.0E+05	max	1.0E+05	max	1.5E+04	nc	1.5E+05	nc	4.0E+02	2.0E+01
1.3E+01	i			1.3E+01	r			0	0.10	98-07-7	Benzotrichloride	3.7E-02	ca	1.3E-01	ca	5.2E-04	ca	5.2E-03	ca		
		3.0E-01	h			3.0E-01	r	0	0.10	100-51-6	Benzyl alcohol	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
1.7E-01	i	2.9E-03	r	1.7E-01	r	2.9E-03	n	1		100-44-7	**Benzyl chloride**	8.9E-01	ca*	2.2E+00	ca	4.0E-02	ca	6.6E-02	ca		
		2.0E-03	i	8.4E+00	i	5.7E-06	i	0		7440-41-7	Beryllium and compounds	1.5E+02	nc	1.9E+03	ca**	8.0E-04	ca*	7.3E+01	nc	6.3E+01	3.0E+00
		1.0E-04	i			1.0E-04	r	0	0.10	141-66-2	Bidrin	6.1E+00	nc	6.2E+01	nc	3.7E-01	nc	3.6E+00	nc		
		1.5E-02	i			1.5E-02	r	0	0.10	82657-04-3	Biphenthrin (Talstar)	9.2E+02	nc	9.2E+03	nc	5.5E+01	nc	5.5E+02	nc		
		5.0E-02	i			5.0E-02	r	1		92-52-4	1,1-Biphenyl	3.5E+02	sat	3.5E+02	sat	1.8E+02	nc	3.0E+02	nc		
1.1E+00	i			1.2E+00	i			1		111-44-4	Bis(2-chloroethyl)ether	2.1E-01	ca	5.5E-01	ca	5.8E-03	ca	9.8E-03	ca	4.0E-04	2.0E-05
7.0E-02	x	4.0E-02	i	3.5E-02	x	4.0E-02	r	1		39638-32-9	Bis(2-chloroisopropyl)ether	2.9E+00	ca	7.4E+00	ca	1.9E-01	ca	2.7E-01	ca		
2.2E+02	i			2.2E+02	i			1		542-88-1	Bis(chloromethyl)ether	1.9E-04	ca	4.3E-04	ca	3.1E-05	ca	5.2E-05	ca		
7.0E-02	x	4.0E-02	i	3.5E-02	x	4.0E-02	r	1		108-60-1	Bis(2-chloro-1-methylethyl)ether	2.9E+00	ca	7.4E+00	ca	1.9E-01	ca	2.7E-01	ca		
1.4E-02	i	2.0E-02	i	1.4E-02	r	2.2E-02	r	0	0.10	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	3.5E+01	ca*	1.2E+02	ca	4.8E-01	ca	4.8E+00	ca		
		5.0E-02	i			5.0E-02	r	0	0.10	80-05-7	Bisphenol A	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		2.0E-01	i			5.7E-03	x	0		7440-42-8	**Boron**	1.6E+04	nc	1.0E+05	max	2.1E+01	nc	7.3E+03	nc		
						2.0E-04	h	0		7637-07-2	Boron trifluoride					7.3E-01	nc				
		4.00E-03	i							15541-45-4	**Bromate**	3.1E+02	nc	4.1E+03	nc	0.0E+00		1.5E+02	nc		
		2.0E-02	n			2.9E-03	n	1		108-86-1	Bromobenzene	2.8E+01	nc	9.2E+01	nc	1.0E+01	nc	2.0E+01	nc		
6.2E-02	i	2.0E-02	i	6.2E-02	r	2.0E-02	r	1		75-27-4	Bromodichloromethane	8.2E-01	ca	1.8E+00	ca	1.1E-01	ca	1.8E-01	ca	6.0E-01	3.0E-02

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+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
7.9E-03	i	2.0E-02	i	3.9E-03	i	2.0E-02	r	0	0.10	75-25-2	Bromoform (tribromomethane)	6.2E+01	ca*	2.2E+02	ca*	1.7E+00	ca*	8.5E+00	ca*	8.0E-01	4.0E-02
		1.4E-03	i			1.4E-03	i	1		74-83-9	Bromomethane (Methyl bromide)	3.9E+00	nc	1.3E+01	nc	5.2E+00	nc	8.7E+00	nc	2.0E-01	1.0E-02
		5.0E-03	h			5.0E-03	r	0	0.10	2104-96-3	Bromophos	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	1689-84-5	Bromoxynil	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	1689-99-2	Bromoxynil octanoate	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
9.8E-01	r			9.8E-01	i			1		106-99-0	**1,3-Butadiene**	6.5E-03	ca	1.4E-02	ca	6.9E-03	ca	1.1E-02	ca		
		1.0E-01	i			2.6E-03	n	0	0.10	71-36-3	**1-Butanol**	6.1E+03	nc	6.1E+04	nc	9.5E+00	nc	3.6E+03	nc	1.7E+01	9.0E-01
		5.0E-02	i			5.0E-02	r	0	0.10	2008-41-5	Butylate	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		4.00E-02	n			4.00E-02	r	1		104-51-8	**n-Butylbenzene**	2.4E+02	sat	2.4E+02	sat	1.5E+02	nc	2.4E+02	nc		
		4.00E-02	n			4.00E-02	r	1		135-9-88	**sec-Butylbenzene**	2.2E+02	sat	2.2E+02	sat	1.5E+02	nc	2.4E+02	nc		
		4.00E-02	n			4.00E-02	r	1		98-06-6	**tert-Butylbenzene**	3.9E+02	sat	3.9E+02	sat	1.5E+02	nc	2.4E+02	nc		
		2.0E-01	i			2.0E-01	r	0	0.10	85-68-7	Butyl benzyl phthalate	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc	9.3E+02	8.1E+02
		1.0E+00	i			1.0E+00	r	0	0.10	85-70-1	Butylphthalyl butylglycolate	6.1E+04	nc	1.0E+05	max	3.7E+03	nc	3.6E+04	nc		
		3.0E-04	h	2.5E-01	r	3.0E-04	r	0	0.10	75-60-5	**Cacodylic acid**	1.9E+00	ca**	6.9E+00	ca*	2.7E-02	ca*	2.7E-01	ca*		
2.5E-01	h	5.0E-04	i	6.3E+00	i			0	0.001	7440-43-9	Cadmium and compounds	3.7E+01	nc	4.5E+02	nc	1.1E-03	ca	1.8E+01	nc	8.0E+00	4.0E-01
3.8E-01				1.5E+01					0.001		**Cadmium "CAL-Modified PRG"**	1.7E+00	ca	7.4E+00	ca	4.5E-04	ca	1.8E-01	ca		
		5.0E-01	i			5.0E-01	r	0	0.10	105-60-2	Caprolactam	3.1E+04	nc	1.0E+05	max	1.8E+03	nc	1.8E+04	nc		
8.6E-03	h	2.0E-03	i	8.6E-03	r	2.0E-03	r	0	0.10	2425-06-1	Captafol	5.7E+01	ca**	2.0E+02	ca**	7.8E-01	ca**	7.8E+00	ca**		
3.5E-03	h	1.3E-01	i	3.5E-03	r	1.3E-01	r	0	0.10	133-06-2	Captan	1.4E+02	ca*	4.9E+02	ca	1.9E+00	ca	1.9E+01	ca		
		1.0E-01	i			1.1E-01	r	0	0.10	63-25-2	Carbaryl	6.1E+03	nc	6.2E+04	nc	4.0E+02	nc	3.6E+03	nc		
2.0E-02	h			2.0E-02	r			0	0.10	86-74-8	Carbazole	2.4E+01	ca	8.6E+01	ca	3.4E-01	ca	3.4E+00	ca	6.0E-01	3.0E-02
		5.0E-03	i			5.0E-03	r	0	0.10	1563-66-2	Carbofuran	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		1.0E-01	i			2.0E-01	i	1		75-15-0	Carbon disulfide	3.6E+02	nc	7.2E+02	sat	7.3E+02	nc	1.0E+03	nc	3.2E+01	2.0E+00
1.3E-01	i	7.0E-04	i	5.3E-02	i	7.0E-04	r	1		56-23-5	Carbon tetrachloride	2.5E-01	ca**	5.5E-01	ca*	1.3E-01	ca*	1.7E-01	ca*	7.0E-02	3.0E-03
		1.0E-02	i			1.0E-02	r	0	0.10	55285-14-8	Carbosulfan	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	5234-68-4	Carboxin	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		1.5E-02	i			1.5E-02	r	0	0.10	133-90-4	Chloramben	9.2E+02	nc	9.2E+03	nc	5.5E+01	nc	5.5E+02	nc		
4.0E-01	h			4.0E-01	r			0	0.10	118-75-2	Chloranil	1.2E+00	ca	4.3E+00	ca	1.7E-02	ca	1.7E-01	ca		
3.5E-01	i	5.0E-04	i	3.5E-01	i	2.0E-04	i	0	0.04	12789-03-6	Chlordane	1.6E+00	ca*	6.5E+00	ca*	1.9E-02	ca*	1.9E-01	ca*	1.0E+01	5.0E-01
		2.0E-02	i			2.0E-02	r	0	0.10	90982-32-4	Chlorimuron-ethyl	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.0E-01	i			5.71E-05	n			7782-50-5	Chlorine					2.1E-01	nc				
						5.7E-05	i			10049-04-4	Chlorine dioxide					2.1E-01	nc				
		2.0E-03	h			2.0E-03	r	0	0.10	79-11-8	Chloroacetic acid	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		8.6E-06	r			8.6E-06	i	1		532-27-4	2-Chloroacetophenone	3.3E-02	nc	1.1E-01	nc	3.1E-02	nc	5.2E-02	nc		
		4.0E-03	i			4.0E-03	r	0	0.10	106-47-8	4-Chloroaniline	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc	7.0E-01	3.0E-02
		2.0E-02	i			1.7E-02	n	1		108-90-7	Chlorobenzene	1.5E+02	nc	5.3E+02	nc	6.2E+01	nc	1.1E+02	nc	1.0E+00	7.0E-02

