Targeted Brownfields Assessment Report for Hoopa High School Football Field 5 Loop Road Hoopa, California

TDD No.: TO-06 09-11-10-0005
Project No.: EE-002693-6020

June 2013

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 9

HOOPA VALLEY TRIBAL ENVIRONMENTAL PROTECTION AGENCY

KLAMATH TRINITY JOINT UNIFIED SCHOOL DISTRICT

Prepared by:

ECOLOGY AND ENVIRONMENT, INC.
1940 Webster Street, Suite 100
Oakland, California 94612

Superfund Technical Assessment and Response Team

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Approved by: _____
Cindy McLeod, START Program Manager
Ecology and Environment, Inc.

Approved by: _____ 6/14/13
Glenn Kistner, U.S. EPA Task Monitor
U.S. Environmental Protection Agency, Region 9

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Acronyms

APN	Assessor's Parcel Number
bgs	below ground surface
CHHSL	California human health screening level
COPC	constituent of potential concern
E & E	Ecology and Environment, Inc.
ESL	environmental screening level
FSP	field sampling plan
mg/kg	milligram per kilogram
MS/MSD	matrix spike/matrix spike duplicate
NOA	naturally occurring asbestos
OCP	organochlorine pesticides
OPP	organophosphorous pesticides
PCB	polychlorinated biphenyl
Phase I ESA	Phase I Environmental Site Assessment
QC	quality control
RCRA	Resource Conservation and Recovery Act
REC	recognized environmental condition
RPD	relative percent difference
RSL	regional screening level
START	Superfund Technical Assessment and Response Team
SVOC	semi-volatile organic compounds
TBA	targeted brownfields assessment

TEPA	Hoopa Valley Tribal Environmental Protection Agency
TPH-d	total petroleum hydrocarbons as diesel
TPH-mo	total petroleum hydrocarbons as motor oil
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey

1 Introduction

At the request of the Hoopa Valley Tribal Environmental Protection Agency (TEPA), the United States Environmental Protection Agency (U.S. EPA) Region 9 directed Ecology & Environment, Inc.'s (E & E) Superfund Technical Assessment and Response Team (START) to conduct a Targeted Brownfields Assessment (TBA) at the Hoopa High School Football Field in Hoopa, California. This sampling effort was implemented following a TBA technical assistance award to the TEPA for assessment of the football field. The site vicinity and specific features of the site are shown on Figures 1 and 2 (Appendix A).

As part of this TBA for the site, START prepared a *Field Sampling Plan for Targeted Brownfields Assessment of Hoopa High School Football Field, Hoopa, California* (FSP), dated November 2012 (E & E 2012b), for collection and laboratory analysis of soil samples. The FSP (E & E 2012b) is a site-specific addendum to the draft *Generic Sampling and Analysis Plan for Targeted Brownfields Assessments*, dated March 2010 (E & E 2010). The U.S. EPA Quality Assurance Office approved the FSP (E & E 2012b) in a letter dated November 19, 2012.

This assessment characterizes contaminant concentrations in shallow fill to provide the appropriate environmental data required to make decisions regarding the potential presence of contamination in soil below the football field. The specific sampling objective for the assessment was to assess potential contamination of surface soil and shallow subsurface soil in the vicinity of the football field. Laboratory analytical results for samples collected during the April 2013 assessment are summarized in Table 1 (Appendix B).

This report was prepared based on information collected from historical file review and April 2013 START field assessment activities. This report contains a summary of historical documents related to the site and discussions of the E & E START April 2013 site activities, laboratory analytical data from this assessment, findings, conclusions, and recommendations.

2 Site Background

2.1 Location

The site is located at 5 Loop Road, Hoopa, California. The geographic coordinates for the approximate center of the site are 41° 02’ 47.96” North Latitude, 123° 40’ 27.47” West Longitude. The site occupies approximately 4 acres of land within assessor’s parcel number (APN) 525-171-007 (subject property). As requested by the TEPA, the site in this assessment is defined as the portion of APN 525-171-007 that is occupied by the football field and associated structure. Figure 1 is a site vicinity map showing features and topography of the site and surrounding area. Figure 2 is a site detail map showing major features of the site. Figures are contained in Appendix A.

2.2 Site Description

The site is located in a mixed commercial and residential area of Hoopa, California. The surrounding and nearby properties consist of residences, classrooms and baseball field for the Hoopa Valley High School, tribal offices, a fisheries facility, and the local fire department. Figure 1 (Appendix A) shows the site and vicinity.

The subject site is currently occupied by a football field and three buildings: a single-story restroom building with wood siding at the northwest end of the football field, a two-story announcer’s booth with wood siding along the southwestern edge of the football field, and a storage shed with sheet metal siding along the northeast edge of the football field. Figure 2 shows details of the subject property including the locations of structures.

2.3 Topographic and Geologic Information

According to the U.S. Geological Survey (USGS) *Hoopa 7.5-minute Quadrangle*, 1997 (USGS 1997), the elevation of the ground surface at the site is approximately 335 feet above sea level. Topography of the site is relatively flat with a gentle slope in an easterly direction. Regional topography slopes in a general easterly direction toward the Trinity River.

According to the *California Geomorphic Provinces, Note 36,* California Geological Survey, prepared by D.L. Wagner, December 2002 (Wagner 2002), the site is located near the western edge of the Klamath Mountains physiographic province of California. The Klamath Mountains are northwest-trending mountain ranges (6,000 to 8,000 feet elevation above sea level) with northwest-trending valleys. According to the *Geologic Map of California Weed Sheet*, State of California Division of Mines and Geology, Compiled by Rudolph G. Strand, 1963 (Strand 1963), rocks in the vicinity of the site consist of late Jurassic sedimentary rocks. Rock types in the vicinity of the site include slaty and phyllitic sandstone, shale, and minor conglomerate with ultramafic rocks exposed within a few hundred feet west of the site along an inferred fault. Ultramafic rocks are also mapped in the Trinity River drainage basin up-stream from the site. According to the *Geologic Map of California Weed Sheet* (Strand 1963), the site is underlain by quaternary sediments of the Trinity River flood plain.

According to a September 2012 *Phase I Environmental Site Assessment* (Phase I ESA) prepared by E & E (E & E 2012a), soils in the site area were determined to be a xerofluvent sandy soil. Xerofluvent soil is well drained to excessively drained and deep sandy to gravelly soil with excessive drainage rates. The xerofluvent soil is at least 60 inches in thickness with bedrock underlying it. The xerofluvent soil component does not meet the requirements for a hydric soil. According to *Report Evaluation of Soil and Ground Water at Former Unocal Bulk Plant No. 0289*, prepared by Applied GeoSystems, May 25, 1991 (Former Unocal Bulk Plant Assessment Report) - (Applied GeoSystems 1991), soil at the Former Unocal Bulk Plant, which is located approximately 1.5 miles north of the subject site, consists mostly of sand and gravel to the total explored depth of approximately 50 feet below ground surface (bgs). Soil conditions at the subject site are anticipated to be similar to those encountered at the Former Unocal Bulk Plant because both sites are located in similar geologic settings. Depth to bedrock at the site is anticipated to be less than at the Former Unocal Bulk Plant because the site is located more distal to the Trinity River near the margin of the flood plain.

The site is located near the margin of a river terrace within the flood plain of the Trinity River. According to the Former Unocal Bulk Plant Assessment Report (Applied GeoSystems 1991), areas in the vicinity of that site (approximately 1.5 miles north of the subject site) are underlain by recent fluvial deposits of the Trinity River extending to a depth of approximately 50 feet bgs, where bedrock was encountered. Groundwater at the Former Unocal Bulk Plant site was encountered at depths ranging from 36 to 45 feet bgs and was calculated to flow in a northerly direction.

No specific groundwater depth or flow direction information is available for the site. Because the site is located near the margin of a river terrace of the Trinity River, bedrock and groundwater are likely to be encountered at much shallower depths than at the Former Unocal Bulk Plant site. Groundwater flow direction is anticipated to be in an easterly direction toward the Trinity River.