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TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
2.7E-01	h	2.0E-02	i	2.7E-01	h	2.0E-02	r	0	0.10	510-15-6	Chlorobenzilate	1.8E+00	ca	6.4E+00	ca	2.5E-02	ca	2.5E-01	ca		
		2.0E-01	h			2.0E-01	r	0	0.10	74-11-3	p-Chlorobenzoic acid	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		2.0E-02	h			2.0E-02	r	0	0.10	98-56-6	4-Chlorobenzotrifluoride	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-02	h			2.0E-03	h	1		126-99-8	2-Chloro-1,3-butadiene	3.6E+00	nc	1.2E+01	nc	7.3E+00	nc	1.4E+01	nc		
		4.0E-01	h			4.0E-01	r	1		109-69-3	1-Chlorobutane	4.8E+02	sat	4.8E+02	sat	1.5E+03	nc	2.4E+03	nc		
		1.4E+01	r			1.4E+01	i	1		75-68-3	1-Chloro-1,1-difluoroethane (HCFC-142b)	3.4E+02	sat	3.4E+02	sat	5.2E+04	nc	8.7E+04	nc		
		1.4E+01	r			1.4E+01	i	1		75-45-6	Chlorodifluoromethane	3.4E+02	sat	3.4E+02	sat	5.1E+04	nc	8.5E+04	nc		
2.9E-03	n	4.0E-01	n	2.9E-03	r	2.9E+00	i	1		75-00-3	Chloroethane	3.0E+00	ca	6.5E+00	ca	2.3E+00	ca	4.6E+00	ca		
		1.0E-02	i			8.6E-04	n	1		67-66-3	**Chloroform**	3.6E+00	ca/nc	1.2E+01	ca/nc	3.1E+00	ca/nc	6.2E+00	ca/nc	6.0E-01	3.0E-02
3.1E-02				1.9E-02				1			**Chloroform "CAL-Modified PRG"**	9.4E-01	ca	2.0E+00	ca	3.5E-01	ca	5.3E-01	ca		
1.3E-02	h			6.3E-03	h	8.6E-02	n	1		74-87-3	Chloromethane	1.2E+00	ca	2.6E+00	ca	1.1E+00	ca	1.5E+00	ca		
5.8E-01	h			5.8E-01	r			0	0.10	95-69-2	4-Chloro-2-methylaniline	8.4E-01	ca	3.0E+00	ca	1.2E-02	ca	1.2E-01	ca		
4.6E-01	h			4.6E-01	r			0	0.10	3165-93-3	4-Chloro-2-methylaniline hydrochloride	1.1E+00	ca	3.7E+00	ca	1.5E-02	ca	1.5E-01	ca		
		8.0E-02	I			8.0E-02	r	1		91-58-7	beta-Chloronaphthalene	4.9E+03	nc	2.3E+04	nc	2.9E+02	nc	4.9E+02	nc		
9.7E-03	h	1.0E-03	h	9.7E-03	r	2.0E-05	h	1		88-73-3	**o-Chloronitrobenzene**	1.4E+00	nc**	4.5E+00	nc**	7.3E-02	nc**	1.5E-01	nc**		
6.7E-03	h	1.0E-03	h	6.7E-03	r	1.7E-04	h	1		100-00-5	**p-Chloronitrobenzene**	1.0E+01	nc**	3.7E+01	nc**	6.2E-01	nc**	1.2E+00	nc**		
		5.0E-03	i			5.0E-03	r	1		95-57-8	2-Chlorophenol	6.3E+01	nc	2.4E+02	nc	1.8E+01	nc	3.0E+01	nc	4.0E+00	2.0E-01
		2.9E-02	r			2.9E-02	h	1		75-29-6	2-Chloropropane	1.7E+02	nc	5.9E+02	nc	1.0E+02	nc	1.7E+02	nc		
1.1E-02	h	1.5E-02	i	1.1E-02	r	1.5E-02	r	0	0.10	1897-45-6	Chlorothalonil	4.4E+01	ca*	1.6E+02	ca*	6.1E-01	ca*	6.1E+00	ca*		
		2.0E-02	I			2.0E-02	r	1		95-49-8	o-Chlorotoluene	1.6E+02	nc	5.6E+02	nc	7.3E+01	nc	1.2E+02	nc		
		2.0E-01	i			2.0E-01	r	0	0.10	101-21-3	Chlorpropham	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		3.0E-03	i			3.0E-03	r	0	0.10	2921-88-2	Chlorpyrifos	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
		1.0E-02	h			1.0E-02	r	0	0.10	5598-13-0	Chlorpyrifos-methyl	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	64902-72-3	Chlorsulfuron	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		8.0E-04	h			8.0E-04	r	0	0.10	60238-56-4	Chlorthiophos	4.9E+01	nc	4.9E+02	nc	2.9E+00	nc	2.9E+01	nc		
				4.2E+01	i			0			Total Chromium (1:6 ratio Cr VI:Cr III)+++	2.1E+02	ca	4.5E+02	ca	1.6E-04	ca			3.8E+01	2.0E+00
		1.5E+00	i							16065-83-1	Chromium III	1.0E+05	max	1.0E+05	max	0.0E+00		5.5E+04	nc		
		3.0E-03	i	2.9E+02	i	2.2E-06	i	0		18540-29-9	Chromium VI+++	3.0E+01	ca**	6.4E+01	ca	2.3E-05	ca	1.1E+02	nc	3.8E+01	2.0E+00
		2.00E-02	n	9.8E+00	n	5.7E-06	n			7440-48-4	**Cobalt**	9.0E+02	ca**	1.9E+03	ca*	6.9E-04	ca*	7.3E+02	nc		
				2.2E+00	i			0		8007-45-2	Coke Oven Emissions					3.1E-03	ca				
		4.00E-02	h					0		7440-50-8	Copper and compounds	3.1E+03	nc	4.1E+04	nc			1.5E+03	nc		
1.9E+00	h			1.9E+00	r			1		123-73-9	Crotonaldehyde	5.3E-03	ca	1.1E-02	ca	3.5E-03	ca	5.9E-03	ca		
		1.0E-01	i			1.1E-01	I	1		98-82-8	Cumene (isopropylbenzene)	5.7E+02	nc	2.0E+03	nc	4.0E+02	nc	6.6E+02	nc		
8.4E-01	h	2.0E-03	h	8.4E-01	r	2.0E-03	r	0	0.10	21725-46-2	Cyanazine	5.8E-01	ca	2.1E+00	ca	8.0E-03	ca	8.0E-02	ca		
		2.0E-02	i					0	0.10	57-12-5	Cyanide (free)	1.2E+03	nc	1.2E+04	nc			7.3E+02	nc		
		2.0E-02	i			8.6E-04	i	1		74-90-8	Cyanide (hydrogen)	1.1E+01	nc	3.5E+01	nc	3.1E+00	nc	6.2E+00	nc		

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SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		4.0E-02	i			4.0E-02	r	1		460-19-5	Cyanogen	1.3E+02	nc	4.3E+02	nc	1.5E+02	nc	2.4E+02	nc		
		9.0E-02	i			9.0E-02	r	1		506-68-3	Cyanogen bromide	2.9E+02	nc	9.7E+02	nc	3.3E+02	nc	5.5E+02	nc		
		5.0E-02	i			5.0E-02	r	1		506-77-4	Cyanogen chloride	1.6E+02	nc	5.4E+02	nc	1.8E+02	nc	3.0E+02	nc		
		5.7E+00	r			5.7E+00	n	1		110-82-7	Cyclohexane	1.4E+02	sat	1.4E+02	sat	2.1E+04	nc	3.5E+04	nc		
		5.0E+00	I			5.0E+00	r	0	0.10	108-94-1	Cyclohexanone	1.0E+05	max	1.0E+05	max	1.8E+04	nc	1.8E+05	nc		
		2.0E-01	i			2.0E-01	r	0	0.10	108-91-8	Cyclohexylamine	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		5.0E-03	I			5.0E-03	r	0	0.10	68085-85-8	Cyhalothrin/Karate	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	52315-07-8	Cypermethrin	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		7.5E-03	i			7.5E-03	r	0	0.10	66215-27-8	Cyromazine	4.6E+02	nc	4.6E+03	nc	2.7E+01	nc	2.7E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	1861-32-1	Dacthal	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		3.0E-02	i			3.0E-02	r	0	0.10	75-99-0	Dalapon	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	39515-41-8	Danitol	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
2.4E-01	I			2.4E-01	r			0	0.03	72-54-8	DDD	2.4E+00	ca	1.0E+01	ca	2.8E-02	ca	2.8E-01	ca	1.6E+01	8.0E-01
3.4E-01	i			3.4E-01	r			0	0.03	72-55-9	DDE	1.7E+00	ca	7.0E+00	ca	2.0E-02	ca	2.0E-01	ca	5.4E+01	3.0E+00
3.4E-01	i	5.0E-04	i	3.4E-01	i	5.0E-04	r	0	0.03	50-29-3	DDT	1.7E+00	ca*	7.0E+00	ca*	2.0E-02	ca*	2.0E-01	ca*	3.2E+01	2.0E+00
		1.0E-02	i			1.0E-02	r	0	0.10	1163-19-5	Decabromodiphenyl ether	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		4.0E-05	i			4.0E-05	r	0	0.10	8065-48-3	Demeton	2.4E+00	nc	2.5E+01	nc	1.5E-01	nc	1.5E+00	nc		
6.1E-02	h			6.1E-02	r			0	0.10	2303-16-4	Diallate	8.0E+00	ca	2.8E+01	ca	1.1E-01	ca	1.1E+00	ca		
		9.0E-04	h			9.0E-04	r	0	0.10	333-41-5	Diazinon	5.5E+01	nc	5.5E+02	nc	3.3E+00	nc	3.3E+01	nc		
		4.0E-03	n			4.0E-03	r	1		132-64-9	Dibenzofuran	2.9E+02	nc	3.1E+03	nc	1.5E+01	nc	2.4E+01	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	106-37-6	1,4-Dibromobenzene	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
8.4E-02	i	2.0E-02	i	8.4E-02	r	2.0E-02	r	1		124-48-1	Dibromochloromethane	1.1E+00	ca	2.6E+00	ca	8.0E-02	ca	1.3E-01	ca	4.0E-01	2.0E-02
1.4E+00	h	5.7E-05	r	2.4E-03	x	5.7E-05	i	1		96-12-8	1,2-Dibromo-3-chloropropane	4.5E-01	ca**	2.0E+00	ca**	2.1E-01	nc	4.8E-02	ca**		
7.0E+00				7.0E+00				1		96-12-8	"CAL-Modified PRG"	1.9E-02	ca	4.6E-02	ca	9.6E-04	ca	1.6E-03	ca		
8.5E+01	i	5.7E-05	r	7.7E-01	i	5.7E-05	h	1		106-93-4	1,2-Dibromoethane	6.9E-03	ca	2.8E-02	ca*	8.7E-03	ca*	7.6E-04	ca		
		1.0E-01	i			1.0E-01	r	0	0.10	84-74-2	Dibutyl phthalate	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc	2.3E+03	2.7E+02
		3.0E-02	i			3.0E-02	r	0	0.10	1918-00-9	Dicamba	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		9.0E-02	i			5.7E-02	h	1		95-50-1	1,2-Dichlorobenzene	3.7E+02	sat	3.7E+02	sat	2.1E+02	nc	3.7E+02	nc	1.7E+01	9.0E-01
		9.00E-04	n			9.00E-04	r	1		541-73-1	1,3-Dichlorobenzene	1.6E+01	nc	6.3E+01	nc	3.3E+00	nc	5.5E+00	nc		
2.4E-02	h	3.00E-02	n	2.2E-02	n	3.00E-02	i	1		106-46-7	1,4-Dichlorobenzene	3.4E+00	ca	7.9E+00	ca	3.1E-01	ca	5.0E-01	ca	2.0E+00	1.0E-01
4.5E-01	i			4.5E-01	r			0	0.10	91-94-1	3,3-Dichlorobenzidine	1.1E+00	ca	3.8E+00	ca	1.5E-02	ca	1.5E-01	ca	7.0E-03	3.0E-04
		3.00E-02	n			3.00E-02	r		0.10	90-98-2	4,4'-Dichlorobenzophenone	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
9.3E+00	r			9.3E+00	h			1		764-41-0	1,4-Dichloro-2-butene	7.9E-03	ca	1.8E-02	ca	7.2E-04	ca	1.2E-03	ca		
		2.0E-01	i			5.7E-02	h	1		75-71-8	Dichlorodifluoromethane	9.4E+01	nc	3.1E+02	nc	2.1E+02	nc	3.9E+02	nc		
		1.0E-01	h			1.4E-01	h	1		75-34-3	1,1-Dichloroethane	5.1E+02	nc	1.7E+03	nc	5.2E+02	nc	8.1E+02	nc	2.3E+01	1.0E+00
5.7E-03				5.7E-03				1			"CAL-Modified PRG"	2.8E+00	ca	6.0E+00	ca	1.2E+00	ca	2.0E+00	ca		