Soil encountered at the site during the April 2013 sampling event consists of either sandy silt or sand and gravel with silt and clay. Soil encountered within the perimeter of the running track consists of a surface fill layer of sandy silt ranging from 0.5 to 2.75 feet in thickness. The sandy silt fill is reported by the TEPA to have been imported from near the Celtor Chemical Works National Priorities List site. Soil encountered below the sandy silt and at the other boring locations generally consists of sand and gravel (both native and imported fill) containing varying amounts of silt and clay. Groundwater was not encountered during the April 2013 sampling event at the total explored depth of 8 feet bgs.

2.4 Site History

The TEPA indicated that the site has been used as the High School football field since the property was donated to the Klamath Trinity Joint Unified School District in 1933 by the Hoopa Valley Tribe. According to the TEPA, the site may have historically been the location of residential home sites.

2.4.1 Current Uses

The site is currently used as the football field for the portion of the Klamath Trinity Joint Unified School District property that is occupied by the Hoopa Valley High School.

2.4.2 Previous Investigations on the Subject Property

No previous samples have been collected from the site for laboratory analysis prior to this TBA.

In September of 2012, a Phase I ESA (E & E 2012) was prepared by E & E as part of this TBA. As part of the Phase I ESA, E & E identified two recognized environmental conditions (RECs) in connection with the subject property. The known presence of a thin layer of soil in fill below the site that potentially contains arsenic, cadmium, copper, mercury, selenium, zinc, cyanide, and naturally occurring asbestos (NOA) is one of the RECs identified in relation to the site. The known presence of fill at the site that was imported from an unknown number of multiple unknown locations and that potentially contains NOA is the second REC identified in relation to the site. The assessment proposed in the FSP (E & E 2012b) was designed to address the RECs identified in the Phase I ESA following the numerous assessment guidance documents established by the California Department of Toxic Substances Control that are specific to environmental assessments at school properties.

2.4.3 Previous Investigations at the Celtor Chemical Works Property

The Celtor Chemical Works site is located roughly 6 miles north of the subject site. The Celtor Chemical Works site is not of concern in this assessment as a potential source for contamination at the subject site except for the potential contamination resulting when fill was imported to the subject site from near the Celtor Chemical Works. Discussion of the Celtor Chemical Works site is provided here because fill is known to have been brought from near there to the subject site before any cleanup was performed. According to an *EPA Superfund Record of Decision: Celtor Chemical Works*, U.S. EPA, September 30, 1985 (U.S. EPA 1985), results of a remedial investigation performed by U.S. EPA revealed that the Celtor Chemical Works site posed a threat to human health and the environment from high levels of arsenic, cadmium, copper, lead, and zinc in soil and surface water, but not in groundwater. Before remediation, the maximum concentrations of metals detected at the site were: arsenic at 600 milligrams per kilogram (mg/kg), cadmium at 310 mg/kg, copper at 25,500 mg/kg, lead at 1,680 mg/kg, and zinc at 62,100 mg/kg (U.S. EPA 1985).

According to a *Second Five-Year Review Report for Celtor Chemical Works Superfund Site*, U.S. EPA, August 29, 2001 (U.S. EPA 2001), soil removal and additional soil assessment activities were performed pursuant to the 1985 Record of Decision (U.S. EPA 1985). According to the Second Five-Year Review Report (U.S. EPA 2001), the 1985 Record of Decision was modified to add cleanup levels for mercury, selenium, and cyanide in soil, though subsequent additional soil sampling confirmed that none of the additional three constituents were present above the project action levels. The only sampling for mercury, selenium, and cyanide was performed after the cleanup was complete. The Second Five-Year Review Report (U.S. EPA 2001) concluded that no further five-year reviews were planned and that the site would be considered for de-listing from the National Priorities List pending resolution of items of concern identified in the report.

3 E & E START Activities

From April 2 to 3, 2013, the START collected soil samples from 17 boring locations at the site. Sampling locations are shown on Figure 2 (Appendix A). Laboratory analytical results are presented in Table 1 (Appendix B). Photographs documenting field sampling activities are contained in Appendix C. Boring logs documenting soils encountered during the April 2013 sampling event are contained in Appendix D. Laboratory analytical and data validation reports are provided on a data disc inside the back cover of this report.

3.1 Deviations from the Field Sampling Plan

E & E START performed field assessment activities in accordance with the FSP (E & E 2012b), as approved by the U.S. EPA Quality Assurance Office, except as discussed below.

Community members had indicated to the TEPA that soil was historically imported to the football field from near the Celtor Chemical Works site, but that it was only used as a thin surface layer on the field to promote the growth of lawn. During field sampling activities, the START observed surface sandy silt soil only within the footprint of the football field, but at thicknesses ranging up to 2.5 feet bgs instead of a thin surface layer, as previously reported. Instead of collecting the proposed surface samples from a depth range of 0 to 0.5 feet bgs as described in the FSP, the entire surface layer of soil was collected as a composite of the full thickness of the surface fill. This change was made in the field to ensure that sampling methods would still characterize the fill considering the unexpected thickness.

Soil observed below the sandy silt surface fill appeared to be at the same elevation of the original ground surface as observed at the off-site residence to the south and appeared to have a similar texture to soil collected in other locations at the approximate elevation of the original (pre-fill) ground surface as observed at the off-site residence adjacent to the south. Deeper fill samples were not collected from borings within the footprint of the football field because there did not appear to be additional fill below the sandy silt fill.

Soil sample HFF-Field-017-S was inadvertently not collected in sufficient volume for analysis of NOA. Analysis of a lower volume of soil was not performed because the large sample volume is required by the analytical method to generate reproducible results from a naturally occurring material that is known to occur heterogeneously.

3.2 Soil Sampling

E & E START collected soil samples at 17 locations using a direct push drilling rig and at nine surface sample locations with a hand trowel. Boring locations were plotted on a grid and located in the field using a global positioning system device. Soil samples were collected from the football field to evaluate the potential threat to human health or the environment related to potential contamination from heavy metals, NOA, and cyanide in surface fill that was brought to the site from near the Celtor Chemical Works National Priorities List site. Because the sources of

additional fill are unknown, soil samples were collected at boring locations within the area of fill for analysis of constituents specific to a variety of possible land uses that could have occurred at the source properties, including metals; NOA; organochlorine pesticides (OCPs); organophosphorous pesticides (OPPs); chlorinated herbicides; semi-volatile organic compounds (SVOCs); polychlorinated biphenyls (PCBs); and total petroleum hydrocarbons as diesel (TPH-d) and TPH as motor oil (TPH-mo).

Nine surface soil samples were collected on a 10-foot grid spacing in the background study area to provide data to evaluate local background concentrations of arsenic, cadmium, copper, lead, selenium, and zinc for comparison to the project screening levels and to the sample results. Sample locations are shown on Figure 2 (Appendix A).

Duplicate soil samples were collected from approximately 10 percent of the sample locations. Additional volumes of soil were collected for matrix spike/matrix spike duplicate (MS/MSD) analysis. One equipment rinse blank was collected at the end of each day's activity and submitted for laboratory analysis.

Soil types and characteristics were logged by a START geologist and recorded on field boring logs. Soil types observed within the football field (bounded by the running track) consisted primarily of sandy silt fill from the ground surface to total depths ranging from 0.5 to 2.75 feet. Outside the football field, native soil and imported fill were observed to consist of sand and gravel with varying amounts of silt and clay. In general, areas of obvious imported fill (along the eastern portion of the site) were observed to contain lesser amounts of silt and clay than native sand and gravel. The total thickness of imported fill in the eastern portions of the site range from approximately 2.75 to 5 feet bgs. Soil at the site in areas without obvious imported fill and below imported fill was observed to consist of sand and gravel with silt and clay to the total explored depth of 8 feet bgs. Drafted copies of the boring logs are contained in Appendix D.

4 Analytical Data

Soil samples of shallow fill imported from near the Celtor Chemical Works were analyzed for arsenic, barium, cadmium, chromium, copper, lead, selenium, silver, and zinc by U.S. EPA Method 6010B; mercury by U.S. EPA Method 7471A; NOA by California Air Resources Board Method 435; and cyanide by U.S. EPA Method 9010C. Soil samples of fill imported from unknown locations were analyzed for Resource Conservation and Recovery Act (RCRA) metals with copper and zinc by U.S. EPA Method 6010B; mercury by U.S. EPA Method 7471A; NOA by California Air Resources Board Method 435; cyanide by U.S. EPA Method 9010C; OCPs by U.S. EPA Method 8081A; OPPs by U.S. EPA Method 8141A; chlorinated herbicides by U.S. EPA Method 8151A; SVOCs by U.S. EPA Method 8270C; PCBs by U.S. EPA Method 8082; and TPH-d with TPH-mo by U.S. EPA Method 8015. Equipment rinse blanks were analyzed for the same compounds as soil samples.

Soil samples analyzed for NOA were submitted to EMS Laboratories, located in Pasadena, California. Soil samples analyzed for chlorinated herbicides and OPPs were submitted to EMAX Laboratories, located in Torrance, California. Soil samples analyzed for cyanide were submitted to GEL Laboratories, located in Charleston, South Carolina. Soil samples analyzed for metals, OCPs, SVOCs, PCBs, TPH-d, and TPH-mo were submitted to the U.S. EPA regional laboratory, located in Richmond, California.

Laboratory analytical results from the U.S. EPA regional laboratory were provided with Tier 1B data validation. Laboratory analytical results provided by all other laboratories were validated by an E & E START data validator using Tier 1A validation criteria. Data were found to be of acceptable quality and were deemed by the laboratory or the START data validator to be usable for the purposes of this investigation with qualifications where appropriate. Data qualifications are indicated in Table 1 (Appendix B) and in the laboratory analytical and data validation reports on the data disc contained in the back cover of this report.

4.1 Summary of Soil Sample Results

Laboratory analytical results for the constituents of potential concern (COPCs) identified in the FSP (E & E 2012b) were compared to the site-specific screening levels for those constituents identified in the FSP. The project screening levels for the additional metals analyzed as part of the standard RCRA metals test (barium, chromium, nickel, and silver) were compared to a screening level determined by selecting the lowest available established regulatory threshold, the same process used to develop the FSP. Because they are not considered COPCs, but were analyzed as a precaution, screening levels were not established in the FSP for OCPs, OPPs, chlorinated herbicides, SVOCs, PCBs, TPH-d, and TPH-mo. None of the constituents analyzed from the list of precautionary analyses were detected by the laboratories at concentrations exceeded laboratory reporting limits; therefore, it was not necessary to review screening levels for them in this report.

The calculated local background concentrations of arsenic and nickel were used as the project screening level because they indicate that naturally occurring concentrations of these elements exceed the lowest published screening levels considered. Local background concentrations were calculated for arsenic and nickel by determining the non-parametric upper tolerance limit for the range of concentrations detected in background samples. E & E START compared arsenic and nickel concentrations in soil samples to the calculated local background concentrations of 7.2 and 210 mg/kg, respectively. Calculation of the local background concentrations is discussed in Section 4.1.2.

E & E START compared cyanide concentrations in soil samples to the laboratory reporting limit of 2.5 mg/kg because the lowest published screening level is lower than any practically achievable quantitation limit. E & E START compared NOA concentrations in soil samples to the laboratory reporting limit of 0.25 percent, which is also the regulatory threshold above which the sale or use of fill is restricted in California. E & E START compared lead concentrations in soil samples to the California EPA's September 2010 California human health screening level (CHHSL) of 80 mg/kg. E & E START compared barium, cadmium, copper, mercury, selenium, silver, and zinc concentrations in soil samples to their respective February 2013 California Regional Water Quality Control Board environmental screening levels (ESL) for shallow soil. For comparison, available screening levels not selected for this project are listed for the COPCs and the RCRA metals not included as COPCs in Table 1 (Appendix B). Possible screening levels considered for this project include the CHHSLs, ESLs, U.S. EPA Regional Screening Levels, and the laboratory reporting limits. The site-specific screening level was selected as the lowest established regulatory threshold, unless the threshold was below the laboratory reporting limit or the calculated local background concentration, in which case the laboratory reporting limit or the calculated local background concentration was used. Soil analytical results, the screening levels considered, and the screening levels selected are presented in Table 1 (Appendix B).

4.1.1 Field Study Area

Concentrations of selenium, silver, cyanide, NOA, OCPs, OPPs, chlorinated herbicides, SVOCs, PCBs, TPH-d, and TPH-mo were below laboratory reporting limits and project screening levels in all samples analyzed. Barium, cadmium, copper, lead, mercury, and zinc were detected in most of the samples, but at concentrations below the project screening levels (all ESLs except lead, which is based on the CHHSL) of 750, 1.7, 230, 80, 1.3, and 600 mg/kg, respectively.

In the Field study area, arsenic was detected in most of the soil samples at concentrations ranging up to 8.1 mg/kg. Reported concentrations of arsenic in soil slightly exceeded the calculated local background concentration of 7.2 mg/kg only at sample location HFF-Field-005-S. Nickel was detected in all of the soil samples at concentrations ranging from 150 to 220 mg/kg. Reported concentrations of nickel slightly exceeded the calculated local background concentration of 210 mg/kg only at sample locations HFF-Field-002-S and HFF-Field-003-S. Chromium was detected in all of the soil samples at concentrations ranging from 110 to 300 mg/kg. Reported concentrations of chromium exceeded the calculated local background concentration of 250 mg/kg and the project screening level of 280 mg/kg only at sample location HFF-Field-002-S.

The only samples with chromium and nickel concentrations above project screening levels or calculated local background concentrations were collected from borings in soil that appears to be native. Concentrations of arsenic and nickel are present at concentrations similar to or below

calculated local background concentrations. Chromium is present at a concentration above the project screening level and the calculated local background concentration only at one location where imported fill was not observed. The most likely source for arsenic, nickel, and chromium in soil is natural occurrence. Soil analytical results for constituents that were detected in at least one sample at or above the laboratory reporting limit are presented in Table 1 (Appendix B). Laboratory analytical and data validation reports are provided on the data disc included inside the back cover of this report.

Soil sample HFF-Field-017-S was inadvertently not collected in sufficient volume for analysis of NOA. Analysis of a lower volume of soil was not performed because the large sample volume is required by the analytical method to generate reproducible results from a naturally occurring material that is known to occur heterogeneously. Considering the observed consistent soil type between other samples of surface sand and gravel fill observed at site, sample HFF- Field-017-S is not likely to have produced different results than the analysis of the other samples collected from the same layer of fill or the result of analysis of sample HFF- Field-017-F, which was collected from the same boring and from the same fill layer. Even without data from sample HFF-Field-017-S, the NOA data set meets the 90% completion goal specified in the FSP (E & E 2012b). The one missing data point is not considered significant when considering the consistent absence of NOA in samples of similar soil and the compliance with project completion goals established in the FSP.

4.1.2 Background Study Area

The background sample results were used to calculate background soil screening levels for arsenic, chromium, and nickel. Background soil screening levels were calculated for arsenic, chromium, and nickel because those are the only naturally occurring elements that were detected in at least one field study area sample at concentrations above the lowest available regulatory screening levels or in the case of arsenic, above the laboratory reporting limit selected as the project screening level. The background study area and background sample locations are shown on Figure 2 (Appendix A). The 95 percent upper tolerance limit was calculated using *ProUCL Version 4.1.01, Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations, EPA/600/R-07/041*, May 2010 (U.S. EPA 2010) and according to U.S. EPA *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites, EPA 540-R-01-003 OSWER 9285.7-41*, September 2002 (U.S. EPA 2002). Non-parametric tests were performed based on the number of background samples. The highest concentration was used for duplicate samples. E & E START calculated local background concentrations for arsenic, chromium, and nickel to be 7.2, 250, and 210 mg/kg. Laboratory analytical results for background samples are presented in Table 1 (Appendix B).

4.2 Summary of Quality Assurance/Quality Control Sample Results

The START reviewed the Tier 1B validated analytical data provided by the U.S. EPA Region 9 Laboratory and performed Tier 1A validation of data provided by the E & E subcontract laboratories EMS Laboratories, GEL Laboratories, and EMAX Laboratories. The E & E START review of the Tier 1B data validation results compared data to specific project quality objectives, which included target analytes, sensitivity, analytical accuracy, analytical and sampling precision, and analytical completeness. The START quality control (QC) review also evaluated

equipment rinse blank contamination and comparison of primary sample to field duplicate results. Results of the START QC review are described below.

4.2.1 Analytical Completeness

All samples submitted to the laboratories were analyzed as requested.

4.2.2 Holding Times

All samples were analyzed by the laboratories within the holding times prescribed by the analytical methods used for analysis.