Key : SFo,I=Cancer Slope Factor oral, inhalation RfDo,I=Reference Dose oral, inhalation i=IRIS h=HEAST n=NCEA x=Withdrawn o=Other EPA Source r=Route-extrapolation ca=Cancer PRG nc=Noncancer PRG ca* (where: nc < 100X ca) ca**(where: nc < 10X ca)
+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
9.1E-02	i	3.0E-02	n	9.1E-02	i	1.4E-03	n	1		107-06-2	1,2-Dichloroethane (EDC)	2.8E-01	ca*	6.0E-01	ca*	7.4E-02	ca*	1.2E-01	ca*	2.0E-02	1.0E-03
		5.0E-02	i			5.7E-02	i	1		75-35-4	**1,1-Dichloroethylene**	1.2E+02	nc	4.1E+02	nc	2.1E+02	nc	3.4E+02	nc	6.0E-02	3.0E-03
		1.0E-02	h			1.0E-02	r	1		156-59-2	1,2-Dichloroethylene (cis)	4.3E+01	nc	1.5E+02	nc	3.7E+01	nc	6.1E+01	nc	4.0E-01	2.0E-02
		2.0E-02	i			2.0E-02	r	1		156-60-5	1,2-Dichloroethylene (trans)	6.9E+01	nc	2.3E+02	nc	7.3E+01	nc	1.2E+02	nc	7.0E-01	3.0E-02
		3.0E-03	i			3.0E-03	r	0	0.10	120-83-2	2,4-Dichlorophenol	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc	1.0E+00	5.0E-02
		8.0E-03	i			8.0E-03	r	0	0.10	94-82-6	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	4.9E+02	nc	4.9E+03	nc	2.9E+01	nc	2.9E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.05	94-75-7	2,4-Dichlorophenoxyacetic Acid (2,4-D)	6.9E+02	nc	7.7E+03	nc	3.7E+01	nc	3.6E+02	nc		
6.8E-02	h	1.1E-03	r	6.8E-02	r	1.1E-03	i	1		78-87-5	1,2-Dichloropropane	3.4E-01	ca*	7.4E-01	ca*	9.9E-02	ca*	1.6E-01	ca*	3.0E-02	1.0E-03
1.0E-01	i	3.00E-02	i	1.4E-02	i	5.7E-03	i	1		542-75-6	1,3-Dichloropropene	7.8E-01	ca	1.8E+00	ca	4.8E-01	ca	4.0E-01	ca	4.0E-03	2.0E-04
		3.0E-03	i			3.0E-03	r	0	0.10	616-23-9	2,3-Dichloropropanol	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
2.9E-01	i	5.0E-04	i	2.9E-01	r	1.4E-04	i	0	0.10	62-73-7	Dichlorvos	1.7E+00	ca*	5.9E+00	ca*	2.3E-02	ca*	2.3E-01	ca*		
4.4E-01	x			4.4E-01	r			0	0.10	115-32-2	Dicofol	1.1E+00	ca	3.9E+00	ca	1.5E-02	ca	1.5E-01	ca		
		3.0E-02	h			5.7E-05	x	1		77-73-6	Dicyclopentadiene	5.4E-01	nc	1.8E+00	nc	2.1E-01	nc	4.2E-01	nc		
1.6E+01	i	5.0E-05	i	1.6E+01	i	5.0E-05	r	0	0.10	60-57-1	Dieldrin	3.0E-02	ca	1.1E-01	ca	4.2E-04	ca	4.2E-03	ca	4.0E-03	2.0E-04
		1.0E-02	h			5.7E-03	h	0	0.10	112-34-5	**Diethylene glycol, monobutyl ether**	6.1E+02	nc	6.2E+03	nc	2.1E+01	nc	3.6E+02	nc		
		6.0E-02	h			8.6E-04	h	0	0.10	111-90-0	**Diethylene glycol, monomethyl ether**	3.7E+03	nc	3.7E+04	nc	3.1E+00	nc	2.2E+03	nc		
		4.0E-03	h			4.0E-03	r	0	0.10	617-84-5	**Diethylformamide**	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
1.2E-03	i	6.0E-01	i	1.2E-03	r	6.0E-01	r	0	0.10	103-23-1	Di(2-ethylhexyl)adipate	4.1E+02	ca	1.4E+03	ca	5.6E+00	ca	5.6E+01	ca		
		8.0E-01	i			8.0E-01	r	0	0.10	84-66-2	Diethyl phthalate	4.9E+04	nc	1.0E+05	max	2.9E+03	nc	2.9E+04	nc		
4.7E+03	h			4.7E+03	r			0	0.10	56-53-1	Diethylstilbestrol	1.0E-04	ca	3.7E-04	ca	1.4E-06	ca	1.4E-05	ca		
		8.0E-02	i			8.0E-02	r	0	0.10	43222-48-6	Difenzoquat (Avenge)	4.9E+03	nc	4.9E+04	nc	2.9E+02	nc	2.9E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	35367-38-5	Diflubenzuron	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.1E+01	r			1.1E+01	i	1		75-37-6	1,1-Difluoroethane					4.2E+04	nc	6.9E+04	nc		
		2.00E-02	n			2.00E-02	r		0.10	28553-12-0	Diisononyl phthalate	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		8.0E-02	i			8.0E-02	r	0	0.10	1445-75-6	Diisopropyl methylphosphonate	4.9E+03	nc	4.9E+04	nc	2.9E+02	nc	2.9E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	55290-64-7	Dimethipin	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-04	i			2.0E-04	r	0	0.10	60-51-5	Dimethoate	1.2E+01	nc	1.2E+02	nc	7.3E-01	nc	7.3E+00	nc		
1.4E-02	h			1.4E-02	r			0	0.10	119-90-4	3,3'-Dimethoxybenzidine	3.5E+01	ca	1.2E+02	ca	4.8E-01	ca	4.8E+00	ca		
		5.7E-06	r			5.7E-06	x	1		124-40-3	Dimethylamine	6.7E-02	nc	2.5E-01	nc	2.1E-02	nc	3.5E-02	nc		
		2.0E-03	i			2.0E-03	r	0	0.10	121-69-7	N-N-Dimethylaniline	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
7.5E-01	h			7.5E-01	r			0	0.10	95-68-1	2,4-Dimethylaniline	6.5E-01	ca	2.3E+00	ca	9.0E-03	ca	9.0E-02	ca		
5.8E-01	h			5.8E-01	r			0	0.10	21436-96-4	2,4-Dimethylaniline hydrochloride	8.4E-01	ca	3.0E+00	ca	1.2E-02	ca	1.2E-01	ca		
9.2E+00	h			9.2E+00	r			0	0.10	119-93-7	3,3'-Dimethylbenzidine	5.3E-02	ca	1.9E-01	ca	7.3E-04	ca	7.3E-03	ca		
		1.0E-01	h			8.6E-03	i	0	0.10	68-12-2	N,N-Dimethylformamide	6.1E+03	nc	6.2E+04	nc	3.1E+01	nc	3.6E+03	nc		
		1.0E-03	n			1.0E-03	r	0	0.10	122-09-8	Dimethylphenethylamine	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	105-67-9	2,4-Dimethylphenol	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc	9.0E+00	4.0E-01

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+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION								CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)	RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
	6.0E-04	i			6.0E-04	r	0	0.10	576-26-1	2,6-Dimethylphenol	3.7E+01	nc	3.7E+02	nc	2.2E+00	nc	2.2E+01	nc		
	1.0E-03	i			1.0E-03	r	0	0.10	95-65-8	3,4-Dimethylphenol	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
	1.0E+01	h			1.0E+01	r	0	0.10	131-11-3	Dimethyl phthalate	1.0E+05	max	1.0E+05	max	3.7E+04	nc	3.6E+05	nc		
	1.0E-01	i			1.0E-01	r	0	0.10	120-61-6	Dimethyl terephthalate	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
	2.0E-03	i			2.0E-03	r	0	0.10	131-89-5	4,6-Dinitro-o-cyclohexyl phenol	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
	1.0E-04	h			1.0E-04	r	0	0.10	528-29-0	**1,2-Dinitrobenzene**	6.1E+00	nc	6.2E+01	nc	3.7E-01	nc	3.6E+00	nc		
	1.0E-04	i			1.0E-04	r	0	0.10	99-65-0	1,3-Dinitrobenzene	6.1E+00	nc	6.2E+01	nc	3.7E-01	nc	3.6E+00	nc		
	1.0E-04	h			1.0E-04	r	0	0.10	100-25-4	**1,4-Dinitrobenzene**	6.1E+00	nc	6.2E+01	nc	3.7E-01	nc	3.6E+00	nc		
	2.0E-03	i			2.0E-03	r	0	0.10	51-28-5	2,4-Dinitrophenol	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc	3.0E-01	1.0E-02
6.8E-01	i		6.8E-01	r			0	0.10	25321-14-6	Dinitrotoluene mixture	7.2E-01	ca	2.5E+00	ca	9.9E-03	ca	9.9E-02	ca	8.0E-04	4.0E-05
	2.0E-03	i			2.0E-03	r	0	0.10	121-14-2	2,4-Dinitrotoluene (see DNT mixture for "ca")	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc	8.0E-04	4.0E-05
	1.0E-03	h			1.0E-03	r	0	0.10	606-20-2	2,6-Dinitrotoluene (see DNT mixture for "ca")	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc	7.0E-04	3.0E-05
	1.0E-03	i			1.0E-03	r	0	0.10	88-85-7	Dinoseb	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
	4.0E-02	h			4.0E-02	r	0	0.10	117-84-0	**di-n-Octyl phthalate**	2.4E+03	nc	2.5E+04	nc	1.5E+02	nc	1.5E+03	nc	1.0E+04	1.0E+04
1.1E-02	i		1.1E-02	r			0	0.10	123-91-1	1,4-Dioxane	4.4E+01	ca	1.6E+02	ca	6.1E-01	ca	6.1E+00	ca		
1.5E+05	h		1.5E+05	h			0	0.03	1746-01-6	Dioxin (2,3,7,8-TCDD)	3.9E-06	ca	1.6E-05	ca	4.5E-08	ca	4.5E-07	ca		
	3.0E-02	i			3.0E-02	r	0	0.10	957-51-7	Diphenamid	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
	2.5E-02	i			2.5E-02	r	0	0.10	122-39-4	Diphenylamine	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
	3.00E-04	n			3.00E-04	r		0.10	74-31-7	N,N-Diphenyl-1,4 benzenediamine (DPPD)	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
8.0E-01	i		7.7E-01	i			0	0.10	122-66-7	1,2-Diphenylhydrazine	6.1E-01	ca	2.2E+00	ca	8.7E-03	ca	8.4E-02	ca		
	3.0E-03	n			3.0E-03	r	0	0.10	127-63-9	**Diphenyl sulfone**	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
	2.2E-03	i			2.2E-03	r	0	0.10	85-00-7	Diquat	1.3E+02	nc	1.4E+03	nc	8.0E+00	nc	8.0E+01	nc		
8.6E+00	h		8.6E+00	r			0	0.10	1937-37-7	Direct black 38	5.7E-02	ca	2.0E-01	ca	7.8E-04	ca	7.8E-03	ca		
8.1E+00	h		8.1E+00	r			0	0.10	2602-46-2	Direct blue 6	6.0E-02	ca	2.1E-01	ca	8.3E-04	ca	8.3E-03	ca		
9.3E+00	h		9.3E+00	r			0	0.10	16071-86-6	Direct brown 95	5.2E-02	ca	1.9E-01	ca	7.2E-04	ca	7.2E-03	ca		
	4.0E-05	i			4.0E-05	r	0	0.10	298-04-4	Disulfoton	2.4E+00	nc	2.5E+01	nc	1.5E-01	nc	1.5E+00	nc		
	1.0E-02	i			1.0E-02	r	0	0.10	505-29-3	1,4-Dithiane	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
	2.0E-03	i			2.0E-03	r	0	0.10	330-54-1	Diuron	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
	4.0E-03	i			4.0E-03	r	0	0.10	2439-10-3	Dodine	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
	2.0E-01	n							7429-91-6	Dysprosium	1.6E+04	nc	1.0E+05	max			7.3E+03	nc		
	6.0E-03	i			6.0E-03	r	0	0.10	115-29-7	Endosulfan	3.7E+02	nc	3.7E+03	nc	2.2E+01	nc	2.2E+02	nc	1.8E+01	9.0E-01
	2.0E-02	i			2.0E-02	r	0	0.10	145-73-3	Endothall	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
	3.0E-04	i			3.0E-04	r	0	0.10	72-20-8	Endrin	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc	1.0E+00	5.0E-02
9.9E-03	i	2.0E-03	h	4.2E-03	h	2.9E-04	i	1		106-89-8	Epichlorohydrin	7.6E+00	nc	2.6E+01	nc	1.0E+00	nc	2.0E+00	nc		
	5.7E-03	r			5.7E-03	i	0	0.10	106-88-7	1,2-Epoxybutane	3.5E+02	nc	3.5E+03	nc	2.1E+01	nc	2.1E+02	nc		
	2.5E-02	i			2.5E-02	r	0	0.10	759-94-4	EPTC (S-Ethyl dipropylthiocarbamate)	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		