4.2.3 Blank Contamination

Equipment rinse blank samples were collected after each day of sampling and analyzed for the COPCs to evaluate the decontamination procedures used on non-dedicated sampling equipment, as described in the FSP (E & E 2011a). None of the COPCs were detected in any of the rinse blanks above laboratory reporting limits. Analytical results for rinse blank samples are presented in Table 1 (Appendix B). Analytical results for laboratory method blanks are contained in the laboratory analytical reports on the compact disc included in the back of this report.

4.2.4 Matrix Related Recoveries

Results of the analysis of MS/MSD samples were within the control limits generated by the laboratories with some exceptions. Relative percent difference (RPD) between MS and MSD analyses were outside control limits for chromium in samples HFF-Field -006-S and HFF-Field-012-S, for all chlorinated pesticides in sample HFF-Field-017-F, and all SVOCs in sample HFF-Field-017-F. The laboratory control standard associated with samples HFF-Field-014-F, HFF-Field-015-F, HFF-Field-016-S, HFF-Field-116-F, and HFF-Field-017-F did not meet recovery criteria for the SVOC 4-chloroaniline. The laboratory control standard associated with both rinse blank samples (HFF-040213-RB and HFF-040313-RB) did not meet recovery criteria for the SVOCs 4-nitroaniline and 3,3-dichlorobenzidine. The quantitation limit standard associated with samples HFF-Field-014-F, HFF-Field-015-F, HFF-Field-016-S, HFF-Field-116-F, and HFF-Field-017-F did not meet recovery criteria for the SVOC 2,4-dinitrophenol. The quantitation limit standard associated with both rinse blank samples (HFF-040213-RB and HFF-040313-RB) did not meet recovery criteria for the SVOCs 2,4-dinitrophenol, 4-nitrophenol, butyl benzyl phthalate, bis(2-ethylhexyl) phthalate, and di-n-octyl phthalate. Results of the analysis of MS/MSD and laboratory standards are presented in the laboratory analytical reports on the data disc inside the back cover of this report.

4.2.5 Field Duplicates

As part of the START QC data review, the analytical results for primary samples and their field duplicates were compared to determine if RPDs were within acceptable ranges as defined in the FSP (E & E 2011a). Concentrations of barium, cadmium, copper, lead, and mercury were outside the acceptable RPD range of 25 percent between soil samples HFF-BG-024 and its field duplicate sample HFF-BG-124. Except as described above, all results for field duplicates that were not reported as estimated were within the acceptable ranges as defined in the FSP (E & E 2012b). For primary and duplicate samples with COPC concentrations resulting in RPDs outside acceptable QC limits, the associated reported concentrations were qualified as estimated (flagged with the letter “J”).

Based on review of results of the Tier 1B validated data from the laboratories and QC review of the data, the data for the Hoopa High School Football Field TBA are classified as acceptable for use with qualifications as identified in the laboratory analytical data Table 1 (Appendix B).

5 Conclusions

Based on review of current laboratory analytical results presented in this report and information presented in the Phase I ESA (E & E 2012a) for the Hoopa High School Football Field TBA, E & E START provides the following conclusions:

- This assessment was performed to assess concentrations of various contaminants in fill, which was historically imported from various and mostly unknown locations. Results of this assessment indicate the absence of all of the tested constituents at concentrations above the site-specific screening levels except for certain RCRA metals, which are naturally occurring. Of the elements analyzed as part of the RCRA metals suite, concentrations of all except arsenic, chromium, and nickel are below the site-specific screening levels.
- Reported concentrations of nickel and chromium in site soil are similar to or slightly above calculated background concentrations and site-specific screening levels and occur at highest concentrations in soil that does not appear to have been imported. Reported concentrations of arsenic in fill imported from near the Celtor Chemical Works site are very slightly higher than in other soil sampled at the site, yet similar to the calculated local background concentration. Site soil containing arsenic, nickel, and chromium is not likely to pose a significantly higher risk to the public or the environment than natural soil in the vicinity of the site.

6 Recommendations

Based on review of current laboratory analytical results presented in this report and information presented in the Phase I ESA (E & E 2012a) for the Hoopa High School Football Field TBA, E & E START provides the following recommendations:

- This assessment did not identify the presence of significant contamination; therefore, no further assessment and no cleanup should be necessary.

7 References

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A Figures

Project # EE-002693-6020
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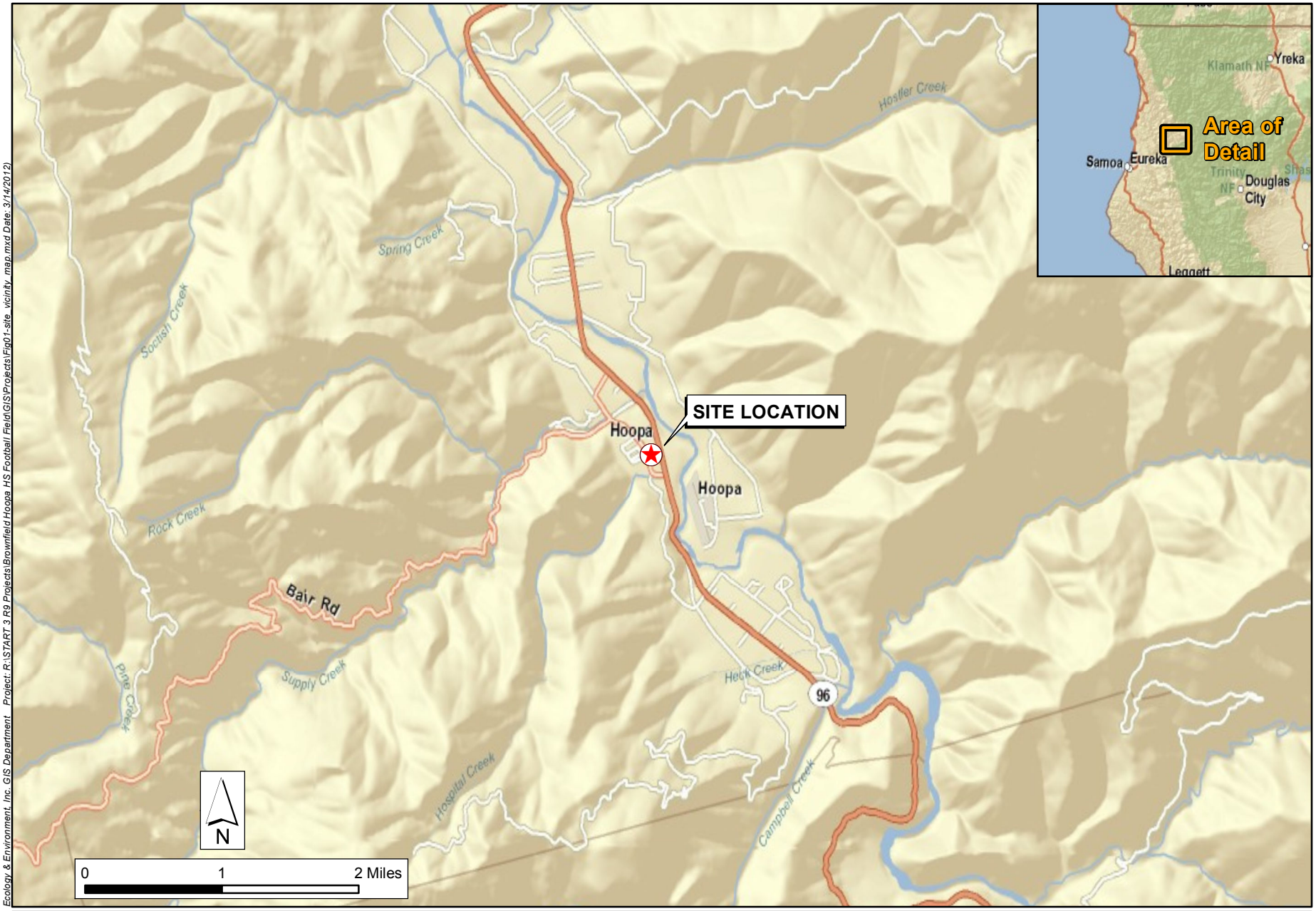
Source: ESRI Streetmaps



Ecology & Environment, Inc. GIS Department Project: R:\START 3 R9 Projects\Brownfield Hoopa HS Football Field\GIS\Projects\Fig01-site_vicinity_map.mxd Date: 3/14/2012)

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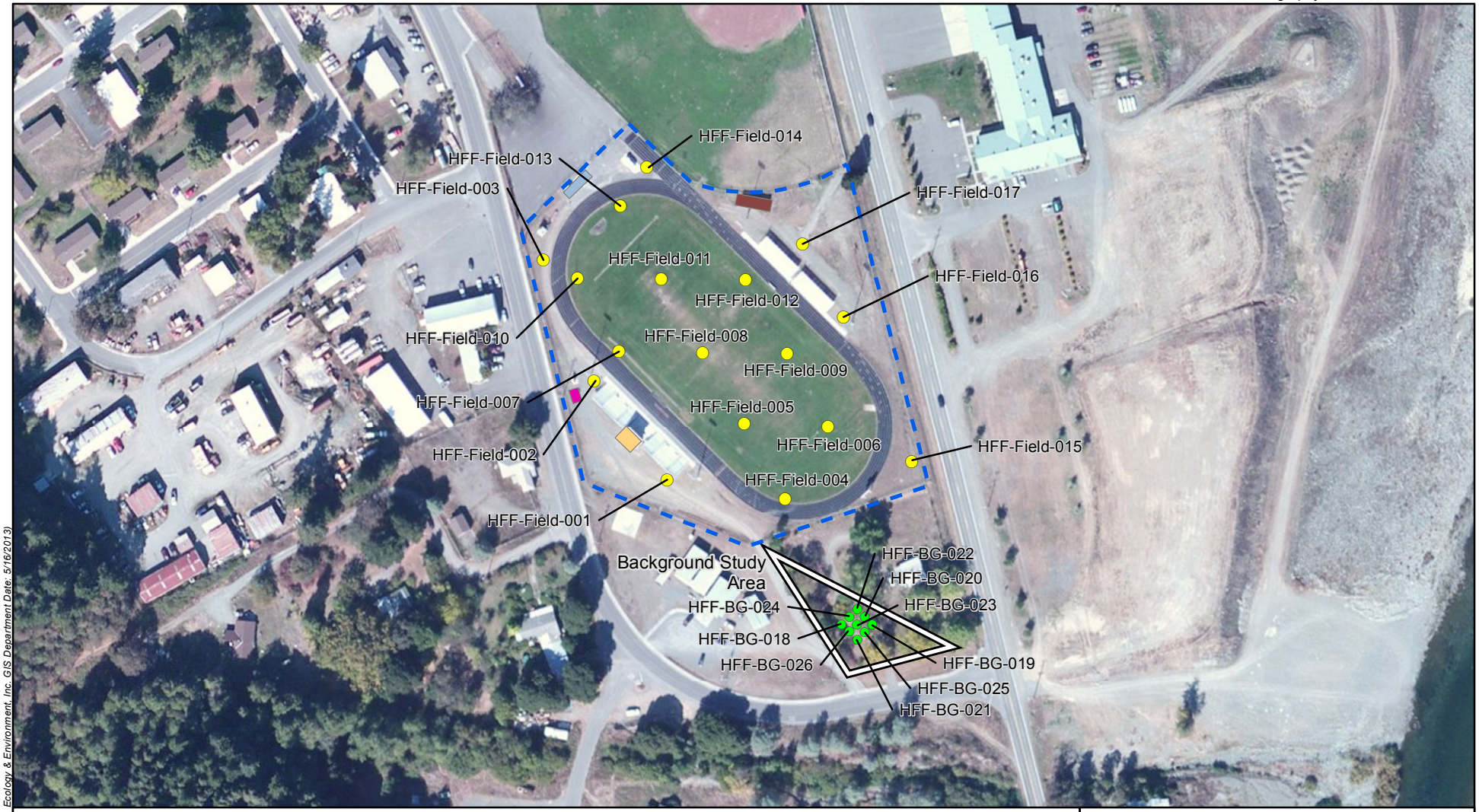
Figure 1

Vicinity Map
Hoopa High School Football Field
5 Loop Road, Hoopa, California

Project # EE-002693-6020
TDD# TO-06 09-11-10-0005

Source: Aerial Photography - USGS 2012 and ESRI



Ecology & Environment, Inc. GIS Department Date: 5/16/2013)

LEGEND

Area

- Background Study Area Points
- Sample Locations
- Site boundary
- Pad-mounted transformer
- Shed
- Announcer's booth
- Restrooms
- Background Study Area

N

0 150 300 Feet

Figure 2

Sample Locations Hoopa High School Football Field

5 Loop Road, Hoopa, California

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B Tables

Table 1
Soil and Rinse Blank Analytical Results for Metals, Cyanide, and TPH
Hoopa High School Football Field
Targeted Brownfields Assessment
Hoopa, California
(All Concentrations in mg/kg except where noted)

TDD: TO06 09-10-11-0005 **EE-002693-6020**

			Arsenic	Barium*	Cadmium	Chromium*	Copper	Lead	Mercury	Nickel*	Selenium	Silver*	Zinc	Cyanide
CHHSL			0.07	5,200	1.7	None	3,000	**80**	18	1,600	380	380	23,000	None
RSL			0.39	15,000	70	**280****	3,100	400	10	3,800	390	390	23,000	47
ESL Shallow Soil			0.39	**750**	**1.7**	None	**230**	200	**1.3**	150	**10**	**20**	**600**	0.0036
Calculated Local Background			**7.2**			250				**210**				
Laboratory Reporting Limit			2	5	0.5	1	4	3	0.10	5	3.5	1.0	8.0	2.5
Sample ID	**Sample Date**	**Sample Depth in feet**												
HFF-Field-001-S	4/2/2013	0 - 0.5	2.8	32	0.33	220	85	2.4	0.033	160	<2.2	<1.1	79	<0.0644
					C1, J			C1, J			U	U		U
HFF-Field-101-S	4/2/2013	0 - 0.5	2.7	32	0.55	190	88	3	0.038	150	<2.2	<1.1	79	<0.0903
								C1, J			U	U		U
HFF-Field-002-S	4/2/2013	0 - 0.5	4.1	49	0.62	300	56	66	0.046	220	<2.2	<1.1	79	<0.0638
											U	U		U
HFF-Field-003-S	4/2/2013	0 - 0.5	2.0	40	0.3	240	60	18	0.072	220	<2.1	<1.1	75	0.326
					C1, J						U	U		
HFF-Field-004-S	4/2/2013	0 - 0.75	1.3	51	0.67	230	52	67	0.043	170	<2.4	<1.2	140	<0.126
			C1, J								U	U		U
HFF-Field-005-S	4/3/2013	0 - 2.5	8.1	110	<0.6	130	54	7.6	0.084	170	<2.4	<1.2	93	0.175
					U						U	U		J
HFF-Field-006-S	4/3/2013	0 - 2.5	5.2	100	<0.59	160	52	6.6	0.079	190	<2.4	<1.2	90	<0.0886
					U	Q4, J					U	U		U
HFF-Field-007-S	4/3/2013	0 - 0.5	6.4	100	<0.65	140	53	9.3	0.084	160	<2.6	<1.3	98	0.248
					U						U	U		J
HFF-Field-008-S	4/3/2013	0 - 2.75	6.9	92	0.34	130	48	7.1	0.078	160	<2.3	<1.2	79	0.104
					C1, J						U	U		J
HFF-Field-009-S	4/3/2013	0 - 2.25	6.0	97	<0.60	140	53	8.0	0.076	180	<2.4	<1.2	85	<0.0956
					U						U	U		U
HFF-Field-010-S	4/3/2013	0 - 0.5	6.9	94	0.41	130	42	10	0.079	150	<2.6	<1.3	86	0.378
					C1, J						U	U		
HFF-Field-011-S	4/3/2013	0 - 2.25	6.5	88	0.37	110	45	7.5	0.078	150	<2.4	<1.2	79	<0.087
					C1, J						U	U		U
HFF-Field-012-S	4/3/2013	0 - 2.0	6.1	99	<0.57	150	54	7.9	0.09	190	<2.3	<1.1	79	<0.0782
					U	Q4, J					U	U		U
HFF-Field-013-S	4/3/2013	0 - 2.0	6.8	96	0.37	210	50	12	0.066	210	<2.5	<1.3	96	<0.102
					C1, J						U	U		U
HFF-Field-014-S	4/3/2013	0 - 0.5	2.7	64	<0.53	180	55	39	0.088	160	<2.1	<1.1	97	<0.0605
					U						U	U		U