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+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		5.0E-03	i			5.0E-03	r	0	0.10	16672-87-0	Ethephon (2-chloroethyl phosphonic acid)	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		5.0E-04	i			5.0E-04	r	0	0.10	563-12-2	Ethion	3.1E+01	nc	3.1E+02	nc	1.8E+00	nc	1.8E+01	nc		
		4.0E-01	h			5.7E-02	i	0	0.10	110-80-5	2-Ethoxyethanol	2.4E+04	nc	1.0E+05	max	2.1E+02	nc	1.5E+04	nc		
		3.0E-01	h			3.0E-01	r	0	0.10	111-15-9	2-Ethoxyethanol acetate	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
		9.0E-01	i			9.0E-01	r	1		141-78-6	Ethyl acetate	1.9E+04	nc	3.7E+04	sat	3.3E+03	nc	5.5E+03	nc		
4.8E-02	h			4.8E-02	r			1		140-88-5	Ethyl acrylate	2.1E-01	ca	4.5E-01	ca	1.4E-01	ca	2.3E-01	ca		
3.85E-03	r	1.0E-01	i	3.85E-03	n	2.9E-01	i	1		100-41-4	**Ethylbenzene**	8.9E+00	ca	2.0E+01	ca	1.7E+00	ca	2.9E+00	ca	1.3E+01	7.0E-01
2.9E-03	n	4.0E-01	n	2.9E-03	r	2.9E+00	i	1		75-00-3	Ethyl chloride	3.0E+00	ca	6.5E+00	ca	2.3E+00	ca	4.6E+00	ca		
		3.0E-01	h			3.0E-01	r	0	0.10	109-78-4	Ethylene cyanohydrin	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
		2.0E-02	h			2.0E-02	r	0	0.10	107-15-3	Ethylene diamine	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E+00	i			2.0E+00	r	0	0.10	107-21-1	Ethylene glycol	1.0E+05	max	1.0E+05	max	7.3E+03	nc	7.3E+04	nc		
		5.0E-01	i			3.7E+00	i	0	0.10	111-76-2	Ethylene glycol, monobutyl ether	3.1E+04	nc	1.0E+05	max	1.4E+04	nc	1.8E+04	nc		
1.0E+00	h			3.5E-01	h			1		75-21-8	Ethylene oxide	1.4E-01	ca	3.4E-01	ca	1.9E-02	ca	2.4E-02	ca		
1.1E-01	h	8.0E-05	i	1.1E-01	r	8.0E-05	r	0	0.10	96-45-7	Ethylene thiourea (ETU)	4.4E+00	ca**	1.6E+01	ca**	6.1E-02	ca**	6.1E-01	ca**		
		2.0E-01	i			2.0E-01	r	1		60-29-7	Ethyl ether	1.8E+03	sat	1.8E+03	sat	7.3E+02	nc	1.2E+03	nc		
		9.0E-02	h			9.0E-02	r	1		97-63-2	Ethyl methacrylate	1.4E+02	sat	1.4E+02	sat	3.3E+02	nc	5.5E+02	nc		
		1.0E-05	i			1.0E-05	r	0	0.10	2104-64-5	Ethyl p-nitrophenyl phenylphosphorothioate	6.1E-01	nc	6.2E+00	nc	3.7E-02	nc	3.6E-01	nc		
		3.0E+00	i			3.0E+00	r	0	0.10	84-72-0	Ethylphthalyl ethyl glycolate	1.0E+05	max	1.0E+05	max	1.1E+04	nc	1.1E+05	nc		
		8.0E-03	i			8.0E-03	r	0	0.10	101200-48-0	Express	4.9E+02	nc	4.9E+03	nc	2.9E+01	nc	2.9E+02	nc		
		2.5E-04	i			2.5E-04	r	0	0.10	22224-92-6	Fenamiphos	1.5E+01	nc	1.5E+02	nc	9.1E-01	nc	9.1E+00	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	2164-17-2	Fluometuron	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		6.0E-02	i					0	0.10	16984-48-8	Flouride	3.7E+03	nc	3.7E+04	nc			2.2E+03	nc		
		8.0E-02	i			8.0E-02	r	0	0.10	59756-60-4	Fluoridone	4.9E+03	nc	4.9E+04	nc	2.9E+02	nc	2.9E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	56425-91-3	Flurprimidol	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		6.0E-02	i			6.0E-02	r	0	0.10	66332-96-5	Flutolanil	3.7E+03	nc	3.7E+04	nc	2.2E+02	nc	2.2E+03	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	69409-94-5	Fluvalinate	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
3.5E-03	i	1.0E-01	i	3.5E-03	r	1.0E-01	r	0	0.10	133-07-3	Folpet	1.4E+02	ca*	4.9E+02	ca	1.9E+00	ca	1.9E+01	ca		
1.9E-01	i			1.9E-01	r			0	0.10	72178-02-0	Fomesafen	2.6E+00	ca	9.1E+00	ca	3.5E-02	ca	3.5E-01	ca		
		2.0E-03	i			2.0E-03	r	0	0.10	944-22-9	Fonofos	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		1.5E-01	i	4.6E-02	i			0	0.10	50-00-0	Formaldehyde	9.2E+03	nc	1.0E+05	nc	1.5E-01	ca	5.5E+03	nc		
		2.0E+00	h			2.0E+00	r	0	0.10	64-18-6	Formic Acid	1.0E+05	max	1.0E+05	max	7.3E+03	nc	7.3E+04	nc		
		3.0E+00	i			3.0E+00	r	0	0.10	39148-24-8	Fosetyl-al	1.0E+05	max	1.0E+05	max	1.1E+04	nc	1.1E+05	nc		
		3.0E+01	i			6.6E+00	h	1		76-13-1	Freon 113	5.6E+03	sat	5.6E+03	sat	3.1E+04	nc	5.9E+04	nc		
		1.0E-03	i			1.0E-03	r	1		110-00-9	Furan	2.5E+00	nc	8.5E+00	nc	3.7E+00	nc	6.1E+00	nc		
3.8E+00	h			3.8E+00	r			0	0.10	67-45-8	Furazolidone	1.3E-01	ca	4.5E-01	ca	1.8E-03	ca	1.8E-02	ca		
		3.0E-03	i			1.4E-02	h	0	0.10	98-01-1	Furfural	1.8E+02	nc	1.8E+03	nc	5.2E+01	nc	1.1E+02	nc		

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TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
5.0E+01	h			5.0E+01	r			0	0.10	531-82-8	Furium	9.7E-03	ca	3.4E-02	ca	1.3E-04	ca	1.3E-03	ca		
3.0E-02	i			3.0E-02	r			0	0.10	60568-05-0	Furmecyclox	1.6E+01	ca	5.7E+01	ca	2.2E-01	ca	2.2E+00	ca		
		4.0E-04	i			4.0E-04	r	0	0.10	77182-82-2	Glufosinate-ammonium	2.4E+01	nc	2.5E+02	nc	1.5E+00	nc	1.5E+01	nc		
		4.0E-04	i			2.9E-04	h	0	0.10	765-34-4	Glycidaldehyde	2.4E+01	nc	2.5E+02	nc	1.0E+00	nc	1.5E+01	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	1071-83-6	Glyphosate	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		5.0E-05	i			5.0E-05	r	0	0.10	69806-40-2	Haloxyfop-methyl	3.1E+00	nc	3.1E+01	nc	1.8E-01	nc	1.8E+00	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	79277-27-3	Harmony	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
4.5E+00	i	5.0E-04	i	4.6E+00	i	5.0E-04	r	0	0.10	76-44-8	Heptachlor	1.1E-01	ca	3.8E-01	ca	1.5E-03	ca	1.5E-02	ca	2.3E+01	1.0E+00
9.1E+00	i	1.3E-05	i	9.1E+00	i	1.3E-05	r	0	0.10	1024-57-3	Heptachlor epoxide	5.3E-02	ca*	1.9E-01	ca*	7.4E-04	ca*	7.4E-03	ca*	7.0E-01	3.0E-02
		2.0E-03	i			2.0E-03	r	0	0.10	87-82-1	Hexabromobenzene	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
1.6E+00	i	8.0E-04	i	1.6E+00	i	8.0E-04	r	0	0.10	118-74-1	Hexachlorobenzene	3.0E-01	ca	1.1E+00	ca	4.2E-03	ca	4.2E-02	ca	2.0E+00	1.0E-01
7.8E-02	i	3.00E-04	n	7.8E-02	i	3.00E-04	r	0	0.10	87-68-3	Hexachlorobutadiene	6.2E+00	ca**	2.2E+01	ca**	8.6E-02	ca*	8.6E-01	ca*	2.0E+00	1.0E-01
6.3E+00	i	5.0E-04	n	6.3E+00	i	5.0E-04	r	0	0.04	319-84-6	**HCH (alpha)**	9.0E-02	ca	3.6E-01	ca	1.1E-03	ca	1.1E-02	ca	5.0E-04	3.0E-05
1.8E+00	i	2.0E-04	n	1.8E+00	i	2.0E-04	r	0	0.04	319-85-7	**HCH (beta)**	3.2E-01	ca	1.3E+00	ca	3.7E-03	ca	3.7E-02	ca	3.0E-03	1.0E-04
1.3E+00	h	3.0E-04	i	1.3E+00	r	3.0E-04	r	0	0.04	58-89-9	HCH (gamma) Lindane	4.4E-01	ca*	1.7E+00	ca	5.2E-03	ca	5.2E-02	ca	9.0E-03	5.0E-04
1.8E+00	i			1.8E+00	i			0	0.04	608-73-1	HCH-technical	3.2E-01	ca	1.3E+00	ca	3.8E-03	ca	3.7E-02	ca	3.0E-03	1.0E-04
		6.0E-03	i			5.7E-05	i	0	0.10	77-47-4	**Hexachlorocyclopentadiene**	3.7E+02	nc	3.7E+03	nc	2.1E-01	nc	2.2E+02	nc	4.0E+02	2.0E+01
1.4E-02	i	1.0E-03	i	1.4E-02	i	1.0E-03	r	0	0.10	67-72-1	Hexachloroethane	3.5E+01	ca**	1.2E+02	ca**	4.8E-01	ca**	4.8E+00	ca**	5.0E-01	2.0E-02
		3.0E-04	i			3.0E-04	r	0	0.10	70-30-4	Hexachlorophene	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
1.1E-01	i	3.0E-03	i	1.1E-01	r	3.0E-03	r	0	0.10	121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	4.4E+00	ca*	1.6E+01	ca	6.1E-02	ca	6.1E-01	ca		
		2.9E-06	r			2.9E-06	i	0	0.10	822-06-0	1,6-Hexamethylene diisocyanate	1.7E-01	nc	1.8E+00	nc	1.0E-02	nc	1.0E-01	nc		
		6.0E-02	h			5.7E-02	i	1		110-54-3	n-Hexane	1.1E+02	sat	1.1E+02	sat	2.1E+02	nc	3.5E+02	nc		
		3.3E-02	i			3.3E-02	r	0	0.10	51235-04-2	Hexazinone	2.0E+03	nc	2.0E+04	nc	1.2E+02	nc	1.2E+03	nc		
3.0E+00	i			1.7E+01	i			0	0.10	302-01-2	Hydrazine, hydrazine sulfate	1.6E-01	ca	5.7E-01	ca	3.9E-04	ca	2.2E-02	ca		
3.0E+00	n			1.7E+01	n				0.10	60-34-4	Hydrazine, monomethyl	1.6E-01	ca	5.7E-01	ca	4.0E-04	ca	2.2E-02	ca		
3.0E+00	n			1.7E+01	n				0.10	57-14-7	Hydrazine, dimethyl	1.6E-01	ca	5.7E-01	ca	4.0E-04	ca	2.2E-02	ca		
						5.7E-03	i			7647-01-0	Hydrogen chloride					2.1E+01	nc				
		2.0E-02	i			8.6E-04	i	1		74-90-8	Hydrogen cyanide	1.1E+01	nc	3.5E+01	nc	3.1E+00	nc	6.2E+00	nc		
		3.0E-03	i			2.9E-04	i			7783-06-4	Hydrogen sulfide					1.0E+00	nc	1.1E+02	nc		
		4.0E-02	h			4.0E-02	r	0	0.10	123-31-9	p-Hydroquinone	2.4E+03	nc	2.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	35554-44-0	Imazalil	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		2.5E-01	i			2.5E-01	r	0	0.10	81335-37-7	Imazaquin	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		4.0E-02	i			4.0E-02	r	0	0.10	36734-19-7	Iprodione	2.4E+03	nc	2.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
		3.0E-01	n					0		7439-89-6	Iron	2.3E+04	nc	1.0E+05	max			1.1E+04	nc		
		3.0E-01	i			3.0E-01	r	1		78-83-1	Isobutanol	1.3E+04	nc	4.0E+04	sat	1.1E+03	nc	1.8E+03	nc		
9.5E-04	i	2.0E-01	i	9.5E-04	r	2.0E-01	r	0	0.10	78-59-1	Isophorone	5.1E+02	ca*	1.8E+03	ca*	7.1E+00	ca	7.1E+01	ca	5.0E-01	3.0E-02