Table 1
Soil and Rinse Blank Analytical Results for Metals, Cyanide, and TPH
Hoopa High School Football Field
Targeted Brownfields Assessment
Hoopa, California
(All Concentrations in mg/kg except where noted)

TDD: TO06 09-10-11-0005 **EE-002693-6020**

			Arsenic	Barium*	Cadmium	Chromium*	Copper	Lead	Mercury	Nickel*	Selenium	Silver*	Zinc	Cyanide
CHHSL			0.07	5,200	1.7	None	3,000	**80**	18	1,600	380	380	23,000	None
RSL			0.39	15,000	70	**280****	3,100	400	10	3,800	390	390	23,000	47
ESL Shallow Soil			0.39	**750**	**1.7**	None	**230**	200	**1.3**	150	**10**	**20**	**600**	0.0036
Calculated Local Background			**7.2**			250				**210**				
Laboratory Reporting Limit			2	5	0.5	1	4	3	0.10	5	3.5	1.0	8.0	**2.5**
Sample ID	**Sample Date**	**Sample Depth in feet**												
HFF-Field-014-F	4/3/2013	0.5 - 2.75	1.8 C1, J	54	0.037 C1, J	190	56	6.0	0.077	190	<2.1 U	<1.1 U	79	<0.0691 U
HFF-Field-015-S	4/2/2013	0 - 0.5	2.5	40	0.43 C1, J	230	55	4.5	0.038	210	<2.2 U	<1.1 U	66	<0.104 U
HFF-Field-015-F	4/2/2013	0.5 - 2.75	<2.2 U	34	0.34 C1, J	150	57	2.9 C1, J	0.038	160	<2.2 U	<1.1 U	62	<0.0957 U
HFF-Field-016-S	4/2/2013	0 - 0.5	2.8	49	0.38 C1, J	210	58	8.6	0.039	180	<2.2 U	<1.1 U	72	<0.0871 U
HFF-Field-116-S	4/2/2013	0 - 0.5	2.2	39	0.34 C1, J	180	56	8.1	0.041	170	<2.1 U	<1.1 U	70	<0.0798 U
HFF-Field-016-F	4/2/2013	0.5 - 5.0	2.4	37	0.46 C1, J	210	62	4.3	0.058	210	<2.1 U	<1.1 U	73	<0.0757 U
HFF-Field-0116-F	4/2/2013	0.5 - 5.0	1.8 C1, J	38	0.36 C1, J	200	71	4.4	0.069	180	<2.1 U	<1.1 U	73	<0.0724 U
HFF-Field-017-S	4/2/2013	0 - 0.5	2.6	57	<0.53 U	170	61	11	0.053	170	<2.1 U	<1.1 U	82	<0.100 U
HFF-Field-017-F	4/2/2013	0.5 - 4.0	1.7 C1, J	48	0.31 C1, J	190	57	10	0.067	180	<2.1 U	<1.1 U	79	<0.086 U
HFF-BG-018	4/2/2013	0 - 0.5	3.0	67	0.49 C1, J	190	76	**140**	0.075	170	<2.5 U	<1.3 U	150	NA
HFF-BG-019	4/2/2013	0 - 0.5	<2.5 U	72	0.72	190	59	**250**	0.22	160	<2.5 U	<1.3 U	270	NA
HFF-BG-020	4/2/2013	0 - 0.5	1.4 C1, J	55	0.31 C1, J	150	60	70	0.079	120	<2.3 U	<1.1 U	110	NA
HFF-BG-021	4/2/2013	0 - 0.5	2.3	58	0.54 C1, J	250	60	**160**	0.040	210	<2.3 U	<1.1 U	140	NA
HFF-BG-022	4/2/2013	0 - 0.5	1.6 C1, J	61	0.64	230	58	**110**	0.075	170	<2.3 U	<1.2 U	100	NA
HFF-BG-023	4/2/2013	0 - 0.5	1.4 C1, J	59	0.61	200	64	**86**	0.048	160	<2.5 U	<1.2 U	160	NA

Table 1
Soil and Rinse Blank Analytical Results for Metals, Cyanide, and TPH
Hoopa High School Football Field
Targeted Brownfields Assessment
Hoopa, California
(All Concentrations in mg/kg except where noted)

TDD: TO06 09-10-11-0005 **EE-002693-6020**

			Arsenic	Barium*	Cadmium	Chromium*	Copper	Lead	Mercury	Nickel*	Selenium	Silver*	Zinc	Cyanide
CHHSL			0.07	5,200	1.7	None	3,000	**80**	18	1,600	380	380	23,000	None
RSL			0.39	15,000	70	**280****	3,100	400	10	3,800	390	390	23,000	47
ESL Shallow Soil			0.39	**750**	**1.7**	None	**230**	200	**1.3**	150	**10**	**20**	**600**	0.0036
Calculated Local Background			7.2			250				**210**				
Laboratory Reporting Limit			2	5	0.5	1	4	3	0.10	5	3.5	1.0	8.0	**2.5**
Sample ID	**Sample Date**	**Sample Depth in feet**												
HFF-BG-024	4/2/2013	0 - 0.5	<2.4 U	49	1.3	140	58	**91**	0.31	120	<2.4 U	<1.2 U	180	NA
HFF-BG-124	4/2/2013	0 - 0.5	2.1 C1, J	68	0.78	180	80	**140**	0.20	130	<2.3 U	<1.2 U	230	NA
HFF-BG-025	4/2/2013	0 - 0.5	7.2	88	<0.7 U	120	49	11	0.09	150	<2.8 U	<1.4 U	87	NA
HFF-BG-026	4/2/2013	0 - 0.5	4.2	71	0.33 C1, J	230	70	18	0.06	210	<2.4 U	<1.2 U	97	NA
HFF-040213-RB	4/2/2013	None	<20 µg/L U	<10 µg/L U	<5 µg/L U	<10 µg/L U	<10 µg/L U	<20 µg/L U	<0.03 µg/L U	<10 µg/L U	<20 µg/L U	<5 µg/L U	<10 µg/L U	2.06 µg/L J
HFF-040313-RB	4/3/2013	None	<20 µg/L U	<10 µg/L U	<5 µg/L U	<10 µg/L U	<10 µg/L U	<20 µg/L U	<0.03 µg/L U	<10 µg/L U	<20 µg/L U	<5 µg/L U	<10 µg/L U	1.73 µg/L J

Notes:
The selected project screening level is indicated in bold.
Results above the site screening levels are indicated in bold
mg/kg - milligrams per kilogram
µg/L - micrograms per liter
CHHSL - California Human Health Screening Level, California Environmental Protection Agency, September 2010
RSL - Regional Screening Levels, U.S. EPA Region 9, November 2012
ESL - Environmental Screening Level, CA Regional Water Quality Control Board, February 2013
NA - Not analyzed
<X - Not detected above the practical quantitation limit of X
* - The analyte is not one of the project constituents of potential concern, however results were provided by the laboratory as part of the analysis and are presented here.
** - The only available established screening level for chromium is the May 2010 RSL

Laboratory Data Qualifiers:
J - The reported result for this analyte should be considered an estimated value.
F13 - Fuel or product type mixed or unknown
Q4 - The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte.
U - The contaminant was not detected at the indicated laboratory reporting limit.
C1 - The reported concentration for this analyte is below the quantitation limit

C Photographs

ECOLOGY AND ENVIRONMENT, INC.
Superfund Technical Assessment and Response Team
Hoopa High School Football Field
5 Loop Road, Hoopa, California

E & E Project. No.: EE-002693-6020 TDD No: TO6-09-11-10-0005

PHOTO 1

Date: 04/02/13

Direction: Southeast

Photographer: M. Diener

Description: Sample locations flagged for sampling in the background study area.

PHOTO 2

Date: 04/02/13

Direction: Down

Photographer: M. Diener

Description: Background sample HFF-BG-026 collected and ready for processing.

PHOTO 3

Date: 04/03/13

Direction: Northwest

Photographer: M. Diener

Description: Collecting soil cores at sample location HFF-Field-014.

PHOTO 4

Date: 04/03/13

Direction: Down

Photographer: M. Diener

Description: Soil cores ready for processing.

PHOTO 5

Date: 04/03/13

Direction: Southwest

Photographer: P. Jones

Description: Decontaminating non-dedicated sampling equipment.

PHOTO 6

Date: 04/03/13

Direction: East

Photographer: M. Diener

Description: Collecting soil cores at sample location HFF-Field-005.

PHOTO 7

Date: 04/03/13

Direction: Northeast

Photographer: M. Diener

Description: Sample location HFF-Field-015 with utility clearance markings.

PHOTO 8

Date: 04/03/13

Direction: Down

Photographer: M. Diener

Description: Typical surface soil at sample location HFF-Field-016 with grouted boreholes.

PHOTO 9

Date: 04/03/13

Direction: Down

Photographer: M. Diener

Description: Typical surface soil at sample location HFF-Field-003 with grouted borehole.

D Boring Logs

E&E Overburden Borehole Logging Form

Location: HFF-Field-001

Client:	U.S. EPA	Date:	4/2/2013
Project:	Hoopa High School Football Field	Drilling Company:	E & E
Site/Area:	5 Loop Road, Hoopa, CA	Operator(s):	P. Jones
Project No.	EE-002693-6020	Rig/Type:	Geoprobe 5400
Geologist:	Paul Jones	Drill Bit - Type/Size:	Macrocore 4' X 2.125"
Signature:		Sample Method:	Direct Push

Start Time: 1020
Top Depth: 0 Ft.
Bottom Depth: 3 Ft.
Finish Time: 1035

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: **Natural** Fill Uncertain
Color: **MUN** GSA: Light Reddish Brown
Coloration: **UNI** MTD VAR STN
Texture: GVL: 40 % ____ ANG **SUB** **RND** NA
SND: 30 % ____ ANG **SUB** **RND** NA
SLT: 20 %
CLY: 10 %
ORG: ____ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:________ Reading ________
Intrument #2: Type:________ Reading ________
Sorting: WEL MOD **POR** NA
Plasticity: **NON** LOW MED HGH NA
Moisture: DRY **MST** WET SAT NA
Cementation: **NON** SLT MOD WEL NA
Strength: NOC / **COH**
Upper Contact: SHP GRD DIF SME **NA**
Clayey, silty SAND and GRAVEL. Bottom of Boring 3 feet.

3 FT BGS

Material: Natural Fill Uncertain
Color: **MUN** GSA ________
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:________ Reading ________
Intrument #2: Type:________ Reading ________
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: **MUN** GSA ________
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:________ Reading ________
Intrument #2: Type:________ Reading ________
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: **MUN** GSA ________
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:________ Reading ________
Intrument #2: Type:________ Reading ________
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-002

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/2/2013
Page: 1 of 1
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1040
Top Depth: 0 Ft.
Bottom Depth: 5 Ft.
Finish Time: 1115

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Light Reddish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: 55 % ___ ANG (SUB) (RND) NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 10 %
CLY: 5 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:
Bottom of Boring 5 feet.

Intrument #1: Type:____ Reading ____
Intrument #2: Type:____ Reading ____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: SHP GRD DIF SME (NA)
Silty SAND and GRAVEL with some clay.

5 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA ____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:____ Reading ____
Intrument #2: Type:____ Reading ____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA ____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:____ Reading ____
Intrument #2: Type:____ Reading ____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA ____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:____ Reading ____
Intrument #2: Type:____ Reading ____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-003

Client:	U.S. EPA	Date:	4/2/2013
Project:	Hoopa High School Football Field	Drilling Company:	E & E
Site/Area:	5 Loop Road, Hoopa, CA	Operator(s):	P. Jones
Project No.	EE-002693-6020	Rig/Type:	Geoprobe 5400
Geologist:	Paul Jones	Drill Bit - Type/Size:	Macrocore 4' X 2.125"
Signature:		Sample Method:	Direct Push

Start Time: 1120
Top Depth: 0 Ft.
Bottom Depth: 4 Ft.
Finish Time: 1150

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural Fill **Uncertain**
Color: **MUN** GSA: Light Reddish Brown
Coloration: **UNI** MTD VAR STN
Texture: GVL: 60 % ___ ANG **SUB** **RND** NA
SND: 25 % ___ ANG **SUB** **RND** NA
SLT: 10 %
CLY: <5 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:___ Reading ___
Intrument #2: Type:___ Reading ___
Sorting: WEL MOD **POR** NA
Plasticity: **NON** LOW MED HGH NA
Moisture: DRY **MST** WET SAT NA
Cementation: **NON** SLT MOD WEL NA
Strength: **NOC** / COH
Upper Contact: SHP GRD DIF SME **NA**

Silty SAND and GRAVEL with some clay. Bottom of Boring 4 feet. Possible fill to 1.5 feet.

4 FT BGS

Material: Natural Fill Uncertain
Color: **MUN** GSA ___
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:___ Reading ___
Intrument #2: Type:___ Reading ___
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: **MUN** GSA ___
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:___ Reading ___
Intrument #2: Type:___ Reading ___
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: **MUN** GSA ___
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:___ Reading ___
Intrument #2: Type:___ Reading ___
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-004

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/2/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1640
Top Depth: 0 Ft.
Bottom Depth: 3 Ft.
Finish Time: 1710

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: 10 % ___ ANG (SUB) (RND) NA
SND: 10 % ___ ANG (SUB) (RND) NA
SLT: 80 %
CLY: ___ %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH)
Upper Contact: SHP GRD DIF SME (NA)
Sandy gravelly SILT.

0.75 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Light Reddish Brown
Coloration: UNI MTD VAR STN
Texture: GVL: 60 % ___ ANG (SUB) (RND) NA
SND: 15 % ___ ANG (SUB) (RND) NA
SLT: 15 %
CLY: 10 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: (SHP) GRD DIF SME NA
Clayey, silty SAND and GRAVEL. Bottom of Boring 3 feet.

3 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-005

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/3/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1455
Top Depth: 0 Ft.
Bottom Depth: 3 Ft.
Finish Time: 1520

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 70 %
CLY: ___ %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH)
Upper Contact: SHP GRD DIF SME (NA)
Sandy SILT.

2.5 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Light Reddish Brown
Coloration: UNI MTD VAR STN
Texture: GVL: 60 % ___ ANG (SUB) (RND) NA
SND: 15 % ___ ANG (SUB) (RND) NA
SLT: 15 %
CLY: 10 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: (SHP) GRD DIF SME NA
Clayey, silty SAND and GRAVEL. Bottom of Boring 3 feet.

3 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-006

Page: 1 of 1

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/3/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 0850
Top Depth: 0 Ft.
Bottom Depth: 4 Ft.
Finish Time: 0940

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 70 %
CLY: ___ %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH)
Upper Contact: SHP GRD DIF SME (NA)
Sandy SILT.

2.5 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Reddish & Grayish Brown
Coloration: UNI MTD (VAR) STN
Texture: GVL: 60 % ___ ANG (SUB) (RND) NA
SND: 15 % ___ ANG (SUB) (RND) NA
SLT: 15 %
CLY: 10 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: (SHP) GRD DIF SME NA
Clayey, silty SAND and GRAVEL. Bottom of Boring 4 feet.

4 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-007

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/3/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1530
Top Depth: 0 Ft.
Bottom Depth: 2 Ft.
Finish Time: 1555

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 70 %
CLY: ___ %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH) _____
Upper Contact: SHP GRD DIF SME (NA)
Sandy SILT.

0.5 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Lt. Reddish & Grayish Brown
Coloration: UNI MTD (VAR) STN
Texture: GVL: 60 % ___ ANG (SUB) (RND) NA
SND: 25 % ___ ANG (SUB) (RND) NA
SLT: 10 %
CLY: 5 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:
Bottom of Boring 2 feet.

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH _____
Upper Contact: (SHP) GRD DIF SME NA
Silty SAND and GRAVEL with some clay.

2 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH _____
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH _____
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-008

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/3/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1430
Top Depth: 0 Ft.
Bottom Depth: 3 Ft.
Finish Time: 1455

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: ___ % ___ ANG (SUB) (RND) NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 70 %
CLY: ___ %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH)
Upper Contact: SHP GRD DIF SME (NA)
Sandy SILT with some gravel.