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TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		1.5E-02	i			1.5E-02	r	0	0.10	33820-53-0	Isopropalin	9.2E+02	nc	9.2E+03	nc	5.5E+01	nc	5.5E+02	nc		
		1.0E-01	i			1.1E-01	r	0	0.10	1832-54-8	Isopropyl methyl phosphonic acid	6.1E+03	nc	6.2E+04	nc	4.0E+02	nc	3.6E+03	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	82558-50-7	Isoxaben	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
8.0E+00	n	3.0E-04	n	8.0E+00	r	3.0E-04	r	0	0.10	143-50-0	**Kepone**	6.1E-02	ca	2.2E-01	ca	8.4E-04	ca	8.4E-03	ca		
		2.0E-03	i			2.0E-03	r	0	0.10	77501-63-4	Lactofen	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
For info see: www.epa.gov/oerrpage/superfund/programs/lead/prods.html#guidance										7439-92-1	Lead+++	4.0E+02	nc	7.5E+02	nc						
For info see: www.dtsc.ca.gov/ScienceTechnology/ledspred.html											**Lead "CAL-Modified PRG"+++**	1.5E+02									
		1.0E-07	i					0	0.10	78-00-2	Lead (tetraethyl)	6.1E-03	nc	6.2E-02	nc			3.6E-03	nc		
		2.0E-03	I			2.0E-03	r	0	0.10	330-55-2	Linuron	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		2.0E-02	x					0		7439-93-2	Lithium	1.6E+03	nc	2.0E+04	nc			7.3E+02	nc		
		2.0E-01	i			2.0E-01	r	0	0.10	83055-99-6	Londax	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	121-75-5	Malathion	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	108-31-6	Maleic anhydride	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		5.0E-01	i			5.0E-01	r	1		123-33-1	Maleic hydrazide	1.7E+03	nc	2.4E+03	sat	1.8E+03	nc	3.0E+03	nc		
		2.0E-05	h			2.0E-05	r	0	0.10	109-77-3	Malononitrile	1.2E+00	nc	1.2E+01	nc	7.3E-02	nc	7.3E-01	nc		
		3.0E-02	h			3.0E-02	r	0	0.10	8018-01-7	Mancozeb	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
6.0E-02	o	5.0E-03	i	6.0E-02	r	5.0E-03	r	0	0.10	12427-38-2	Maneb	8.1E+00	ca*	2.9E+01	ca	1.1E-01	ca	1.1E+00	ca		
		2.4E-02	i			1.4E-05	i	0		7439-96-5	Manganese and compounds+++	1.8E+03	nc	1.9E+04	nc	5.1E-02	nc	8.8E+02	nc		
		9.0E-05	h			9.0E-05	r	0	0.10	950-10-7	Mephosfolan	5.5E+00	nc	5.5E+01	nc	3.3E-01	nc	3.3E+00	nc		
		3.0E-02	I			3.0E-02	r	0	0.10	24307-26-4	Mepiquat chloride	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
2.9E-02	n	1.0E-01	n	2.9E-02	r	1.0E-01	r	0	0.10	149-30-4	2-Mercaptobenzothiazole	1.7E+01	ca	5.9E+01	ca	2.3E-01	ca	2.3E+00	ca		
		3.0E-04	i					0		7487-94-7	Mercury chloride	2.3E+01	nc	3.1E+02	nc			1.1E+01	nc		
						8.6E-05	i			7439-97-6	Mercury (elemental)	0.0E+00		0.0E+00		3.1E-01	nc				
		1.0E-04	I					0	0.10	22967-92-6	Mercury (methyl)	6.1E+00	nc	6.2E+01	nc			3.6E+00	nc		
		3.0E-05	i			3.0E-05	r	0	0.10	150-50-5	Merphos	1.8E+00	nc	1.8E+01	nc	1.1E-01	nc	1.1E+00	nc		
		3.0E-05	I			3.0E-05	r	0	0.10	78-48-8	Merphos oxide	1.8E+00	nc	1.8E+01	nc	1.1E-01	nc	1.1E+00	nc		
		6.0E-02	I			6.0E-02	r	0	0.10	57837-19-1	Metalaxyl	3.7E+03	nc	3.7E+04	nc	2.2E+02	nc	2.2E+03	nc		
		1.0E-04	i			2.0E-04	h	1		126-98-7	Methacrylonitrile	2.1E+00	nc	8.4E+00	nc	7.3E-01	nc	1.0E+00	nc		
		5.0E-05	i			5.0E-05	r	0	0.10	10265-92-6	Methamidophos	3.1E+00	nc	3.1E+01	nc	1.8E-01	nc	1.8E+00	nc		
		5.0E-01	i			5.0E-01	r	0	0.10	67-56-1	Methanol	3.1E+04	nc	1.0E+05	max	1.8E+03	nc	1.8E+04	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	950-37-8	Methidathion	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		2.5E-02	i			2.5E-02	r	1		16752-77-5	Methomyl	4.4E+01	nc	1.5E+02	nc	9.1E+01	nc	1.5E+02	nc		
		5.0E-03	I			5.0E-03	r	0	0.10	72-43-5	Methoxychlor	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc	1.6E+02	8.0E+00
		1.0E-03	h			5.7E-03	i	0	0.10	109-86-4	2-Methoxyethanol	6.1E+01	nc	6.2E+02	nc	2.1E+01	nc	3.6E+01	nc		
		2.0E-03	h			2.0E-03	r	0	0.10	110-49-6	2-Methoxyethanol acetate	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
4.6E-02	h			4.6E-02	r			0	0.10	99-59-2	2-Methoxy-5-nitroaniline	1.1E+01	ca	3.7E+01	ca	1.5E-01	ca	1.5E+00	ca		

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+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		1.0E+00	h			1.0E+00	r	1		79-20-9	Methyl acetate	2.2E+04	nc	9.2E+04	nc	3.7E+03	nc	6.1E+03	nc		
		3.0E-02	h			3.0E-02	r	1		96-33-3	Methyl acrylate	7.0E+01	nc	2.3E+02	nc	1.1E+02	nc	1.8E+02	nc		
2.4E-01	h			2.4E-01	r			0	0.10	95-53-4	2-Methylaniline (o-toluidine)	2.0E+00	ca	7.2E+00	ca	2.8E-02	ca	2.8E-01	ca		
1.8E-01	h			1.8E-01	r			0	0.10	636-21-5	2-Methylaniline hydrochloride	2.7E+00	ca	9.6E+00	ca	3.7E-02	ca	3.7E-01	ca		
		5.0E-04	i			5.0E-04	r	0	0.10	94-74-6	2-Methyl-4-chlorophenoxyacetic acid	3.1E+01	nc	3.1E+02	nc	1.8E+00	nc	1.8E+01	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	94-81-5	4-(2-Methyl-4-chlorophenoxy) butyric acid	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	93-65-2	2-(2-Methyl-4-chlorophenoxy) propionic acid	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	16484-77-8	2-(2-Methyl-1,4-chlorophenoxy) propionic acid	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		8.6E-01	r			8.6E-01	h	1		108-87-2	Methylcyclohexane	2.6E+03	nc	8.7E+03	nc	3.1E+03	nc	5.2E+03	nc		
2.5E-01	h			2.5E-01	r			0	0.10	101-77-9	4,4'-Methylenebisbenzeneamine	1.9E+00	ca	6.9E+00	ca	2.7E-02	ca	2.7E-01	ca		
1.3E-01	h	7.0E-04	h	1.3E-01	h	7.0E-04	r	0	0.10	101-14-4	4,4'-Methylene bis(2-chloroaniline)	3.7E+00	ca*	1.3E+01	ca*	5.2E-02	ca*	5.2E-01	ca*		
4.6E-02	i			4.6E-02	r			0	0.10	101-61-1	4,4'-Methylene bis(N,N'-dimethyl)aniline	1.1E+01	ca	3.7E+01	ca	1.5E-01	ca	1.5E+00	ca		
		1.0E-02	h			1.0E-02	r	1		74-95-3	Methylene bromide	6.7E+01	nc	2.3E+02	nc	3.7E+01	nc	6.1E+01	nc		
7.5E-03	i	6.0E-02	i	1.8E-03	i	8.6E-01	h	1		75-09-2	Methylene chloride	9.1E+00	ca	2.1E+01	ca	4.1E+00	ca	4.3E+00	ca	2.0E-02	1.0E-03
		1.7E-04	r			1.7E-04	i	0	0.10	101-68-8	4,4'-Methylene diphenyl diisocyanate	1.0E+01	nc	1.0E+02	nc	6.2E-01	nc	6.2E+00	nc		
		6.0E-01	i			2.9E-01	i	1		78-93-3	Methyl ethyl ketone	7.3E+03	nc	2.7E+04	nc	1.0E+03	nc	1.9E+03	nc		
		8.0E-02	h			2.3E-02	h	1		108-10-1	Methyl isobutyl ketone	7.9E+02	nc	2.8E+03	nc	8.3E+01	nc	1.6E+02	nc		
		5.7E-04	r			5.7E-04	n	0	0.10	74-93-1	Methyl Mercaptan	3.5E+01	nc	3.5E+02	nc	2.1E+00	nc	2.1E+01	nc		
		1.4E+00	i			2.0E-01	i	1		80-62-6	Methyl methacrylate	2.2E+03	nc	2.7E+03	sat	7.3E+02	nc	1.4E+03	nc		
3.3E-02	h			3.3E-02	r			0	0.10	99-55-8	2-Methyl-5-nitroaniline	1.5E+01	ca	5.2E+01	ca	2.0E-01	ca	2.0E+00	ca		
		2.5E-04	i			2.5E-04	r	0	0.10	298-00-0	Methyl parathion	1.5E+01	nc	1.5E+02	nc	9.1E-01	nc	9.1E+00	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	95-48-7	2-Methylphenol	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc	1.5E+01	8.0E-01
		5.0E-02	i			5.0E-02	r	0	0.10	108-39-4	3-Methylphenol	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		5.0E-03	h			5.0E-03	r	0	0.10	106-44-5	4-Methylphenol	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.0E-02	n			2.0E-02	r	0	0.10	993-13-5	Methyl phosphonic acid	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		6.0E-03	h			1.1E-02	h	1		25013-15-4	Methyl styrene (mixture)	1.3E+02	nc	5.4E+02	nc	4.2E+01	nc	6.0E+01	nc		
		7.0E-02	h			7.0E-02	r	1		98-83-9	Methyl styrene (alpha)	6.8E+02	sat	6.8E+02	sat	2.6E+02	nc	4.3E+02	nc		
3.3E-03	n	8.6E-01	r	3.5E-04	n	8.6E-01	i	1		1634-04-4	**Methyl tertbutyl ether (MBTE)**	6.2E+01	ca*	1.6E+02	ca	1.9E+01	ca	1.3E+01	ca		
1.8E-03				1.8E-03				1			"CAL-Modified PRG"	1.7E+01	ca	3.6E+01	ca	3.7E+00	ca	6.2E+00	ca		
		1.5E-01	l			1.5E-01	r	0	0.10	51218-45-2	Metolaclor (Dual)	9.2E+03	nc	9.2E+04	nc	5.5E+02	nc	5.5E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	21087-64-9	Metribuzin	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
1.8E+00	x	2.0E-04	i	1.8E+00	r	2.0E-04	r	0	0.10	2385-85-5	Mirex	2.7E-01	ca*	9.6E-01	ca	3.7E-03	ca	3.7E-02	ca		
		2.0E-03	i			2.0E-03	r	0	0.10	2212-67-1	Molinate	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		5.0E-03	i					0		7439-98-7	Molybdenum	3.9E+02	nc	5.1E+03	nc			1.8E+02	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	10599-90-3	Monochloramine	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		2.0E-03	i			2.0E-03	r	0	0.10	300-76-5	Naled	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		

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TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		1.0E-01	i			1.0E-01	r	0	0.10	15299-99-7	Napropamide	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		2.0E-02	i					0		7440-02-0	Nickel (soluble salts)	1.6E+03	nc	2.0E+04	nc			7.3E+02	nc	1.3E+02	7.0E+00
				8.4E-01	i			0			Nickel refinery dust					8.0E-03	ca				
				1.7E+00	i			0		12035-72-2	Nickel subsulfide			1.1E+04	ca	4.0E-03	ca				
Tap Water PRG Based on Infant NOAEL (see IRIS)										14797-55-8	Nitrate+++							1.0E+04	nc		
Tap Water PRG Based on Infant NOAEL (see IRIS)										14797-65-0	Nitrite+++							1.0E+03	nc		
		2.86E-05	r			2.86E-05	h	0	0.10	88-74-4	2-Nitroaniline	1.7E+00	nc	1.8E+01	nc	1.0E-01	nc	1.0E+00	nc		
		5.0E-04	i			5.7E-04	h	1		98-95-3	Nitrobenzene	2.0E+01	nc	1.0E+02	nc	2.1E+00	nc	3.4E+00	nc	1.0E-01	7.0E-03
		7.0E-02	h			7.0E-02	r	0	0.10	67-20-9	Nitrofurantoin	4.3E+03	nc	4.3E+04	nc	2.6E+02	nc	2.6E+03	nc		
1.5E+00	h			1.5E+00	r			0	0.10	59-87-0	Nitrofurazone	3.2E-01	ca	1.1E+00	ca	4.5E-03	ca	4.5E-02	ca		
1.4E-02	n			1.4E-02	r			0	0.10	55-63-0	Nitroglycerin	3.5E+01	ca	1.2E+02	ca	4.8E-01	ca	4.8E+00	ca		
		1.0E-01	i			1.0E-01	r	0	0.10	556-88-7	Nitroguanidine	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
9.4E+00	r	5.7E-03	r	9.4E+00	h	5.7E-03	i	1		79-46-9	2-Nitropropane					7.2E-04	ca	1.2E-03	ca		
5.4E+00	i			5.6E+00	i			1		924-16-3	N-Nitrosodi-n-butylamine	2.4E-02	ca	5.8E-02	ca	1.2E-03	ca	2.0E-03	ca		
2.8E+00	i			2.8E+00	r			0	0.10	1116-54-7	N-Nitrosodiethanolamine	1.7E-01	ca	6.2E-01	ca	2.4E-03	ca	2.4E-02	ca		
1.5E+02	i			1.5E+02	i			0	0.10	55-18-5	N-Nitrosodiethylamine	3.2E-03	ca	1.1E-02	ca	4.5E-05	ca	4.5E-04	ca		
5.1E+01	i			4.9E+01	i			0	0.10	62-75-9	N-Nitrosodimethylamine	9.5E-03	ca	3.4E-02	ca	1.4E-04	ca	1.3E-03	ca		
4.9E-03	i			4.9E-03	r			0	0.10	86-30-6	N-Nitrosodiphenylamine	9.9E+01	ca	3.5E+02	ca	1.4E+00	ca	1.4E+01	ca	1.0E+00	6.0E-02
7.0E+00	i			7.0E+00	r			0	0.10	621-64-7	N-Nitroso di-n-propylamine	6.9E-02	ca	2.5E-01	ca	9.6E-04	ca	9.6E-03	ca	5.0E-05	2.0E-06
2.2E+01	i			2.2E+01	r			0	0.10	10595-95-6	N-Nitroso-N-methylethylamine	2.2E-02	ca	7.8E-02	ca	3.1E-04	ca	3.1E-03	ca		
2.1E+00	i			2.1E+00	i			0	0.10	930-55-2	N-Nitrosopyrrolidine	2.3E-01	ca	8.2E-01	ca	3.1E-03	ca	3.2E-02	ca		
		1.0E-02	h			1.0E-02	r	1		99-08-1	m-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
		1.0E-02	h			1.0E-02	r	1		99-08-1	o-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
		1.0E-02	h			1.0E-02	r	1		99-99-0	p-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
		4.0E-02	i			4.0E-02	r	0	0.10	27314-13-2	Norflurazon	2.4E+03	nc	2.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
		7.0E-04	i			7.0E-04	r	0	0.10	85509-19-9	NuStar	4.3E+01	nc	4.3E+02	nc	2.6E+00	nc	2.6E+01	nc		
		3.0E-03	i			3.0E-03	r	0	0.10	32536-52-0	Octabromodiphenyl ether	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	2691-41-0	Octahydro-1357-tetranitro-1357- tetrazocine (HMX)	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		2.0E-03	h			2.0E-03	r	0	0.10	152-16-9	Octamethylpyrophosphoramide	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	19044-88-3	Oryzalin	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	19666-30-9	Oxadiazon	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	23135-22-0	Oxamyl	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		3.0E-03	i			3.0E-03	r	0	0.10	42874-03-3	Oxyfluorfen	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	76738-62-0	Paclobutrazol	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		4.5E-03	i			4.5E-03	r	0	0.10	4685-14-7	Paraquat	2.7E+02	nc	2.8E+03	nc	1.6E+01	nc	1.6E+02	nc		
		6.0E-03	h			6.0E-03	r	0	0.10	56-38-2	Parathion	3.7E+02	nc	3.7E+03	nc	2.2E+01	nc	2.2E+02	nc		

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+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		5.0E-02	h			5.0E-02	r	0	0.10	1114-71-2	Pebulate	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		4.0E-02	i			4.0E-02	r	0	0.10	40487-42-1	Pendimethalin	2.4E+03	nc	2.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
2.3E-02	h			2.3E-02	r			0	0.10	87-84-3	Pentabromo-6-chloro cyclohexane	2.1E+01	ca	7.5E+01	ca	2.9E-01	ca	2.9E+00	ca		
		2.0E-03	i			2.0E-03	r	0	0.10	32534-81-9	Pentabromodiphenyl ether	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		8.0E-04	i			8.0E-04	r	0	0.10	608-93-5	Pentachlorobenzene	4.9E+01	nc	4.9E+02	nc	2.9E+00	nc	2.9E+01	nc		
2.6E-01	h	3.0E-03	i	2.6E-01	r	3.0E-03	r	0	0.10	82-68-8	Pentachloronitrobenzene	1.9E+00	ca*	6.6E+00	ca	2.6E-02	ca	2.6E-01	ca		
1.2E-01	i	3.0E-02	i	1.2E-01	r	3.0E-02	r	0	0.25	87-86-5	Pentachlorophenol	3.0E+00	ca	9.0E+00	ca	5.6E-02	ca	5.6E-01	ca	3.0E-02	1.0E-03
		1.00E-04	x					0		7601-90-3	Perchlorate	7.8E+00	ca/nc	1.0E+02	ca/nc			3.6E+00	ca/nc		
		5.0E-02	i			5.0E-02	r	0	0.10	52645-53-1	Permethrin	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		2.5E-01	i			2.5E-01	r	0	0.10	13684-63-4	Phenmedipham	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		6.0E-01	i			6.0E-01	r	0	0.10	108-95-2	Phenol	3.7E+04	nc	1.0E+05	max	2.2E+03	nc	2.2E+04	nc	1.0E+02	5.0E+00
		2.0E-03	n			2.0E-03	r	0	0.10	92-84-2	Phenothiazine	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		6.0E-03	i			6.0E-03	r	0	0.10	108-45-2	m-Phenylenediamine	3.7E+02	nc	3.7E+03	nc	2.2E+01	nc	2.2E+02	nc		
		1.9E-01	h			1.9E-01	r	0	0.10	106-50-3	p-Phenylenediamine	1.2E+04	nc	1.0E+05	max	6.9E+02	nc	6.9E+03	nc		
		8.0E-05	i			8.0E-05	r	0	0.10	62-38-4	Phenylmercuric acetate	4.9E+00	nc	4.9E+01	nc	2.9E-01	nc	2.9E+00	nc		
1.9E-03	h			1.9E-03	r			0	0.10	90-43-7	2-Phenylphenol	2.5E+02	ca	8.9E+02	ca	3.5E+00	ca	3.5E+01	ca		
		2.0E-04	h			2.0E-04	r	0	0.10	298-02-2	Phorate	1.2E+01	nc	1.2E+02	nc	7.3E-01	nc	7.3E+00	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	732-11-6	Phosmet	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		3.0E-04	i			8.6E-05	I	0	0.10	7803-51-2	Phosphine	1.8E+01	nc	1.8E+02	nc	3.1E-01	nc	1.1E+01	nc		
						2.9E-03	i			7664-38-2	Phosphoric acid					1.0E+01	nc				
		2.0E-05	I					0		7723-14-0	Phosphorus (white)	1.6E+00	nc	2.0E+01	nc			7.3E-01	nc		
		1.0E+00	h			1.0E+00	r	0	0.10	100-21-0	p-Phthalic acid	6.1E+04	nc	1.0E+05	max	3.7E+03	nc	3.6E+04	nc		
		2.0E+00	i			3.4E-02	h	0	0.10	85-44-9	Phthalic anhydride	1.0E+05	max	1.0E+05	max	1.2E+02	nc	7.3E+04	nc		
		7.0E-02	i			7.0E-02	r	0	0.10	1918-02-1	Picloram	4.3E+03	nc	4.3E+04	nc	2.6E+02	nc	2.6E+03	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	29232-93-7	Pirimiphos-methyl	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
8.9E+00	h	7.0E-06	h	8.9E+00	r	7.0E-06	r	0	0.10		Polybrominated biphenyls	5.5E-02	ca**	1.9E-01	ca*	7.6E-04	ca*	7.6E-03	ca*		
2.0E+00	i			2.0E+00	I			0	0.14	1336-36-3	Polychlorinated biphenyls (PCBs)	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		
7.0E-02	i	7.0E-05	i	7.0E-02	i	7.0E-05	r	0	0.14	12674-11-2	Aroclor 1016	3.9E+00	nc	2.1E+01	ca**	9.6E-02	ca**	9.6E-01	ca**		
2.0E+00	i			2.0E+00	i			0	0.14	11104-28-2	Aroclor 1221	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	i			2.0E+00	i			0	0.14	11141-16-5	Aroclor 1232	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	i			2.0E+00	i			0	0.14	53469-21-9	Aroclor 1242	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	I			2.0E+00	i			0	0.14	12672-29-6	Aroclor 1248	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	i	2.0E-05	i	2.0E+00	i	2.0E-05	r	0	0.14	11097-69-1	Aroclor 1254	2.2E-01	ca**	7.4E-01	ca*	3.4E-03	ca*	3.4E-02	ca*		
2.0E+00	I			2.0E+00	i			0	0.14	11096-82-5	Aroclor 1260	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		

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TOXICITY INFORMATION									CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C / skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
4.5E+00	n			4.5E+00	r			0.10	61788-33-8	**Polychlorinated terphenyls**	1.1E-01	ca	3.8E-01	ca	1.5E-03	ca	1.5E-02	ca		
								0.13		Polynuclear aromatic hydrocarbons (PAHs)										
		6.0E-02	i			6.0E-02	r	1	83-32-9	Acenaphthene	3.7E+03	nc	2.9E+04	nc	2.2E+02	nc	3.7E+02	nc	5.7E+02	2.9E+01
		3.0E-01	i			3.0E-01	r	1	120-12-7	Anthracene	2.2E+04	nc	1.0E+05	max	1.1E+03	nc	1.8E+03	nc	1.2E+04	5.9E+02
7.3E-01	n			7.3E-01	r			0	0.13	56-55-3	**Benz[a]anthracene**	6.2E-01	ca	2.1E+00	ca	9.2E-03	ca	9.2E-02	ca	2.0E+00	8.0E-02
7.3E-01	n			7.3E-01	r			0	0.13	205-99-2	**Benzo[b]fluoranthene**	6.2E-01	ca	2.1E+00	ca	9.2E-03	ca	9.2E-02	ca	5.0E+00	2.0E-01
7.3E-02	n			7.3E-02	r			0	0.13	207-08-9	**Benzo[k]fluoranthene**	6.2E+00	ca	2.1E+01	ca	9.2E-02	ca	9.2E-01	ca	4.9E+01	2.0E+00
1.2E+00				3.9E-01					0.13	207-08-9	**"CAL-Modified PRG"**	3.8E-01	ca	1.3E+00	ca	1.7E-02	ca	5.6E-02	ca		
7.3E+00	i			7.3E+00	r			0	0.13	50-32-8	**Benzo[a]pyrene**	6.2E-02	ca	2.1E-01	ca	9.2E-04	ca	9.2E-03	ca	8.0E+00	4.0E-01
7.3E-03	n			7.3E-03	r			0	0.13	218-01-9	**Chrysene**	6.2E+01	ca	2.1E+02	ca	9.2E-01	ca	9.2E+00	ca	1.6E+02	8.0E+00
1.2E-01				3.9E-02					0.13		**"CAL-Modified PRG"**	3.8E+00	ca	1.3E+01	ca	1.7E-01	ca	5.6E-01	ca		
7.3E+00	n			7.3E+00	r			0	0.13	53-70-3	**Dibenz[ah]anthracene**	6.2E-02	ca	2.1E-01	ca	9.2E-04	ca	9.2E-03	ca	2.0E+00	8.0E-02
		4.0E-02	i			4.0E-02	r	0	0.13	206-44-0	Fluoranthene	2.3E+03	nc	2.2E+04	nc	1.5E+02	nc	1.5E+03	nc	4.3E+03	2.1E+02
		4.0E-02	i			4.0E-02	r	1		86-73-7	Fluorene	2.7E+03	nc	2.6E+04	nc	1.5E+02	nc	2.4E+02	nc	5.6E+02	2.8E+01
7.3E-01	n			7.3E-01	r			0	0.13	193-39-5	**Indeno[1,2,3-cd]pyrene**	6.2E-01	ca	2.1E+00	ca	9.2E-03	ca	9.2E-02	ca	1.4E+01	7.0E-01
		2.0E-02	i			8.6E-04	i	1		91-20-3	Naphthalene	5.6E+01	nc	1.9E+02	nc	3.1E+00	nc	6.2E+00	nc	8.4E+01	4.0E+00
		3.0E-02	i			3.0E-02	r	1		129-00-0	Pyrene	2.3E+03	nc	2.9E+04	nc	1.1E+02	nc	1.8E+02	nc	4.2E+03	2.1E+02
1.5E-01	i	9.0E-03	i	1.5E-01	r	9.0E-03	r	0	0.10	67747-09-5	Prochloraz	3.2E+00	ca	1.1E+01	ca	4.5E-02	ca	4.5E-01	ca		
		6.0E-03	h			6.0E-03	r	0	0.10	26399-36-0	Profluralin	3.7E+02	nc	3.7E+03	nc	2.2E+01	nc	2.2E+02	nc		
		1.5E-02	i			1.5E-02	r	0	0.10	1610-18-0	Prometon	9.2E+02	nc	9.2E+03	nc	5.5E+01	nc	5.5E+02	nc		
		4.0E-03	i			4.0E-03	r	0	0.10	7287-19-6	Prometryn	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		7.5E-02	i			7.5E-02	r	0	0.10	23950-58-5	Pronamide	4.6E+03	nc	4.6E+04	nc	2.7E+02	nc	2.7E+03	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	1918-16-7	Propachlor	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	709-98-8	Propanil	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	2312-35-8	Propargite	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-03	i			2.0E-03	r	0	0.10	107-19-7	Propargyl alcohol	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	139-40-2	Propazine	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	122-42-9	Propham	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	60207-90-1	Propiconazole	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		1.0E-01	i			1.1E-01	i	1		98-82-8	Isopropylbenzene (Cumene)	1.6E+02	nc	5.2E+02	nc	4.0E+02	nc	6.6E+02	nc		
		4.00E-02	n			4.00E-02	r	1		103-65-1	**n-Propylbenzene**	2.4E+02	sat	2.4E+02	sat	1.5E+02	nc	2.4E+02	nc		
		5.0E-01	h			8.6E-04	h	0	0.10	57-55-6	**Propylene glycol**	3.0E+04	nc	1.0E+05	max	3.1E+00	nc	1.8E+04	nc		
		7.0E-01	h			7.0E-01	r	0	0.10	52125-53-8	Propylene glycol, monoethyl ether	4.3E+04	nc	1.0E+05	max	2.6E+03	nc	2.6E+04	nc		
		7.0E-01	h			5.7E-01	i	0	0.10	107-98-2	Propylene glycol, monomethyl ether	4.3E+04	nc	1.0E+05	max	2.1E+03	nc	2.6E+04	nc		
2.4E-01	i	8.6E-03	r	1.3E-02	i	8.6E-03	i	1		75-56-9	Propylene oxide	1.9E+00	ca*	6.6E+00	ca*	5.2E-01	ca*	2.2E-01	ca		

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SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		2.5E-01	I			2.5E-01	r	0	0.10	81335-77-5	Pursuit	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		2.5E-02	I			2.5E-02	r	0	0.10	51630-58-1	Pydrin	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		1.0E-03	I			1.0E-03	r	0	0.10	110-86-1	Pyridine	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		5.0E-04	i			5.0E-04	r	0	0.10	13593-03-8	Quinalphos	3.1E+01	nc	3.1E+02	nc	1.8E+00	nc	1.8E+01	nc		
3.0E+00	i			3.0E+00	r			0	0.10	91-22-5	**Quinoline**	1.6E-01	ca	5.7E-01	ca	2.2E-03	ca	2.2E-02	ca		
1.1E-01	i	3.0E-03	I	1.1E-01	r	3.0E-03	r	0	0.10	121-82-4	RDX (Cyclonite)	4.4E+00	ca*	1.6E+01	ca	6.1E-02	ca	6.1E-01	ca		
		3.0E-02	I			3.0E-02	r	0	0.10	10453-86-8	Resmethrin	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		5.0E-02	h			5.0E-02	r	0	0.10	299-84-3	Ronnel	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		4.0E-03	i			4.0E-03	r	0	0.10	83-79-4	Rotenone	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	78587-05-0	Savey	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		5.0E-03	i					0	0.10	7783-00-8	Selenious Acid	3.1E+02	nc	3.1E+03	nc			1.8E+02	nc		
		5.0E-03	i					0		7782-49-2	Selenium	3.9E+02	nc	5.1E+03	nc			1.8E+02	nc	5.0E+00	3.0E-01
		5.0E-03	h					0	0.10	630-10-4	Selenourea	3.1E+02	nc	3.1E+03	nc			1.8E+02	nc		
		9.0E-02	i			9.0E-02	r	0	0.10	74051-80-2	Sethoxydim	5.5E+03	nc	5.5E+04	nc	3.3E+02	nc	3.3E+03	nc		
		5.0E-03	I					0		7440-22-4	Silver and compounds	3.9E+02	nc	5.1E+03	nc			1.8E+02	nc	3.4E+01	2.0E+00
1.2E-01	h	5.0E-03	i	1.2E-01	r	2.0E-03	r	0	0.10	122-34-9	Simazine	4.1E+00	ca*	1.4E+01	ca	5.6E-02	ca	5.6E-01	ca		
		4.0E-03	i							26628-22-8	Sodium azide										
2.7E-01	h	3.0E-02	i	2.7E-01	r	3.0E-02	r	0	0.10	148-18-5	Sodium diethyldithiocarbamate	1.8E+00	ca	6.4E+00	ca	2.5E-02	ca	2.5E-01	ca		
		2.0E-05	i			2.0E-05	r	0	0.10	62-74-8	Sodium fluoroacetate	1.2E+00	nc	1.2E+01	nc	7.3E-02	nc	7.3E-01	nc		
		1.0E-03	h			1.0E-03	r	0	0.10	13718-26-8	Sodium metavanadate	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		6.0E-01	i					0		7440-24-6	Strontium, stable	4.7E+04	nc	1.0E+05	max			2.2E+04	nc		
		3.0E-04	i			3.0E-04	r	0	0.10	57-24-9	Strychnine	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
		2.0E-01	i			2.9E-01	i	1		100-42-5	Styrene	1.7E+03	sat	1.7E+03	sat	1.1E+03	nc	1.6E+03	nc	4.0E+00	2.0E-01
		1.00E-03	n			1.00E-03	r			80-07-9	1,1'-Sulfonylbis (4-chlorobenzene)	7.8E+01	nc	1.0E+03	nc	3.7E+00	nc	3.6E+01	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	88671-89-0	Systhane	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
1.5E+05	h			1.5E+05	h			0	0.03	1746-01-6	2,3,7,8-TCDD (dioxin)	3.9E-06	ca	1.6E-05	ca	4.5E-08	ca	4.5E-07	ca		
		7.0E-02	i			7.0E-02	r	0	0.10	34014-18-1	Tebuthiuron	4.3E+03	nc	4.3E+04	nc	2.6E+02	nc	2.6E+03	nc		
		2.0E-02	h			2.0E-02	r	0	0.10	3383-96-8	Temephos	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	5902-51-2	Terbacil	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		2.5E-05	h			2.5E-05	r	0	0.10	13071-79-9	Terbufos	1.5E+00	nc	1.5E+01	nc	9.1E-02	nc	9.1E-01	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	886-50-0	Terbutryn	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		3.0E-04	i			3.0E-04	r	0	0.10	95-94-3	1,2,4,5-Tetrachlorobenzene	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
2.6E-02	i	3.0E-02	i	2.6E-02	i	3.0E-02	r	1		630-20-6	1,1,1,2-Tetrachloroethane	3.2E+00	ca	7.3E+00	ca	2.6E-01	ca	4.3E-01	ca		
2.0E-01	i	6.00E-02	n	2.0E-01	I	6.00E-02	r	1		79-34-5	1,1,2,2-Tetrachloroethane	4.1E-01	ca	9.3E-01	ca	3.3E-02	ca	5.5E-02	ca	3.0E-03	2.0E-04
5.2E-02	n	1.0E-02	i	1.00E-02	n	1.7E-01	n	1		127-18-4	**Tetrachloroethylene (PCE)**	1.5E+00	ca*	3.4E+00	ca*	6.7E-01	ca	6.6E-01	ca	6.0E-02	3.0E-03
		3.0E-02	i			3.0E-02	r	0	0.10	58-90-2	2,3,4,6-Tetrachlorophenol	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS h=HEAST n=NCEA x=Withdrawn o=Other EPA Source r=Route-extrapolation ca=Cancer PRG nc=Noncancer PRG ca* (where: nc < 100X ca) ca**(where: nc < 10X ca)
+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
2.0E+01	h			2.0E+01	r			0	0.10	5216-25-1	p,a,a,a-Tetrachlorotoluene	2.4E-02	ca	8.6E-02	ca	3.4E-04	ca	3.4E-03	ca		
2.4E-02	h	3.0E-02	i	2.4E-02	r	3.0E-02	r	0	0.10	961-11-5	Tetrachlorovinphos	2.0E+01	ca*	7.2E+01	ca	2.8E-01	ca	2.8E+00	ca		
		5.0E-04	i			5.0E-04	r	0	0.10	3689-24-5	Tetraethyldithiopyrophosphate	3.1E+01	nc	3.1E+02	nc	1.8E+00	nc	1.8E+01	nc		
7.6E-03	n	2.1E-01	n	6.8E-03	n	8.6E-02	n	1		109-99-9	**Tetrahydrofuran**	9.4E+00	ca	2.1E+01	ca	9.9E-01	ca	1.6E+00	ca		
		6.6E-05	I					0		7440-28-0	Thallium and compounds+++	5.2E+00	nc	6.7E+01	nc			2.4E+00	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	28249-77-6	Thiobencarb	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		5.0E-02	n			5.0E-02	r	0	0.10	N/A	**Thiocyanate**	3.1E+03	nc	1.0E+05	max	1.8E+02	nc	1.8E+03	nc		
		3.0E-04	h			3.0E-04	r	0	0.10	39196-18-4	Thiofanox	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
		8.0E-02	i			8.0E-02	r	0	0.10	23564-05-8	Thiophanate-methyl	4.9E+03	nc	4.9E+04	nc	2.9E+02	nc	2.9E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	137-26-8	Thiram	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		6.0E-01	h					0			Tin (inorganic, see tributyltin oxide for organic tin)	4.7E+04	nc	1.0E+05	max			2.2E+04	nc		
		2.0E-01	i			1.1E-01	i	1		108-88-3	Toluene	5.2E+02	sat	5.2E+02	sat	4.0E+02	nc	7.2E+02	nc	1.2E+01	6.0E-01
3.2E+00	h			3.2E+00	r			0	0.10	95-80-7	Toluene-2,4-diamine	1.5E-01	ca	5.4E-01	ca	2.1E-03	ca	2.1E-02	ca		
		6.0E-01	h			6.0E-01	r	0	0.10	95-70-5	Toluene-2,5-diamine	3.7E+04	nc	1.0E+05	max	2.2E+03	nc	2.2E+04	nc		
		2.0E-01	h			2.0E-01	r	0	0.10	823-40-5	Toluene-2,6-diamine	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
2E-01	i			2E-01	r			0	0.10	106-49-0	p-Toluidine	2.6E+00	ca	9.1E+00	ca	3.5E-02	ca	3.5E-01	ca		
1.1E+00	i			1.1E+00	i			0	0.10	8001-35-2	Toxaphene	4.4E-01	ca	1.6E+00	ca	6.0E-03	ca	6.1E-02	ca	3.1E+01	2.0E+00
		7.5E-03	i			7.5E-03	r	0	0.10	66841-25-6	Tralomethrin	4.6E+02	nc	4.6E+03	nc	2.7E+01	nc	2.7E+02	nc		
		1.3E-02	I			1.3E-02	r	0	0.10	2303-17-5	Triallate	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	82097-50-5	Triasulfuron	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	615-54-3	1,2,4-Tribromobenzene	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		3.0E-04	i					0	0.10	56-35-9	Tributyltin oxide (TBTO)	1.8E+01	nc	1.8E+02	nc			1.1E+01	nc		
3.4E-02	h			3.4E-02	r			0	0.10	634-93-5	2,4,6-Trichloroaniline	1.4E+01	ca	5.1E+01	ca	2.0E-01	ca	2.0E+00	ca		
2.9E-02	h			2.9E-02	r			0	0.10	33663-50-2	2,4,6-Trichloroaniline hydrochloride	1.7E+01	ca	5.9E+01	ca	2.3E-01	ca	2.3E+00	ca		
		1.0E-02	i			5.7E-02	h	1		120-82-1	1,2,4-Trichlorobenzene	6.5E+02	nc	3.0E+03	sat	2.1E+02	nc	1.9E+02	nc	5.0E+00	3.0E-01
		2.8E-01	n			6.3E-01	n	1		71-55-6	**1,1,1-Trichloroethane**	1.2E+03	sat	1.2E+03	sat	2.3E+03	nc	3.2E+03	nc	2.0E+00	1.0E-01
5.7E-02	i	4.0E-03	i	5.6E-02	i	4.0E-03	r	1		79-00-5	1,1,2-Trichloroethane	7.3E-01	ca*	1.6E+00	ca*	1.2E-01	ca	2.0E-01	ca	2.0E-02	9.0E-04
4.00E-01	n	3.00E-04	n	4.00E-01	n	1.00E-02	n	1		79-01-6	**Trichloroethylene (TCE)**	5.3E-02	ca	1.1E-01	ca	1.7E-02	ca	2.8E-02	ca	6.0E-02	3.0E-03
		3.0E-01	i			2.0E-01	h	1		75-69-4	Trichlorofluoromethane	3.9E+02	nc	2.0E+03	sat	7.3E+02	nc	1.3E+03	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	95-95-4	2,4,5-Trichlorophenol	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc	2.7E+02	1.4E+01
1.1E-02	i	1.0E-04	n	1.1E-02	i	1.0E-04	r	0	0.10	88-06-2	**2,4,6-Trichlorophenol**	6.1E+00	nc**	6.2E+01	nc**	3.7E-01	nc**	3.6E+00	nc**	2.0E-01	8.0E-03
7.0E-02				7.0E-02					0.10	88-06-2	**"CAL-Modified PRG"**	6.9E+00	ca	2.5E+01	ca	9.6E-02	ca	9.6E-01	ca		
		1.0E-02	i			1.0E-02	r	0	0.10	93-76-5	2,4,5-Trichlorophenoxyacetic Acid	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		8.0E-03	i			8.0E-03	r	0	0.10	93-72-1	2-(2,4,5-Trichlorophenoxy) propionic acid	4.9E+02	nc	4.9E+03	nc	2.9E+01	nc	2.9E+02	nc		
		5.0E-03	i			5.0E-03	r	1		598-77-6	1,1,2-Trichloropropane	1.5E+01	nc	5.1E+01	nc	1.8E+01	nc	3.0E+01	nc		
2.0E+00	n	6.0E-03	i	2.0E+00	r	1.4E-03	n	1		96-18-4	**1,2,3-Trichloropropane**	5.0E-03	ca	1.1E-02	ca	3.4E-03	ca	5.6E-03	ca		

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+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		5.0E-03	h			5.0E-03	r	1		96-19-5	1,2,3-Trichloropropene	1.2E+01	nc	3.8E+01	nc	1.8E+01	nc	3.0E+01	nc		
		3.0E-03	i			3.0E-03	r	0	0.10	58138-08-2	Tridiphane	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
		2.0E-03	r			2.0E-03	i	1		121-44-8	Triethylamine	2.3E+01	nc	8.6E+01	nc	7.3E+00	nc	1.2E+01	nc		
7.7E-03	i	7.5E-03	i	7.7E-03	r	7.5E-03	r	0	0.10	1582-09-8	Trifluralin	6.3E+01	ca**	2.2E+02	ca*	8.7E-01	ca*	8.7E+00	ca*		
		1.400E-04	r			1.400E-04	n		0.10	552-30-7	Trimellitic Anhydride (TMAN)	8.6E+00	nc	8.6E+01	nc	5.1E-01	nc	5.1E+00			
		5.0E-02	n			1.7E-03	n	1		95-63-6	1,2,4-Trimethylbenzene	5.2E+01	nc	1.7E+02	nc	6.2E+00	nc	1.2E+01	nc		
		5.0E-02	n			1.7E-03	n	1		108-67-8	1,3,5-Trimethylbenzene	2.1E+01	nc	7.0E+01	nc	6.2E+00	nc	1.2E+01	nc		
3.7E-02	h			3.7E-02	r			0	0.10	512-56-1	Trimethyl phosphate	1.3E+01	ca	4.7E+01	ca	1.8E-01	ca	1.8E+00	ca		
		3.0E-02	i			3.0E-02	r	0	0.10	99-35-4	1,3,5-Trinitrobenzene	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		1.0E-02	h			1.0E-02	r	0	0.10	479-45-8	Trinitrophenylmethylnitramine	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
3E-02	i	5.0E-04	i	3E-02	r	5.0E-04	r	0	0.10	118-96-7	2,4,6-Trinitrotoluene	1.6E+01	ca**	5.7E+01	ca**	2.2E-01	ca**	2.2E+00	ca**		
		5.00E-03	n			5.00E-03	r		0.10	791-28-6	**Triphenylphosphine oxide**	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
3.2E-03	n	1.1E-01	n	3.2E-03	r	1.1E-01	r		0.10	115-96-8	**Tris(2-chloroethyl) phosphate**	1.5E+02	ca*	5.4E+02	ca	2.1E+00	ca	2.1E+01	ca		
		2.00E-04	n							7440-61-0	Uranium (chemical toxicity only)	1.6E+01	nc	2.0E+02	nc			7.3E+00	nc		
		7.0E-03	h					0		7440-62-2	Vanadium and compounds	5.5E+02	nc	7.2E+03	nc			2.6E+02	nc	6.0E+03	3.0E+02
		1.0E-03	i			1.0E-03	r	0	0.10	1929-77-7	Vernam	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	50471-44-8	Vinclozolin	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		1.0E+00	h			5.7E-02	i	1		108-05-4	Vinyl acetate	4.3E+02	nc	1.4E+03	nc	2.1E+02	nc	4.1E+02	nc	1.7E+02	8.0E+00
1.1E-01	r	8.6E-04	r	1.1E-01	h	8.6E-04	i	1		593-60-2	Vinyl bromide (bromoethene)	1.9E-01	ca*	4.2E-01	ca*	6.1E-02	ca*	1.0E-01	ca*		
1.5E+00	i	3.00E-03	i	3.1E-02	i	2.86E-02	i	1		75-01-4	**Vinyl chloride (child/adult)+++**	7.9E-02	ca			1.1E-01	ca	2.0E-02	ca	1.0E-02	7.0E-04
7.5E-01	i	3.00E-03	i	1.6E-02	i	2.86E-02	i	1		75-01-4	Vinyl chloride (adult)			7.5E-01	ca						
		3.0E-04	i			3.0E-04	r	0	0.10	81-81-2	Warfarin	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
		7.0E-01	i			2.9E-02	i	1	0.10	1330-20-7	**Xylenes**	2.7E+02	nc	4.2E+02	sat	1.1E+02	nc	2.1E+02	nc	2.1E+02	1.0E+01
		3.0E-01	i					0		7440-66-6	Zinc	2.3E+04	nc	1.0E+05	max			1.1E+04	nc	1.2E+04	6.2E+02
		3.0E-04	i					0		1314-84-7	Zinc phosphide	2.3E+01	nc	3.1E+02	nc			1.1E+01	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	12122-67-7	Zineb	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		

APPENDIX E

ATSDR ToxFAQs

BARIUM
CAS # 7440-39-3

This fact sheet answers the most frequently asked health questions (FAQs) about barium. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to barium occurs mostly in the workplace or from drinking contaminated water. Ingesting high levels of barium can cause problems with the heart, stomach, liver, kidneys, and other organs. This chemical has been found in at least 649 of 1,416 National Priorities List sites identified by the Environmental Protection Agency.

What is barium?

(Pronounced bär'ē-əm)

Barium is a silvery-white metal found in nature. It occurs combined with other chemicals such as sulfur or carbon and oxygen. These combinations are called compounds. Barium compounds can also be produced by industry.

Barium compounds are used by the oil and gas industries to make drilling muds. Drilling muds make it easier to drill through rock by keeping the drill bit lubricated. They are also used to make paint, bricks, tiles, glass, and rubber.

A barium compound (barium sulfate) is sometimes used by doctors to perform medical tests and to take x-rays of the stomach.

What happens to barium when it enters the environment?

- Barium gets into the air during the mining, refining, and production of barium compounds, and from the burning of coal and oil.
- Some barium compounds dissolve easily in water and are found in lakes, rivers, and streams.
- Barium is found in most soils and foods at low levels.
- Fish and aquatic organisms accumulate barium.

How might I be exposed to barium?

- Breathing very low levels in air, drinking water, and eating food.
- Breathing higher levels in air while working in industries that make or use barium compounds.
- Drinking water containing high levels of barium from natural sources.
- Breathing air near barium mining or processing plants.

How can barium affect my health?

The health effects of the different barium compounds depend on how well the compound dissolves in water. Barium compounds that do not dissolve well in water are not generally harmful and are often used by doctors for medical purposes.

Those barium compounds that dissolve well in water may cause harmful health effects in people. Ingesting high levels of barium compounds that dissolve well in water over the short term has resulted in

- Difficulties in breathing
- Increased blood pressure
- Changes in heart rhythm
- Stomach irritation.

- Brain swelling
- Muscle weakness
- Damage to the liver, kidney, heart, and spleen.

We don't know the effects in people of ingesting low levels of barium over the long term. Animal studies have found increased blood pressure and changes in the heart from ingesting barium over a long time. We don't know the effects of barium from breathing it or from touching it.

How likely is barium to cause cancer?

The Department of Health and Human Services, the International Agency for Research on Cancer, and the Environmental Protection Agency (EPA) have not classified barium as to its human carcinogenicity.

Barium has not been classified because there are no studies in people and the two available animal studies were inadequate to determine whether or not barium causes cancer.

Is there a medical test to show whether I've been exposed to barium?

There is no routine medical test to show whether you have been exposed to barium. However, doctors can measure barium in the blood, bones, urine, and feces, using very complex instruments. Due to the complexity of the tests, these tests are usually done only for cases of severe barium poisoning and for medical research.

Has the federal government made recommendations to protect human health?

EPA allows 2 parts of barium per million parts of drinking water (2 ppm). EPA requires that discharges or spills into the environment of 10 pounds or more of barium cyanide be reported.

The Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and the American Conference of Governmental Industrial Hygienists (ACGIH) have set an occupational exposure limit of 0.5 milligrams of soluble barium compounds per cubic meter of air (0.5 mg/m^3) for an 8-hour workday, 40-hour workweek.

The OSHA exposure limit for barium sulfate dust in air is 5 to 15 milligrams of barium per cubic meter of air (5–15 mg/m^3).

NIOSH currently recommends that a level of 50 mg/m^3 be considered immediately dangerous to life and health. This is the exposure level of barium that is likely to cause permanent health problems or death.

Glossary

Carcinogenicity: Ability to cause cancer.

Ingesting: Taking food or drink into your body.

Long-term: Lasting one year or longer.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Short-term: Lasting 14 days or less.

Soluble: Dissolves well in liquid.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1992. Toxicological profile for barium. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-639-6359. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.