2.75 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Lt. Reddish Brown
Coloration: UNI MTD (VAR) STN
Texture: GVL: 55 % ___ ANG (SUB) (RND) NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 10 %
CLY: 5 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:
Bottom of Boring 3 feet.

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: (SHP) GRD DIF SME NA
Silty SAND and GRAVEL with some clay.

3 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-009

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/3/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 0950
Top Depth: 0 Ft.
Bottom Depth: 8 Ft.
Finish Time: 1050

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: 5 % ____ ANG (SUB) (RND) NA
SND: 25 % ____ ANG (SUB) (RND) NA
SLT: 70 %
CLY: ____ %
ORG: ____ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH) _____
Upper Contact: SHP GRD DIF SME (NA)
Sandy SILT with some gravel.

2.25 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Lt. Reddish & Grayish Brown
Coloration: UNI MTD (VAR) STN
Texture: GVL: 50 % ____ ANG (SUB) (RND) NA
SND: 35 % ____ ANG (SUB) (RND) NA
SLT: 10 %
CLY: 5 %
ORG: ____ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:
Bottom of Boring 8 feet.

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH _____
Upper Contact: (SHP) GRD DIF SME NA
Silty SAND and GRAVEL with some clay.

8 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH _____
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH _____
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-010

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/3/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1600
Top Depth: 0 Ft.
Bottom Depth: 2 Ft.
Finish Time: 1640

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 70 %
CLY: ___ %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH) _____
Upper Contact: SHP GRD DIF SME (NA)
Sandy SILT.

0.5 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Reddish & Grayish Brown
Coloration: UNI MTD (VAR) STN
Texture: GVL: 55 % ___ ANG (SUB) (RND) NA
SND: 25 % ___ ANG (SUB) (RND) NA
SLT: 15 %
CLY: 5 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:
Bottom of Boring 2 feet.

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH _____
Upper Contact: (SHP) GRD DIF SME NA
Silty SAND and GRAVEL with some clay.

2 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH _____
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH _____
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-011

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/3/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1330
Top Depth: 0 Ft.
Bottom Depth: 3 Ft.
Finish Time: 1415

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 70 %
CLY: ___ %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH)
Upper Contact: SHP GRD DIF SME (NA)
Sandy SILT.

2.25 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Reddish & Grayish Brown
Coloration: UNI MTD (VAR) STN
Texture: GVL: 50 % ___ ANG (SUB) (RND) NA
SND: 25 % ___ ANG (SUB) (RND) NA
SLT: 15 %
CLY: 10 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:
Bottom of Boring 3 feet.

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH)
Upper Contact: (SHP) GRD DIF SME NA
Silty, clayey SAND and GRAVEL.

3 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-012

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/3/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1100
Top Depth: 0 Ft.
Bottom Depth: 4 Ft.
Finish Time: 1155

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 70 %
CLY: ___ %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH) _____
Upper Contact: SHP GRD DIF SME (NA)
Sandy SILT.

2 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Reddish & Grayish Brown
Coloration: UNI MTD (VAR) STN
Texture: GVL: 55 % ___ ANG (SUB) (RND) NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 10 %
CLY: 5 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:
Bottom of Boring 4 feet.

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH _____
Upper Contact: (SHP) GRD DIF SME NA
Silty SAND and GRAVEL with some clay.

4 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH _____
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH _____
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-013

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/3/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1200
Top Depth: 0 Ft.
Bottom Depth: 3 Ft.
Finish Time: 1235

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 70 %
CLY: ___ %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC /(COH) _____
Upper Contact: SHP GRD DIF SME (NA)
Sandy SILT.

2 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Reddish & Grayish Brown
Coloration: UNI MTD (VAR) STN
Texture: GVL: 60 % ___ ANG (SUB) (RND) NA
SND: 25 % ___ ANG (SUB) (RND) NA
SLT: 10 %
CLY: 5 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:
Bottom of Boring 3 feet.

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH _____
Upper Contact: (SHP) GRD DIF SME NA
Silty SAND and GRAVEL with some clay.

3 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH _____
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH _____
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-014

Page: 1 of 1

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/3/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1240
Top Depth: 0 Ft.
Bottom Depth: 5 Ft.
Finish Time: 1325

Analyses	Recovery (ft)	Sample ID	Interval	Type	GRAPHIC LOG

0 FT BGS

Material: Natural Fill (Uncertain)
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: 55 % ____ ANG (SUB) (RND) NA
SND: 25 % ____ ANG (SUB) (RND) NA
SLT: 15 %
CLY: 5 %
ORG: ____ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: SHP GRD DIF SME (NA)
Silty SAND and GRAVEL with some clay (possible fill).

2.75 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Light Reddish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: 30 % ____ ANG (SUB) (RND) NA
SND: 20 % ____ ANG (SUB) (RND) NA
SLT: 40 %
CLY: 10 %
ORG: ____ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: NON (LOW) MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC (COH)
Upper Contact: (SHP) GRD DIF SME NA
Gravelly, sandy clayey SILT. Bottom of boring 5 feet.

5 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-015

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/2/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1310
Top Depth: 0 Ft.
Bottom Depth: 4 Ft.
Finish Time: 1415

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Gray
Coloration: UNI MTD (VAR) STN
Texture: GVL: 50 % ____ ANG (SUB) (RND) NA
SND: 40 % ____ ANG (SUB) (RND) NA
SLT: 8 %
CLY: 2 %
ORG: ____ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: SHP GRD DIF SME (NA)
SAND and GRAVEL with some silt and clay.

2.75 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Reddish & Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: 60 % ____ ANG (SUB) (RND) NA
SND: 25 % ____ ANG (SUB) (RND) NA
SLT: 10 %
CLY: 15 %
ORG: ____ %
USCS SYM: GC
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: NON (LOW) MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC / (COH)
Upper Contact: (SHP) GRD DIF SME NA
Clayey, silty SAND and GRAVEL. Bottom of boring 4 feet.

5 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-016

Page: 1 of 1

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/2/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1420
Top Depth: 0 Ft.
Bottom Depth: 8 Ft.
Finish Time: 1520

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: 50 % ___ ANG (SUB) (RND) NA
SND: 40 % ___ ANG (SUB) (RND) NA
SLT: 8 %
CLY: 2 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: SHP GRD DIF SME (NA)
SAND and GRAVEL with some silt and clay.

5 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Light Reddish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: 50 % ___ ANG (SUB) (RND) NA
SND: 25 % ___ ANG (SUB) (RND) NA
SLT: 15 %
CLY: 10 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: NON (LOW) MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC / (COH)
Upper Contact: SHP (GRD) DIF SME NA
Clayey, silty SAND and GRAVEL. Bottom of boring 8 feet.

8 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

E&E Overburden Borehole Logging Form

Location: HFF-Field-017

Page: 1 of 1

Client: U.S. EPA
Project: Hoopa High School Football Field
Site/Area: 5 Loop Road, Hoopa, CA
Project No. EE-002693-6020
Geologist: Paul Jones
Signature:

Date: 4/2/2013
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Geoprobe 5400
Drill Bit - Type/Size: Macrocore 4' X 2.125"
Sample Method: Direct Push

Start Time: 1520
Top Depth: 0 Ft.
Bottom Depth: 6 Ft.
Finish Time: 1630

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Grayish Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: 50 % ____ ANG (SUB) (RND) NA
SND: 35 % ____ ANG (SUB) (RND) NA
SLT: 10 %
CLY: 5 %
ORG: ____ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: SHP GRD DIF SME (NA)
Silty SAND and GRAVEL with some clay.

4 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Brown
Coloration: (UNI) MTD VAR STN
Texture: GVL: 40 % ____ ANG (SUB) (RND) NA
SND: 35 % ____ ANG (SUB) (RND) NA
SLT: 15 %
CLY: 10 %
ORG: ____ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD (POR) NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC / (COH)
Upper Contact: SHP (GRD) DIF SME NA
Clayey, silty SAND and GRAVEL. Bottom of boring 6 feet.

6 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA _____
Coloration: UNI MTD VAR STN
Texture: GVL: ____ % ____ ANG SUB RND NA
SND: ____ % ____ ANG SUB RND NA
SLT: ____ %
CLY: ____ %
ORG: ____ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS