GROUP 6 – NORTHEASTERN PORTION OF AREA IV
RCRA FACILITY INVESTIGATION REPORT
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

VOLUME II - RFI SITE REPORTS

APPENDIX A2

OLD CONSERVATION YARD (SWMU 7.4)

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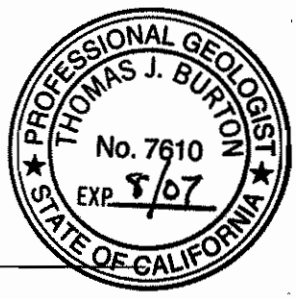





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LIST OF ACRONYMS

AI	Atomics International
AOC	Area of Concern
AST	aboveground storage tank
B040	Building 040
bgs	below ground surface
BMP	best management practices
Boeing	The Boeing Company
CAS	Columbia Analytical Services
CFOU	Chatsworth Formation Operable Unit
CMS	Corrective Measures Study
COPC	contaminant of potential concern
CPEC	contaminant of potential environmental concern
DHS-RHB	Department of Health Services- Radiological Health Branch
Dioxins/Furans	(a) - *see table below*
DOE	United States Department of Energy
DTSC	Department of Toxic Substances Control
EPC	exposure point concentration
ERA	ecological risk assessment
GRC	Groundwater Resources Consultants, Inc.
GWCC	groundwater comparison concentration
HRA	Human health risk assessment
HI	hazard index
HML	Hazardous Materials Laboratory
HQ	hazard quotient
HRA	human health risk assessment
HSA	Historical Site Assessment
H&A	Haley & Aldrich
ICF	ICF Kaiser Engineers
mg/kg	milligrams per kilogram
MSL	mean sea level
MW	Montgomery Watson
MWH	MWH, Inc
NA	Not Applicable
NCY	New Conservation Yard
ND	not detected
NFA	no further action
ng/kg	nanograms per kilogram
NPDES	National Pollutant Discharge Elimination System
NSGW	near-surface groundwater
OCY	Old Conservation Yard
Ogden	Ogden Environmental and Energy Services Company, Inc.
OU	operable unit

LIST OF ACRONYMS (Continued)

PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RME	reasonable maximum exposure
SAIC	Science Applications International Corporation
Sapere	Sapere Consulting, Inc.
SAP	Sampling Analysis Plan
SCTI	Sodium Component Test Installation
SPA	Storable Propellant Area
SRAM	Standardized Risk Assessment Methodology Work Plan
SRE	Sodium Reactor Experiment
SSFL	Santa Susana Field Laboratory
SQL	sample quantitation limit
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TCE	trichloroethene
TPH	total petroleum hydrocarbons
UCL	upper confidence limit
USEPA	United States Environmental Protection Agency
UST	underground storage tank
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
VCEHD	Ventura County Environmental Health Department
VOC	volatile organic compound
WPA	Work Plan Addendum

(a) Definition of dioxin/furan congeners

PCDD/PCDDs	**Polychlorinated dibenzo-p-dioxins/dibenzofurans**
2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
1,2,3,7,8-PeCDD	1,2,3,7,8-pentachlorodibenzo-p-dioxin
1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-hexachlorodibenzo-p-dioxin
1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-hexachlorodibenzo-p-dioxin
1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-hexachlorodibenzo-p-dioxin
1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin
OCDD	1,2,3,4,6,7,8,9-octachlorodibenzo-p-dioxin
2,3,7,8-TCDF	2,3,7,8-tetrachlorodibenzofuran
1,2,3,7,8-PeCDF	1,2,3,7,8-pentachlorodibenzofuran
2,3,4,7,8-PeCDF	2,3,4,7,8-pentachlorodibenzofuran

PCDD/PCDDs	**Polychlorinated dibenzo-p-dioxins/dibenzofurans**
1,2,3,4,7,8-HxCDF	1,2,3,4,7,8-hexachlorodibenzofuran
1,2,3,6,7,8-HxCDF	1,2,3,6,7,8-hexachlorodibenzofuran
2,3,4,6,7,8-HxCDF	2,3,4,6,7,8-hexachlorodibenzofuran
1,2,3,7,8,9-HxCDF	1,2,3,7,8,9-hexachlorodibenzofuran
1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-heptachlorodibenzofuran
1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8,9-heptachlorodibenzofuran
OCDF	1,2,3,4,6,7,8,9-octachlorodibenzofuran
TEQ	Toxic Equivalency Quotients (normalized to 2,3,7,8 TCDD)

SECTION A2.1
INTRODUCTION

This appendix to the Group 6 Resource Conservation Recovery Act (RCRA) Facility Investigation (RFI) Report presents results and recommendations for the investigation conducted at the Old Conservation Yard (OCY) RFI site (Area IV Solid Waste Management Unit [SWMU] 7.4) at the Santa Susana Field Laboratory (SSFL). The RCRA Corrective Action Program at the SSFL is being conducted under the oversight of the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC).

The OCY RFI Site is one of four RFI sites included in the Group 6 RFI Report area. A RFI site is an area that includes a SWMU(s) and/or an Area(s) of Concern (AOC(s)), plus some adjacent land for the purpose of characterization. The location of the OCY RFI Site within the SSFL and Group 6 is shown on Figure A2.1-1. The other three sites are the New Conservation Yard (NCY – SWMU 7.8), Sodium Reactor Experiment (SRE – Area IV AOCs), and Building 064 Leach Field (Area IV AOC). The OCY RFI Site is located in the northeastern portion of SSFL Area IV, between the adjacent NCY RFI site and the northern undeveloped land. The OCY RFI Site is was leased to the United States Department of Energy (DOE) from Rockwell International, a predecessor company of The Boeing Company (Boeing), who operated the site on behalf of DOE.

The SSFL RFI was conducted to characterize the presence of SSFL operation-related chemicals in environmental media, estimate risks to human health and the environment (i.e., the ecosystem), gather data for the next phase of RCRA Corrective Action, the Corrective Measures Study, and identify areas for additional work. For purposes of characterization, the SSFL has been divided into two Operable Units (OUs): the Surficial Media Operable Unit (Surficial OU) and the Chatsworth Formation Operable Unit (CFOU). The OCY RFI Site characterization presented in this appendix includes investigation data from both OUs, discussed together.

The Surficial OU includes soil, sediment, surface water, air, biota, and near-surface groundwater (NSGW) at the SSFL. NSGW is defined as groundwater occurring within alluvium or weathered bedrock of the Chatsworth formation. Vadose zone bedrock and deeper groundwater that occurs within unweathered Chatsworth formation bedrock is

defined as the CFOU. Further details regarding NSGW and CFOU groundwater are presented in Appendix B of this Group 6 RFI Report. A summary of the human health risk assessment (HRA) and ecological risk assessment (ERA) results is presented in Section A2.4 of this appendix. Appendix C presents the details of the risk evaluation of chemicals present in both the Surficial OU and the CFOU. Potential exposures and risks from both OUs are integrated in the HRA and ERA results.

This OCY RFI Site Appendix provides detailed data and evaluation pertaining to the OCY RFI Site, which includes all relevant information needed to evaluate the completeness of characterization, risk assessment results, and site recommendations. This information is presented in sections organized as follows:

- Section A2.2 – Site history, chemical use, and existing conditions.
- Section A2.3 – Nature and extent of chemical impacts.
- Section A2.4 – HRA and ERA findings summary.
- Section A2.5 – Corrective Measures Study (CMS) recommendations.
- Section A2.6 – References cited.

Site-specific additional information is provided in the following attachments:

- Attachment A2-1 – Site-specific regulatory agency documents and correspondence.
- Attachment A2-2 – Subsurface investigation (utility clearance and soil boring and trench logs).
- Attachment A2-3 – Laboratory analytical data, data validation, and data quality reports.

Information regarding characterization for the OCY RFI Site is contained in the following figures and tables:

- **Figure A2.1-1:** Presents the location of the OCY RFI Site within the SSFL and the Group 6 reporting area.
- **Figures A2.2-1A and A2.2-1B**: Present a view of the OCY RFI Site, showing chemical use areas, soil sampling locations, and nearby monitoring wells.

- **Table A2.3-2A and Figures A2.3-1 through A2.3-4B**: Present characterization details for all soil sampling at the OCY RFI Site. Soil sampling results are shown on the seven maps and correlate with appropriate sections of Table A2.3-2A.
- **Table A2.3-2B:** Presents a summary of groundwater characterization.

Information regarding Group 6 area-wide conditions, transport and fate of chemicals between RFI sites, and other evaluations of area-wide issues are contained in the Group 6 RFI Report, and appendices. Pertinent appendices to the Group 6 RFI Report are:

- **Appendix B:** Presents information regarding groundwater conditions in the Group 6 reporting area, including the OCY RFI Site. Information includes groundwater occurrence and quality, chemical transport, data set representativeness, and supporting data (monitoring results, time-series plots, and hydrographs), as well as an evaluation of naturally occurring constituents.
- **Appendix C:** Presents risk assessment information including a description of any methodology variances from the Standardized Risk Assessment Methodology (SRAM) Work Plan, risk calculations, result tables, and all transport and fate modeling (except groundwater).
- **Appendix D:** Presents the *Soil Background Report Addendum*. This addendum report provides the results and interpretation of soil and ash samples collected from background sample locations and analyzed for fire-related chemicals after the September 2005 Topanga Fire.

Information presented in this OCY RFI report is also supplemented by background documents that contain information about site and facility background, Surficial OU Program background, and methodologies/procedures. These reports are inclusive of previous documents including the Current Conditions Report (ICF, 1993) and the RCRA Facility Assessment (RFA) Report (SAIC, 1994). Other reports include:

- *RFI Program Report* (MWH, 2004) – This report contains:
  - A general description of the SSFL facility, including an operational history, physical setting information, and regulatory programs and oversight.
  - A summary of the RCRA Corrective Action Program being conducted at the SSFL and a description of the OUs.
  - A comprehensive description of the Surficial OU field sampling program, including overall sampling scope, sampling methods and subcontractors used, and protocols followed.

  - Details of the analytical program for the Surficial OU RFI, including laboratories used, data validation findings, and Data Quality Assessment findings.
  - Programmatic key decision points or significant issues that influenced sampling, laboratory procedures, methodologies, or step-out requirements.

- *Surficial OU Standardized Risk Assessment Methodology (SRAM) Work Plan, Revision 2* (MWH, 2005) – This report contains:
  - Procedures for completing HRAs and ERAs.
  - Background soil concentrations and groundwater comparison concentrations.
  - A biological conditions report for the SSFL.
- *RFI Work Plan Addendum and Amendments* (Ogden, 1996; 2000b and c) – These reports contain:
  - Sampling procedures and rationale.
  - RFI site descriptions and operational history.
- *Near-Surface Groundwater Characterization Report* (MWH, 2003b) – This report contains:
  - Nature and extent of near-surface groundwater at the SSFL.
  - Distribution, transport, and fate of trichloroethene (TCE) and other chemicals of concern, and the relationship of NSGW to CFOU groundwater.
- *CFOU Characterization Reports* (Montgomery Watson, 2000; MWH, 2002 and 2003a) – These reports contain:
  - Geologic framework at the SSFL and hydrogeologic conditions of both NSGW and CFOU groundwater.
  - Transport and fate of TCE, and the occurrence and transport of other chemicals of concern in the CFOU.

SECTION A2.2
SITE HISTORY, CHEMICAL USE, AND EXISITING CONDITIONS

The OCY RFI Site is approximately 10 acres and is located in the northeastern portion of Area IV at the SSFL. The site location within the SSFL is shown on Figure A2.1-1. This figure also shows the Group 6 Reporting Area boundary. Figures A2.2-1A and A2.2-1B show the site layout and the relationship between chemical use areas and sample locations. The figures also show the locations of three surficial cross-sections across the site.

The OCY RFI Site is comprised of one SWMU identified during the RCRA Facility Assessment (RFA): SWMU 7.4 (SAIC, 1994). SWMU 7.4 was initially defined in the RFA as the OCY Container Storage Area, an unlined rectangular area located along E Street that was formerly used for storage of salvageable materials and equipment. Based on reviews of historical facility maps, photos, and waste characterization data (Boeing, 1999b), interviews with site personnel, and geophysical surveys conducted during the RFI, SWMU 7.4 was expanded to include the chemical use areas shown on Figure A2.2-1A.

After the Topanga Fire in September 2005, during which the dense brush north of the site burned, two debris areas were discovered. These debris areas were subsequently investigated for the presence of SSFL-related chemicals, and are identified on Figure A2.2-1B as the North Slope Debris Areas A and B (Chemical Use Areas 6c and 6d, respectively).

In a previous draft of this OCY RFI Report (MWH, 2003c), the site was divided into eastern and western portions. The western portion included a diesel fuel pipeline and aboveground storage tank (AST). However, based on a recent reorganization of SSFL reporting areas, and in consultation with the DTSC, the western portion of the OCY (and investigation results) will be included with the adjacent Reporting Group 5 (see Figure A2.1-1).

A2.2.1 Site History and Chemical Use

A summary of the site chronology, description of operations, and investigation activities for the OCY RFI Site is presented below. Facility correspondence, demolition and decommissioning reports, investigation reports, waste disposal records, maps, drawings, photographs and personnel interviews as cited in the references to this document were reviewed and evaluated to compile the site history information presented below. Primary sources of information include the RCRA Facility Assessment (RFA) (SAIC, 1994), the Current Conditions Report (ICF, 1993), the RFI Work Plan Addendum (Ogden, 1996), the DOE Historical Site Assessment (Sapere, 2005), and the Final Decontamination and Radiological Survey of the Old Conservation Yard (Rockwell, 1990).

1952 – 1977	The OCY RFI Site was used primarily for staging and storage of salvageable materials (Rockwell, 1990). Based on review of historical aerial photographs (USEPA, 1997), investigation and closure reports (Rockwell, 1990; GRC, 1989) and site inspections, five areas were potentially used for storage at the site. The two best defined areas are located in the southeastern and central portions of the site (Chemical Use Areas 1a and 1b), and are designated the Rocketdyne Conservation Yard (Area 1a) and Atomics International (AI) Conservation Storage Yard (Area 1b). They were used between 1957 and 1977 as staging areas for excess salvageable materials, such as scrap metal parts (GRC, 1989). Materials were stored in drums, and then either reused or sold to a salvage contractor. The Rocketdyne Conservation Yard (Chemical Use Area 1a) was also used to store empty drums. In 1969, the Rocketdyne and AI Conservation Yards were converted to a material storage yard for the Rocketdyne Plant Services (Sapere, 2005). Other portions of the OCY RFI Site were also potentially used during this period for storage of equipment and materials in drums. Reportedly, numerous ('hundreds') drums were stored at the OCY RFI Site during the 1960s and 1970s (GRC, 1989). Based on review of historical photographs, the areas northeast, south, and within the later-bermed AST areas (Chemical Use Areas 1c, 1d, 2a, and 2b) were potentially used for storage during this period. Specific dates of storage in these areas are not documented; however, they are visible in historical aerial photographs taken of OCY in 1965 (USEPA, 1997). Based on these aerial historical photographs, it appears that the additional storage areas were not used prior to 1957 and, by 1978, storage at the site was limited to the Rocketdyne and AI Conservation Yards (Areas 1a and 1b).

1950s – 1970s (approximate)	A small asphalt covered area in the southern portion of the OCY RFI Site (noted on Figure A2.2-1A as "Former Parking Area 511") was used for parking associated with the historical Area IV access control gate (Buildings 623 and 113). According to facility maps, the parking area was moved to the north side of E Street.
1970s (approximate)	Two areas in the eastern part of the OCY RFI Site (Chemical Use Areas 6a and 6b) were used for disposal of construction debris (metal, concrete, charred wood, asbestos containing materials [ACM], etc.), and empty containers (5-gallon cans and 55-gallon drums). Specific dates of use or original sources of disposed material for this area are not available, but the area is shown as disturbed in the historical aerial photograph taken in 1978 (USEPA, 1997). Based on historical aerial photographs, it does not appear that this portion of the site was used prior to 1965 or after 1988.
1977 – 1986	In 1977, all salvage materials were moved from Rocketdyne and AI Conservation Yards (Chemical Use Areas 1a and Area 1b) to the New Conservation Yard (SWMU 7.8) and the OCY was used for material storage by Plant Services (Rockwell, 1990; Sapere, 2005).
1977 – 1981	A fuel oil storage area was constructed in the northern portion of the OCY RFI Site to provide adequate storage for Sodium Component Test Installation (SCTI) facility operations in Area IV. Fuel oil consists of diesel-range petroleum products. The storage area included: • Two 1.5-million gallon-capacity ASTs (Structures 731 and 732); AST 731 was built in 1977, and AST 732 in 1981 (Trippeda, 2002). • Approximately 6- to 13-feet high earthen berms surrounding these ASTs constructed for secondary containment (Boeing, 1976a and 1976b). The fill source material for the berms is not documented. A thin (less than ½-inch thick) oil/fine aggregate coating was observed on the slopes of the eastern berm during the RFI. • A pump house (Building 320). • A 20,000-gallon underground storage tank (UST) (UT-28). • A pipe manifold area with a concrete ditch and clarifier to provide overflow containment during UST filling operations. No fuel spills or leaks have been reported within any of the bermed AST areas, or along the pipeline (ICF, 1993).

1977 - 1981 (continued)	Because of location and similarity of purpose, the above items associated with the fuel tanks have been grouped into the following chemical use areas (see Figure A2.2-1A): • Chemical Use Areas 2a and 2b include the large ASTs and surrounding berms. • Chemical Use Area 3 includes the pump house, UT-28, the fuel spill excavation area, the concrete-lined ditch, and the clarifier.
1960s – 1990s (approximate)	The southern drainage leading from the OCY site received effluent discharge water from a pipeline leading from the SRE Pond (Area IV AOC – Chemical Use Area 4, Figure A2.2-1A). This pipeline was installed in 1959 as part of repairs to the earthen berm at the SRE Pond (Rockwell, 1977) and appears in the historical aerial photograph taken in 1965 (USEPA, 1997). Based on this aerial photograph, in 1965 the SRE Pond pipeline discharged directly into a drainage south of the area where the ASTs would be installed during 1977. Following AST and berm installation, the pipeline from the SRE Pond discharged into a grated, concrete-lined sump set below grade south of the western AST berm. This concrete-lined sump discharged into a subsurface pipeline that ran parallel to the ditch described above. The date at which this pipeline was no longer used is not documented, but it was likely inactive by the early or mid-1990s (Trippeda, 2006b).
1982	During fueling operations, 400 gallons of diesel fuel were spilled on the asphalt adjacent to UT-28. The asphalt was rinsed with water and the fuel/water mixture flowed into a vegetated natural depression east of Building 320. The wash water and fuel were pumped out, and impacted soils were excavated to a depth of 4 to 5 feet below ground surface (bgs). Spilled materials and soils were disposed of offsite. It was estimated that approximately 300 to 350 gallons of spilled diesel fuel were recovered (ICF, 1993).
1986 to late 1990s	In 1986, the Rocketdyne Conservation Yard (Chemical Use Area 1a) was converted to a parking area for shipping trailers and containers (Rockwell, 1990).
1988	The former UT-28 UST was removed under the oversight of the Ventura County Environmental Health Department (VCEHD) (Rockwell, 1994). No evidence of leakage was observed in the UST excavation and no further action was required (Ogden, 1996). Clean closure was granted for UT-28 by VCEHD in 1994 (Rockwell, 1994).

1989	During a 1988 Rockwell survey to assess radioactive contamination in Area IV, cesium-137 was found at concentrations up to 200 picocuries per gram (pCi/g) at the OCY RFI Site (Rockwell, 1990). In 1989, impacted surficial soil from a 400 square-foot area was excavated from the southwestern corner of the Rocketdyne Conservation Yard, and four metal containers were sent offsite for disposal (Rockwell, 1990). There is no record of the excavation being backfilled, and the area had been repaved by the mid-1990s. A subsequent survey was performed by the California Department of Health Services Radiological Health Branch (DHS-RHB) in 1995 (DHS, 1995), and the OCY was approved for unrestricted use in 1995 (Attachment A2-1).
1994	ASTs 731 and 732 were drained since fuel oil backup was no longer necessary for Area IV operations (Ogden, 1996).
1995	The OCY was released for unrestricted use (DHS, 1995; Attachment A2-1).
1998-1999	As observed during site walks, a vegetated area immediately north of the Rocketdyne Conservation Yard was used to temporarily store telephone poles (Chemical Use Area 5). During 1999, an RFI site inspection indicated many of the stored poles had been burned. All poles were removed from the site in 2000. This storage area is above a wooden retaining wall that forms the northern boundary of the Rocketdyne Conservation Yard (Chemical Use Area 1a).
1999-2000	The ASTs, Building 320, pump manifold area, fuel pipelines, SRE discharge pipeline, concrete ditch, and clarifier were removed. Waste disposal characterization of the AST base materials indicated elevated oil-range hydrocarbons and polychlorinated biphenyls (PCBs) (Boeing, 1999b).
2002	Earthen berms were leveled, and the berm soils were used to re-grade portions of the AST areas, former Building 320, and Rocketdyne Conservation Yard areas (Trippeda, 2002). The locations of the former berms, as well as the areas where soil was placed, are identified on Figure A2.2-1C.
2005	Post-Topanga Fire inspections of areas surrounding the OCY RFI Site revealed two additional debris areas: North Slope Debris Area A (Chemical Use Area 6c) and North Slope Debris Area B (Chemical Use Area 6d). Both are located downslope and north of the OCY RFI Site.

Additional OCY RFI Site information is provided in the following tables:

- Building inventory – Table A2.2-1

- Fuel and solvent storage tank inventory – Table A2.2-2
- Transformer inventory – Table A2.2-3
- Documented chemical use – Table A2.2-4

Chemical use areas at the OCY RFI Site are shown on Figures A2.2-1A and A2.2-1B and described in detail in Section 3. The 19 potential chemical use areas evaluated at or adjacent to the site include the following (Chemical Use Area numbers):

- Three conservation yards/ storage areas (1a, 1b, and 1c)
- A storage area for equipment (1d)
- Two former ASTs and surrounding earthen berm (2a and 2b)
- A former fueling area, including a concrete ditch and soil excavation area (3)
- SRE Pond pipeline and discharge area (4)
- A former telephone pole storage area (5)
- Two debris areas in the southern portion of the site (6a and 6b)
- Two debris areas along the slope north of the site (6c and 6d)
- Five pad- or pole-mounted electrical transformers (7a,7b, 7c, 7d, and 7e)
- A topographic low spot and downslope discharge area (8)

The surface water drainages leading north and south from the OCY RFI Site chemical use areas were also evaluated as part of the RFI. Potential chemicals stored or used at the site are listed in Table A2.2-4.

The fuel pipeline and western AST 735 characterized as part of the OCY RFI Site lie mostly outside of Reporting Group 6 (MWH, 2003c) and within adjacent Group 5. As a result, investigation of these units will be included with the Group 5 RFI Report (see Section A2.3).

A2.2.2 Site Conditions

General Conditions and Topography

Site conditions at the OCY RFI Site are diverse. The southern portion of the site is mostly a gently south-sloping area that is bordered to the north by a steep, north-facing slope (Figure A2.2-1B), to the south by Burro Flats, and to the west and east by rocky outcrops (Figure A2.2-1A). Prior to 2002, surface conditions at the site included level, graded areas for ASTs surrounded by raised earthen berms. The ASTs were installed above a gravel/sand aggregate base material. This material was removed shortly after the ASTs were removed from the site in 1999 (Boeing, 1999b).

The Building 320 Fuel Farm, AI and Rocketdyne Conservation Yards, and southern adjacent parking area appear to be paved after 1978 (USEPA, 1997). The northern boundary of the Rocketdyne Conservation Yard is a wooden retaining wall (about 1 to 2 feet high). During the RFI, the asphalt in the Rocketdyne Conservation Yard (Chemical Use Area 1a) was observed to be in generally good condition, except in the southwest corner of the yard. The asphalt in this portion of the yard was cracked and uneven. The yard is shown on Figure A2.2-1A as a dashed area within the Rocketdyne Conservation Yard (Chemical Use Area 1a). The surface of a portion of the AI Conservation Yard (Chemical Use Area 1b) was coated prior to the 1990s with an asphalt-like aggregate material, varying between less than ½-inch to 2 inches thick. This area is shown on Figure A2.2-1A as the area outlined as "583" within the AI Conservation Yard (Chemical Use Area 1b).

As described above, the AST area earthen berms were leveled in 2002 and spread out to a depth of approximately 1-foot over a portion of the site, as depicted on Figure A2.2-1C. The change in site conditions (i.e., thickness of graded soil in each area) is shown on Figure A2.2-1C and the extent of the spread berm soil is noted. Soil samples that were collected from this area prior to soil spreading are approximately 1-foot deeper than originally reported (this is indicated in sample summary tables within Section A2.3).

Surface elevations within the OCY RFI Site boundary range from a minimum of approximately 1,700 feet above mean sea level (MSL) in the North Slope Debris Area "A" to approximately 1,860 feet MSL along sandstone outcrops in the east and northeast portions of the site. The central portion of the site where the earthen berms were leveled now gently slopes to the south; the elevation through this area is approximately 1,825 feet

MSL. The elevation of the drainages that begin at the southwest and southeast portions of the site is approximately 1,820 feet MSL; their confluence to the southeast is approximately 1,805 feet MSL. Three surficial cross-sections through the site are presented as Figures A2.2-2A through A2.2-2C. Cross-section location lines are shown on Figure A2.2-1A through C.

Currently, the main southern portion of the OCY RFI Site is an open, re-vegetated, grassy area with mature oak trees and sandstone outcrops in places. The steep northern portion of the site is characterized by thin soil covering bedrock outcrops cut by narrow drainages trending north-northwest. Erosion control measures have been implemented at the telephone pole storage and at the northern debris areas (MWH, 2006).

Geology

The site is situated on the Upper Burro Flats Member of the Upper Chatsworth formation (MWH, 2002). The Upper Chatsworth formation is a series of interbedded sandstone and shale units that generally strike North 70 degrees East and dip 25 degrees Northwest. The Upper Burro Flats Member is comprised of fine to medium-grained sandstone. Figure 2-5 of the Group 6 RFI Report shows the geologic units represented within the site. The ELV Member occurs between the Upper and Lower Burro Flats Members, and is comprised of thinly interbedded, fine-grained sandstone, siltstone, and shale. A similar, but thinner, shale unit has been mapped west of the former AST earthen berms (the 'Lot Bed').

Soils

At the OCY RFI Site, soils consist primarily of weathered products of Chatsworth formation bedrock, and colluvium with fill soils comprised mostly of silty sand to sandy silt. The downslope topographic low spot (Chemical Use Area 8) contains sediment washed down from areas within and upgradient of the site (including the SRE Pond to the west). These sediments are typically lean clays and sandy silts. Sediment in the downstream drainages typically consists of sandy silt and silty fine-to-medium sands. Based on soil boring logs (Attachment A2-2), soil thickness at the OCY RFI Site ranges up to 8 feet (OCBS43, near UST UT-28). Soils are generally comprised of lean clay, sandy silt, and silty sand.

Groundwater

Groundwater occurs at and near the OCY RFI Site in monitoring wells completed within both the Surficial OU (weathered bedrock) and the deeper CFOU. Details of the groundwater system and monitoring network in RFI Group 6 (including the OCY RFI Site) are presented in the Group 6 RFI Report, Appendix B. In that appendix, Figure B-1 shows wells and piezometers that are used to monitor groundwater at and near the OCY RFI Site. NSGW is monitored southeast of the site in piezometer PZ-114; however, groundwater does not occur within site. CFOU groundwater is monitored in Wells RD-14 and WS-07 (both within the OCY RFI Site). Based on OCY RFI Site findings (Section A2.3), NSGW occurs periodically within weathered bedrock at depths ranging from 34 to 48 feet bgs in PZ-114. Groundwater is more commonly found below this depth, typically 50 to 60 feet bgs, and is considered part of Chatsworth formation groundwater (H&A, 2006). Groundwater flow gradient in the CFOU is to the north-northwest (Section A2.3).

Seeps/ Springs

There are no seeps or springs present at the OCY RFI site.

Surface Water

Surface water flow at the OCY RFI Site is shown on Figure 2-7B of the Group 6 RFI Report. A surface water divide occurs in the northern portion of the OCY RFI Site, as shown on Figure A2.2-1A. Surface water flow to the north of this divide, at the North Slope Storage Area and North Slope Debris Areas (Chemical Use Area 1c, 6c, and 6d), is to the north into several natural drainages leading offsite. Surface water flow to the south of this divide is to the south, toward the southwestern or southeastern drainages that lead to the Silvernale Reservoir (SWMU 6.8, see Figure A2.1-1). Surface water flowing to the north enters Arroyo Simi, and surface water flowing to the south enters Bell Creek – a tributary of the Los Angeles River. Prior to the 2002 berm soil spreading and grading activities at the site, storm water runoff from the ASTs and southwestern portion of the OCY RFI Site was channeled via asphalt/concrete ditches into the topographic low spot in the southwestern portion of the site (Chemical Use Area 8). Flow from the area leaves the site through a metal culvert below E Street, and discharges to an asphalt-lined surface water drainage south of the road. As described above, when operational, SRE Pond effluent was released into the topographic low spot via a pipeline discharge (Chemical Use Area 4). This drainage traverses south through the NCY RFI site (Group 6 RFI Report, Appendix A1), where it turns east and becomes unlined.

Surface water runoff from the eastern portion of the OCY RFI Site, near the debris areas, was (and still is) toward a natural drainage in the southeastern portion of the site. This drainage also exits the OCY RFI Site via a metal culvert beneath E Street, trends south, and joins the drainage described above. After the confluence, the drainage leads to Silvernale Reservoir (SWMU 6.8), which in turn discharges to the R-2 Ponds (SWMU 5.26) and eventually off site to Bell Creek, a tributary of the Los Angeles River.

Biology

Biological conditions at the OCY RFI Site (prior to the 2005 Topanga Fire) are shown on Figure 2-12 within the Group 6 RFI Report. As described above, portions of the OCY RFI Site were recently graded and seeded. These areas are considered disturbed, non-native grassland. The remaining portion of the eastern OCY RFI Site is a mixture of developed, non-native grassland, and venturan coastal sage scrub vegetation – with interspersed areas of coast live oak woodland, mulefat scrub, and rock outcrop. The northern portion of the OCY RFI Site is primarily ruderal habitat, nonnative grassland, mulefat scrub, developed land and sandstone outcrops – with small areas of venturan coastal sage scrub and chaparral (contiguous with extensive areas of coastal sage and chaparral off site to the north). Sensitive species at or near the OCY RFI Site include the mule deer, two-striped garter snake, bobcat, coast live oak, and Santa Susana tarplant (MWH 2005).

During the September/October 2005 Topanga Fire, much of the vegetation at the OCY RFI Site was burned and significant ash deposited, especially in drainages. Both native and non-native plant species identified above were destroyed by the fire. In areas with limited vegetation (e.g., the Rocketdyne Conservation Yard) effects of the fire were minimal. Areas with more vegetation, including the topographic low spot, were impacted significantly by burning and deposition of ash.

At the time of this report, the plant community at OCY is in a transitional state, where early post-fire plant species are growing. It is expected that the plant community will continue to grow and transition until a more stable plant community is established. This final community may or may not be the same as was present at the time of the fire, due to the aggressiveness of some non-native species, i.e., grasslands.

SECTION A2.3
NATURE AND EXTENT OF CHEMICAL IMPACTS

This section describes the data used to define the nature and extent of chemical impacts to environmental media at the OCY RFI Site. The presentation includes sampling objectives, scope, key decision points related to characterization activities, and findings.

Transport and fate evaluations are discussed in:

- Group 6 RFI Report, Section 5 – Potential migration via surface water flow.
- Group 6 RFI Report, Appendix B, Groundwater – Potential migration from soil to groundwater, groundwater migration.
- Group 6 RFI Report, Appendix C, Risk Assessment – Potential VOC migration from groundwater to soil, soil to indoor air.

A2.3.1 Sampling Objectives

The purpose of collecting soil and sediment samples was to characterize the extent of potential chemical impacts at the OCY RFI Site. The process of selecting sampling locations, depths, and analytical methods considered the following objectives:

- Defining the lateral and vertical extent of chemical impacts.
- Defining potential chemical gradients.
- Obtaining sufficient data for the risk assessment.
- Obtaining sufficient data to estimate CMS soil volumes within a factor of 10.

To achieve these objectives, soil sampling was conducted as described in the RFI Work Plan Addendum (Ogden, 1996), or as directed by DTSC during the RFI field program. Additional sampling was also performed to achieve the objectives outlined above, considering:

- Additional information regarding site use and observed site conditions.
- Site sampling results and data trends.
- Knowledge of chemical properties (e.g., mobility, volatility, association with other chemicals, etc.).
- SSFL metals and dioxins background concentrations.
- SSFL SRAM-based screening concentrations for human health and ecological receptors.
- Risk assessment results and knowledge of areas anticipated to require further evaluation during the CMS.

Groundwater has been sampled to meet site-wide routine monitoring requirements and additional characterization objectives according to regulatory agency-approved work plans (see below). Based on detected RFI site chemicals, chemical distribution, and site conditions, additional groundwater sampling and analyses were conducted to complete characterization of individual RFI sites and provide data sufficient for risk assessment. Groundwater sampling was conducted as described in the Sampling Analysis Plans (GRC, 1995a and b) and the *Shallow Zone Groundwater Investigation Work Plan* (Ogden, 2000b).

A2.3.2 Scope

A total of 26 soil vapor and 178 soil matrix samples were collected between August 1988 and April 2006 to assess potential impacts associated with the 19 potential chemical use areas at the OCY RFI Site. Sampling locations and analytical suites were based on DTSC-approved work plans (ICF, 1993; Ogden, 1996), sampling results from previous investigations, additional facility information from site inspections, personnel interviews (Trippeda, 2002 ad 2006b), waste disposal characterization data (Boeing, 1999b), historical and/or aerial photographs, and DTSC site inspections and requests. Sampling schedules are presented in Tables A2.3-1A through A2.3-1C.

Both the CFOU and NSGW have been sampled and analyzed according to agency approved work plans (GRC, 1995a and b; Ogden, 2000c; H&A, 2004). Two monitoring wells and one piezometer were used to characterize groundwater at and near the OCY RFI Site. As described in the risk assessment, groundwater-monitoring data from the entire Group 6 area is used to characterize some potential exposure routes to human receptors. Groundwater characterization data for the OCY RFI Site are presented with the entire Group 6 groundwater data set in Appendix B of this Group 6 RFI Report.

Based on quality assurance (QA) review conducted on sediment, soil, soil vapor and piezometer sampling results, these data have been deemed usable and meet RFI Program requirements as defined by DTSC-approved Quality Assurance Project Plans. The RFI QA program included individual sample data validation; assessment of each laboratory's performance; and a qualitative review of the precision, accuracy, representativeness, reliability, and completeness parameters for the datasets. Overall data quality is described in the RFI Program Report (MWH, 2004). Site-specific data quality summaries for the OCY RFI site are described by media in the sections below.

As an ongoing, additional QA measure, DTSC Hazardous Materials Laboratory (HML) is performing an independent data validation of 5 to 10 percent of the surficial media analyses performed for the RFI. This regulatory review includes evaluation of original electronic instrument raw data. To date, the HML review to date has found that the data collected for the RFI meet the project requirements (MWH, 2004). Other sampled environmental matrices (i.e., routine groundwater and/or surface water, as appropriate), have their own QC data reviews. These data are generally considered useable for the RFI if they meet their respective program requirements, although there are additional evaluations performed to assess historical trends and select representative data for use in the RFI.

This report presents characterization results for all media sampled at the OCY RFI Site, including:

- Soil vapor
- Soil matrix (including soil and drainage sediment)
- Groundwater

A2.3.3 Key Decision Points

DTSC has been an integral part of the decision-making process during the SSFL RFI program. Although the Rocketdyne Conservation Yard, excavation area, and drainage at the OCY RFI Site were originally proposed for RFI sampling (Ogden, 1996), the remainder of the site chemical use areas (ASTs/fuel farm, pipeline, debris areas, transformers, and all potential storage areas) were added to the program at the request of DTSC during a comprehensive SSFL RFI site review. All OCY chemical use areas were evaluated for sampling by DTSC based on review of historical operations, sampling results, physical inspection, and site personnel interviews. On the basis of this evaluation, DTSC required additional sampling of site media in the chemical use areas identified in this report. DTSC also provided ongoing review during the SSFL RFI field sampling, selected all trench locations and additional step-out sample locations, reviewed field sampling protocols, and collected split samples.

Site-specific characterization decision points are listed below. These decision points represent either assumptions upon which sampling was based, or decisions made during step-out sampling or data evaluation. Programmatic decision points (those common to all RFI sites) are described and included in the RFI Program Report (MWH, 2004).

1) The focus of RFI sampling/analysis was on the chemical use areas shown on Figures A2.2-1A and A2.2-1B, and described in Table A2.3-2A.

    a) These areas include the potential chemical use areas at the OCY RFI Site and where DTSC requested sampling.

    b) Sampling was not conducted in areas where non-hazardous materials were handled, stored, or used – such as the Fuel Farm Pump House (Building 320).

2) Soil sampling was not conducted at the UST (UT-28), because the unit was clean-closed by VCEHD in 1994. At the request of DTSC, soil vapor sampling was conducted nearby.

3) Sampling was not conducted beneath the pole-mounted transformers in the southern-central portion of the site (Chemical Use Area 7d) because they were installed post–1980, when transformers did not contain polychlorinated biphenyl (PCB) oils.

4) Sampling beneath the large ASTs targeted TPH, metals, and PCBs since detected in tank base waste characterization samples (Boeing, 1999b).

5) Although the source of the fill soils used to create the AST berms is undocumented, it is possible that OCY RFI Site soils were used to create them. Because of the potential for releases in former storage area soils, which were possibly relocated into the earthen berms, the berms were targeted for investigation and soil sampling. Comprehensive analytical suites were used at these locations based on DTSC request.

6) The aboveground pipeline leading from the SRE Pond (Area IV AOC) to the OCY RFI Site was visually inspected during the RFI, but not sampled since: (a) the pipeline appeared structurally sound and to be in good repair, and (b) samples were collected from the natural drainage into which the pipeline discharged.

7) Volatile organic compound (VOC) concentrations reported by Columbia Analytical Services (CAS) were adjusted, as specified by DTSC, to account for uncertainty associated with laboratory procedures. All detected soil CAS VOC concentrations were increased by a factor of 2, and detection limits were raised for bromoform, chloroform, methylene chloride, chloromethane, and bromomethane (see Attachment 3, Data Quality Report). Adjusted sample results are shown on Figure A2.3-1.

8) Potential post-Topanga Fire ash impacts in the drainage channels were considered in selecting sampling locations and depths when soil/sediment samples were collected for dioxins and polynuclear aromatic hydrocarbon (PAH) analyses (PAHs are a subset of semivolatile organic compounds [SVOCs]). Soil samples within drainages were collected according to procedures outlined in the Soil Background Report Addendum presented as Appendix D of this Group 6 RFI Report. To avoid fire impacts by overlying ash materials, pebbles, visible vegetation, charred twigs, and leaves were carefully removed by scraping them aside with a pre-cleaned trowel. Samples were then collected from the underlying soil.

9) Characterization sampling did not attempt to define concentration gradients for all compounds within areas recommended for further evaluation during the CMS (see Section A2.5). Rather, concentration gradients were defined to the extent such that risk assessment data reflect the maximum analyte concentration, or concentrations are sufficiently high to result in risk requiring a recommendation for CMS evaluation. Such data may be deemed unnecessary if other constituent concentrations are sufficient to require a CMS recommendation, provided the CMS areas for both constituents are roughly similar.

10) In order to establish elevation control for soil samples collected prior to and after the earthen berm was leveled in 2002, soil borings were hand-augered in several places within the earthen berm material to characterize the thickness of fill (DTSC, 2004). Figure A2.2-1C shows relative dates of samples collected within the extent of fill, which was approximately 1-foot thick within the perimeter shown. Depths of samples collected after 2002 are shown in Table A2.3-1C.

A2.3.4 Soil Vapor and Soil Matrix Findings

All soil sampling results and characterization findings are presented in Table A2.3-2A. The purpose of the table is to:

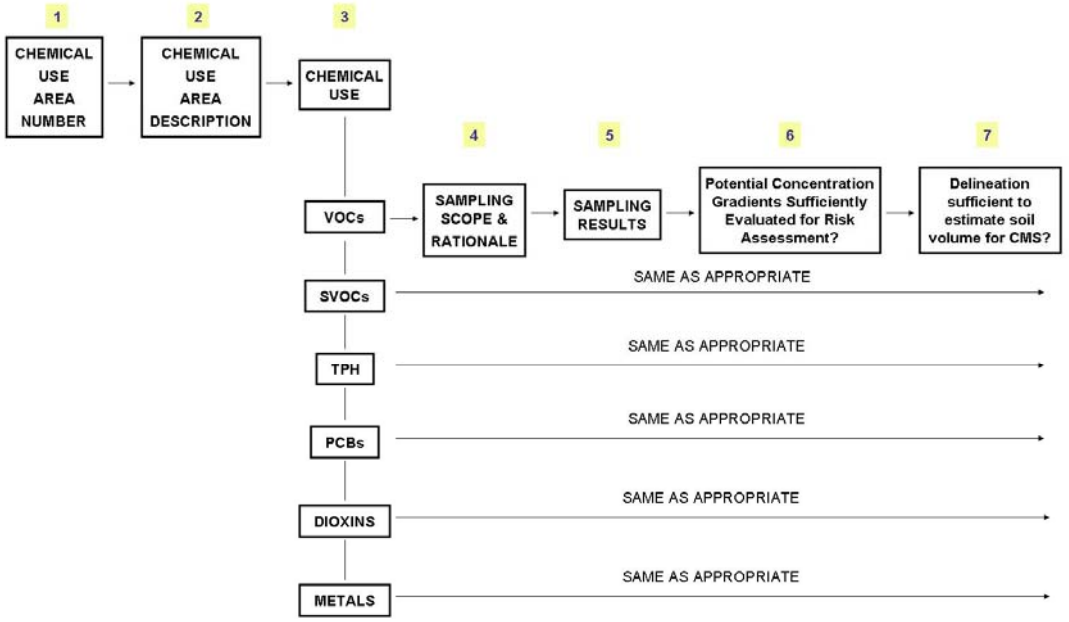
1) Present sampling results, including nature and extent.
2) Demonstrate that soil characterization is sufficient for the purposes of risk assessment.
3) Indicate soil volumes requiring further evaluation during the CMS are defined sufficiently to allow comparison of alternatives.

To achieve Goals 1 and 2, risk assessment results and CMS recommendations have been used to evaluate the characterization completeness. Risk assessment results were also used to guide delineation of areas recommended for further consideration in the CMS. This approach is further discussed below.

Data quality summaries for the OCY RFI Site are provided in Tables A2.3-3A through A2.3-3G.

A2.3.4.1 Soil Data Presentation

Relevant site information, sampling rationale, results, and evaluation of the results are presented in Table A2.3-2A. A flow chart illustrating the table structure is presented below.



Flow diagram illustrating Table A4.2-2A process

Reference numbers at the top of the illustration correspond to the Table A2.3-2A columns and text descriptions provided below. Sampling results have been organized by row for each chemical use area category and chemical group subcategory:

1 Chemical use area map number (see Figures A2.2-1A and A2.2-1B, and A2.3-1 through A2.3-4B).

2 Includes relevant site history, site characteristics, and chemical use-related activities.

3 Chemical group (dioxins, metals, etc.).

4 Sampling scope and rationale for each chemical group.

5 Sampling results provide sample identification numbers and other descriptions that direct the reader's attention to key locations on data maps (Figures A2.3-1 through A2.3-4B). Sample results are compared to established SSFL background concentrations (metals and dioxins only) and/or SSFL SRAM-based screening levels[i]. These screening levels are also displayed on the Figures A2.3-1 through A2.3-4B.

[i] The use of the SRAM-based screening levels for comparison purpose does not serve as a risk assessment. These screening levels are not used to determine the significance of detected chemical concentrations or if a chemical use area will be recommended for further consideration in the CMS, but only to provide the reader another tool to evaluate the characterization data. The SRAM-based screening levels represent conservative concentrations that pose a low level of risk. See Appendix C.

6 Summary of sampling results and determination if characterization of chemical gradients in each group is sufficient for risk assessment:

- If risk assessment results indicated recommendation for further consideration in the CMS, additional data were generally not collected within a chemical use area unless further definition of CMS volumes was needed (see 7 below).

- If maximum concentrations do not pose risks that require further CMS consideration, then determine if characterization is sufficient to define gradients or to indicate a gradient does not exist.

7 Determination if nature and extent of chemicals is defined sufficiently to estimate soil volumes (within a factor of 10) identified for further consideration in the CMS (if needed).

A2.3.4.2 Soil Data Summary

As detailed in Table A2.3-2A, the following 19 potential chemical use areas were investigated at the OCY RFI Site (Chemical Use Area number follows name):

- Rocketdyne Conservation Yard (1a)
- AI Conservation Yard (1b)
- Northern Storage Area (1c)
- Container Storage Area (1d)
- AST 732 and earthen berm (2a)
- AST 731 and earthen berm (2b)
- Fueling Area at Building 320 (3)
- SRE Pipeline and Discharge Area (4)
- Telephone Pole Storage Area (5)
- Northern Debris Areas (6a, 6b)
- Southern Debris Area (6a, 6b)
- North Slope Debris Area “A” (6c)
- North Slope Debris Area “B” (6d)
- Pad- and pole-mounted electrical transformers (7a through 7e)
- Topographic Low Spot/ Downslope Discharge Area (8)

A brief summary of characterization findings is provided below and described in detail in Table A2.3-2A. Sample data are depicted on Figures A2.3-1 through A2.3-4B. Information regarding the earthen berms is provided in Attachment A2-4.

(Chemical Use Area 1a) Rocketdyne Conservation Yard:

- Compounds analyzed in soil: VOCs, SVOCs, total petroleum hydrocarbons (TPH), and metals.
- Primary impacts were related to SVOCs (up to 1,600 micrograms per kilogram [µg/kg] phenanthrene), although this historical result (1988) was not reproduced in collocated 1997 RFI sampling.
- VOCs detected in soil vapor (up to 66 micrograms per liter [µg/L] TCE) in 1997; results not reproducible in 2006 (VOCs were not detected).

(Chemical Use Area 1b) AI Conservation Yard:

- Compounds analyzed in soil: VOCs, SVOCs, TPH, and PCBs
- Primary impacts were related to TPH (up to 8,300 milligrams per kilogram [mg/kg] lubricant oil-range TPH) and PCBs (up to 2,200 µg/kg Aroclor 1254).

(Chemical Use Area 1c) Northern Storage Area:

- Compounds analyzed in soil: VOCs, SVOCs, TPH, PCBs, and metals.
- Primary impacts were related to SVOCs (up to 480 µg/kg benzo(a)pyrene within storage area) and PCBs (up to 24,000,000 µg/kg Aroclor 1248 in downslope drainage).

(Chemical Use Area 1d) Container Storage Area:

- Compounds analyzed in soil: VOCs and TPH.
- No impacts significant enough to warrant further evaluation during the CMS (see Sections A2.4 and A2.5).

(Chemical Use Areas 2a and 2b) ASTs 732/731 and Earthen Berm:

- DTSC selected six trenching locations in the AST earthen berms for visual inspection of potential impacts (e.g., debris, staining, odors). Six trenches were dug into the berm soils. No staining or hydrocarbon or other odors were noted and the soils were not discolored. Debris was encountered in two trenches; one trench contained a small lense of asphalt (1-inch thick) in the center of the berm, and one trench contained small concrete fragments near the base of the berm.

Photographs and trench logs for the berms are provided in Attachment A2-4. Soil sampling was also performed in 2006 after the berm soils were spread, and again, no staining or odor was observed in the upper ½-foot of soil (estimated thickness of spread berm materials).

- Analytical results of six samples collected in 1999 (before spreading) did not contain detectable VOCs, SVOCs, or PCBs (Table 1, Attachment A2-4). Detected analytes included:
  - TPH was detected in four samples at concentrations less than RBSLs (76 mg/kg diesel range, and 39 to 250 mg/kg oil-range).
  - Three metals were detected above background, including aluminum, mercury, and silver. For two of these the ecological RBSL is less than background: aluminum was detected at a concentration of 21,000 mg/kg, just slightly above background of 20,000 mg/kg, and silver was detected at 3 mg/kg, approximately four times background.

- Analytical results for four samples collected in 2006 (after spreading) also did not contain detectable SVOCs (Table 2, Attachment A2-4). Detected analytes included:
  - Boron was detected at a concentration of 12 mg/kg, just slightly over the background level of 9.7 mg/kg (the ecological RBSL is less than background).

- The OCY RFI Site risk assessment included these sampling results within the data set and estimated risks for the site are presented in Section A.2.4. Evaluation of the berm sampling results in context of the estimated risks for potential receptors is described in Section A.2.5. Based on this analysis the spread berm soil chemical use Areas (2a and 2b) were not recommended for further evaluation in the CMS.

(Chemical Use Area 3) Building 320 fueling area, concrete ditch, and soil excavation area:

- Compounds analyzed in soil: VOCs, SVOCs, and TPH.

- Primary impacts were related to VOCs (up to 4,800 µg/kg acetone, 280 µg/kg methylene chloride, and benzene associated with gasoline-range TPH – up to 42 mg/kg).

(Chemical Use Area 4) SRE Pipeline and Discharge Area:

- Compounds analyzed in soil: VOCs, SVOCs, TPH, PCBs, dioxins, and metals.

- Primary impacts were related to dioxins (toxicity equivalency quotient [TEQs] of 35.7 nanograms per kilogram [ng/kg]).

(Chemical Use Area 5) Telephone Pole Storage Area:

- Compounds analyzed in soil: SVOCs and dioxins.
- Primary impacts were related to SVOCs (up to 29 µg/kg benzo(a)pyrene) and dioxins TEQs up to 183 ng/kg in surface soils; decreases to 34 ng/kg in deeper soil and 7 ng/kg in downslope shallow soil.

(Chemical Use Area 6a) Northern Debris Area:

- Compounds analyzed in soil: VOCs, SVOCs, TPH, PCBs, dioxins, and metals.
- Primary impacts were related to SVOCs (up to 34 µg/kg benzo(a)pyrene), PCBs (up to 94 µg/kg Aroclor 1254), dioxins (TEQs up to 51.7 ng/kg), and nine individual metals detected above their respective background concentrations.

(Chemical Use Area 6b) Southern Debris Area:

- Compounds analyzed in soil: VOCs, SVOCs, TPH, PCBs, dioxins, and metals.
- Primary impacts were related to dioxins. TEQs were below background (0.98 ng/kg) in the area, but up to 2.9 ng/kg in downslope soils and up to 8.3 ng/kg in downslope drainage; TEQ decreases to about background levels (0.99 ng/kg) in furthest down-drainage sediment sample.

(Chemical Use Area 6c) North Slope Debris Area "A":

- Compounds analyzed in soil: SVOCs, TPH, PCBs, and metals.
- Primary impacts were related to PCBs (up to 250 µg/kg Aroclor 1254); area is downslope from PCB-impacted Northern Storage Area (1c).

(Chemical Use Area 6d) North Slope Debris Area "B":

- Compounds analyzed in soil: SVOCs, TPH, PCBs, and metals.
- Primary impacts were related to PCBs. Although all results were nondetect, laboratory detection limits were significantly elevated (up to 8,900 µg/kg for various Aroclors).

(Chemical Use Area 7a-e) Pad- and pole-mounted electrical transformers:

- Compounds analyzed in soil: PCBs.
- PCB impacts were found in two of five areas: up to 240 µg/kg Aroclor 1254 in the southeast OCY (Chemical Use Area 7a), and up to 1,900 µg/kg Aroclor 1248 in the central OCY Area 737 (Chemical Use Area 7c).

(Chemical Use Area 8) Low Spot/ Downslope Discharge Area:

- Compounds analyzed in soil: SVOCs, TPH, PCBs, dioxins, and metals.
- Primary impacts in soil/sediment were related to SVOCs (up to 280 µg/kg benzo(a)pyrene), PCBs (up to 480 µg/kg Aroclor 1254), dioxins (TEQs up to 36 ng/kg), and metals (cadmium, lead, mercury, silver, and zinc detected above background, with aluminum and barium also of potential concern for the ERA – see Section A2.4).

The potential contribution of the Topanga Fire to dioxins and metals concentrations in soil have been considered for the characterization of the nature and extent of chemical impacts at the OCY RFI site. For OCY, 47 post-fire soil samples were analyzed for metals and seven samples were analyzed for dioxins. No post-fire dioxin samples were identified as affecting CMS recommendations. Several metals results should be considered further in the CMS: barium, boron, lead and zinc were slightly elevated in multiple samples collected after the fire.

A2.3.5 Groundwater Findings

Groundwater occurrence at the OCY RFI Site is described below.

A2.3.5.1 Groundwater Data Presentation

Groundwater sampling results and characterization findings are summarized in Table A2.3-2B. The purpose of the table is to:

- Summarize soil impacts as they potentially relate to groundwater impacts.
- Present groundwater-sampling results.
- Demonstrate that groundwater characterization is sufficient for the purposes of risk assessment, including:
  - Groundwater characterization is appropriate for detected site chemical constituents.
  - Site soil characterization is appropriate for detected groundwater chemical constituents.

Similar to Table A2.3-2A, Table A2.3-2B describes groundwater data by chemical group (metals, VOCs, SVOCs, etc.). Table A2.3-2B is organized as follows:

- Column 1 – Analytical Group
- Column 2 – Site Soil Impacts
- Column 3 – Samples Collected and Analytes Monitored
- Column 4 – Constituents Detected in Groundwater Above Comparison Criteria
- Column 5 – Groundwater Concentrations Site-related
- Column 6 – Groundwater Characterized Sufficiently for Risk Assessment

A detailed compilation of groundwater data is provided in Appendix B of this Group 6 RFI Report. The Groundwater Appendix contains a description of hydrogeologic conditions (occurrence, water levels, recharge, yield, etc.), groundwater quality, and transport and fate. These data include:

- Laboratory analytical results
- Hydrographs
- Time-series plots
- Cumulative distribution plots

A site-wide report on SSFL groundwater will be prepared as part of the RFI program. This report will comprehensively address across the site the same characterization and transport issues addressed in Appendix B.

A2.3.5.2 Groundwater Data Summary

Two monitoring wells and one near-surface piezometer monitor groundwater quality at and near the OCY RFI Site. A detailed evaluation of Group 6 groundwater metals results is provided in Appendix B.

Dissolved cobalt was detected in RD-14 at 2.7 µg/L in 2006, above the Groundwater Comparison Concentration (GWCC, MWH 2005_) of 1.9 µg/L. This metal was not detected above background in any soil sample collected at the OCY RFI Site, and this concentration is considered to reflect naturally occurring cobalt concentrations since.

Dissolved silver was not detected in RD-14 (<O.O25 µg/L); however, total silver was detected in PZ-114 at a concentration of 2.3 µg/L. Although GWCCs are not established for total metals (the GWCC for dissolved silver is <0.17 µg/L), the result is conservatively assumed to be related to silver detected in soil within the upslope Northern and Southern Debris Areas (Chemical Use Areas 6a and 6b) and the east drainage.

Dissolved manganese was detected in water supply well WS-07 at 210 µg/L in 1984, above the GWCC of 150 µg/L, followed by 50 µg/L in 1985. Manganese soil concentrations at the OCY RFI Site were below background.

SVOCs

No SVOCs were detected in groundwater at the OCY RFI Site.

VOCs

VOCs were detected in groundwater at the OCY RFI Site, including TCE up to 13 µg/L (RD-14 in 1990), cis-1,2-dichloroethene up to 0.35 µg/L (WS-07 in 1990), and trans-1,2-dichloroethene up to 0.25 µg/L (WS-07 in 1988). Based on site history and the low concentrations of VOCs detected in groundwater and site soils (soil vapor), these compounds are considered related to small, isolated releases at the OCY RFI Site.

PCBs

No PCBs were detected in groundwater at the OCY RFI Site.

Dioxins

No dioxins were detected in groundwater at the OCY RFI Site.

Petroleum Hydrocarbons

No TPH were detected in groundwater at the OCY RFI Site.

A2.3.6 Surface Water Findings

There is no surface water consistently present at the OCY RFI Site, and no surface water samples were collected during the RFI.

SECTION A2.4
RISK ASSESSMENT FINDINGS SUMMARY

The following sections summarize the findings of the HRA and ERA performed for the OCY RFI Site within the Group 6 RFI Report area. Details regarding how the HRA and ERA were conducted are presented in the SRAM (MWH, 2005) Work Plan and Appendix C of this Group 6 RFI Report.

A2.4.1 Key Decision Points

Site-specific key decision points for the HRA and ERA are listed below and described in Appendix C. These are decisions made for the risk assessments based on site-specific conditions, chemical characteristics, and assessment findings. Programmatic decision points are described and included in the RFI Program Report (MWH, 2004). Site-specific key decision points include:

1) Due to low yield (less than 200 gallons/day), the OCY RFI Site NSGW was not considered for domestic use. CFOU groundwater was considered for domestic use.

2) Exposure Point Concentration (EPC) calculations were based on collected characterization data, as follows:

   - All groundwater EPCs were based on maximum levels detected at the OCY RFI Site (for indirect pathway), or detected within the Group 6 area (direct pathway).

   - A review of time series plots for chemical constituents, groundwater gradients, and source areas indicates maximum concentrations detected during the last consecutive 3 years conservatively represent potential future conditions for the purpose of estimating future risks.

   - Soil EPCs were based on maximum concentrations (either detected or the detection limit, if sufficient evidence that the chemical is present) unless there were sufficient data to calculate a statistical upper bound estimate of the concentration.

3) Large home range receptors were assumed to live only in source areas within the OCY RFI Site. Risks for these receptors using home range adjusted exposures were calculated for the purpose of comparing to the RFI site only risks. Large home range receptor cumulative risk across the SSFL will be presented later in a Site-Wide Summary Large Home Range Receptor Risk Assessment Report.

A2.4.2 Human Health Risk Assessment Findings

The receptors included in the human heath risk assessment are the current worker and potential trespasser and the future resident, worker and recreator. Since the current potential trespasser and future recreator have the same exposure parameters, they have been presented together as the recreator.

Supporting information for the HRA is presented in the following tables and figure:

- Chemicals of Potential Concern (COPCs) for human health – Table A2.4-1
- Human Health Risk Estimates – Table A2.4-2
- Human Health Risk Assessment Uncertainty Analysis – Table A2.4-3
- Generalized Conceptual Site Model of HRA Exposures – Figure A2.4-1

A summary of the HRA findings is presented below. For comparison purposes, estimated potential human health risks are generally considered acceptable for non-cancer Hazard Index (HI) values less than 1 and cancer risks between 10^{-4} and 10^{-6} (USEPA, 1993). Also, blood lead concentrations less than 10 micrograms per deciliter (µg/dl) are generally considered to be acceptable for making remedial decisions (DTSC, 1992). These criteria were used to make evaluation recommendations for the CMS.

<u>Exposure to Surficial Media Plus Indirect Groundwater Exposure</u>

The Reasonable Maximum Exposure (RME) risks presented in this section were based on exposures to all relevant surficial media plus indirect exposure to VOCs in groundwater due to vapor migration, and included:

- Estimated cancer risks for all receptors ranged up to 2×10^{-2}; HIs ranged up to 5.5 (child resident). The chemicals contributing to these potential risks were PCBs

(Aroclor 1248, Aroclor 1254, and Aroclor 1260), dioxins, benzo(a)pyrene, TCE, methylene chloride and benzene in soil; and TCE in groundwater.

- Estimated blood lead levels associated with soil exposures were less than 10 µg/dl for all receptors. Estimated blood lead levels for a child resident ranged up to 4.2 µg/dl.

Exposure through Direct Groundwater Use as Drinking Water

The RME risks presented in this section were based on direct use of CFOU groundwater as a drinking water source, and included:

- Estimated cancer risks for all receptors ranged up to 3×10^{-6}; HIs ranged up to 8.2 (child resident). The chemical contributing most substantially to these potential risks was TCE in groundwater.

Total Exposure From All Potential Exposures

The RME risks presented in this section were based on both exposure to all relevant surficial media, plus both indirect and direct exposures to chemicals in groundwater, and included:

- Estimated cancer risks for all receptors range up to 2×10^{-2}; HIs ranged up to 13.7 (child resident). The chemicals contributing to these potential risks were PCBs (Aroclor 1248, Aroclor 1254, and Aroclor 1260), dioxins, benzo(a)pyrene, TCE, methylene chloride and benzene in soil; and TCE in groundwater.

The major issues related to uncertainty and conservatism in these risk estimates are presented in Table A2.4-3.

A2.4.3 Ecological Risk Assessment Findings

The ecological receptors representing the site are the deer mouse, the thrush, the hawk, the bobcat, and the mule deer. Supporting information for the ERA is presented in the following tables and figure:

- Chemicals of Potential Ecological Concern (CPECs) – Table A2.4-4
- Risk Estimates for Ecological Receptors – Table A2.4-5
- Ecological Risk Assessment Uncertainty Analysis – Table A2.4-6
- Ecological Risk Assessment Conceptual Site Model – Figure A2.4-2

A summary of the ERA findings is presented below. For comparison purposes, estimated potential ecological risks are generally considered acceptable for Hazard Quotient (HQ) or HI values less than 1 (HQs are hazard estimates for single CPECs, HIs are cumulative hazard estimates for all CPECs). The ERA findings included:

- Estimated HIs for all receptors ranged from 143 to greater than 1,000 at the OCY RFI Site, with the deer mouse, bobcat and mule deer having the highest estimated HI. These estimated HIs were primarily associated with PCBs (Aroclor 1248, Aroclor 1260, and Aroclor 1254), dioxins, antimony, barium, cadmium, lead, mercury, zinc, methylene chloride, 1,1-dichloroethene, 2,4-dinitrophenol, and phenanthrene for all the terrestrial ecological receptors evaluated at the OCY RFI Site.

- The deer mouse burrow air inhalation pathway does not contribute significantly to their risks, compared to the risks from other non-volatile constituents.

- The major items related to uncertainty and conservatism in these risk estimates are presented in Table A2.4-6.

SECTION A2.5
SITE ACTION RECOMMENDATIONS

This section presents a summary of RFI reporting requirements as they apply to the OCY RFI Site. Section A2.5.1 describes RFI reporting requirements, particularly identification of areas for further work, or 'site action' recommendations. The process and criteria used for making site action recommendations is described in Section A2.5.2, and site action recommendations for the OCY RFI Site are summarized in Section A2.5.3.

A2.5.1 RFI REPORTING REQUIREMENTS

As described in regulatory guidance documents for the SSFL RCRA Corrective Action Program (see Section 1.2.3), the purpose of the RFI is to: (1) characterize the nature and extent of contamination, and identify potential source areas; (2) assess potential migration pathways; (3) estimate risks to actual or potential receptors; and, (4) gather necessary data to support the CMS (DTSC, 1995). The RFI Report is required to: (1) present findings regarding the above information; (2) describe completeness of the investigation; and, (3) indicate if additional work is needed.

The OCY RFI Site Report accomplishes these requirements by:

1. Presenting detailed characterization findings, source area identification, and investigation completeness determinations by media and by chemical class for all chemical use areas (and associated down-drainage locations) (Table A2.3-2A and A2.3-2B). Section A2.3 summarizes the overall characterization of contamination nature and extent, potential source areas, and an assessment of investigation completeness.

2. Evaluating groundwater migration pathways in Appendix B of the Group 6 RFI Site report, and other potential transport pathways in Appendix C of the Group 6 RFI Site report.

3. Identifying potential receptors and estimating potential risks at the OCY RFI site (Section A2.5 and Appendix C).

4. Identifying OCY RFI Site areas requiring further work (this section).

A2.5.2 BASIS FOR SITE ACTION RECOMMENDATIONS

In summary, site action recommendations included in the OCY RFI Site Report identify areas for:

- further evaluation in the CMS (CMS Areas),
- no further action (NFA),
- interim corrective measures to stabilize source areas and control contaminant migration (Stabilization Areas).

Site action recommendations are based on the characterization and risk assessment findings. Characterization findings provide definition of the nature and extent of site contaminants, based on chemical data and transport and fate evaluation. Risk assessments evaluate characterization data and estimates human health and ecological risks based on specified land use scenarios, and identifies chemicals that drive or contribute to those risks.

The three site action recommendations listed above result from two evaluations described below. CMS or NFA Area recommendations are based on an integrated evaluation of characterization and risk assessment results. Stabilization Area recommendations rely on characterization evaluations, including transport and fate analysis, and comparison to risk-based levels. Each process is described further below.

CMS and NFA Site Action Evaluation Process

CMS or NFA site action recommendations are based on a 4-step process in detail in Section 7.1 of the Group 6 RFI Report.

- The first step in making site action recommendations, risk assessment results for human and ecological receptors are compared to "acceptable" levels published by the USEPA or DTSC as guidance for site managers (DTSC, 1992; USEPA, 1992). The low end of the risk range (i.e., 1×10^{-6}, or 1 in 1,000,000) is used to ensure that a conservatively estimated areal extent is recommended for site action.

- In the second step, when estimated RFI site risks are greater than 1 x 10^{-6} (cancer risks) or HI values greater than 1 (noncancer and ecological risks), each RFI site's risks are reviewed on a chemical-by-chemical basis to identify risk-drivers and significant risk contributors to cumulative, total risk for each receptor (residential, industrial, recreational, and ecological).

- The third step is an evaluation of characterization findings from the entire RFI site to spatially identify areas where higher concentrations of risk drivers and contributors are detected. The identified areas are termed in this report 'CMS Areas' and represent locations recommended for further evaluation during the CMS. Areas recommended for further evaluation during the CMS are comprehensive of all potential receptors or land use scenarios.

- The fourth step identifies any uncertainties in OCY RFI Site characterization and risk assessments that affect findings. For example, some chemicals are assumed to be present in soil based on TPH extrapolation factors (e.g., benzene and PAHs) and contribute to total risk for the RFI site above acceptable levels. Since this assumption is often highly conservative, its use as a basis for CMS recommendations may be further evaluated in the CMS.

Site action recommendations are tabulated by chemical use area and chemical risk drivers/contributors are identified for each potential receptor in Table A2.5-1. CMS Areas are also depicted graphically in Figure A2.5-1 to illustrate location and approximate areal extent.

Two additional aspects of RFI reporting will serve to confirm and/or finalize the areas recommended in Group RFI Reports for evaluation in the CMS. The first is an ecological evaluation for large-home range receptors (e.g., mule deer and hawk). The second is a groundwater evaluation that will be reported in the Site-Wide Groundwater Report.

Source Area Stabilization Site Action Evaluation Process

Chemical data collected during the RFI is evaluated for contaminant migration. Resulting site action recommendations focus on stabilization measures related to sediment transport via the surface water pathway.

Criteria used to evaluate if source area stabilization measures are needed to control surface water migration include:

- presence of concentrations above background or RBSLs in surficial (not deeper) soils,
- proximity of surficial source area to an active surface water drainage pathway,
- moderate to steep topography,
- absence of containment features (e.g., surface coatings, dams), and
- concentration gradients that indicate prior transport away from the surficial source area.

Each criterion is considered important, and a weight-of-evidence evaluation is used to make a recommendation for source area stabilization measures. Source area stabilization measures to prevent migration to surface water use best management practices (BMPs) such as installation of straw bales, fiber rolls, silt fencing, or covering areas with plastic tarp. Erosion control measures have been applied to many surficial soil source areas at the SSFL to prevent contaminant migration. These are described in the SSFL Storm Water Pollution and Prevention Plan (MWH, 2006).

A2.5.3 RECOMMENDATIONS FOR THE OCY RFI SITE

OCY RFI Site action recommendations are listed in Table A2.5-1 and presented on Figure A2.5-1. Table A2.5-1 lists CMS or NFA recommendations and includes identification of chemical risk drivers and contributors for each exposure scenario. Source area stabilization recommendations are also identified for some CMS Areas as noted. CMS Areas shown on Figure A2.5-1 are approximate and represent evaluations inclusive of all potential receptors. As noted above, recommendations reported in this document will be reviewed upon completion of the site-wide groundwater report and large-home range receptor evaluations, and updates to this report prepared as needed.

OCY RFI Site areas recommended for further evaluation in the CMS and for surficial soil source stabilization measures are summarized below. Portions of the OCY RFI Site outside these areas are recommended for NFA.

- Sixteen CMS Areas, including storage and transformer areas (PAHs, PCBs), debris areas (PAHs, PCBs, dioxins, metals), the fuel spill area (methylene chloride, benzene, and 2,4-dinitrophenol), and downslope areas (PAHs, PCBs, dioxins, metals).

- Eight Stabilization Areas, including the Northern Storage area, and associated down-slope and down-drainage areas (PAHs, PCBs), the telephone pole and northern/southern debris areas (PAHs, PCBs, dioxins, metals), and the down-slope areas (PAHs, PCBs, dioxins, metals). Source stabilization measures are currently present at the telephone pole and northern debris areas (MWH, 2006), so additional measures are recommended for the others identified above.

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SECTION A2.6
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TABLES

Table A2.2-1

Building Inventory at the OCY RFI Site

Building	Current Use	Former Use	Status	DTSC Site Visit Date
Building 320	None	Fuel Oil Pump Building	Removed - 1999	Observed during site visits (June 1999)
Building 313	None	Conservation Shack[(a)]	Removed - 1999	Observed during site visits (June 1999)

Notes:
(a) Building 313 was a metallic shed that was relocated several times within the OCY RFI site.

Sources: SAIC 1994, ICF 1993, Ogden 1996, GRC 1989

Table A2.2-2

Fuel and Solvent Storage Tank Inventory at the OCY RFI Site

Tank Designator[(a)]	Location	Tank Size (gallons)	Contents	Operational Status	Regulatory Status
Aboveground Tanks					
731	North Central	1,500,000	Diesel Fuel Oil	Removed – 1999	NA
732	Northwest	1,500,000	Diesel Fuel Oil	Removed – 1999	NA
Underground Tanks					
UT-28	Next to Building 320	20,000	Fuel Oil/ Diesel	Removed – 1988	Closed[(b)] VCEHD 1994

(a) Only fuel and solvent tanks listed on this table; all tanks, including those for inert or non-hazardous materials (e.g., gases, water, alcohol), are shown on site figures.
(b) VCEHD Closure letter provided in Attachment A2-1.
NA = Not Applicable
RWQCB = Regional Water Quality Control Board
VCEHD = Ventura County Environmental Health Division

Table A2.2-3

Transformer Inventory at the OCY RFI Site

Area or Pole Number	Location	Status	Date Oil Sampled for PCBs	PCB Sampling Results[a]	Visual Inspection Findings[b]
Pole F510	SW OCY	3 Transformers – Removed	November 1983	<1 ppm	Platform; no staining or leak
Pole F525	SE OCY	3 Transformers – Removed	November 1983	<1 ppm	Removed prior to June 2000
Pole 163	South OCY	3 Transformers – Active	(c)	(c)	No staining or leakage observed
Area 737	Near B320	1 Transformer – Removed	(d)	(d)	(d)
Substation 783	SW of OCY	1 Transformer – Removed	(e)	(e)	(f)

Notes:
(a) Results are for Aroclor 1260 in oils collected from within transformer housing.
(b) Visual inspection conducted by AMEC (June 2000) and MWH (August 2002).
(c) Pole 163 transformers were not observed during June 2000 visual inspection; therefore, it is assumed that these transformers were installed after that time and do not contain PCB oils.
(d) Area 737 electrical substation was removed prior to 1983 PCB inventory/ sampling activities by the SSFL.
(e) Not documented in facility records
(f) Substation 783 was removed prior to June 2000 visual inspection.

Acronyms:
< = Less than
B320 = Building 320
OCY = Old Conservation Yard
ppm = parts per million
PCBs = polychlorinated biphenyls
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
SE = southeast
SW = Southwest

Sources: Site field inspections and facility records.

Table A2.2-4

Chemicals Used at the OCY RFI Site

Diesel Fuel Oil
See notes - (a, b)

(a) The OCY RFI site was used to store salvageable materials and equipment in drums (SAIC 1994; ICF 1993; Ogden 1996). Drums and containers of unknown origin and contents were also stored at the site (GRC 1989).

(b) During the RFI field work, asbestos-containing material (ACM), scrap metal, and charred wood were observed in the two debris areas in southern OCY (Chemical Use Areas 6a and 6b), and oil-stained soils were observed beneath an asphalt-like surface coating (Chemical Use Area 1b).

Sources: SAIC 1994, ICF 1993, Ogden 1996, GRC 1989

Table A2.3-1A (Page 1 of 1)

RFI Sampling Summary
OCY RFI Site

Sample Type	Total Number of Samples	Total QC Samples	Total Agency Samples	Total Validated Samples
Soil Vapor Samples (Table A2.3-1B)	24	3	0	26
Soil Matrix Samples (Table A2.3-1C)	162	16	0	178

Notes:

1. Detailed sample and analytical program information is contained in Tables A2.3-1B and A2.3-1C as indicated above.
2. Total samples = total primary site investigation samples, includes historical samples.
3. Quality Control (QC) samples = Site-specific QC Samples, co-located duplicates and laboratory split samples.
   The total QC sample count in this table DOES NOT include Trip Blanks, Equipment Rinsates or Field Blanks.
   According to RFI sampling protocols, these types of QC samples are not site-specific; findings are summarized in the RFI Program Report.
4. Agency Samples = Department of Toxic Substance Control (DTSC) or United States Environmental Protection Agency (USEPA) split samples.
5. All groundwater data presented in Appendix B.

Table A2.3-1B (Page 1 of 2)

RFI Soil Vapor Sampling and Analytical Summary
OCY RFI Site

Sample Identification	EPA No.	Date Collected	Depth (ft. bgs)	New Depth (ft. bgs)	Sample Type	VOC	Validated [a]	Rationale [b]	Consultant [c]	Reference Document [d]
OCSV01S01	MV573	02/27/06	7		Primary Sample	X	yes	DGA	MWH	This Document
OCSV01S01	RR052	08/09/97	5.5		Sample Split	X	no	WP	HGS	This Document
OCSV01S01	RV217	06/17/97	6		Primary Sample	X	yes	WP	Ogden/AMEC	This Document
OCSV01S01	RV346	06/30/97	5.5		Primary Sample	X	yes	WP	Ogden/AMEC	This Document
OCSV02S01	RV251	06/19/97	4		Primary Sample	X	yes	WP	Ogden/AMEC	This Document
OCSV03S01	MV574	02/27/06	7		Primary Sample	X	yes	DGA	MWH	This Document
OCSV03S01	RV249	06/19/97	4		Primary Sample	X	yes	WP	Ogden/AMEC	This Document
OCSV03S02	RV250	06/19/97	8		Primary Sample	X	yes	WP	Ogden/AMEC	This Document
OCSV04S01	RV605	07/25/97	4		Primary Sample	X	yes	WP	Ogden/AMEC	This Document
OCSV05S01	RV603	07/25/97	4		Primary Sample	X	yes	WP	Ogden/AMEC	This Document
OCSV06D01	RV610	07/28/97	5		Field Duplicate	X	yes	WP	Ogden/AMEC	This Document
OCSV06S01	RV604	07/25/97	5		Primary Sample	X	yes	WP	Ogden/AMEC	This Document
OCSV06S02	RV619	07/28/97	10		Primary Sample	X	yes	WP	Ogden/AMEC	This Document
OCSV07S01	RV700	06/16/99	5		Primary Sample	X	yes	DTSC	Ogden/AMEC	This Document
OCSV07S02	RV701	06/16/99	13		Primary Sample	X	yes	DTSC	Ogden/AMEC	This Document
OCSV08S01	RV702	06/16/99	7		Primary Sample	X	yes	DTSC	Ogden/AMEC	This Document
OCSV09S01	RV703	06/16/99	6	7	Primary Sample	X	yes	DTSC	Ogden/AMEC	This Document
OCSV10S01	RV709	06/16/99	5		Primary Sample	X	yes	DTSC	Ogden/AMEC	This Document
OCSV11S01	RV708	06/16/99	2.5	3.5	Primary Sample	X	yes	DTSC	Ogden/AMEC	This Document
OCSV12S01	RV707	06/16/99	6	7	Primary Sample	X	yes	DTSC	Ogden/AMEC	This Document
OCSV13D01	RV710	06/16/99	5	6	Field Duplicate	X	yes	DTSC	Ogden/AMEC	This Document
OCSV13S01	RV706	06/16/99	5	6	Primary Sample	X	yes	DTSC	Ogden/AMEC	This Document
OCSV14S01	RV704	06/16/99	4	5	Primary Sample	X	yes	DTSC	Ogden/AMEC	This Document
OCSV15S01	RV705	06/16/99	6	7	Primary Sample	X	yes	DTSC	Ogden/AMEC	This Document
OCSV16S01	MV015	11/08/01	1.5		Primary Sample	X	yes	DTSC	MWH	This Document
OCSV18S01	MV017	11/08/01	4		Primary Sample	X	yes	DTSC	MWH	This Document
OCSV19S01	MV018	11/08/01	4		Primary Sample	X	yes	DTSC	MWH	This Document

[a] **Validated** indicates analysis reviewed according to RFI protocols; soil vapor laboratory split data was not validated but reviewed for comparability.

[b] **WP** - Indicates samples collected based on DTSC-approved Work Plan scope.
DTSC - Indicates samples collected at direction of DTSC resulting from site review during the RFI field program.
STEP - Indicates stepout samples were collected as a part of the RFI program (prior to Data Gaps Analysis) to delineate concentrations above comparison levels or anomalous conditior
DGA - Indicates samples taken in 2006 as a part of the Data Gaps Analysis to address delineation with stepout samples, elevated detection limit issues, and specific DTSC resquests.

[c] **Consultant** - indicates contractor responsible for sampling and reporting for each location.

[d] **Reference Document** indicates where data are published; "This report" includes the RFI site report and the Group 6 RFI Report.

Table A2.3-1B (Page 2 of 2)

RFI Soil Vapor Sampling and Analytical Summary
OCY RFI Site

Sample Identification	EPA No.	Date Collected	Depth (ft. bgs)	New Depth (ft. bgs)	Sample Type	VOC	Validated [a]	Rationale [b]	Consultant [c]	Reference Document [d]

[e] **Included in Risk Assessment** - indicates data evaluated for risk assessment (Section A2.4).

Sample Identification = RFI site and sample identifier code
EPA Identification = Laboratory reporting code
bgs = below ground surface
VOC = Volatile Organic Compound, analyzed using either EPA Method 8260 or 8260B, modified for soil vapor
HGS = Hydrogeospectrum

Notes
1. Includes co-located duplicate and split samples - does not include other QC samples (e.g., blanks)
2. New Depth values resulted from AST earthen berm soil being spread approximately one foot thick over sample location in 2002 (see Figure A2.3-1C and text).

Table A2.3-1C (Page 1 of 4)

RFI Soil Matrix Sampling and Analytical Summary
OCY RFI Site

Sample Identification	EPA No.	Date Collected	Sample Method	Depth (ft. bgs) [a]	New Depth (ft. bgs)	Sample Type	VOC	SVOC	PCB	Dioxin/ Furans	TPH	Metals	Aluminum	Lead	Mercury	Potassium	Silver	Sodium	Thallium	Hex Chrome	Anions	pH	General Minerals	Validated [b]	Rationale [c]	Consultant [d]	Reference Document [e]
OCBS01D01	RD034	10/15/97	GP	0.5	N/A	Field Duplicate	X				X													yes	WP	Ogden/AMEC	This Report
OCBS01S01	RC003	10/15/97	HA	0.5	N/A	Sample Split	X				X													yes	WP	Ogden/AMEC	This Report
OCBS01S01	RD033	10/15/97	GP	0.5	N/A	Primary Sample	X				X													yes	WP	Ogden/AMEC	This Report
OCBS01S02	RC001	10/15/97	GP	4.5	N/A	Sample Split	X				X													yes	WP	Ogden/AMEC	This Report
OCBS01S02	RD035	10/15/97	GP	4.5	N/A	Primary Sample	X				X													yes	WP	Ogden/AMEC	This Report
OCBS02S01	RD037	10/15/97	GP	1	N/A	Primary Sample	X				X													yes	WP	Ogden/AMEC	This Report
OCBS02S02	RD038	10/15/97	GP	5	N/A	Primary Sample	X				X													yes	WP	Ogden/AMEC	This Report
OCBS03S01	RD063	10/20/97	GP	1.5	N/A	Primary Sample	X				X													yes	WP	Ogden/AMEC	This Report
OCBS03S02	RD064	10/20/97	GP	6	N/A	Primary Sample	X				X													yes	WP	Ogden/AMEC	This Report
OCBS04S01	RD065	10/20/97	GP	1	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCBS04S02	RD066	10/20/97	GP	4.5	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCBS05S01	RD067	10/20/97	GP	1	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCBS06S01	MJ110	12/12/02	HA	0.5	N/A	Primary Sample		X			X													yes	STEP*	MWH	This Report
OCBS06S01	RD068	10/20/97	GP	0.5	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCBS06S02	RD266	11/13/97	HA	5.5	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCBS07S01	RD069	10/20/97	GP	1	N/A	Primary Sample					X													yes	WP	Ogden/AMEC	This Report
OCBS07S01	RF030	10/20/97	GP	1	N/A	Primary Sample		X				X									X	X		yes	WP	Ogden/AMEC	This Report
OCBS07S01	RS696	01/29/98	HA	1	N/A	Primary Sample														X				yes	WP	Ogden/AMEC	This Report
OCBS07S01	RS881	06/17/99	HA	1	N/A	Primary Sample					X													yes	WP	Ogden/AMEC	This Report
OCBS07S02	RD070	10/20/97	GP	5	N/A	Primary Sample					X													yes	WP	Ogden/AMEC	This Report
OCBS07S02	RF031	10/20/97	GP	5	N/A	Primary Sample		X				X									X	X		yes	WP	Ogden/AMEC	This Report
OCBS07S03	RS668	01/27/98	HA	0.5	N/A	Primary Sample					X													yes	WP	Ogden/AMEC	This Report
OCBS08S01	RD071	10/20/97	GP	1	N/A	Primary Sample					X													yes	WP	Ogden/AMEC	This Report
OCBS08S01	RF032	10/20/97	GP	1	N/A	Primary Sample		X				X									X	X		yes	WP	Ogden/AMEC	This Report
OCBS08S02	RD072	10/20/97	GP	5	N/A	Primary Sample					X													yes	WP	Ogden/AMEC	This Report
OCBS08S02	RF033	10/20/97	GP	5	N/A	Primary Sample		X				X									X	X		yes	WP	Ogden/AMEC	This Report
OCBS09S01	RD727	10/29/97	HA	0.5	N/A	Primary Sample	X				X													yes	WP	Ogden/AMEC	This Report
OCBS10D01	MJ684	02/16/06	G	0.5	N/A	Field Duplicate		X	X		X	X												yes	DGA	MWH	This Report
OCBS10S01	MJ683	02/16/06	G	0.5	N/A	Primary Sample		X	X		X													yes	DGA	MWH	This Report
OCBS10S01	MJ735	04/10/06	HA	0.5	N/A	Primary Sample				X														yes	DGA	MWH	This Report
OCBS10S01	RD728	10/29/97	HA	0.5	N/A	Primary Sample					X													yes	WP	Ogden/AMEC	This Report
OCBS10S01	RF728	10/29/97	HA	0.5	N/A	Primary Sample		X				X									X	X		yes	WP	Ogden/AMEC	This Report
OCBS10S02	RS669	01/27/98	HA	4	N/A	Primary Sample					X			X			X							yes	WP	Ogden/AMEC	This Report
OCBS13S01	RD737	10/30/97	HA	0.5	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCBS14S01	RD738	10/30/97	HA	0.5	N/A	Primary Sample	X				X													yes	DTSC	Ogden/AMEC	This Report
OCBS14S01	RF738	10/30/97	HA	0.5	N/A	Primary Sample		X				X									X	X		yes	DTSC	Ogden/AMEC	This Report
OCBS15D01	RD177	11/03/97	GP	1	N/A	Field Duplicate					X													yes	DTSC	Ogden/AMEC	This Report
OCBS15S01	RD176	11/03/97	GP	1	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCBS15S01	RF176	11/03/97	GP	1	N/A	Primary Sample		X				X									X	X		yes	DTSC	Ogden/AMEC	This Report
OCBS16S01	RS581	12/16/97	HA	0.5	N/A	Primary Sample					X						X							yes	DTSC	Ogden/AMEC	This Report
OCBS17D01	RS807	10/08/98	HA	7	N/A	Field Duplicate					X													yes	DTSC	Ogden/AMEC	This Report
OCBS17S01	RS806	10/08/98	HA	7	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCBS18S01	RS670	01/27/98	HA	0.5	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCBS23S01	RS879	06/17/99	HA	0.5	N/A	Primary Sample	X	X			X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCBS24S01	MJ685	02/16/06	G	0.5	N/A	Primary Sample						X												yes	DGA	MWH	This Report
OCBS24S01	MJ736	04/10/06	HA	0.5	N/A	Primary Sample				X														yes	DGA	MWH	This Report
OCBS24S01	RS880	06/17/99	HA	1	N/A	Primary Sample	X	X			X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCBS26S01	RJ782	11/02/00	HA	0.5	N/A	Primary Sample		X	X	X	X	X										X	X	yes	DTSC	Ogden/AMEC	This Report
OCBS27S01	RJ783	11/02/00	HA	0.5	N/A	Primary Sample		X		X														yes	DTSC	Ogden/AMEC	This Report
OCBS27S02	MJ031	11/19/01	HA	3	N/A	Primary Sample		X		X														yes	STEP	MWH	This Report
OCBS28S01	MC032	11/19/01	HA	0.5	N/A	Sample Split		X		X														yes	STEP	MWH	This Report
OCBS28S01	MJ032	11/19/01	HA	0.5	N/A	Primary Sample		X		X														yes	STEP	MWH	This Report
OCBS29S01	MC034	11/19/01	HA	0.5	N/A	Sample Split						X												yes	STEP	MWH	This Report
OCBS29S01	MJ034	11/19/01	HA	0.5	N/A	Primary Sample						X												yes	STEP	MWH	This Report
OCBS29S01	MJ676	02/16/06	G	0.5	N/A	Primary Sample											X		X					yes	DGA	MWH	This Report
OCBS30S01	MT801	09/10/03	HA	0.5	N/A	Primary Sample			X															yes	DTSC	MWH	This Report
OCBS31S01	MT802	09/10/03	HA	0.5	N/A	Primary Sample			X															yes	DTSC	MWH	This Report

Table A2.3-1C (Page 2 of 4)

RFI Soil Matrix Sampling and Analytical Summary
OCY RFI Site

Sample Identification	EPA No.	Date Collected	Sample Method	Depth (ft. bgs) [a]	New Depth (ft. bgs)	Sample Type	VOC	SVOC	PCB	Dioxin/ Furans	TPH	Metals	Aluminum	Lead	Mercury	Potassium	Silver	Sodium	Thallium	Hex Chrome	Anions	pH	General Minerals	Validated [b]	Rationale [c]	Consultant [d]	Reference Document [e]
OCBS32S01	MJ665	02/16/06	G	0.5	N/A	Primary Sample				X									X					yes	DGA	MWH	This Report
OCBS32S02	MJ686	02/16/06	HA	3	N/A	Primary Sample													X					yes	DGA	MWH	This Report
OCBS32S02	MJ718	02/17/06	HA	3.5	N/A	Primary Sample													X					yes	DGA	MWH	This Report
OCBS33S01	MJ666	02/16/06	G	0.5	N/A	Primary Sample													X					yes	DGA	MWH	This Report
OCBS34S01	MJ669	02/16/06	G	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS34S02	MJ670	02/16/06	G	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS34S03	MJ671	02/16/06	G	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS34S70	MJ668	02/16/06	COMP	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS34S80	MJ672	02/16/06	COMP	3	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS35S01	MJ677	02/16/06	G	0.5	N/A	Primary Sample				X		X												yes	DGA	MWH	This Report
OCBS36S01	MJ678	02/16/06	G	0.5	N/A	Primary Sample				X		X												yes	DGA	MWH	This Report
OCBS37S01	MJ679	02/16/06	G	0.5	N/A	Primary Sample				X		X												yes	DGA	MWH	This Report
OCBS37S01	MJ814	04/13/06	HA	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS38S01	MJ680	02/16/06	G	0.5	N/A	Primary Sample				X		X												yes	STEP	MWH	This Report
OCBS39S01	MJ681	02/16/06	HA	1	N/A	Primary Sample		X																yes	DGA	MWH	This Report
OCBS40S01	MJ688	02/17/06	HA	4.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS40S02	MJ689	02/17/06	HA	4.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS40S03	MJ690	02/17/06	HA	4.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS40S70	MJ687	02/17/06	COMP	4.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS40S80	MJ691	02/17/06	COMP	7.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS41S01	MJ695	02/17/06	HA	7	N/A	Primary Sample		X				X												yes	DGA	MWH	This Report
OCBS42S01	MJ696	02/17/06	HA	6.5	N/A	Primary Sample					X		X											yes	DGA	MWH	This Report
OCBS43S01	MJ697	02/17/06	HA	7	N/A	Primary Sample					X		X											yes	DGA	MWH	This Report
OCBS43S01	MJ720	02/21/06	HA	3.5	N/A	Primary Sample					X													yes	DGA	MWH	This Report
OCBS44S01	MJ698	02/17/06	HA	7	N/A	Primary Sample					X		X											yes	DGA	MWH	This Report
OCBS45S01	MJ699	02/17/06	HA	3	N/A	Primary Sample							X											yes	DGA	MWH	This Report
OCBS46S01	MJ700	02/17/06	G	0.5	N/A	Primary Sample		X				X												yes	DGA	MWH	This Report
OCBS47S01	MJ701	02/17/06	G	0.5	N/A	Primary Sample		X				X												yes	DGA	MWH	This Report
OCBS48S01	MJ702	02/17/06	G	0.5	N/A	Primary Sample		X				X												yes	DGA	MWH	This Report
OCBS49S01	MJ703	02/17/06	G	0.5	N/A	Primary Sample		X				X												yes	DGA	MWH	This Report
OCBS50S01	MJ704	02/17/06	G	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS51S01	MJ705	02/17/06	G	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS52S01	MJ707	02/17/06	G	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS53S01	MJ708	02/17/06	G	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS54S01	MJ709	02/17/06	G	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS55S01	MJ710	02/17/06	G	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS56S70	MJ711	02/17/06	COMP	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS56S80	MJ715	02/17/06	COMP	3	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS57S01	MJ721	02/21/06	HA	7	N/A	Primary Sample					X													yes	DGA	MWH	This Report
OCBS58S01	MJ722	02/21/06	HA	7	N/A	Primary Sample					X													yes	DGA	MWH	This Report
OCBS65S01	MJ739	04/11/06	HA	2	N/A	Primary Sample			X		X	X												yes	DGA	MWH	This Report
OCBS66S01	MJ744	04/11/06	HA	0.5	N/A	Primary Sample			X			X												yes	DGA	MWH	This Report
OCBS66S01	MJ744RE	04/11/06	HA	0.5	N/A	Primary Sample									X									yes	DGA	MWH	This Report
OCBS66S02	MJ746	04/11/06	HA	3	N/A	Primary Sample			X			X												yes	DGA	MWH	This Report
OCBS67S01	MJ748	04/11/06	HA	0.5	N/A	Primary Sample			X			X												yes	DGA	MWH	This Report
OCBS68S01	MJ745	04/11/06	HA	0.5	N/A	Primary Sample			X			X												yes	DGA	MWH	This Report
OCBS68S02	MJ747	04/11/06	HA	3	N/A	Primary Sample			X			X												yes	DGA	MWH	This Report
OCBS69S01	MJ750	04/11/06	HA	0.5	N/A	Primary Sample			X			X												yes	DGA	MWH	This Report
OCBS70S01	MJ752	04/11/06	HA	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS71S01	MJ754	04/11/06	HA	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS72S01	MJ756	04/11/06	HA	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS73S01	MJ759	04/11/06	HA	4.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS74S01	MJ761	04/11/06	HA	4.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS75S01	MJ763	04/11/06	HA	4.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS76S01	MJ781	04/12/06	HA	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS77S01	MJ782	04/12/06	HA	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS78S01	MJ783	04/12/06	HA	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report

Table A2.3-1C (Page 3 of 4)

RFI Soil Matrix Sampling and Analytical Summary
OCY RFI Site

Sample Identification	EPA No.	Date Collected	Sample Method	Depth (ft. bgs) [a]	New Depth (ft. bgs)	Sample Type	VOC	SVOC	PCB	Dioxin/ Furans	TPH	Metals	Aluminum	Lead	Mercury	Potassium	Silver	Sodium	Thallium	Hex Chrome	Anions	pH	General Minerals	Validated [b]	Rationale [c]	Consultant [d]	Reference Document [e]
OCBS79S01	MJ784	04/12/06	HA	0.5	N/A	Primary Sample			X			X												yes	DGA	MWH	This Report
OCBS80S01	MJ786	04/12/06	HA	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS81S01	MJ787	04/12/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS82S01	MJ788	04/12/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS83S01	MJ789	04/12/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS84S01	MJ790	04/12/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS85S01	MJ791	04/12/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS88S01	MJ794	04/12/06	G	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS89S01	MJ795	04/12/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS90S01	MJ796	04/12/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS92S01	MJ798	04/12/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS93S01	MJ799	04/12/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS94S01	MJ800	04/12/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS95D01	MJ804	04/13/06	G	0.5	N/A	Field Duplicate			X															yes	DGA	MWH	This Report
OCBS95S01	MJ803	04/13/06	G	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS96S01	MJ805	04/13/06	G	0.5	N/A	Primary Sample			X															yes	DGA	MWH	This Report
OCBS97D01	MJ807	04/13/06	HA	0.5	N/A	Field Duplicate		X	X		X	X												yes	DGA	MWH	This Report
OCBS97D01	MJ811	04/13/06	HA	1.5	N/A	Field Duplicate	X																	yes	DGA	MWH	This Report
OCBS97S01	MJ806	04/13/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCBS97S01	MJ810	04/13/06	HA	1.5	N/A	Primary Sample	X																	yes	DGA	MWH	This Report
OCBS98D01	MJ809	04/13/06	HA	0.5	N/A	Field Duplicate		X	X		X	X												yes	DGA	MWH	This Report
OCBS98S01	MJ808	04/13/06	HA	0.5	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCSS01S01	RS671	01/27/98	G	0	N/A	Primary Sample					X													yes	STEP	Ogden/AMEC	This Report
OCSS02S01	RS878	06/17/99	G	0	N/A	Primary Sample		X			X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCSS03S01	RB077	05/24/00	COMP		N/A	Primary Sample			X															yes	WP	Ogden/AMEC	This Report
OCSS04S01	MJ682	02/16/06	G	0	N/A	Primary Sample		X	X		X	X												yes	DGA	MWH	This Report
OCTS04S01	RS303	06/18/99	HA	5.5	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCTS05S01	RS287	06/17/99	TS	3	4	Primary Sample	X	X			X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS06S01	RS288	06/17/99	TS	2	3	Primary Sample		X	X		X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS07S01	RS289	06/17/99	TS	2.5	3.5	Primary Sample		X			X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS08S01	RS290	06/17/99	TS	2	3	Primary Sample		X			X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS09S01	RS291	06/17/99	TS	1	2	Primary Sample	X	X			X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS10S01	RS292	06/17/99	TS	1	2	Primary Sample		X			X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS11S01	RS293	06/17/99	TS	0.75	1.75	Primary Sample			X		X													yes	DTSC	Ogden/AMEC	This Report
OCTS12S01	RS294	06/17/99	TS	1.5	2.5	Primary Sample			X		X													yes	DTSC	Ogden/AMEC	This Report
OCTS13S01	RS295	06/17/99	TS	2	3	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCTS14S01	RS296	06/17/99	TS	1	2	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCTS15S01	RS297	06/17/99	TS	4	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCTS15S02	RS298	06/17/99	TS	4	N/A	Primary Sample					X													yes	DTSC	Ogden/AMEC	This Report
OCTS18S01	RS302	06/18/99	TS	2	N/A	Primary Sample	X	X			X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS21S01	RS320	09/21/99	TS	1	2	Primary Sample			X															yes	STEP	Ogden/AMEC	This Report
OCTS21S02	RS321	09/21/99	TS	2.5	3.5	Primary Sample					X													yes	STEP	Ogden/AMEC	This Report
OCTS22S01	RS323	09/21/99	TS	0.5	N/A	Primary Sample			X															yes	STEP	Ogden/AMEC	This Report
OCTS22S02	RS324	09/21/99	TS	4	N/A	Primary Sample			X															yes	STEP	Ogden/AMEC	This Report
OCTS23D01	RJ773	11/01/00	TS	5	N/A	Field Duplicate		X	X	X	X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS23S01	RJ772	11/01/00	TS	5	N/A	Primary Sample		X	X	X	X	X										X	X	yes	DTSC	Ogden/AMEC	This Report
OCTS23S02	RJ776	11/01/00	TS	6.5	N/A	Primary Sample		X	X	X	X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS23S02	RZ776	11/01/00	TS	6.5	N/A	Sample Split		X	X	X	X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS24D01	RJ775	11/01/00	TS	5	N/A	Field Duplicate		X	X	X	X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS24S01	RJ774	11/01/00	TS	5	N/A	Primary Sample		X	X	X	X	X										X	X	yes	DTSC	Ogden/AMEC	This Report
OCTS24S02	RJ781	11/01/00	TS	6.5	N/A	Primary Sample		X	X	X	X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS24S02	RZ781	11/01/00	TS	6.5	N/A	Sample Split		X	X	X	X	X										X		yes	DTSC	Ogden/AMEC	This Report
OCTS35S01	RJ777	11/01/00	TS	2	N/A	Primary Sample		X	X	X		X										X	X	yes	STEP	Ogden/AMEC	This Report
OCTS37S01	RJ780	11/01/00	TS	7	N/A	Primary Sample		X		X		X										X	X	yes	STEP	Ogden/AMEC	This Report
OCTS38S01	RJ778	11/01/00	TS	0.5	N/A	Primary Sample		X		X		X										X	X	yes	STEP	Ogden/AMEC	This Report
OCTS39S01	RJ779	11/01/00	TS	1	N/A	Primary Sample		X		X		X										X	X	yes	STEP	Ogden/AMEC	This Report
OLDCONS1	OLDCONS1	08/25/88	TS	0.5	N/A	Primary Sample	X	X			X					X		X				X		yes	WP	GRC	GRC, 1989 [f]

Table A2.3-1C (Page 4 of 4)

RFI Soil Matrix Sampling and Analytical Summary
OCY RFI Site

Sample Identification	EPA No.	Date Collected	Sample Method	Depth (ft. bgs) [a]	New Depth (ft. bgs)	Sample Type	VOC	SVOC	PCB	Dioxin/ Furans	TPH	Metals	Aluminum	Lead	Mercury	Potassium	Silver	Sodium	Thallium	Hex Chrome	Anions	pH	General Minerals	Validated [b]	Rationale [c]	Consultant [d]	Reference Document [e]
OLDCONS2	OLDCONS2	08/25/88	TS	1	N/A	Primary Sample	X	X			X					X		X				X		yes	WP	GRC	GRC, 1989 [f]
OLDCONS3	OLDCONS3	08/25/88	TS	3.5	N/A	Primary Sample	X	X			X					X		X				X		yes	WP	GRC	GRC, 1989 [f]
OLDCONS4	OLDCONS4	08/25/88	TS	0.5	N/A	Primary Sample	X	X			X					X		X				X		yes	WP	GRC	GRC, 1989 [f]
OLDCONS5	OLDCONS5	08/25/88	TS	0.5	N/A	Primary Sample	X	X			X					X		X				X		yes	WP	GRC	GRC, 1989 [f]
OLDCONS6	OLDCONS6	08/25/88	TS	0.5	N/A	Primary Sample	X	X			X					X		X				X		yes	WP	GRC	GRC, 1989 [f]
XFBS22S70	WD089	08/25/04	COMP	1	N/A	Primary Sample			X															yes	DTSC	MWH	This Report
XFBS23S70	WD092	08/25/04	COMP		N/A	Primary Sample			X															yes	DTSC	MWH	This Report

Notes

[a] New Depth values resulted from AST earthen berm soil being spread approximately one foot thick over sample location in 2002 (see Figure A2.3-1C and text).
N/A - Indicates that no new depths in samples.

[b] **Validated** indicates at least one analysis has been validated following RFI protocols; agency split samples were not validated but were reviewed for comparability.

[c] **DTSC -** Indicates samples collected at direction of DTSC resulting from site review during the RFI field program.
WP - Indicates samples collected based on DTSC-approved Work Plan scope.
STEP - Indicates stepout samples were collected as a part of the RFI program (prior to Data Gaps Analysis) to delineate concentrations above comparison levels or anomalous conditions.
DGA - Indicates samples taken in 2006 as a part of the Data Gaps Analysis to address delineation with stepout samples, elevated detection limit issues, and specific DTSC resquests.

[d] **Consultant -** indicates contractor responsible for sampling and reporting for each location.

[e] **Reference Document** indicates where data are published; "This report" includes the RFI site appendix and the Group 6 RFI Report (See References, Section A2.6).

[f] **Included in Risk Assessment** indicates data evaluated for risk assessment (A2.4).

[g] **GRC 1989-** Phase II Investigation of Soil and Groundwater Conditions- Area IV

1. Samples OCSS03 and OCSS04S01 were collected from contained units.
2. Samples at locations OCBS30, OCBS31, OCBS34, OCBS40, OCBS56, OCBS70 - 75, XFBS22 and XFBS23 were collected near pad- or pole-mounted transformers.

Sample Identification = RFI site and sample identifier code
EPA Identification = Laboratory reporting code
bgs = below ground surface
HA = Hand Auger sample
TS = Trench Sample collected with a slide hammer
GRC- Groundwater Resources Consultants
GP = Geoprobe soil boring sample
G = Grab sample
COMP = Composite soil sample
PCB = Polychlorinated biphenyls
VOC = Volatile Organic Compound
SVOC = Semivolatile Organic Compound
TPH = Total Petroleum Hydrocarbons
Anions = Chloride, Nitrate, Nitrite, Fluoride
General Minerals = Asbestos

Laboratory Analytical Methods Represented (EPA Method No.)

VOC - 8021A, 8021B, 8240, 8260, 8260B
SVOC - 8270, 8270 SIM, 8270C, 8270C SIM, 8270M, 429M
PCB - 8082, 1668
Dioxin/Furans - 8290
TPH - 8015, 8015B, 8015M, 8015D
Metals - 6010B/7000
Aluminum - 6010B
Lead - 6020
Mercury - 7471A
Potassium - 7610
Silver - 6020
Sodium - 7770
Thallium - 6020
Hex Chrome - 7196
Anions - 300.0
pH - 9045
General Minerals - EPA/600/R-93/116

Table A2.3-2A (Page 1 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
1a	**Former Rocketdyne Conservation Yard** (also known as Container Storage Area) Former primary storage area for salvageable materials, equipment and drums with unknown contents. A 20-foot x 20-foot by 4-inch deep (average) area in the southwest corner of the yard was excavated in 1989 after a 1988 radiological survey indicated soil was contaminated by a release of liquid, from a storage container, possibly contaminated with "mixed fission products" (Rockwell, 1990). This excavated area is a topographic low within the yard. Area slopes gently to southwest; surface water drains sheet flow in this direction toward the Topographic Low Spot in Chemical Use Area 8. Soil thickness ranges up to 8 feet in the central portion of the area.	**VOCs** Site documentation does not indicate use or storage of VOCs or other solvents.	Based on unknown content of drums, screen area for potential presence of VOCs or other solvents by collecting samples in representative locations. <u>Soil Matrix (1988)</u> Collect soil samples at three locations within southwest corner of area (OLDCONS-1, -5 and -6) in former release area and a topographic low within yard. <u>Soil Vapor (1997)</u> Screen area for VOCs by collecting and analyzing soil vapor at probes at three locations around the yard (OCSV01 at 6 feet bgs, OCSV02 at 4 feet bgs, OCSV03 at 4 and 7 feet bgs). Target southwest corner of yard where VOCs detected in soil matrix (OCSV01). Reinstall and collect additional primary and laboratory confirmation samples at OCSV01 at 5.5 feet bgs. <u>Soil Vapor (2006)</u> To address a discrepancy in 1997 soil vapor results (sample IDs listed above), reinstall probes and recollect soil vapor samples where VOCs previously detected (OCSV01 and OCSV03, probes installed at 7 feet bgs).	VOC sample results are shown on Figure A2.3-1 <u>Soil Matrix (1988)</u> VOCs were detected in two sample locations (OLDCONS-1, OLDCONS-5): toluene (up to 15 µg/kg in OLDCONS-5 at 0.5 feet) and total xylenes at 10 µg/kg in same sample. Results exceed the ecological RBSL (EcoRBSL) for toluene (2.7 µg/kg), but are slightly below the EcoRBSL for total xylenes (11 µg/kg, respectively). TCE was not detected. <u>Soil Vapor (1997)</u> Six VOCs detected at two of three locations (OCSV01 and OCSV03): ▪ TCE was highest in OCSV01 and ranged from 28 to 66 µg/L in samples collected at slightly different depths; concentration above ResRBSL (1.4 µg/L). ▪ 1,2-Dichloroethane was detected at 1.4 µg/L in the 8 foot sample in OCSV03, but was nondetect in the 4-foot sample; concentration exceeds ResRBSL (0.13 µg/L). ▪ Toluene was not detected at OCSV01, near former soil matrix VOC detects. <u>Soil Vapor (2006)</u> No VOCs detected. VOC concentrations are low or nondetect across the yard in representative sample locations; no further delineation needed.	<u>Southwest Corner of Yard</u> YES Southwest corner of yard recommended for further CMS evaluation based on SVOC concentrations and risk assessment results as described below. <u>Remainder of Yard</u> VOCs nondetect or low in representative locations. Based on VOC, SVOC, TPH and metals data in remainder of yard, and risk assessment results, area is not recommended for evaluation in CMS.	VOCs low and associated risks do not drive recommendation for the portion of the yard requiring further CMS evaluation.
		SVOCs Site documentation does not indicate use or storage of SVOCs.	Based on unknown content of drums, screen area for potential presence of SVOCs by collecting samples in representative locations. Also target area of known release in southwest corner of yard. <u>Southwest Corner of Yard</u> In 1988, collect shallow soil samples (0.5 feet bgs) at three locations (OLDCONS-1, -5 and -6), targeting area of former release in topographic low. In 1997, collect shallow and deep samples from two locations (OCBS07 and OCBS08, 1 foot and 5 feet bgs) adjacent and downslope of OLDCONS-1. <u>Remainder of Yard</u> Collect soil samples from representative locations in the eastern (OCBS15) and central (OCBS39) portion of yard.	SVOC sample results are shown on Figure A2.3-2A <u>Southwest Corner of Yard</u> ▪ Four SVOCs detected in one location OLDCONS-1 (0.5-foot bgs); up to 2,100 µg/kg fluoranthene. ▪ Phenanthrene detected at 1,600 µg/kg, above EcoRBSL (1,300 µg/kg). ▪ 2,4-dinitrophenol detection limit of 2,000 µg/kg in OLDCONS-1 and OLDCONS-5 exceeds EcoRBSL (590 µg/kg). ▪ SVOCs nondetect in deeper samples. SVOC detects limited and delineated by targeted sample results, topography within low area and bedrock depth assessed in trenches/ soil borings. <u>Remainder of Yard</u> ▪ No SVOCs detected in representative locations; no further delineation needed.	<u>Southwest Corner of Yard</u> YES Area recommended for further CMS evaluation based on phenanthrene concentrations, 2,4-dinitrophenol detection limits, and risk assessment results. <u>Remainder of Yard</u> No SVOCs detected in representative locations. As described above, area is not recommended for evaluation in CMS.	YES Extent of impacted area delineated by topography (extent of low area) and sample results.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
1a	**Former Rocketdyne Conservation Yard (continued)**	**TPH** Site documentation does not indicate use or storage of petroleum hydrocarbons.	Based on unknown content of drums, screen area for potential presence of petroleum hydrocarbons by collecting samples in representative locations. Also target area of known release in southwest corner of yard. <u>Southwest Corner of Yard</u> Sampling rationale is the same as for SVOCs in this area; see above for details. <u>Remainder of Yard</u> Collect soil sample from representative location in the eastern portion of yard (OCBS15).	TPH results are shown on Figure A2.3-2A. <u>Southwest Corner of Yard</u> ▪ TPH detected up to 95 mg/kg lubricant oil in OCBS07 (1 foot bgs); below RBSL for combined kerosene, diesel, and lubricant oil ranges (1,400 mg/kg). ▪ Other TPH ranges very low or nondetect at 5-feet bgs. <u>Remainder of Yard</u> TPH not detected; no further delineation needed. TPH detects are low, delineated at depth by nondetects, and are located in a targeted release area in the yard's low spot. No further delineation needed.	<u>Southwest Corner of Yard</u> YES Area recommended for further CMS evaluation based on SVOC concentrations and risk assessment results as described above. <u>Remainder of Yard</u> TPH nondetect in representative samples. Area not recommended for CMS based on VOC, SVOC, TPH and metals data, and risk assessment results.	<u>Southwest Corner of Yard</u> YES TPH limited and associated risks do not drive CMS recommendation.
		Metals Documentation does not indicate metals used or stored.	Based on history of materials storage in the area, screen area for potential presence of metals. <u>Southwest Corner of Yard</u> Sampling rationale is the same as for SVOCs in this area; see above for details. <u>Remainder of Yard</u> Collect sample from one location in the eastern portion of the yard (OCBS15, 1 foot bgs).	Metals results are shown on Figure A2.3-4a No metals detected above background in either targeted or representative sample locations within yard. No further delineation needed.	<u>Southwest Corner of Yard</u> YES Area recommended for further evaluation during CMS based on SVOC concentrations and risk assessment results as described above. <u>Remainder of Yard</u> No metals detected above background in representative sample. Area not recommended for CMS based on VOC, SVOC, TPH and metals data, and risk assessment results.	Area recommended for further CMS evaluation based on SVOC results (see above).

Table A2.3-2A (Page 3 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
1b	**Former Atomics International (AI) Conservation Yard** Flat former storage area (main yard) for salvageable materials, equipment, and drums with unknown contents. Fenced-in area identified as "583" on facility maps. Surface of main yard coated with a ½- to 2-inch thick asphalt-like/aggregate material. Area slopes gently southwest. Surface water drains from area via an asphalt/concrete swale along former C Street, crosses former 3rd Street by a concrete gutter, and enters the topographical Low Spot (Chemical Use Area 8). Soil thickness up to 6 feet within area.	**VOCs** Site documentation does not indicate use or storage of VOCs or other solvents.	Based on unknown content of drums, screen main yard and downslope area for potential presence of VOCs or other solvents in representative locations in the center of the yard near an observed oil stain on the asphalt surface. <u>Soil Matrix (1988)</u> Collect shallow soil sample at one downslope location (OLDCONS-4). <u>Soil Vapor (1997)</u> Collect and analyze soil vapor sample at one location within main yard (OCSV04).	VOC results are shown on Figure A2.3-1. <u>Soil Matrix</u>: 2-butanone detected at 11 µg/kg in OLDCONS-4; result does not exceed RBSLs. No other VOCs detected. <u>Soil Vapor</u>: VOCs not detected. Soil vapor and soil matrix data collected in representative locations for main yard and downslope areas, respectively. VOC concentrations are low or nondetect within area; no further delineation needed.	YES <u>Main Yard</u> Area recommended for CMS based on PAH (as TPH) and PCB concentrations and risk assessment results as described below. <u>Downslope Soil Area</u> Area not recommended for CMS evaluation based on VOC results and risk assessment results.	YES VOCs low and associated risks do not drive CMS recommendation.
		SVOCs Site documentation does not indicate use or storage of SVOCs; however, potential SVOCs associated with asphalt-like aggregate surface coating.	Based on unknown content of drums, and potential SVOCs associated with heavy hydrocarbons in asphalt-like aggregate surface coating, screen area for potential presence of SVOCs. <u>Main Yard</u> Collect shallow soil matrix sample (at 0.5 feet bgs) just beneath asphalt surface coating at one location (OCBS06). <u>Downslope Soil Area</u> Collect shallow (0.5 feet bgs) soil matrix sample from one location (OLDCONS-4) in soil southwest of asphalt storage area.	SVOC results are shown on Figure A2.3-2B. <u>Main Yard</u> SVOCs detected in soil beneath asphalt surface coating (OCBS06): ▪ PAHs (a subset of SVOCs) detected, up to 184 µg/kg benzo(g,h,i)perylene; benzo(a)pyrene was not detected. ▪ SVOC concentrations are below RBSLs. <u>Downslope Soil Area</u> No SVOCs detected in downslope sample OLDCONS-4. SVOC detects in OCBS06 not delineated at depth; however, TPH and PCBs were not detected in deeper sample (5.5 feet bgs) from same boring (see below). Depth to bedrock is approximately 6 feet bgs.	YES <u>Main yard</u> Area recommended for further evaluation during CMS based on PAH (as TPH) and PCB concentrations and risk assessment results (see below). <u>Downslope Soil Area</u> Area not recommended for CMS evaluation based on SVOC results and risk assessment results.	YES Impacted soil area based on extent of visible surface coating. Vertical extent of impacts based on limited mobility of SVOCs associated with TPH and PCBs, and sample results at depth.

Table A2.3-2A (Page 4 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
		TPH Site documentation does not indicate use or storage of petroleum hydrocarbons; however, heavy hydrocarbons are associated with asphalt surface coating.	Based on unknown content of drums and potential petroleum hydrocarbons associated with asphalt surface coating, screen area for potential presence of petroleum hydrocarbons near an observed oil stain on the asphalt surface. <u>Main Yard</u> In 1997-98, collect sediment sample from oil-stained portion of the asphalt surface coating (OCSS01), and collect soil matrix samples beneath asphalt coating from one boring location (OCBS06, 0.5 and 5.5 feet bgs). Based on 1997 result, recollect OCBS06 at 0.5 feet bgs in 2002. <u>Downslope Soil Area</u> Collect historical (1988) shallow sample in one location outside extent of surface coating material (OLDCONS-4, 0.5 feet bgs). During RFI (1998), collect additional soil matrix sample from one location (OCBS18, 0.5 feet bgs).	TPH results are shown on Figure A2.3-2B. <u>Main Yard</u> Diesel-range (up to 1,200 mg/kg) and lubricant oil-range (up to 8,300 mg/kg) hydrocarbons detected in surface sediment sample (on asphalt surface coating) and soil matrix sample (beneath coating). ▪ No other ranges detected in samples. ▪ TPH ranges were also nondetect in the deeper sample at OCBS06. ▪ Combined concentrations of diesel and lubricant oil range hydrocarbons in both samples exceed ResRBSL for kerosene, diesel and lubricant oil ranges (1,400 mg/kg). ▪ Diesel (670 mg/kg) and lubricant oil (92 mg/kg) were detected in recollected sample OCBS06. <u>Downslope Soil Area</u> ▪ Hydrocarbon range C09-C22 detected at 2 mg/kg (0.5 feet bgs) in OLDCONS-4. ▪ No TPH ranges were detected in OCBS18. TPH concentrations in soil are highest directly beneath the asphalt surface coating and are delineated laterally by the extent of this material and by downslope sample results (outside extent of surface coating). Impacts are delineated vertically based on nondetects in deeper sample.	YES Area is recommended for further evaluation during CMS based on PAH (as TPH) and PCB concentrations and risk assessment results.	YES Impacted soil area based on visible extent of surface coating. Vertical extent of impacts is based on limited mobility of petroleum hydrocarbons and sample results at depth.
1b	**Former Atomics International (AI) Conservation Yard (continued)**	**PCBs** Site documentation does not indicate use or storage of PCBs. Potential PCBs associated with asphalt surface coating.	Based on unknown content of drums and potential PCBs associated with heavy hydrocarbons in asphalt surface coating, screen area for potential presence of PCBs. <u>Surface Coating Material/ Surficial Soil</u> Characterize composition of asphalt surface coating material by collecting composite sample of material mixed with underlying surficial soil (OCSS03); analyze for PCB congeners and Aroclors. <u>Soil Matrix Within Storage Area</u> Excavate trench in one location within area (OCTS22). Collect soil samples from just beneath asphalt coating (0.5 feet bgs) and at depth (4 feet bgs).	PCBs results are shown on Figure A2.3-2B. <u>Surface Coating Material/ Surficial Soil</u> ▪ 25 of 28 PCB congeners detected in OCSS03, up to 54 µg/kg PCB-138. ▪ Aroclor 1254 detected at 97 µg/kg; result exceeds EcoRBSL (79 µg/kg). <u>Soil Matrix Within Storage Area</u> ▪ Aroclor 1254 detected up to 2,200 µg/kg in OCTS22 (0.5 feet bgs). ▪ No Aroclors detected in deeper (4 feet bgs) sample within trench. ▪ Aroclor 1254 results exceed ResRBSL (350 µg/kg) and EcoRBSL (79 µg/kg). PCB and heavy hydrocarbon impacts in shallow soil samples collected directly beneath the asphalt surface coating suggest PCBs are associated with heavy oils in the surface coating. Therefore, impacts are delineated laterally by the extent of this material, and at depth by nondetects.	YES Area is recommended for further evaluation during CMS based on PCB and PAH (as TPH) concentrations, and risk assessment results.	YES CMS volume is based on lateral extent of surface coating, limited mobility of petroleum hydrocarbons and nondetect samples at depth.

Table A2.3-2A (Page 5 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
1c	**Former Northern Storage Area** Flat area at top of ridge was formerly used for storage of equipment and materials; some likely in drums. Area slopes gently north and is drained to the north and northwest by two steep natural surface water drainages (Figure A2.2-1B). Drainage to the north leads to the North Slope Debris Area "A" (see Chemical Use Area 6c). Soil extent is limited laterally and vertically by bedrock outcrops within area and downslope drainages. Soil thickness ranges up to 3 feet within flat portion of storage area and up to 1 foot along drainages. See Chemical Use Area 6c for description of downslope debris area.	**VOCs** Site documentation does not indicate use or storage of VOCs or other solvents.	Based on unknown material storage and/or drum contents, sample representative locations within flat storage area for potential presence of VOCs. <u>Soil Vapor</u> Collect and analyze soil vapor at one location (OCSV10) within storage area. <u>Soil Matrix</u> Collect soil sample from one boring location (OCBS23) within storage area.	VOC results are shown on Figure A2.3-1. <u>Soil Vapor</u> VOCs not detected. <u>Soil Matrix</u> VOCs not detected. No VOCs detected in representative locations; no further delineation needed.	YES Area recommended for CMS evaluation based on SVOC and PCB concentrations, and risk assessment results.	Risks associated with SVOCs and PCBs drive CMS recommendation (see below).
		SVOCs Site documentation does not indicate use or storage of SVOCs.	Based on unknown material storage and/or drum contents, target flat storage area and downslope drainages for potential presence of SVOCs. <u>Within Storage Area</u> Collect soil matrix samples from four locations (OCBS23, OCBS50, OCBS51, and OCBS52) at 0.5 feet bgs. <u>Downslope Areas</u> Collect soil matrix samples from three locations within downslope drainages at surface (OCSS02) and at 0.5 feet bgs (OCBS53, OCBS55).	SVOC results are shown on Figure A2.3-2C. <u>Within Storage Area</u> • PAHs detected in one location (OCBS50), up to 480 µg/kg pyrene. • Benzo(a)pyrene detected at 190 µg/kg, exceeding ResRBSL (6 µg/kg). • SVOCs nondetect in 3 other locations. <u>Downslope Areas</u> No SVOCs detected in downslope samples. Extent of impacts delineated by nondetects in downslope drainages. Soil cover is limited laterally by bedrock outcrops within area; thickness up to 3 feet in flat storage area and less than 1 foot in drainages.	YES Area recommended for CMS evaluation based on SVOC and PCB concentrations, and risk assessment results.	YES Lateral and vertical extent of impacts delineated by sample results, thin soil cover, and bedrock outcrops.
1c	**Former Northern Storage Area (continued)**	**TPH** Site documentation does not indicate use or storage of petroleum hydrocarbons.	Based on unknown material storage and/or drum contents, target flat storage area for potential presence of petroleum hydrocarbons. <u>Within Storage Area</u> Sampling rationale is the same as for SVOCs in this area; see above for details. <u>Downslope Areas</u> Sampling rationale is the same as for SVOCs in this area; see above for details.	TPH results are shown on Figure A2.3-2C. <u>Within Storage Area</u> ▪ No gasoline-, kerosene-, diesel- or lubricant oil-range hydrocarbons detected. ▪ Sample results do not suggest the storage area is a source of petroleum hydrocarbons. No further delineation needed. <u>Downslope Areas</u> ▪ No gasoline-, kerosene- or diesel-range hydrocarbons detected. ▪ Lubricant oil-range hydrocarbons detected in OCBS53 (drainage to northwest) and OCBS55 (drainage to north), at 4.5 mg/kg and 2.2 mg/kg, respectively. Extent of soil is limited laterally by narrow channels and bedrock outcrops. Maximum soil thickness is approximately 1.5 feet.	YES Area is recommended for CMS evaluation based on SVOC and PCB concentrations and risk assessment results as described above and below.	YES TPH concentrations are low and associated risks do not drive CMS recommendation.

Table A2.3-2A (Page 6 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
		PCBs Site documentation does not indicate use or storage of PCBs.	Based on unknown material storage and/or drum contents, target flat storage area and downslope drainages for potential presence of PCBs. <u>Within Storage Area</u> Collect soil matrix samples from three locations within storage area (OCBS50, OCBS51, and OCBS52). <u>Downslope Drainage Northwest</u> Collect soil matrix samples at two locations (OCBS53 and OCBS54). Based on initial sample results within drainage, collect stepout samples at two locations further downslope (OCBS95 and OCBS96). <u>Downslope Drainage North</u> Collect soil matrix samples at one location (OCBS55) in the drainage. Based on results, collect stepout samples at 3 upslope (OCBS76, OCBS77, and OCBS79) and 2 downslope locations (OCBS78 and OCBS80, within adjacent Chemical Use Area 6c).	PCBs results are shown on Figure A2.3-2C. <u>Within Storage Area</u> ▪ Aroclor 1248 detected in one sample location at 79 µg/kg (OCBS52), result exceeds EcoRBSL (12 µg/kg). ▪ No PCBs detected in upslope samples OCBS50 and OCBS51. <u>Downslope Drainage Northwest</u> ▪ PCBs detected up to 120 µg/kg Aroclor 1248 in OCBS53; result exceeds EcoRBSL (12 µg/kg). ▪ Concentrations decrease downslope to nondetect in OCBS54, OCBS95, and OCBS96. <u>Downslope Drainage North</u> ▪ PCBs detected in four samples, up to 24,000,000 µg/kg Aroclor 1248 in furthest upslope drainage sample (OCBS79). ▪ Concentrations decrease downslope to nondetect in OCBS82 (see Chemical Use Area 6c). PCB concentrations are highest in the upper portions of the downslope drainages, with the highest detect in the north drainage. Concentrations decrease downslope to nondetect in both drainages. Impacts are delineated vertically by thin soil cover (max. 1.5 feet) and bedrock outcrops in narrow drainage channels; no further delineation needed.	YES Area is recommended for CMS evaluation based on PCB and SVOC concentrations, and risk assessment results.	YES Lateral and vertical extent of impacted soil is delineated by sample results, thin soil cover, and bedrock outcrops.
1c	**Former Northern Storage Area (continued)**	**Metals** Site documentation does not indicate metals used or stored; however, metallic debris visible within flat storage area and in drainages.	Target metallic debris within flat storage area and downslope drainages for potential presence of metals. <u>Within Storage Area</u> Collect soil matrix samples from four locations (OCBS23, OCBS50, OCBS51, and OCBS52). <u>Downslope Drainage Northwest</u> Collect soil matrix samples at one location in downslope drainage to the north (OCBS53) <u>Downslope Drainage North</u> Collect soil matrix samples at two locations in drainage to the northwest (OCBS55 and OCSS02). Based on field observations, collect additional downslope sample (OCBS79).	Metals results are shown on Figure A2.3-4B. <u>Within Storage Area</u> Two metals were detected slightly above background once each in two locations (OCBS50 and OCBS51). ▪ Mercury at 0.12 mg/kg (background = 0.09 mg/kg) and chromium at 45 mg/kg (background = 36.8 mg/kg) ▪ Metals detected below background in samples collected downslope of both locations. ▪ Deeper samples not collected due to thin soil (maximum 2 feet) above bedrock. <u>Downslope Drainages North and Northwest</u> No metals detected above background; no further delineation needed.	YES Area is recommended for CMS evaluation based on SVOC and PCB concentrations and risk assessment results as described above.	YES Metals limited and associated risks do not drive CMS recommendation.

Table A2.3-2A (Page 7 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
1d	**Former Container Storage Area** Former staging area for storage containers on asphalt road surface after fuel farm built in 1977; surface paved until 2002. Area is divided into west and east portions by concrete ditch in Chemical Use Area 3. Also located adjacent to former SRE Pond Discharge Pipeline (part of Chemical Use Area 4). Former paved area sloped gently to the east; surface water drained to adjacent topographic low spot (Chemical Use Area 8). After berms leveled, area was covered with approximately 1 foot of soil. Soil thickest within middle of area (up to 8 feet), and thins toward the southwest and northeast (see Figure A2.2-2b).	**VOCs** Site documentation does not indicate use or storage of VOCs or other solvents.	Screen area for VOCs in representative locations. Collect and analyze soil vapor samples at one location in the east portion (OCSV05, 4 feet bgs) and one in the west portion (OCSV06, 5 and 10 feet bgs) of storage area.	VOC results are shown on Figure A2.3-1. No VOCs were detected in representative locations; no further delineation necessary.	YES No VOCs detected.	Area is not recommended for CMS.
		TPH Site documentation does not indicate use or storage of petroleum hydrocarbons within area; however, located adjacent to fueling operations (Chemical Use Area 3).	Screen area for petroleum hydrocarbons in representative locations. Collect and analyze soil samples from one boring location within the west portion of the storage area (OCBS04, 1 foot and 4.5 feet bgs) and one in the east portion (OCBS05, 1 foot bgs). <u>Note</u>: Borings OCBS59 and OCBS60 installed to address greenish fuel staining discovered in adjacent Building 320 Fueling Area (Chemical Use Area 3).	TPH results are shown on Figure A2.3-2B. TPH results as follows: • In OCBS04, lubricant oil-range hydrocarbons detected at 85 mg/kg (1 foot bgs); TPH not detected in deeper sample within greenish petroleum staining observed from 3 to 5 feet bgs. • Gasoline, kerosene and diesel range hydrocarbons not detected in any samples. • Lubricant oil-range detected at 110 mg/kg in OCBS05 (1 foot bgs); bedrock depth approximately 3.5 feet bgs in adjacent boring OCBS59. • TPH concentrations do not exceed ResRBSLs. Impacts delineated vertically based on nondetect in deeper sample from OCBS04. Low TPH concentrations detected within visually impacted soil and no visual impacts observed in stepout borings to the southwest and northeast; no further delineation needed. Note: greenish fuel staining observed in OCBS04 discussed below with characterization of Building 320 Fueling Area (Chemical Use Area 3).	YES TPH concentrations low in representative samples.	Area is not recommended for CMS evaluation based on low TPH concentrations and risk assessment results.

Table A2.3-2A (Page 8 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
2a	**Former AST 732 and Earthen Berm** Area used for general storage, including drums of unknown contents, between 1952 and 1977. Former 1.5 million-gallon capacity aboveground tank constructed in 1981 for emergency storage of diesel fuel. Pipeline connected tank to the pumping station adjacent to Building 320. AST removed in 1999; berm leveled and soil spread out over area in 2002. Surface water within bermed area drained south from a grated drain to the concrete sump in Chemical Use Area 4, which discharged to the topographic Low Spot in Chemical Use Area 8 (Trippeda 2002). After berms were leveled, area was re-graded to drain surface water south. Berm soil thickness is approximately 1 foot within area (see Figure A2.2-1C). Trace debris (asphalt-like material, concrete fragments, etc.) was encountered in berm soil during RFI trenching activities. Underlying native soil thickness ranges up to 3 additional feet. No historical spills or leaks reported within area.	**VOCs** Site documentation does not indicate use or storage of VOCs in area. Potential VOCs associated with historical drum storage (prior to 1977).	Based on unknown content and location of drums, screen area for presence of VOCs in representative locations. <u>Former Earthen Berm (Prior to Grading)</u> Collect and analyze soil vapor samples at 3 locations within bermed AST area (OCSV09 at 6 feet bgs, OCSV14 at 5 feet bgs, and OCSV15 at 4 feet bgs). Collect and analyze a soil matrix sample from 1 of 3 trenches in base of earthen berm (OCTS05).	VOC results are shown on Figure A2.3-1. No VOCs were detected. No further delineation needed; sampling in representative areas is adequate to characterize potential impacts. Depth to bedrock (approximately 5.5 to 6.5 feet bgs) within area was assessed during trenching activities.	YES No VOCs detected in representative sample locations.	Area is not recommended for further evaluation during CMS.
		SVOCs Site documentation does not indicate use or storage of SVOCs in area; however, potential SVOCs associated with historical drum storage (prior to 1977) and with diesel fuel oil (associated PAHs).	Based on unknown origin of berm material, screen berm for presence of SVOCs in representative locations. <u>Former Earthen Berm (Prior to Grading)</u> Collect and analyze soil matrix samples from 3 trenches in earthen berm (OCTS05, OCTS06, and OCTS07) ranging from 2-3 feet bgs. <u>After Berms Leveled (2006)</u> Based on DTSC request to address nondetect SVOC concentrations in sample from OCTS06 (elevated laboratory detection limits), collect and analyze soil matrix samples from 4 borings located throughout extent of spread out berm soil (OCBS46, OCBS47, OCBS48 and OCBS49). Potential impacts in leveled berm soil were assessed by sampling throughout the whole berm area extent (including Chemical Use Area 2b) rather than solely within Chemical Use Area 2a.	SVOC results are shown on Figure A2.3-2B. No SVOCs were detected, and no staining was observed in soil within trenches. Sampling in representative areas is adequate to characterize potential impacts; no further delineation needed.	YES SVOCs nondetect in representative samples.	Area is not recommended for further evaluation during CMS.

Table A2.3-2A (Page 9 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
		TPH Petroleum hydrocarbons associated with AST and historical drum storage (prior to 1977). Waste oil detected in excavated tank base material (Boeing 1999).	<u>Former Earthen Berm (Prior to Grading)</u> Based on unknown origin of berm material, screen berm for presence of petroleum hydrocarbons in representative locations. Sampling scope in this area is the same as for SVOCs (see above). <u>Tank Base Material</u> Target tank base material to assess potential impacts from fuel releases. Collect soil matrix samples from two trenches (OCTS13 and OCTS14) within tank base material and underlying soil. Potential impacts in leveled berm soil were assessed by sampling throughout the whole berm area extent (including Chemical Use Area 2b) rather than solely within Chemical Use Area 2a.	TPH results are shown on Figure A2.3-2B. <u>Former Earthen Berm (Prior to Grading)</u> TPH were detected in two of three trench samples (OCTS06, OCTS07): ▪ Gasoline- and kerosene-range hydrocarbons not detected. ▪ Diesel and lubricant oil-range hydrocarbons detected up to 76 and 250 mg/kg in OCTS06, respectively; 39 mg/kg lubricant oil detected in OCTS07. ▪ Sum of diesel- and lubricant oil- range concentrations below ResRBSL for combined kerosene, diesel, and lubricant oil (1,400 mg/kg) in either sample. ▪ Samples from trenches OCTS06 and OCTS07 were collected within discontinuous layers of debris within berm material (Attachment 2), including asphalt-like substance. No visual evidence of impacts from fuel releases observed in either trench. Low or nondetect TPH results at representative locations; no further evaluation needed. <u>Tank Base Material</u> ▪ No TPH ranges detected in targeted locations; no further evaluation needed.	<u>Former Earthen Berm</u> YES TPH concentrations are low or nondetect within representative sample locations. <u>Tank Base Material</u> YES TPH nondetect in targeted sample locations.	Area is not recommended for CMS evaluation based on low TPH concentrations risk assessment results.
	Former AST 732 and Earthen Berm (continued)	**PCBs** Site documentation does not indicate use or storage of PCBs in area; however, potential PCBs associated with historical drum storage (prior to 1977).	Assess potential PCB impacts within berm material. <u>Former Earthen Berm (Prior to Grading)</u> Collect and analyze a soil matrix sample from 1 of 3 test pits in earthen berm soils (OCTS06).	PCB results are shown on Figure A2.3-2B. <u>Former Earthen Berm (Prior to Grading)</u> No PCBs detected. No further delineation needed.	YES PCBs nondetect within representative sampling location.	Area is not recommended for further evaluation during CMS.
		Metals Site documentation does not indicate use or storage of metals in area.	Screen area for metals in representative locations. <u>Former Earthen Berm (Prior to Grading)</u> Berm sampling scope in this area is the same as for SVOCs (see above). <u>After Berms Leveled (2006)</u> Based on DTSC request for additional berm soil characterization, collect soil matrix samples from 4 borings located throughout extent of berm soil (OCBS46, OCBS47, OCBS48, and OCBS49). Potential impacts in leveled berm soil were assessed by sampling throughout the whole berm area extent (including Chemical Use Area 2b) rather than solely within Chemical Use Area 2a.	Metals results are shown on Figure A2.3-4A. <u>Former Earthen Berm (Prior to Grading)</u> Three metals detected above background in either of two locations (OCTS06 and OCTS07): ▪ Aluminum detected at 21,000 mg/kg, slightly above background (20,000 mg/kg). ▪ Silver detected at 3 mg/kg, above background (0.79 mg/kg). ▪ Mercury detected at 0.2 mg/kg, above background (0.09 mg/kg). <u>After Berms Leveled (2006)</u> ▪ Boron detected at 12 mg/kg in one location (OCBS47), result slightly exceeds background (9.7 mg/kg). ▪ No other metals detected above background concentrations. Detects generally below background in additional representative samples of spread berm soils adequately characterizes material, supporting the conclusion that no apparent metals source exists within berm soil.	YES Metals concentrations are low in representative sample locations.	Area is not recommended for further evaluation during CMS based on low metals concentrations and risk assessment results.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
2b	**Former AST 731 and Earthen Berm** Area used for general storage, including drums of unknown contents, between 1952 and 1977. Former 1.5 million-gallon capacity aboveground tank constructed in 1977 for emergency storage of diesel fuel oil. Pipeline connected tank to the pumping station adjacent to Building 320. AST removed in 1999; berm leveled and soil spread out over area in 2002. Surface water within bermed area drained south from a grated drain to the concrete sump in Chemical Use Area 4, which discharged to the topographic Low Spot in Chemical Use Area 8 (Trippeda 2002). After berms were leveled, area was re-graded to drain surface water south. Berm soil thickness is approximately 1 foot within area (see Figure A2.2-1C). Underlying native soil thickness ranges up to 3 additional feet. No historical spills or leaks reported within area.	**VOCs** Site documentation does not indicate use or storage of VOCs in area. Potential VOCs associated with historical drum storage (prior to 1977).	Based on unknown content and location of drums, screen area for presence of VOCs in representative locations. <u>Soil Vapor</u> Collect and analyze soil vapor at probe(s) in 3 locations (OCSV11, OCSV12, and OCSV13) around former AST. <u>Soil Matrix</u> Collect and analyze soil matrix sample from 1 of 3 test pits in earthen berm soil (OCTS09).	VOCs results are shown on Figure A2.3-1. No VOCs were detected in representative sample locations for soil vapor or soil matrix; no further delineation needed.	YES No VOCs detected in representative sampling locations.	Area is not recommended for CMS.
		SVOCs Site documentation does not indicate use or storage of SVOCs in area; however, potential SVOCs associated with historical drum storage (prior to 1977) and with diesel fuel oil (as PAHs).	Based on unknown content of drums, assess potential presence of SVOCs by sampling in representative locations. <u>Former Earthen Berm (Prior to Grading)</u> Collect and analyze soil matrix samples from 3 test pits in earthen berm soils (OCTS08, OCTS09, and OCTS10). <u>After Berms Leveled (2006)</u> As described above, address DTSC request regarding elevated PAH detection limits by collecting soil matrix samples from 4 borings located throughout extent of spread out berm soil (OCBS46, OCBS47, OCBS48 and OCBS49). Potential impacts in leveled berm soil were assessed by sampling throughout the whole berm area extent (see above, Chemical Use Area 2a).	SVOCs results are shown on Figure A2.3-2B. No SVOCs were detected in any sample locations. Nondetects confirm elevated detection limits are not indicative of PAH concentrations in earlier samples. No further delineation needed.	YES No SVOCs detected in representative sampling locations.	Area is not recommended for CMS.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
		TPH Petroleum hydrocarbons associated with AST and potentially with drum storage.	<u>Former Earthen Berm (Prior to Grading)</u> Based on unknown origin of berm material, screen berm for presence of petroleum hydrocarbons in representative locations. Collect soil matrix samples from three trenches excavated into earthen berm soil (OCTS08, OCTS09, and OCTS10). <u>Tank Base Material</u> Based on waste characterization data from tank base material (waste oil TPH detected up to 9,600 mg/kg [Boeing 1999b]), target area for trenching/ sampling. Collect soil matrix samples from two trenches (OCTS11 and OCTS21) beneath tank base material, and one trench in soil below former tank/pipeline connection (OCTS12). Target stained soil horizon if observed in trenches.	TPH results are shown on Figure A2.3-2B. <u>Former Earthen Berm (Prior to Grading)</u> ▪ Gasoline-, diesel-, and kerosene-range hydrocarbons not detected. ▪ Lubricant oil-range hydrocarbons detected at 42 mg/kg in OCTS08, below ResRBSL (1400 mg/kg). TPH low within representative berm sample locations; no further delineation needed. <u>Tank Base Material/ Tank Pipeline Connection</u> TPH detected in one location on the south side of the tank base (OCTS11) ▪ Kerosene, diesel and lubricant oil-range hydrocarbons detected at to 89, 700 and 720 mg/kg, respectively; ▪ Combined concentrations exceed the cumulative ResRBSL (1,400 mg/kg). ▪ Impacts delineated to north and west by nondetects, to east by bedrock outcrop, and south by lower concentrations. TPH detected in only one sample below tank base material. Shallow bedrock (approximately 3 feet bgs) precluded collection of deeper samples.	<u>Former Earthen Berm</u> YES TPH low at representative sample locations. <u>Tank Base Material/ Tank Pipeline Connection</u> TPH low at targeted sample locations.	Area is not recommended for CMS evaluation based on low TPH concentrations and risk assessment results.
2b	**Former AST 731 and Earthen Berm (continued)**	**PCBs** Potential PCBs associated with hydrocarbon staining in AST base material .	Based on waste characterization data from tank base material (PCBs detected up to 910 µg/kg Aroclor 1260 [Boeing 1999b]), target this area for trenching/ sampling. Collect soil matrix samples from two trenches targeting former tank base material (OCTS11 and OCTS21) and one at former tank/ pipeline connection (OCTS12).	PCBs results are shown on Figure A2.3-2B. No PCBs detected in targeted sampling locations; no further delineation needed. Depth to bedrock (approximately 2 to 3 feet bgs) within area assessed during field trenching activities.	YES No PCBs detected in targeted samples.	YES Area is not recommended for further evaluation during CMS.

Table A2.3-2A (Page 12 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
		Metals Site documentation does not indicate use or storage of metals in area.	Screen area for metals by sampling in representative locations. Former Earthen Berm (Prior to Grading) Collect soil matrix samples from three trenches excavated into earthen berm soil (OCTS08, OCTS09, and OCTS10. After Berms Leveled (2006) Based on DTSC request for additional berm soil characterization, collect soil matrix samples from 4 borings located within perimeter of spread out berm soil (OCBS46, OCBS47, OCBS48, and OCBS49). Potential impacts in leveled berm soil were assessed by sampling throughout the whole berm area extent (see above, Chemical Use Area 2a).	Metals results are shown on Figure A2.3-4A. Former Earthen Berm (Prior to Grading) ▪ Mercury detected slightly above background (0.09 mg/kg) in OCTS08 at 0.2 mg/kg; below ResRBSL (23 mg/kg) and EcoRBSL (0.89 mg/kg). After Berms Leveled (2006) (as noted above in 2a) ▪ Boron detected at 12 mg/kg in one location (OCBS47), result slightly exceeds background (9.7 mg/kg). ▪ No other metals detected above background concentrations. Detects generally below background in additional representative samples of spread berm soils adequately characterizes material, supporting the conclusion that no apparent metals source exists within berm soil.	YES Metals concentrations are low in representative sample locations.	Area is not recommended for further evaluation during CMS based on low metals concentrations and risk assessment results.
3	**Former Fueling Area at Building 320** Includes the following: • UST UT-28, • a concrete ditch with pipeline to a clarifier, • soil excavation area, Concrete ditch/ pipeline and clarifier were installed for UT-28 overflow containment. Before 1977, area was located within OCY drum storage yard. Beginning in 1977, area used primarily to transfer diesel fuel from trucks to ASTs 731 and 732 (Chemical Use Areas 2a and 2b). Former concrete ditch divides adjacent Container Storage Area (Chemical Use Area 1d). Approximate 400-gallon diesel fuel release near UT-28 in 1982 resulted in a 15-foot diameter, 3.5-foot deep excavation east of	**VOCs** Potential VOCs associated with fueling operations and/or drum storage. Diesel fuel release within area in 1982.	Screen area for VOCs, targeting former UST and fuel release excavation area. Fuel Release/ Soil Excavation Area During 1988 follow-up investigation, collect and analyze two soil samples from one trench through former excavation of fuel-impacted soil: • Within excavation (OLDCONS-3); and • Adjacent to excavation (OLDCONS-2). During 1997 RFI sampling, collect and analyze soil samples at four locations to evaluate historical sampling results: • One sample in bottom of excavation (OCBS09); • Three samples outside perimeter of excavation (OCBS01, OCBS02, and OCBS03) at depths between 0.5 and 6 feet bgs. UST UT-28 Collect and analyze soil vapor samples from two locations adjacent to UST (OCSV07 and OCSV08).	VOC results are shown on Figure A2.3-1. Fuel Release/ Soil Excavation Area In 1988, four VOCs detected in two samples: ▪ Methylene chloride up to 6 µg/kg in OLDCONS-3 (3.5 feet bgs); result exceeds ResRBSL (4 µg/kg). ▪ Acetone up to 14 µg/kg in OLDCONS-3 (3.5 feet bgs). ▪ Toluene at 7 µg/kg and total xylenes at 13 µg/kg in OLDCONS-2 (1 foot bgs). In 1997, two VOCs detected in three samples (OCBS01, OCBS02, and OCBS03) around the rim of the excavation. ▪ Methylene chloride up to 280 µg/kg; concentrations exceed ResRBSL. ▪ Acetone detected up to 4,800 µg/kg; VOCs not detected in sample within excavation. UST UT-28 (1999) No VOCs detected in soil vapor samples targeting UST; no further delineation needed.	Fuel Release/ Soil Excavation Area YES Recommended for further consideration in CMS based on methylene chloride concentrations, potential benzene (as TPH), elevated SVOC detection limits and risk assessment results. UST UT-28 YES VOCs nondetect in targeted sample locations.	Fuel Release/ Soil Excavation Area YES Extent of impacted area delineated by targeted sampling results in known spill area.

Table A2.3-2A (Page 13 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	**Chemical Use Area Name** Status, How Used, and Physical Characteristics (see text for Site History)	**Potential Chemicals Used / Stored**	**Sampling Rationale and Scope** [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	**Sampling Results** Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	**Potential concentration gradients sufficiently evaluated for risk assessment?**[3,4]	**Is delineation sufficient to estimate soil volume in CMS?** [4,5] [see Figure A2.5-1 for CMS areas]
	Building 320. UT-28 was removed in 1987 and clean-closed by VCEHD in 1994 based on visual observations in tank excavation and PID readings. Soil thickness ranges up to 8 feet within area.	**SVOCs** Site documentation does not indicate use or storage of SVOCs in area. Potential SVOCs associated with diesel fuel oil (as PAHs) and/or drum storage.	Screen area for SVOCs. <u>Fuel Release/ Soil Excavation Area</u> During 1988 follow-up investigation, collect and analyze two soil samples from one trench through former excavation of fuel-impacted soil: • Within excavation (OLDCONS-3); and • Adjacent to excavation (OLDCONS-2).	SVOC results are shown on Figure A2.3-2B. <u>Fuel Release/ Soil Excavation Area</u> No SVOCs were detected; however, detection limits for 2,4-dinitrophenol were 2,000 µg/kg (OLDCONS-2) and 20,000 µg/kg (OLDCONS-3).	<u>Fuel Release/ Soil Excavation Area</u> YES Area recommended for CMS based on VOCs (as TPH), elevated SVOC detection limits, and risk assessment results.	<u>Fuel Release/ Soil Excavation Area</u> YES Extent is defined by targeted sampling results in known spill area.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
3	**Former Fueling Area at Building 320 (continued)**	**TPH** Diesel fuel oil was stored/ transferred within area. Diesel fuel release within area in 1982.	<u>Fuel Release/ Soil Excavation Area</u> During 1988 follow-up investigation, collect and analyze two soil samples from one trench through former excavation of fuel-impacted soil: • Within excavation (OLDCONS-3); and • Adjacent to excavation (OLDCONS-2). During 1997 RFI sampling, collect and analyze soil samples at four locations to evaluate historical sampling results: • One sample in bottom of excavation (OCBS09); • Three samples outside perimeter of excavation (OCBS01, OCBS02, and OCBS03) at depths between 0.5 and 6 feet bgs. <u>UT-28, Concrete Ditch and Clarifier</u> UST visually inspected upon removal in 1987. Results revealed no holes in the tank or contamination in the soil (Rockwell, 1994). During RFI, collect and analyze soil samples from: • Open excavation after concrete ditch and associated clarifier piping removal (OCTS15; 4 feet bgs); adjacent to base of clarifier (OCBS17; 7 feet bgs); and at clarifier outfall (OCBS13; 0.5 feet bgs) • Based on sample results in Chemical Use Area 1D, at six locations targeting deeper, greenish fuel-stained soils surrounding the former concrete ditch: ➢ Between soil excavation and concrete ditch (OCBS42 through OCBS45); and ➢ Beneath petroleum-stained soil at two boring locations (OCBS57 and OCBS58) to the northeast/ southwest. Visually inspect soil in stepout boring locations OCBSS59 and OCBS60 to delineate TPH staining.	TPH results are shown on Figure A2.3-2B. <u>Fuel Release/ Soil Excavation Area</u> During 1988 sampling, petroleum hydrocarbons detected in both samples: • OLDCONS-3, at bottom of excavation, contained 4,000 mg/kg “heavy oil range” (C22-C40) hydrocarbons. Concentration exceeds ResRBSL for combined kerosene-, diesel- and lubricant oil-range TPH (1,400 mg/kg). • OLDCONS-2, adjacent to excavation at 1 foot bgs, contained 4 mg/kg C09-C22 hydrocarbons. • Gasoline- and jet fuel- range hydrocarbon ranges were not detected. During 1997 RFI sampling: • No petroleum hydrocarbons detected in OCBS09, within open excavation. • Two of three perimeter samples (OCBS01 and OCBS02) did not contain detectable petroleum hydrocarbons. OCBS03 contained: ➢ 42 mg/kg gasoline-range hydrocarbons at 1.5 feet bgs; concentration exceeds ResRBSL (1.1 mg/kg) ➢ 160 mg/kg diesel-range hydrocarbons and 83 mg/kg lubricant-range at 6 feet bgs; concentrations are below ResRBSL for combined kerosene-, diesel- and lubricant oil-range TPH (1400 mg/kg). • Limited, low TPH concentrations detected in targeted locations within and around perimeter of excavation indicate that earlier results reflect isolated concentrations that were not laterally extensive. Natural attenuation between 1989 and 1997 may have further reduced TPH impacts. No further delineation needed based on targeted sampling results. <u>UT-28, Concrete Ditch and Clarifier</u> • No TPH ranges detected at OCTS15, OCBS13 or OCBS17; • Greenish staining, typical of degraded fuel, observed in OCBS43 (between 7 and 8 feet bgs) and OCBS44 (between 6 and 7 feet bgs): ➢ TPH kerosene (13 mg/kg), diesel (59 mg/kg), and lubricant oil (60 mg/kg) detected in OCBS43 at 7 feet bgs. ➢ No TPH ranges detected in OCBS44 at 7 feet, or at 3.5 feet bgs in OCBS43. ➢ Extent delineated visually in soil borings within area. • Trace amount of greenish fuel staining noted in soil between 5 and 6 feet in OCBS57 and between 3.5 and 4.5 feet in OCBS58; however, no TPH ranges were detected in samples collected beneath fuel staining (7 feet bgs in each boring). TPH impacts are further delineated laterally (east/ west) by absence of fuel staining and shallow bedrock (3.5 to 4 feet bgs) in additional stepout borings OCBS59 and OCBS60. No further delineation needed.	<u>Fuel Release/ Soil Excavation Area</u> YES Area is recommended for further evaluation in CMS based on TPH (as benzene), methylene chloride and SVOC concentrations, and risk assessment results. <u>UT-28, Concrete Ditch and Clarifier</u> YES Low concentrations of TPH detected in targeted samples within discrete, well-defined layer of weathered fuel. Based on risk assessment results, area not recommended for further CMS evaluation.	<u>Fuel Release/ Soil Excavation Area</u> YES Extent is defined by targeted sampling results within known spill area.

Table A2.3-2A (Page 15 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
4	**Former SRE Pond Discharge Pipeline** Pipeline was constructed to divert SRE Pond (Area IV AOC) water to the main portion of the SSFL, with drainage south to Silvernale Reservoir (SWMU 6.8). Discharge water potentially contained VOCs, SVOCs, TPH and metals (Ogden 1999). PCBs and dioxins also detected in SRE Pond sediment during February 2006 sampling. Includes concrete sump and upper portion of topographical Low Spot (Chemical Use Area 8). Area likely collected surface water runoff from adjacent Chemical Use Areas 1d and 3 to the north (see above). Former concrete sump and subsurface portion of pipeline are covered by approximately 1 foot of spread earthen berm soil. A 5-foot wide shallow asphalt swale channeled discharge water south into the adjacent Low Spot in Chemical Use Area 8. Soil thickness ranges up to 6 feet within area. The SRE Discharge Pipeline was removed in 1999.	**VOCs** Site documentation does not indicate use or storage of VOCs in area; however, VOCs potentially contained in SRE Pond discharge.	Based on detects in SRE Pond sediment (see Appendix A3, SRE RFI Report), target pipeline discharge area for VOC sampling. <u>Discharge Area</u> Collect soil sample at pipeline discharge area (OCBS24). Note: soil vapor sampling not conducted in discharge area since drilling is not permitted within active drainages. <u>Pipeline</u> Collect soil sample immediately below former pipeline (OCTS18).	VOC results are shown on Figure A2.3-1. <u>Discharge Area</u> No VOCs detected. <u>Pipeline</u> ▪ Acetone detected at 110 µg/kg in OCTS18 (2 feet bgs), below ResRBSL (51,000 µg/kg) and EcoRBSL (46,000 µg/kg). ▪ No other VOCs detected Acetone is a common laboratory contaminant and its presence is not likely related to site activities or considered representative of potential VOC impacts. VOC detects low at targeted sample locations immediately below pipeline. No further delineation needed.	<u>Discharge Area</u> YES Area recommended for further consideration in CMS based on dioxins concentrations and risk assessment results as described below. <u>Pipeline</u> YES VOCs low or nondetect in targeted sampling location. Area not recommended for CMS based on VOC concentrations and risk assessment results.	YES VOCs low and associated risks do not drive CMS recommendation.
		SVOCs Site documentation does not indicate use or storage of SVOCs in area; however, SVOCs potentially contained in SRE Pond discharge.	Based on SVOCs detected in SRE Pond sediment (see Appendix A3, SRE RFI Report), screen area for SVOCs at targeted locations. <u>Pipeline, Concrete Sump and Discharge Area</u> Collect soil matrix samples from two locations below former SRE pipeline (OCBS47, OCTS18), one location adjacent to base of former concrete sump/ pipe junction box (OCBS41), and one location at pipeline discharge area (OCBS24).	SVOC results are shown on Figure A2.3-2B. No SVOCs detected in any targeted sample; no further delineation needed.	<u>Discharge Area</u> YES Area recommended for further consideration in CMS based on dioxins concentrations and risk assessment results as described below. <u>All Other Areas</u> YES Areas not recommended for CMS based on nondetect SVOCs in targeted samples.	YES Risks associated with dioxins drive CMS recommendation.
		TPH Subsurface portion of pipeline lies adjacent to diesel fueling area (Chemical Use Area 3). Petroleum hydrocarbons also potentially contained in SRE Pond discharge.	Based on petroleum hydrocarbon detects in SRE Pond sediment (see Appendix A3, SRE RFI Report), and proximity to fueling area, target subsurface portion of pipeline and discharge area. <u>Pipeline and Discharge Area</u> Collect soil samples from excavation of subsurface portion of pipeline (OCTS18, 2 feet bgs) and within pipeline discharge area (OCBS24, 1 foot bgs).	TPH results are shown on Figure A2.3-2B. No TPH staining observed, and no TPH were detected in either sample.	<u>Discharge Area</u> YES Area recommended for further consideration in CMS based on dioxin concentrations and risk assessment results as described below. <u>Pipeline</u> TPH nondetect in targeted locations; area not recommended for CMS.	YES TPH low and associated risks do not drive CMS recommendation.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
4	**Former SRE Pond Discharge Pipeline (continued)**	**Dioxins** Dioxins potentially contained in SRE Pond discharge.	Assess dioxins in drainages- associated with SRE Pond, OCY Topographic Low Spot, and NCY drainage. Screen area for dioxins in targeted locations. <u>Discharge Area</u> Collect soil matrix sample from one location at SRE pipeline discharge area (OCBS24).	Dioxins results are shown on Figure A2.3-3. <u>Discharge Area</u> ▪ 2,3,7,8-TCDD Total Equivalency Quotient (TEQ) of 35.7 ng/kg exceeds background (0.98 ng/kg), EcoRBSL (3.4 ng/kg) and ResRBSL (6.9 ng/kg). ▪ Similarly, all dioxin congener concentrations exceed background. Due to the nature of the area as a topographic low, the lateral extent of dioxins impacts is defined by the extent of soil within the discharge area. This low area is contiguous with the adjacent topographic Low Spot (Chemical Use Area 8) also recommended for further CMS evaluation (see below) for dioxins.	<u>Discharge Area</u> YES Area is recommended for further evaluation during CMS based on dioxins concentrations and risk assessment results.	YES Extent of impacted area is based on topography (low spot extent within area) and surrounding bedrock outcrops.
		Metals Site documentation does not indicate use or storage of metals in area. Metals potentially contained in SRE Pond discharge.	Based on metals detected above background in SRE Pond sediment (see Appendix A3, SRE RFI Report), screen area for metals by sampling in representative locations. <u>Along Pipeline (aboveground)</u> Collect soil matrix sample at one location (OCBS47) to assess elevated detect of aluminum at location of soil sample near former AST berm (OCTS06, see Chemical Use Area 2a). <u>Adjacent to Concrete Sump</u> Collect soil matrix sample at depth (7 feet bgs) at one location (OCBS41) targeting the base of the former concrete sump. <u>Beneath Subsurface Portion of Pipeline</u> Collect soil matrix samples from one trench location (OCTS18) where subsurface portion of pipeline excavated. Based on results, collect stepout soil matrix samples at four locations adjacent and parallel to former pipeline (OCBS42 through OCBS45); vary depths of samples from 3 to 7 feet bgs). Analyze for aluminum only. <u>Pipe Discharge Area</u> Collect shallow (0.5 to 1 foot bgs) soil matrix sample at one location beneath pipe discharge (OCBS24); based on elevated detection limits for several metals, resample location in 2006.	Metals results are shown on Figure A2.3-4A. Six metals were detected above background in the pipe discharge area (OCBS24), beneath the subsurface portion of pipeline (OCTS18), and along the pipeline aboveground (OCBS47). <u>Along Pipeline (aboveground)</u> ▪ Aluminum detected in OCBS47 at 17,000 mg/kg; below background. ▪ Boron detected at 12 mg/kg; exceeds background (9.7 mg/kg). <u>Adjacent to Base of Concrete Sump</u> ▪ No metals were detected above background. <u>Beneath Subsurface Portion of Pipeline</u> ▪ Aluminum detected at 24,000 mg/kg in OCTS18; result exceeds background (20,000 mg/kg). ▪ No other metals were detected above background in OCTS18. ▪ Aluminum concentrations in soil samples OCBS42, OCBS43, OCBS44, and OCBS45 were within background ranges. <u>Pipe Discharge Area</u> Four metals detected slightly above background in the original sample, but were not detected elsewhere in the Chemical Use Area: ▪ Cadmium at 1.5 mg/kg (background = 1 mg/kg) ▪ Lead at 45 mg/kg, (background = 34 mg/kg) ▪ Mercury at 0.13 mg/kg (background = 0.09 mg/kg) ▪ Silver at 2.2 mg/kg (background = 0.79 mg/kg) No metals were detected above background in the 2006 resample.	<u>Discharge Area</u> YES Area recommended for further CMS evaluation based on dioxins concentrations and risk assessment results. <u>All Other Areas</u> YES Isolated concentrations above background are delineated by numerous stepout samples.	YES Extent of impacted area defined by topography (low spot extent within area) and surrounding bedrock outcrops.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
5	**Telephone Pole Storage Area** Former storage area for old telephone poles (approximately 12 onsite during RFI); during site walk, it was noted that some poles had been burned. Surficial charred wood fragments remained after poles were removed in 2000. Area slopes to southwest; surface water drains in sheet flow across adjacent Rocketdyne Conservation Yard (Chemical Use Area 1a) and collects in the topographic Low Spot in Chemical Use Area 8. Post-Topanga Fire erosion control measures were emplaced to control potential chemical migration from the area. Soil thickness ranges up to 3 feet within area.	**SVOCs** Potential SVOCs (PAHs) associated with by-products of telephone pole combustion.	Collect soil samples within (OCBS27) and downslope (OCBS28) of storage area at approximately 0.5 feet and 3 feet bgs; analyze for SVOCs. Collect an additional laboratory confirmation sample at the downslope location (OCBS28, 0.5 feet bgs).	SVOC results are shown on Figure A2.3-2A. SVOCs were detected in the two sample locations:. ▪ SVOCs detected up to 62 µg/kg benzo(k)fluoranthene in OCBS27 at 0.5 feet bgs; benzo(a)pyrene detected once at 29 µg/kg, above ResRBSL of 4.7 µg/kg. ▪ Concentrations are generally highest in OCBS27 and decrease downslope within area to OCBS28; benzo(a)pyrene decreases to nondetect (< 3 µg/kg). In laboratory confirmation sample OCBS28, 2,4-dinitrophenol was nondetect at a detection limit at 1,600 µg/kg, above EcoRBSL of 590 µg/kg. 2,4-dinitrophenol was not analyzed in other samples. Bedrock outcrops within area limit southern, downslope extent of soil impacts. Extent of SVOCs defined by the mapped former storage area, visible charred debris and sample results.	YES Area is recommended for further evaluation during CMS based on elevated detection limits of 2,4-dinitrophenol, dioxins concentrations, and risk assessment results.	YES Extent of impacts limited by sample results, known visible extent of pole storage, and sample results.
		Dioxins Potential dioxins associated with by-products of telephone pole combustion.	Collect soil samples within (OCBS27) and downslope (OCBS28) of storage area for dioxins, at approx. 0.5 feet bgs and 3 feet bgs. Collect an additional laboratory confirmation sample at the downslope location (OCBS28).	Dioxin results are shown on Figure A2.3-3. Dioxin TEQs exceed background (0.98 ng/kg) and ResRBSL (6.9 ng/kg) and EcoRBSL (3.4 ng/kg) in all locations and at all depths collected within and downslope of storage area. ▪ Dioxin TEQs were detected up to 183 ng/kg in shallow sample within the area (OCBS27). ▪ TEQs decrease in deeper sample and in downslope sample to 7.0 ng/kg. Similarly, dioxin congeners are generally above background in all samples, and follow similar trends. Bedrock outcrops within area limit southern, downslope extent of soil impacts. Extent of dioxins based on the mapped former storage area and visible charred debris.	YES Area is recommended for further consideration in CMS based on dioxins concentrations and risk assessment results.	YES Extent is delineated by sampling results, bedrock, visible extent of storage area and visible charred debris.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
6a	**Northern Debris Area** Disposal area for construction debris, including wood, roofing materials, sheet metal and other metallic debris (rebar, wire, nails, etc.), asbestos-containing material (ACM), and empty containers (5-gallon cans, glass). Central portion of area contains debris in soil up to 5 feet deep. Debris burned prior to burial. Surrounding area with surficial debris consists of intermittent metal, wood, and concrete materials, as well as some ACM. Lateral and vertical extent of debris has been defined by geophysical surveys, RFI exploratory trenches (12) and hand auger borings. Soil thickness ranges up to approximately 7 feet, and bedrock outcrops are prevalent within the area. Area slopes to the south-southeast. Surface water drains by sheet flow across a portion of the adjacent Southern Debris Area (Chemical Use Area 6b), enters a metal culvert under E Street and discharges into a natural drainage. Post-Topanga Fire erosion control measures were emplaced to control potential chemical migration from the area.	**VOCs** No documented use of VOCs within area.	Although no documented use, screen area in representative locations for potential VOC impacts associated with debris. Collect soil vapor samples at one upslope location (OCSV16) and two locations within debris (OCSV17, OCSV18).	VOC results are shown on Figure A2.3-1. No VOCs detected in OCSV16 or OCSV18; sample could not be collected from OCSV17. No VOCs detected in representative locations; no further delineation needed.	YES Area is recommended for further evaluation during CMS based on SVOC, PCB, dioxins, and metals concentrations, and risk assessment results, as described below.	Risks associated with SVOCs, PCBs, dioxins, and metals drive CMS recommendation.
		SVOCs Potential SVOCs associated with debris and byproducts of burned material.	<u>Upslope Area</u> Collect one soil sample from exploratory trench upslope and outside extent of surficial debris area (OCTS35, 2 feet bgs). <u>Within Debris</u> Excavate exploratory trenches through deepest area of buried debris (OCTS23, OCTS24). In each trench, collect samples from sidewall targeting debris-impacted soil horizon (5 feet bgs) and native soil beneath (6.5 feet bgs). <u>Downslope Lateral Areas</u> Collect soil samples above bedrock in each of two trenches (OCTS37, 39) located downslope and outside extent of surficial debris.	SVOC results are shown on Figure A2.3-2A. <u>Upslope Area</u> • SVOCs detected up to 65 µg/kg fluoranthene. • Benzo(a)pyrene detected at 34 µg/kg, above ResRBSL of 6 µg/kg. <u>Within Debris</u> • SVOCs detected up to 22 µg/kg chrysene. • Benzo(a)pyrene detected at 8 µg/kg, above ResRBSL. • No SVOCs detected in deeper samples within native soil. <u>Downslope Lateral Areas</u> No SVOCs detected in either sample. Highest concentrations in upslope area and decrease downslope. Lateral and vertical extent also delineated by extent of surficial and buried debris, defined during field activities.	YES Area is recommended for further evaluation during CMS based on SVOC, PCB, dioxins, and metals concentrations, and risk assessment results. For CMS recommendation, area is combined with downgradient Southern Debris Area (Chemical Use Area 6b, see below).	YES Extent of impacts within area delineated by targeted sampling results and known extent of debris. Extent of debris defined by geophysical surveys, exploratory trenches and hand auger borings. Soil thickness ranges up to approximately 7 feet in the area.
		TPH No documented use of petroleum hydrocarbons within area.	Although no documented use, screen area for potential petroleum hydrocarbon impacts associated with debris. <u>Within Debris</u> Sampling rationale is the same as for SVOCs in this area (see above).	TPH results are shown on Figure A2.3-2A. <u>Within Debris</u> • Gasoline- and kerosene-range hydrocarbons not detected in any samples. • Diesel-range hydrocarbons detected in 5-foot sample from OCTS24 up to 6.5 mg/kg. • Lubricant oil-range hydrocarbons detected in each 5-foot sample, up to 550 mg/kg in the middle of the buried debris (OCTS24). One deeper sample (collected beneath sample with maximum detect) contained lubricant oil range at 18 mg/kg. • Combined concentrations are below ResRBSLs (1400 mg/kg).	YES Area is recommended for further evaluation during CMS based on SVOC, PCB, dioxins, and metals concentrations, and risk assessment results, as described above and below.	YES Risks associated with SVOCs, PCBs, dioxins, and metals drive CMS recommendation.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
6a	**Northern Debris Area (continued)**	**PCBs** Potential PCBs associated with debris.	Upslope Area Sampling rationale is the same as for SVOCs in this area; see above for details. Within Debris Sampling rationale is the same as for SVOCs in this area; see above for details.	PCB results are shown on Figure A2.3-2A. Upslope Area No PCBs detected. Within Debris PCBs detected in one of four samples: ▪ Aroclor 1254 detected up to 94 µg/kg in OCTS23 (5 feet bgs) within debris area, above EcoRBSL (79 µg/kg). ▪ Aroclor 1260 detected at 20 µg/kg. ▪ No PCBs detected at depth within native soil beneath debris. Lateral and vertical extent also determined by known extent of surficial and deeper buried debris.	YES Area is recommended for further evaluation during CMS based on SVOC, PCB, dioxins, and metals concentrations, and risk assessment results. For CMS recommendation, area is combined with downgradient Southern Debris Area (Chemical Use Area 6b, see below).	YES Extent of impacts within area delineated by targeted sampling results and known extent of debris. Extent of debris defined by geophysical surveys, exploratory trenches and hand auger borings. Soil thickness ranges up to approximately 7 feet in the area.
		Dioxins Potential dioxins associated with burned material in debris area.	Upslope Area Sampling rationale is the same as for SVOCs in this area; see above for details. Within Debris Sampling rationale is the same as for SVOCs in this area; see above for details. Downslope Lateral Areas Collect soil samples above bedrock in each of two trenches (OCTS37, OCTS39) located downslope and outside extent of surficial debris. Analyze for dioxins.	Dioxins results are shown on Figure A2.3-3. Upslope Area Dioxin TEQ (2.68 ng/kg) exceeds background (0.98 ng/kg) but below ResRBSL (6.9 ng/kg) and EcoRBSL (3.4 ng/kg). Within Debris Dioxin TEQs are above background in both OCTS23 and OCTS24: ▪ Within impacted horizon (5 feet bgs), highest TEQ (51.7 ng/kg) is in OCTS23 and decreases downslope to 16 ng/kg (OCTS24). ▪ TEQs decrease in underlying native soil in both OCTS23 and OCTS24; TEQ below background in OCTS23 and above background in one sample in OCTS24 (4.0 ng/kg). ▪ Similarly, dioxin congeners generally detected above background at the same locations and follow general trends. Downslope Lateral Areas Dioxin TEQs detected up to 0.32 ng/kg, below background. Maximum detected dioxins TEQs are in the center of debris-impacted soil. Concentrations generally decrease downslope and outside the extent of surficial debris, and in deeper samples. See Southern Debris Area (Chemical Use Area 6b) below for discussion of sample results in areas further downslope of both Northern and Southern Debris Areas.	YES Area is recommended for further evaluation during CMS based on SVOC, PCB, dioxins, and metals concentrations, and risk assessment results. For CMS recommendation, area is combined with downgradient Southern Debris Area (Chemical Use Area 6b, see below).	YES Extent of impacts within area delineated by targeted sampling results, known extent of debris and sample results for Chemical Use Area 6b (see below). Extent of debris defined by geophysical surveys, exploratory trenches and hand auger borings. Soil thickness ranges up to approximately 7 feet in the area.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
6a	**Northern Debris Area (continued)**	**Metals** Metallic debris visible in area.	Upslope Area Sampling rationale is the same as for SVOCs in this area; see above for details. Within Debris Sampling rationale is the same as for SVOCs in this area; see above for details. Downslope Lateral Areas Sampling rationale is the same as for dioxins in this area; see above for details.	Metals results are shown on Figure A2.3-4A. Upslope Area Thallium detected at 1.3 mg/kg in OCTS35, above background (0.46 mg/kg) but below RBSLs. Within Debris Nine metals detected above background in 5-foot samples from OCTS23 and OCTS24: aluminum, barium, cadmium, chromium, copper, lead, silver, zinc, and thallium. ▪ Highest concentrations detected in OCTS23 (5 feet bgs) and decrease downslope in OCTS24. ▪ Only silver (10.8 mg/kg) and thallium (up to 2.3 mg/kg) detected above background in native soil samples at 6.5 feet bgs. Downslope Lateral Areas Thallium detected in both samples (up to 2.8 mg/kg), above background.	YES Area is recommended for further evaluation during CMS based on SVOC, PCB, dioxins, and metals concentrations, and risk assessment results. For CMS recommendation, area is combined with downgradient Southern Debris Area (Chemical Use Area 6b, see below).	YES Extent of impacts within area delineated by targeted sampling results and known extent of debris. Extent of debris defined by geophysical surveys, exploratory trenches/ borings, and sample results for Chemical Use Area 6b (see below). Soil thickness ranges up to approximately 7 feet in the area.
		Asbestos Asbestos-containing material visible within surficial debris in area.	Based on visible asbestos observed in surficial debris, screen area for asbestos with targeted sampling in debris areas. Upslope Area Sampling rationale is the same as for SVOCs in this area; see above for details. Within Debris Excavate exploratory trenches through deepest area of buried debris (OCTS23, 24). Collect samples from sidewall within debris-impacted soil horizon (5 feet bgs). Downslope Lateral Areas Sampling rationale is the same as for SVOCs in this area; see above for details.	Asbestos not detected in any sample. No further delineation needed.	Not Applicable	Not Applicable

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
6b	**Southern Debris Area** Disposal area for construction debris. Potentially includes wood, roofing materials, sheet metal and other metallic debris (rebar, wire, nails, etc.), asbestos-containing material (ACM), and empty containers (5-gallon cans, glass). One 55-gallon drum noted in southern portion of area. Debris localized within area, mixed with soil in upper 2.5 feet bgs. Surrounding area with surface debris consists of intermittent metal, wood, and concrete materials, and some ACM. Soil thickness ranges up to approximately 4 feet, and bedrock outcrops occur within the area. Lateral and vertical extent of debris defined by geophysical surveys, exploratory trenches (6) and hand auger borings. Area slopes southeast toward a short section of drainage along bedrock. Surface water drains from there by sheet flow into the metal culvert under E Street and discharges into a natural drainage. Post-Topanga Fire erosion control measures were emplaced to control potential chemical migration from the area.	**VOCs** No documented use of VOCs within area.	Although no documented use of VOCs, target debris area for potential impacts. <u>Soil Vapor</u> Collect soil vapor sample from one location (OCSV19) within debris area. <u>Soil Matrix</u> Collect and analyze shallow soil sample from one location (OCBS14) at southern end of debris, downslope from buried drum.	VOC results are shown on Figure A2.3-1. No VOCs detected in targeted soil vapor and soil matrix samples; no further delineation required.	YES Debris, downslope areas and drainage recommended for further evaluation in CMS based on metals and dioxins concentrations, and risk assessment results. For CMS recommendation, areas are combined with upgradient Northern Debris Area (Chemical Use Area 6a, see above).	Risks associated with dioxins and metals drive CMS recommendation.
		SVOCs Potential SVOCs associated with debris and byproducts of burned material.	Although no documented use of SVOCs, target debris area for potential impacts. <u>Within Debris</u> Collect and analyze shallow soil sample from one exploratory trench (OCTS38). <u>Downslope Soil Areas</u> Collect and analyze shallow soil samples from three downslope locations (OCBS14, OCBS15, and OCBS26).	SVOC results are shown on Figure A2.3-2A. <u>Within Debris</u> No SVOCs detected. <u>Downslope Soil Areas</u> Several SVOCs detected in one sample (OCBS26): • SVOCs detected up to 9 µg/kg pyrene and fluoranthene. • Benzo(a)pyrene detected up to 6 µg/kg. • No results exceed RBSLs.	YES Debris, downslope areas and drainage recommended for further evaluation in CMS based on dioxins and metals, and risk assessment results. For CMS recommendation, areas are combined with upgradient Northern Debris Area (Chemical Use Area 6a, see above).	YES Risks associated with dioxins and metals drive CMS recommendation.
		TPH No documented use of petroleum hydrocarbons within area.	Although no documented use of petroleum hydrocarbons, screen area for potential impacts associated with debris. <u>Downslope Soil Areas</u> Collect shallow soil samples from three downslope locations (OCBS14, OCBS15, and OCBS26). Collect one duplicate sample from location OCBS15.	TPH results are shown on Figure A2.3-2A. <u>Downslope Soil Areas</u> • Gasoline- and kerosene-range hydrocarbons not detected in any sample. • Diesel- range hydrocarbons detected in OCBS26 at 1.7 mg/kg. • Lubricant oil-range hydrocarbons detected in OCBS26 at 120 mg/kg. • TPH not detected in OCBS14 or OCBS15.	YES Debris, downslope areas and drainage recommended for further evaluation in CMS based on dioxins and metals, and risk assessment results. For CMS recommendation, areas are combined with upgradient Northern Debris Area (Chemical Use Area 6a, see above).	YES Risks associated with dioxins and metals drive CMS recommendation.

Table A2.3-2A (Page 22 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
6b	**Southern Debris Area (continued)**	**PCBs** Potential PCBs associated with debris.	Although no documented use of PCBs, screen area for potential impacts associated with debris. <u>Downslope Soil Areas</u> Collect shallow soil sample from one downslope location (OCBS26).	PCB results are shown on Figure A2.3-2A. <u>Downslope Soil Areas</u> No PCBs detected; no further evaluation needed.	YES Debris, downslope areas and drainage recommended for further evaluation in CMS based on dioxins and metals, and risk assessment results.	Risks associated with dioxins and metals drive CMS recommendation.
		Dioxins Potential dioxins associated with burned material in debris area.	Conduct exploratory trenching to define extent of debris. Collect soil samples at depth targeting impacted soil. <u>Within Debris</u> Collect shallow (0.5 feet bgs) soil sample at OCBS32 and from one exploratory trench (OCTS38). <u>Downslope Soil Areas</u> Based on DTSC request, collect one shallow (0.5 feet bgs) soil sample from one downslope location to the east (OCBS26). Based on sample results, collect and analyze shallow (0.5 feet bgs) soil samples from two additional downslope locations to the south (OCBS35 and OCBS36). <u>Downslope Drainage</u> Based on soil sample results in debris (including upslope Northern Debris Area 6a) and downslope soil areas, analyze sediment in downslope drainage for dioxins. Collect sediment samples at two locations spaced 50 feet apart along natural drainage to the south. Analyze sample collected furthest upstream (OCBS37), and, pending detects, analyze downstream sample (OCBS38).	Dioxins results are shown on Figure A2.3-3. <u>Within Debris</u> • Detected dioxin TEQs up to 3.8 ng/kg in OCSB32. • Dioxin congeners similarly highest in OCBS32. • In OCBS32, congeners exceed background but are below RBSLs; TEQ exceeds background (0.98 ng/kg) and EcoRBSL (3.4 ng/kg), but below ResRBSL (6.9 ng/kg). <u>Downslope Soil Areas</u> Dioxin TEQs decrease downslope from within the debris area. TEQs exceed background, but are below RBSLs in all downslope samples: • TEQ ranges from 2.0 to 2.9 ng/kg. • Similarly, dioxin congeners are generally above background and follow comparable trends. • Bedrock depth (approximately 3.5 feet bgs) assessed by borings within area delineates vertical extent; bedrock outcrop limits lateral extent to the east. <u>Downslope Drainage</u> TEQ in OCBS37 (8.3 ng/kg) exceeds background but decreases to roughly background levels in downstream sample OCBS38 (0.99 ng/kg). Dioxin congeners decrease in the same manner. Dioxin TEQs highest in downslope drainage sediment	YES Debris, downslope areas and drainage recommended for further evaluation in CMS based on dioxins and metals, and risk assessment results. For the CMS, areas are combined with upgradient Northern Debris Area (Chemical Use Area 6a, see above).	<u>Debris and Downslope Areas</u> YES Extent of impacts defined by targeted sampling results, bedrock depth and topography. <u>Drainage</u> YES Extent of impacted drainage area defined by targeted sampling results and the known extent of drainage.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
6b	**Southern Debris Area (continued)**	**Metals** Metallic debris visible in area.	<u>Within Debris</u> Collect shallow (0.5 feet bgs) soil sample from one exploratory trench (OCTS38). Based on elevated laboratory detection limits for thallium in upslope and downslope samples, collect and analyze 2 additional samples in 2006 (OCBS32, OCBS33). <u>Downslope Soil Areas</u> Collect one shallow (0.5-1 feet bgs) soil sample from each of four downslope locations (OCBS14, OCBS15, OCBS26, and OCBS29) adjacent to debris area; analyze for metals. Based on sample results, collect and analyze shallow (0.5 feet bgs) soil samples from two additional downslope locations (OCBS35 and OCBS36). To confirm elevated metals results, recollect and analyze soil sample at OCBS29. <u>Downslope Drainage</u> Based on soil sample results in debris and downslope soil areas, analyze sediment in downslope drainage for metals. Collect sediment samples at two locations spaced 50 feet apart along natural drainage to the south. Analyze sample collected furthest upstream (OCBS37) for metals. Pending detects, also analyze downstream sample (OCBS38).	Metals results are shown on Figure A2.3-4A. <u>Within Debris</u> • Thallium detected up to 1.1 mg/kg in OCTS38, above background (0.46 mg/kg). • Thallium detected below background in OCBS32 and OCBS33. <u>Downslope Soil Areas</u> Six metals detected above background and EcoRBSLs in five samples (OCBS14, OCBS26, OCBS29, OCBS35, and OCBS36): silver in four samples; lead, cadmium, nickel, vanadium, and zinc in one sample each. • Silver detected up to 4 mg/kg (background = 0.79 mg/kg). • Lead detected at 94.2 mg/kg (background = 34 mg/kg). • Nickel detected at 39 mg/kg (background = 29 mg/kg). <u>Downslope Drainage</u> • Lead, silver and zinc detected above background. • Silver is ubiquitous within Northern and Southern Debris Areas and into the drainage; Concentration decreases from 4 mg/kg just downslope of debris to 1.4 mg/kg in drainage. • All metals below background down-drainage in OCBS38 Extent of impacts from metals delineated by targeted sampling results, depth to bedrock assessed by trenching/ hand auguring, bedrock outcrops and topography.	YES Debris, downslope areas and drainage recommended for further evaluation in CMS based on dioxins and metals, and risk assessment results. For the CMS, areas are combined with upgradient Northern Debris Area (Chemical Use Area 6a, see above).	<u>Debris and Downslope Areas</u> YES Extent of impacts defined by targeted sampling results, bedrock depth and topography. <u>Drainage</u> YES Extent of impacted drainage area defined by targeted sampling results and the known extent of drainage.
		Asbestos Visible asbestos-containing material (ACM) in surficial debris.	<u>Downslope Soil Areas</u> Collect shallow (0.5 feet bgs) soil sample from one downslope location (OCBS26) adjacent to debris area.	Asbestos not detected in any sample; no further delineation needed.	Not applicable	Not applicable

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
6c	**North Slope Debris Area "A"** Debris discovered after September 2005 Topanga Fire burned surrounding vegetation. Area is located along a steep natural drainage immediately downslope from the former Northern Storage Area (Chemical Use Area 1c, see above for characterization). Scattered metallic debris consists of crushed empty 10- to 55-gallon storage drums and 5-gallon drums containing sand grit. Graphite cylinders also noted during site walks. Isolated debris (small drum) also found along hillside west of drainage area after Topanga Fire. Area slopes steeply to the north; surface water drains to the north in narrow drainage and turns west along large outcrops (see Figure A2.2-1B). Very thin soil/ sediment covers bedrock in narrow drainage (up to 6 inches). Soil thickness outside drainage ranges up to 1 foot.	**SVOCs** No documented use of SVOCs.	Although no documented use of SVOCs, screen area for potential impacts associated with debris. <u>Debris Area</u> Collect shallow(0.5 feet bgs) soil matrix samples at seven locations (OCBS81 through OCBS87) within visible extent of surficial debris near drainage. Analyze samples from five upslope locations for SVOCs; analyze two downslope samples (OCBS86 and OCBS87) pending results. <u>Isolated Debris West of Area</u> Collect additional sample downslope of isolated debris (small drum) along hillside west of area (OCBS88).	SVOC results are shown on Figure A2.3-2C. <u>Debris Area</u> SVOCs detected in three of five samples (OCBS81, OCBS82, and OCBS85): • SVOCs detected up to 28 µg/kg chrysene in OCBS81. • Benzo(a)pyrene detected up to 3.6 µg/kg, below ResRBSL (6 µg/kg) and EcoRBSL (4700 µg/kg) in OCBS81. <u>Isolated Debris West of Area</u> Benzo(a)anthracene detected at 4.4 µg/kg; no other SVOCs detected.	YES Area recommended for further CMS evaluation based on PCB concentrations and risk assessment results as described below.	YES SVOCs low and associated risks do not drive CMS recommendation.
		TPH No documented use of petroleum hydrocarbons.	Although no documented use of petroleum hydrocarbons, screen area for potential impacts associated with debris. <u>Debris Area</u> Sampling rationale is the same as for SVOCs in this area; see above for details. <u>Isolated Debris West of Area</u> Sampling rationale is the same as for SVOCs in this area; see above for details.	TPH results are shown on Figure A2.3-2C. <u>Debris Area</u> Highest TPH concentrations detected in OCBS81: • Gasoline-range up to 3 mg/kg; diesel-range up to 6 mg/kg; and lubricant oil-range up to 22 mg/kg. • Kerosene-range hydrocarbons not detected in any sample. <u>Isolated Debris West of Area</u> • Gasoline-, kerosene- and diesel-range hydrocarbons not detected. • Lubricant oil-range hydrocarbons detected at 7.7 mg/kg.	YES Area recommended for further CMS evaluation based on PCB concentrations and risk assessment results as described below.	YES TPH limited and associated risks do not drive CMS recommendation.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
6c	**North Slope Debris Area "A" (continued)**	**PCBs** Potential PCBs associated with debris.	Although no documented use of PCBs, screen area for potential impacts associated with debris. Debris Area Sampling rationale is the same as for SVOCs in this area; see above for details. Isolated Debris West of Area Sampling rationale is the same as for SVOCs in this area; see above for details.	PCB results are shown on Figure A2.3-2C. Upslope (as described in North Slope Storage Area, Chemical Use Area 1c) ▪ PCBs detected up to 24,000,000 µg/kg Aroclor 1248. Debris Area PCBs detected in three samples (OCBS78, OCBS80, and OCBS81) in the upslope portion of the area. • Aroclor 1248 detected at 110 µg/kg and Aroclor 1254 at 250 µg/kg in furthest upslope sample collected within area (OCBS81). • Both concentrations exceed respective EcoRBSLs (12 µg/kg and 79 µg/kg, respectively). No PCBs detected in any of the four samples collected further downslope. Isolated Debris West of Area No PCBs detected. Highest concentrations within area were located in the upslope area adjacent to North Slope Storage Area (Chemical Use Area 1c) and decrease downslope to nondetect within this debris area. Extent of impacts delineated vertically and laterally by shallow bedrock and outcrops along sides of drainage.	YES Area recommended for further CMS evaluation based on PCB concentrations and risk assessment results.	YES Extent of impacted area defined by targeted sampling results, limited soil extent, and bedrock outcrops.
		Metals Metallic debris visible in area.	Screen area for potential impacts associated with debris. Debris Area Sampling rationale is the same as for SVOCs in this area; see above for details. Isolated Debris West of Area Sampling rationale is the same as for SVOCs in this area; see above for details.	Metals results are shown on Figure A2.3-4B. Debris Area No metals detected above background in any of the five samples analyzed. No further delineation needed. Isolated Debris West of Area No metals detected above background. No further delineation needed.	YES Area recommended for further CMS evaluation based on PCB results and risk assessment results as described above.	Risk associated with PCBs drives CMS recommendation.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
6d	**North Slope Debris Area "B"** Area contains metallic and concrete construction debris, including empty drums. Area is located on steep slope north of former Fuel AST 731. The debris is contained within a "flatter" area surrounded by rock outcrops and slopes steeply north at the edge of the area. Surface water drains north to a confluence with the drainage leading from SRE Pond (Area IV AOC, see Appendix A3). Soil thickness ranges up to 1 foot within debris area and up to a few inches within drainage. Bedrock is exposed along most of the drainage.	**VOCs** Potential VOCs associated with debris.	Although no documented use of solvents, screen area for potential VOCs associated with debris. <u>Debris Area</u> Collect primary and duplicate samples from one location within extent of debris (OCBS97, 1.5 feet bgs).	VOC results are shown on Figure A2.3-1. 4-isopropyltoluene detected up to 1.9 µg/kg. No other VOCs detected; no further delineation needed.	YES Area recommended for CMS based on PCB results and risk assessment results as described below.	YES VOCs low and associated risks do not drive CMS recommendation.
6d	**North Slope Debris Area "B" (continued)**	**SVOCs** Potential SVOCs associated with debris.	Although no documented use of SVOCs, screen area for potential impacts associated with debris. <u>Debris Area</u> Collect one shallow (0.5 feet bgs) soil matrix sample from five locations (OCBS92, OCBS93, OCBS94, OCBS97, and OCBS98). Collect duplicate samples at OCBS97 and OCBS98. <u>Downslope Drainage</u> Collect shallow (0.5 feet bgs) sediment samples from three locations (OCBS89, OCBS90, and OCBS91).	SVOC results are shown on Figure A2.3-2C. <u>Debris Area and Downslope Drainage</u> • PAHs detected at four locations; up to 53 µg/kg chrysene at OCBS92. • Benzo(a)pyrene detected in two locations up to 5.9 µg/kg. • All PAH concentrations detected in debris area decrease in downslope samples; maximum detected concentration in furthest downslope sample was chrysene at 7.2 µg/kg. • Benzo(a)pyrene not detected in any downslope drainage samples. • Debris in area has been mapped visually and the highest concentrations were detected generally within the potential source area.	YES Area recommended for CMS based on PCB results and risk assessment results as described below.	YES SVOCs low and associated risks do not drive CMS recommendation.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
6d	**North Slope Debris Area "B" (continued)**	**TPH** Potential petroleum hydrocarbons in debris.	Although no documented use of petroleum hydrocarbons, screen area for potential impacts associated with debris. Debris Area Sampling rationale is the same as for SVOCs in this area; see above for details. Downslope Drainage Sampling rationale is the same as for SVOCs in this area; see above for details.	TPH results are shown on Figure A2.3-2C. Debris Area Highest TPH detected in OCBS92: • Gasoline at 7.3 mg/kg, kerosene up to 3.3 mg/kg, diesel up to 11 mg/kg, and lubricant oil up to 64 mg/kg. Downslope Drainage • Gasoline and kerosene ranges not detected; • Diesel-range detected at 8.5 mg/kg in OCBS90; • Lubricant oil-range detected at 28 mg/kg in OCBS89; concentration decreases to 21 mg/kg in furthest downslope sample analyzed (OCBS90).	YES Area recommended for CMS based on PCB results and risk assessment results as described below.	YES TPH low and associated risks do not drive CMS recommendation.
6d	**North Slope Debris Area "B" (continued)**	**PCBs** Potential PCBs in debris.	Although no documented use of PCBs, screen area for potential impacts associated with debris. Debris Area Sampling rationale is the same as for SVOCs in this area; see above for details. Downslope Drainage Sampling rationale is the same as for SVOCs in this area; see above for details.	PCB results are shown on Figure A2.3-2C. Debris Area and Downslope Drainage Although no PCBs were detected, detection limits elevated at many locations. In samples from OCBS98, PCB detection limits were 5,900 µg/kg and 8,900 µg/kg. Detection limits at other locations ranged from 81 µg/kg to 190 µg/kg. Soil cover is approximately 1 foot thick within the debris area and up to a few inches in the drainage, as observed during sampling activities. Potential PCB concentrations are limited laterally to the east and west by rock outcrops. Debris in area has been mapped visually and highest concentrations (of other chemical groups) are generally present within this potential source area.	YES No PCBs were detected; however, area is recommended for further evaluation in CMS based on elevated detection limits and risk assessment results. Uncertainty associated with detection limits will be addressed in CMS.	YES Extent of potentially impacted area is defined by rock outcrops, visible extent of debris area, drainage dimensions and thin soil.
		Metals Debris contained metal wastes.	Debris Area Sampling rationale is the same as for SVOCs in this area; see above for details. Downslope Drainage Sampling rationale is the same as for SVOCs in this area; see above for details.	Metals results are shown on Figure A2.3-4B. Debris Area and Downslope Drainage Lead and mercury detected above background in two locations within debris area (OCBS94 and OCBS97): • Lead detected up to 57 mg/kg, above background of 34 mg/kg; • Mercury detected up to 0.29 mg/kg, above background of 0.09 mg/kg but below RBSLs; • Metals concentrations generally decrease downslope. • Boron detect of 12 mg/kg in downslope drainage sample OCBS90 slightly exceeds background of 9.7 mg/kg, but boron was not detected in any other sample within or downslope of debris area. Metals concentrations are highest in the southwestern corner of the debris area and generally decrease downslope and into the drainage to below background.	YES Area recommended for CMS based on PCBs and risk assessment results as described above.	YES Metals low and associated risks do not drive CMS recommendation.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
7a	**Transformer Area in Southeast (SE) OCY** Three former aboveground, platform-mounted transformers on power pole F525. Transformers removed from pole in 2002. Area slopes to the southeast; surface water within area drains southeast in sheet flow to a culvert that discharges to a natural drainage south of OCY. This drainage ultimately leads to Silvernale Reservoir. Soil thickness within area ranges up to approx. 4 feet.	**PCBs** PCBs associated with transformer oils.	Target soil beneath former transformers. <u>Adjacent to Transformer Pole</u> Collect shallow and deep (0.5 and 3 feet bgs) soil matrix samples at three locations around pole (collectively location OCBS34). Create composite from each set of samples and analyze shallow composite. If PCBs detected, analyze individual samples and deep composite, then collect and analyze shallow stepout samples from 3 locations (OCBS70, OCBS71, OCBS72). <u>Downslope Drainage</u> Based on results adjacent to transformer, collect and analyze sediment sample within natural drainage downslope and to the south (OCBS37).	PCB results are shown on Figure A2.3-2A. <u>Adjacent to Transformer Pole</u> • PCBs detected up to 72 µg/kg Aroclor 1254 in shallow composite and 120 µg/kg Aroclor 1254 in individual samples. • PCBs not detected in deep composite. • PCBs detected in shallow stepouts up to 240 µg/kg Aroclor 1254. <u>Downslope Drainage</u> No PCBs detected in downslope drainage. Highest concentrations detected around transformer in targeted sample locations; impacts decrease to nondetect at depth and downslope.	YES Area recommended for further evaluation in CMS based on PCB concentrations and risk assessment results.	YES Extent is defined by targeted and stepout sampling results at known source.
7b	**Transformer Area in Southwest (SW) OCY** Three former aboveground, platform-mounted transformers on power pole F510. Transformers and platform removed in 2002. Area slopes to the east; surface water within area drains east to the Low Spot (Chemical Use Area 8). Soil thickness within area ranges up to 3 feet.	**PCBs** PCBs associated with transformer oils.	Target soil beneath former transformers. Collect shallow and deep (0.5 and 3 feet bgs) soil matrix samples at three locations around pole (collectively location OCBS56). Create composite from each set of samples and analyze shallow composite. If PCBs detected, analyze individual samples and deep composite, then collect and analyze stepout samples.	PCB results are shown on Figure A2.3-2A. No PCBs detected in the shallow composite; individual and stepout samples did not require analysis. No further delineation needed.	YES No PCBs detected in targeted samples.	Area is not recommended for CMS.

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Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
7c	**Transformer Area 737** Identified as "Area 737" on facility maps; removed prior to 1977. Single transformer formerly located on concrete pad near later location of Building 320. Transformer not identified in 1986 SSFL PCB inventory. Area slopes gently to the southeast; surface water within area drains southeast in sheet flow to the Low Spot, drains down through NCY and ultimately ends up in the Silvernale Reservoir. Area was covered with approximately 1 foot of soil fill from leveled earthen berm around ASTs 731 and 732. Soil thickness within area ranges up to approx. 8 feet.	**PCBs** PCBs associated with transformer oils.	Target soil around perimeter of former transformer pad. Collect shallow and deep (4.5 and 7 feet bgs) soil matrix samples at three locations around former pad (collectively location OCBS40). Create composite from each set of samples and analyze shallow composite. If PCBs detected, analyze individual samples and deep composite, then collect and analyze shallow stepout samples (OCBS73, OCBS74, and OCBS75).	PCB results are shown on Figure A2.3-2B. PCBs were detected as follows: • Aroclor 1248 up to 260 µg/kg in shallow composite and up to 310 µg/kg in the individual shallow samples. • PCBs detected up to 1,900 µg/kg Aroclor 1248 in stepouts. • Concentrations exceed both EcoRBSL (12 µg/kg) and ResRBSL (350 µg/kg). • No PCBs detected in the deep composite. Highest concentrations were detected around transformer in targeted sample locations; impacts decrease to nondetect at depth.	YES Area is recommended for further evaluation based on PCB results and risk assessment results.	YES Extent of impacted area is defined to CMS criteria (order of magnitude) based on low mobility compounds.
7d	**Transformer Area in South OCY** Within Former Rocketdyne Conservation Yard Three platform-mounted transformers on power pole 163. Transformers do not appear on historical facility power diagrams, are not listed on 1986 PCB inventory, and were not observed during June 2000 site walk/ visual inspection.	**PCBs** PCBs associated with transformer oils.	Not sampled since installed post-1986. Transformers no longer contained PCB dielectric fluids after about 1980.	No samples collected; no investigation needed.	Not applicable.	Not applicable.

Table A2.3-2A (Page 30 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
7e	**Transformer Area near SRE** Former concrete pad-mounted transformers located southwest of OCY near entrance road to SRE RFI Site. Removed in 1999. Area slopes gently northwest; surface water drains from the area toward the Low Spot in chemical Use Area 8. Soil thickness within area ranges up to 2 feet.	**PCBs** PCBs associated with transformer oils.	Target soil around perimeter of former transformer pad. **<u>2003 (using former sampling method)</u>** Around the perimeter of the pad, collect shallow soil matrix samples (0.5 feet bgs) spaced approximately 8 feet apart along two adjacent sides. Create a field composite from the six samples and submit as one sample (OCBS30). Repeat process along other two sides and submit as one sample (OCBS31). Deeper samples not collected due to shallow bedrock depth. **<u>2004 (using new sampling method)</u>** Recollect shallow (0.5 feet bgs) soil matrix samples along 2 adjacent sides of former pad (XFBS22, collocated with OCBS30). Analyze laboratory composite from individual samples (sample XFBS22S70). Repeat for other 2 sides of pad (location XFBS23, collocated with OCBS31), and for deeper samples (feet bgs) at each location. If Aroclors detected in shallow composite, 1) two individual shallow samples analyzed, 2) deep composites (XFBS22S80, XFBS23S80) analyzed, and 3) stepout shallow samples collected further out from each location and analyzed. If Aroclors detected in deep composite, individual samples making up the deep composite also analyzed.	PCB results are shown on Figure A2.3-2A. No PCBs detected in shallow composite samples; no further sampling required.	YES No PCBs detected in targeted sample locations.	Area is not recommended for CMS.

Table A2.3-2A (Page 31 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
8	**Topographic Low Spot and Downslope Discharge Area** Low spot collects surface water runoff from all OCY Chemical Use Areas south of the surface water divide, with the exception of those in the southeast portion of the site. Extent of area is controlled by topography and adjacent bedrock outcrops on the east and west sides. Surface water from area discharges south via metal culvert under E Street and enters an asphalt swale. This swale runs through the New Conservation Yard RFI Site (SWMU 7.8) where it becomes an unlined drainage. See Appendix A1, Table A1.3-2A for further discussion of this drainage. See Group 6 Report text for discussion of potential contaminant transport and fate between RFI site exposure areas. Sediment/ soil thickness up to 6 feet within low spot; swale typically contains only small, isolated pockets of accumulated sediment.	**SVOCs** None documented; however, SVOCs detected in Chemical Use Areas that may drain to this area.	Screen sediment/ soil for SVOCs within topographic low spot by collecting samples from representative locations. Target sediment accumulated within downslope swale and screen underlying soil. <u>Within Low Spot (1997)</u> Collect a shallow soil sample at 0.5 feet bgs from one location within middle of area (OCBS10). <u>Within Low Spot (2006)</u> Based on elevated detection limits in 1997 sample results, recollect and analyze shallow sample to achieve lower detection limits. <u>Downslope Discharge Area</u> Collect sediment sample from one location within asphalt swale (OCSS04). Based on results, collect a soil sample from one adjacent location beneath the asphalt swale (OCBS65, 2 feet bgs).	SVOC results are shown on Figure A2.3-2A. <u>Within Low Spot</u> • No SVOCs detected during 1997 sampling; however, PAH detection limits were elevated, up to 1,800 µg/kg. • During 2006 sampling, SVOCs detected up to 640 µg/kg pyrene. Benzo(a)pyrene detected up to 280 µg/kg, above ResRBSL of 6 µg/kg. Extent of impacts limited by lateral extent of the receiving area and depth to bedrock assessed by soil borings. No further delineation needed within area. <u>Downslope Discharge Area</u> SVOCs detected in OCSS04: • SVOCs detected within swale up to 780 µg/kg 2-methylnaphthalene. • Benzo(a)pyrene detected at 220 µg/kg, above ResRBSL. • No SVOCs were detected in the soil sample beneath the asphalt swale. • Swale is a partially-contained unit- sample results do not necessarily represent underlying soil conditions.	YES Low spot and downslope discharge area are recommended for further evaluation in CMS based on SVOC, PCB, dioxins and metals concentrations, and risk assessment results.	YES Extent of impacts within area defined by topography (Low Spot extent), bedrock outcrops, and sample results for other compounds (see below). <u>Downslope Discharge Area</u> Extent of impacts defined by extent of sediment contained within the swale.

Table A2.3-2A (Page 32 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
8	**Topographic Low Spot and Downslope Discharge Area (continued)**	**TPH** None documented; however, petroleum hydrocarbons detected in Chemical Use Areas that may drain to this area.	Screen sediment/ soil for TPH within topographic low spot by collecting samples from representative locations. Target sediment accumulated within downslope swale and screen underlying soil. <u>Within Low Spot</u> In 1997-1998, collect shallow (0.5 feet bgs) and deep (4 feet bgs) soil samples from one location within middle of area (OCBS10). Collect a shallow soil sample from one location at furthest downslope point within drainage area (OCBS16) at 0.5 feet bgs. In 2006, based on detects in previous samples, recollect shallow sample and a duplicate at OCBS10. <u>Downslope Discharge Area</u> Collect sediment sample from one location above asphalt swale (OCSS04). Based on detects in sediment sample, collect soil sample from one adjacent location (OCBS65) beneath base of swale (2 feet bgs).	TPH results are shown on Figure A2.3-2A. <u>Within Low Spot</u> During 1997-1998 sampling: • Diesel-range hydrocarbons detected at 210 mg/kg in OCBS10 (0.5 feet); deeper and downslope samples nondetect. • Lubricant oil-range hydrocarbons detected at 920 mg/kg in shallow sample; deeper and downstream samples nondetect. • No gasoline or kerosene ranges detected. During 2006 sampling, concentrations in recollected shallow sample were significantly lower: • Diesel-range hydrocarbons detected up to 10 mg/kg. • Lubricant oil-range hydrocarbons detected up to 71 mg/kg. Extent of impacts limited by lateral extent of the receiving area and depth to bedrock assessed by soil borings. No further delineation needed within area. <u>Downslope Discharge Area</u> TPH were detected in OCSS04, collected from a contained unit (results do not represent underlying soil conditions): • Diesel-range hydrocarbons detected at 4.2 mg/kg. • Lubricant oil-range hydrocarbons detected at 69 mg/kg. • No gasoline or kerosene ranges detected. • No TPH were detected in OCBS65. TPH concentrations in swale sediment are low; extent of impacts defined by limited extent of sediment within swale and nondetects in underlying native soil.	YES Low spot and downslope discharge area are recommended for further evaluation in CMS based on SVOC, PCB, dioxins and metals concentrations, and risk assessment results.	YES <u>Within Low Spot</u> TPH low and associated risks do not drive CMS recommendation. <u>Downslope Discharge Area</u> Extent of impacts defined by extent of sediment contained within the swale.

Table A2.3-2A (Page 33 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
8	**Topographic Low Spot and Downslope Discharge Area (continued)**	**PCBs** None documented; however, PCBs detected in Chemical Use Areas that may drain to this area.	Screen sediment/ soil for PCBs within topographic low spot by collecting samples from representative locations. Target sediment accumulated within downslope swale and screen underlying soil. <u>Within Low Spot</u> Based on PCBs detects in upslope areas: • Collect shallow (0.5 feet bgs) soil sample and duplicate from one location within middle of area (OCBS10). Based on shallow sample results: • Collect shallow (0.5 feet bgs) and deep (3 feet bgs) lateral stepout samples on either side of OCBS10 (OCBS66 and OCBS68); • Collect shallow stepout samples from two additional locations further out (OCBS67, 69). <u>Downslope Discharge Area</u> Sampling rationale is the same as for TPH in this area (see above).	PCB results are shown on Figure A2.3-2A. <u>Within Low Spot</u> • PCBs detected at OCBS10 up to 480 µg/kg Aroclor 1254. • PCBs detected in all shallow stepouts, up to 460 µg/kg Aroclor 1254. • No PCBs detected in deeper samples. • PCB detects exceed RBSLs. Extent of impacts limited by lateral extent of the receiving area and depth to bedrock assessed by soil borings. No further delineation needed within area. <u>Downslope Discharge Area</u> PCBs were detected in OCSS04, collected from a contained unit (results do not represent underlying soil conditions): • Aroclor 1254 detected at 110 µg/kg. • PCBs not detected in underlying soil sample OCBS65, indicating impacts limited to sediment above asphalt surface. PCB concentrations are highest within the low spot and decrease in downslope sediment contained within the swale (nondetect in OCBS65). See NCY RFI Report (Appendix A1) for summary of PCBs detects in downslope drainage.	YES Low spot and downslope discharge area are recommended for further evaluation in CMS based on SVOC, PCB, dioxins and metals concentrations, and risk assessment results.	YES <u>Within Low Spot</u> Extent of impacted area within the low spot defined by topography (Low Spot extent) and sample results. <u>Downslope Discharge Area</u> Extent of impacts defined by extent of sediment contained within the swale.
8	**Topographic Low Spot and Downslope Discharge Area (continued)**	**Dioxins** None documented; however, dioxins detected in Chemical Use Areas that may drain to this area.	Screen sediment/ soil for dioxins within topographic low spot by collecting samples from representative locations. <u>Within Low Spot</u> Based on dioxins detects in upslope areas (at SRE Pond and within OCY), collect shallow (0.5 feet bgs) soil sample from one location within middle of area (OCBS10). <u>Downslope Discharge Area</u> Sampling conducted in unlined drainage within adjacent NCY RFI site. See NCY RFI Report (Appendix A1).	PCB results are shown on Figure A2.3-3. <u>Within Low Spot</u> Dioxin TEQ (36 ng/kg) exceeds background (0.98 ng/kg), ResRBSL (3.4 ng/kg) and EcoSL (6.9 ng/kg). Similarly all dioxin congeners were detected above background. Extent of impacts limited by lateral extent of the receiving area and depth to bedrock assessed by soil borings. No further delineation needed within area. <u>Downslope Discharge Area</u> See NCY RFI Report (Appendix A1) for summary of dioxins sampling in downslope drainage.	YES Low spot and downslope discharge area are recommended for further evaluation in CMS based on SVOC, PCB, dioxins and metals concentrations, and risk assessment results.	YES <u>Within Low Spot</u> Extent of impacted area within the low spot defined by topography (Low Spot extent) and sample results. <u>Downslope Discharge Area</u> Extent of impacts defined by extent of sediment contained within the swale.

Table A2.3-2A (Page 34 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

Map Key	Chemical Use Area Name Status, How Used, and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored	Sampling Rationale and Scope [1] [See Figure A2.2-1A and A2.2-1B for sampling locations]	Sampling Results Chemical concentrations detected above background and/or risk screening levels (RBSLs)? [2]	Potential concentration gradients sufficiently evaluated for risk assessment?[3,4]	Is delineation sufficient to estimate soil volume in CMS? [4,5] [see Figure A2.5-1 for CMS areas]
		Metals None documented; however, metals detected in Chemical Use Areas that may drain to this area.	Screen sediment/ soil for metals within topographic low spot by collecting samples from representative locations. Target sediment accumulated within downslope swale and screen underlying soil. <u>Within Low Spot</u> 1997-1998: Collect shallow (0.5 feet bgs) and deep (4 feet bgs) soil samples from one location within middle of area (OCBS10). 2006: based on elevated detection limits in 1997 results, recollect shallow sample at OCBS10 (DTSC request). Also analyze aluminum since not previously analyzed. Based on these sample results, collect shallow (0.5 feet bgs) and deep (3 feet bgs) lateral stepout samples on either side of OCBS10 (OCBS66 and OCBS68), and shallow stepout samples from two locations further out (OCBS67 and OCBS69). <u>Downslope Discharge Area</u> Sampling rationale is the same as for TPH in this area (see above).	Metals results are shown on Figure A2.3-4A. <u>Within Low Spot 1997-1998</u> Two metals detected above background in shallow sample: • Cadmium detected at 2 mg/kg , above background of 1 mg/kg. • Silver detected at 3 mg/kg, above background of 0.79 mg/kg. • No metals detected above background in deeper sample. • Detection limits elevated for antimony, molybdenum, mercury, selenium and thallium (all nondetect). <u>Within Low Spot (2006)</u> • OCBS10 results were similar to 1997 result, with mercury and zinc also detected slightly above background. • In shallow stepout samples, cadmium, mercury, silver, and zinc primarily detected above background. • In deep stepout samples, aluminum, barium and thallium detected slightly above background. • Mercury detect above background at OCBS66 (23 mg/kg) exceeds EcoRBSL of 0.89 mg/kg. Extent of impacts limited by lateral extent of the receiving area and depth to bedrock assessed by soil borings. No further delineation needed within area. <u>Downslope Discharge Area</u> Lead, mercury, and zinc detected above background in contained sediment sample OCSS04, but at lower concentrations than upslope within the low spot. Further downstream, no metals were detected above background in soil sample OCBS65, which indicates that metals are limited to sediment above asphalt surface. See Table 3-2A in NCY RFI Report within this Appendix for further summary of metals detects in downslope drainage.	YES Low spot and downslope discharge area are recommended for further evaluation in CMS based on SVOC, PCB, dioxins and metals concentrations, and risk assessment results.	YES <u>Within Low Spot</u> Extent of impacted area within the low spot defined by topography (Low Spot extent) and sample results. <u>Downslope Discharge Area</u> Extent of impacts defined by extent of sediment contained within the swale.

Sources: Rockwell 1990, ICF 1993, SAIC 1994 , Ogden 1996, USEPA 1997, Boeing 1999b, Trippeda 2002, Lenox 2003

Notes:

All ASTs and associated pipelines, buildings, etc. were removed in 1999-2000; earthen berms were leveled and spread across the site in 2002.
See NCY and SRE RFI Reports (Appendices A1 and A3, respectively) for detailed description of chemical use areas at those sites.
Sample OCTS04 was collected from a trench targeting the former fuel pipeline from OCY to an AST in Area IV; investigation of this unit, including this sample, will be discussed in the Group 5 RFI Report (see text).

NDMA was not analyzed as a part of all SVOC analyses in all samples. Some samples did not include NDMA analysis; however NDMA was analyzed in representative locations throughout the site.

All pH results in soil samples (6.9 – 8.1) were within normal range.

[1] Where historical records and physical characteristics do not suggest the presence of a chemical group, that chemical group was not analyzed in samples from the respective chemical use area and is not reflected in this table.

[2] The use of the SRAM-based screening levels for comparison purpose does not serve as a risk assessment. These screening levels are not used to determine the significance of detected chemical concentrations or if a chemical use area will be recommended for further consideration in the CMS, but only to provide the reader another tool to evaluate the characterization data. The SRAM-based screening levels represent conservative concentrations that pose a low level of risk.

Table A2.3-2A (Page 35 of 35)

Description of Chemical Use Areas at the OCY RFI Site and Soil Sampling Results Summary

[3] Concentration gradients must be defined such that risk assessment reflects maximum analyte concentration OR concentration sufficiently high to result in risk requiring further consideration during CMS. Such data may be unnecessary if other constituent concentrations are sufficient to require a CMS recommendation, provided the CMS areas for both constituents are roughly similar.

[4] Chemicals listed as basis for CMS recommendation include both chemical drivers (above 1 x 10^{-6} risk and HI of 1.0) and significant chemical contributors to overall risk.

[5] Potential volumes for CMS evaluation must be known within a factor of ten for comparison of remedy selection.

ACRONYMS

bgs = below ground surface
CMS = Corrective Measures Study
EcoRBSL = Ecological Risk Based Screening Level
mg/kg = milligrams per kilogram
NCY = New Conservation Yard
ng/kg = nanograms per kilogram
OCY = Old Conservation Yard
PAH = Polynuclear Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
ResRBSL = Residential Risk Based Screening Level
RFI = Resource Conservation and Recovery Act (RCRA) Facility Investigation
SRAM = Standardized Risk Assessment Methodology
SRE = Sodium Reactor Experiment
SVOC = Semi volatile Organic Compounds
TEQ = Total Equivalency Quotient (normalized to 2,3,7,8 TCDD)
TPH = Total Petroleum Hydrocarbons
µg/kg = micrograms per kilogram
VOC = Volatile Organic Compound

Table A2.3-2B (Page 1 of 4)
Summary and Evaluation of Groundwater Sampling Results
OCY RFI Site

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts) [See Table A2.3-2A for a complete summary of soil impacts]	Monitored in GW? Number of samples/Date Range [See Figure A2.2-1 for monitoring locations]	Constituents Detected in GW? Above GWCC or Regulatory Criteria?* [see Appendix B for a summary of groundwater results]	Site Related? (Describe Transport & Fate)	Groundwater Characterized Sufficiently for Risk Assessment?
VOCs	YES **Soil Vapor** VOCs detected only at the Rocketdyne Conservation Yard, but at low concentrations. • TCE was detected up to 66 µg/L **Soil Matrix** <u>Rocketdyne Conservation Yard</u> Toluene and xylenes detected in two historical (1988) soil samples. <u>AI Conservation Yard</u> One VOC (2-butanone) detected in soil matrix in one location. <u>Building 320 Fueling Area/ Excavation</u> Four VOCs detected in historical soil matrix samples (all results less than 15 µg/kg): toluene, xylenes, acetone and methylene chloride Two VOCs detected in RFI program samples (acetone and methylene chloride) • Methylene chloride detected up to 280J µg/kg). <u>SRE Discharge Pipeline</u> One VOC (acetone) detected in a single sample. 1,4-Dioxane was not analyzed in surficial soil.	YES A total of 35 samples were collected and analyzed for VOCs between 1984 and 2004 in RD-14 (21 samples) and WS-7 (14 samples). One sample collected from PZ-114 in 2002. 1,4-Dioxane was analyzed in 3 samples between 1996 and 2001 in RD-14.	YES All VOCs detected at the OCY RFI Site are detected in groundwater; two above Maximum Contaminant Levels (MCLs): • Trichloroethene (TCE) up to 13 µg/L in RD-14 (1990). • Benzene in PZ-114 (5 µg/L) and WS-07 (5 µg/L in 1984). 1,4-Dioxane was not detected.	YES Based on soil vapor and soil matrix.	YES VOCs likely the result of small releases within Group 6; not related to areas outside of Group. CMS recommendation for Group 6 groundwater will be made in Final Sitewide Groundwater Report, if needed. Groundwater risk results suggest CMS recommendation likely for Group 6 as a whole.
SVOCs	YES SVOCs were detected throughout the site. Benzo(a)pyrene was detected in: • Northern Storage Area (Chemical Use Area 1c) at 190 µg/kg. • Telephone Pole Storage Area (Chemical Use Area 5) at 29 µg/kg. • Northern Debris Area (Chemical Use Area 6a) up to 34 µg/kg. • North Slope Debris Area “A” (Chemical Use Area 6c) up to 3.5 µg/kg. • North Slope Debris Area “B” (Chemical Use Area 6d) up to 5.9 µg/kg. • Topographic Low Spot (Chemical Use Area 8) up to 280 µg/kg. Phenanthrene was also detected in the Rocketdyne Conservation Yard (Chemical Use Area 1a) at 1,600 µg/kg. N-nitrosodimethylamine (NDMA) was analyzed in representative locations throughout the site, but was not detected in any samples.	YES A total of three samples were collected and analyzed for SVOCs (including NDMA) between 1984 and 1989: 1 sample from RD-14, 2 samples from WS-07. PZ-114 has not been sampled for SVOC analysis.	NO No SVOCs, including NDMA, were detected in RD-14 or WS-07.	--	YES

Table A2.3-2B (Page 2 of 4)
Summary and Evaluation of Groundwater Sampling Results
OCY RFI Site

Analytical Group	**Site Soil Impacts?** **(Summary of Relevant Impacts)** [See Table A2.3-2A for a complete summary of soil impacts]	**Monitored in GW?** **Number of samples/Date Range** [See Figure A2.2-1 for monitoring locations]	**Constituents Detected in GW?** **Above GWCC or Regulatory Criteria?*** [see Appendix B for a summary of groundwater results]	**Site Related?** (Describe Transport & Fate)	**Groundwater Characterized Sufficiently for Risk Assessment?**
TPH	YES <u>AI Conservation Yard (Chemical Use Area 1b)</u> Combined kerosene, diesel, and lubricant oil- ranges detected at 4,700 mg/kg. No TPH ranges were detected in deeper samples. <u>AST 731 Tank Base Material (Chemical Use Area 2b)</u> Combined kerosene, diesel, and lubricant oil- ranges detected at 1,509 mg/kg in a shallow sample. <u>Building 320 Fueling Area (Chemical Use Area 3)</u> TPH was detected only within the excavation area (of the fuel spill) in both historical (1988) and RFI program (1997) samples. • Heavy oil range detected up to 4,000 mg/kg in a historical sample (1988) <u>Northern Debris Area (Chemical Use Area 6a)</u> Diesel- and lubricant oil-range hydrocarbons detected within debris area. Lubricant oil-range hydrocarbons detected at 550 mg/kg in one sample from 5 feet bgs. <u>North Slope Debris Area "A" (Chemical Use Area 6c)</u> Gasoline-, diesel-, and lubricant-oil range hydrocarbons were detected within the debris area. Gasoline-range hydrocarbons detected up to 3 mg/kg in three samples.	YES One sample from RD-14 analyzed for Total Recoverable Petroleum Hydrocarbons (TRPH, EPA Method 418.1) in 1989.	NO TRPH detected in RD-14 at 50 µg/L. [Note: benzene not detected in RD-14]	NO TRPH method does not indicate carbon range and may include naturally occurring organic material; concentration is very low. No benzene or SVOCs detected.	YES
PCBs	YES <u>Main Site (South)</u> PCBs detected in AI Conservation Yard (Chemical Use Area 1b), Transformer Area (7a), Transformer Area 737 (7c), Topographic Low Spot and Drainage Discharge Area (8), and Northern Debris Areas (6a). Concentrations up to 2,200 µg/kg (Aroclor 1254) in AI Conservation Yard. <u>Northern Areas</u> PCBs detected at Northern Storage Area (Chemical Use Area 1c). Aroclors 1248, 1254, and 1260 detected within the area, downslope, and in the drainage. Concentrations detected up to 24,000,000 µg/kg.	YES Two samples were collected and analyzed for PCBs between 2002 and 2006: 1 sample each from PZ-114 and RD-14.	NO No PCBs were detected in OCY or in Group 6 groundwater monitoring wells or piezometers.	--	YES
Dioxins	YES Dioxins detected in several areas at OCY. 2,3,7,8-TCDD Total Equivalency Quotient (TEQ) ranges up to 183 ng/kg in the Telephone Pole Storage Area (Chemical Use Area 5).	YES Dioxins analyzed in one sample from RD-14 in March 2006.	NO Dioxins were not detected.	--	YES

Table A2.3-2B (Page 3 of 4)
Summary and Evaluation of Groundwater Sampling Results
OCY RFI Site

Analytical Group	**Site Soil Impacts?** **(Summary of Relevant Impacts)** [See Table A2.3-2A for a complete summary of soil impacts]	**Monitored in GW?** **Number of samples/Date Range** [See Figure A2.2-1 for monitoring locations]	**Constituents Detected in GW?** **Above GWCC or Regulatory Criteria?*** [see Appendix B for a summary of groundwater results]	**Site Related?** (Describe Transport & Fate)	**Groundwater Characterized Sufficiently for Risk Assessment?**
Metals	YES Metals detected above background at OCY as follows: <u>Northern and Southern Debris Areas (Chemical Use Areas 6a and 6b)</u> Antimony, barium, cadmium, copper, chromium, lead, nickel, silver, thallium, vanadium, and zinc detected above background. • Generally highest within the Northern Debris Area and decrease downslope from both debris areas into the downslope drainage. • Silver and thallium at depth in the Northern Debris Area. • Silver (in downslope drainage) decreases to below background. • Areas are approximately 50 to 100 feet from WS-07 and drain south toward PZ-114 (approx. 250 feet away). <u>ASTs 731/732 and Earthen Berm (Chemical Use Area 2a and 2b)</u> • Aluminum, silver and mercury above background within berms. ▪ Boron slightly above background after berm soil spread out. ▪ No metals above background in deeper samples. <u>Topographic Low Spot/ Downslope Discharge Area (Chemical Use Area 8)</u> Aluminum, barium, cadmium, lead, mercury, silver, thallium, and zinc: • Aluminum, barium, and thallium above background in deeper samples. • No metals above background in sample beneath asphalt swale in downslope drainage; area approxi. 250 feet downslope from RD-14. <u>Northern Storage Area (Chemical Use Area 1c)</u> • Mercury and chromium detected above background. • Area drains to the north, away from WS-07, RD-14 and PZ-114. <u>North Slope Debris Areas "B" (Chemical Use Areas 6d)</u> • Debris Area "B": lead and mercury detected above background. • Boron above background in downslope drainage. • Areas drain to the north, away from WS-07, RD-14 and PZ-114.	YES A total of 10 samples collected and analyzed for metals between 1955 and 2006: • RD-14 (2 sample), • WS-07 (7 samples), and • PZ-114 (1 sample).	YES <u>RD-14</u> • Dissolved cobalt detected at 2.7 µg/L, above GWCC of 1.9 µg/L. • Thallium detected at 0.15 µg/L, just above the GWCC of <0.13 (detection limit); result is not considered to exceed GWCC. <u>WS-07</u> • Samples collected before 1987. • Detection limits generally elevated above GWCCs. • Galvanized steel casing may affect metals analysis. <u>PZ-114</u> • Total (unfiltered) metals analyzed. • Total silver detected at 2.3 µg/L, above the dissolved GWCC for dissolved silver (<0.17 µg/L). • No other metals exceeded GWCCs. See Group 6 RFI Report Appendix B (Section 3 and Table B-14) for detailed groundwater metals results.	YES (Silver) As a conservative assumption (based on comparison of total silver with dissolved GWCC), silver is assumed to be related to soil silver impacts in upslope OCY Northern and Southern Debris Areas (Chemical Use Areas 6a and 6b). Cobalt not detected above background in site soils, groundwater cobalt not considered site related.	YES CMS recommendation for Group 6 groundwater will be made in Final Sitewide Groundwater Report, if needed. Groundwater risk results suggest CMS recommendation likely for all Group 6 as a whole.

Table A2.3-2B (Page 4 of 4)
Summary and Evaluation of Groundwater Sampling Results
OCY RFI Site

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts) [See Table A2.3-2A for a complete summary of soil impacts]	Monitored in GW? Number of samples/Date Range [See Figure A2.2-1 for monitoring locations]	Constituents Detected in GW? Above GWCC or Regulatory Criteria?* [see Appendix B for a summary of groundwater results]	Site Related? (Describe Transport & Fate)	Groundwater Characterized Sufficiently for Risk Assessment?
Perchlorate	No known use, storage, or discharge of perchlorate at the site, therefore not analyzed in OCY surficial media samples.	YES Six samples collected for perchlorate between 1999 and 2004 in RD-14.	Perchlorate not detected in any samples.	--	YES
Pesticides	Pesticides have no known related chemical use, storage, or discharge at site and were not analyzed in surficial media samples at OCY.	YES Two samples were collected in 1984 in WS-07.	Pesticides not detected in either sample.	--	YES

ACRONYMS

AI	Atomics International	mg/L	milligrams per liter	TEQ	toxicity equivalency quotient (normalized to 2,3,7,8 TCDD)
AST	aboveground storage tank	OCY	Old Conservation Yard	TPH	total petroleum hydrocarbons
bgs	below ground surface	PCB	polychlorinated biphenyls	VOC	volatile organic compounds
CMS	corrective measures study	ResRBSL	residential risk-based screening level	µg /kg	micrograms per kilogram
EcoRBSL	Ecological risk-based screening level	SVOC	semivolatile organic compounds	µg/L	micrograms per liter
mg/kg	milligrams per kilogram	TCE	trichloroethene		

Notes:
* Screening levels for groundwater are provided in Table B-5 in Appendix B of the Group 6 RFI report.

Table A2.3-3A
OCY RFI Report
Soil Vapor VOC Analytical Data Quality
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Constituent	units	Screening Levels [1]		SWMU 7.4 - Old Conservation RFI Site Data									Data Issue	Issue Resolution[2]
				Site Data Summary (all)					Site Non Detect Data Summary					
		Residential (ResRBSL)	Ecological (EcoRBSL)	Samples Analyzed	Samples Detected	Minimum Detected Concentration	Maximum Detected Concentration	Samples ND	Minimum ND	Maximum ND	NDs > ResRBSL	NDs > EcoRBSL		
1,1,1-Trichloroethane	µg/L	640	NA	27	3	2	15	24	1	1	0	NA	--	--
1,1,2-Trichloroethane	µg/L	0.17	NA	27	0	NA	NA	27	1	1	27	NA	--	--
1,1,2-Trichlorotrifluoroethane	µg/L	8800	NA	27	4	1.4	3.5	23	1	5	0	NA	--	--
1,1-Dichloroethane	µg/L	1.7	NA	27	0	NA	NA	27	1	1	0	NA	--	--
1,1-Dichloroethene	µg/L	58	NA	27	3	1.8	10	24	1	1	0	NA	--	--
1,2-Dichloroethane	µg/L	0.13	NA	27	1	1.5	1.5	26	1	1	26	NA	--	--
Benzene	µg/L	0.095	NA	27	0	NA	NA	27	1	1	27	NA	--	--
Carbon tetrachloride	µg/L	0.063	NA	27	0	NA	NA	27	1	1	27	NA	--	--
Chloroform	µg/L	0.5	NA	27	0	NA	NA	27	1	1	27	NA	--	--
cis-1,2-Dichloroethene	µg/L	10	NA	27	1	15	15	26	1	1	0	NA	--	--
Dichlorodifluoromethane	µg/L	58	NA	27	0	NA	NA	27	1	1	0	NA	--	--
Ethylbenzene	µg/L	290	NA	27	0	NA	NA	27	1	1	0	NA	--	--
m,p-Xylene	µg/L	NA	NA	27	0	NA	NA	27	1	2	NA	NA	--	--
Methylene chloride	µg/L	2.7	NA	27	0	NA	NA	27	1	50	5	NA	Elevated DLs	a, d, and/or e; (d - Methylene chlroide had two elevated DLs outside of CMS areas, upslope of the Northern Debris Area and in the Rocketdyne Conservation Yard (Chemical Use Area 6a and 1a). No other VOCs were detected in the Northern Debris Area sample or anywhere in the Northern or Southern Debris Area. No other VOCs were detected in the sample taken in the middle of the Rocketdyne Conservation Yard, nor in samples taken at the same location but at different depths.)
o-Xylene	µg/L	29	NA	27	0	NA	NA	27	1	1	0	NA	--	--
Tetrachloroethene	µg/L	0.45	NA	27	1	1.5	1.5	26	1	1	26	NA	--	--
Toluene	µg/L	110	NA	27	0	NA	NA	27	1	1	0	NA	--	--
trans-1,2-Dichloroethene	µg/L	20	NA	27	0	NA	NA	27	1	1	0	NA	--	--
Trichloroethene	µg/L	1.4	NA	27	5	1.9	66	22	1	1	0	NA	--	--
Trichlorofluoromethane	µg/L	200	NA	27	0	NA	NA	27	1	1	0	NA	--	--
Vinyl chloride	µg/L	0.035	NA	27	0	NA	NA	27	1	2	27	NA	--	--

Notes: -- Indicates that the constituent does not have elevated detection limits.

[1] Risk-based screening levels for human health (ResRBSL) and Ecological (EcoRBSL) receptors are provided as reference points for assessing adequacy of data quality. ResRBSL is based on residentia receptor for a risk level of 1 x 10^{-6} cancer risk or noncancer Hazard Index.

[2] The following statements indicate standard DL issue resolutions and important notes throughout the group. Additional detail is provided when the elevated DL does not fall within a CMS are

(a) Elevated DLs are located within an area recommended for further evaluation in CMS.

(b) Samples were recollected and analyzed with adequate DLs at representative locations; Results do not indicate that elevated DLs in earlier samples are an issue.

(c) Elevated DLs were observed group-wide in areas with no indications of a source.

(d) Site history does not indicate a source; results of other analytes in the same area suggest low concentrations.

(e) DL concentrations achieved were within practicable laboratory reporting limits at the time the sample was collected. The adequacy assessment of sample results for characterization decisions wa made based on surrounding sampling results, potential for laboratory interference, data trends, and reporting limits with respect to screening levels.

(f) DL concentrations are only slightly above background or screening levels

ACRONYMS
DL - detection limit
EcoRBSL - ecological screening level
NA - not applicable
ND - not detected
ResRBSL - residential screening level

Table A2.3-3B
OCY RFI Report
Soil Matrix VOC Analytical Data Quality
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Constituent	units	Screening Levels [1]		SWMU 7.4 - Old Conservation RFI Site Data									Data Issue	Issue Resolution[2]
				Site Data Summary (all)					Site Non Detect Data Summary					
		Residential (ResRBSL)	Ecological (EcoRBSL)	Samples Analyzed	Samples Detected	Minimum Detected Concentration	Maximum Detected Concentration	Samples ND	Minimum ND	Maximum ND	NDs > ResRBSL	NDs > EcoRBSL		
1,1,1-Trichloroethane	µg/kg	490	2800000	24	0	NA	NA	24	1	27	0	0	--	--
1,1,2-Trichloroethane	µg/kg	1.2	9000	24	0	NA	NA	24	2.7	27	24	0	Elevated DLs	a and/or e
1,1,2-Trichlorotrifluoroethane	µg/kg	16000	200000	18	0	NA	NA	18	6.8	108	0	0	--	--
1,1-Dichloroethane	µg/kg	1.6	230000	24	0	NA	NA	24	1	27	22	0	Elevated DLs	a and/or e
1,1-Dichloroethene	µg/kg	23	12000	24	0	NA	NA	24	5	27	1	0	Elevated DLs	a and/or e
1,2,4-Trimethylbenzene	µg/kg	35	690000	18	0	NA	NA	18	1	108	3	0	Elevated DLs	a and/or e
1,2-Dichloroethane	µg/kg	0.5	76000	24	0	NA	NA	24	1	27	24	0	Elevated DLs	a and/or e
1,2-Dichloroethene (total)	µg/kg	14	74000	6	0	NA	NA	6	5	5	0	0	--	--
1,3,5-Trimethylbenzene	µg/kg	36	690000	18	0	NA	NA	18	1	108	3	0	Elevated DLs	a and/or e
1,4-Dichlorobenzene	µg/kg	10	170000	18	0	NA	NA	18	2	54	14	0	Elevated DLs	a, d, and/or e; (d - 1,4-Dichlorobenzene had four elevated DLs outside of CMS areas, in trench samples in the former earthen berms (Chemical Use Area 2a and 2b), along the SRE Discharge Pipeline (Chemical Use Area 4) and in the downslope sample in the AI Conservation yard (Chemical Use Area 1b). Other VOCs in these samples are not detected above RBSLs.)
2-Butanone	µg/kg	62000	8200000	24	1	11	11	23	5	270	0	0	--	--
4-Isopropyltoluene	µg/kg	NA	NA	2	2	1.3	1.9	0	NA	NA	NA	NA	--	--
Acetone	µg/kg	51000	46000	24	4	14	4800	20	10	103	0	0	--	--
Benzene	µg/kg	0.13	4600	24	0	NA	NA	24	1	27	24	0	Elevated DLs	a and/or e
Carbon disulfide	µg/kg	NA	NA	6	0	NA	NA	6	5	5	NA	NA	--	--
Carbon tetrachloride	µg/kg	0.042	1600	24	0	NA	NA	24	1	27	24	0	Elevated DLs	a and/or e
Chlorobenzene	µg/kg	97	63000	24	0	NA	NA	24	1	27	0	0	--	--
Chloroform	µg/kg	0.77	920	24	0	NA	NA	24	2	54	24	0	Elevated DLs	a, d, and/or e; (d - Chloroform had four elevated DLs outside of CMS areas, in trench samples in the former earthen berms (Chemical Use Area 2a and 2b), along the SRE Discharge Pipeline (Chemical Use Area 4), and in the downslope sample in the AI Conservation yard (Chemical Use Area 1b). Other VOCs in these samples are not detected above RBSLs.)
cis-1,2-Dichloroethene	µg/kg	14	74000	18	0	NA	NA	18	2	27	1	0	Elevated DLs	a and/or e
Dichlorodifluoromethane	µg/kg	15	69000	18	0	NA	NA	18	5	54	2	0	Elevated DLs	a and/or e
Ethylbenzene	µg/kg	1200	220000	24	0	NA	NA	24	1	27	0	0	--	--
m,p-Xylene	µg/kg	150	690000	18	0	NA	NA	18	2	27	0	0	--	--
Methyl tert-butyl ether	µg/kg	NA	NA	2	0	NA	NA	2	6.8	7.6	NA	NA	--	--
Methylene chloride	µg/kg	4	27000	24	6	6	280	18	5	108	18	0	Elevated DLs	a, d, and/or e; (d - Methylene chloride had four elevated DLs outside of CMS areas, in trench samples in the former earthen berms (Chemical Use Area 2a and 2b), along the SRE Discharge Pipeline (Chemical Use Area 4) and in the downslope sample in the AI Conservation yard (Chemical Use Area 1b). Other VOCs in these samples are not detected above RBSLs.)
Naphthalene	µg/kg	6000	240000	2	0	NA	NA	2	6.8	7.6	0	0	--	--
o-Xylene	µg/kg	190	690000	18	0	NA	NA	18	1	27	0	0	--	--
Tetrachloroethene	µg/kg	0.43	2300	24	0	NA	NA	24	1	27	24	0	--	--
Toluene	µg/kg	300	2700	24	3	3	14	21	1	27	0	0	--	--
trans-1,2-Dichloroethene	µg/kg	16	1000000	18	0	NA	NA	18	2	27	1	0	Elevated DLs	a and/or e
Trichloroethene	µg/kg	2.2	3200	24	0	NA	NA	24	1	27	22	0	Elevated DLs	a and/or e
Trichlorofluoromethane	µg/kg	110	320000	18	0	NA	NA	18	1	27	0	0	--	--

Table A2.3-3B
OCY RFI Report
Soil Matrix VOC Analytical Data Quality
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Constituent	units	Screening Levels [1]		SWMU 7.4 - Old Conservation RFI Site Data									Data Issue	Issue Resolution[2]
				Site Data Summary (all)					Site Non Detect Data Summary					
		Residential (ResRBSL)	Ecological (EcoRBSL)	Samples Analyzed	Samples Detected	Minimum Detected Concentration	Maximum Detected Concentration	Samples ND	Minimum ND	Maximum ND	NDs > ResRBSL	NDs > EcoRBSL		
Vinyl chloride	µg/kg	0.0096	780	24	0	NA	NA	24	2	54	24	0	Elevated DLs	a, d, and/or e; (d - Vinyl chloride had elevated DLs in trench samples in the former earthen berms (Chemical Use Area 2a and 2b), along the SRE Discharge Pipeline (Chemical Use Area 4), and in the downslope sample in the AI Conservation yard (Chemical Use Area 1b). Other VOCs in these samples are not detected above RBSLs.)
Xylenes (total)	µg/kg	150	690000	6	3	6	13	3	5	5	0	0	--	--

Notes: Soil matrix VOC results reported by Columbia Analytical Services (CAS) during 1997-98 have been conservatively multiplied by 2 to address uncertainty in the data.

-- Indicates that the constituent does not have elevated detection limits.

[1] Risk-based screening levels for human health (ResRBSL) and Ecological (EcoRBSL) receptors are provided as reference points for assessing adequacy of data quality. ResRBSL is based on residential receptor for a risk level of 1 x 10^{-6} cancer risk or noncancer Hazard Index.

[2] The following statements indicate standard DL issue resolutions and important notes throughout the group. Additional detail is provided when the elevated DL does not fall within a CMS area.

(a) Elevated DLs are located within an area recommended for further evaluation in CMS.

(b) Samples were recollected and analyzed with adequate DLs at representative locations; Results do not indicate that elevated DLs in earlier samples are an issue.

(c) Elevated DLs were observed group-wide in areas with no indications of a source.

(d) Site history does not indicate a source; results of other analytes in the same area suggest low concentrations.

(e) DL concentrations achieved were within practicable laboratory reporting limits at the time the sample was collected. The adequacy assessment of sample results for characterization decisions was made based on surrounding sampling results, potential for laboratory interference, data trends, and reporting limits with respect to screening levels.

(f) DL concentrations are only slightly above background or screening levels.

ACRONYMS

DL - detection limit

EcoRBSL - ecological screening level

NA - not applicable

ND - not detected

ResRBSL - residential screening level

Table A2.3-3C
OCY RFI Report
SVOC Analytical Data Quality
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Constituent	units	Screening Levels [1]		SWMU 7.4 - Old Conservation RFI Site Data									Data Issue	Issue Resolution[2]
				Site Data Summary (all)					Site Non Detect Data Summary					
		Residential (ResRBSL)	Ecological (EcoRBSL)	Samples Analyzed	Samples Detected	Minimum Detected Concentration	Maximum Detected Concentration	Samples ND	Minimum ND	Maximum ND	NDs > ResRBSL	NDs > EcoRBSL		
1-Methylnaphthalene	µg/kg	NA	230000	29	3	6.7	390	26	20	27	NA	0	--	--
2-Chloronaphthalene	µg/kg	NA	NA	9	0	NA	NA	9	30	3000	NA	NA	--	--
2-Methylnaphthalene	µg/kg	230000	230000	53	10	3	780	43	3	3000	0	0	--	--
Acenaphthene	µg/kg	3400000	2500	70	3	8	15	67	1.96	3200	0	2	Elevated DL	a, d, and/or e; (d - Acenaphthene had one elevated DL outside of CMS areas, in a trench sample in the former earthen berm (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Acenaphthylene	µg/kg	1700000	810000	70	1	7	7	69	1.96	3200	0	0	--	--
Anthracene	µg/kg	17000000	2400	70	7	2	39	63	1.96	3200	0	2	Elevated DL	a, d, and/or e; (d - Anthracene had one elevated DL outside of CMS areas, in a trench sample in the former earthen berm (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Benzo(a)anthracene	µg/kg	600	1700	70	19	3	340	51	1.96	3200	3	3	Elevated DL	a, d, and/or e; (d - Benzo(a)anthracene had one elevated DL outside of CMS areas, in a trench sample in the former earthen berm (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Benzo(a)pyrene	µg/kg	6	4700	70	12	2.6	280	58	1.96	3200	49	0	Elevated DL	a, d, and/or e; (d - Benzo(a)pyrene had an elevated DL in one sample in the Rocketdyne Conservation Yard (Chemical Use Area 1a). No other SVOCs or TPH detected, and detected metals were less than background in that sample. Benzo(a)pyrene also had elevated DLs in two trench samples in the Former AST 732 Earthen Berms (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.
Benzo(b)fluoranthene	µg/kg	600	5500	70	14	2.2	460	56	1.96	3200	3	0	Elevated DL	a, d, and/or e; (d - Benzo(b)fluoranthene had an elevated DL in one trench sample in the former earthen berm (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Benzo(e)pyrene	µg/kg	NA	NA	1	1	172	172	0	NA	NA	NA	NA	--	--
Benzo(g,h,i)perylene	µg/kg	NA	6400	70	11	4.8	184	59	3	3200	NA	0	--	--
Benzo(k)fluoranthene	µg/kg	600	3700	70	13	3	380	57	3	3200	3	0	Elevated DL	a, d, and/or e; (d - Benzo(k)fluoranthene had an elevated DL in one trench sample in the former earthen berm (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
bis(2-Ethylhexyl)phthalate	µg/kg	250000	4900	28	0	NA	NA	28	30	11000	0	2	Elevated DL	a, d and/or e; (d - bis(2-Ethylhexyl)phthalate had one elevated DL outside of CMS areas, in a trench sample in the former earthen berm (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Butylbenzylphthalate	µg/kg	11000000	370000	9	0	NA	NA	9	30	3000	0	0	--	--
Chrysene	µg/kg	6000	2400	70	20	4	500	50	3	3200	0	2	Elevated DL	a, d and/or e; (d - Chrysene had one elevated DL outside of CMS areas, in a trench sample in the former earthen berm (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Dibenzo(a,h)anthracene	µg/kg	170	1700	70	7	3.9	33	63	3	3200	14	3	Elevated DL	a, d, and/or e; (d - Dibenzo(a,h)anthracene had an elevated DL in one sample in the Rocketdyne Conservation Yard (Chemical Use Area 1a). No other SVOCs or TPH detected, and detected metals were less than background in that sample. Dibenzo(a,h)anthracene also had elevated DLs in two trench samples in the Former AST 732 Earthen Berms (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Diethylphthalate	µg/kg	46000000	7000000	28	0	NA	NA	28	4	11000	0	0	--	--

Table A2.3-3C
OCY RFI Report
SVOC Analytical Data Quality
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Constituent	units	Screening Levels [1]		SWMU 7.4 - Old Conservation RFI Site Data									Data Issue	Issue Resolution[2]
				Site Data Summary (all)					Site Non Detect Data Summary					
		Residential (ResRBSL)	Ecological (EcoRBSL)	Samples Analyzed	Samples Detected	Minimum Detected Concentration	Maximum Detected Concentration	Samples ND	Minimum ND	Maximum ND	NDs > ResRBSL	NDs > EcoRBSL		
Di-n-butyl phthalate	µg/kg	5700000	500	28	0	NA	NA	28	30	11000	0	11	Elevated DL	a, d, and/or e; (d - Di-n-butyl phthalate had an elevated DL in one sample in the Rocketdyne Conservation Yard (Chemical Use Area 1a). No other SVOCs or TPH detected, and detected metals were less than background in that sample. Di-n-butyl phthalate also had elevated DLs in two trench samples in the Former AST 732 Earthen Berms (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Fluoranthene	µg/kg	2300000	130000	70	21	3.9	2100	49	3	3200	0	0	--	--
Fluorene	µg/kg	2300000	1600	70	1	6	6	69	3	3200	0	3	Elevated DL	a, d, and/or e; (d - Fluorene had DL issues in one trench sample in the former earthen berm (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Indeno(1,2,3-cd)pyrene	µg/kg	600	3900	70	8	6	110	62	3	3200	3	0	Elevated DL	a, d, and/or e; (d - Indeno(1,2,3-cd)pyrene had an elevated DL in one trench sample in the former earthen berm (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Naphthalene	µg/kg	6000	240000	70	10	4	640	60	3	3200	0	0	--	--
Perylene	µg/kg		63000	1	1	98.1	98.1	0	NA	NA	NA	NA	--	--
Phenanthrene	µg/kg	1700000	1300	70	16	4	1600	54	3	3200	0	3	Elevated DL	a, d, and/or e; (d - Phenanthrene had one elevated DL outside of CMS areas, in a trench sample in the former earthen berm (Chemical Use Area 2a). No other SVOCs detected in that sample or in other trench and soil boring samples in the earthen berm. All other analytes were nondetect or below screening levels, except for a few isolated detections of metals.)
Phenol	µg/kg	18000000	280000	9	0	NA	NA	9	30	3000	0	0	--	--
Pyrene	µg/kg	1700000	79000	70	20	5	1000	50	3	3200	0	0	--	--

Notes: ● Results for N-nitrosodimethylamine (NDMA) were rejected in 13 samples at the OCY RFI Site. Rejected samples were located at the Northern and Southern Debris Areas, which is recommended for further evaluation in CMS.

-- Indicates that the constituent does not have elevated detection limits.

[1] Risk-based screening levels for human health (ResRBSL) and Ecological (EcoRBSL) receptors are provided as reference points for assessing adequacy of data quality. ResRBSL is based on residential receptor for a risk level of 1×10^{-6} cancer risk or noncancer Hazard Index.

[2] The following statements indicate standard DL issue resolutions and important notes throughout the group. Additional detail is provided when the elevated DL does not fall within a CMS area.

(a) Elevated DLs are located within an area recommended for further evaluation in CMS.

(b) Samples were recollected and analyzed with adequate DLs at representative locations; Results do not indicate that elevated DLs in earlier samples are an issue.

(c) Elevated DLs were observed group-wide in areas with no indications of a source.

(d) Site history does not indicate a source; results of other analytes in the same area suggest low concentrations.

(e) DL concentrations achieved were within practicable laboratory reporting limits at the time the sample was collected. The adequacy assessment of sample results for characterization decisions was made based on surrounding sampling results, potential for laboratory interference, data trends, and reporting limits with respect to screening levels.

(f) DL concentrations are only slightly above background or screening levels.

ACRONYMS
DL - detection limit
EcoRBSL - ecological screening level
NA - not applicable
ND - not detected
NDMA - N-nitrosodimethylamine
ResRBSL - residential screening level

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Constituent	units	Screening Levels [1]		SWMU 7.4 - Old Conservation RFI Site Data									Data Issue	Issue Resolution[2]
				Site Data Summary (all)					Site Non Detect Data Summary					
		Residential (ResRBSL)	Ecological (EcoRBSL)	Samples Analyzed	Samples Detected	Minimum Detected Concentration	Maximum Detected Concentration	Samples ND	Minimum ND	Maximum ND	NDs > ResRBSL	NDs > EcoRBSL		
C08-C11 (Gasoline Range)	mg/kg	1.1	NA	90	5	2.3	42	85	3	140	85	NA	Elevated DL	a, d and/or e; (d - Gasoline Range hydrocarbons had elevated DLs in two trench sample in the former earthen berms (Chemical Use Area 2a and 2b). All other analytes were not detected or were detected below screening levels in that sample or in other trench and soil boring samples in the earthen berms, except for metals.)
C09-C22	mg/kg	1400	NA	5	4	0.3	64	1	0.1	0.1	0	NA	--	--
C11-C14 (Kerosene Range)	mg/kg	1400	NA	58	1	89	89	57	3	140	0	NA	--	--
C12-C14 (Kerosene Range)	mg/kg	1400	NA	30	2	3.3	13	28	5.2	21	0	NA	--	--
C12-C22 (Kerosene, Diesel Ranges)	mg/kg	1400	NA	2	0	NA	NA	2	10	10	0	NA	--	--
C14-C20 (Diesel Range)	mg/kg	1400	NA	58	10	1.7	1200	48	3	53	0	NA	--	--
C15-C20 (Diesel Range)	mg/kg	1400	NA	30	12	2.7	59	18	5.2	21	0	NA	--	--
C20-C30 (Lubricant Oil Range)	mg/kg	1400	NA	58	18	3.6	8300	40	3.6	15	0	NA	--	--
C21-C30 (Lubricant Oil Range)	mg/kg	1400	NA	30	20	2.2	71	10	5.2	10	0	NA	--	--
C22-C30 (Lubricant Oil Range)	mg/kg	1400	NA	2	0	NA	NA	2	10	10	0	NA	--	--
C22-C40 (Heavy Oil)	mg/kg	1400	NA	3	2	5	4000	1	0.1	0.1	0	NA	--	--

Notes: -- Indicates that the constituent does not have elevated detection limits.

[1] Risk-based screening levels for human health (ResRBSL) and Ecological (EcoRBSL) receptors are provided as reference points for assessing adequacy of data quality. ResRBSL is based on residential receptor for a risk level of 1 x 10^{-6} cancer risk or noncancer Hazard Index.

[2] The following statements indicate standard DL issue resolutions and important notes throughout the group. Additional detail is provided when the elevated DL does not fall within a CMS area.

(a) Elevated DLs are located within an area recommended for further evaluation in CMS.

(b) Samples were recollected and analyzed with adequate DLs at representative locations; Results do not indicate that elevated DLs in earlier samples are an issue.

(c) Elevated DLs were observed group-wide in areas with no indications of a source.

(d) Site history does not indicate a source; results of other analytes in the same area suggest low concentrations.

(e) DL concentrations achieved were within practicable laboratory reporting limits at the time the sample was collected. The adequacy assessment of sample results for characterization decisions was made based on surrounding sampling results, potential for laboratory interference, data trends, and reporting limits with respect to screening levels.

(f) DL concentrations are only slightly above background or screening levels.

ACRONYMS

DL - detection limit

EcoRBSL - ecological screening level

NA - not applicable

ND - not detected

ResRBSL - residential screening level

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Constituent	units	Screening Levels [1]		SWMU 7.4 - Old Conservation RFI Site Data									Data Issue	Issue Resolution[2]
				Site Data Summary (all)					Site Non Detect Data Summary					
		Residential (ResRBSL)	Ecological (EcoRBSL)	Samples Analyzed	Samples Detected	Minimum Detected Concentration	Maximum Detected Concentration	Samples ND	Minimum ND	Maximum ND	NDs > ResRBSL	NDs > EcoRBSL		
Aroclor 1248	µg/kg	350	380	78	16	79	24000000	62	34	8900	3	62	Elevated DL	a, d, and/or e; (d - Aroclor 1248 had one elevated DL outside of CMS areas, in OCBS90 in the North Slope Debris Area B (Chemical Use Area 6d). PCBs were not detected within the area; CMS recommendation was based on DLs. Furthermore, Aroclors were not detected in the sample immediately upstream at OCBS89, which did not have elevated DLs.)
Aroclor 1254	µg/kg	350	380	79	21	37	5400	58	34	86000	3	58	Elevated DL	a, d, and/or e; (d - Aroclor 1254 had one elevated DL outside of CMS areas, in OCBS90 in the North Slope Debris Area B (Chemical Use Area 6d). PCBs were not detected within the area; CMS recommendation was based on DLs. Furthermore, Aroclors were not detected in the sample immediately upstream at OCBS89, which did not have elevated DLs.
Aroclor 1260	µg/kg	350	380	78	13	20	630000	65	34	8900	3	65	Elevated DL	a, d, and/or e; (d - Aroclor 1260 had one elevated DL outside of CMS areas, in OCBS90 in the North Slope Debris Area B (Chemical Use Area 6d). PCBs were not detected within the area; CMS recommendation was based on DLs. Furthermore, Aroclors were not detected in the sample immediately upstream at OCBS89, which did not have elevated DLs.

Notes: -- Indicates that the constituent does not have elevated detection limits.

[1] Risk-based screening levels for human health (ResRBSL) and Ecological (EcoRBSL) receptors are provided as reference points for assessing adequacy of data quality. ResRBSL is based on residential receptor for a risk level of 1 x 10^{-6} cancer risk or noncancer Hazard Index.

[2] The following statements indicate standard DL issue resolutions and important notes throughout the group. Additional detail is provided when the elevated DL does not fall within a CMS area.

(a) Elevated DLs are located within an area recommended for further evaluation in CMS.

(b) Samples were recollected and analyzed with adequate DLs at representative locations; Results do not indicate that elevated DLs in earlier samples are an issue.

(c) Elevated DLs were observed group-wide in areas with no indications of a source.

(d) Site history does not indicate a source; results of other analytes in the same area suggest low concentrations.

(e) DL concentrations achieved were within practicable laboratory reporting limits at the time the sample was collected. The adequacy assessment of sample results for characterization decisions was made based on surrounding sampling results, potential for laboratory interference, data trends, and reporting limits with respect to screening levels.

(f) DL concentrations are only slightly above background or screening levels.

ACRONYMS

DL - detection limit
EcoRBSL - ecological screening level
NA - not applicable
ND - not detected
ResRBSL - residential screening level

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Constituent	units	Background/ Screening Levels[1]			SWMU 7.4 - Old Conservation RFI Site Data										Data Issue	Issue Resolution[3]
					Site Data Summary (all)					Site Non Detect Data Summary						
		Background[2]	Residential (ResRBSL)	Ecological (EcoRBSL)	Samples Analyzed	Samples Detected	Minimum Detected Concentration	Maximum Detected Concentration	Samples ND	Minimum ND	Maximum ND	NDs > Background	NDs > ResRBSL	NDs > EcoRBSL		
1,2,3,4,7,8,9-HpCDF	ng/kg	0.19	690	340	24	16	0.155	55	8	0.83	14	8	0	0	Elevated DL	a and/or e
1,2,3,4,7,8-HxCDD	ng/kg	0.34	69	34	24	19	0.233	150	5	0.5	1.4	5	0	0	--	--
1,2,3,4,7,8-HxCDF	ng/kg	0.73	69	34	24	19	0.306	120	5	0.31	1.8	2	0	0	--	--
1,2,3,6,7,8-HxCDD	ng/kg	0.95	69	34	24	20	0.71	160	4	0.48	1.1	1	0	0	--	--
1,2,3,6,7,8-HxCDF	ng/kg	0.3	69	34	24	15	0.222	17	9	0.52	51	9	0	1	Elevated DL	a and/or e
1,2,3,7,8,9-HxCDD	ng/kg	1.1	69	35	24	19	0.457	170	5	0.4	1.1	1	0	0	--	--
1,2,3,7,8,9-HxCDF	ng/kg	0.43	69	34	24	13	0.269	17	11	0.0681	1.3	5	0	0	--	--
1,2,3,7,8-PeCDD	ng/kg	0.18	140	3.4	24	15	0.147	60	9	0.213	2.2	9	0	0	Elevated DL	a and/or e
1,2,3,7,8-PeCDF	ng/kg	0.59	140	69	24	15	0.122	14	9	0.21	1.1	4	0	0	Elevated DL	a and/or e
2,3,4,6,7,8-HxCDF	ng/kg	0.45	69	34	24	20	0.26	30	4	0.26	1.1	3	0	0	--	--
2,3,4,7,8-PeCDF	ng/kg	0.64	14	6.9	24	19	0.37	26	5	0.24	1.1	1	0	0	Elevated DL	a and/or e
2,3,7,8-TCDD	ng/kg	0.5	6.9	3.4	24	9	0.239	7.8	15	0.0482	1	5	0	0	--	--
2,3,7,8-TCDF	ng/kg	1.8	69	4.4	24	18	0.253	12	6	0.28	0.89	0	0	0	--	--
OCDD	ng/kg	140	69000	140000	24	24	46	15000	0	NA	NA	NA	NA	NA	--	--
OCDF	ng/kg	8.1	69000	99000	24	22	1.5	799	2	4.6	5.9	0	0	0	--	--
TCDD TEQ (ND = 0)	ng/kg	0.98	6.9	3.4	24	24	0.10485	183.615	0	NA	NA	NA	NA	NA	--	--
Total HpCDD	ng/kg	NA	NA	NA	24	24	11	9300	0	NA	NA	NA	NA	NA	--	--
Total HpCDF	ng/kg	NA	NA	NA	24	24	0.41	880	0	NA	NA	NA	NA	NA	--	--
Total HxCDD	ng/kg	NA	NA	NA	24	24	0.66	2900	0	NA	NA	NA	NA	NA	--	--
Total HxCDF	ng/kg	NA	NA	NA	24	24	0.95	540	0	NA	NA	NA	NA	NA	--	--
Total PeCDD	ng/kg	NA	NA	NA	24	18	1.4	550	6	0.35	0.52	NA	NA	NA	--	--
Total PeCDF	ng/kg	NA	NA	NA	24	21	0.8	200	3	0.22	0.63	NA	NA	NA	--	--
Total TCDD	ng/kg	NA	NA	NA	24	17	0.19	140	7	0.36	1	NA	NA	NA	--	--
Total TCDF	ng/kg	NA	NA	NA	24	19	0.92	250	5	0.28	0.89	NA	NA	NA	--	--

Notes:

-- Indicates that the constituent does not have elevated detection limits.

[1] Background, Residential Screening Levels (ResRBSL) and Ecological Screening Levels (EcoRBSL) are provided as reference points for assessing adequacy of data quality. ResRBSL based on residential receptor for a risk level of 1 x 10^{-6} cancer risk or noncancer Hazard Index of 1, whichever is lowest. EcoRBSL based on HI = 1 for most sensitive ecological receptor.

[2] Reference Soil Background Report (MWH 2005)

[3] The following statements indicate standard DL issue resolutions and important notes throughout the group. Additional detail is provided when the elevated DL does not fall within a CMS area.

(a) Elevated DLs are located within an area recommended for further evaluation in CMS.

(b) Samples were recollected and analyzed with adequate DLs at representative locations; Results do not indicate that elevated DLs in earlier samples are an issue.

(c) Elevated DLs were observed group-wide in areas with no indications of a source.

(d) Site history does not indicate a source; results of other analytes in the same area suggest low concentrations.

(e) DL concentrations achieved were within practicable laboratory reporting limits at the time the sample was collected. The adequacy assessment of sample results for characterization decisions was made based on surrounding sampling results, potential for laboratory interference, data trends, and reporting limits with respect to screening levels.

(f) DL concentrations are only slightly above background or screening levels.

ACRONYMS

DL - detection limit
EcoRBSL - ecological risk-based screening level
NA - not applicable
ND - not detected
ResRBSL - residential risk-based screening level

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Constituent	units	Background/ Screening Levels[1]			SWMU 7.4 - Old Conservation RFI Site Data											
					Site Data Summary (all)					Site Non Detect Data Summary						
		Background[2]	Residential (ResRBSL)	Ecological (EcoRBSL)	Samples Analyzed	Samples Detected	Minimum Detected Concentration	Maximum Detected Concentration	Samples ND	Minimum ND	Maximum ND	NDs > Background	NDs > ResRBSL	NDs > EcoRBSL	Data Issue	Issue Resolution[3]
Aluminum	mg/kg	20000	75000	14	67	67	3100	27000	0	NA	NA	NA	NA	NA	--	--
Antimony	mg/kg	8.7	30	0.096	56	14	0.12	17.5	42	0.034	12	14	0	40	Elevated DLs	a, b, c, d, e and/or f; (b - Antimony had elevated DLs outside of CMS areas in the berm soils spread over the former ASTs (Chemical Use Area 2a and 2b). Metals were resampled and detected below background in these samples.); (d - Antimony had an elevated DL outside of CMS areas, in the Rocketdyne Conservation Yard (Chemical Use Area 1d). No other metals were detected above background in this sample.)
Arsenic	mg/kg	15	0.095	0.34	71	54	1.1	6.5	17	4.4	6	0	17	17	--	--
Barium	mg/kg	140	15000	15	71	71	43	190	0	NA	NA	NA	NA	NA	--	--
Beryllium	mg/kg	1.1	150	5.7	71	58	0.14	1	13	0.21	0.6	0	0	0	--	--
Boron	mg/kg	9.7	15000	6.3	63	21	2.5	12	42	1.1	12	12	0	16	Elevated DLs	a, b, d, e and/or f; (b - Boron had elevated DLs outside of CMS areas in the berm soils spread over the former ASTs (Chemical Use Area 2a and 2b). Metals were resampled and detected below background in these samples.); (d - Boron had an elevated DL outside of CMS areas, in the Former SRE Pond Discharge Pipeline (Chemical Use Area 4). One metal detected above background in this sample, and no other metals were detected above background stepout sample.)
Cadmium	mg/kg	1	2.6	0.0031	71	46	0.058	3	25	0.03	1	0	0	25	--	--
Chromium	mg/kg	36.8	3400	940	71	71	6.8	45	0	NA	NA	NA	NA	NA	--	--
Cobalt	mg/kg	21	1500	10	71	70	2	10	1	2.2	2.2	0	0	0	--	--
Copper	mg/kg	29	3000	1.1	71	71	3	60.4	0	NA	NA	NA	NA	NA	--	--
Iron	mg/kg	28000	NA	NA	11	11	5230	19900	0	NA	NA	NA	NA	NA	--	--
Lead	mg/kg	34	150	0.063	72	69	3.2	143	3	5	6	0	0	3	--	--
Manganese	mg/kg	495	9500	63	11	11	62.3	308	0	NA	NA	NA	NA	NA	--	--
Mercury	mg/kg	0.09	23	0.89	71	42	0.004	23	29	0.0033	0.3	19	0	0	Elevated DLs	a, b, d and/or e; (b - Mercury had elevated DLs outside of CMS areas in the berm soils spread over the former ASTs (Chemical Use Area 2a and 2b). Metals were resampled and detected below background in these samples.); (d - Mercury had elevated DLs outside of CMS areas in the Rocketdyne Conservation Yard (Chemical Use Area 1d) and the Former SRE Pond Discharge Pipeline (Chemical Use Area 4). No other metals were detected in these samples except for one metal slightly above background, and no other metals were detected above background stepout sample.)
Molybdenum	mg/kg	5.3	380	0.11	71	27	0.25	1.6	44	0.26	12	27	0	44	Elevated DLs	a, b, c, d and/or e; (b - Molybdenum had elevated DLs outside of CMS areas in the berm soils spread over the former ASTs (Chemical Use Area 2a and 2b). Metals were resampled and detected below background in these samples.); (d - Molybdenum had elevated DLs outside of CMS areas in the Rocketdyne Conservation Yard (Chemical Use Area 1d) and the Former SRE Pond Discharge Pipeline (Chemical Use Area 4). No other metals were detected in these samples except for one metals slightly above background, and no other metals were detected above background stepout sample.)
Nickel	mg/kg	29	1500	0.1	71	65	2.2	39	6	2.5	7.4	0	0	6	--	--
Potassium	mg/kg	6400	NA	NA	17	17	1300	5000	0	NA	NA	NA	NA	NA	--	--
Selenium	mg/kg	0.655	380	0.18	61	5	0.27	0.47	56	0.2	6	35	0	56	Elevated DLs	a, b, c, d, and/or f; (b - Selenium was resampled in the berm soils spread over the former ASTs (Chemical Use Area 2a and 2b). Metals were detected below background in these samples.); (d - Selenium had elevated DLs outside of CMS areas in the Rocketdyne Conservation Yard (Chemical Use Area 1d) and the Former SRE Pond Discharge Pipeline (Chemical Use Area 4). No other metals were detected in these samples except for one metals slightly above background, and no other metals were detected above background stepout sample.)
Silver	mg/kg	0.79	380	0.55	74	48	0.023	10.8	26	1	4.5	26	0	26	Elevated DLs	a and/or e
Sodium	mg/kg	110	NA	NA	17	17	57.3	423	0						--	--

Table A2.3-3G
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Constituent	units	Background/ Screening Levels[1]			SWMU 7.4 - Old Conservation RFI Site Data											
					Site Data Summary (all)					Site Non Detect Data Summary						
		Background[2]	Residential (ResRBSL)	Ecological (EcoRBSL)	Samples Analyzed	Samples Detected	Minimum Detected Concentration	Maximum Detected Concentration	Samples ND	Minimum ND	Maximum ND	NDs > Background	NDs > ResRBSL	NDs > EcoRBSL	Data Issue	Issue Resolution[3]
Thallium	mg/kg	0.46	6.1	3.2	76	50	0.11	2.8	26	0.1	6	22	0	20	Elevated DLs	a, b, c, d and/or e; (b - Thalium had elevated DLs outside of CMS areas in the berm soils spread over the former ASTs (Chemical Use Area 2a and 2b). Metals were resampled and detected below background in these samples.); (d - Thallium had elevated DLs outside of CMS areas in the Rocketdyne Conservation Yard (Chemical Use Area 1d) and the Former SRE Pond Discharge Pipeline (Chemical Use Area 4). No other metals were detected in these samples except for one metals slightly above background, and no other metals were detected above background stepout sample.)
Vanadium	mg/kg	62	76	1.6	71	71	10	66	0	NA	NA	NA	NA	NA	--	--
Zinc	mg/kg	110	23000	22	71	71	30	729	0	NA	NA	NA	NA	NA	--	--

Notes:

● Risk based screening levels are not listed for metals detected below established background concentrations. Detection limits below background are considered adequate for characterization and COPC evaluation.

● Results for antimony were rejected in 12 samples and selenium in 7 samples at the OCY RFI Site. Rejected samples were located at the Northern and Southern Debris Areas (antimony and selenium) and in the southwestern topographic low of the Rocketdyne Conservation Yard (antimony). Both of these areas are recommended for further evaluation in CMS.

-- Indicates that the constituent does not have elevated detection limits.

[1] Background, Residential Screening Levels (ResRBSL) and Ecological Screening Levels (EcoRBSL) are provided as reference points for assessing adequacy of data quality. ResRBSL based on residential receptor for a risk level of 1×10^{-6} cancer risk or noncancer Hazard Index of 1, whichever is lowest. EcoRBSL based on HI = 1 for most sensitive ecological receptor.

[2] Reference Soil Background Report (MWH 2005)

[3] The following statements indicate standard DL issue resolutions and important notes throughout the group. Additional detail is provided when the elevated DL does not fall within a CMS area.

(a) Elevated DLs are located within an area recommended for further evaluation in CMS.

(b) Samples were recollected and analyzed with adequate DLs at representative locations; Results do not indicate that elevated DLs in earlier samples are an issue.

(c) Elevated DLs were observed group-wide in areas with no indications of a source.

(d) Site history does not indicate a source; results of other analytes in the same area suggest low concentrations.

(e) DL concentrations achieved were within practicable laboratory reporting limits at the time the sample was collected. The adequacy assessment of sample results for characterization decisions was made based on surrounding sampling results, potential for laboratory interference, data trends, and reporting limits with respect to screening levels.

(f) DL concentrations are only slightly above background or screening levels.

ACRONYMS

DL - detection limit

EcoRBSL - ecological screening level

NA - not applicable

ND - not detected

ResRBSL - residential screening level

Table A2.4-1 (1 of 2)

Chemicals of Potential Concern for Human Health
Old Conservation Yard RFI Site

Chemical	Soil (0 to 2 feet bgs)	Soil (0 to 10 feet bgs)	RFI Site Chatsworth Formation Groundwater (a)	Group 6 Reporting Area Chatsworth Formation Groundwater (a)	Soil Vapor
Inorganic Compounds					
Antimony		X			
Barium		X			
Boron	X	X			
Cadmium	X	X			
Copper		X		X	
Fluoride				X	
Lead	X	X			
Mercury	X	X			
Nitrate				X	
Silver	X	X			
Thallium	X	X		X	
Zinc	X	X			
VOCs					
1,1,1-Trichloroethane	X	X			X
1,1,2-Trichloro-1,2,2-trifluoroethane	X	X			X
1,1-Dichloroethane				X	
1,1-Dichloroethene	X	X			X
1,2-Dichloroethane				X	
2-Butanone	X	X			
Acetone	X	X		X	
Benzene	X	X		X	X
Carbon disulfide				X	
Chloromethane			X	X	
cis-1,2-Dichloroethene			X	X	
Ethylbenzene	X	X			X
m,p-Xylene	X	X			X
Methylene chloride	X	X		X	X
o-Xylene	X	X			X
p-Isopropyltoluene	X	X			X
Toluene	X	X		X	X
Trichloroethene	X	X	X	X	X
Xylenes (total)	X	X			X
SVOCs					
1-Methylnaphthalene	X	X			
2-Methylnaphthalene	X	X			
Acenaphthene	X	X			
Acenaphthylene	X	X			
Anthracene	X	X			
Benzo(a)anthracene	X	X			
Benzo(a)pyrene	X	X			
Benzo(b)fluoranthene	X	X			
Benzo(e)pyrene	X	X			
Benzo(g,h,i)perylene	X	X			
Benzo(k)fluoranthene	X	X			
Chrysene	X	X			
Dibenz(a,h)anthracene	X	X			
Fluoranthene	X	X			
Fluorene	X	X			
Indeno(1,2,3-cd)pyrene	X	X			
Naphthalene	X	X			
Perylene	X	X			
Phenanthrene	X	X			
Pyrene	X	X			

Table A2.4-1 (2 of 2)

Chemicals of Potential Concern for Human Health
Old Conservation Yard RFI Site

Chemical	Soil (0 to 2 feet bgs)	Soil (0 to 10 feet bgs)	RFI Site Chatsworth Formation Groundwater (a)	Group 6 Reporting Area Chatsworth Formation Groundwater (a)	Soil Vapor
Total Petroleum Hydrocarbons					
C08-C11(Gasoline Range)	X	X			
C11-C14(Kerosene Range)	X	X			
C14-C20(Diesel Range)	X	X	X	X	
C20-C30(Lubricant Oil Range)	X	X			
C22-C40 (Heavy Oil)	X	X			
Dioxins					
2,3,7,8-TCDD	X	X			
1,2,3,7,8-PeCDD	X	X			
1,2,3,4,7,8-HxCDD	X	X			
1,2,3,6,7,8-HxCDD	X	X			
1,2,3,7,8,9-HxCDD	X	X			
1,2,3,4,6,7,8-HpCDD	X	X			
OCDD	X	X			
2,3,7,8-TCDF	X	X			
1,2,3,7,8-PeCDF	X	X			
2,3,4,7,8-PeCDF	X	X			
1,2,3,4,7,8-HxCDF	X	X			
1,2,3,6,7,8-HxCDF	X	X			
2,3,4,6,7,8-HxCDF	X	X			
1,2,3,7,8,9-HxCDF	X	X			
1,2,3,4,6,7,8-HpCDF	X	X			
1,2,3,4,7,8,9-HpCDF	X	X			
OCDF	X	X			
PCBs					
Aroclor-1248	X	X			
Aroclor-1254	X	X			
Aroclor-1260	X	X			
PCB-105	X	X			
PCB-114	X	X			
PCB-118	X	X			
PCB-123	X	X			
PCB-126	X	X			
PCB-156	X	X			
PCB-157	X	X			
PCB-167	X	X			
PCB-169	X	X			
PCB-189	X	X			
PCB-77	X	X			
PCB-81	X	X			

Notes:
VOC - volatile organic compound
SVOC - semi-volatile organic compound
PCBs - polychlorinated biphenyls
COPC - chemical of potential concern
bgs - below ground surface
x - chemical selected as COPC
(a) Only Chatsworth Formation groundwater is considered in the risk assessment because near-surface groundwater is localized (does not occur at the OCY RFI site or does not meet State Water Resources Control Board yield requirements.

Table A2.4-2 (Page 1 of 1)

Human Health Risk Estimates[1]
Old Conservation Yard RFI Site

Receptor	Soil Media[2]				Groundwater[3]				Total for Site Media			
	HI Range	CD[4]	Risk Range	CD	HI Range	CD	Risk Range	CD	HI Range	CD	Risk Range	CD
Adult Worker	0.036 - 0.78		6E-05 - 1E-02	a, b, c, d, g	<0.001 - <0.001		4E-10 - 3E-09		0.036 - 0.78		6E-05 - 1E-02	a, b, c, d, e, g
Future Adult Recreator	0.0042 - 0.44		7E-06 - 6E-03	a, b, c, d	<0.001 - <0.001		5E-12 - 2E-11		0.0042 - 0.44		7E-06 - 6E-03	a, b, c, d
Future Child Recreator	0.082 - 1.4		9E-05 - 5E-03	a, b, c, d	<0.001 - <0.001		2E-11 - 1E-10		0.082 - 1.39	b	9E-05 - 5E-03	a, b, c, d, e
Future Adult Resident	0.06 - 0.70		1E-04 - 8E-03	a, b, c, d, e, f, g, h	1.4 - 2.2	f	8E-07 - 3E-06	f	1.5 - 2.9	f	1E-04 - 8E-03	a, b, c, d, e, f, g, h
without domestic use of groundwater[5]	NA NA		NA NA		<0.001 - <0.001		1E-09 - 9E-09		0.058 - 0.70		1E-04 - 8E-03	a, b, c, d, e, f, g
Future Child Resident	0.62 - 5.5	c	7E-04 - 2E-02	a, b, c, d, e, f, g, h	4.9 - 8.2	f	2E-06 - 3E-06	f	5.5 - 13.7	c,f	7E-04 - 2E-02	a, b, c, d, e, f, g, h
without domestic use of groundwater[5]	NA NA		NA NA		<0.001 - <0.001		4E-09 - 6E-09		0.62 - 5.5	c	7E-04 - 2E-02	a, b, c, d, e, f, g

Notes:

1. Risk estimates shown are a sum of all exposure pathways per media; the range reported is for the central tendency and reasonable maximum exposures, respectively.
2. Soil media risk estimates are a sum of all direct and indirect exposure so site soil and soil vapor.
3. Groundwater media risk estimates are a sum of indirect and direct exposure to site groundwater, except where indicated that direct exposure due to domestic groundwater use is excluded..
4. Chemical risk drivers are those COPCs detected onsite with an HI > 1, risk > $1x10^{-6}$. Only major risk contributors listed if cumulative HI >> 1 or cancer risk >> $1x10^{6}$.
5. Groundwater media risk estimates are for indirect exposure only and assume no domestic use of groundwater.

a = Aroclor 1248
b = Aroclor 1260
c = Aroclor 1254
d = Dioxins
e = Benzo(a)Pyrene
f = Trichloroethene
g = Methylene chloride
h = Benzene
CD = Chemical risk driver
COPC = Chemical of potential concern
HI = Hazard index
NA = Not Applicable

Table A2.4-3 (1 of 1)

Human Health Risk Assessment Uncertainty Analysis
Old Conservation Yard RFI Site

Assessment Element	Uncertainty	Magnitude of Impact	Direction of Impact
COPC Selection	A number of inorganics (e.g., antimony, barium, copper) that were demonstrated to be consistent with background concentrations through Wilcoxon Rank Sum test were included as COPCs because the maximum detected concentrations were substantially above the maximum detected background concentration, and were located in areas of suspected metals impacts.	Moderate	Conservative
Exposure Pathways	Risks associated with drinking of groundwater are not realistic because the groundwater beneath the SSFL is not currently used as a drinking water source and the presence of the contamination will likely require a restriction on its future use as well.	High	Conservative
	Groundwater monitoring data and comparison concentrations (i.e., background) are filtered samples (i.e., dissolved concentrations) as per agency-approved groundwater monitoring work plan. Although dissolved concentrations represent the concentrations that may migrate, the total concentration in groundwater may be greater when there are significant amount of suspended solids present (i.e., total concentration).	Moderate	Realistic
	Future land use of the site is currently undecided but may be commercial or recreational, which have lower risks than residential.	Moderate	Uncertain
EPC Calculations	The extrapolation of soil TPH concentrations to individual petroleum constituent (i.e., PAHs) concentrations introduces some uncertainty into the EPC estimates for petroleum constituents.	Low	Conservative
	In cases where BTEX compounds (e.g., benzene) were not detected but were extrapolated, the estimated EPC is considered conservative.	Low	Conservative
	The extapolation of soil TPH concentrations to individual petroleum constituent (i.e., BTEX), extrapolations were conducted on a dataset containing elevated detection limits. Therefore, the estimated EPCs are considered conservative.	Moderate	Conservative
	Soil matrix COPC methylene chloride, significant risks are estimated associated with vapor concentrations related to 1/2 the DL though the chemical was not detected in soil vapor.	Low	Conservative
	The 95% UCL concentration of some chemicals is greater than the maximum concentratio therefore the maximum was used as the EPC. This is considered to be a likely overestimation of the representative exposure point concentration because samples were collected in areas with the highest likelihood to detect the highest concentrations at the site.	Moderate	Conservative
	The maximum detected concentration of each COPC detected in groundwater was used as the EPC.	Moderate	Conservative
	Vapor migration into indoor air has been estimated using a model which is being validated for the site. Migration estimates may be changed once the model validation is complete.	Moderate	Uncertain
Cancer Slope Factor	Extrapolation of dose-response data from laboratory animals to humans.	High	Conservative
	Assumes that all carcinogens do not have a threshold below which carcinogenic response occurs, and therefore, any dose, no matter how small, results in some potential risk.	Moderate	Conservative
	Cancer slope factors derived from animal studies are the upper-bound maximum likelihood estimates based on a linear dose-response curve, and therefore, overstate carcinogenic potency.	Moderate	Conservative
Reference Dose	High degree of uncertainty in extrapolation of dose-response data from laboratory animals to humans.	High	Conservative

Notes:

COPC - chemical of potential concern
PAH - polycyclic aromatic hydrocarbon
TPH - total petroleum hydrocarbons
BTEX - benzene, toluene, ethylbenzene, and xylenes
EPC - exposure point concentration
UCL - upper confidence limit
HRA - human health risk assessment
DL - detection limit

Table A2.4-4 (1 of 2)

Summary of Chemicals of Potential Ecological Concern
Old Conservation Yard RFI Site

Chemical	Soil 0 to 2 feet bgs	Soil 0 to 4 feet bgs	Soil 0 to 6 feet bgs	Soil Vapor 0 to 6 feet bgs
Inorganic Compounds				
Antimony	X	X	X	
Barium	X	X	X	
Boron	X	X	X	
Cadmium	X	X	X	
Copper			X	
Lead	X	X	X	
Mercury	X	X	X	
Silver	X	X	X	
Thallium	X	X	X	
Zinc	X	X	X	
VOCs				
1,1,1-Trichloroethane	X	X	X	X
1,1,2-Trichloro-1,2,2-trifluoroethane	X	X	X	X
1,1-Dichloroethene	X	X	X	X
2-Butanone	X	X	X	
Acetone	X	X	X	
Benzene	X	X	X	X
Ethylbenzene	X	X	X	X
m,p-Xylene	X	X	X	X
Methylene chloride	X	X	X	X
o-Xylene	X	X	X	X
p-Isopropyltoluene	X	X	X	X
Toluene	X	X	X	X
Trichloroethene	X	X	X	X
Xylenes (total)	X	X	X	X
SVOCs				
1-Methylnaphthalene	X	X	X	
2,4-Dinitrophenol	X	X	X	
2-Methylnaphthalene	X	X	X	
Acenaphthene	X	X	X	
Acenaphthylene	X	X	X	
Anthracene	X	X	X	
Benzo(a)anthracene	X	X	X	
Benzo(a)pyrene	X	X	X	
Benzo(b)fluoranthene	X	X	X	
Benzo(e)pyrene	X	X	X	
Benzo(g,h,i)perylene	X	X	X	
Benzo(k)fluoranthene	X	X	X	
Chrysene	X	X	X	
Dibenz(a,h)anthracene	X	X	X	
Fluoranthene	X	X	X	
Fluorene	X	X	X	
Indeno(1,2,3-cd)pyrene	X	X	X	
Naphthalene	X	X	X	
Perylene	X	X	X	
Phenanthrene	X	X	X	
Pyrene	X	X	X	
Total Petroleum Hydrocarbons				
C08-C11(Gasoline Range)	X	X	X	
C11-C14(Kerosene Range)	X	X	X	
C14-C20(Diesel Range)	X	X	X	
C20-C30(Lubricant Oil Range)	X	X	X	
Dioxins				
2,3,7,8-TCDD	X	X	X	
1,2,3,7,8-PeCDD	X	X	X	
1,2,3,4,7,8-HxCDD	X	X	X	
1,2,3,6,7,8-HxCDD	X	X	X	
1,2,3,7,8,9-HxCDD	X	X	X	
1,2,3,4,6,7,8-HpCDD	X	X	X	

Table A2.4-4 (2 of 2)

Summary of Chemicals of Potential Ecological Concern
Old Conservation Yard RFI Site

Chemical	Soil 0 to 2 feet bgs	Soil 0 to 4 feet bgs	Soil 0 to 6 feet bgs	Soil Vapor 0 to 6 feet bgs
OCDD	X	X	X	
2,3,7,8-TCDF	X	X	X	
1,2,3,7,8-PeCDF	X	X	X	
2,3,4,7,8-PeCDF	X	X	X	
1,2,3,4,7,8-HxCDF	X	X	X	
1,2,3,6,7,8-HxCDF	X	X	X	
2,3,4,6,7,8-HxCDF	X	X	X	
1,2,3,7,8,9-HxCDF	X	X	X	
1,2,3,4,6,7,8-HpCDF	X	X	X	
1,2,3,4,7,8,9-HpCDF	X	X	X	
OCDF	X	X	X	
PCBs				
Aroclor-1248	X	X	X	
Aroclor-1254	X	X	X	
Aroclor-1260	X	X	X	
PCB-105	X	X	X	
PCB-114	X	X	X	
PCB-118	X	X	X	
PCB-123	X	X	X	
PCB-126	X	X	X	
PCB-156	X	X	X	
PCB-157	X	X	X	
PCB-167	X	X	X	
PCB-169	X	X	X	
PCB-189	X	X	X	
PCB-77	X	X	X	
PCB-81	X	X	X	

Notes:
VOC - volatile organic compound
SVOC - semi-volatile organic compound
PCB - polychlorinated biphenyl
CPEC - chemical of potential ecological concern
bgs - below ground surface
x - chemical selected as CPEC

Table A2.4-5 (Page 1 of 1)

Risk Estimates for Ecological Receptors
Old Conservation Yard RFI Site

Receptor	Total for Site Media (Soil Only)	
	HI Range[1]	CD[2]
Deer Mouse	>1000 - >1000	Aroclor-1248, Aroclor-1260, Aroclor-1254, Dioxins, Antimony, Lead, Barium, Cadmium, 1,1-Dichloroethene, Methylene Chloride
without inhalation pathway	>1000 - >1000	Aroclor-1248, Aroclor-1260, Aroclor-1254, Dioxins, Antimony, Lead, Barium, Cadmium
Thrush	304 - 466	Aroclor-1260, Lead, Cadmium, Aroclor-1254, Mercury, Zinc, 2,3,7,8-TCDF, Barium, 2,4-Dinitrophenol, Phenanthrene
Hawk	98 - 143	Lead, Aroclor-1260, 2,4-Dinitrophenol, Zinc, Aroclor-1254
Using Large Home Range Factor3	4.9 - 7.1	Lead, Aroclor-1260
Bobcat	>1000 - >1000	Aroclor-1248, Aroclor-1260, 1,2,3,7,8-PeCDD, Aroclor-1254
Using Large Home Range Factor3	14 - 153	Aroclor-1248
Mule Deer	>1000 - >1000	Aroclor-1248, Aroclor-1260, Dioxins, Cadmium, Aroclor-1254, Lead, Antimony
Using Large Home Range Factor3	104 - >1000	Aroclor-1248, Aroclor-1260

Notes:

1. HI Range is the sum of the hazard quotients for all exposure pathways; the range reported is for the mean and 95% upper confidence limit estimates, respectively.

2. Chemical risk drivers are those CPECs detected onsite with an HQ > 1, or major risk contributors if cumulative HIs >> 1. "None" indicates that no chemical's HQs > 1.

3. The HIs for hawk, mule deer, and bobcat assume that their home ranges are equal to the RFI site acreage. This is an extremely conservative assumption; RFI site acreage is typically only a small fraction of a large animal's home range. The estimated HIs decrease to the values indicated above if an adjustment is made to reflect a more realistic home range for these receptors.

CD = Chemical risk driver
CPEC = Chemical of potential ecological concern
HI = Hazard index
HQ = Hazard Quotient

Table A2.4-6 (1 of 1)

Ecological Risk Assessment Uncertainty Analysis
Old Conservation Yard RFI Site

Assessment Element	Uncertainty	Magnitude of Impact	Direction of Impact
CPEC Selection	A number of inorganics (e.g., antimony, barium, copper) that were demonstrated to be consistent with background concentrations through Wilcoxon Rank Sum test were included as CPECs because the maximum detected concentrations were substantially above the maximum detected background concentration, were located in suspected areas of metals impacts and in some cases SQLs were above ESLs.	Moderate	Conservative
EPC Calculations	The extapolation of soil TPH concentrations to individual petroleum constituent (i.e., PAHs) concentrations introduces some uncertainty into the EPC estimates for petroleum constituents. Because several samples collected for SVOCs did not detect PAHs, the uncertainty associated with this procedure is low.	Low	Conservative
	The extapolation of soil TPH concentrations to individual petroleum constituent (i.e., BTEX), extrapolations were conducted on a dataset containing elevated detection limits. Therefore, the estimated EPC is considered very conservative.	Moderate	Conservative
	The 95% UCL concentration of some chemicals is greater than the maximum concentration, therefore the maximum was used as the EPC. This is considered to be likely overestimation of the representative exposure point concentration because samples were collected in areas with the highest likelihood to detect the highest concentrations at the site.	Moderate	Conservative
	Soil matrix CPEC methylene chloride, significant risks are estimated associated with vapor concentrations related to 1/2 the DL though the chemical was not detected in soil vapor.	Low	Conservative
	Estimation of soil vapor concentrations overstates actual burrow concentrations: 1. Model is conservative 2. Air flow in burrows is not accounted for	Moderate	Conservative
Toxicity Reference Value	High degree of uncertainty in extrapolation of dose-response data from laboratory animals to representative receptors.	High	Conservative
	Avian toxicity values are only available for a limited number of chemicals. For the types of chemicals observed at the OCY RFI site, there is likely little difference in the degree of toxicity between mammals and avian species.	Low	Not conservative
	Use of short-term (acute) toxicity data to estimate chronic toxicity values are highly uncertain.	High	Conservative

Notes:
CPEC - chemical of potential ecological concern
UCL - upper confidence limit
PAH - polycyclic aromatic hydrocarbon
EPC - exposure point concentration
bgs - below ground surface
TPH - total petroleum hydrocarbons
SVOC - semivolatile organic chemicals
BTEX - benzene, toluene, ethylbenzene, and xylenes
SQL - sample quantitation limit
ESL - ecological screening level

Table A2.5-1 (Page 1 of 2)
Surficial Media Site Action Recommendations
OCY RFI Site

Area	Associated Chemical Use Area(s)	CMS Area[1] (Figure 7-1)	Recommended for Further Consideration in CMS Based On:			
			Residential Receptor[2]	Industrial Receptor[2]	Recreational Receptor[2]	Ecological Receptor[2]
Southwest Corner of Rocketdyne Conservation Yard	1a	OCY 1-1	--	--	--	Phenanthrene; 2,4-dinitrophenol[3]
Atomics International Conservation Yard	1b	OCY 1-2	PAHs (as TPH)[4], PCBs	PAHs (as TPH)[4], PCBs	PAHs (as TPH)[4], PCBs	PCBs
Northern Storage Area (downslope drainage areas)	1c	OCY 1-3 (stabilization)	PAHs, PCBs	PAHs, PCBs	PAHs, PCBs	--
Northern Storage Area (upper flat portion)	1c	OCY 1-4 (stabilization)	PAHs, PCBs	PAHs, PCBs	PAHs, PCBs	--
Container Storage Area	1d	--	--	--	--	--
Former AST 732 and Earthen Berm	2a	--	--	--	--	--
Former AST 732 and Earthen Berm	2b	--	--	--	--	--
Former Fuel Spill Excavation	3	OCY 3-1	Methylene chloride, Benzene (as TPH)[5]	Methylene chloride	--	Methylene chloride; 2,4-dinitrophenol[3]
SRE Pipeline Discharge Area	4	OCY 4-1 (stabilization)	Dioxins	Dioxins	Dioxins	Dioxins
Telephone Pole Storage Area	5	OCY 5-1 (stabilization	Dioxins	Dioxins	Dioxins	2,4-dinitrophenol[3], dioxins
Northern/ Southern Debris Areas (soil to approx. 5 feet bgs)	6a, 6b	OCY 6-1 (stabilization)	PAHs, PCBs, dioxins	PAHs, dioxins	PAHs, dioxins	PCBs, dioxins, 2,4-dinitrophenol[3], Metals (antimony, cadmium, copper, lead, silver, thallium, vanadium, zinc)
Soil Downslope of Northern/ Southern Debris Areas (to approx. 2 feet bgs)	6a, 6b	OCY 6-2 (stabilization)	PAHs, PCBs, dioxins	PAHs, PCBs, dioxins	PAHs, dioxins	PCBs, dioxins, Metals (cadmium, lead, silver, vanadium, zinc)
Southeast Drainage	6a, 6b	OCY 6-3	Dioxins	--	--	Dioxins, silver
North Slope Debris Area A	6c	OCY 6-4 (stabilization)	PCBs	PCBs	PCBs	PCBs
North Slope Debris Area B	6d	OCY 6-5	PCBs	PCBs	PCBs	PCBs, Metals (lead)
Transformer Area in SE OCY	7a	OCY 7-1	--	--	--	PCBs
Transformer Area in SW OCY	7b	--	--	--	--	--
Transformer Area 737	7c	OCY 7-2	PCBs	PCBs	PCBs	PCBs

Table A2.5-1 (Page 2 of 2)
Surficial Media Site Action Recommendations
OCY RFI Site

Area	Associated Chemical Use Area(s)	CMS Area[1] (Figure 7-1)	Recommended for Further Consideration in CMS Based On:			
			Residential Receptor[2]	Industrial Receptor[2]	Recreational Receptor[2]	Ecological Receptor[2]
Transformer Area in South OCY	7d	--	--	--	--	--
Transformer Area near SRE	7e	--	--	--	--	--
Low Spot[7]	8	OCY 8-1 (stabilization)	PAHs, PCBs, Dioxins	PAHs, PCBs, Dioxins	PAHs, PCBs, Dioxins	PAHs, PCBs, Dioxins, Metals (aluminum, barium, cadmium, lead, mercury, silver, zinc)
Asphalt-lined drainage downslope of Low Spot	8	OCY 8-2	Samples collected above liner in drainage not included in risk assessment (i.e. contained unit). Sediments recommended for removal as part of facility maintenance activities based on concentrations similar to and downgradient of OCY CMS Area 8-1 (SVOCs, TPH, PCBs, dioxins, lead, mercury, and zinc).			
Groundwater	N/A	--	• Indirect groundwater risks insignificant, do not affect surficial media CMS decisions • Direct groundwater risks > 1 x 10^{-6} may affect surficial media CMS decisions	• Indirect groundwater risks insignificant, do not affect surficial media CMS decisions • No direct use of groundwater	• Indirect groundwater risks insignificant, do not affect surficial media CMS decisions • No direct use of groundwater	• Indirect groundwater risks insignificant, do not affect surficial media CMS decisions • No direct use of groundwater

General Notes:

(a) -- Indicates area is recommended for No Further Action (NFA) for respective receptor, or parameter not applicable.

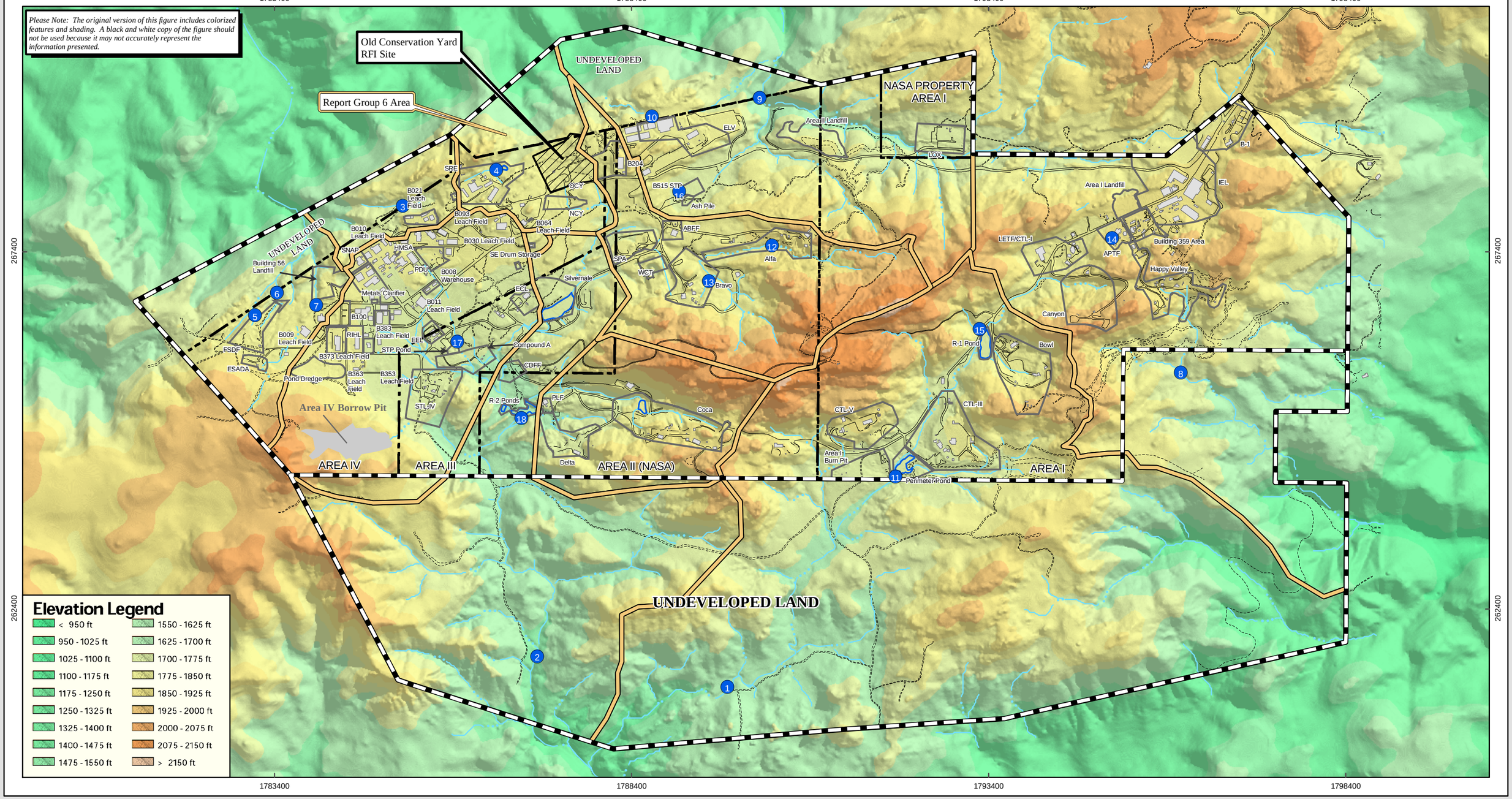
(b) PAHs are included in SVOC analytical methods, and are referenced specifically in this table where prominent as risk drivers/contributors apart from other SVOCs (e.g. phthalates, 2,4-dinitrophenol).

Footnotes:

1. CMS Areas are numbered in sequence based on associated Chemical Use Areas (e.g. 14-1, 14-2, for Chemical Use Area 14). Extent of CMS Areas shown on Figures 4-1 through 4-6 and 7-1 are approximate and reflect site action recommendations based on characterization and risk assessment results inclusive for all receptors (See Section 7.2).
2. CMS recommendations are based on compounds considered risk drivers (excess cancer risk > 1 x 10^{-6}) or hazard index > 1) and/or significant risk contributors.
3. 2,4-dinitrophenol was not detected at OCY; however, elevated laboratory detection limits were reported and contribute to estimated risk.
4. Detected PAHs do not contribute significantly to risk; CMS recommendation is based on extrapolated PAHs concentrations based on detected diesel-, kerosene-, and lubricant-oil range petroleum hydrocarbons.
5. Benzene was not detected; CMS recommendation is based on extrapolated benzene concentrations based on detected gasoline-range petroleum hydrocarbons.
6. A portion of the OCY Low Spot drainage is asphalt-lined, and sediments above the liner are recommended for removal as part of facility maintenance activities.

ACRONYMS
CMS = Corrective Measures Study
NFA = No further action
OCY = Old Conservation Yard
PAH = Polynuclear aromatic hydrocarbons
PCB = polychlorinated biphenyls
SVOC = Semivolatile organic compound
SWMU = Solid Waste Management Unit

FIGURES



N

0 1,300
FEET

MAP COORDINATES IN STATEPLANE, NAD 27, ZONE V

RFI SITES

AREA I
SWMU 4.1 - B-1 Area
SWMU 4.2 - Area I Landfill
SWMUs 4.3, 4.4 and AOC - Instrument and Equipment Laboratories (IEL)
SWMU 4.5, 4.6 - LOX Plant Former Sump/Clarifier and Drum Disposal Area
SWMU 4.7 - Component Test Laboratory III (CTL-III) Area
SWMU 4.8 - Area I Burn Pit
SWMU 4.9, AOC - Advanced Propulstion Test Facility (APTF) Area
SWMU 4.12 - Laser Engineering Test Facility (LETF)/Component Test Lab I (CTL-I) Area
SWMU 4.14 - Canyon Area
SWMU 4.15 and AOC - Bowl Area and Building 901 Leachfield
SWMU 4.16 - Area I Reservoir (R-1 Pond)
SWMU 4.17 - Perimeter Pond
AOC - Building 359 Sump
AOC - Happy Valley Area

AREA II
SWMU 5.1 - Area II Landfill
SWMU 5.2 - ELV Final Assembly, Building 206
SWMU 5.5 and AOC - Building 204 Area
SWMU 5.6 - Former Incinerator Ash Pile
SWMU 5.7 - Hazardous Waste Storage Area Waste Coolant Tank (WCT)
SWMU 5.9, 5.10, 5.11 - Alfa Area
SWMU 5.12, 5.13, 5.14, 5.15 - Alfa/Bravo Skim Pond and Bravo Area
SWMU 5.18, 5.19 - Coca Area
SWMU 5.20, 5.21, 5.22 - Propellant Load Facility (PLF)
SWMU 5.23 - Delta Area
SWMU 5.26 - R-2A and R-2B Ponds
AOC - Building 515 Sewage Treatment Plant
AOC - Storable Propellant Area (SPA)
AOC - Alfa/Bravo Fuel Farm
AOC - Coca/Delta Fuel Farm

AREA III
SWMUs 6.1, 6.3, AOC - Engineering Chemistry Laboratory (ECL) Area
SWMU 6.4 Compound A Facility
SWMU 6.5 Systems Test Laboratory IV (STL-IV) Area
SWMU 6.8 - Silvernale Reservoir
SWMU 6.9 - Environmental Effects Laboratory (EEL)
AOC - Sewage Treatment Plant (STP) Pond Area

AREA IV
SWMU 7.1 - Building 56 Landfill
SWMU 7.3 - Former Sodium Disposal Facility (FSDF)
SWMU 7.4 - Old Conservation Yard (OCY)
SWMU 7.5 - Building 100 Trench
SWMU 7.6 - Radioactive Materials Handling Facility (RMHF)

AREA IV (cont)
SWMU 7.7 - Rockwell International Hot Laboratory (RIHL)
SWMU 7.8 - New Conservation Yard (NCY)
SWMU 7.9 - ESADA Chemical Storage Area
SWMU 7.10 - Former Coal Gasification PDU
AOC - Former Hazardous Materials Storage Area (HMSA)
AOC - Chemistry Laboratory Metals Clarifier
AOC - Pond Dredge Area
AOC - Sodium Reactor Experiment (SRE) Area
AOC - SE Drum Storage Yard
AOC - SNAP Facility
AOC - Boeing Are IV Leach Fields
AOC - DOE Area IV Leach Fields

Legend
SSFL Property Boundary
Administrative Boundary
Report Group Boundary
RFI Boundary
OCY Boundary
Building
Pond
Drainage
Dirt Road
Road
NPDES Outfall
5

Old Conservation Yard (OCY) RFI Site Location Map

SANTA SUSANA FIELD LABORATORY

Date: Sep 28, 2006

Document: RFI-Report-Group6_OC_RFI_Location.mxd

MWH MONTGOMERY WATSON HARZA

FIGURE A2.1-1

Potential Chemical Use Areas and Sample Locations (South) Old Conservation Yard (SWMU 7.4)

Santa Susana Field Laboratory

MWH MONTGOMERY WATSON HARZA

FIGURE A2.2-1A

Soil Sample Location

- Soil Matrix
- Soil Vapor
- Surface Water

Sample Number
Historical Sample Number
Contained Sample Number

Chemical Use Areas

Solvent, Petroleum, Oil, Transformer, Metal, Debris Areas, Hydrazine, Perchlorate, Screening, Multiple Use

OCY Chemical Use Areas

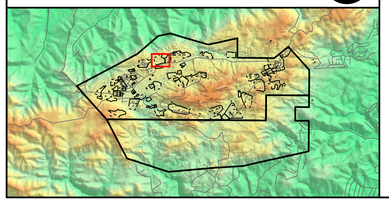
1a Rocketdyne Conservation Yard
1b AI Conservation Yard
1c North Slope Storage Area
1d Container Storage Area
2a AST 732 and Earthen Berm
2b AST 731 and Earthen Berm
3 Fueling Area at Building 320
4 SRE Pipeline Discharge Area
5 Telephone Pole Storage Area
6a Northern Debris Area
6b Southern Debris Area
6c North Slope Debris Area "A"
6d North Slope Debris Area "B"
7a Transformer Area in Southeast OCY
7b Transformer Area in Southwest OCY
7c Transformer Area 737
7d Transformer Area in South OCY
7e Transformer Substation 783
8 Low Spot and Downslope Discharge Area

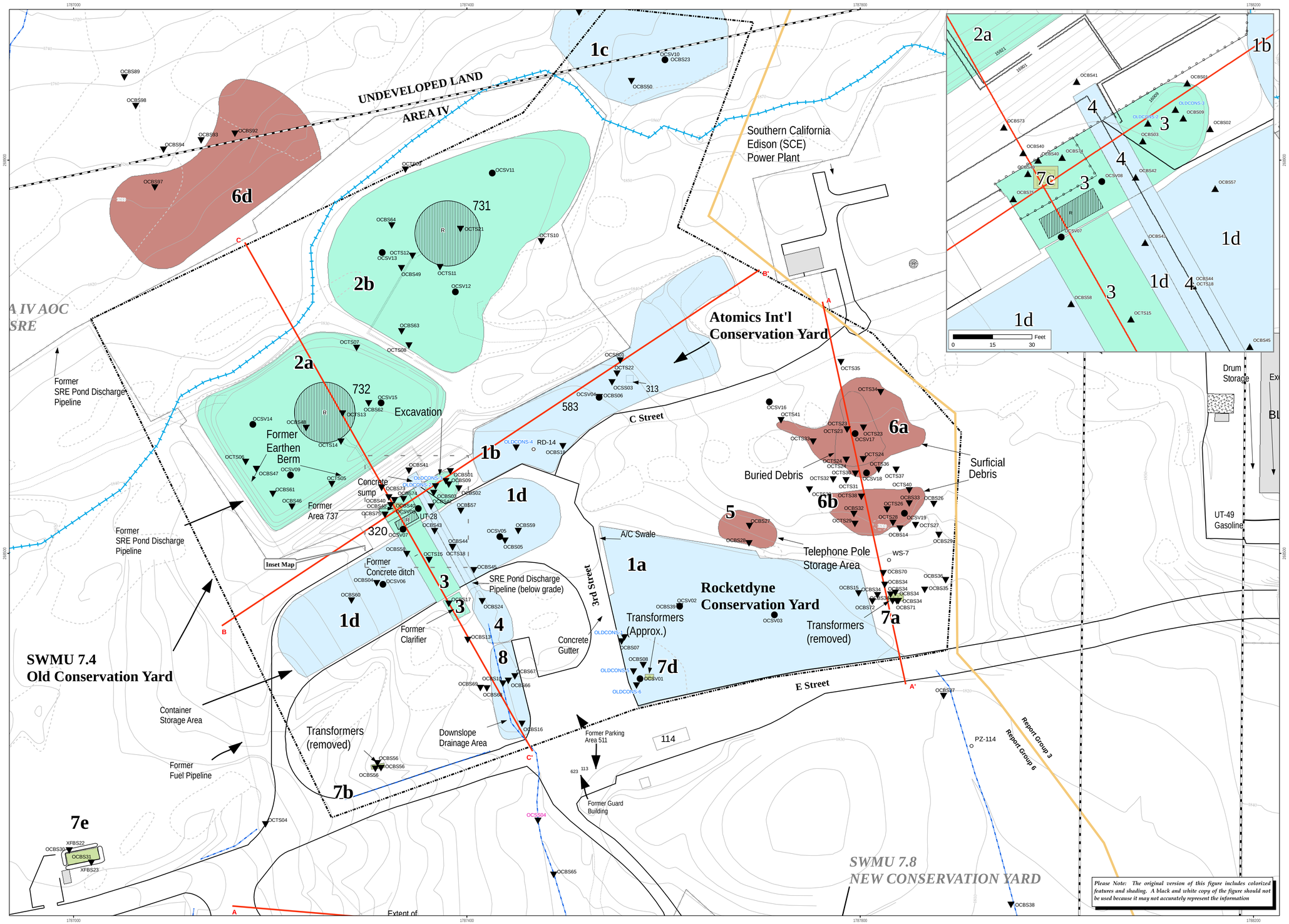
Base Map Legend

Administrative Area Boundary, RFI Boundary, Report Group Boundary, Existing Building or Structure, Removed Building or Structure, Other Tanks, Solvent Tank, Petroleum Fuel/Oil Tank, Hydrazine Tank, Awning, Dirt Road, A/C Curbing, Trench Locations, Fence, Pipe, Leachfield, NPDES Outfall, Well, Pond, Possible Pond, Drainage, Surface Water Divide, Elevation Contour, Rock Outcrop, Cross Section

Date: Sep 29, 2006 Document: RFI-Report-Group6_OC_Chemical_Use_a.mxd

1 inch equals 40 feet 0 40 80 Feet





Potential Chemical Use Areas and Sample Locations (North)
Old Conservation Yard (SWMU 7.4)

Santa Susana Field Laboratory

MWH MONTGOMERY WATSON HARZA

FIGURE A2.2-1B

Soil Sample Location

- ▼ Soil Matrix
- ● Soil Vapor
- Surface Water

Sample Number
Historical Sample Number
Contained Sample Number

Chemical Use Areas

Solvent	Metal	Screening
Petroleum	Debris Areas	Multiple Use
Oil	Hydrazine	
Transformer	Perchlorate	

OCY Chemical Use Areas

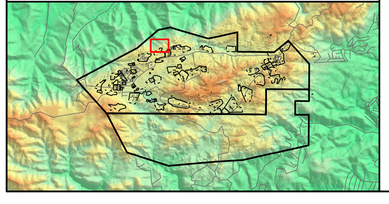
1a Rocketdyne Conservation Yard
1b AI Conservation Yard
1c North Slope Storage Area
1d Container Storage Area
2a AST 732 and Earthen Berm
2b AST 731 and Earthen Berm
3 Fueling Area at Building 320
4 SRE Pipeline Discharge Area
5 Telephone Pole Storage Area
6a Northern Debris Area
6b Southern Debris Area
6c North Slope Debris Area "A"
6d North Slope Debris Area "B"
7a Transformer Area in Southeast OCY
7b Transformer Area in Southwest OCY
7c Transformer Area 737
7d Transformer Area in South OCY
7e Transformer Substation 783
8 Low Spot and Downslope Discharge Area

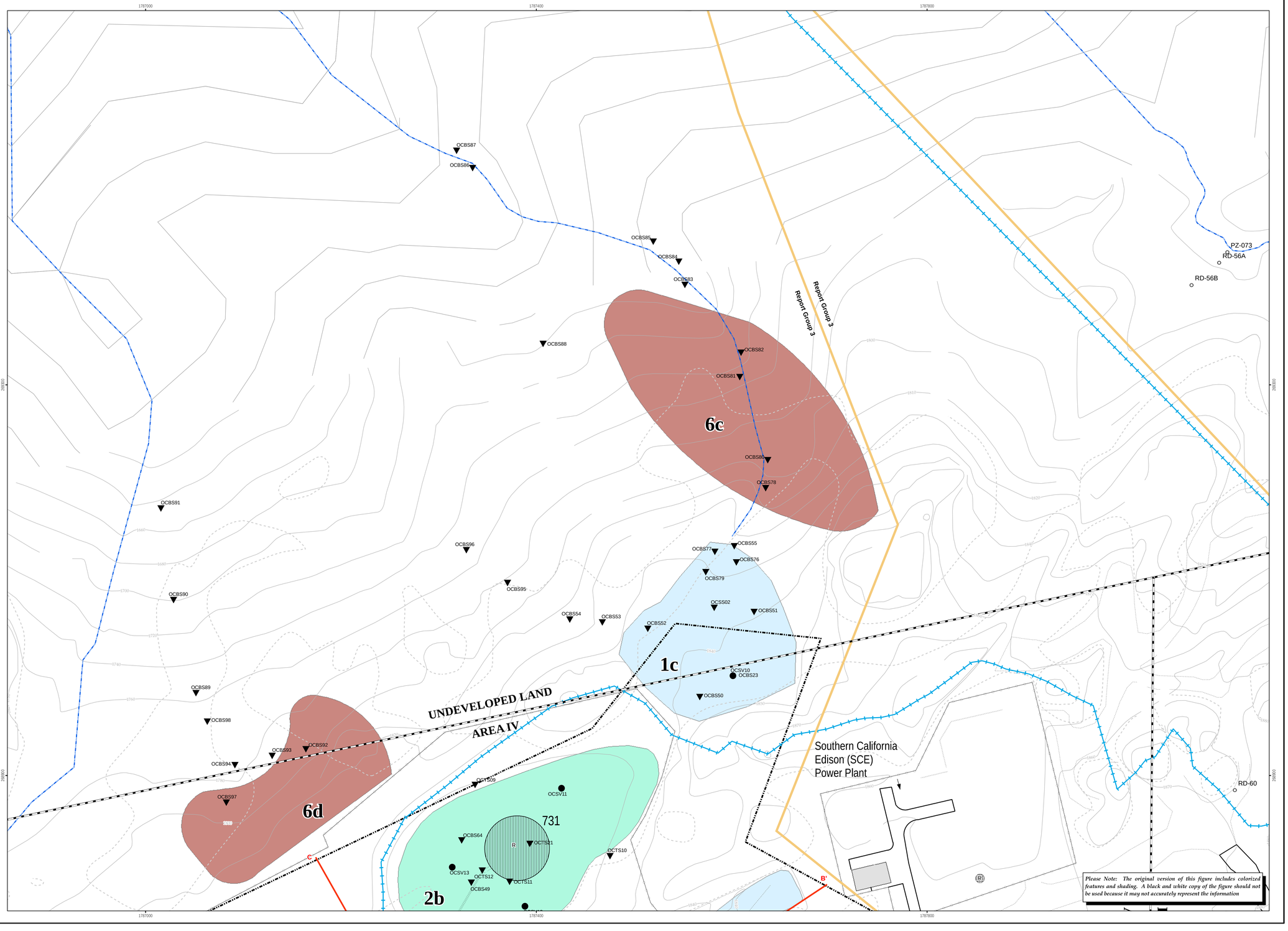
Base Map Legend

- Administrative Area Boundary
- RFI Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Dirt Road
- A/C Curbing
- Trench Locations
- Fence
- Pipe
- Leachfield
- NPDES Outfall
- Well
- Pond
- Possible Pond
- Drainage
- Surface Water Divide
- Elevation Contour
- Rock Outcrop
- Cross Section

Date: Sep 29, 2006 Document: RFI-Report-Group6_OC_Chemical_Use_b.mxd

1 inch equals 40 feet 0 40 80 Feet





Approximate Extent of Earthen Berm Fill Soil
Old Conservation Yard (SWMU 7.4)

Santa Susana Field Laboratory

MWH MONTGOMERY WATSON HARZA

FIGURE A2.2-1C

Soil Fill Area

- Pre 2002 Sample
- Post 2002 Sample
- Eathern Berm Soil Fill Extent (Post 2002, approximately 1' Deep)

Chemical Use Areas

Solvent	Metal	Screening
Petroleum	Debris Areas	Multiple Use
Oil	Hydrazine	
Transformer	Perchlorate	

OCY Chemical Use Areas

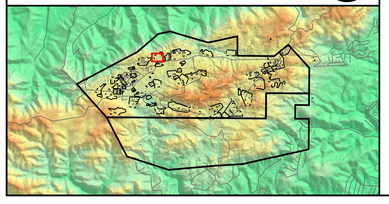
1a Rocketdyne Conservation Yard
1b AI Conservation Yard
1c North Slope Storage Area
1d Container Storage Area
2a AST 732 and Earthen Berm
2b AST 731 and Earthen Berm
3 Fueling Area at Building 320
4 SRE Pipeline Discharge Area
5 Telephone Pole Storage Area
6a Northern Debris Area
6b Southern Debris Area
6c North Slope Debris Area "A"
6d North Slope Debris Area "B"
7a Transformer Area in Southeast OCY
7b Transformer Area in Southwest OCY
7c Transformer Area 737
7d Transformer Area in South OCY
7e Transformer Substation 783
8 Low Spot and Downslope Discharge Area

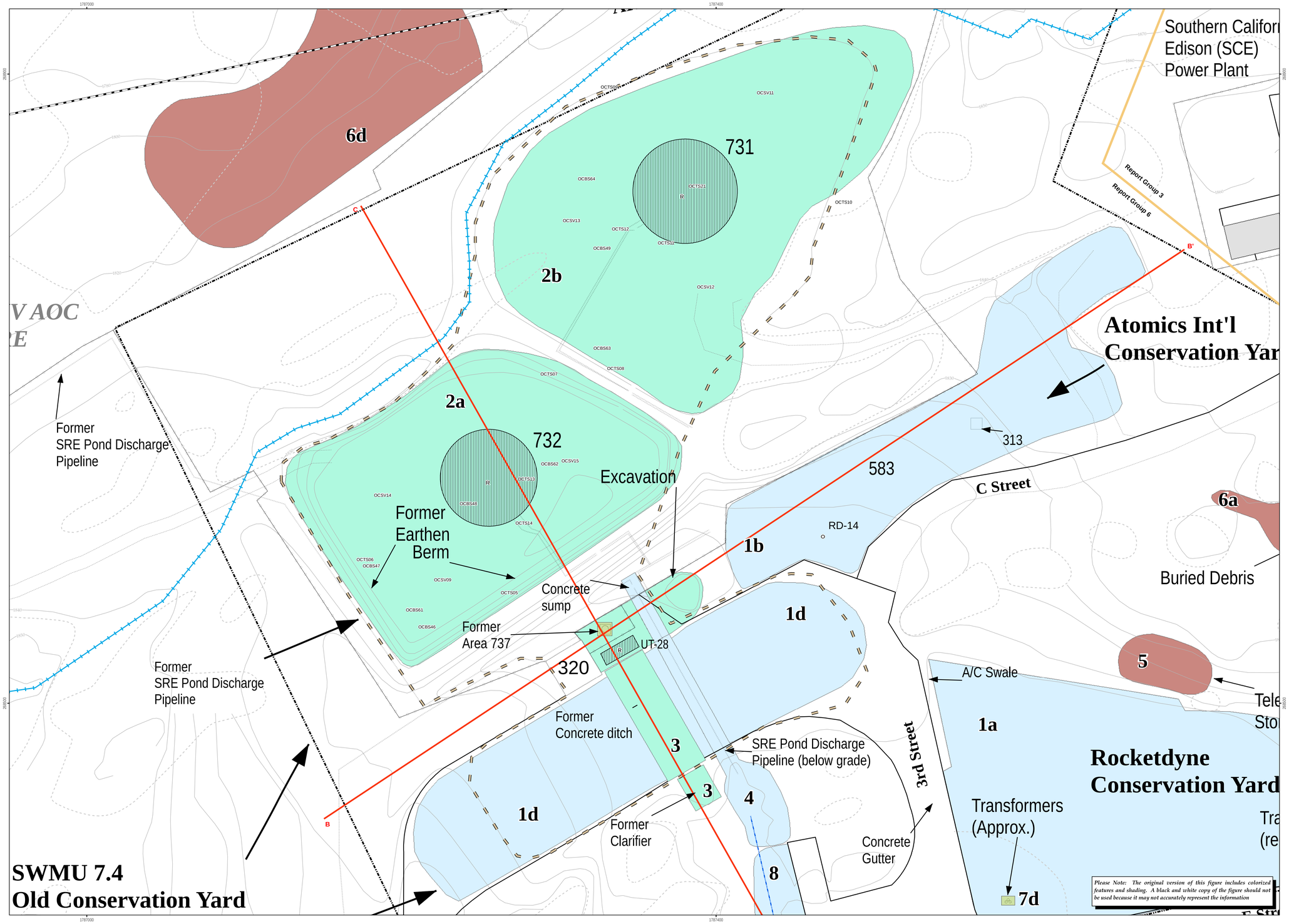
Base Map Legend

Administrative Area Boundary	Fence
RFI Boundary	Pipe
Report Group Boundary	Leachfield
Existing Building or Structure	NPDES Outfall
Removed Building or Structure	Well
Other Tanks	Pond
Solvent Tank	Possible Pond
Petroleum Fuel/Oil Tank	Drainage
Hydrazine Tank	Surface Water Divide
Awning	Elevation Contour
Dirt Road	Rock Outcrop
A/C Curbing	Cross Section
Trench Locations	

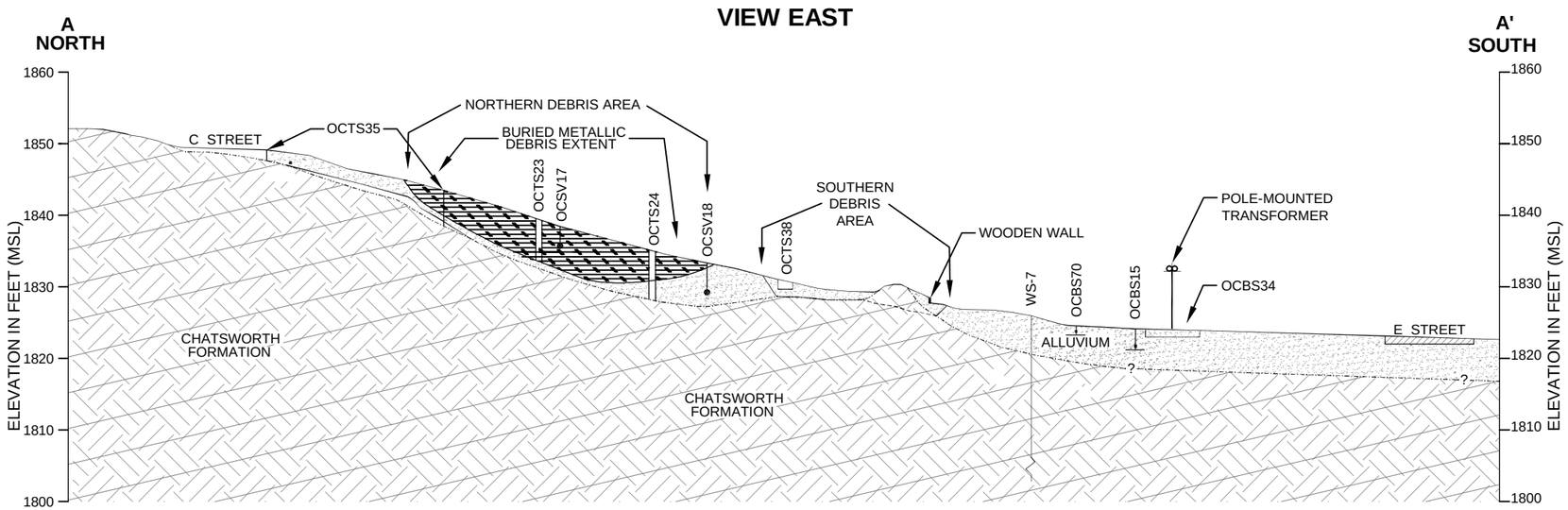
Date: Sep 29, 2006 Document: RFI-Report-Group6_OC_Chemical_Use_c.mxd

1 inch equals 25 feet 0 25 50 Feet





Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information



0 20 40

HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 2X

LEGEND

- EXPLORATORY TRENCH LOCATION
- SOIL VAPOR BORING
- SOIL BORING
- LITHOLOGIC CONTACT
- ASPHALT

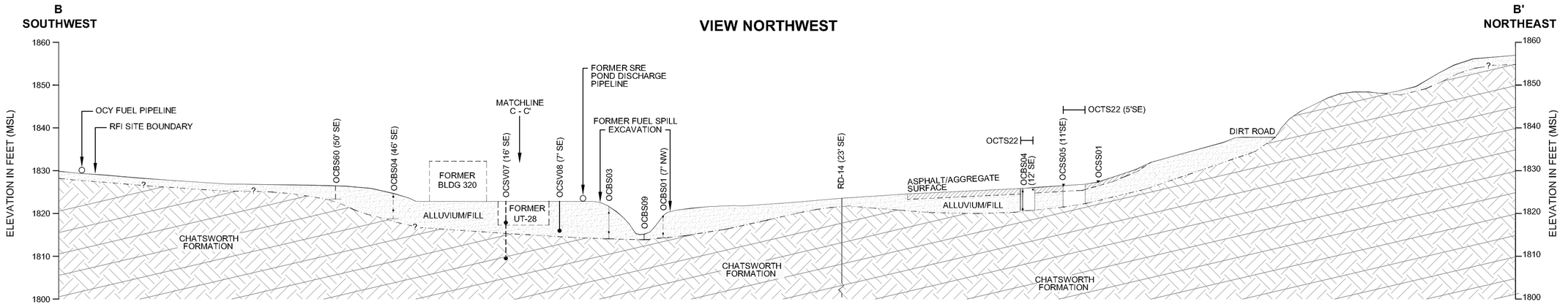
REVISION	DATE

MWH

Surficial Cross-Section A-A'
OCY RFI Site

FIGURE

A2.2-2A



0 20 40

HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 2X

LEGEND

- EXPLORATORY TRENCH LOCATION
- SOIL VAPOR BORING (DASHED WHERE PROJECTED)
- GROUNDWATER WELL
- SOIL BORING (DASHED WHERE PROJECTED)
- (22' NE) PROJECTED DISTANCE IN FEET
- LITHOLOGIC CONTACT (DASHED WHERE APPROXIMATE, QUERIED WHERE UNCERTAIN)
- TAR/ASPHALT

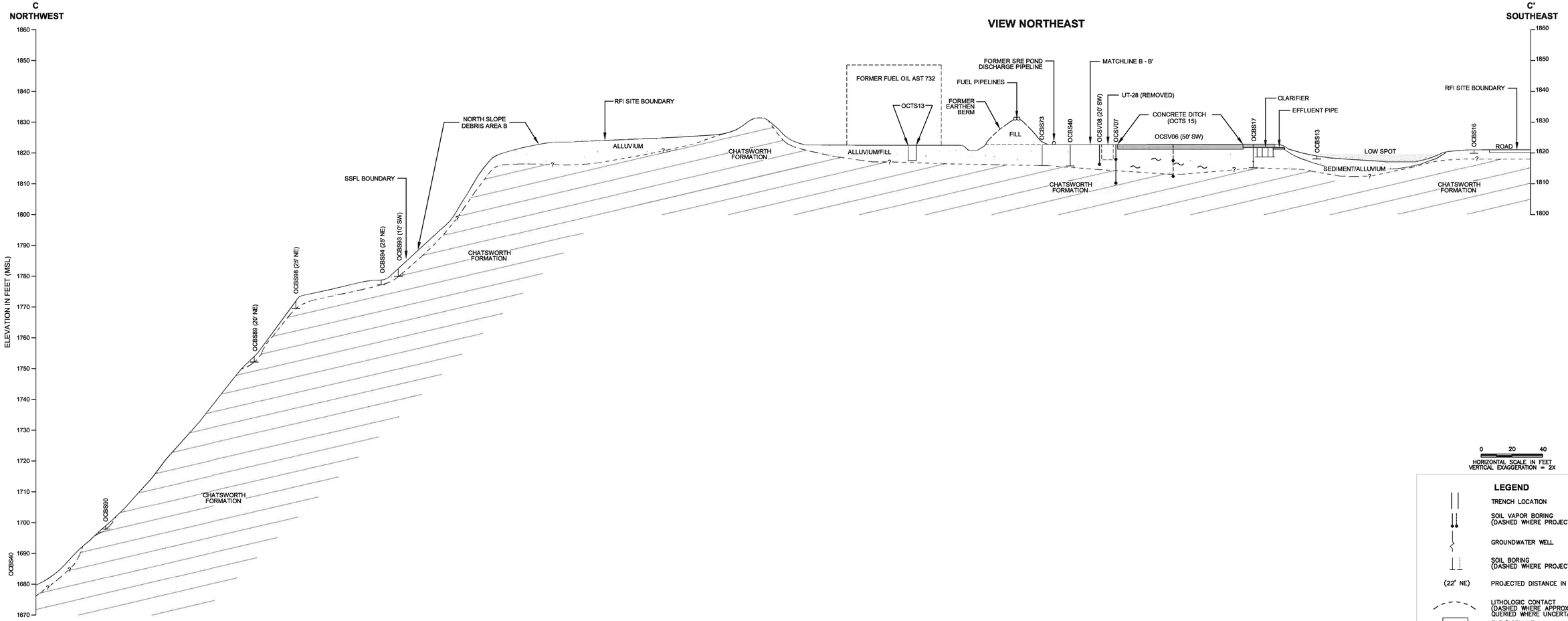
REVISION DATE	

MWH

Surficial Cross-Section B - B'
OCY RFI Site

FIGURE

A2.2-2B



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Surficial Cross-Section C - C'
OCY RFI Site

FIGURE
A2.2-2C

Soil Vapor and Soil Matrix VOC Results
Old Conservation Yard (SWMU 7.4)

Santa Susana Field Laboratory

MWH MONTGOMERY WATSON HARZA

FIGURE A2.3-1

Soil Sample Location Symbol Legend

- Soil sample location with detected VOC
- Soil vapor sample location with detected VOC
- Soil sample location with no detected VOC
- Soil vapor sample location with no detected VOC
- Soil sample location not analyzed for VOC
- Soil vapor sample location not analyzed for VOC
- Contained unit soil sample
- Refused sample (refusal depth < 1' below ground surface)
- Soil Sample not analyzed by any sample method

Comparison Levels

VOCs	Soil Res RBSL (ug/kg)	Soil Eco RBSL (ug/kg)	Vapor Res RBSL (ug/L)	Vapor Eco RBSL (ug/L)
1,1,1-Trichloroethane	490	2800000	640	- -
1,1,2-Trichlorotrifluoroethane	16000	200000	8800	- -
1,1-Dichloroethene	23	12000	58	- -
1,2-Dichloroethane	0.5	76000	0.13	- -
2-Butanone	62000	8200000	1500	- -
4-Isopropyltoluene	- -	- -	- -	- -
Acetone	51000	46000	920	- -
cis-1,2-Dichloroethene	14	74000	10	- -
Methylene chloride	4	27000	2.7	- -
Naphthalene	6000	240000	- -	- -
Tetrachloroethene	0.43	2300	0.45	- -
Toluene	300	2700	110	- -
Trichloroethene	2.2	3200	1.4	- -
Xylenes (total)	150	690000	- -	- -

Note: (ug/kg) = micrograms per kilogram

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Data Date: 082306

Data Box Information

Sample Location ID: OCBS01 | 1.00 | S01 | MH007

- 1.00 — Depth in Feet
- S01 — Sample Number
- MH007 — Lab Reporting Code (EPA ID)

(Historical Sample)

12.05	Detect with sample concentration shown
< 0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
-	Analyte not reported
[#]	If more than one result per sample depth, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results .

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Chemical Use Areas

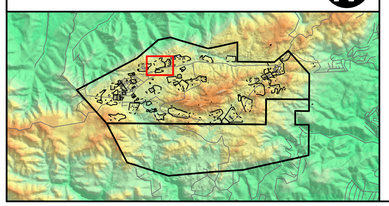
- Solvent
- Petroleum
- Oil
- Transformer
- Metal
- Debris
- Hydrazine
- Perchlorate
- Screening
- Multiple Use

Base Map Legend

- Administrative Area Boundary
- RFI Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Dirt Road
- A/C Curbing
- Trench
- Fence
- Pipe
- Leachfield
- NPDES Outfall
- Well
- Pond
- Possible Pond
- Drainage
- Surface Water Divide
- Elevation Contour
- Rock Outcrop

Date: Sep 26, 2006 Document: RFI-Report-Group6_OC_Vapor_VOC.mxd

1 inch equals 60 feet — 0 — 60 — 120 Feet



OCBS97	1.50 D01 MJ811	1.50 D01 MJ811RE	1.50 S01 MJ810	1.50 S01 MJ810RE
1,1,1-Trichloroethane	< 2.7	-	< 3	-
1,1,2-Trichlorotrifluoroethane	< 6.8	-	< 7.6	-
1,1-Dichloroethene	< 6.8	-	< 7.6	-
1,2-Dichloroethane	< 2.7	-	< 3	-
2-Butanone	< 14	-	< 15	-
4-Isopropyltoluene	**1.3 J**	-	**1.9 J**	-
Acetone	-	< 15	-	< 14
cis-1,2-Dichloroethene	< 2.7	-	< 3	-
Methylene chloride	< 27	-	< 30	-
Naphthalene	< 6.8	-	< 7.6	-
Tetrachloroethene	< 2.7	-	< 3	-
Toluene	< 2.7	-	< 3	-
Trichloroethene	< 2.7	-	< 3	-

OCSV13	5.00 D01 RV710	5.00 S01 RV706
1,1,1-Trichloroethane	< 1	< 1
1,1,2-Trichlorotrifluoroethane	< 1	< 1
1,1-Dichloroethene	< 1	< 1
1,2-Dichloroethane	< 1	< 1
cis-1,2-Dichloroethene	< 1	< 1
Methylene chloride	< 1	< 1
Tetrachloroethene	< 1	< 1
Toluene	< 1	< 1
Trichloroethene	< 1	< 1

OCSV12	6.00 S01 RV707
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 1
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 1
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OCTS09	1.00 S01 RS291
1,1,1-Trichloroethane	< 5
1,1,2-Trichlorotrifluoroethane	< 22
1,1-Dichloroethene	< 5
1,2-Dichloroethane	< 5
2-Butanone	< 54
Acetone	< 54
cis-1,2-Dichloroethene	< 5
Methylene chloride	< 22
Tetrachloroethene	< 5
Toluene	< 5
Trichloroethene	< 5

OCSV11	2.50 S01 RV708
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 1
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 1
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OCSV10	5.00 S01 RV709
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 1
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 1
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OCBS23	0.50 S01 RS879
1,1,1-Trichloroethane	< 10
1,1,2-Trichlorotrifluoroethane	< 41
1,1-Dichloroethene	< 10
1,2-Dichloroethane	< 10
2-Butanone	< 103
Acetone	< 103
cis-1,2-Dichloroethene	< 10
Methylene chloride	< 41
Tetrachloroethene	< 10
Toluene	< 10
Trichloroethene	< 10

OCSV14	4.00 S01 RV704
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 1
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 1
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OCSV15	6.00 S01 RV705
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 1
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 1
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OCSV04	4.00 S01 RV605
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 1
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 1
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OLDCONS-4	0.50 - OLDCONS4
1,1,1-Trichloroethane	< 5
1,1-Dichloroethene	< 5
1,2-Dichloroethane	< 5
2-Butanone	11 J
Acetone	< 10
Methylene chloride	< 5
Tetrachloroethene	< 5
Toluene	< 5
Trichloroethene	< 5
Xylenes (total)	< 5

OCSV16	1.50 S01 MV015
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 5
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 20
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OCSV18	4.00 S01 MV017
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 5
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 20
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OCSV19	4.00 S01 MV018
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 5
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 20
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OCTS05	3.00 S01 RS287
1,1,1-Trichloroethane	< 5
1,1,2-Trichlorotrifluoroethane	< 21
1,1-Dichloroethene	< 5
1,2-Dichloroethane	< 5
2-Butanone	< 53
Acetone	< 53
cis-1,2-Dichloroethene	< 5
Methylene chloride	< 21
Tetrachloroethene	< 5
Toluene	< 5
Trichloroethene	< 5

OCSV09	6.00 S01 RV703
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 1
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 1
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OCBS01	0.50 D01 RD034RE	0.50 S01 RC003	0.50 S01 RD033	4.50 S02 RC001	4.50 S02 RD035RE
1,1,1-Trichloroethane	< 6	< 1	< 11	< 1	< 6
1,1,2-Trichlorotrifluoroethane	< 21	< 20	< 41	< 20	< 21
1,1-Dichloroethene	< 5	< 5	< 11	< 5	< 6
1,2-Dichloroethane	< 6	< 1	< 11	< 1	< 6
2-Butanone	< 52	< 5	< 103	< 5	< 53
Acetone	< 52	< 50	< 103	< 50	< 53
cis-1,2-Dichloroethene	< 6	< 2	< 11	< 2	< 6
Methylene chloride	**40 J**	< 10	**176 J**	< 10	< 21
Tetrachloroethene	< 6	< 1	< 11	< 1	< 6
Toluene	< 6	< 1	< 11	< 1	< 6
Trichloroethene	< 6	< 1	< 11	< 1	< 6

OLDCONS-2	1.00 - OLDCONS2
1,1,1-Trichloroethane	< 5
1,1-Dichloroethene	< 5
1,2-Dichloroethane	< 5
2-Butanone	< 10
Acetone	< 10
Methylene chloride	< 5
Tetrachloroethene	< 5
Toluene	7 J
Trichloroethene	< 5
Xylenes (total)	13

OCBS03	1.50 S01 RD063	1.50 S01 RD063DL	6.00 S02 RD064
1,1,1-Trichloroethane	< 6	-	< 27
1,1,2-Trichlorotrifluoroethane	< 22	-	< 108
1,1-Dichloroethene	< 6	-	< 27
1,2-Dichloroethane	< 6	-	< 27
2-Butanone	< 55	-	< 270
Acetone	-	**4800 J**	**660 J**
cis-1,2-Dichloroethene	< 6	-	< 27
Methylene chloride	**52 NJ**	-	< 108
Tetrachloroethene	< 6	-	< 27
Toluene	< 6	-	< 27
Trichloroethene	< 6	-	< 27

OCSV08	7.00 S01 RV702
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 1
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 1
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OCSV07	13.00 S02 RV701	5.00 S01 RV700
1,1,1-Trichloroethane	< 1	< 1
1,1,2-Trichlorotrifluoroethane	< 1	< 1
1,1-Dichloroethene	< 1	< 1
1,2-Dichloroethane	< 1	< 1
cis-1,2-Dichloroethene	< 1	< 1
Methylene chloride	< 1	< 1
Tetrachloroethene	< 1	< 1
Toluene	< 1	< 1
Trichloroethene	< 1	< 1

OCSV06	10.00 S02 RV619	5.00 D01 RV610	5.00 S01 RV604
1,1,1-Trichloroethane	< 1	< 1	< 1
1,1,2-Trichlorotrifluoroethane	< 1	< 1	< 1
1,1-Dichloroethene	< 1	< 1	< 1
1,2-Dichloroethane	< 1	< 1	< 1
cis-1,2-Dichloroethene	< 1	< 1	< 1
Methylene chloride	< 1	< 1	< 1
Tetrachloroethene	< 1	< 1	< 1
Toluene	< 1	< 1	< 1
Trichloroethene	< 1	< 1	< 1

OLDCONS-3	3.50 - OLDCONS3
1,1,1-Trichloroethane	< 5
1,1-Dichloroethene	< 5
1,2-Dichloroethane	< 5
2-Butanone	< 10
Acetone	14
Methylene chloride	6
Tetrachloroethene	< 5
Toluene	< 5
Trichloroethene	< 5
Xylenes (total)	6

OCBS09	0.50 S01 RD727
1,1,1-Trichloroethane	< 6
1,1,2-Trichlorotrifluoroethane	< 22
1,1-Dichloroethene	< 6
1,2-Dichloroethane	< 6
2-Butanone	< 55
Acetone	< 55
cis-1,2-Dichloroethene	< 6
Methylene chloride	< 22
Tetrachloroethene	< 6
Toluene	< 6
Trichloroethene	< 6

OCTS18	2.00 S01 RS302
1,1,1-Trichloroethane	< 6
1,1,2-Trichlorotrifluoroethane	< 24
1,1-Dichloroethene	< 6
1,2-Dichloroethane	< 6
2-Butanone	< 60
Acetone	**220 J**
cis-1,2-Dichloroethene	< 6
Methylene chloride	< 24
Tetrachloroethene	< 6
Toluene	< 6
Trichloroethene	< 6

OCBS24	1.00 S01 RS880
1,1,1-Trichloroethane	< 6
1,1,2-Trichlorotrifluoroethane	< 23
1,1-Dichloroethene	< 6
1,2-Dichloroethane	< 6
2-Butanone	< 56
Acetone	< 56
cis-1,2-Dichloroethene	< 6
Methylene chloride	< 23
Tetrachloroethene	< 6
Toluene	< 6
Trichloroethene	< 6

OCBS02	1.00 S01 RD037	1.00 S01 RD037DL	5.00 S02 RD038RE
1,1,1-Trichloroethane	< 6	-	< 6
1,1,2-Trichlorotrifluoroethane	< 21	-	< 21
1,1-Dichloroethene	< 6	-	< 6
1,2-Dichloroethane	< 6	-	< 6
2-Butanone	< 52	-	< 53
Acetone	< 52	-	< 53
cis-1,2-Dichloroethene	< 6	-	< 6
Methylene chloride	-	**280 J**	**62 J**
Tetrachloroethene	< 6	-	< 6
Toluene	< 6	-	< 6
Trichloroethene	< 6	-	< 6

OCSV05	4.00 S01 RV603
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 1
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 1
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OLDCONS-6	0.50 - OLDCONS6
1,1,1-Trichloroethane	< 5
1,1-Dichloroethene	< 5
1,2-Dichloroethane	< 5
2-Butanone	< 10
Acetone	< 10
Methylene chloride	< 5
Tetrachloroethene	< 5
Toluene	< 5
Trichloroethene	< 5
Xylenes (total)	< 5

OCBS14	0.50 S01 RD738
1,1,1-Trichloroethane	< 6
1,1,2-Trichlorotrifluoroethane	< 22
1,1-Dichloroethene	< 6
1,2-Dichloroethane	< 6
2-Butanone	< 55
Acetone	< 55
cis-1,2-Dichloroethene	< 6
Methylene chloride	< 22
Tetrachloroethene	< 6
Toluene	< 6
Trichloroethene	< 6

OCSV03	4.00 S01 RV249	7.00 S01 MV574	8.00 S02 RV250
1,1,1-Trichloroethane	**2**	< 1	< 1
1,1,2-Trichlorotrifluoroethane	**1.9**	< 5	**1.4**
1,1-Dichloroethene	**1.8**	< 1	< 1
1,2-Dichloroethane	< 1	< 1	**1.5**
cis-1,2-Dichloroethene	< 1	< 1	< 1
Methylene chloride	< 1	< 50	< 1
Tetrachloroethene	< 1	< 1	< 1
Toluene	< 1	< 1	< 1
Trichloroethene	**11**	< 1	**1.9**

OCSV02	4.00 S01 RV251
1,1,1-Trichloroethane	< 1
1,1,2-Trichlorotrifluoroethane	< 1
1,1-Dichloroethene	< 1
1,2-Dichloroethane	< 1
cis-1,2-Dichloroethene	< 1
Methylene chloride	< 1
Tetrachloroethene	< 1
Toluene	< 1
Trichloroethene	< 1

OLDCONS-1	0.50 - OLDCONS1
1,1,1-Trichloroethane	< 5
1,1-Dichloroethene	< 5
1,2-Dichloroethane	< 5
2-Butanone	< 10
Acetone	< 10
Methylene chloride	< 5
Tetrachloroethene	< 5
Toluene	3 J
Trichloroethene	< 5
Xylenes (total)	< 5

OLDCONS-5	0.50 - OLDCONS5
1,1,1-Trichloroethane	< 5
1,1-Dichloroethene	< 5
1,2-Dichloroethane	< 5
2-Butanone	< 10
Acetone	< 10
Methylene chloride	< 5
Tetrachloroethene	< 5
Toluene	14 J
Trichloroethene	< 5
Xylenes (total)	10

OCSV01	5.50 S01 RR052	5.50 S01 RV346	6.00 S01 RV217	7.00 S01 MV573
1,1,1-Trichloroethane	< 1	**2.1 J**	**15**	< 1
1,1,2-Trichlorotrifluoroethane	< 1	**2.8 J**	**3.5**	< 5
1,1-Dichloroethene	< 1	**2.8 J**	**10**	< 5
1,2-Dichloroethane	< 1	< 1	< 1	< 1
cis-1,2-Dichloroethene	< 1	**15 J**	< 1	< 1
Methylene chloride	< 1	< 1	< 1	< 50
Tetrachloroethene	**1.5 ***	< 1	< 1	< 1
Toluene	< 1	< 1	< 1	< 1
Trichloroethene	**2.1 ***	**28 J**	**66**	< 1

Note: Analytes detected at least once at Old Conservation Yard are listed in the Comparison Levels Table. Analytes listed in the table, but not displayed for a given sample, were not included in that sample's analytical suite.

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Soil SVOC/TPH/PCB Results (South, 1 of 2) Old Conservation Yard South (SWMU 7.4)

Santa Susana Field Laboratory

MWH MONTGOMERY WATSON HARZA

FIGURE A2.3-2A

Soil Sample Location Symbol Legend

- Soil sample location with detected SVOC/TPH/PCB's
- Soil sample location with no detected SVOC/TPH/PCB's
- Soil sample location not analyzed for SVOC/TPH/PCB's
- Contained unit soil sample
- Refused sample (refusal depth < 1' below ground surface)
- Soil Sample not analyzed by any sample method

Comparison Levels

SVOCs	Res RBSL (ug/kg)	Eco RBSL (ug/kg)
1-Methylnaphthalene	- -	- -
2-Methylnaphthalene	- -	- -
Acenaphthene	3400000	2500
Acenaphthylene	1700000	810000
Anthracene	17000000	2400
Benzo(a)anthracene	600	1700
Benzo(a)pyrene	6	4700
Benzo(b)fluoranthene	600	5500
Benzo(e)pyrene	- -	7000
Benzo(g,h,i)perylene	- -	6400
Benzo(k)fluoranthene	600	3700
Chrysene	6000	2400
Dibenzo(a,h)anthracene	170	1700
Fluoranthene	2300000	130000
Fluorene	2300000	1600
Indeno(1,2,3-cd)pyrene	600	3900
Naphthalene	6000	1400000
Perylene	- -	63000
Phenanthrene	1700000	1300
Pyrene	1700000	79000

TPHs	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
C08-C11 (Gasoline Range)	1.1	- -
C09-C22	1400	- -
C11-C14 (Kerosene Range)	1400	- -
C12-C14 (Kerosene Range)	1400	- -
C14-C20 (Diesel Range)	1400	- -
C15-C20 (Diesel Range)	1400	- -
C20-C30 (Lubricant Oil Range)	1400	- -
C21-C30 (Lubricant Oil Range)	1400	- -
C22-C40 (Heavy Oil)	1400	- -
C05-C12 (Gasoline Range)	1.1	- -
C10-C16 (Jet Fuel Range)	1400	- -
C12-C22 (Kerosene, Diesel Ranges)	1400	- -
C14-C22 (Diesel Range)	1400	- -
C22-C30 (Lubricant Oil Range)	1400	- -

PCBs	Res RBSL (ug/kg)	Eco RBSL (ug/kg)
Aroclor 1248	350	12
Aroclor 1254	350	79
Aroclor 1260	350	79
PCB-105	- -	- -
PCB-114	- -	- -
PCB-118	- -	- -
PCB-123	- -	- -
PCB-126	- -	- -
PCB-128	- -	- -
PCB-138	- -	- -
PCB-153	- -	- -
PCB-156	- -	- -
PCB-157	- -	- -
PCB-167	- -	- -
PCB-170	- -	- -
PCB-180	- -	- -
PCB-187	- -	- -
PCB-189	- -	- -
PCB-195	- -	- -
PCB-206	- -	- -
PCB-209	- -	- -
PCB-44	- -	- -
PCB-52	- -	- -
PCB-66	- -	- -
PCB-77	- -	- -
PCB-8	- -	- -
PCB-81	- -	- -
PCB-90/101	- -	- -
Aroclor 1016	3900	1600
Aroclor 1221	350	1600
Aroclor 1232	350	79
Aroclor 1242	350	80
PCB-169	- -	- -
PCB-18	- -	- -
PCB-28	- -	- -

Note: (mg/kg) = milligrams per kilogram
(ug/kg) = micrograms per kilogram

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Data Date: 092106

Data Box Information

Sample Location ID: OCBS01 — 1.00 Depth in Feet; S01 Sample Number; MH007 Lab Reporting Code (EPA ID)

(Historical Sample)

12.05	Detect with sample concentration shown
< 0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
-	Analyte not reported
[#]	If more than one result per sample depth, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results .

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Chemical Use Areas

- Solvent
- Petroleum
- Oil
- Transformer
- Metal
- Debris
- Hydrazine
- Perchlorate
- Screening
- Multiple Use

Base Map Legend

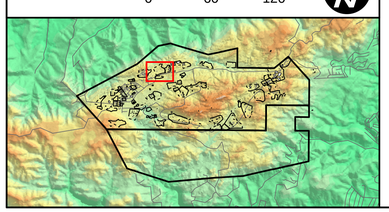
- Administrative Area Boundary
- RFI Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Dirt Road
- A/C Curbing
- Trench
- Fence
- Pipe
- Leachfield
- NPDES Outfall
- Well
- Pond
- Possible Pond
- Drainage
- Surface Water Divide
- Elevation Contour
- Rock Outcrop

Date: Sep 29, 2006

Document: RFI-Report-Group6_OCS_TPH_PCB_SVOC_a.mxd

1 inch equals 60 feet

Feet 0 60 120



OCBS07	0.50 S03 RS668	1.00 S01 RD069	1.00 S01 RF030	1.00 S01 RS881	5.00 S02 RD070	5.00 S02 RF031
Acenaphthene	-	-	< 320	-	-	< 330
Acenaphthylene	-	-	< 320	-	-	< 330
Anthracene	-	-	< 320	-	-	< 330
Benzo(a)anthracene	-	-	< 320	-	-	< 330
Benzo(a)pyrene	-	-	< 320	-	-	< 330
Benzo(b)fluoranthene	-	-	< 320	-	-	< 330
Benzo(g,h,i)perylene	-	-	< 320	-	-	< 330
Benzo(k)fluoranthene	-	-	< 320	-	-	< 330
C08-C11 (Gasoline Range)	< 13	< 11	-	< 53	< 11	-
C11-C14 (Kerosene Range)	< 13	< 11	-	< 53	< 11	-
C14-C20 (Diesel Range)	< 13	< 11	-	< 53	< 11	-
C20-C30 (Lubricant Oil Range)	< 13	< 11	-	95	< 11	-
Chrysene	-	-	< 320	-	-	< 330
Dibenzo(a,h)anthracene	-	-	< 320	-	-	< 330
Fluoranthene	-	-	< 320	-	-	< 330
Fluorene	-	-	< 320	-	-	< 330
Indeno(1,2,3-cd)pyrene	-	-	< 320	-	-	< 330
Naphthalene	-	-	< 320	-	-	< 330
Phenanthrene	-	-	< 320	-	-	< 330
Pyrene	-	-	< 320	-	-	< 330

OLDCONS-1	0.50 OLDCONS1
2-Methylnaphthalene	< 300
Acenaphthene	< 300
Acenaphthylene	< 300
Anthracene	< 300
Benzo(a)anthracene	< 300
Benzo(a)pyrene	< 300
Benzo(b)fluoranthene	< 300
Benzo(g,h,i)perylene	< 300
Benzo(k)fluoranthene	< 300
C09-C22	64
C22-C40 (Heavy Oil)	< 0.1
Chrysene	500
Dibenzo(a,h)anthracene	< 300
Fluoranthene	2100
Fluorene	< 300
Indeno(1,2,3-cd)pyrene	< 300
Naphthalene	< 300
Phenanthrene	1600
Pyrene	1000

OCBS28	0.50 S01 MC032	0.50 S01 MJ032
2-Methylnaphthalene	< 33	3 J
Acenaphthene	< 33	< 3
Acenaphthylene	< 33	< 3
Anthracene	< 33	2 J
Benzo(a)anthracene	< 66	4
Benzo(a)pyrene	< 66	< 3
Benzo(b)fluoranthene	< 33	3 J
Benzo(g,h,i)perylene	< 99	< 3
Benzo(k)fluoranthene	< 66	3 J
Chrysene	< 33	6
Dibenzo(a,h)anthracene	< 99	< 3
Fluoranthene	< 33	16
Fluorene	< 33	< 3
Indeno(1,2,3-cd)pyrene	< 130	< 3
Naphthalene	< 33	8
Phenanthrene	< 66	11
Pyrene	< 33	9

OCBS27	0.50 S01 RJ783	0.50 S01 RJ783DL	3.00 S02 MJ031
2-Methylnaphthalene	-	210	5
Acenaphthene	8	-	< 3
Acenaphthylene	7	-	< 3
Anthracene	8	-	2 J
Benzo(a)anthracene	35	-	3 J
Benzo(a)pyrene	29	-	< 3
Benzo(b)fluoranthene	56	-	3 J
Benzo(g,h,i)perylene	14	-	< 3
Benzo(k)fluoranthene	62	-	3 J
Chrysene	-	96	7
Dibenzo(a,h)anthracene	6	-	< 3
Fluoranthene	-	140	17
Fluorene	6	-	< 3
Indeno(1,2,3-cd)pyrene	20	-	< 3
Naphthalene	-	150	8
Phenanthrene	-	130	19
Pyrene	-	120	10

OCTS39	1.00 S01 RJ779
2-Methylnaphthalene	< 3
Acenaphthene	< 3
Acenaphthylene	< 3
Anthracene	< 3
Benzo(a)anthracene	< 3
Benzo(a)pyrene	< 3
Benzo(b)fluoranthene	< 3
Benzo(g,h,i)perylene	< 3
Benzo(k)fluoranthene	< 3
Chrysene	< 3
Dibenzo(a,h)anthracene	< 3
Fluoranthene	< 3
Fluorene	< 3
Indeno(1,2,3-cd)pyrene	< 3
Naphthalene	< 3
Phenanthrene	< 3
Pyrene	< 3

OCTS35	2.00 S01 RJ777
2-Methylnaphthalene	< 3
Acenaphthene	< 3
Acenaphthylene	< 3
Anthracene	< 3
Aroclor 1248	< 35
Aroclor 1254	< 35
Aroclor 1260	< 35
Benzo(a)anthracene	17
Benzo(a)pyrene	34
Benzo(b)fluoranthene	38
Benzo(g,h,i)perylene	19
Benzo(k)fluoranthene	48
Chrysene	44
Dibenzo(a,h)anthracene	6
Fluoranthene	65
Fluorene	< 3
Indeno(1,2,3-cd)pyrene	22
Naphthalene	< 3
Phenanthrene	25
Pyrene	63

OCTS23S01	5.00 D01 RJ773	5.00 S01 RJ772
2-Methylnaphthalene	< 17	< 3
Acenaphthene	< 17	< 3
Acenaphthylene	< 17	< 3
Anthracene	< 17	< 3
Aroclor 1248	< 34	< 34
Aroclor 1254	64	94 J
Aroclor 1260	< 34	20 J
Benzo(a)anthracene	< 17	9
Benzo(a)pyrene	< 17	8
Benzo(b)fluoranthene	< 17	18
Benzo(g,h,i)perylene	< 17	6
Benzo(k)fluoranthene	< 17	17
C08-C11 (Gasoline Range)	< 3.5	< 3.4
C11-C14 (Kerosene Range)	< 3.5	< 3.4
C14-C20 (Diesel Range)	2.1 J	< 3.4
C20-C30 (Lubricant Oil Range)	34	18
Chrysene	18	22
Dibenzo(a,h)anthracene	< 17	< 3
Fluoranthene	18	18
Fluorene	< 17	< 3
Indeno(1,2,3-cd)pyrene	< 17	6
Naphthalene	< 17	< 3
Phenanthrene	< 17	7
Pyrene	< 17	17

OCTS23S02	6.50 S02 RJ776	6.50 S02 RJ776
2-Methylnaphthalene	< 4	< 33
Acenaphthene	< 4	< 33
Acenaphthylene	< 4	< 33
Anthracene	< 4	< 33
Aroclor 1248	< 35	< 50
Aroclor 1254	< 35	< 50
Aroclor 1260	< 35	< 50
Benzo(a)anthracene	< 4	< 66
Benzo(a)pyrene	< 4	< 66
Benzo(b)fluoranthene	< 4	< 33
Benzo(g,h,i)perylene	< 4	< 99
Benzo(k)fluoranthene	< 4	< 99
C08-C11 (Gasoline Range)	< 3.6	< 10
C11-C14 (Kerosene Range)	< 3.6	-
C14-C20 (Diesel Range)	< 3.6	-
C20-C30 (Lubricant Oil Range)	< 3.6	-
Chrysene	< 4	< 33
Dibenzo(a,h)anthracene	< 4	< 99
Fluoranthene	< 4	< 33
Fluorene	< 4	< 33
Indeno(1,2,3-cd)pyrene	< 4	< 130
Naphthalene	< 4	< 33
Phenanthrene	< 4	< 66
Pyrene	< 4	< 33

OCBS08	1.00 S01 RD071	1.00 S01 RF032	5.00 S02 RD072	5.00 S02 RF033DL
Acenaphthene	-	< 310	-	< 330
Acenaphthylene	-	< 310	-	< 330
Anthracene	-	< 310	-	< 330
Benzo(a)anthracene	-	< 310	-	< 330
Benzo(a)pyrene	-	< 310	-	< 330
Benzo(b)fluoranthene	-	< 310	-	< 330
Benzo(g,h,i)perylene	-	< 310	-	< 330
Benzo(k)fluoranthene	-	< 310	-	< 330
C08-C11 (Gasoline Range)	< 11	-	< 11	-
C11-C14 (Kerosene Range)	< 11	-	< 11	-
C14-C20 (Diesel Range)	< 11	-	< 11	-
C20-C30 (Lubricant Oil Range)	< 11	-	< 11	-
Chrysene	-	< 310	-	< 330
Dibenzo(a,h)anthracene	-	< 310	-	< 330
Fluoranthene	-	< 310	-	< 330
Fluorene	-	< 310	-	< 330
Indeno(1,2,3-cd)pyrene	-	< 310	-	< 330
Naphthalene	-	< 310	-	< 330
Phenanthrene	-	< 310	-	< 330
Pyrene	-	< 310	-	< 330

OLDCONS-6	0.50 OLDCONS6
2-Methylnaphthalene	< 30
Acenaphthene	< 30
Acenaphthylene	< 30
Anthracene	< 30
Benzo(a)anthracene	< 30
Benzo(a)pyrene	< 30
Benzo(b)fluoranthene	< 30
Benzo(g,h,i)perylene	< 30
Benzo(k)fluoranthene	< 30
C09-C22	0.1
C22-C40 (Heavy Oil)	5
Chrysene	< 30
Dibenzo(a,h)anthracene	< 30
Fluoranthene	< 30
Fluorene	< 30
Indeno(1,2,3-cd)pyrene	< 30
Naphthalene	< 30
Phenanthrene	< 30
Pyrene	< 30

OLDCONS-5	0.50 OLDCONS5
2-Methylnaphthalene	< 300
Acenaphthene	< 300
Acenaphthylene	< 300
Anthracene	< 300
Benzo(a)anthracene	< 300
Benzo(a)pyrene	< 300
Benzo(b)fluoranthene	< 300
Benzo(g,h,i)perylene	< 300
Benzo(k)fluoranthene	< 300
C09-C22	0.3
Chrysene	< 300
Dibenzo(a,h)anthracene	< 300
Fluoranthene	< 300
Fluorene	< 300
Indeno(1,2,3-cd)pyrene	< 300
Naphthalene	< 300
Phenanthrene	< 300
Pyrene	< 300

OCBS10	0.50 D01 MJ684	0.50 S01 MJ683	0.50 S01 RD728	0.50 S01 RF728DL	4.00 S02 RS669
1-Methylnaphthalene	< 23	30	-	-	-
2-Methylnaphthalene	30	40	-	-	-
Acenaphthene	< 23	< 24	-	< 1800	-
Acenaphthylene	< 23	< 24	-	< 1800	-
Anthracene	39	38	-	< 1800	-
Aroclor 1248	< 56	< 56	-	-	-
Aroclor 1254	480	400	-	-	-
Aroclor 1260	< 56	95	-	-	-
Benzo(a)anthracene	290	270	-	< 1800	-
Benzo(a)pyrene	280	260	-	< 1800	-
Benzo(b)fluoranthene	460	420	-	< 1800	-
Benzo(g,h,i)perylene	79	73	-	< 1800	-
Benzo(k)fluoranthene	380	300	-	< 1800	-
C08-C11 (Gasoline Range)	< 11	< 11	< 58	-	< 12
C11-C14 (Kerosene Range)	-	-	< 58	-	< 12
C12-C14 (Kerosene Range)	< 11	< 11	-	-	-
C14-C20 (Diesel Range)	-	-	210 J	-	< 12
C15-C20 (Diesel Range)	10 J	8.8 J	-	-	-
C20-C30 (Lubricant Oil Range)	-	-	920 J	-	< 12
C21-C30 (Lubricant Oil Range)	71	52	-	-	-
Chrysene	500	440	-	< 1800	-
Dibenzo(a,h)anthracene	27	25	-	< 1800	-
Fluoranthene	610	580	-	< 1800	-
Fluorene	< 23	< 24	-	< 1800	-
Indeno(1,2,3-cd)pyrene	100	100	-	< 1800	-
Naphthalene	< 23	31	-	< 1800	-
Phenanthrene	220	250	-	< 1800	-
Pyrene	640	600	-	< 1800	-

XFBS22	0.00 S70 WD089
Aroclor 1016	< 51
Aroclor 1221	< 51
Aroclor 1232	< 51
Aroclor 1242	< 51
Aroclor 1248	< 51
Aroclor 1254	< 51
Aroclor 1260	< 51

OCBS56	0.00 S70 MJ711	0.00 S80 MJ715
Aroclor 1248	< 52	< 53
Aroclor 1254	< 52	< 53
Aroclor 1260	< 52	< 53

OCBS30	0.50 S01 MT801
Aroclor 1248	< 51
Aroclor 1254	< 51
Aroclor 1260	< 51

OCTS04	5.50 S01 RS303
C08-C11 (Gasoline Range)	< 11
C11-C14 (Kerosene Range)	< 11
C14-C20 (Diesel Range)	< 11
C20-C30 (Lubricant Oil Range)	< 11

XFBS23	0.00 S70 WD092
Aroclor 1016	< 51
Aroclor 1221	< 51
Aroclor 1232	< 51
Aroclor 1242	< 51
Aroclor 1248	< 51
Aroclor 1254	< 51
Aroclor 1260	< 51

OCBS31	0.50 S01 MT802
Aroclor 1248	< 51
Aroclor 1254	< 51
Aroclor 1260	< 51

OCBS69	0.50 S01 MJ750
Aroclor 1248	180 J
Aroclor 1254	460 J
Aroclor 1260	< 200

OCBS68	0.50 S01 MJ745	3.00 S02 MJ747
Aroclor 1248	< 100	< 180
Aroclor 1254	350	< 180
Aroclor 1260	< 100	< 180

OCSS04	0.00 S01 MJ682
1-Methylnaphthalene	390
2-Methylnaphthalene	780
Acenaphthene	< 20
Acenaphthylene	< 20
Anthracene	30
Aroclor 1248	< 50
Aroclor 1254	110 J
Aroclor 1260	53 J
Benzo(a)anthracene	340
Benzo(a)pyrene	220
Benzo(b)fluoranthene	260
Benzo(g,h,i)perylene	43
Benzo(k)fluoranthene	270
C08-C11 (Gasoline Range)	< 10
C12-C14 (Kerosene Range)	< 10
C15-C20 (Diesel Range)	4.2 J
C21-C30 (Lubricant Oil Range)	69 J
Chrysene	390
Dibenzo(a,h)anthracene	< 20
Fluoranthene	490
Fluorene	< 20
Indeno(1,2,3-cd)pyrene	58
Naphthalene	640
Phenanthrene	170
Pyrene	580

OCBS67	0.50 S01 MJ748
Aroclor 1248	< 170
Aroclor 1254	220 J
Aroclor 1260	200 J

OCBS72	0.50 S01 MJ756
Aroclor 1248	< 84
Aroclor 1254	< 84
Aroclor 1260	< 84

OCBS66	0.50 S01 MJ744	3.00 S02 MJ746
Aroclor 1248	< 92	< 180
Aroclor 1254	260	< 180
Aroclor 1260	< 92	< 180

OCBS16	0.50 S01 RS581
C08-C11 (Gasoline Range)	< 14
C11-C14 (Kerosene Range)	< 14
C14-C20 (Diesel Range)	< 14
C20-C30 (Lubricant Oil Range)	< 14

OCBS65	2.00 S01 MJ739
Aroclor 1248	< 84
Aroclor 1254	< 84
Aroclor 1260	< 84
C08-C11 (Gasoline Range)	< 5.6
C12-C14 (Kerosene Range)	< 5.6
C15-C20 (Diesel Range)	< 5.6
C21-C30 (Lubricant Oil Range)	< 5.6

OCBS39	1.00 S01 MJ681
1-Methylnaphthalene	< 21
2-Methylnaphthalene	< 21
Acenaphthene	< 21
Acenaphthylene	< 21
Anthracene	< 21
Benzo(a)anthracene	< 21
Benzo(a)pyrene	< 21
Benzo(b)fluoranthene	< 21
Benzo(g,h,i)perylene	< 21
Benzo(k)fluoranthene	< 21
Chrysene	< 21
Dibenzo(a,h)anthracene	< 21
Fluoranthene	< 21
Fluorene	< 21
Indeno(1,2,3-cd)pyrene	< 21
Naphthalene	< 21
Phenanthrene	< 21
Pyrene	< 21

OCBS15	1.00 D01 RD177	1.00 S01 RD176	1.00 S01 RF176DL
Acenaphthene	-	-	< 310
Acenaphthylene	-	-	< 310
Anthracene	-	-	< 310
Benzo(a)anthracene	-	-	< 310
Benzo(a)pyrene	-	-	< 310
Benzo(b)fluoranthene	-	-	< 310
Benzo(g,h,i)perylene	-	-	< 310
Benzo(k)fluoranthene	-	-	< 310
C08-C11 (Gasoline Range)	< 12	< 12	-
C11-C14 (Kerosene Range)	< 12	< 12	-
C14-C20 (Diesel Range)	< 12	< 12	-
C20-C30 (Lubricant Oil Range)	< 12	< 12	-
Chrysene	-	-	< 310
Dibenzo(a,h)anthracene	-	-	< 310
Fluoranthene	-	-	< 310
Fluorene	-	-	< 310
Indeno(1,2,3-cd)pyrene	-	-	< 310
Naphthalene	-	-	< 310
Phenanthrene	-	-	< 310
Pyrene	-	-	< 310

OCTS37	7.00 S01 RJ780
2-Methylnaphthalene	< 3
Acenaphthene	< 3
Acenaphthylene	< 3
Anthracene	< 3
Benzo(a)anthracene	< 3
Benzo(a)pyrene	< 3
Benzo(b)fluoranthene	< 3
Benzo(g,h,i)perylene	< 3
Benzo(k)fluoranthene	< 3
Chrysene	< 3
Dibenzo(a,h)anthracene	< 3
Fluoranthene	< 3
Fluorene	< 3
Indeno(1,2,3-cd)pyrene	< 3
Naphthalene	< 3
Phenanthrene	< 3
Pyrene	< 3

OCTS24S02	6.50 S02 RJ781	6.50 S02 RJ781
2-Methylnaphthalene	< 3	< 120
Acenaphthene	< 3	< 120
Acenaphthylene	< 3	< 120
Anthracene	< 3	< 120
Aroclor 1248	< 35	< 190
Aroclor 1254	< 35	< 190
Aroclor 1260	< 35	< 190
Benzo(a)anthracene	< 3	< 250
Benzo(a)pyrene	< 3	< 250
Benzo(b)fluoranthene	< 3	< 120
Benzo(g,h,i)perylene	< 3	< 370
Benzo(k)fluoranthene	< 3	< 370
C08-C11 (Gasoline Range)	< 3.5	< 10
C11-C14 (Kerosene Range)	< 3.5	-
C14-C20 (Diesel Range)	< 3.5	-
C20-C30 (Lubricant Oil Range)	18	-
Chrysene	< 3	< 120
Dibenzo(a,h)anthracene	< 3	< 120
Fluoranthene	< 3	< 120
Fluorene	< 3	< 490
Indeno(1,2,3-cd)pyrene	< 3	< 120
Naphthalene	< 3	< 250
Phenanthrene	< 3	< 120
Pyrene	< 3	< 120

OCTS24S01	5.00 D01 RJ775	5.00 D01 RJ775RE	5.00 S01 RJ774
2-Methylnaphthalene	< 17	-	< 3
Acenaphthene	< 17	-	< 3
Acenaphthylene	< 17	-	< 3
Anthracene	< 17	-	< 3
Aroclor 1248	< 34	-	< 34
Aroclor 1254	< 34	-	< 34
Aroclor 1260	< 34	-	< 34
Benzo(a)anthracene	< 17	-	< 3
Benzo(a)pyrene	< 17	-	< 3
Benzo(b)fluoranthene	< 17	-	< 3
Benzo(g,h,i)perylene	< 17	-	< 3
Benzo(k)fluoranthene	< 17	-	< 3
C08-C11 (Gasoline Range)	-	< 3	< 17
C11-C14 (Kerosene Range)	-	< 3	< 17
C14-C20 (Diesel Range)	-	< 3	6.5 J
C20-C30 (Lubricant Oil Range)	-	3.6 J	550
Chrysene	< 17	-	4
Dibenzo(a,h)anthracene	< 17	-	< 3
Fluoranthene	< 17	-	4
Fluorene	< 17	-	< 3
Indeno(1,2,3-cd)pyrene	< 17	-	< 3
Naphthalene	< 17	-	< 3
Phenanthrene	< 17	-	6
Pyrene	< 17	-	5

OCBS26	0.50 S01 RJ782
2-Methylnaphthalene	< 3
Acenaphthene	< 3
Acenaphthylene	< 3
Anthracene	< 3
Aroclor 1248	< 67
Aroclor 1254	< 67
Aroclor 1260	< 67
Benzo(a)anthracene	4
Benzo(a)pyrene	6
Benzo(b)fluoranthene	8
Benzo(g,h,i)perylene	< 3
Benzo(k)fluoranthene	7
C08-C11 (Gasoline Range)	< 17
C11-C14 (Kerosene Range)	< 17
C14-C20 (Diesel Range)	1.7 J
C20-C30 (Lubricant Oil Range)	120
Chrysene	8
Dibenzo(a,h)anthracene	< 3
Fluoranthene	9
Fluorene	< 3
Indeno(1,2,3-cd)pyrene	< 3
Naphthalene	< 3
Phenanthrene	4
Pyrene	9

OCTS38	0.50 S01 RJ778
2-Methylnaphthalene	< 3
Acenaphthene	< 3
Acenaphthylene	< 3
Anthracene	< 3
Benzo(a)anthracene	< 3
Benzo(a)pyrene	< 3
Benzo(b)fluoranthene	< 3
Benzo(g,h,i)perylene	< 3
Benzo(k)fluoranthene	< 3
Chrysene	< 3
Dibenzo(a,h)anthracene	< 3
Fluoranthene	< 3
Fluorene	< 3
Indeno(1,2,3-cd)pyrene	< 3
Naphthalene	< 3
Phenanthrene	< 3
Pyrene	< 3

OCBS14	0.50 S01 RD738	0.50 S01 RF738DL
Acenaphthene	-	< 300
Acenaphthylene	-	< 300
Anthracene	-	< 300
Benzo(a)anthracene	-	< 300
Benzo(a)pyrene	-	< 300
Benzo(b)fluoranthene	-	< 300
Benzo(g,h,i)perylene	-	< 300
Benzo(k)fluoranthene	-	< 300
C08-C11 (Gasoline Range)	< 11	-
C11-C14 (Kerosene Range)	< 11	-
C14-C20 (Diesel Range)	< 11	-
C20-C30 (Lubricant Oil Range)	< 11	-
Chrysene	-	< 300
Dibenzo(a,h)anthracene	-	< 300
Fluoranthene	-	< 300
Fluorene	-	< 300
Indeno(1,2,3-cd)pyrene	-	< 300
Naphthalene	-	< 300
Phenanthrene	-	< 300
Pyrene	-	< 300

Note: Analytes detected at least once at Old Conservation Yard South are listed in the Comparison Levels Table. Analytes listed in the table, but not displayed for a given sample, were not included in that sample's analytical suite.

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

Soil SVOC/TPH/PCB Results (South, 2 of 2)
Old Conservation Yard South (SWMU 7.4)

Santa Susana Field Laboratory

MWH MONTGOMERY WATSON HARZA

FIGURE A2.3-2B

Soil Sample Location Symbol Legend

- Soil sample location with detected SVOC/TPH/PCB
- Soil sample location with no detected SVOC/TPH/PCB
- Soil sample location not analyzed for SVOC/TPH/PCB
- Contained unit soil sample
- Refused sample (refusal depth < 1' below ground surface)
- Soil Sample not analyzed by any sample method

Comparison Levels

SVOCs	Res RBSL (ug/kg)	Eco RBSL (ug/kg)
1-Methylnaphthalene	- -	230000
2-Methylnaphthalene	230000	230000
Acenaphthene	3400000	2500
Acenaphthylene	17000000	810000
Anthracene	17000000	2400
Benzo(a)anthracene	600	1700
Benzo(a)pyrene	6	4700
Benzo(b)fluoranthene	600	5500
Benzo(e)pyrene	- -	- -
Benzo(g,h,i)perylene	- -	6400
Benzo(k)fluoranthene	600	3700
Chrysene	6000	2400
Dibenzo(a,h)anthracene	170	1700
Fluoranthene	2300000	130000
Fluorene	2300000	1600
Indeno(1,2,3-cd)pyrene	600	3900
Naphthalene	6000	240000
Perylene	- -	63000
Phenanthrene	1700000	1300
Pyrene	1700000	79000

PCBs	Res RBSL (ug/kg)	Eco RBSL (ug/kg)
Aroclor 1248	350	12
Aroclor 1254	350	79
Aroclor 1260	350	79
PCB-105	- -	- -
PCB-114	- -	- -
PCB-118	- -	- -
PCB-123	- -	- -
PCB-126	- -	- -
PCB-128	- -	- -
PCB-138	- -	- -
PCB-153	- -	- -
PCB-156	- -	- -
PCB-157	- -	- -
PCB-167	- -	- -
PCB-170	- -	- -
PCB-180	- -	- -
PCB-187	- -	- -
PCB-189	- -	- -
PCB-195	- -	- -
PCB-206	- -	- -
PCB-209	- -	- -
PCB-44	- -	- -
PCB-52	- -	- -
PCB-66	- -	- -
PCB-77	- -	- -
PCB-8	- -	- -
PCB-81	- -	- -
PCB-90/101	- -	- -

TPHs	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
C08-C11 (Gasoline Range)	1.1	- -
C09-C22	1400	- -
C11-C14 (Kerosene Range)	1400	- -
C12-C14 (Kerosene Range)	1400	- -
C14-C20 (Diesel Range)	1400	- -
C15-C20 (Diesel Range)	1400	- -
C20-C30 (Lubricant Oil Range)	1400	- -
C21-C30 (Lubricant Oil Range)	1400	- -
C22-C40 (Heavy Oil)	1400	- -

Note: (mg/kg) = milligrams per kilogram
(ug/kg) = micrograms per kilogram

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Data Date: 092106

Data Box Information

Sample Location ID — OCBS01 — 1.00 (Depth in Feet) / S01 (Sample Number) / MH007 (Lab Reporting Code (EPA ID))

(Historical Sample)

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results .

12.05	Detect with sample concentration shown
< 0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
-	Analyte not reported
[#]	If more than one result per sample depth, the maximum is presented, with number of results in backets.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Chemical Use Areas

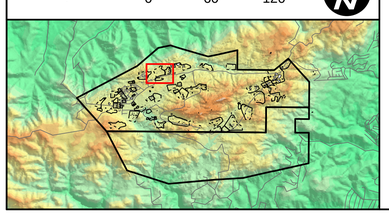
- Solvent
- Petroleum
- Oil
- Transformer
- Metal
- Debris
- Hydrazine
- Perchlorate
- Screening
- Multiple Use

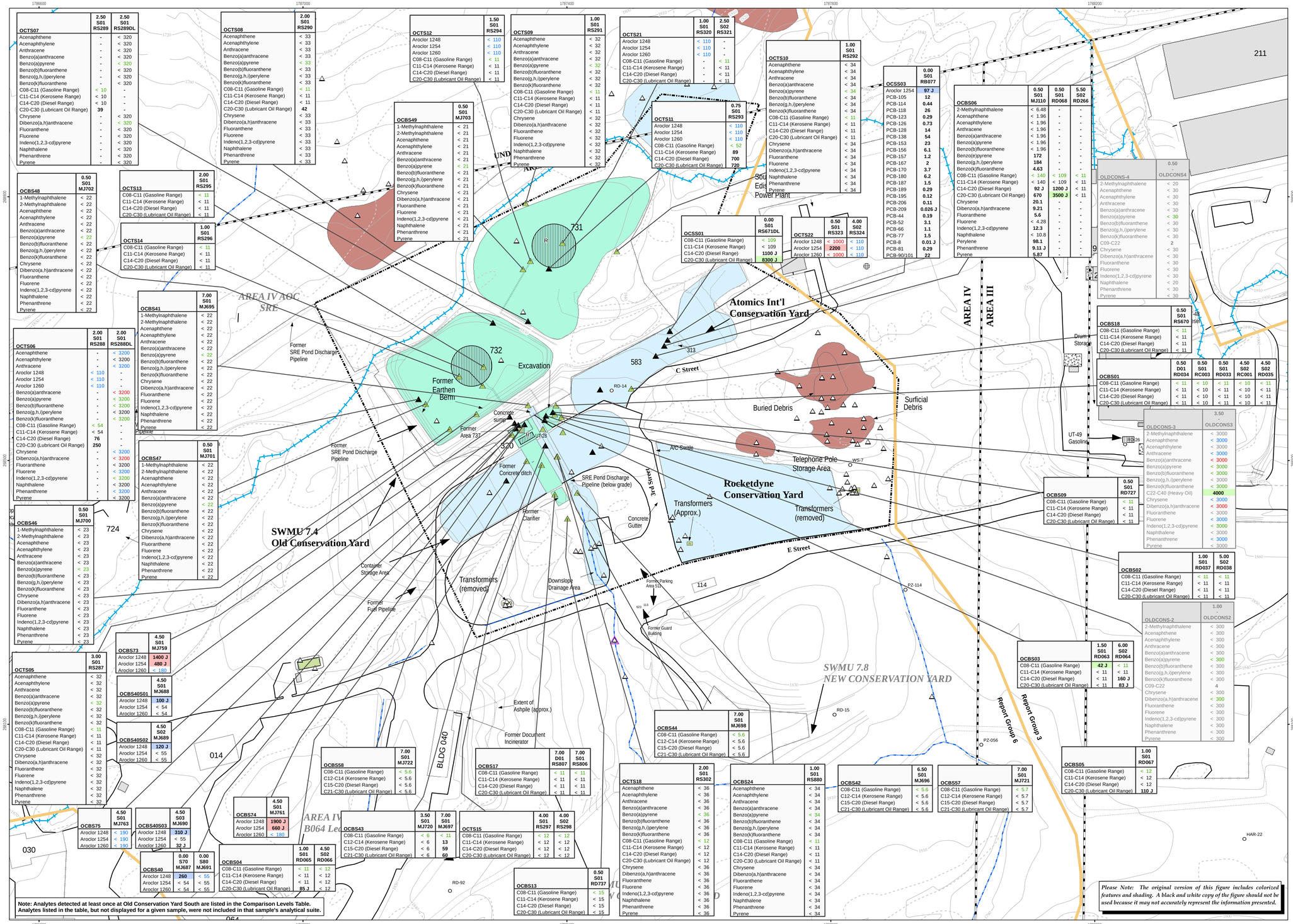
Base Map Legend

- Administrative Area Boundary
- RFI Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Dirt Road
- A/C Curbing
- Trench
- Fence
- Pipe
- Leachfield
- NPDES Outfall
- Well
- Pond
- Possible Pond
- Drainage
- Surface Water Divide
- Elevation Contour
- Rock Outcrop

Date: Sep 27, 2006 Document: RFI-Report-Group6_OCS_TPH_PCB_SVOC_b.mxd

1 inch equals 60 feet — 0 — 60 — 120 Feet





Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Soil SVOC/TPH/PCB Results (North)
Old Conservation Yard North (SWMU 7.4)

Santa Susana Field Laboratory

MWH MONTGOMERY WATSON HARZA

FIGURE A2.3-2C

Soil Sample Location Symbol Legend

- Soil sample location with detected SVOC/TPH/PCB
- Soil sample location with no detected SVOC/TPH/PCB
- Soil sample location not analyzed for SVOC/TPH/PCB
- Contained unit soil sample
- Refused sample (refusal depth < 1' below ground surface)
- Soil Sample not analyzed by any sample method

Comparison Levels

SVOCs	Res RBSL (ug/kg)	Eco RBSL (ug/kg)
1-Methylnaphthalene	- -	- -
2-Methylnaphthalene	- -	- -
Acenaphthene	3400000	2500
Acenaphthylene	1700000	810000
Anthracene	17000000	2400
Benzo(a)anthracene	600	1700
Benzo(a)pyrene	6	4700
Benzo(b)fluoranthene	600	5500
Benzo(g,h,i)perylene	- -	6400
Benzo(k)fluoranthene	600	3700
Chrysene	6000	2400
Dibenzo(a,h)anthracene	170	1700
Fluoranthene	2300000	130000
Fluorene	2300000	1600
Indeno(1,2,3-cd)pyrene	600	3900
Naphthalene	6000	1400000
Phenanthrene	1700000	1300
Pyrene	1700000	79000
TPHs	**Res RBSL (mg/kg)**	**Eco RBSL (mg/kg)**
C08-C11 (Gasoline Range)	1.1	- -
C11-C14 (Kerosene Range)	1400	- -
C12-C14 (Kerosene Range)	1400	- -
C14-C20 (Diesel Range)	1400	- -
C15-C20 (Diesel Range)	1400	- -
C20-C30 (Lubricant Oil Range)	1400	- -
C21-C30 (Lubricant Oil Range)	1400	- -
PCBs	**Res RBSL (ug/kg)**	**Eco RBSL (ug/kg)**
Aroclor 1248	350	12
Aroclor 1254	350	79
Aroclor 1260	350	79

Note: (mg/kg) = milligrams per kilogram
(ug/kg) = micrograms per kilogram

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Data Date: 071206

Data Box Information

Sample Location ID: OCBS01 | 1.00 Depth in Feet | S01 Sample Number | MH007 Lab Reporting Code (EPA ID) | (Historical Sample)

12.05	Detect with sample concentration shown
< 0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
-	Analyte not reported
[#]	If more than one result per sample depth, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results .

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Chemical Use Areas

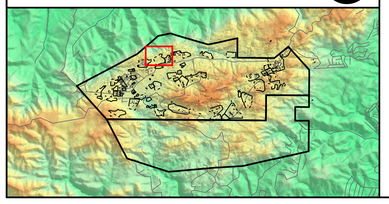
- Solvent
- Petroleum
- Oil
- Transformer
- Metal
- Debris
- Hydrazine
- Perchlorate
- Screening
- Multiple Use

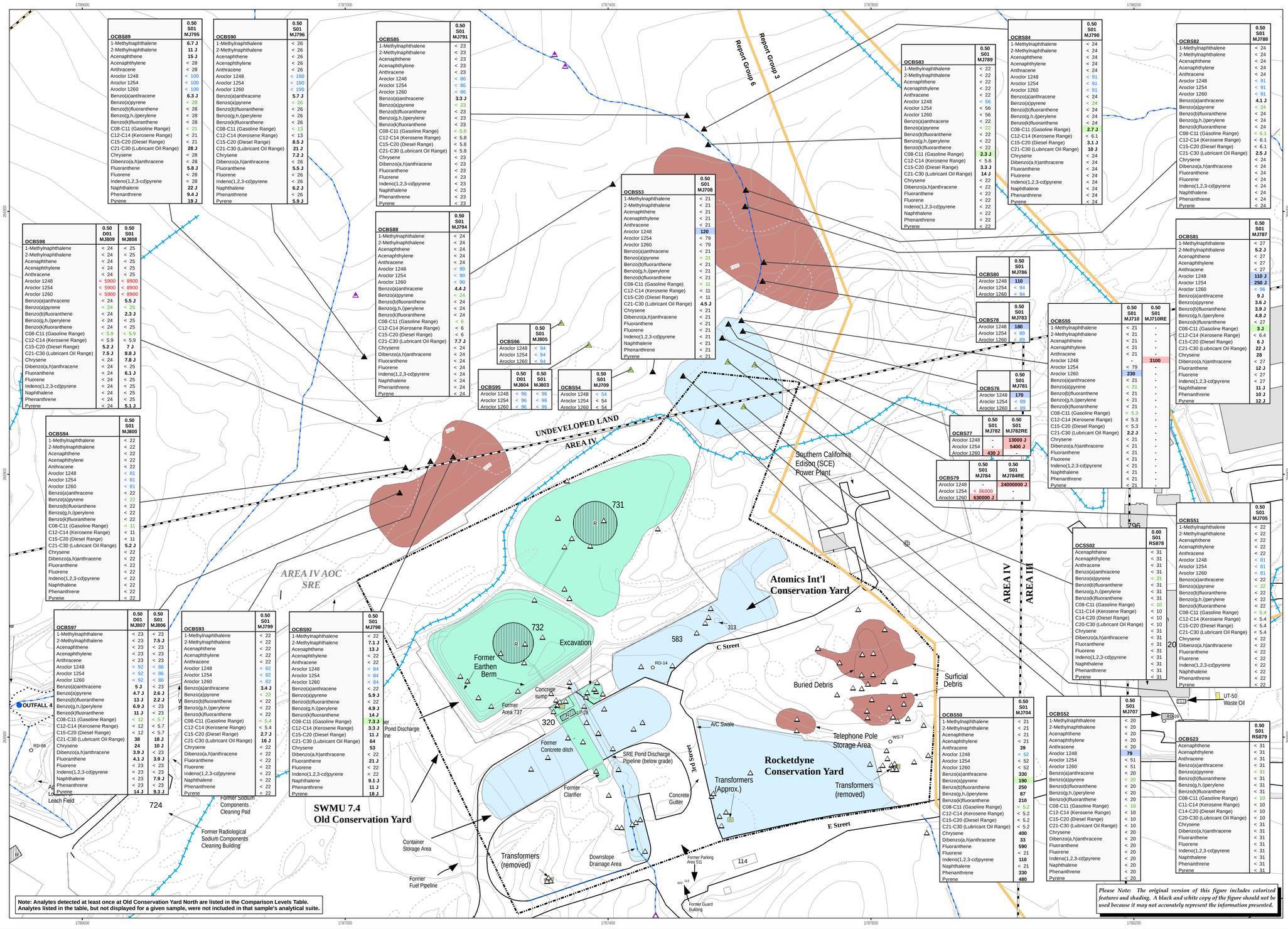
Base Map Legend

- Administrative Area Boundary
- RFI Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Dirt Road
- A/C Curbing
- Trench
- Fence
- Pipe
- Leachfield
- NPDES Outfall
- Well
- Pond
- Possible Pond
- Drainage
- Surface Water Divide
- Elevation Contour
- Rock Outcrop

Date: Sep 26, 2006 Document: RFI-Report-Group6_OCN_TPH_PCB_SVOC_c.mxd

1 inch equals 60 feet 0 60 120 Feet





OCBS89	0.50 S01 MJ795
1-Methylnaphthalene	6.7 J
2-Methylnaphthalene	11 J
Acenaphthene	15 J
Acenaphthylene	< 28
Anthracene	< 28
Aroclor 1248	< 100
Aroclor 1254	< 100
Aroclor 1260	< 100
Benzo(a)anthracene	6.3 J
Benzo(a)pyrene	< 28
Benzo(b)fluoranthene	< 28
Benzo(g,h,i)perylene	< 28
Benzo(k)fluoranthene	< 28
C08-C11 (Gasoline Range)	< 21
C12-C14 (Kerosene Range)	< 21
C15-C20 (Diesel Range)	< 21
C21-C30 (Lubricant Oil Range)	28 J
Chrysene	< 28
Dibenzo(a,h)anthracene	< 28
Fluoranthene	5.8 J
Fluorene	< 28
Indeno(1,2,3-cd)pyrene	< 28
Naphthalene	22 J
Phenanthrene	9.4 J
Pyrene	19 J

OCBS90	0.50 S01 MJ796
1-Methylnaphthalene	< 26
2-Methylnaphthalene	< 26
Acenaphthene	< 26
Acenaphthylene	< 26
Anthracene	< 26
Aroclor 1248	< 190
Aroclor 1254	< 190
Aroclor 1260	< 190
Benzo(a)anthracene	5.7 J
Benzo(a)pyrene	< 26
Benzo(b)fluoranthene	< 26
Benzo(g,h,i)perylene	< 26
Benzo(k)fluoranthene	< 26
C08-C11 (Gasoline Range)	< 13
C12-C14 (Kerosene Range)	< 13
C15-C20 (Diesel Range)	8.5 J
C21-C30 (Lubricant Oil Range)	21 J
Chrysene	7.2 J
Dibenzo(a,h)anthracene	< 26
Fluoranthene	5.5 J
Fluorene	< 26
Indeno(1,2,3-cd)pyrene	< 26
Naphthalene	6.2 J
Phenanthrene	< 26
Pyrene	5.9 J

OCBS85	0.50 S01 MJ791
1-Methylnaphthalene	< 23
2-Methylnaphthalene	< 23
Acenaphthene	< 23
Acenaphthylene	< 23
Anthracene	< 23
Aroclor 1248	< 86
Aroclor 1254	< 86
Aroclor 1260	< 86
Benzo(a)anthracene	3.3 J
Benzo(a)pyrene	< 23
Benzo(b)fluoranthene	< 23
Benzo(g,h,i)perylene	< 23
Benzo(k)fluoranthene	< 23
C08-C11 (Gasoline Range)	< 5.8
C12-C14 (Kerosene Range)	< 5.8
C15-C20 (Diesel Range)	< 5.8
C21-C30 (Lubricant Oil Range)	< 5.8
Chrysene	< 23
Dibenzo(a,h)anthracene	< 23
Fluoranthene	< 23
Fluorene	< 23
Indeno(1,2,3-cd)pyrene	< 23
Naphthalene	< 23
Phenanthrene	< 23
Pyrene	< 23

OCBS88	0.50 S01 MJ794
1-Methylnaphthalene	< 24
2-Methylnaphthalene	< 24
Acenaphthene	< 24
Acenaphthylene	< 24
Anthracene	< 24
Aroclor 1248	< 90
Aroclor 1254	< 90
Aroclor 1260	< 90
Benzo(a)anthracene	4.4 J
Benzo(a)pyrene	< 24
Benzo(b)fluoranthene	< 24
Benzo(g,h,i)perylene	< 24
Benzo(k)fluoranthene	< 24
C08-C11 (Gasoline Range)	< 6
C12-C14 (Kerosene Range)	< 6
C15-C20 (Diesel Range)	< 6
C21-C30 (Lubricant Oil Range)	7.7 J
Chrysene	< 24
Dibenzo(a,h)anthracene	< 24
Fluoranthene	< 24
Fluorene	< 24
Indeno(1,2,3-cd)pyrene	< 24
Naphthalene	< 24
Phenanthrene	< 24
Pyrene	< 24

OCBS53	0.50 S01 MJ708
1-Methylnaphthalene	< 21
2-Methylnaphthalene	< 21
Acenaphthene	< 21
Acenaphthylene	< 21
Anthracene	< 21
Aroclor 1248	120
Aroclor 1254	< 79
Aroclor 1260	< 79
Benzo(a)anthracene	< 21
Benzo(a)pyrene	< 21
Benzo(b)fluoranthene	< 21
Benzo(g,h,i)perylene	< 21
Benzo(k)fluoranthene	< 21
C08-C11 (Gasoline Range)	< 11
C12-C14 (Kerosene Range)	< 11
C15-C20 (Diesel Range)	< 11
C21-C30 (Lubricant Oil Range)	4.5 J
Chrysene	< 21
Dibenzo(a,h)anthracene	< 21
Fluoranthene	< 21
Fluorene	< 21
Indeno(1,2,3-cd)pyrene	< 21
Naphthalene	< 21
Phenanthrene	< 21
Pyrene	< 21

OCBS83	0.50 S01 MJ789
1-Methylnaphthalene	< 22
2-Methylnaphthalene	< 22
Acenaphthene	< 22
Acenaphthylene	< 22
Anthracene	< 22
Aroclor 1248	< 56
Aroclor 1254	< 56
Aroclor 1260	< 56
Benzo(a)anthracene	< 22
Benzo(a)pyrene	< 22
Benzo(b)fluoranthene	< 22
Benzo(g,h,i)perylene	< 22
Benzo(k)fluoranthene	< 22
C08-C11 (Gasoline Range)	2.3 J
C12-C14 (Kerosene Range)	< 5.6
C15-C20 (Diesel Range)	3.3 J
C21-C30 (Lubricant Oil Range)	14 J
Chrysene	< 22
Dibenzo(a,h)anthracene	< 22
Fluoranthene	< 22
Fluorene	< 22
Indeno(1,2,3-cd)pyrene	< 22
Naphthalene	< 22
Phenanthrene	< 22
Pyrene	< 22

OCBS84	0.50 S01 MJ790
1-Methylnaphthalene	< 24
2-Methylnaphthalene	< 24
Acenaphthene	< 24
Acenaphthylene	< 24
Anthracene	< 24
Aroclor 1248	< 91
Aroclor 1254	< 91
Aroclor 1260	< 91
Benzo(a)anthracene	< 24
Benzo(a)pyrene	< 24
Benzo(b)fluoranthene	< 24
Benzo(g,h,i)perylene	< 24
Benzo(k)fluoranthene	< 24
C08-C11 (Gasoline Range)	2.7 J
C12-C14 (Kerosene Range)	< 6.1
C15-C20 (Diesel Range)	3.1 J
C21-C30 (Lubricant Oil Range)	10 J
Chrysene	< 24
Dibenzo(a,h)anthracene	< 24
Fluoranthene	< 24
Fluorene	< 24
Indeno(1,2,3-cd)pyrene	< 24
Naphthalene	< 24
Phenanthrene	< 24
Pyrene	< 24

OCBS82	0.50 S01 MJ788
1-Methylnaphthalene	< 24
2-Methylnaphthalene	< 24
Acenaphthene	< 24
Acenaphthylene	< 24
Anthracene	< 24
Aroclor 1248	< 91
Aroclor 1254	< 91
Aroclor 1260	< 91
Benzo(a)anthracene	4.1 J
Benzo(a)pyrene	< 24
Benzo(b)fluoranthene	< 24
Benzo(g,h,i)perylene	< 24
Benzo(k)fluoranthene	< 24
C08-C11 (Gasoline Range)	< 6.1
C12-C14 (Kerosene Range)	< 6.1
C15-C20 (Diesel Range)	< 6.1
C21-C30 (Lubricant Oil Range)	2.5 J
Chrysene	< 24
Dibenzo(a,h)anthracene	< 24
Fluoranthene	< 24
Fluorene	< 24
Indeno(1,2,3-cd)pyrene	< 24
Naphthalene	< 24
Phenanthrene	< 24
Pyrene	< 24

OCBS81	0.50 S01 MJ787
1-Methylnaphthalene	< 27
2-Methylnaphthalene	5.2 J
Acenaphthene	< 27
Acenaphthylene	< 27
Anthracene	< 27
Aroclor 1248	110 J
Aroclor 1254	250 J
Aroclor 1260	< 96
Benzo(a)anthracene	9 J
Benzo(a)pyrene	3.6 J
Benzo(b)fluoranthene	3.9 J
Benzo(g,h,i)perylene	4.8 J
Benzo(k)fluoranthene	< 27
C08-C11 (Gasoline Range)	3 J
C12-C14 (Kerosene Range)	< 6.4
C15-C20 (Diesel Range)	6 J
C21-C30 (Lubricant Oil Range)	22 J
Chrysene	28
Dibenzo(a,h)anthracene	< 27
Fluoranthene	12 J
Fluorene	< 27
Indeno(1,2,3-cd)pyrene	< 27
Naphthalene	11 J
Phenanthrene	10 J
Pyrene	12 J

OCBS80	0.50 S01 MJ786
Aroclor 1248	110
Aroclor 1254	< 94
Aroclor 1260	< 94

OCBS78	0.50 S01 MJ783
Aroclor 1248	180
Aroclor 1254	< 89
Aroclor 1260	< 89

OCBS76	0.50 S01 MJ781
Aroclor 1248	170
Aroclor 1254	< 89
Aroclor 1260	< 89

OCBS77	0.50 S01 MJ782	0.50 S01 MJ782RE
Aroclor 1248	-	13000 J
Aroclor 1254	-	5400 J
Aroclor 1260	430 J	-

OCBS79	0.50 S01 MJ784	0.50 S01 MJ784RE
Aroclor 1248	-	24000000 J
Aroclor 1254	< 98000	-
Aroclor 1260	630000 J	-

OCBS55	0.50 S01 MJ710	0.50 S01 MJ710RE
1-Methylnaphthalene	< 21	-
2-Methylnaphthalene	< 21	-
Acenaphthene	< 21	-
Acenaphthylene	< 21	-
Anthracene	< 21	-
Aroclor 1248	< 79	3100
Aroclor 1254	230	-
Aroclor 1260	-	-
Benzo(a)anthracene	< 21	-
Benzo(a)pyrene	< 21	-
Benzo(b)fluoranthene	< 21	-
Benzo(g,h,i)perylene	< 21	-
Benzo(k)fluoranthene	< 21	-
C08-C11 (Gasoline Range)	< 5.3	-
C12-C14 (Kerosene Range)	< 5.3	-
C15-C20 (Diesel Range)	< 5.3	-
C21-C30 (Lubricant Oil Range)	2.2 J	-
Chrysene	< 21	-
Dibenzo(a,h)anthracene	< 21	-
Fluoranthene	< 21	-
Fluorene	< 21	-
Indeno(1,2,3-cd)pyrene	< 21	-
Naphthalene	< 21	-
Phenanthrene	< 21	-
Pyrene	< 21	-

OCBS50	0.50 S01 MJ704
1-Methylnaphthalene	< 21
2-Methylnaphthalene	< 21
Acenaphthene	< 21
Acenaphthylene	< 21
Anthracene	39
Aroclor 1248	< 52
Aroclor 1254	< 52
Aroclor 1260	< 52
Benzo(a)anthracene	330
Benzo(a)pyrene	190
Benzo(b)fluoranthene	250
Benzo(g,h,i)perylene	87
Benzo(k)fluoranthene	210
C08-C11 (Gasoline Range)	< 5.2
C12-C14 (Kerosene Range)	< 5.2
C15-C20 (Diesel Range)	< 5.2
C21-C30 (Lubricant Oil Range)	< 5.2
Chrysene	400
Dibenzo(a,h)anthracene	33
Fluoranthene	590
Fluorene	< 21
Indeno(1,2,3-cd)pyrene	110
Naphthalene	< 21
Phenanthrene	330
Pyrene	480

OCBS52	0.50 S01 MJ707
1-Methylnaphthalene	< 20
2-Methylnaphthalene	< 20
Acenaphthene	< 20
Acenaphthylene	< 20
Anthracene	< 20
Aroclor 1248	79
Aroclor 1254	< 51
Aroclor 1260	< 51
Benzo(a)anthracene	< 20
Benzo(a)pyrene	< 20
Benzo(b)fluoranthene	< 20
Benzo(g,h,i)perylene	< 20
Benzo(k)fluoranthene	< 20
C08-C11 (Gasoline Range)	< 10
C12-C14 (Kerosene Range)	< 10
C15-C20 (Diesel Range)	< 10
C21-C30 (Lubricant Oil Range)	< 10
Chrysene	< 20
Dibenzo(a,h)anthracene	< 20
Fluoranthene	< 20
Fluorene	< 20
Indeno(1,2,3-cd)pyrene	< 20
Naphthalene	< 20
Phenanthrene	< 20
Pyrene	< 20

OCBS51	0.50 S01 MJ705
1-Methylnaphthalene	< 22
2-Methylnaphthalene	< 22
Acenaphthene	< 22
Acenaphthylene	< 22
Anthracene	< 22
Aroclor 1248	< 81
Aroclor 1254	< 81
Aroclor 1260	< 81
Benzo(a)anthracene	< 22
Benzo(a)pyrene	< 22
Benzo(b)fluoranthene	< 22
Benzo(g,h,i)perylene	< 22
Benzo(k)fluoranthene	< 22
C08-C11 (Gasoline Range)	< 10
C11-C14 (Kerosene Range)	< 5.4
C14-C20 (Diesel Range)	< 10
C20-C30 (Lubricant Oil Range)	< 10
Chrysene	< 31
Dibenzo(a,h)anthracene	< 31
Fluoranthene	< 31
Fluorene	< 31
Indeno(1,2,3-cd)pyrene	< 31
Naphthalene	< 31
Phenanthrene	< 31
Pyrene	< 31

OCBS23	0.50 S01 RS879
Acenaphthene	< 31
Acenaphthylene	< 31
Anthracene	< 31
Benzo(a)anthracene	< 31
Benzo(a)pyrene	< 31
Benzo(b)fluoranthene	< 31
Benzo(g,h,i)perylene	< 31
Benzo(k)fluoranthene	< 31
C08-C11 (Gasoline Range)	< 10
C12-C14 (Kerosene Range)	< 10
C14-C20 (Diesel Range)	< 10
C20-C30 (Lubricant Oil Range)	< 10
Chrysene	< 31
Dibenzo(a,h)anthracene	< 31
Fluoranthene	< 31
Fluorene	< 31
Indeno(1,2,3-cd)pyrene	< 31
Naphthalene	< 31
Phenanthrene	< 31
Pyrene	< 31

OCBS98	0.50 D01 MJ809	0.50 S01 MJ808
1-Methylnaphthalene	< 24	< 25
2-Methylnaphthalene	< 24	< 25
Acenaphthene	< 24	< 25
Acenaphthylene	< 24	< 25
Anthracene	< 24	< 25
Aroclor 1248	< 5900	< 8900
Aroclor 1254	< 5900	< 8900
Aroclor 1260	< 5900	< 8900
Benzo(a)anthracene	< 24	5.5 J
Benzo(a)pyrene	< 24	< 25
Benzo(b)fluoranthene	< 24	2.3 J
Benzo(g,h,i)perylene	< 24	< 25
Benzo(k)fluoranthene	< 24	< 25
C08-C11 (Gasoline Range)	< 5.9	< 5.9
C12-C14 (Kerosene Range)	< 5.9	< 5.9
C15-C20 (Diesel Range)	5.2 J	7 J
C21-C30 (Lubricant Oil Range)	7.5 J	8.8 J
Chrysene	< 24	7.8 J
Dibenzo(a,h)anthracene	< 24	< 25
Fluoranthene	< 24	6.1 J
Fluorene	< 24	< 25
Indeno(1,2,3-cd)pyrene	< 24	< 25
Naphthalene	< 24	7.9 J
Phenanthrene	< 24	< 25
Pyrene	< 24	5.1 J

OCBS94	0.50 S01 MJ800
1-Methylnaphthalene	< 22
2-Methylnaphthalene	< 22
Acenaphthene	< 22
Acenaphthylene	< 22
Anthracene	< 22
Aroclor 1248	< 81
Aroclor 1254	< 81
Aroclor 1260	< 81
Benzo(a)anthracene	< 22
Benzo(a)pyrene	< 22
Benzo(b)fluoranthene	< 22
Benzo(g,h,i)perylene	< 22
Benzo(k)fluoranthene	< 22
C08-C11 (Gasoline Range)	< 11
C12-C14 (Kerosene Range)	< 11
C15-C20 (Diesel Range)	< 11
C21-C30 (Lubricant Oil Range)	5.2 J
Chrysene	< 22
Dibenzo(a,h)anthracene	< 22
Fluoranthene	< 22
Fluorene	< 22
Indeno(1,2,3-cd)pyrene	< 22
Naphthalene	< 22
Phenanthrene	< 22
Pyrene	< 22

OCBS97	0.50 D01 MJ807	0.50 S01 MJ806
1-Methylnaphthalene	< 23	< 23
2-Methylnaphthalene	< 23	7.5 J
Acenaphthene	< 23	< 23
Acenaphthylene	< 23	< 23
Anthracene	< 23	< 23
Aroclor 1248	< 92	< 86
Aroclor 1254	< 92	< 86
Aroclor 1260	< 92	< 86
Benzo(a)anthracene	5 J	< 23
Benzo(a)pyrene	4.7 J	2.6 J
Benzo(b)fluoranthene	13 J	2.2 J
Benzo(g,h,i)perylene	6.9 J	< 23
Benzo(k)fluoranthene	11 J	< 23
C08-C11 (Gasoline Range)	< 12	< 5.7
C12-C14 (Kerosene Range)	< 12	< 5.7
C15-C20 (Diesel Range)	< 12	< 5.7
C21-C30 (Lubricant Oil Range)	38	18 J
Chrysene	24	10 J
Dibenzo(a,h)anthracene	3.9 J	< 23
Fluoranthene	4.1 J	3.9 J
Fluorene	< 23	< 23
Indeno(1,2,3-cd)pyrene	< 23	< 23
Naphthalene	< 23	7.9 J
Phenanthrene	< 23	< 23
Pyrene	14 J	9.3 J

OCBS93	0.50 S01 MJ799
1-Methylnaphthalene	< 22
2-Methylnaphthalene	< 22
Acenaphthene	< 22
Acenaphthylene	< 22
Anthracene	< 22
Aroclor 1248	< 82
Aroclor 1254	< 82
Aroclor 1260	< 82
Benzo(a)anthracene	3.4 J
Benzo(a)pyrene	< 22
Benzo(b)fluoranthene	< 22
Benzo(g,h,i)perylene	< 22
Benzo(k)fluoranthene	< 22
C08-C11 (Gasoline Range)	< 5.4
C12-C14 (Kerosene Range)	< 5.4
C15-C20 (Diesel Range)	2.7 J
C21-C30 (Lubricant Oil Range)	16 J
Chrysene	< 22
Dibenzo(a,h)anthracene	< 22
Fluoranthene	< 22
Fluorene	< 22
Indeno(1,2,3-cd)pyrene	< 22
Naphthalene	< 22
Phenanthrene	< 22
Pyrene	< 22

OCBS92	0.50 S01 MJ798
1-Methylnaphthalene	< 22
2-Methylnaphthalene	7.1 J
Acenaphthene	13 J
Acenaphthylene	< 22
Anthracene	< 22
Aroclor 1248	< 84
Aroclor 1254	< 84
Aroclor 1260	< 84
Benzo(a)anthracene	< 22
Benzo(a)pyrene	5.9 J
Benzo(b)fluoranthene	< 22
Benzo(g,h,i)perylene	4.9 J
Benzo(k)fluoranthene	14 J
C08-C11 (Gasoline Range)	7.3 J
C12-C14 (Kerosene Range)	3.3 J
C15-C20 (Diesel Range)	11 J
C21-C30 (Lubricant Oil Range)	64
Chrysene	53
Dibenzo(a,h)anthracene	< 22
Fluoranthene	21 J
Fluorene	< 22
Indeno(1,2,3-cd)pyrene	< 22
Naphthalene	9.1 J
Phenanthrene	11 J
Pyrene	18 J

OCBS96	0.50 S01 MJ805
Aroclor 1248	< 94
Aroclor 1254	< 94
Aroclor 1260	< 94

OCBS95	0.50 D01 MJ804	0.50 S01 MJ803
Aroclor 1248	< 96	< 96
Aroclor 1254	< 96	< 96
Aroclor 1260	< 96	< 96

OCBS54	0.50 S01 MJ709
Aroclor 1248	< 54
Aroclor 1254	< 54
Aroclor 1260	< 54

Note: Analytes detected at least once at Old Conservation Yard North are listed in the Comparison Levels Table. Analytes listed in the table, but not displayed for a given sample, were not included in that sample's analytical suite.

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Soil Dioxins Results
Old Conservation Yard (SWMU 7.4)

Santa Susana Field Laboratory

MWH
MONTGOMERY WATSON HARZA

FIGURE
A2.3-3

Soil Sample Location Symbol Legend

- Soil sample location with detected Dioxins
- Soil sample location with no detected Dioxins
- Soil sample location not analyzed for Dioxins
- Contained unit soil sample
- Refused sample (refusal depth < 1' below ground surface)
- Soil Sample not analyzed by any sample method

Comparison Levels

Dioxins/Furans	Background (ng/kg)	Res RBSL (ng/kg)	Eco RBSL (ng/kg)
1,2,3,4,6,7,8-HpCDD	13	690	1000
1,2,3,4,6,7,8-HpCDF	2.5	690	340
1,2,3,4,7,8,9-HpCDF	0.19	690	340
1,2,3,4,7,8-HxCDD	0.34	69	34
1,2,3,4,7,8-HxCDF	0.73	69	34
1,2,3,6,7,8-HxCDD	0.95	69	34
1,2,3,6,7,8-HxCDF	0.3	69	34
1,2,3,7,8,9-HxCDD	1.1	69	35
1,2,3,7,8,9-HxCDF	0.43	69	34
1,2,3,7,8-PeCDD	0.59	140	69
2,3,4,6,7,8-HxCDF	0.45	69	34
2,3,4,7,8-PeCDF	0.64	14	6.9
2,3,7,8-TCDD	0.5	6.9	3.4
2,3,7,8-TCDF	1.8	69	4.4
OCDD	140	69000	140000
OCDF	8.1	69000	99000
TCDD TEQ (ND = 0)	0.98	6.9	3.4
Total HpCDD	- -	- -	- -
Total HpCDF	- -	- -	- -
Total HxCDD	- -	- -	- -
Total HxCDF	- -	- -	- -
Total PeCDD	- -	- -	- -
Total PeCDF	- -	- -	- -
Total TCDD	- -	- -	- -
Total TCDF	- -	- -	- -

Note: (ng/kg) = nanograms per kilogram

Background **Background Level**
Res RBSL **Residential Risk-Based Screening Level**
Eco RBSL **Ecological Risk-Based Screening Level**

Data Date: 070306

Data Box Information

Sample Location ID — OCBS01 — 1.00 (Depth in Feet) / S01 (Sample Number) / MH007 (Lab Reporting Code (EPA ID))

(Historical Sample)

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results .

12.05	Detect with sample concentration shown
< 0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
-	Analyte not reported
[#]	If more than one result per sample depth, the maximum is presented, with number of results in backets.

Detect	Non-Detect
12.05	<0.06 Exceeds Background
12.05	<0.06 Exceeds Background + Res RBSL
12.05	<0.06 Exceeds Background + Eco RBSL
12.05	<0.06 Exceeds Background + Res RBSL + Eco RBSL

Chemical Use Areas

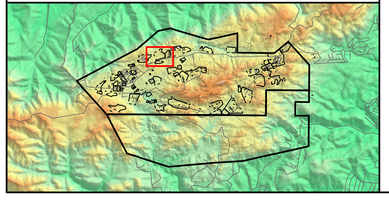
- Solvent
- Petroleum
- Oil
- Transformer
- Metal
- Debris
- Hydrazine
- Perchlorate
- Screening
- Multiple Use

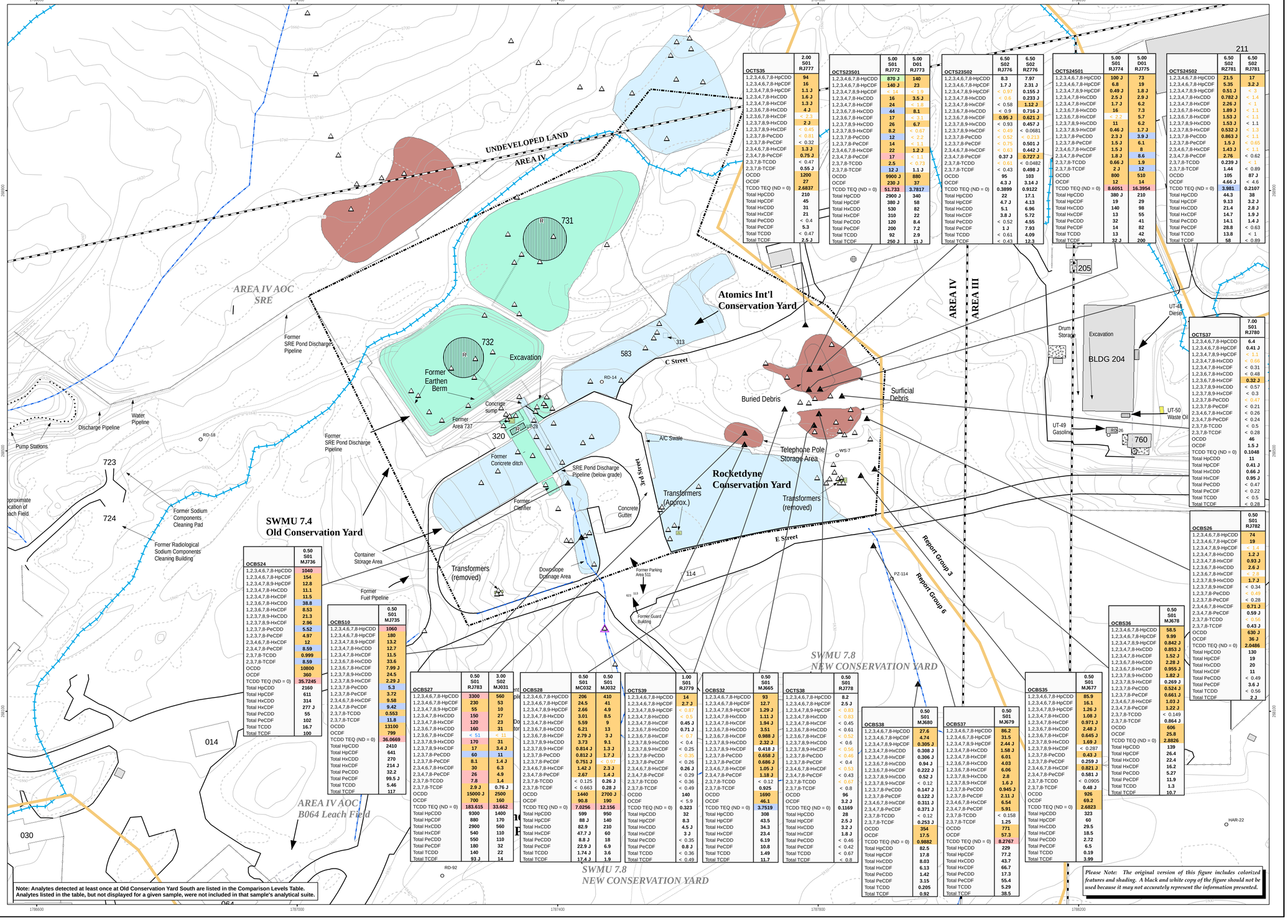
Base Map Legend

- Administrative Area Boundary
- RFI Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Dirt Road
- A/C Curbing
- Trench
- Fence
- Pipe
- Leachfield
- NPDES Outfall
- Well
- Pond
- Possible Pond
- Drainage
- Surface Water Divide
- Elevation Contour
- Rock Outcrop

Date: Sep 26, 2006 Document: RFI-Report-Group6_OCS_Dioxin.mxd

1 inch equals 60 feet — Feet: 0, 60, 120





OCTS35	2.00 S01 RJ777
1,2,3,4,6,7,8-HpCDD	94
1,2,3,4,6,7,8-HpCDF	16
1,2,3,4,7,8,9-HpCDF	1.1 J
1,2,3,4,7,8-HxCDD	1.6 J
1,2,3,4,7,8-HxCDF	1.3 J
1,2,3,6,7,8-HxCDD	4.3 J
1,2,3,6,7,8-HxCDF	< 0.3
1,2,3,7,8,9-HxCDD	2 J
1,2,3,7,8,9-HxCDF	< 0.45
1,2,3,7,8-PeCDD	< 0.81
1,2,3,7,8-PeCDF	< 0.32
2,3,4,6,7,8-HxCDF	1.3 J
2,3,4,7,8-PeCDF	0.75 J
2,3,7,8-TCDD	< 0.47
2,3,7,8-TCDF	0.55 J
OCDD	1200
OCDF	27
TCDD TEQ (ND = 0)	2.6837
Total HpCDD	210
Total HpCDF	45
Total HxCDD	31
Total HxCDF	21
Total PeCDD	< 0.4
Total PeCDF	5.3
Total TCDD	< 0.47
Total TCDF	2.5 J

OCTS23S01	5.00 S01 RJ772	5.00 D01 RJ773
1,2,3,4,6,7,8-HpCDD	870 J	140
1,2,3,4,6,7,8-HpCDF	140 J	23
1,2,3,4,7,8,9-HpCDF	< 1.6	< 1.8
1,2,3,4,7,8-HxCDD	16	3.5 J
1,2,3,4,7,8-HxCDF	24	< 1.8
1,2,3,6,7,8-HxCDD	44	8.1
1,2,3,6,7,8-HxCDF	17	< 1.4
1,2,3,7,8,9-HxCDD	26	6.7
1,2,3,7,8,9-HxCDF	8.2	< 0.67
1,2,3,7,8-PeCDD	12	< 2.2
1,2,3,7,8-PeCDF	14	< 1.1
2,3,4,6,7,8-HxCDF	22	1.2 J
2,3,4,7,8-PeCDF	17	< 1.1
2,3,7,8-TCDD	2.5	< 0.73
2,3,7,8-TCDF	12 J	1.1 J
OCDD	9900 J	880
OCDF	230 J	37
TCDD TEQ (ND = 0)	51.733	3.7817
Total HpCDD	2900 J	340
Total HpCDF	380 J	58
Total HxCDD	530	82
Total HxCDF	310	22
Total PeCDD	120	8.4
Total PeCDF	200	7.2
Total TCDD	92	2.9
Total TCDF	250 J	11 J

OCTS23S02	6.50 S02 RJ776	6.50 S02 RZ776
1,2,3,4,6,7,8-HpCDD	8.3	7.97
1,2,3,4,6,7,8-HpCDF	1.7 J	2.31 J
1,2,3,4,7,8,9-HpCDF	< 0.07	0.155 J
1,2,3,4,7,8-HxCDD	< 0.6	0.233 J
1,2,3,4,7,8-HxCDF	< 0.58	1.12 J
1,2,3,6,7,8-HxCDD	< 0.9	0.716 J
1,2,3,6,7,8-HxCDF	0.95 J	0.621 J
1,2,3,7,8,9-HxCDD	< 0.93	0.457 J
1,2,3,7,8,9-HxCDF	< 0.49	< 0.0681
1,2,3,7,8-PeCDD	< 0.52	< 0.2243
1,2,3,7,8-PeCDF	< 0.75	0.501 J
2,3,4,6,7,8-HxCDF	< 0.63	0.442 J
2,3,4,7,8-PeCDF	0.37 J	0.727 J
2,3,7,8-TCDD	< 0.63	< 0.0482
2,3,7,8-TCDF	< 0.43	0.498 J
OCDD	95	103
OCDF	4.3 J	3.14 J
TCDD TEQ (ND = 0)	0.3899	0.9122
Total HpCDD	22	17.1
Total HpCDF	4.7 J	4.13
Total HxCDD	5.1	6.96
Total HxCDF	3.8 J	5.72
Total PeCDD	< 0.52	4.55
Total PeCDF	1 J	7.93
Total TCDD	< 0.61	4.09
Total TCDF	< 0.43	12 J

OCTS24S01	5.00 S01 RJ774	5.00 D01 RJ775
1,2,3,4,6,7,8-HpCDD	100 J	73
1,2,3,4,6,7,8-HpCDF	6.8	19
1,2,3,4,7,8,9-HpCDF	0.49 J	1.8 J
1,2,3,4,7,8-HxCDD	2.5 J	2.9 J
1,2,3,4,7,8-HxCDF	1.7 J	6.2
1,2,3,6,7,8-HxCDD	16	7.3
1,2,3,6,7,8-HxCDF	< 2.2	5.7
1,2,3,7,8,9-HxCDD	11	6.2
1,2,3,7,8,9-HxCDF	0.46 J	1.7 J
1,2,3,7,8-PeCDD	2.3 J	3.9 J
1,2,3,7,8-PeCDF	1.5 J	6.1
2,3,4,6,7,8-HxCDF	1.5 J	8
2,3,4,7,8-PeCDF	1.8 J	8.6
2,3,7,8-TCDD	0.66 J	1.9
2,3,7,8-TCDF	2 J	12
OCDD	800	510
OCDF	12	14
TCDD TEQ (ND = 0)	0.6051	16.3954
Total HpCDD	380 J	210
Total HpCDF	19	29
Total HxCDD	140	98
Total HxCDF	13	55
Total PeCDD	32	41
Total PeCDF	14	82
Total TCDD	13	42
Total TCDF	32 J	200

OCTS24S02	6.50 S02 RZ781	6.50 S02 RJ781
1,2,3,4,6,7,8-HpCDD	21.5	17
1,2,3,4,6,7,8-HpCDF	5.35	3.2 J
1,2,3,4,7,8,9-HpCDF	0.51 J	< 3
1,2,3,4,7,8-HxCDD	0.782 J	< 1.4
1,2,3,4,7,8-HxCDF	2.26 J	< 1
1,2,3,6,7,8-HxCDD	1.89 J	< 1.1
1,2,3,6,7,8-HxCDF	1.53 J	< 1.1
1,2,3,7,8,9-HxCDD	1.53 J	< 1.1
1,2,3,7,8,9-HxCDF	0.532 J	< 1.3
1,2,3,7,8-PeCDD	0.863 J	< 1.1
1,2,3,7,8-PeCDF	1.5 J	< 0.65
2,3,4,6,7,8-HxCDF	1.43 J	< 1.1
2,3,4,7,8-PeCDF	2.76	< 0.62
2,3,7,8-TCDD	0.239 J	< 1
2,3,7,8-TCDF	1.44	< 0.89
OCDD	105	87 J
OCDF	4.66 J	< 4.6
TCDD TEQ (ND = 0)	3.981	0.2107
Total HpCDD	139	38
Total HpCDF	9.13	3.2 J
Total HxCDD	21.4	2.8 J
Total HxCDF	14.7	1.9 J
Total PeCDD	14.1	1.4 J
Total PeCDF	28.8	< 0.63
Total TCDD	13.8	< 1
Total TCDF	58	< 0.89

OCTS37	7.00 S01 RJ780
1,2,3,4,6,7,8-HpCDD	6.4
1,2,3,4,6,7,8-HpCDF	0.41 J
1,2,3,4,7,8,9-HpCDF	< 1.1
1,2,3,4,7,8-HxCDD	< 0.66
1,2,3,4,7,8-HxCDF	< 0.31
1,2,3,6,7,8-HxCDD	< 0.48
1,2,3,6,7,8-HxCDF	0.32 J
1,2,3,7,8,9-HxCDD	< 0.57
1,2,3,7,8,9-HxCDF	< 0.3
1,2,3,7,8-PeCDD	< 0.47
1,2,3,7,8-PeCDF	< 0.21
2,3,4,6,7,8-HxCDF	< 0.26
2,3,4,7,8-PeCDF	< 0.24
2,3,7,8-TCDD	< 0.5
2,3,7,8-TCDF	< 0.28
OCDD	46
OCDF	1.5 J
TCDD TEQ (ND = 0)	0.1048
Total HpCDD	11
Total HpCDF	0.41 J
Total HxCDD	0.66 J
Total HxCDF	0.95 J
Total PeCDD	< 0.47
Total PeCDF	< 0.22
Total TCDD	< 0.5
Total TCDF	< 0.28

OCBS26	0.50 S01 RJ782
1,2,3,4,6,7,8-HpCDD	74
1,2,3,4,6,7,8-HpCDF	19
1,2,3,4,7,8,9-HpCDF	< 1.4
1,2,3,4,7,8-HxCDD	1.2 J
1,2,3,4,7,8-HxCDF	0.93 J
1,2,3,6,7,8-HxCDD	2.6 J
1,2,3,6,7,8-HxCDF	< 1.8
1,2,3,7,8,9-HxCDD	1.7 J
1,2,3,7,8,9-HxCDF	< 0.34
1,2,3,7,8-PeCDD	< 0.49
1,2,3,7,8-PeCDF	< 0.28
2,3,4,6,7,8-HxCDF	0.71 J
2,3,4,7,8-PeCDF	0.59 J
2,3,7,8-TCDD	< 0.56
2,3,7,8-TCDF	0.43 J
OCDD	630 J
OCDF	36 J
TCDD TEQ (ND = 0)	2.0486
Total HpCDD	130
Total HpCDF	19
Total HxCDD	20
Total HxCDF	11
Total PeCDD	< 0.49
Total PeCDF	3.6 J
Total TCDD	< 0.56
Total TCDF	2 J

OCBS36	0.50 S01 MJ678
1,2,3,4,6,7,8-HpCDD	58.5
1,2,3,4,6,7,8-HpCDF	9.99
1,2,3,4,7,8,9-HpCDF	0.842 J
1,2,3,4,7,8-HxCDD	0.853 J
1,2,3,4,7,8-HxCDF	1.52 J
1,2,3,6,7,8-HxCDD	2.28 J
1,2,3,6,7,8-HxCDF	0.955 J
1,2,3,7,8,9-HxCDD	1.82 J
1,2,3,7,8,9-HxCDF	0.269 J
1,2,3,7,8-PeCDD	0.524 J
1,2,3,7,8-PeCDF	0.661 J
2,3,4,6,7,8-HxCDF	1.03 J
2,3,4,7,8-PeCDF	1.22 J
2,3,7,8-TCDD	< 0.149
2,3,7,8-TCDF	0.864 J
OCDD	606
OCDF	25.8
TCDD TEQ (ND = 0)	2.8826
Total HpCDD	139
Total HpCDF	26.4
Total HxCDD	22.4
Total HxCDF	16.2
Total PeCDD	5.27
Total PeCDF	11.9
Total TCDD	1.3
Total TCDF	10.7

OCBS24	0.50 S01 MJ736
1,2,3,4,6,7,8-HpCDD	1040
1,2,3,4,6,7,8-HpCDF	154
1,2,3,4,7,8,9-HpCDF	12.8
1,2,3,4,7,8-HxCDD	11.1
1,2,3,4,7,8-HxCDF	11.5
1,2,3,6,7,8-HxCDD	38.8
1,2,3,6,7,8-HxCDF	8.53
1,2,3,7,8,9-HxCDD	21.3
1,2,3,7,8,9-HxCDF	2.96
1,2,3,7,8-PeCDD	5.52
1,2,3,7,8-PeCDF	4.97
2,3,4,7,8-PeCDF	8.59
2,3,7,8-TCDD	0.999
2,3,7,8-TCDF	8.59
OCDD	10800
OCDF	360
TCDD TEQ (ND = 0)	35.7245
Total HpCDD	2160
Total HpCDF	611
Total HxCDD	314
Total HxCDF	277 J
Total PeCDD	55
Total PeCDF	102
Total TCDD	16.7
Total TCDF	100

OCBS10	0.50 S01 MJ735
1,2,3,4,6,7,8-HpCDD	1060
1,2,3,4,6,7,8-HpCDF	180
1,2,3,4,7,8,9-HpCDF	13.2
1,2,3,4,7,8-HxCDD	12.7
1,2,3,4,7,8-HxCDF	11.5
1,2,3,6,7,8-HxCDD	33.6
1,2,3,6,7,8-HxCDF	7.99 J
1,2,3,7,8,9-HxCDD	24.5
1,2,3,7,8,9-HxCDF	2.29 J
1,2,3,7,8-PeCDD	5.3
1,2,3,7,8-PeCDF	3.72
2,3,4,6,7,8-HxCDF	9.58
2,3,4,7,8-PeCDF	9.42
2,3,7,8-TCDD	0.553
2,3,7,8-TCDF	11.8
OCDD	13100
OCDF	799
TCDD TEQ (ND = 0)	36.0669
Total HpCDD	2410
Total HpCDF	641
Total HxCDD	270
Total HxCDF	214 J
Total PeCDD	32.2
Total PeCDF	99.5 J
Total TCDD	5.46
Total TCDF	117

OCBS27	0.50 S01 RJ783	3.00 S02 MJ031
1,2,3,4,6,7,8-HpCDD	3300	560
1,2,3,4,6,7,8-HpCDF	230	53
1,2,3,4,7,8,9-HpCDF	55	10
1,2,3,4,7,8-HxCDD	150	27
1,2,3,4,7,8-HxCDF	120	23
1,2,3,6,7,8-HxCDD	160	31
1,2,3,6,7,8-HxCDF	< 51	< 11
1,2,3,7,8,9-HxCDD	170	31
1,2,3,7,8,9-HxCDF	17	3.4 J
1,2,3,7,8-PeCDD	60	11
1,2,3,7,8-PeCDF	8.1	1.4 J
2,3,4,6,7,8-HxCDF	30	6.3
2,3,4,7,8-PeCDF	26	4.9
2,3,7,8-TCDD	7.8	1.4
2,3,7,8-TCDF	2.9 J	0.76 J
OCDD	15000 J	2500
OCDF	700	160
TCDD TEQ (ND = 0)	183.615	33.662
Total HpCDD	9300	1400
Total HpCDF	880	170
Total HxCDD	2900	560
Total HxCDF	540	110
Total PeCDD	550	110
Total PeCDF	180	32
Total TCDD	140	22
Total TCDF	93 J	14

OCBS28	0.50 S01 MC032	0.50 S01 MJ032
1,2,3,4,6,7,8-HpCDD	206	410
1,2,3,4,6,7,8-HpCDF	24.5	41
1,2,3,4,7,8,9-HpCDF	2.66	4.9
1,2,3,4,7,8-HxCDD	3.01	8.5
1,2,3,4,7,8-HxCDF	5.59	9
1,2,3,6,7,8-HxCDD	6.21	13
1,2,3,6,7,8-HxCDF	2.79 J	3 J
1,2,3,7,8,9-HxCDD	3.73	9.1
1,2,3,7,8,9-HxCDF	0.814 J	1.3 J
1,2,3,7,8-PeCDD	0.812 J	1.7 J
1,2,3,7,8-PeCDF	0.751 J	< 0.97
2,3,4,6,7,8-HxCDF	1.42 J	2.3 J
2,3,4,7,8-PeCDF	2.67	1.4 J
2,3,7,8-TCDD	< 0.125	0.26 J
2,3,7,8-TCDF	< 0.663	0.28 J
OCDD	1440	2700 J
OCDF	90.8	190
TCDD TEQ (ND = 0)	7.0256	12.156
Total HpCDD	599	950
Total HpCDF	88 J	140
Total HxCDD	82.9	210
Total HxCDF	47.7 J	60
Total PeCDD	8.8 J	18
Total PeCDF	22.9 J	6.9
Total TCDD	1.74 J	3.6
Total TCDF	17.4 J	1.9

OCTS39	1.00 S01 RJ779
1,2,3,4,6,7,8-HpCDD	14
1,2,3,4,6,7,8-HpCDF	2.7 J
1,2,3,4,7,8,9-HpCDF	< 0.87
1,2,3,4,7,8-HxCDD	< 0.5
1,2,3,4,7,8-HxCDF	0.45 J
1,2,3,6,7,8-HxCDD	0.71 J
1,2,3,6,7,8-HxCDF	< 0.7
1,2,3,7,8,9-HxCDD	< 0.4
1,2,3,7,8,9-HxCDF	< 0.25
1,2,3,7,8-PeCDD	< 0.75
1,2,3,7,8-PeCDF	< 0.26
2,3,4,6,7,8-HxCDF	0.26 J
2,3,4,7,8-PeCDF	< 0.29
2,3,7,8-TCDD	< 0.36
2,3,7,8-TCDF	< 0.49
OCDD	140
OCDF	< 5.9
TCDD TEQ (ND = 0)	0.323
Total HpCDD	32
Total HpCDF	8.3
Total HxCDD	4.5 J
Total HxCDF	3 J
Total PeCDD	< 0.35
Total PeCDF	0.8 J
Total TCDD	< 0.36
Total TCDF	< 0.49

OCBS32	0.50 S01 MJ665
1,2,3,4,6,7,8-HpCDD	93
1,2,3,4,6,7,8-HpCDF	12.7
1,2,3,4,7,8,9-HpCDF	1.29 J
1,2,3,4,7,8-HxCDD	1.11 J
1,2,3,4,7,8-HxCDF	1.94 J
1,2,3,6,7,8-HxCDD	3.51
1,2,3,6,7,8-HxCDF	0.988 J
1,2,3,7,8,9-HxCDD	2.32 J
1,2,3,7,8,9-HxCDF	0.418 J
1,2,3,7,8-PeCDD	0.658 J
1,2,3,7,8-PeCDF	0.686 J
2,3,4,6,7,8-HxCDF	1.05 J
2,3,4,7,8-PeCDF	1.18 J
2,3,7,8-TCDD	< 0.12
2,3,7,8-TCDF	0.925
OCDD	1690
OCDF	46.1
TCDD TEQ (ND = 0)	3.7519
Total HpCDD	308
Total HpCDF	43.5
Total HxCDD	34.3
Total HxCDF	23.4
Total PeCDD	6.19
Total PeCDF	10.8
Total TCDD	1.49
Total TCDF	11.7

OCTS38	0.50 S01 RJ778
1,2,3,4,6,7,8-HpCDD	8.2
1,2,3,4,6,7,8-HpCDF	2.5 J
1,2,3,4,7,8,9-HpCDF	< 0.83
1,2,3,4,7,8-HxCDD	< 0.45
1,2,3,4,7,8-HxCDF	< 0.61
1,2,3,6,7,8-HxCDD	< 0.52
1,2,3,6,7,8-HxCDF	< 0.46
1,2,3,7,8,9-HxCDD	< 0.6
1,2,3,7,8,9-HxCDF	< 0.56
1,2,3,7,8-PeCDD	< 0.46
1,2,3,7,8-PeCDF	< 0.4
2,3,4,6,7,8-HxCDF	< 0.53
2,3,4,7,8-PeCDF	< 0.43
2,3,7,8-TCDD	< 0.67
2,3,7,8-TCDF	< 0.8
OCDD	96
OCDF	3.2 J
TCDD TEQ (ND = 0)	0.1169
Total HpCDD	28
Total HpCDF	2.5 J
Total HxCDD	3.2 J
Total HxCDF	1.8 J
Total PeCDD	< 0.46
Total PeCDF	< 0.42
Total TCDD	< 0.67
Total TCDF	< 0.8

OCBS38	0.50 S01 MJ680
1,2,3,4,6,7,8-HpCDD	27.6
1,2,3,4,6,7,8-HpCDF	4.74
1,2,3,4,7,8,9-HpCDF	0.305 J
1,2,3,4,7,8-HxCDD	0.308 J
1,2,3,4,7,8-HxCDF	0.306 J
1,2,3,6,7,8-HxCDD	0.94 J
1,2,3,6,7,8-HxCDF	0.222 J
1,2,3,7,8,9-HxCDD	0.52 J
1,2,3,7,8,9-HxCDF	< 0.12
1,2,3,7,8-PeCDD	0.147 J
1,2,3,7,8-PeCDF	0.122 J
2,3,4,6,7,8-HxCDF	0.311 J
2,3,4,7,8-PeCDF	0.371 J
2,3,7,8-TCDD	< 0.12
2,3,7,8-TCDF	0.253 J
OCDD	354
OCDF	17.5
TCDD TEQ (ND = 0)	0.9882
Total HpCDD	82.5
Total HpCDF	17.8
Total HxCDD	8.03
Total HxCDF	6.13
Total PeCDD	1.42
Total PeCDF	3.15
Total TCDD	0.205
Total TCDF	0.92

OCBS37	0.50 S01 MJ679
1,2,3,4,6,7,8-HpCDD	86.2
1,2,3,4,6,7,8-HpCDF	31.5
1,2,3,4,7,8,9-HpCDF	2.44 J
1,2,3,4,7,8-HxCDD	1.58 J
1,2,3,4,7,8-HxCDF	6.01
1,2,3,6,7,8-HxCDD	4.03
1,2,3,6,7,8-HxCDF	6.06
1,2,3,7,8,9-HxCDD	2.8
1,2,3,7,8,9-HxCDF	1.6 J
1,2,3,7,8-PeCDD	0.945 J
1,2,3,7,8-PeCDF	2.11 J
2,3,4,6,7,8-HxCDF	6.54
2,3,4,7,8-PeCDF	5.91
2,3,7,8-TCDD	< 0.158
2,3,7,8-TCDF	1.25
OCDD	771
OCDF	57.3
TCDD TEQ (ND = 0)	8.2767
Total HpCDD	229
Total HpCDF	77.2
Total HxCDD	43.7
Total HxCDF	66.7
Total PeCDD	17.3
Total PeCDF	55.4
Total TCDD	5.29
Total TCDF	38.5

OCBS35	0.50 S01 MJ677
1,2,3,4,6,7,8-HpCDD	85.9
1,2,3,4,6,7,8-HpCDF	16.1
1,2,3,4,7,8,9-HpCDF	1.26 J
1,2,3,4,7,8-HxCDD	1.08 J
1,2,3,4,7,8-HxCDF	0.971 J
1,2,3,6,7,8-HxCDD	2.48 J
1,2,3,6,7,8-HxCDF	0.645 J
1,2,3,7,8,9-HxCDD	1.69 J
1,2,3,7,8,9-HxCDF	< 0.287
1,2,3,7,8-PeCDD	0.43 J
1,2,3,7,8-PeCDF	0.259 J
2,3,4,6,7,8-HxCDF	0.821 J
2,3,4,7,8-PeCDF	0.581 J
2,3,7,8-TCDD	< 0.0905
2,3,7,8-TCDF	0.48 J
OCDD	926
OCDF	69.2
TCDD TEQ (ND = 0)	2.6823
Total HpCDD	323
Total HpCDF	60
Total HxCDD	29.5
Total HxCDF	18.5
Total PeCDD	2.72
Total PeCDF	6.5
Total TCDD	0.19
Total TCDF	3.99

Note: Analytes detected at least once at Old Conservation Yard South are listed in the Comparison Levels Table. Analytes listed in the table, but not displayed for a given sample, were not included in that sample's analytical suite.

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Soil Metals/pH Results (South)
Old Conservation Yard South (SWMU 7.4)

Santa Susana Field Laboratory

MWH
MONTGOMERY WATSON HARZA

FIGURE
A2.3-4A

Soil Sample Location Symbol Legend

- Soil sample location with detected Metals/pH
- Soil sample location with no detected Metals/pH
- Soil sample location not analyzed for Metals/pH
- Contained unit soil sample
- Refused sample (refusal depth < 1' below ground surface)
- Soil Sample not analyzed by any sample method

Comparison Levels

Metals	Background (mg/kg)	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
Aluminum	20000	75000	14
Antimony	8.7	30	0.096
Arsenic	15	0.095	0.34
Barium	140	15000	15
Beryllium	1.1	150	5.7
Boron	9.7	15000	6.3
Cadmium	1	2.6	0.0031
Calcium	- -	- -	- -
Chromium	37	3400	940
Cobalt	21	1500	10
Copper	29	3000	1.1
Iron	28000	- -	- -
Lead	34	150	0.063
Magnesium	- -	- -	- -
Manganese	495	9500	63
Mercury	0.09	23	0.89
Molybdenum	5.3	380	0.11
Nickel	29	1500	0.1
Potassium	- -	- -	- -
Selenium	0.655	380	0.18
Silver	0.79	380	0.55
Sodium	- -	- -	- -
Thallium	0.46	6.1	3.2
Vanadium	62	76	1.6
Zinc	110	23000	22

Note: (mg/kg) = milligrams per kilogram

Background Background Level
Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Data Date: 092106

Data Box Information

Sample Location ID: OCBS01 | 1.00 (Depth in Feet) | S01 (Sample Number) | MH007 (Lab Reporting Code) (EPA ID)

(Historical Sample)

12.05	Detect with sample concentration shown
< 0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
-	Analyte not reported
[#]	If more than one result per sample depth, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results .

Detect	Non-Detect
12.05	<0.06 Exceeds Background
12.05	<0.06 Exceeds Background + Res RBSL
12.05	<0.06 Exceeds Background + Eco RBSL
12.05	<0.06 Exceeds Background + Res RBSL + Eco RBSL

Chemical Use Areas

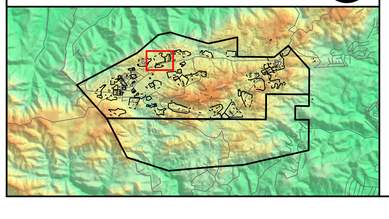
- Solvent
- Petroleum
- Oil
- Transformer
- Metal
- Debris
- Hydrazine
- Perchlorate
- Screening
- Multiple Use

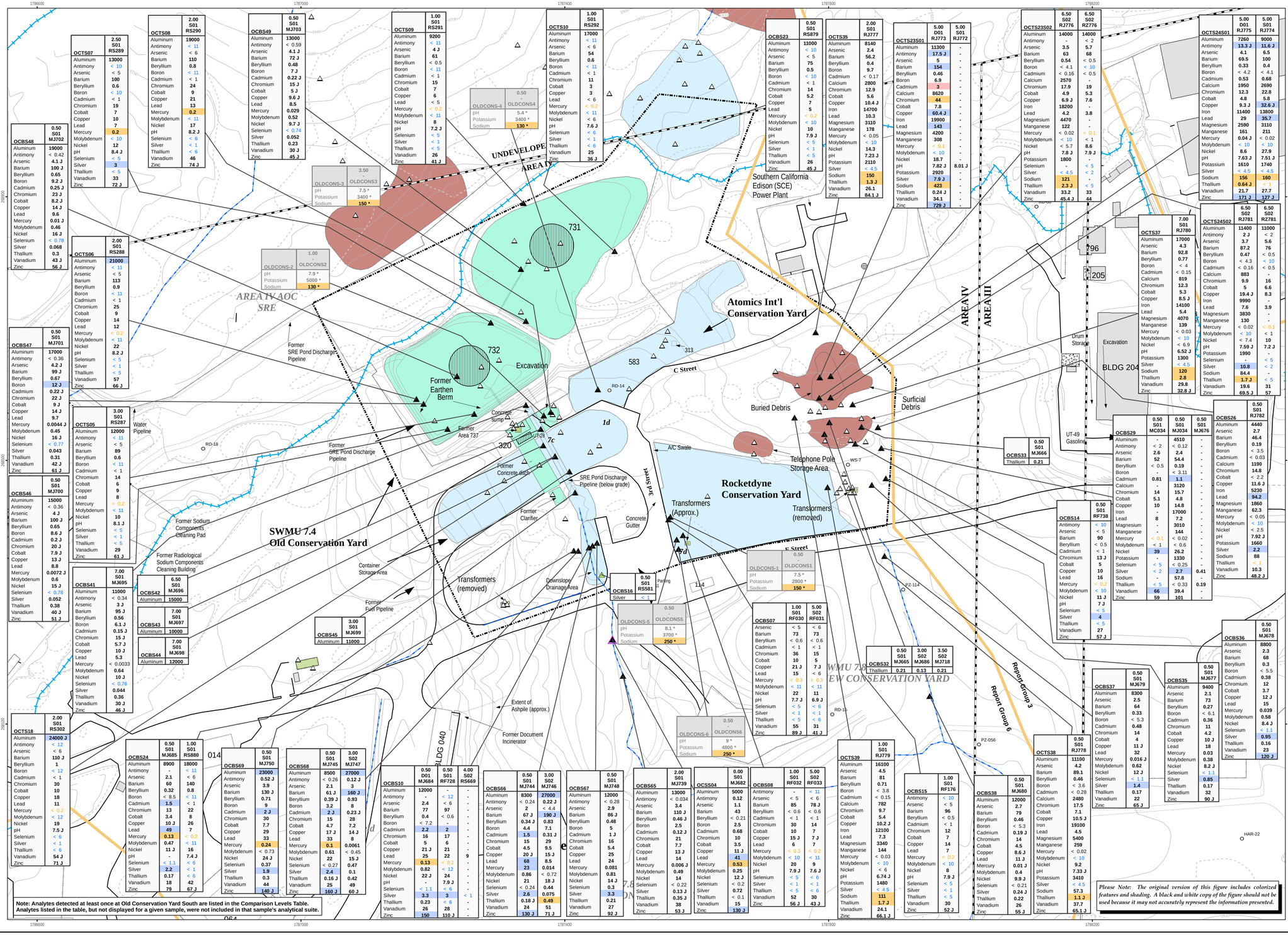
Base Map Legend

- Administrative Area Boundary
- RFI Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Dirt Road
- A/C Curbing
- Trench
- Fence
- Pipe
- Leachfield
- NPDES Outfall
- Well
- Pond
- Possible Pond
- Drainage
- Surface Water Divide
- Elevation Contour
- Rock Outcrop

Date: Sep 26, 2006 Document: RFI-Report-Group6_OCS_Metals.mxd

1 inch equals 60 feet — 0 60 120 Feet





Note: Analytes detected at least once at Old Conservation Yard South are listed in the Comparison Levels Table. Analytes listed in the table, but not displayed for a given sample, were not included in that sample's analytical suite.

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Soil Metals/pH Results (North)
Old Conservation Yard North (SWMU 7.4)

Santa Susana Field Laboratory

MWH MONTGOMERY WATSON HARZA

FIGURE A2.3-4B

Soil Sample Location Symbol Legend

- ▲ Soil sample location with detected Metals/pH
- ▲ Soil sample location with no detected Metals/pH
- △ Soil sample location not analyzed for Metals/pH
- Contained unit soil sample
- Refused sample (refusal depth < 1' below ground surface)

Comparison Levels

Metals	Background (mg/kg)	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
Aluminum	20000	75000	14
Antimony	8.7	30	0.096
Arsenic	15	0.095	0.34
Barium	140	15000	15
Beryllium	1.1	150	5.7
Boron	9.7	15000	6.3
Cadmium	1	2.6	0.0031
Chromium	37	3400	940
Cobalt	21	1500	10
Copper	29	3000	1.1
Lead	34	150	0.063
Mercury	0.09	23	0.89
Molybdenum	5.3	380	0.11
Nickel	29	1500	0.1
Selenium	0.655	380	0.18
Silver	0.79	380	0.55
Thallium	0.46	6.1	3.2
Vanadium	62	76	1.6
Zinc	110	23000	22

Note: (mg/kg) = milligrams per kilogram

Background Background Level
Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Data Date: 070306

Data Box Information

Sample Location ID: OCBS01 | 1.00 (Depth in Feet) | S01 (Sample Number) | MH007 (Lab Reporting Code (EPA ID))

(Historical Sample)

12.05	Detect with sample concentration shown
< 0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
-	Analyte not reported
[#]	If more than one result per sample depth, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results .

Detect	Non-Detect	
12.05	<0.06	Exceeds Background
12.05	<0.06	Exceeds Background + Res RBSL
12.05	<0.06	Exceeds Background + Eco RBSL
12.05	<0.06	Exceeds Background + Res RBSL + Eco RBSL

Chemical Use Areas

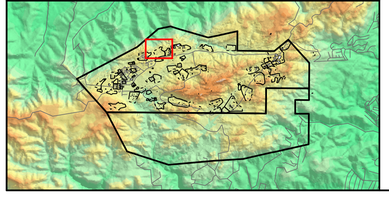
- Solvent
- Petroleum
- Oil
- Transformer
- Metal
- Debris
- Hydrazine
- Perchlorate
- Screening
- Multiple Use

Base Map Legend

- Administrative Area Boundary
- RFI Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Dirt Road
- A/C Curbing
- Trench
- Fence
- Pipe
- Leachfield
- NPDES Outfall
- Well
- Pond
- Possible Pond
- Drainage
- Surface Water Divide
- Elevation Contour
- Rock Outcrop

Date: Sep 26, 2006 Document: RFI-Report-Group6_OCN_Metals.mxd

1 inch equals 60 feet — Feet 0 60 120



OCBS85	0.50 S01 MJ791
Aluminum	12000
Antimony	< 0.21
Arsenic	2.7
Barium	75
Beryllium	0.43
Boron	< 4.2
Cadmium	0.12
Chromium	18
Cobalt	5.3
Copper	7.7 J
Lead	5.4 J
Mercury	0.011
Molybdenum	< 0.42
Nickel	10
Selenium	0.27
Silver	0.051
Thallium	0.31
Vanadium	37
Zinc	42 J

OCBS84	0.50 S01 MJ790
Aluminum	11000
Antimony	< 0.091
Arsenic	2.6
Barium	79
Beryllium	0.42
Boron	< 1.2
Cadmium	0.11
Chromium	18
Cobalt	5.3
Copper	7.8 J
Lead	4.4 J
Mercury	0.004
Molybdenum	< 0.33
Nickel	10
Selenium	< 0.24
Silver	0.048
Thallium	0.21
Vanadium	35
Zinc	42 J

OCBS83	0.50 S01 MJ789
Aluminum	9700
Antimony	< 0.11
Arsenic	2.2
Barium	56
Beryllium	0.32
Boron	< 1.1
Cadmium	0.092
Chromium	14
Cobalt	4.7
Copper	7 J
Lead	6.7 J
Mercury	0.0075
Molybdenum	< 0.31
Nickel	8.2
Selenium	< 0.22
Silver	0.034
Thallium	0.18
Vanadium	31
Zinc	38 J

OCBS82	0.50 S01 MJ788
Aluminum	11000
Antimony	< 0.1
Arsenic	2
Barium	62
Beryllium	0.36
Boron	< 1.2
Cadmium	0.12
Chromium	17
Cobalt	4.9
Copper	6.6 J
Lead	4.2 J
Mercury	0.0066
Molybdenum	< 0.34
Nickel	9.3
Selenium	< 0.24
Silver	0.056
Thallium	0.21
Vanadium	33
Zinc	38 J

OCBS81	0.50 S01 MJ787
Aluminum	11000
Antimony	< 0.19
Arsenic	2.2
Barium	89
Beryllium	0.39
Boron	< 2.7
Cadmium	0.48
Chromium	17
Cobalt	5
Copper	8 J
Lead	17
Mercury	0.051
Molybdenum	< 0.57
Nickel	10
Selenium	< 0.25
Silver	0.056
Thallium	0.22
Vanadium	34
Zinc	48 J

OCBS55	0.50 S01 MJ710
Aluminum	6200
Antimony	< 0.18
Arsenic	2 J
Barium	68 J
Beryllium	0.27
Boron	5.4 J
Cadmium	0.19 J
Chromium	11 J
Cobalt	3.3 J
Copper	6.2 J
Lead	12
Mercury	0.015 J
Molybdenum	0.33
Nickel	6.8 J
Selenium	< 0.74
Silver	0.057
Thallium	0.11
Vanadium	20 J
Zinc	34 J

OCBS79	0.50 S01 MJ784
Aluminum	11000
Antimony	< 0.26
Arsenic	2.3
Barium	71
Beryllium	0.4
Boron	< 1.1
Cadmium	0.13
Chromium	15
Cobalt	4.2
Copper	6.9 J
Lead	7.3 J
Mercury	0.0054
Molybdenum	1.6
Nickel	8.6
Selenium	< 0.23
Silver	0.041
Thallium	0.28
Vanadium	31
Zinc	42 J

OCBS51	0.50 S01 MJ705
Aluminum	10000
Antimony	< 0.4
Arsenic	3.4 J
Barium	140 J
Beryllium	0.38
Boron	6.4 J
Cadmium	0.35 J
Chromium	45 J
Cobalt	5.7 J
Copper	8.2 J
Lead	8.6
Mercury	0.011 J
Molybdenum	0.37
Nickel	13 J
Selenium	< 0.75
Silver	0.058
Thallium	0.18
Vanadium	25 J
Zinc	39 J

OCBS89	0.50 S01 MJ795
Aluminum	9900
Antimony	< 0.15
Arsenic	2.8
Barium	66
Beryllium	0.38
Boron	< 7.4
Cadmium	0.25
Chromium	14
Cobalt	3.9
Copper	8 J
Lead	12 J
Mercury	0.018
Molybdenum	< 0.6
Nickel	7.8
Selenium	< 0.28
Silver	0.074
Thallium	0.2
Vanadium	26
Zinc	57 J

OCBS90	0.50 S01 MJ796
Aluminum	9200
Antimony	< 0.43
Arsenic	2.3
Barium	72
Beryllium	0.35
Boron	12
Cadmium	0.28
Chromium	13
Cobalt	3.9
Copper	7.6 J
Lead	17
Mercury	0.038
Molybdenum	< 0.45
Nickel	7.5
Selenium	< 0.25
Silver	0.09
Thallium	0.18
Vanadium	25
Zinc	61 J

OCBS94	0.50 S01 MJ800
Aluminum	9700
Antimony	0.61 J
Arsenic	2.8
Barium	47
Beryllium	0.36
Boron	< 3
Cadmium	0.52
Chromium	14
Cobalt	3.9
Copper	9.7 J
Lead	43
Mercury	0.078
Molybdenum	0.51
Nickel	7.6
Selenium	< 0.22
Silver	0.41
Thallium	0.2
Vanadium	27
Zinc	110 J

OCBS93	0.50 S01 MJ799
Aluminum	9000
Antimony	< 0.21
Arsenic	2.8
Barium	50
Beryllium	0.35
Boron	< 1.1
Cadmium	0.058
Chromium	10
Cobalt	3.6
Copper	4.2 J
Lead	3.2 J
Mercury	0.008
Molybdenum	< 0.26
Nickel	5.5
Selenium	< 0.22
Silver	0.023
Thallium	0.18
Vanadium	22
Zinc	34 J

OCBS92	0.50 S01 MJ798
Aluminum	11000
Antimony	0.97 J
Arsenic	3.2
Barium	63
Beryllium	0.37
Boron	< 1.1
Cadmium	0.15
Chromium	14
Cobalt	4.6
Copper	6.5 J
Lead	10 J
Mercury	0.06
Molybdenum	< 0.45
Nickel	8
Selenium	< 0.22
Silver	0.073
Thallium	0.22
Vanadium	29
Zinc	44 J

OCBS88	0.50 S01 MJ794
Aluminum	11000
Antimony	< 0.11
Arsenic	2.5
Barium	68
Beryllium	0.43
Boron	< 1.2
Cadmium	0.1
Chromium	19
Cobalt	5.2
Copper	7.8 J
Lead	5.4 J
Mercury	0.02
Molybdenum	< 0.45
Nickel	11
Selenium	< 0.24
Silver	0.061
Thallium	0.24
Vanadium	37
Zinc	43 J

OCBS53	0.50 S01 MJ708
Aluminum	5300
Antimony	< 0.32
Arsenic	1.8 J
Barium	59 J
Beryllium	0.26
Boron	8.7 J
Cadmium	0.19 J
Chromium	9.5 J
Cobalt	3.3 J
Copper	5.9 J
Lead	11
Mercury	0.021 J
Molybdenum	0.25
Nickel	5.8 J
Selenium	< 0.74
Silver	0.057
Thallium	< 0.11
Vanadium	19 J
Zinc	35 J

OCBS98	0.50 D01 MJ809	0.50 S01 MJ808
Aluminum	12000	12000
Antimony	0.21	0.25
Arsenic	3.1	2.9
Barium	63	59
Beryllium	0.48	0.46
Boron	< 6.1	< 7
Cadmium	0.24	0.26
Chromium	15	17
Cobalt	5.3	4.6
Copper	9.3 J	10 J
Lead	26	26
Mercury	0.059	0.048
Molybdenum	0.48	0.45
Nickel	9.9	8.7
Selenium	< 0.24	< 0.24
Silver	0.13	0.33
Thallium	0.22	0.21
Vanadium	30	29
Zinc	69 J	72 J

OCBS97	0.50 D01 MJ807	0.50 S01 MJ806
Aluminum	13000	11000
Antimony	0.36	0.53
Arsenic	3.3	2.7
Barium	75	60
Beryllium	0.5	0.41
Boron	< 5.7	< 3.6
Cadmium	0.66	0.48
Chromium	15	13
Cobalt	5.9	4.1
Copper	15 J	9.6 J
Lead	51	57
Mercury	0.29	0.16
Molybdenum	0.68	0.5
Nickel	11	8.3
Selenium	< 0.25	< 0.23
Silver	0.14	0.16
Thallium	0.22	0.2
Vanadium	32	25
Zinc	83 J	52 J

OCSS02	0.00 S01 RS878
Aluminum	11000
Antimony	< 10
Arsenic	< 5
Barium	83
Beryllium	< 0.5
Boron	< 10
Cadmium	< 1
Chromium	17
Cobalt	6
Copper	8
Lead	13
Mercury	< 0.2
Molybdenum	< 10
Nickel	11
pH	7.1 J
Selenium	< 5
Silver	< 1
Thallium	< 5
Vanadium	34
Zinc	54 J

OCBS23	0.50 S01 RS879
Aluminum	11000
Antimony	< 10
Arsenic	< 5
Barium	75
Beryllium	0.5
Boron	< 10
Cadmium	< 1
Chromium	14
Cobalt	5.2
Copper	7
Lead	5
Mercury	< 0.2
Molybdenum	< 10
Nickel	10
pH	7.9 J
Selenium	< 5
Silver	< 1
Thallium	< 5
Vanadium	26
Zinc	45 J

OCBS52	0.50 S01 MJ707
Aluminum	3100
Antimony	< 0.93
Arsenic	3.9 J
Barium	43 J
Beryllium	0.14
Boron	5 J
Cadmium	0.19 J
Chromium	6.8 J
Cobalt	2 J
Copper	9.2 J
Lead	7.8
Mercury	0.047
Molybdenum	0.33
Nickel	2.2 J
Selenium	< 0.71
Silver	0.039
Thallium	< 0.1
Vanadium	10 J
Zinc	30 J

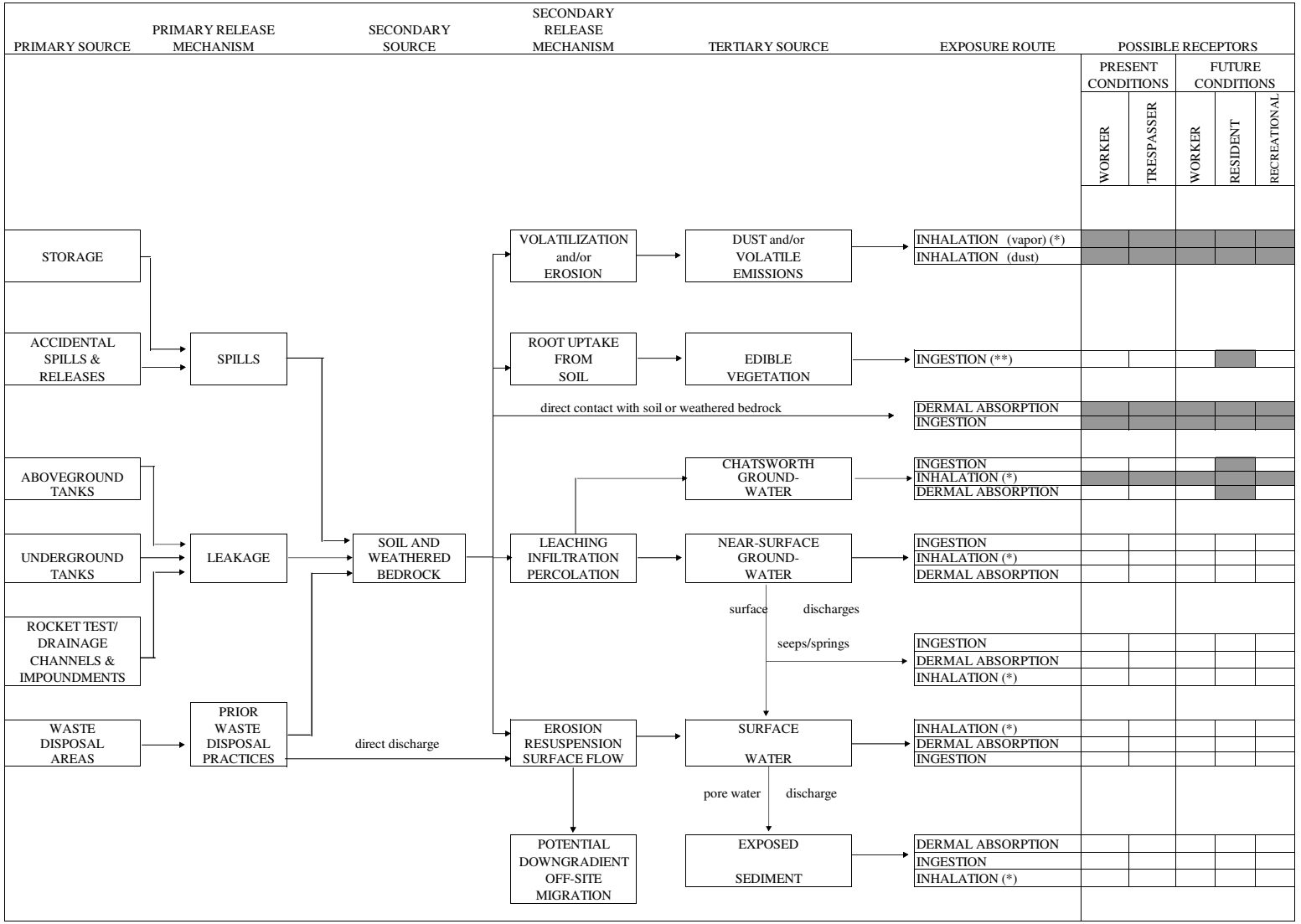
OCBS50	0.50 S01 MJ704
Aluminum	6500
Antimony	< 0.9
Arsenic	4.7 J
Barium	72 J
Beryllium	0.33
Boron	6.4 J
Cadmium	0.86 J
Chromium	11 J
Cobalt	3.7 J
Copper	6.6 J
Lead	11
Mercury	0.12
Molybdenum	0.37
Nickel	7.1 J
Selenium	< 0.72
Silver	0.14
Thallium	0.14
Vanadium	18 J
Zinc	65 J

Note: Analytes detected at least once at Old Conservation Yard North are listed in the Comparison Levels Table. Analytes listed in the table, but not displayed for a given sample, were not included in that sample's analytical suite.

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Figure A2.4-1

Human Health Risk Assessment Conceptual Site Model
Old Conservation Yard RFI Site



NOTES:

As described in the SRAM (MWH 2005), note that risk estimates for the potential future recreational user (recreator) are used as surrogate risk estimates for the trespasser.

(*) Exposure limited to volatile compounds as defined in the text; residential and worker receptors include both indoor and outdoor air exposure to volatiles; non-residental and non-worker receptors include only outdoor air exposure. For workers, inhalation of volatiles from groundwater beneath the RFI site includes pathways associated with both migration to indoor air and ambient air (domestic groundwater use is an incomplete exposure pathway). For residents, exposures to reporting area Chatsworth formation groundwater includes pathways associated with both migration to indoor air and ambient air, as well as domestic use. Exposure to fugitive dust is limited to non-VOC compounds.

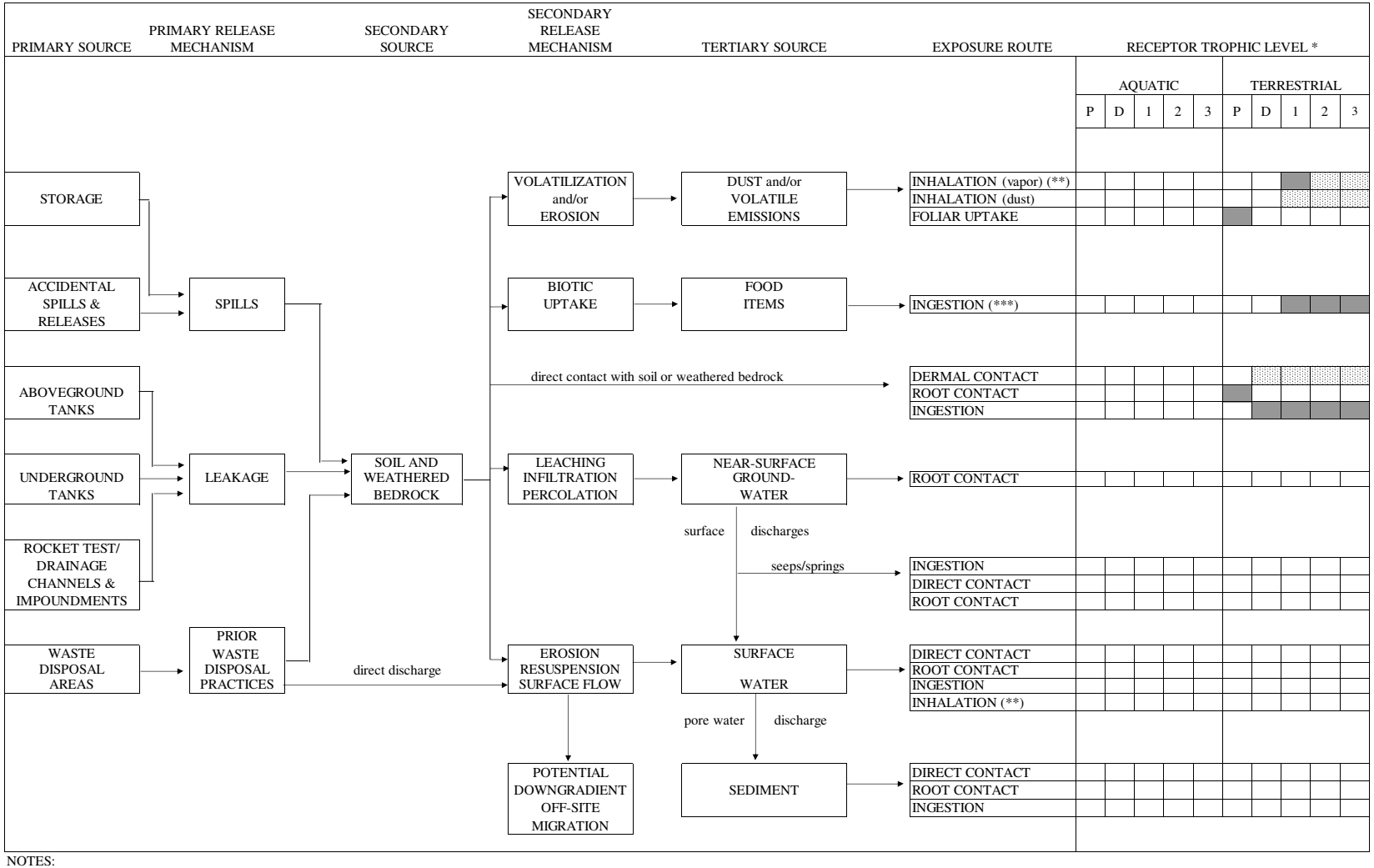
(**) Exposure limited to bioaccumulatable compounds as described in the text.

- complete and potentially complete exposure pathways evaluated in this risk assessment

- incomplete exposure pathways not evaluated in this risk assessment

Table A2.4-2 (1 of 1)

Ecological Risk Assessment Conceptual Site Model
Old Conservation Yard RFI Site



NOTES:

(*) Trophic Level: P = primary producers (e.g., plants); D = detrivores (e.g., invertabrates); 1 = 1st consumer (e.g., mule deer); 2 = 2nd consumer (e.g. deer mouse); 3 = 3rd consumer (e.g., red-tailed hawk).

(**) Exposure limited to volatile compounds as defined in the text.

(***) Exposures limited to bioacummulative compounds as defined in the text.

- complete and potentially complete exposure pathways evaluated in this risk assessment

- incomplete exposure pathways not evaluated in this risk assessment

- minor exposure pathway not evaluated in this risk assessment

RFI SITE	CMS AREAS	DRIVERS (Eco and HH)
OCY	1-1	PAHs
OCY	1-2	PAHs, PCBs
OCY	1-3	PAHs, PCBs
OCY	1-4	PAHs, PCBs
OCY	3-1	VOCs
OCY	4-1	Dioxins
OCY	5-1	PAHs, Dioxins
OCY	6-1	PAHs, PCBs, Dioxins, Metals
OCY	6-2	PCBs, Dioxins, Metals
OCY	6-3	Dioxins, Metals
OCY	6-4	PCBs
OCY	6-5	PCBs, Metals
OCY	7-1	PCBs
OCY	7-2	PCBs
OCY	8-1	PAHs, PCBs, Dioxins, Metals

* Shaded areas represent the approximate extent of areas recommended for further evaluation in the CMS and are those listed in Table 5-1. These approximate areas, and associated chemical driver or contributors, are based on evaluations comprehensive of all potential receptors. CMS areas may be refined during the CMS based on land use scenarios and further risk assessment.

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Base Map Legend

- Administrative Area Boundary
- RFI Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Awning
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Dirt Road
- A/C Curbing
- Fence
- Rock Outcrop
- Elevation Contour
- Surface Water Divide
- NPDES Outfall
- Drainage
- Pond
- Possible Pond
- Leachfield
- Pipe
- Well

CMS Areas

OCY 3-1 — OCY CMS Areas

CMS Areas-Areas recommended for further evaluation in Corrective Measures Study (CMS)

CMS area designations identified in Table A2.5-1

Surficial Media Site Action Recommendations Old Conservation Yard

Date: Sep 29, 2006

Document: RFI-Report-Group6_OC_CMS_ Areas.mxd

1 inch equals 150 feet

0 150 300 Feet

SANTA SUSANA FIELD LABORATORY

MWH MONTGOMERY WATSON HARZA

FIGURE A2.5-1

APPENDIX A2-1

REGULATORY AGENCY CORRESPONDENCE

RESOURCE MANAGEMENT AGENCY
county of ventura

Environmental Health Division
Donald W. Koepp
Director



October 5, 1994

A.J. Lenox
Rocketdyne Division
P.O. Box 7922
Canoga Park, CA 91306-7922

REVIEW OF UNDERGROUND STORAGE TANK REMOVAL REPORTS FOR ROCKWELL INTERNATIONAL, SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY CALIFORNIA

The Ventura County Environmental Health Division (VCEHD) has received the report dated July 13, 1994, for the above-referenced site. This report presented a comprehensive review of site status for 35 underground tanks at the Rockwell Santa Susana Field Laboratory facility. Summarizing available tank removal information on a tank-by-tank basis allowed the VCEHD to gain an understanding of the underground fuel tank history at this facility for the first time. Based on this information, determinations were made which are outlined below:

1. Based on the information available in our files and the above-mentioned report, the VCEHD will not require additional work for the following numbered tanks:

1	11	36	47
2	18	42	49
6	19	43	50
8	22	44	52
9	27	45	54 (same as 36)
10	28	46	66

2. Tank # 3 will be added to the LUFT site list. The site assessment defined the lateral extent in the soil. There is no information available to support that the contamination detected during the tank removal was remediated or that verification samples were collected to document the remediation. You are required to respond within thirty days of receipt of the release notification documentation which you will receive shortly.

09621 RC

800 South Victoria Avenue, L1730, Ventura, CA 93009 (805) 654-3518 FAX (805) 654-2480

3. As per your recommendations, tanks #55 and #67 will require additional investigation. Both tanks will be added to the LUFT site list. You are required to respond within thirty days of receipt of the release notification documentation which you will receive shortly. Tank # 55 was also referred to as tank # 12. This tank is listed as containing radioactive waste. The VCEHD requires clarification on whether radioactive waste was stored in this tank.

4. Tanks #37 and #38 are listed as LUFT site #C94011. Tanks #39, 40, and 41 are listed as LUFT site #C90067. Comments with regard to additional site assessment or remediation at these sites will be issued separately by VCEHD.

5. The reports on tanks #'s 48, 51, and 53 do not contain sufficient information for a determination to close the files on these tanks. The VCEHD does not consider the presence of VCEHD representatives in the photograph attributed to tank #53 to be significant. You are required to obtain at least two soil samples from these three tanks at the approximate location of the base of each of the former tank excavations. The VCEHD will use this information to determine whether there is a need for additional work. **Submit a proposal to perform this additional assessment.**

California Health and Safety Code §25299.37 requires that the above-mentioned information be submitted in report form to this Division. Submit said report by December 15, 1994.

If you have any questions, please contact me at (805) 654-3525 Monday through Thursday.

Michael C. McFadden

MICHAEL C. MCFADDEN
UNDERGROUND TANK PROGRAM
ENVIRONMENTAL HEALTH DIVISION

MCM/sw/9rockwel

c: Gay Norris, Los Angeles Regional Water Quality Control Board
Peter Raftery, GTI

COUNTY OF VENTURA
ENVIRONMENTAL HEALTH DEPARTMENT

APPLICATION FOR PERMIT TO ABANDON UNDERGROUND HAZARDOUS MATERIAL STORAGE TANK

Joint Agency Application For Permit To Abandon Underground Hazardous Materials Storage Tank

TANK LOCATION: SANTA SUSANA	
OWNER: ROCKWELL INTERNATIONAL	CONTACT/PHONE: 818-710-4537
MAILING ADDRESS (Number, Street, City and Zip Code): 6633 CANOGA AVE, CANOGA PARK, CA 91303	
OPERATOR: ROCKWELL INTERNATIONAL	CONTACT/PHONE: 818-710-4537
MAILING ADDRESS (Number, Street, City and Zip Code): SAME AS ABOVE	
REMOVAL CONTRACTOR: SECHRIST & KELLY	CONTACT/PHONE: 213-945-2671
MAILING ADDRESS (Number, Street, City and Zip Code): 8815 S. GORDON SANTA FE SPRINGS 90607	
WORKMEN'S COMPENSATION INSURANCE COMPANY: F.D.I. #27-76-X9	PHONE: 318-840-6866

PREVIOUS OWNER AND OPERATORS TANK(S) LIC #237527A

DATE	OWNER/OPERATOR

COMPLETE THE FOLLOWING FOR EACH TANK TO BE ABANDONED

TANK NO.	SIZE	CONSTRUCTION (Steel, Fiberglass, Etc.)	CONTENTS PRESENT AND PREVIOUSLY
1	20000 GAL	FIBERGLASS	FUEL OIL
2			
3			
4			
5			

Estimated Start Date 4-1-88

ATTACH A PLOT PLAN SHOWING:

- ☐ Location of all tanks, piping and secondary containment
- ☐ Leak detection system
- ☐ Overfill protection system
- ☐ Scale
- ☐ North arrow
- ☐ Property lines
- ☐ Nearest intersection or road
- ☐ Equipment summary
- ☐ Existing equipment and equipment to be removed

SIGNATURES OF APPLICANT OR REPRESENTATIVE _____ DATE _____

FOR OFFICE USE ONLY

- ☐ Fee 315.25
- ☐ Check No. 557628
- ☐ Receipt No. 14119
- ☐ File No.
- ☐ Date 3/10/88

APPLICATION: ☒ Approved ☐ Abandon in Place ☒ Removal

See Conditions for Approval on Back of Form

☐ Denied Reason for Denial: _____

By Douglas O Beach INSPECTOR 3/11/88 DATE

RMA-304 (2/86) DISTRIBUTION: White—EH Canary—Contractor Pink—Applicant Goldenrod—Fire Dept.

RESOURCE MANAGEMENT AGENCY

County of Ventura

Environmental Health Department
Donald W. Koepp
Director

ABANDON TANK CHECKLIST

File # 913

I. ADMINISTRIVIA:

	Y/N	DATE	INITIAL
* Application for Permit to Abandon	Y	3/16/88	
* Fee Paid	Y		
* Permit to Abandon from Oxnard Fire, if nec.	N/A		
* Deleted from Underground Tank Computer Inventory (both facility record & tank record)	Y		
* Deleted from Haz-Mat Inventory (waste tanks only)	N/A		
* Workers' Compensation Insurance	Y		
* Permit to Abandon Issued	Y		
* Name of Contingency Clean-up Company or Soil Borings Showing Site is Clean	AST		

II. A. INSPECTION: ABANDON BY REMOVAL--INSPECTOR:

* Tank(s) has been completely emptied prior to removal (watch for remote fill lines).	Y	5/17/88	
* All piping removed	Y		
* For flammable liquids, dry ice added (10 lbs. per 1,000 gallon volume)	Y		
* Tank(s) removed	Y		
* Tank(s) inspected - any holes:	N		
* If holes, how many, where located and size: _____			
* Final disposition of removed tanks: DISPOSED Address: _____			
* Tanks Marked with file #:	N		
* Soil sampled beneath tank	Y		

F CALIFORNIA—HEALTH AND WELFARE AGENCY PETE WILSON, Governor

RTMENT OF HEALTH SERVICES
P STREET
942732
ENTO, CA 94234-7320

OLD Con 7.4

December 21, 1995

JAN 2 1996

P. D. Rutherford, Manager
Radiation Protection and Health Physics Services
Rocketdyne Division
Rockwell International Corporation
P.O. Box 7922 M/S T100
Canoga Park, California 91309-7922

Dear Mr. Rutherford:

RE: Rocketdyne's letter dated July 6, 1995 with attachments concerning the release of Buildings T029, T028 and OCY.

Radiologic Health Branch (RHB) staff has reviewed the above documents submitted for concurrence of release of buildings T028, T029 and the Old Conservation Yard (OCY) for unrestricted use. The review showed that a comprehensive survey for both fixed and removable contamination had been conducted.

The results of the surveys performed on September 14, 1995 by RHB staff showed no residual contamination exceeding the current limits for unrestricted release. Therefore, RHB concurs that buildings T028, T029, and the OCY may be released for unrestricted use.

If there are any questions please contact Mr. Steve Hsu at (916) 322-4797.

Sincerely,

Gerard Wong, Ph.D., Chief
Radioactive Material Licensing Sec.
Radiologic Health Branch

cc: Edgar D. Bailey, C.H.P., Chief
Radiologic Health Branch

Mike Lopez, DOE/OAK

0127RC

Terry Tamminen
Agency Secretary
Cal/EPA

Department of Toxic Substances Control

Edwin F. Lowry, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Arnold Schwarzenegger
Governor

February 3, 2004

Mr. Arthur J. Lenox
Environmental Remediation
Rocketdyne Propulson & Power
6633 Canoga Avenue
Post Office Box 7922
Canoga Park, California 91309-7922

COMMENTS ON THE OLD CONSERVATION YARD (SWMU 7.4) SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY, CALIFORNIA

Dear Mr. Lenox:

The Department of Toxic Substances Control (DTSC) has reviewed the Old Conservation Yard (SWMU 7.4) Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report dated February 2003. The report summarizes results of the RFI, previous investigations, and groundwater monitoring activities conducted at this Solid Waste Management Unit (SWMU 7.4). Comments and recommendations from Laura Rainey of DTSC's Geological Services Unit (GSU) are provided in the enclosed memorandum.

DTSC has several key concerns and comments on the Old Conservation Yard (OCY) report outlined in the GSU memorandum. The following general comments apply to this and other RFI Reports:

- Data for all groundwater monitoring wells and piezometers located within drainages that historically received surficial runoff from this and other areas associated with this SWMU need to be provided in the OCY report.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.dtsc.ca.gov.

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- Tabulated summaries of analytical results for all sampled media need to be included. All laboratory-generated analytical reports (with quality assurance/quality control results) for samples collected during the RFI, and chain-of-custody documentation with the laboratory reports need to be provided.

- Sampling of all existing and former transformers that are/were pole-mounted and/or ground-based for PCBs need to be completed.

- Maps showing the locations and extent of all previous excavations associated with the SWMUs need to be provided. For each excavation, indicate the nature and extent of contaminants removed, including all environmental sample locations on the map, and tabulated results. Information regarding the source of all the backfill used at the SWMUs need to be provided.

- The ground-surface elevations need to be maintained and provided for areas where demolition or excavation activities have occurred and where ground surface differs with respect to the pre-demolition ground surface and RFI sample depths.

DTSC has the following specific comments on the OCY report:

- Insufficient history was provided on all the contaminants historically detected in and near the Sodium Reactor Experiment (SRE) pond and pipeline discharge locations to the Old Conservation Yard. A more thorough and complete description of the historical chemicals associated with releases of the radioactive liquid waste from the former SRE tanks and description of contaminants detected in and near the pond needs to be provided.

- Additional sampling for all constituents of concern for all media associated with the SRE Pond Pipeline discharge is needed.

- Collection of step-out samples at the former Telephone Pole Storage Area where PCBs and dioxins exceed their respective FALs is needed.

- Additional step out soil vapor sample locations are necessary to define the nature and extent of VOC impacts in the OCY.

Your prompt attention to address these general and specific comments will help expedite our future reviews of the RFI reports. If you have any questions regarding this letter or the enclosed memorandum, please contact me at (916) 255-3600.

Sincerely,

Gerard J. Abrams

Gerard J. Abrams, C.Hg.
Senior Engineering Geologist
Northern California Permitting and Corrective Action Branch

Enclosure

cc: Mr. Stephen Baxter
Department of Toxic Substances Control
1011 N. Grandview Avenue
Glendale, California 91201-2205

Ms. Laura Rainey
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

Ms. Elizabeth Crawford
c/o Supervisor Linda Parks
County of Ventura
2100 East Thousand Oaks Boulevard
Suite C
Thousand Oaks, California 91362

Mr. Daniel Hirsch
2-1185 East Cliff Dr.
Santa Cruz, California 95062

cc: Mr. Thomas Seckington
Department of Toxic Substances Control
1011 N. Grandview Avenue
Glendale, CA 91201-2205

Mr. Dave Bacharowski
California Regional Water
Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Ms. Judy Mikels
Ventura County Supervisor
3855-F Alamo Street
Simi Valley, CA 93063

Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Terry Tamminen
Agency Secretary
Cal/EPA

Arnold Schwarzenegger
Governor

MEMORANDUM

TO: Gerard Abrams, C.Hg.
Senior Engineering Geologist
Northern California Permitting and Corrective Action Branch
Hazardous Waste Management Program

FROM: Laura Rainey, R.G.
Senior Engineering Geologist
Geology, Permitting and Corrective Action Branch
Hazardous Waste Management Program

DATE: January 22, 2004

SUBJECT: PRELIMINARY COMMENTS REGARDING
OLD CONSERVATION YARD (SWMU 7.4)
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

PCA 22120 SITE CODE 300381 WP 00

Background

As requested, the Geological Services Unit (GSU) of the Geology, Permitting and Corrective Action Branch (GPCAB) at the Department of Toxic Substances Control (DTSC) reviewed the "Old Conservation Yard (SWMU 7.4) RCRA Facility Investigation Report", dated February 2003 (Report). The Report was prepared by MWH for the Boeing Company and the U.S. Department of Energy.

The Report summarizes results of RCRA Facility Investigation (RFI), previous investigations, and groundwater monitoring activities conducted at this Solid Waste Management Unit (SWMU 7.4) between 1984 and 2002. The Report provides an abbreviated summary of site history, chemical use, and existing conditions for the Old Conservation Yard (OCY) RFI site. The Report also summarizes findings of the Surficial Operating Unit (OU) characterization program, in which 23 soil vapor and 82 soil matrix samples were collected to assess potential impacts associated with identified chemical

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use areas. Groundwater monitoring results for select wells in the vicinity of the OCY RFI site are also discussed in the Report. The Report also includes a summary of risk assessment findings and RFI Site recommendations. GSU reviewed portions of the Report relevant to OCY's Surficial OU characterization program. GSU did not review portions of the Report regarding the human health risk assessment, as it is assumed that these portions will be reviewed by DTSC's Human and Ecological Risk Division (HERD).

GENERAL COMMENTS

1. **Completeness of Report:** The Report states that "Information presented in this RFI report is supplemented by several companion documents. These companion documents contain key information not repeated in this report." It should be noted that several of the companion documents referenced (i.e., MWH 2003a, MWH 2003b, and AMEC 2003) were "in preparation" at the time the RFI report was submitted. One of the companion documents (MWH 2003a) has not yet been submitted to DTSC for review and/or approval. Since these documents contain "key information" that is not included in the RFI Report, GSU's comments included herein should be considered preliminary, and subject to revision as relevant "key information" becomes available to DTSC for review and approval.

   GSU Recommendation: The Report should serve as a "stand alone" document that enables the reader to perform an adequate review. Revise the Report to include all relevant "key information" for purposes of determining if the RFI is complete.

2. **Data Presentation:** The Report does not include a tabulated summary of analytical results for any of the media sampled (i.e., soil vapor, soil matrix, or groundwater), nor does it include any laboratory analytical reports. Figures 4, 5, and 6 include analytical results only for detected constituents. These figures indicate which borings have "sample(s) without detects", but do not specify the method reporting limits, nor the specific constituents that were analyzed. For example, soil matrix sample location OCBS16 had no detects, according to Figure 5. Table 7C indicates that this sample was analyzed for "TPH" and "Metals". No information regarding the carbon chain range of total petroleum hydrocarbons (TPH), nor specific metals analyzed was provided in either the figure or table. No information regarding the method reporting limits is included in the hardcopy report. To obtain this information, the reader must rely on viewing electronic database files included with the enclosed compact disc (CD, Appendix C). GSU was not able to open all of the data files on the CD, and after discussion with MWH, it appears that the files are not consistently formatted. MWH subsequently emailed reformatted data files from this report to GSU for review. In the RFI report's current format, the relevant analytical data are not accessible either electronically or in hardcopy. Lack of a hardcopy tabulated summary of analytical results in the report results in more time expended for the reader to review the report.

GSU recommendation: Include hardcopy tabulated summaries of analytical results for all sampled media in the RFI report. Inclusion of hardcopy tabulated summary tables should enable adequate access to analytical data at public repositories. Also, include all laboratory-generated analytical reports (with quality assurance/quality control results) for samples collected during the RFI. Include chain-of-custody documentation with the laboratory reports. Reformat the enclosed CD data files to a consistent format to allow viewing of files with software that is readily available to the reader.

3. **Field Action Levels (FALs) for Detected Chemicals in Soil:** Insufficient information was provided in the RFI report regarding use of "DTSC-approved background concentrations" as FALs for metals in soil. GSU understands that DTSC has approved certain background data sets for metals in soil; however, DTSC has not approved all procedures proposed for determining FALs based on all background data sets.

   GSU Recommendation: Consult with HERD and GSU to establish a DTSC-approved protocol for using background data when establishing soil and groundwater FALs. This should be accomplished prior to GSU's review of additional RFI reports. GSU reserves the right to request additional source characterization samples if significant concentration gradients are present that may be indicative of a source, regardless of the FAL. It is important to note that FALs are applicable only for determining the need for step out samples, and are not intended to be used for limiting source characterization. In addition, for each area investigated, any constituent's Method Reporting Limit (MRL) that exceeds it's respective FAL should be identified and explained. In situations where a constituent's MRL exceeds it's FAL, resampling may be necessary.

4. **Sampling of Former Transformer Areas:** Other than what is provided in Table 3, no information regarding the historical use of transformers is provided in the Report. Although some transformers had oil sampled for Aroclor 1260 in November 1983, none of the transformer locations appear to have been sampled for polychlorinated biphenyls (PCBs) in soil. Insufficient information is provided to demonstrate that no PCB-containing oils were historically used at the transformers. Note that Aroclor 1254 was detected in shallow soil in nearby Area "583" during the RFI. In a July 16, 2002 memorandum regarding the RFI report for Advanced Propulsion Testing Facility (APTF), GSU requested that transformer locations be sampled for PCBs as part of the RFI.

   GSU recommendation: Detected concentrations of elevated PCBs nearby in the Old Conservation Yard may be indicative of poor handling practices of PCB-containing materials. In light of this, GSU recommends sampling of all existing and former transformers that are/were pole-mounted and/or ground-based. For each transformer facility, collect shallow soil samples for analysis of PCBs. For each transformer facility, collect shallow soil samples along the four sides of the former concrete slab foundation for analysis of PCBs. Multiple samples (from up to two sides) per foundation should be laboratory-composited, for a total of two

composited samples analyzed per transformer. Laboratory compositing should consist of extruding each sample from each tube into a dish, mixing, and analysis of the mixed sample.

5. **Surface Elevation Control at Sample Collection Locations (pre- and post-demolition):** It is not clear in the report how the elevation of the current (post-demolition) ground surface differs with respect to the pre-demolition ground surface and RFI sample depths. Can the RFI sample depths (and pre- and post-demolition ground surface elevations) be correlated with any existing surveyed elevation locations? According to information provided by MWH on September 5, 2003, numerous sampled areas at the Old Conservation Yard were subsequently regraded to a different elevation, either by removal or placement of fill. Survey-control will be needed to establish the lateral and vertical coordinates of all sample locations. If additional sampling is conducted, Boeing must demonstrate that the additional samples are representative of the horizon previously sampled.

   GSU Recommendation: Clarify in the report if there is any survey control over the elevations of the samples that were collected for the RFI and previous and current ground surface elevations. Provide survey coordinates (lateral and vertical) for all sample locations. For areas where fill has been emplaced over previous sampled locations, collect additional shallow soil samples to adequately characterize the current ground surface conditions. Include a note on all maps (depicting pre-graded conditions) that indicates the topography shown does not depict current topographic conditions. Provide an updated topographic map showing current ground surface conditions.

6. **Previous Excavations:** The Interim Final RCRA Facility Assessment Report (SAIC, July 10, 1991) indicates that several areas at the Old Conservation Yard were previously excavated to remove radiological and hydrocarbon-contaminated soil. One excavation is depicted in the Figures of the RFI report, but it is not clear which release this is associated with. No other information regarding the location and extent of previous excavations at this SWMU was provided in the Report. It is thus unknown if RFI data represents native soil or backfill material.

   GSU Recommendation: Provide a map showing the locations and extent of all previous excavations associated with this SWMU. For each excavation, indicate the nature and extent of contaminants removed. Include all environmental sample locations on the map. Include information regarding the source of all backfill used at this SWMU. Include a discussion that addresses if RFI sample data represents native soil or backfill conditions.

7. **Groundwater Data:** Insufficient information is provided in the Report that indicates which groundwater monitoring wells are located in the vicinity of this Solid Waste Management Unit (SWMU). The Report only provides data for select groundwater wells PZ-114, RD-14, RD-18, and WS-7. According to the Near Surface Groundwater Characterization Report (MWH, November 2003), additional wells are in the vicinity of the Old Conservation Yard. For example, PZ-

115 and PZ-056 exist in the drainage downslope from the Old Conservation Yard, but no information was provided in the RFI report regarding these wells. Well RD-15 is also located in the vicinity of the Old Con Yard.

GSU Recommendation: Provide a map showing all monitoring wells and piezometers (near-surface and deeper) located throughout Area IV. Include an electronic and hardcopy tabulated summary of all relevant groundwater analytical data (current and historical for near-surface and deeper wells) in the RFI report. Provide information showing the groundwater flow direction and gradient for all aquifers monitored in Area IV. Include a discussion regarding the adequacy of the existing monitoring wells and piezometers for monitoring water levels and water quality (including appropriate constituents of concern) for the Old Con Yard.

To expedite RFI report review, GSU also recommends submittal of an electronic comprehensive site-wide groundwater database that includes all groundwater data collected at the site. This database should be submitted to DTSC for use when reviewing each RFI report. A CD should be provided on a regular basis to DTSC as the database is updated to incorporate ongoing groundwater monitoring data. The database should include data for all monitoring wells (shallow and deep) and piezometers, and should include water quality data, water level data, and survey location and elevation coordinates. All historical groundwater data should be included in the database. After discussing with the DTSC project team, it appears that such a database does not yet exist. Submittal of this recommended database will greatly expedite review of the RFI reports.

SPECIFIC COMMENTS

1. **Former Rocketdyne Conservation Yard (map key location 1a).**
   Soil Vapor: Two out of seven soil vapor sampling locations contained detected concentrations of volatile organic compounds (VOCs). These two locations (OCSV01 and OCSV03) had detected concentrations of one or more of the following VOCs: tetrachloroethene (PCE), trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1,2-trichlorotrifluoroethene (1,1,2-TCTFE), and 1,2-dichlorethane (1,2-DCA). These detected concentrations are in excess of VOC soil vapor FALs. Table 5 erroneously states that soil vapor sampling results were below FALs. Since the soil vapor FALs were exceeded, ***GSU recommends additional step out soil vapor sample locations to define the nature and extent of VOC impacts in this area, such that the data may be contoured to identify VOC source areas.*** Note that elevated method reporting limits (i.e., greater than 1 ug/L) were used for soil vapor sample locations OCSV16, OCSV17, OCSV18, and OCSV19 for methylene chloride (20 ug/L), m,p-xylene (2 ug/L), and 1,1,2-TCTFE (5 ug/L).
   Soil Matrix: See General Comment No. 3 regarding evaluating the need for additional source characterization samples for metals in soil. Detected metals show a general decrease in concentration with depth in soil in this area, possibly

indicating shallow surficial impacts. Vanadium appears to be consistently elevated in shallow soil samples collected at one foot bgs from the two recent soil borings (OCBS07 and OCBS08). ***GSU recommends collection of additional samples to define the extent of elevated vanadium in soil in this area.***

2. **Former Atomics International (AI) Conservation Yard, Including Former Area "583" (map key location 1b).**
   Soil Vapor: No VOCs were detected in the one soil vapor sample (OCSV04) collected beneath the former asphalt-like/aggregate material (i.e., area designated "583").
   Soil Matrix: Soil samples collected directly beneath the asphalt-like/aggregate in area "583" contained elevated concentrations of TPH (diesel and lubricant oil range), PCBs (Aroclor 1254), and polyaromatic hydrocarbons (PAHs). No metals analyses appear to have been conducted for this area. The RFI report concludes that PCBs and PAHs were limited to the extent of the asphalt-like/aggregate material; however, no step out soil matrix data has been collected to support this assumption. According to information provided by MWH on September 5, 2003, the asphalt-like/aggregate material may have been excavated during the RFI activities. The vertical extent of PCBs in soil at sample location OCTS22 was defined at a depth of 4 feet bgs (before excavation), but concentrations of residual PCBs at existing grade (if present) are unknown. ***GSU recommends 1) collection of confirmation shallow surface soil samples within the footprint of the former asphalt-like/aggregate material, and 2) collection of step out soil samples downhill from the former asphalt-like/aggregate material for analysis of PCBs and PAHs. Also, please revise Figure 5 to reflect detected concentrations of PAHs in soil samples from OCBS06.***

3. **Former North Storage Area (map key location 1c).**
   Soil Vapor: No VOCs were detected in the one soil vapor sample (OCSV10) collected from this area.
   Soil Matrix: Soil matrix samples were collected from two locations in this area (OCBS02 and OCBS23). See General Comment No. 3 regarding evaluating the need for step out samples for metals in soil.

4. **Former Container Storage Area (map key location 1d).**
   Soil Vapor: No VOCs were detected in the two soil vapor samples (OCSV05 and OCSV06) collected from this area.
   Soil Matrix: Two soil matrix samples were collected from this area (OCBS04 and OCBS05). These samples were only analyzed for TPH. The eastern portion of this area may be subject to step out samples related to addressing PCBs and benzo(a)pyrene (BaP) detected near area "583".

5. **Former AST 732 and Earthen Berm (map key location 2a).**
   Soil Vapor: No VOCs were detected in the four soil vapor samples (OCSV9, OCSV13, OCSV14 and OCSV15) collected from this area.
   Soil Matrix: No TPH (gasoline, diesel, kerosene, and lubricant oil range) was detected in soil samples from the two locations closest to the former

AST(OCTS13 and OCTS14). Aluminum exceeded its FAL in OCTS06, located closest to the former SRE pipeline. Elevated aluminum was also detected in soil samples collected adjacent to the SRE Pond Discharge Pipeline to the southeast (OCTS18@2 ft bgs and OCBS24@1 ft bgs). ***GSU recommends collection of additional soil samples to identify and characterize the source and extent of elevated aluminum and other relevant chemicals of concern. Based on data provided, it appears that the former SRE pipeline may be the source. Also, refer to Specific Comment No. 8 regarding elevated aluminum.***

6. **Former AST 731 and Earthen Berm (map key location 2b).**
   Soil Vapor: No VOCs were detected in the two soil vapor samples (OCSV11 and OCSV12) collected from this area. Table 5 appears to have a discrepancy as it indicates three soil vapor samples were collected in this area. Please clarify.
   Soil Matrix: No TPH (gasoline, diesel, kerosene, and lubricant oil range) was detected in soil samples from the two locations closest to the former AST (OCTS12 and OCTS21).

7. **Former Fueling Area at Building 320 (map key location 3).**
   Soil Vapor: No VOCs were detected in the two soil vapor samples collected from this area (OCSV08).
   Soil Matrix: No constituents analyzed during the RFI appear to exceed their respective FALs.

8. **Former SRE Pond Discharge Pipeline (map key location 4).**
   History: Insufficient information was provided to show the historical location of the SRE Pond discharge pipeline. The Report indicates that the AST earthen berms were constructed between 1977 and 1981. The SRE Pond discharge pipeline observed during the RFI postdated the earthen berms, as it was situated on top of the berm. The Report; however, indicates that a 1965 aerial photograph shows the location of the SRE Pond discharge pipeline. GSU assumes that the SRE Pond (otherwise known as "Building 143 Hold Up Pond") and its discharge are as old as Building 143, which was constructed in 1957 (per Rockwell International's "Sodium Reactor Experiment Decommissioning Final Report", dated August 15, 1983). ***Provide a map showing the location(s) of all discharge from the SRE Pond throughout the SRE Pond's entire history. Provide a written description of all contaminants historically detected in and near the SRE Pond.***

   Also, provide a description of constituents of concern associated with the release of radioactive liquid waste from the former two 5,000-gallon storage tanks which resulted in "contaminated soil existed in the immediate vicinity of the tanks and along rock outcroppings in the cut bank below them" (Rockwell, August 15, 1983). Since this release occurred directly above the drainage to the SRE Pond, it is assumed that sediments from the drainage could have migrated to the pond, and subsequently through to the Old Conservation Yard as effluent from the pond through the discharge outlet. Also, ***provide a description of constituents of concern for the following: Building 003's***

former leach field located adjacent to the SRE Pond (including the use of explosives during the two-year mock up testing program [1975-1977] for dismantling the reactor); the former industrial dry well located adjacent to the SRE Pond; and other chemicals associated with the release of mercury located adjacent to the SRE Pond.

GSU recommends collection of additional samples for all media throughout the historical SRE Pond pipeline discharge area (including the former concrete sump and downslope drainage) for all relevant historical constituents of concern that were affiliated with the SRE Pond and adjacent releases.

Soil Matrix: No soil vapor samples were collected adjacent to this former pipeline. Two soil matrix samples were collected (OCTS18@2' bgs and OCBS24@1' bgs), and were analyzed for pH, VOCs, SVOCs, TPH, and metals. The MRLs for antimony (up to 12 mg/kg) and benzo(a)pyrene and dibenzo(a,h)anthracene (up to 0.036 mg/kg each) exceed their FALs (8.7 mg/kg [antimony] and 0.0114 mg/kg, respectively). Table 5 states acetone was detected at 110 ug/Kg, whereas the electronic database indicates acetone was detected in OCTS18 at 220 ug/kg. Please clarify. See General Comment No. 3 regarding evaluating the need for additional source characterization and step out samples for metals in soil. Aluminum either equals or exceeds it's FAL for both soil samples collected (i.e., 18,000 mg/kg in OCBS24 and 24,000 mg/kg in OCTS18). Insufficient data is presented in the report that clearly demonstrates the correlation of elevated aluminum to increased clay content in native soil. Detected aluminum, chromium, and the MRL for boron appear to generally increase at sample locations closer to the former SRE pipeline. More data is needed to characterize the SRE pipeline.

GSU recommends addressing the aluminum background issue by 1) clarifying if aluminum is a constituent of concern affiliated with any former processes or releases present in the vicinity of the SRE Pond, and 2) evaluating the range of natural occurring aluminum using the site's background dataset, using probability plots of the pooled data, univariant plots showing the distribution of aluminum for fine versus course grained soils, and box plots showing background aluminum at specific SWMU areas throughout the site.

9. **Former Telephone Pole Storage Area (map key location 5).**
Soil Matrix: No soil vapor sampling was conducted. Soil matrix results indicate the presence of elevated concentrations of BaP and dioxins at concentrations greater than their respective FALs. The report states that the lateral extent of these contaminants can be assumed by mapping the extent of area based on "visible charred debris". This assumption is not adequate, and the lateral extent should be determined based on analytical data from additional soil step out samples. ***GSU recommends collection of step out samples (prior to remedial excavation) for areas where BaP and dioxins exceed their respective FALs. Additional step out samples will be required to the south, since asphalt has been removed from the downslope area.***

10. **Northern Debris Area (map key location 6a).**
Soil Vapor: No VOCs were detected in the three soil vapor samples collected from this area (OCSV16, OCSV17, and OCSV18).
Soil Matrix: Soil samples were collected from the following locations: OCTS23@5' and 6.5' bgs, OCTS24@5' and 6.5' bgs, OCTS35@2' bgs, OCTS37@7' bgs, and OCTS39@1' bgs,. TPH (lubricant oil range), dioxins, and BaP exceed their respective FALs in this area. Elevated concentrations of metals (including lead, antimony, silver, thallium, and zinc) were also detected. ***Clarify in the Report if the vertical extent of thallium and silver were defined (ie, was bedrock encountered?).*** The northern lateral extent of BaP, dioxin (OCDD), and thallium was not defined, as these constituents exceeded their FALs in the northernmost sample (OCTS35@2' bgs). The report indicates no additional sampling is needed, as the northern extent is limited by shallow soils and bedrock outcrop. Information provided in Figure 5 does not support this conclusion (i.e, north area is not entirely bounded by outcrop). No information regarding the depth of soil to bedrock appears to have been provided for the northern portion of this area. ***Revise Figure 5 to show the locations and depths of shallow outcrop. GSU recommends collection of pre-remediation step out samples to verify the vertical extent of thallium and silver, and the northern extent of BaP, dioxin, and thallium. Include a description in the logs and in the report text of the vertical extent of soil to bedrock, if encountered in the excavations. Clarify if the burn ash layer observed in trench OCTS23 was observed to the north in trench OCTS35. Include descriptive notes on the trench log for OCTS35 (none were provided).***

11. **Southern Debris Area (map key location 6b).**
Soil Vapor: No VOCs were detected in the one soil vapor sample collected from this area (OCSV19).
Soil Matrix: ***GSU recommends collection of step out samples, as the lateral and vertical extent of elevated metals (including silver, thallium, vanadium, and lead) is not defined.***

12. **Former Transformer Areas (map key locations 7a, 7b, and 7c).**
Soil Matrix: No soil sampling was conducted at either of the two former transformer areas (see General Comment No. 5). Since PCBs (including Aroclor 1254) were detected in nearby soil in the "583" area, GSU recommends collection and analysis of soil matrix samples from each former transformer area for PCBs. Refer to General Comment No. 4.

13. **Active Transformer Area (map key location 7d).** No testing for PCBs was required since the transformer area is relatively new and reportedly postdates the 1986 PCB inventory. No additional work is requested for this area.

14. **Downslope/Downstream Area (map key location 8).**
Soil Matrix: This area appears to be associated with historic discharge from the former SRE pipeline. No soil vapor sampling was conducted in this area. Soil

matrix samples were collected from two locations (OCBS10 and OCBS16). The MRL for antimony (12 mg/kg) exceeds its respective FAL. (8.7 mg/kg). No aluminum analysis appears to have been run on samples from OCBS10 or OCBS16. ***GSU recommends additional sampling in this area for analysis of aluminum, which exceeded its FAL in nearby sample location OCBS24, located uphill and adjacent to the SRE pipeline discharge.***

GSU also recommends additional sampling for all constituents of concern for all media associated with the SRE Pond pipeline discharge (see Specific Comment No. 8).

Groundwater: Provide data for all groundwater monitoring wells and piezometers located within drainages that historically received surficial run off from this and other areas associated with this SWMU. Not all relevant data has been provided in the RFI report. For example, other relevant wells include RD-15, PZ-115, and PZ-56. Once COCs are identified for this SWMU and all relevant wells are identified, GSU recommends review of groundwater data to ensure that all relevant wells have been sampled and analyzed for the applicable COCs.

Based on information presented in Near-Surface Groundwater Characterization Report (MWH, November 2003), it appears that piezometer PZ-115 located in the drainage below the SRE pipeline discharge location has been dry. Review of the well construction details and nearby measured water levels suggests that PZ-115 was terminated at a depth too shallow to monitor groundwater. In April 2002, the groundwater elevation in wells RD-15 (1764.81 feet msl) and PZ-114 (1767.9 ft msl) was below the base of the well casing for PZ-115 (at 1777.81 ft msl). Water level data for well RD-15 indicates that measured water levels (from 2001 through mid 2003) have been consistently lower than the base of PZ-115. ***GSU recommends installation of an appropriately screened monitoring well near PZ-115 to assess water levels and water quality for the drainage area below the former SRE pipeline. The monitoring well design should take into account nearby historical measured water levels to assure that the well is properly constructed.***

15. **Former Fuel Pipeline, AST 735 and Earthen Berm (map key location 9).**
Soil Matrix: No soil vapor samples were collected for this former diesel fuel pipeline. Aluminum and vanadium were detected at concentrations exceeding their respective FALs. ***GSU recommends collection of step out samples to address the exceedences (refer to GSU Specific Comment No. 8).***

Thank you for the opportunity to comment on this report. If you have any questions or require clarification, please feel free to contact me at (714) 484-5434.

Peer reviewed by:

Thomas Seckington, C.Hg.
Senior Engineering Geologist
Cypress Geological Services Unit

cc:

T.R. Hathaway, DVM, MS, DABT
Staff Toxicologist
Human and Ecological Risk Division

Department of Toxic Substances Control

Alan C. Lloyd, Ph.D.
Agency Secretary
Cal/EPA

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Arnold Schwarzenegger
Governor

June 30, 2005

Mr. Arthur J Lenox
The Boeing Company
6633 Canoga Avenue
P.O. Box 7922
Canoga Park, California 91309-7922

CLARIFICATION OF RCRA FACILITY INVESTIGATION (RFI) REQUIREMENTS, SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY, CALIFORNIA

Dear Mr. Lenox:

This letter is a follow-up regarding clarification of RFI requirements discussed in meetings on April 4, 2005 (soil background) and April 20, 2005 (general RFI Characterization issues) between DTSC and Boeing. RFI requirements clarified during the meetings included the following:

i. Modify the Soil Background Data Set
ii. Sampling at pole mounted transformers
iii. Need to resurvey topography after RFI sampling completed if any changes have occurred (i.e. minor grading, building demo or interim measures).
iv. Need to characterize artificial fill placed after RFI sampling completed (i.e. Old Conservation Yard (OCY) "unknown" fill source).
v. Soil Sampling prior to Corrective Measures Study (CMS) to further define clean-up boundaries
vi. Inclusion of DOE radiological data in RFI Reports
vii. Providing a bibliography and access to DOE reports

The following has been agreed to:

i. Soil Background Data Set.

Samples from BG03 location differ chemically and geologically from background samples from onsite formations and will be removed. Prior DTSC site decisions using soil background will not be affected by this data set modification for the RFI. All remaining existing background sample locations will remain in the dataset.

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Boeing will collect additional samples at existing background sample locations to augment the existing soil background dataset for metals not analyzed during previous sampling events or replace sample data that had elevated analytical detection limits.

Information regarding the supplemental Soil Background Sampling is summarized in a letter from Boeing to DTSC dated April 8, 2005, which details the locations and analysis of the samples. Additional background locations or sampling depths are not required.

Results from the proposed sampling that show an order of magnitude or greater difference for metal concentrations (i.e. the dataset) will be evaluated further for possible anthropogenic impacts and acceptability before the data is incorporated into the background data set. Boeing and DTSC will use best professional judgment in determining acceptability of supplemental metal results. The final soil background data set from this and earlier sampling will be published in a separate report for DTSC review and approval.

The Standard Risk Assessment Methodology (SRAM) will use 95% UCL of 99% percentile (or max if lower) and the Wilcoxon Rank Sum (WRS) Test per SRAM Workplan (2005) for risk assessment.

Characterization will also use the 95% UCL of the 99 percentile (or max if lower) along with other site information (e.g., sampling data trends, risk assessment findings, historical operations) in a best professional judgment approach to make additional sampling decisions.

ii. PCB sampling at pole mounted transformers

The soil beneath onsite Boeing pole mounted transformers (installed prior to 1980) will be visually inspected for staining.

At locations where there is a single pole-mounted transformer (installed pre-1980) and no staining or leakage is identified, soil sampling/analysis for PCBs would not be conducted. If, however, staining of the soil is identified, then soil sampling will be conducted.

Where two or more transformers (installed prior to 1980) are or have been mounted on a pole(s) above an unpaved surface, then soil sampling will be conducted regardless of staining conditions on the poles or transformers. This approach is suggested due to the combined volume of multiple transformers.

If, the ground surface beneath the two or more mounted transformers (installed pre-1980) is covered with asphalt or concrete and staining is not identified, then soil sampling/analysis for PCBs will not be conducted. If, however, staining is identified on the paved surface, then soil sampling will be conducted.

If PCBs are detected from nearby SWMUs, samples will also be collected beneath pole mounted transformers adjacent to or within the SWMU.

A map showing all onsite Boeing owned pole mounted transformers will be prepared. Pole mounted transformers installed prior to 1980 will be identified (based on available information).

The RFI report(s) will have an affirmative statement summarizing the results of the pole mounted investigation within/near the reporting area.

All SSFL transformer inspection, sampling, and data will be reported to the DTSC. All reports will be signed by licensed professional (standard practice).

iii. Need to resurvey topography after RFI sampling completed if any changes have occurred (i.e. significant and minor grading, building demolition or interim measures).

For the Old Conservation Yard (OCY) site:

The RFI report will identify estimated extent of fill placement area and depth. The extent of fill in the Old Conservation Yard will be mapped and shown on a figure in the RFI report. Instead of re-surveying, depth estimates of the fill at OCY will be supported with hand auger data collected from 2 to 3 locations to document existing soil conditions. A note will also be provided on the figure that describes the topographical changes relative to fill.

Other RFI site locations:

In areas where significant changes in topography occur (due to import of fill material or building demolition), Boeing will resurvey the topography and provide information regarding the thickness and extent of fill at SWMUs and AOCs. Where resurveys are not conducted, Boeing will map in the extent of the fill. The figures will be modified to show the most recent topographic changes. In summary, these include: (1) text to describe amount of fill and/or topographic changes, (2) a figure showing the extent and location of fill material, along with a note to describe topographic changes; (3) hand

auger data will be collected to confirm fill depth in areas of broad fill placement (small building demolitions will be noted but not checked with hand auger).

Fill will not be placed above known areas of elevated soil concentrations resulting in estimated unacceptable risks.

Re-surveying will be conducted at areas where significant soil disturbance has occurred at SWMUs or AOCs. For example, following significant soil excavations at Interim Measures clean up activities (FSDF, Building 203 and Happy Valley) surveying was conducted. In addition, building demolition at SWMU and AOC locations that involve extensive soil movement (e.g., Building 4059) may warrant surveying to ensure excavation boundaries are documented so that subsequent RFI soil sampling will be performed and located correctly. If surveying information is not available, then the report should clearly indicate this and existing figures and photos will be used to document excavation boundaries.

The above requirements for mapping and re-surveying apply to SWMUs and AOCs sites investigated during the RFI.

iv. Fill from unknown sources, regardless of thickness, must be documented and adequately characterized when emplaced after RFI sampling is completed.

Boeing will provide statements in the RFI report that will either describe (1) the origin of the fill material (when documentation is available), or (2) state that the origin of the fill is unknown (if documentation does not exist). Boeing will provide supporting data that demonstrate that the fill is not impacted (e.g., sampling data, visual observations during construction, boring or trench logs, or photographs), photographs or other documentation that describes the current condition of the fill material. The RFI report will provide a statement (signed by an appropriate licensed professional) affirming that the fill is not impacted and does not pose a risk to human health or the environment.

In the case of the Old Conservation Yard site, analytical data of the fill material, description of DTSC-directed investigation of the berm soils subsequently used as fill material, and photographs will be included in the revised RFI report.

v. Soil Sampling prior to CMS to further define clean up boundaries

During the course of RFI sampling, it may be efficient to defer further sampling of an impacted area in a SWMU to the CMS or CMI phase of work provided sufficient characterization has been completed to delineate the volume and extent of

contamination. This is predicated upon the assumption that (1) the risks posed by the impacted area will require remediation and (2) existing RFI characterization results enable a volumetric estimate that would not change CMS evaluation of appropriate cleanup technologies, or CEQA-related determinations (i.e. the characterization should be sufficient that the volumes estimated generally are within a factor of 10).

The Old Conservation Yard site has a localized area that meets these criteria. RFI sampling has identified an area that has elevated dioxin concentrations in soil that will require remediation (excavation is presumed). The source of the dioxins is from burned and charred telephone poles and the extent of impacts is based on visual indicators (e.g. location of charred poles, the lateral extent is partially bounded with paved surfaces and bedrock). Since the extent and volume of the impacted soils is discernable and the soils will need to be removed then it may be efficient to defer further sampling until after the cleanup action (i.e., CMI) at which time more complete confirmation sampling will be conducted.

The remaining two DOE issues (i.e., vi. inclusion of radiological data in RFI Reports, and vii. providing an Area IV bibliography and access to DOE reports), still need to be resolved and we look forward to hearing from you soon.

If you have any questions regarding these issues, please do not hesitate to give me a call at (916) 255-3600.

Sincerely,

For

Gerard J Abrams, C.HG.
Senior Engineering Geologist
Northern California Permitting and Corrective Action Branch

cc: Mr. Stephen Baxter
Department of Toxic Substances Control
1011 Grandview Avenue
Glendale, California 912101-2205

Ms. Laura Rainey
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

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APPENDIX A2-2

ELECTRONIC COPY OF SUBSTANCE INFORMATION (SOIL BORING AND TRENCH LOGS)

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FIELD LOG OF BORING

BORING NUMBER OCB501 SHEET 1 OF 1

PROJECT NAME DOE ~~ROCKET DYNE~~	PROJECT NUMBER 313150002	ELEVATION AND DATUM	LOCATION ~~INTEX~~ DLDCON
DRILLING COMPANY INTERPHASE	DRILLER (GW) CHARLIE	DATE AND TIME STARTED 10/15 1620	DATE AND TIME COMPLETED 10/15 1640
DRILLING EQUIPMENT GEOPROBE	DRILLING METHOD	COMPLETION DEPTH 5'	TOTAL NO. OF SAMPLES 4
SIZE AND TYPE OF BIT	HOLE DIAMETER 3"	NO. OF SAMPLES: BULK / SS	DRIVE 4 / PITCHER
DRILLING FLUID NONE	DRILLING ANGLE 90°	WATER LEVEL: FIRST —	AFTER _____ HOURS
SAMPLE HAMMER TYPE / DRIVING WT. / DROP		HYDROGEOLOGIST / DATE D. BARRIE	CHECKED BY / DATE

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
		X	3 3/4		SURF. = BARE SOIL &	SM	—	70	30	@ 1625
		X	4/4		DUP. DRY GRASS ADJ. TO EXCAVATION [SM]					OCB501S01D0.5
	1									OCB501D01 DR.5
										HS = 1.2 APM
	2				@ 0.5'; ~~SILT~~ SILTY SAND;	ML	—	20	80	(confirmation sample + duplicate for mobile)
					DARK Yel. BRN (10YR 3/4);					
			5/6		DRY-MOIST; LOOSE; FINE GR.;					
	3				NON-PLASTIC;					
	4	X			@ 2'; SILT W/ SAND; DARK					@ 1635
		X			Yel. BRN (10 YR 3/4);					OCB501S02D4.5
	5				MOIST; LOOSE; LOW					OCB501SD2D4.5
					PLAST.					HS = 0 PPM
	6				T.D. 5'					
					ref. @ 5'					
	7									
	8									
	9									
	10									
	11									
	12									

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FIELD LOG OF BORING

BORING NUMBER OCBS02

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
DOE ROCKETDYNE	31315000Z		OLDCON

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
INTERPHASE	Paul/Charlie	10/15 16:45	10/15/97

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
GEOPROBE 5400	DIR. PUSH	8'	2

SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE	PITCHER
	3"				2	

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST	AFTER ___ HOURS
NONE	90°		—	

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			D. GARRIE	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
					SURF = DRY GRASS &	CL	–	10	90	@ 1645
	1	X	3/4		BARE SOIL ADJ. TO					OCBS02S01D1.0
					EXCAVATION					HS = 0 ppm
	2				@ 0.5'; LEAN CLAY; BRN.	SM	30	55	15	
					[10YR 4/3]; DRY; HARD;					
	3		6 1/2		VISIBLE POROSITY					
			7 1/2		PIN-HOLES, FRACTS, ETC.);					
	4				w/GRAVEL]					
					@ 2'; SILTY SAND; BRN					@ 1655
	5	X			[10 YR 4/3]; MOIST;					OCBS02S02D5.0
					MED. DENSE; F. GR.;					HS = 4.2 ppm
	6				GRAVELS = 1/4" PEA GRAV.;					
					SUB ∡-SUB R.; BECOMES					
	7		3/4		COARSER w/DEPTH					
	8				@ 8'; SILTY SAND; MOTTLED					
					YEL. BRN [10YR 5/6] &	SM	–	85	15	
	9				DK. YEL. BRN [10YR 4/4];					
					MOIST; DENSE; MED.					
	10				GR [W. BEDRK.]					
					T.D. 8'					
					REF. @ 8'					

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FIELD LOG OF BORING

BORING NUMBER OCBS03 | SHEET 1 OF 1

PROJECT NAME: DOE	PROJECT NUMBER: 3131500004	ELEVATION AND DATUM:	LOCATION: OLDCON
DRILLING COMPANY: INTERPHASE	DRILLER: PAUL/CHARLIE	DATE AND TIME STARTED: 10/20 1220	DATE AND TIME COMPLETED: 10/20
DRILLING EQUIPMENT: GEOPROBE 5400	DRILLING METHOD: DIR. PUSH	COMPLETION DEPTH: 7.5'	TOTAL NO. OF SAMPLES: 2
SIZE AND TYPE OF BIT: —	HOLE DIAMETER: 3"	NO. OF SAMPLES: BULK: SS:	DRIVE: 2 PITCHER:
DRILLING FLUID: NONE	DRILLING ANGLE: 90°	WATER LEVEL: FIRST: —	AFTER ____ HOURS
SAMPLE HAMMER TYPE: DRIVING WT.: DROP:		HYDROGEOLOGIST / DATE: D. BARRIE	CHECKED BY / DATE:

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
					SURFACE = BARE SOIL	CL	TR.	10	90	@ 1230
	1	X	2.5/4		ADJ. TO EXCAVATION					OCBS0350 1 D1.5'
						CL	TR	10	90	HS = 45 PPM
	2				@ 0.5'; LEAN CLAY (CL); BRN (10YR 4/3);					
			7.5							
	3		7.5		DRY - MOIST; STIFF - HARD; MED. PLAST.;					
	4				HIGH DRY STR.;	ML	—	10	90	
	5				@ 1.5'; LEAN CLAY, AS ABOVE					@ 1235
		X				ML	—	10	90	OCBS0352 D6'
	6				@ 4.5'; SILT; V. DARK					HS = 305 PPM
	7				GRAY (2.5Y 3/1); MOIST;	SM	—	TR	30	
					MED. STIFF; STRONG					
	8				PETRO. PROD. ODOR					
										@ 7.5';
	9				@ 6'; SILT (ML), AS ABOVE					HS = 95 PPM
	10				T.D. 7.5' - REF.					
	11				@ 6.5'; SILTY SAND (SM);					
	12				OLIVE GRAY (2.5Y 4/2); MOIST; MED. DENSE; FINE GR.					
					GROUTED W/ BENTONITE 10/20/97					

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FIELD LOG OF BORING

BORING NUMBER DCBS04 SHEET 1 OF 1

PROJECT NAME: DOE	PROJECT NUMBER: 313150004	ELEVATION AND DATUM:	LOCATION: OLDCON
DRILLING COMPANY: INTERPHASE	DRILLER: PAUL/CHARLIE	DATE AND TIME STARTED: 10/10 1400	DATE AND TIME COMPLETED: 10/10 14:40
DRILLING EQUIPMENT: GEOPROBE 5400	DRILLING METHOD: DIR. PUSH	COMPLETION DEPTH: 6'	TOTAL NO. OF SAMPLES: 2
SIZE AND TYPE OF BIT:	HOLE DIAMETER: 3"	NO. OF SAMPLES: BULK / SS / DRIVE: 2 / PITCHER	
DRILLING FLUID: NONE	DRILLING ANGLE: 90°	WATER LEVEL: FIRST —	AFTER _____ HOURS
SAMPLE HAMMER TYPE: DRIVING WT.: DROP:		HYDROGEOLOGIST / DATE: D. BARRIE	CHECKED BY / DATE

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
					TO V. DARK GRAY (10 YR 3/1)					
					SURF. = ASPHALT					@ 1400
	1	X	2.5/4		@ 0.5'; LEAN CLAY (CL); DARK BRN (10 YR 3/3); MOIST;	CL	-	10	90	DCBS@4S@1D1.0 HS = 2.5 PPM
	2		7/7.5		V. STIFF; MED. PLAST.; @ 1.0'; LEAN CLAY (CL), AS ABOVE W/ DARK GREENISH GRAY (GLEY 5G4/1) PATCHES	ML	-	35	65	
	3									@ 1405
	4	X			@ 3'; SANDY SILT (ML); V. DARK GRAY (10 YR 3/1); MOIST; MED. STIFF; SLIGHT ODOR	ML	-	35	65	DCBS@4S@2D4.5 HS = 55 PPM
	5									
	6									HS @ 6' = 0
	7				@ 4.5'; SANDY SILT (ML); AS ABOVE					
	8				@ 5', BECOMES V. DARK GRAY (10 YR 3/1)					
	9									
	10				T.D. 6'; BORING TERMINATED PRIOR TO REFUSAL; GROUTED W/ BENTONITE 10/20/97					

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FIELD LOG OF BORING

BORING NUMBER OCBS@5

SHEET 1 OF 1

PROJECT NAME: DOE	PROJECT NUMBER: 313150004	ELEVATION AND DATUM:	LOCATION: OLDCON
DRILLING COMPANY: INTERPHASE	DRILLER: PAUL/CHARLIE	DATE AND TIME STARTED: 10/10 14:45	DATE AND TIME COMPLETED: 10/10 14:55
DRILLING EQUIPMENT: GEOPROBE 5400	DRILLING METHOD: DIR. PUSH	COMPLETION DEPTH: 2'	TOTAL NO. OF SAMPLES: 1
SIZE AND TYPE OF BIT:	HOLE DIAMETER: 3"	NO. OF SAMPLES: BULK / SS:	DRIVE: 1 / PITCHER:
DRILLING FLUID: NONE	DRILLING ANGLE: 90°	WATER LEVEL: FIRST —	AFTER ____ HOURS
SAMPLE HAMMER TYPE: DRIVING WT.: DROP:		HYDROGEOLOGIST / DATE: D. BARRIE	CHECKED BY / DATE:

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
	0			CL	SURF. = ASPHALT					@ 1445
	1	X	3/4		@ 0.5'; LEAN CLAY / DARK BRN. - 10YR 3/3; MOIST;	CL - TR	100			OCBS@5S@1D1.0
	2				STIFF - V. STIFF; MED. PLAST.	CL - TR	100			HS = Ø
	3				@ 1.0'; LEAN CLAY, AS ABOVE					
	4									
	5				T.D. 2' BORING TERM. PRIOR TO REFUSAL. GROUTED W/ BENT.					

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FIELD LOG OF BORING

BORING NUMBER OCBS#6

SHEET 1 OF 1

PROJECT NAME: DOE	PROJECT NUMBER: 313150004	ELEVATION AND DATUM:	LOCATION: OLDLON
DRILLING COMPANY: INTERPHASE	DRILLER: Paul/CHARLIE	DATE AND TIME STARTED: 10/10 1500	DATE AND TIME COMPLETED: 10/10 1523
DRILLING EQUIPMENT: GEOPROBE 5400	DRILLING METHOD: DIR. PUSH	COMPLETION DEPTH: 2'	TOTAL NO. OF SAMPLES: 1
SIZE AND TYPE OF BIT:	HOLE DIAMETER: 3"	NO. OF SAMPLES: BULK / SS	DRIVE: 1 / PITCHER
DRILLING FLUID: NONE	DRILLING ANGLE: 90°	WATER LEVEL: FIRST —	AFTER _____ HOURS
SAMPLE HAMMER TYPE:	DRIVING WT.:	DROP:	HYDROGEOLOGIST / DATE: D. BARRIE	CHECKED BY / DATE:

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
	0	X			SURFACE: EXPOSED SOIL NEAR FENCE	SM	—	60	40	@ 1515 OCBS#6S#1D0.5' HS = 14 ppm
	1		4/4		@ 0.5'; SILTY SAND (SM); DK. YEL. BRN (10YR 4/4); MOIST; MED. DENSE; FINE GR.					
	2									
	3									
	4				T.D. 2' BORING TERM. PRIOR TO REF.; GROUTED W/ BENT. CHIPS 10/20/97					

OGDEN

FIELD LOG OF BORING

Re-OCCUPATION

BORING NUMBER OCBS#6 DCB

SHEET 1 OF 1

PROJECT NAME DOE	PROJECT NUMBER 31315000 4	ELEVATION AND DATUM	LOCATION OLDON
DRILLING COMPANY INTERPHASE	DRILLER Paul / Charlie	DATE AND TIME STARTED 11/13/97 1105	DATE AND TIME COMPLETED 11/13/97 1124
DRILLING EQUIPMENT GeoProbe 5400	DRILLING METHOD D.R. PUSH	COMPLETION DEPTH 5.5'	TOTAL NO. OF SAMPLES 1
SIZE AND TYPE OF BIT —	HOLE DIAMETER 3"	NO. OF SAMPLES: BULK — SS — DRIVE 1 — PITCHER	
DRILLING FLUID None	DRILLING ANGLE 90°	WATER LEVEL: FIRST — AFTER ____ HOURS	
SAMPLE HAMMER TYPE — DRIVING WT. — DROP —		HYDROGEOLOGIST / DATE D. BARRIE	CHECKED BY / DATE

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
					Surface: Asphalt, Adj. To & S. of FENCE	SM	—	65	35	
	1		1		@ 2"; SILTY SAND (SM);					
	2		7.5		DK. Yel. BRN (10YR 3/6); MOIST; MED. DENSE; F. GR.					
	3									
	4	X			@ 5'; WEATHERED SLTST. BEDROCK; CONSISTS OF.					
	5	X			V. THIN-BEDDED SLTST. BROWNISH YELLOW (10YR 6/6); MOIST; FRIABLE; POORLY INDURATED; BREAKS DOWN TO SILT w/ SAND (ML), & SILTY SAND (SM).	SM ML	—	70	30	@ 1115 OCBS#6 S#2 D 5.5
	6				T.D. 5.5' Ref. @ 5.5' BACKFILLED w/ BENTONITE					

OGDEN

FIELD LOG OF BORING

BORING NUMBER OCBS07 SHEET 1 OF 1

PROJECT NAME DOE	PROJECT NUMBER 313150004	ELEVATION AND DATUM	LOCATION OLDCON
DRILLING COMPANY INTERPHASE	DRILLER PAUL/CHARLIE	DATE AND TIME STARTED 10/16 1530	DATE AND TIME COMPLETED 10/16 1555
DRILLING EQUIPMENT GEOPROBE 5400	DRILLING METHOD DIR PUSH	COMPLETION DEPTH 5.5'	TOTAL NO. OF SAMPLES 4
SIZE AND TYPE OF BIT —	HOLE DIAMETER 3¼	NO. OF SAMPLES: BULK / SS	DRIVE 4 / PITCHER
DRILLING FLUID NONE	DRILLING ANGLE 90°	WATER LEVEL: FIRST —	AFTER _____ HOURS
SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE D. BARRIE	CHECKED BY / DATE

ML = MOBILE LAB
FL = FIXED LAB

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
					SURF. = BARE SOIL	SM	—	55	45	@ 1540
	1	X	3.5/4	ML/FL	NEAR PHONE POLE	SM	—	55	45	OCBS075Ø1D1.Ø
		X				SM	—	55	45	OCBS075Ø1D1.Ø
	2				@ 0.5'; SILTY SAND (SM);					HS = 85 PPM
					V. DARK GRAYISH BRN.					RESAMPLED @ D1Ø
	3		6.5/7.0		(10YR 3/2); MOIST; MED.					DLL 1/29/98
					DENSE; FINE GR.;					
	4				NON-PLASTIC					
					@ 1'; SILTY SAND (SM), AS ABOVE					@ 1550
	5	X		ML	@ 2'; SILTY SAND (SM); AS	SM	—	60	40	OCBS075Ø2D5.Ø
		X		FL	ABOVE	SM	—	60	40	OCBS075Ø2D5.Ø
					@ 2.5'; BECOMES V. DARK					HS = Ø PPM
	6				~~GRAYISH~~ BRN. (10YR 3/4)					
					YELLOWISH					
	7									
					T.D. 5.5'					
	8				BORING TERM. D.T. REF.					
	9				GROUTED W/ BENT. CHIPS,					
					10/20/97					
	10				@ 5.0'; SILTY SAND (SM),					
	11				AS ABOVE BUT SL.					
					FEWER FINES					
	12				[Resampled @ Ø.5' 1/27/98]					(OCBSØ75Ø3DØ.5)
	13									
	14									

OGDEN

FIELD LOG OF BORING

BORING NUMBER OCBS4B8 SHEET 1 OF 1

PROJECT NAME DOE	PROJECT NUMBER 313150004	ELEVATION AND DATUM	LOCATION OLDCON
DRILLING COMPANY INTERPHASE	DRILLER PAUL/CHARLIE	DATE AND TIME STARTED 10/15 1600	DATE AND TIME COMPLETED 10/15 1655
DRILLING EQUIPMENT GEOPROBE 5400	DRILLING METHOD DIR. PUSH	COMPLETION DEPTH 8'	TOTAL NO. OF SAMPLES 4
SIZE AND TYPE OF BIT	HOLE DIAMETER 3"	NO. OF SAMPLES: BULK / SS / DRIVE 4 / PITCHER	
DRILLING FLUID NONE	DRILLING ANGLE 90°	WATER LEVEL: FIRST —	AFTER ____ HOURS
SAMPLE HAMMER TYPE / DRIVING WT. / DROP		HYDROGEOLOGIST / DATE DON BARRIE	CHECKED BY / DATE

ML = MOBILE LAB
FL = FIXED LAB

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
					SURF. = BARE SOIL E. OF PHONE POLE					@ 1610
	1	X	ML 3/4 FL		@ 0.5'; SANDY SILT (ML); V. DARK GRAY (2.5Y 3/1); MOIST; V. STIFF;	ML	60	40		OCBS4BS4D1D1.0'
		X				ML	60	40		OCBS4BS4D1D1.0' HS = 8
	2									
	3		7.5		PETRO. ODOR					
			7.5		@ 4'; SILTY SAND (SM); MOIST; MED. DENSE; BRN. (10YR 4/3); F. GR.	SM	70	30		
	4									
	5	X			VISIBLE (PINHOLE-SIZE) POROSITY.	SM	70	30		OCBS4BS4D2D5.0
		X				SM	70	30		OCBS4BS4D2D5.0
	6					SM & CL	70 & 100	30		@ 6', HS = 15 PPM
			4/4		@ 5'; SILTY SAND (SM), AS ABOVE					
	7									
	8				@ 6'; ~~INTERBEDDED~~ SILTY SAND W/ THIN (1/4 - 1/2" THICK) LEAN CLAY INTERBEDS. SILTY SAND (SM) = DK. YEL. BRN (10YR 4/6) MOIST; LOOSE; F-M GR.; LEAN CLAY = DARK GREENISH GRAY (GLEY, 5G4/1); MOIST; SOFT; MED. PLASTICITY; CONTAINS ROOTS, UP TO 1/4" DIA. [W. BEDROCK]	DB				
					T.D. 8'; REF. @ 8' - REFUSED					W/ BEN T.

OGDEN

FIELD LOG OF BORING

BORING NUMBER OCBS09

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
DOE	313150004		OLD CON VLS 12

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
	T. Burton	10/29/97 1030	10/29 1130

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
	HA	16"	1

SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE	PITCHER
	2"					

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST	AFTER ____ HOURS

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			T. Burton 10/29	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
	0.5	X			Surface: pit 6' deep, debris (cones, piping, cans, dry leaves), mud cracks	SP	20	75	5	@ 1040 OCBS09S@D0.5 Headspace: ~~125ppm~~ 125 ppm
	1									
	2				Poorly graded sand w/gravel (SP), brown (10YR4/2), dry, loose, sub-round gravels		~~20~~	~~75~~	~~5~~	
					@ 1': Poorly graded sand (SP) brown (10YR5/6), dry, loose, weathered bedrock		–	90	10	@ 1100
					Refusal @ 16"					@ 1115
					Backfilled w/ cuttings					

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FIELD LOG OF BORING

BORING NUMBER OCBS1Ø

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
DOE	313150004		OLDCON ULS7

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
	K Jamieson	10/29/97 1130	10/29/97 1140

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
	HA	1.0'	2

SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE	PITCHER
	2"					

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST	AFTER ____ HOURS
			1ft.	

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			T. Burton 10/29/97	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
	0.5	X			Surface: weeds, grass, (drainage),					
		X			wet	SM	–	70	30	@ 1135
	1				Silty Sand (SM), brown (2.5Y 3/2), black					OCBS1ØSØ1DØ.5
H_2O saturated	2				wet (saturated), loose-med. dense					Headspace: 0 ppm
	3				Total Depth: 1' (Hole caved in)					@ Ø820; 1/27/98
	4	X			[Hole Reoccupied 1/27/98]	ML	–	10	90	OCBS1ØSØ2D4.Ø
xxxx	5				H_2O @ Ø.5', 2' after ½ hr @ 4.Ø' Silt (ML), v.dk grey (10YR 2/1), moist-wet, m.stiff, fine sand, med. plasticity					
					T.D. 4.5' Bedrock Refusal					

MWH

Boring #: OCBS10 MW#: Sheet 1 of 1

Project: Groupe Data Gap

Job #: Site: SSFL - OCY

Logged By: JDolman Reviewed By:

Drilling Contractor: NA

Drill Rig Type/Method: Hand Auger

Drillers Name: B Burton

Borehole Diam./Drill Bit Type: 3" Total Depth: 0.5' Ref. Elev.:

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

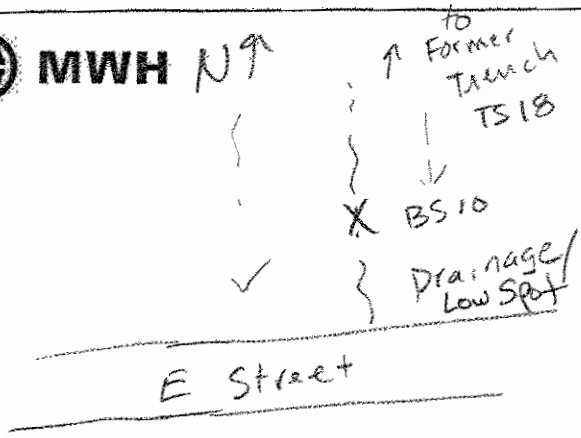
Depth to other Water Bearing Zones:

Drill Start Time/Date: 2/10/06 Drill Finish Time/Date:

Well Completion Time/Date:

Soil Boring Backfill Time/Date:

Site Sketch Map



PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Re Occupied Pipe Outfall Low Spot					
NA	X			X				ML	Sparsely vegitated 5-10° slope to South	—	—	—	40	60
							1		0.252" Ash layer (10YR 3/2) Dark gray brown NOT sampled					
							2		SANDY SILT (ML)					
							3		dark yellowish brown (10YR 4/4) med dense					
							4		slightly moist.					
							5		Boring not deepened to Bedrock					
							6		Boring re-occupied 4/10/06					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

OGDEN

FIELD LOG OF BORING

BORING NUMBER OCBS13

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
DOE	313150004		OLDCON ULS 10

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
	K.J.	10/30/97 0900	10/30 0930

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
	HA	TB# 0.5'	TB# 1

SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE	PITCHER
	2"					

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST	AFTER _____ HOURS
			0.5'	-

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			T Burton 10/30/97	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
	0.5	X			Surface: reeds, sage, H_2O, poison oak	OL	—	10	90	@ 0930
	1				Organic silt (OL), black, wet, decayed organics					OCBS13SP(D)0.5
										No HS, taken
	2									
					Total Depth: 0.5'					
					Hole filled w/ H_2O					

OGDEN

~~BUBS15~~ TB 10/9/01

FIELD LOG OF BORING

BORING NUMBER ~~OCBS14~~ TB OCBS14

SHEET 1 OF 1

PROJECT NAME ~~DOE~~ TB NASA / DOE	PROJECT NUMBER 313150004 TB	ELEVATION AND DATUM	LOCATION ~~OLD~~ TB CON B204/Old Con
DRILLING COMPANY	DRILLER T. Burton	DATE AND TIME STARTED 10/30/97 0945	DATE AND TIME COMPLETED 10/30 1000
DRILLING EQUIPMENT	DRILLING METHOD HA	COMPLETION DEPTH 1'	TOTAL NO. OF SAMPLES 2
SIZE AND TYPE OF BIT	HOLE DIAMETER 2"	NO. OF SAMPLES / BULK / SS / DRIVE / PITCHER	
DRILLING FLUID	DRILLING ANGLE	WATER LEVEL FIRST —	AFTER _____ HOURS
SAMPLE HAMMER TYPE DRIVING WT. DROP		HYDROGEOLOGIST / DATE T. Burton 10/30/97	CHECKED BY / DATE

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
	0.5	X			Surface: Dry Grass					@ 1000 ~~BUBS15~~ TB
	1	X			~~Topsoil~~ TB silt (ML), brown (10YR 5/3), dry, very loose, low-no plasticity	ML	—	25	75	~~OCBS14~~ TB SD1 D@5 No H.S. taken
	2				Total Depth: 1' filled w/ silt					

10/9/01 T. Burton

Note: Boring + sample IDs were not changed completely in database + on map. Names to be changed back to OC.. based on agreed ownership of debris area.

OGDEN

FIELD LOG OF BORING

BORING NUMBER OCBS15

SHEET 1 OF 1

PROJECT NAME: DOE	PROJECT NUMBER: 31315000.4	ELEVATION AND DATUM:	LOCATION: OLDCON
DRILLING COMPANY: INTERPHASE	DRILLER: Paul/Charlie	DATE AND TIME STARTED: 11/3/97 1030	DATE AND TIME COMPLETED: 11/3/97 1050
DRILLING EQUIPMENT: GeoProbe 5400	DRILLING METHOD: DIR. PUSH	COMPLETION DEPTH: 3'	TOTAL NO. OF SAMPLES: 3
SIZE AND TYPE OF BIT:	HOLE DIAMETER: 3"	NO. OF SAMPLES: BULK / SS	DRIVE: 3 / PITCHER
DRILLING FLUID: NONE	DRILLING ANGLE: 90°	WATER LEVEL: FIRST —	AFTER _____ HOURS
SAMPLE HAMMER TYPE: DRIVING WT.: DROP:		HYDROGEOLOGIST / DATE: D. Barrie	CHECKED BY / DATE:

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
					SURFACE: Asphalt.					@ 1035
	1	X	5/6		ADJ. TO WELL # WS-7	SM	-	80	20	OCBS15S@1D1.0
		X				SM	-	80	20	OCBS15S@1D1.5
	2	X			@ 2"; SILTY SAND (SM); DK. YEL. BRN (10YR 3/6); MOIST; MED. DENSE; F. GR.	SM	-	80	20	OCBS15D@1D1.0
	3				T.D. 3' TERM. PRIOR TO REF. BACKFILLED W/ BENT.					

OGDEN

FIELD LOG OF BORING

BORING NUMBER CCB516

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
DCE	313150004	clear	Old Con Rd. S 19

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
	K.J.	12/16/97 1620	12/16 1630

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
	# Push	0.5'	1

SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE	PITCHER
	2"					

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST	AFTER ____ HOURS
			0'	

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			T Burton 12/16/97	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
		X			Surface: drainage wet	OL	-	5	95	@ ~~1625~~ 1630
	1				@0.5 Organic silt (OL), black (10YR 2/1), wet, loose, decaying					CCB516S01
										Full Sleeve
	2				organic odor, abundant plant material					
					T.D 0.5'					

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FIELD LOG OF BORING

BORING NUMBER OCBS 17

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
Rocketdyne	3131S0002		OLD CON

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
	K.J./T.B.	10/8/98 1005	10/8/98 1130

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
	Hand Auger	7.5'	

SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE	PITCHER
	4"					

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST	AFTER ____ HOURS
			—	

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			T. Burton 10/8/98	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
(open)	1				Surface: 2' deep excavated area (3' x 4') between sump and concrete					Excavation to 2' bgs
	2									
	3				@ 3' Silt (ML), dk. yellowish brown (10YR 3/4), moist, loose, micaceous, med. plasticity, coated w/ fine sand (weathered sandstone bedrock)	ML	–	5	95	
						SP	–	90	10	
	4					ML	–	15	85	
						ML	–	5	95	
	5					ML	–	5	95	
	6				@ 3.5' Poorly graded sand w/ silt (SP), dry, v. loose, fine sand - VF sand					@ 1120
	7	X				ML	–	5	95	OCBS175@1, D@1 depth = 7', 7.5' Full Sleeves
		X								
	8				@ 4' Silt w/ sand (ML), v. dk. brn. (10YR /), moist, loose, low plasticity, VF sand					
					@ 4.5' Silt, as above, moist - wet trace micas					
					@ 5' As above, wet					
					@ 7' As above, dark grayish brown (10YR 4/2)					
					T.D. 7.5' Terminated Before Refusal					

OGDEN

FIELD LOG OF BORING

BORING NUMBER OCBS18

SHEET 1 OF 1

PROJECT NAME: DOE	PROJECT NUMBER: 313150004	ELEVATION AND DATUM:	LOCATION: OLD CON ULS 14a
DRILLING COMPANY:	DRILLER: K.J.	DATE AND TIME STARTED: 0900 1/27/98	DATE AND TIME COMPLETED: 0915
DRILLING EQUIPMENT:	DRILLING METHOD: slidehammer	COMPLETION DEPTH: 0.5	TOTAL NO. OF SAMPLES: 1
SIZE AND TYPE OF BIT:	HOLE DIAMETER: 2"	NO. OF SAMPLES: BULK: SS:	DRIVE: PITCHER:
DRILLING FLUID:	DRILLING ANGLE:	WATER LEVEL: FIRST: —	AFTER ____ HOURS
SAMPLE HAMMER TYPE: DRIVING WT.: DROP:		HYDROGEOLOGIST / DATE: T. Burton 1/27/98	CHECKED BY / DATE:

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
ML		X			SFC: bare soil	ML	—	5	95	@ 0915
	1				@ 0.5' Silt (ML), v. dk. brown 10YR 2/2, dry to slt. moist, m. stiff, no plasticity					OCBS18S01D0.5
	2				T.D. 0.5' Terminated before refusal					

OGDEN

FIELD LOG OF BORING

BORING NUMBER OCBS23

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
DOE	313150004		Old Con ULS 21

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
	T.S.	6/17/99 1955	1400

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
		0.5'	1

SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE 1	PITCHER

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST ___	AFTER ___ HOURS

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			T. Burton	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
		X	100	15	Surface: gravelly dry soil	ML	tr	30	70	(OCSV18 location)
										OCBS23 S@1 D@.5
	1				@ 0.5' Sandy silt (ML), brown					@ 1400
					(7.5YR4/2), dry, v. loose, tr					H.S. = 0 ppm
	2				q-tz. gravels (1/2"), no plast.,					
					fine gr.					
					TD. 0.5'					
					(SV refusal @ 5.0' 6/14/99)					

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FIELD LOG OF BORING

BORING NUMBER OCBS24 SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
DOE	313150004		Old Con Pond UES 24

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
		6/17/99 1530	1535

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
		1.0'	1

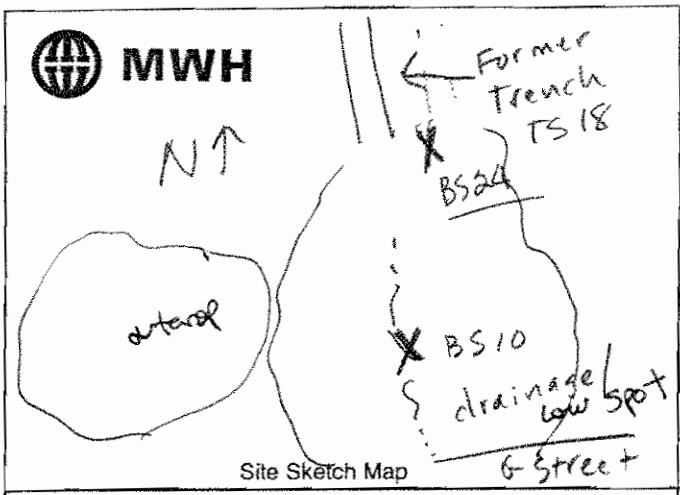
SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE	PITCHER
					1	

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST	AFTER ____ HOURS
			—	

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			T. Burton 6/17/99	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
					Surface: moist, disturbed soil					
	1	X	100	12	from adj. excavation; dry	ML	—	30	70	@ 1535
					pond; above former swale					OCBS24 Soil 0-1.0'
	2									Headspace = 0 ppm
					@ 1.0' Sandy Silt (ML), very					RS 880
					dk. grey brown (10YR 3/2), moist					
					loose, fine gr., low-no Plast.					
					T.D. 1.0' bgs (no Refusal)					

MWH



Site Sketch Map

Boring #: BS24 MW#:	Sheet 1 of 1
Project: Groupe Data Gap	
Job #:	Site: SSFL-OCY
Logged By: JDolmat	Reviewed By:
Drilling Contractor: NA	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth 0.5' / Ref. Elev.
Sampler Type: —	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/10/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X			X			0.5'	SM	Reoccupied Pipe outfall low grassy vegetation on surface 0.125" ash layer not sampled 5-10° slope to South SILTY SAND (10YR 5/4) yellowish Brown dry, dense Boring re-occupied 4/10/06	—	—	—	60	40
							1							
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

UGDEN

FIELD LOG OF BORING

BORING NUMBER OCBS25

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
DOE	313150004		Old Con Pipeline, ULS 51

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
	DB	6/18/99 1235	6/18/99 1240

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
	Slidehammer	1.0'	1

SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE	PITCHER
	2"				1	

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST	AFTER ____ HOURS
			—	

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			T. Burton 6/18/99	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
					Surface: flat, dry, bare soils in					@ 1240
	1	X	100		fmr. Fuel AST area	SM	-	80	20	OCBS25 S01 D1.0
										RS 306
	2				Silty sand (SM), weathered Chats Fm., dk. yellow brn (10YR6/4), dry, dense, fine, some med. grains					
					T.D. 1.0' bgs					
					Refusal - bedrock					

OGDEN

FIELD LOG OF BORING

BORING NUMBER OCBS26 #70

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
DOE	313150004		OLD CON

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
		11/2/00	11/2/00

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
	HAND AUGER	0.5'	1

SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE	PITCHER
				1		

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST	AFTER _____ HOURS
			N/A	

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			C DOMINGO	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
	0				POORLY GRADED SAND. YELLOWISH BROWN. DRY LOOSE. ANGULAR TO SUBANGULAR COARSE	SP				OCBS26S0105@ 1700, RJ782
					TD 0.5' bgs					

OGDEN

OCBS27

FIELD LOG OF BORING

BORING NUMBER ~~RJ783~~ #71

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	ELEVATION AND DATUM	LOCATION
DOE	313150004		OLD CON

DRILLING COMPANY	DRILLER	DATE AND TIME STARTED	DATE AND TIME COMPLETED
		11/2/00	11/2/00

DRILLING EQUIPMENT	DRILLING METHOD	COMPLETION DEPTH	TOTAL NO. OF SAMPLES
	HAND AUGER	0.5	1

SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS 1	DRIVE	PITCHER

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST N/A	AFTER _____ HOURS

SAMPLE HAMMER TYPE	DRIVING WT.	DROP	HYDROGEOLOGIST / DATE	CHECKED BY / DATE
			CDOMINGO 11/2/00	

LITHOLOGY	DEPTH (FEET)	SAMPLES	RECOVERY	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	COMMENTS
	0				SILTY SAND. BROWN DRY LOOSE	SM	—	60	40	OCBS27 S01.0:5
					POORLY SORTED.					@ 1730 ; RJ783
	1				Refusal @ 0.5'					

MONTGOMERY WATSON

Boring #: OCBS28 MW#: Sheet 1 of 1

Project: Boeing / RocketDyne

Job #: Site: SSFL - Old Con

Logged By: BS Reviewed By:

Drilling Contractor: —

Drill Rig Type/Method: Hand Augur

Drillers Name: B. Stewart

Borehole Diam./Drill Bit Type: 3 in. Total Depth 1.5'

Ref. Elev.

Site Sketch Map

Sampler Type:

Depth to 1st Water (▽): — Time/Date: —

Drill Start Time/Date: 1340, 11/19/01 Drill Finish Time/Date: 1350 11/19/01

Depth to Water After Drilling (▼): — Time/Date: —

Well Completion Time/Date: —

Depth to other Water Bearing Zones: —

Soil Boring Backfill Time/Date: 1350 11/19/01

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X								Surface: Top Soil / Grass / Cleared Material					
							1	ML	@ 1 ft' Sandy Silt (ML), dry, red, loose, light brown, fine grained	0			30	70
							1.5		TD refusal @ 1.5 ft; Chatsworth Formation Sandstone					
							2							
							3							
							4							
							5		OCBS28S01 @ 1345 D01 @ 1345					
							6							
							7							
							8							
							9							
							10							
							11							
							12							

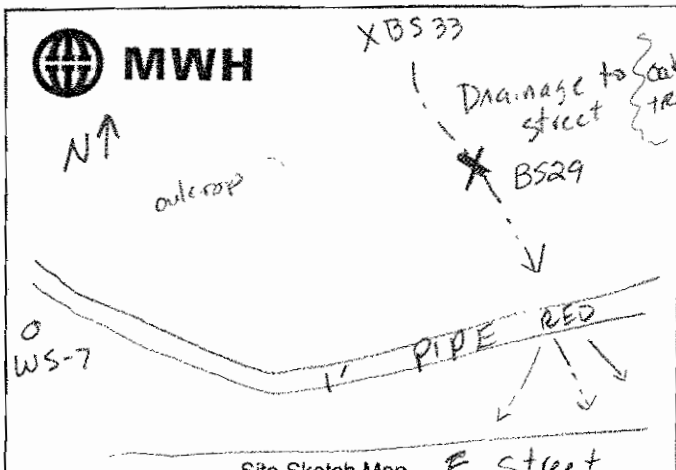
MONTGOMERY WATSON

Site Sketch Map

Boring #: OCBS29 MW#:	Sheet 1 of 1
Project: Boeing / Rocketdyne	
Job #:	Site: SSFL - Old Con
Logged By: BB	Reviewed By:
Drilling Contractor: —	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B. Stewart	
Borehole Diam./Drill Bit Type: 3 in.	Total Depth 0.5'
	Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 1400 11/19/01 Drill Finish Time/Date: 1420 11/19/01
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: 1420 11/19/01

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
	X						0.5	GP	Surface drainage @ 0.5 ft Gravelly Sand (GP), 40/50/10, dry, olive gray, med-loose dense, fine-gr. sand coarse gravel to 0.5 in. (angular granitics)	40			50	10
							1							
							2							
							3		TD refusal @ 0.5 ft - Chatsworth Formation Sandstone					
							4							
							5		*Attempted 3 borings - gravel becomes too coarse @ 0.5 ft					
							6		OCBS29S01 @ 1420					
							7							
							8							
							9							
							10							
							11							
							12							

MWH



Site Sketch Map

Boring #: OCBS29 MW#:	Sheet 1 of 1
Project: Groupwide Data Gap	
Job #:	Site: SSFL - OCR
Logged By: JDolmat	Reviewed By:
Drilling Contractor: NA	
Drill Rig Type/Method: Hand trowel	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth: 0.5' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/16/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Reoccupied OCBS29 Drainage Adj South Debris Area					
SOI	X			X			0.5'	SM	in drainage sloping S/SE 10-20° grassy vegetation surface ash <0.125 not sampled	—	—	5	60	35
							1							
							2		SILTY SAND yellowish brown (10 YR 5/4) dry med dense					
							3							
							4		Not augured to Bedrock					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

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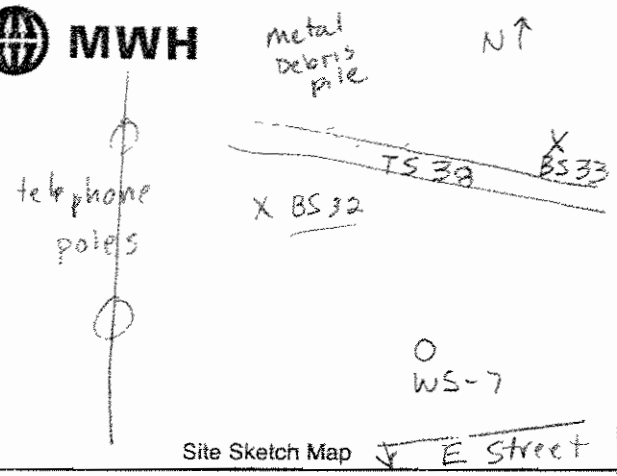

Site Sketch Map

Boring #: OCBS32 MW#:	Sheet 1 of 1
Project: Data Gap Group 6	
Job #: Site: SSFL - OCY	
Logged By: JDolan Reviewed By:	
Drilling Contractor: N/A	
Drill Rig Type/Method: Hand trowel	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth 3' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/16/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

	PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
										Debris OCY Area					
SO1	—	X			X			0.5'	ML	Surface grassy sloping 10-20° to south toward E. Street	—	—	—	35	65
								1		SANDY SILT, dark yellowish Brown (10YR 4/4) med dense dry					
								2							
SO2		X			X			3.5'	SM	Surface 0.125" ash dark grey (2.5Y 4/1)	—	—	—	60	40
								4		NOT sampled					
								5		Boring NOT sampled to Bedrock					
								6		0.5' tar substance — black NOT in 0.5'					
								7		sample for analysis only ½ inch thick					
								8							
								9		3' SILTY SAND dk yellowish brown loose - med dense slightly moist					
								10							
								11							
								12							

QA/QC

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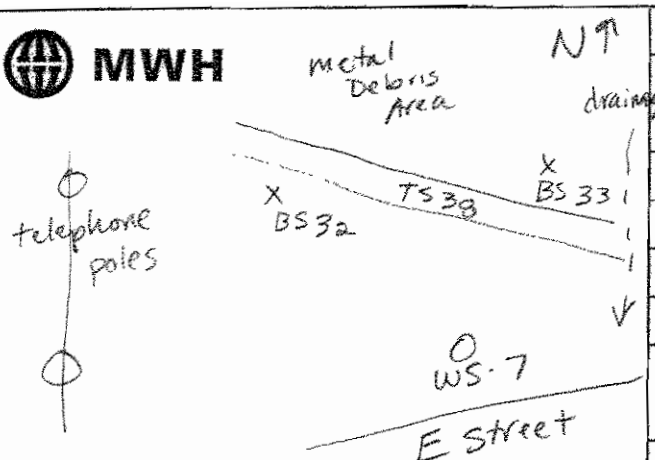


Site Sketch Map

Boring #: DC BS 33 MW#:	Sheet 1 of 1
Project: Group 16 Data Gap	
Job #:	Site: SSFL - OCY
Logged By: JDolmat	Reviewed By:
Drilling Contractor: NA	
Drill Rig Type/Method: Hand trowel Auger	
Drillers Name: B Burton / B Stewart	
Borehole Diam./Drill Bit Type: 3"	Total Depth 3' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/10/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Debris Area					
S01	X			X			0.5'	SM	Surface grassy sloping S-SW 10-20°	–	–	–	35	65
							1		drainage 5' to East surface ash (0.125")					
							2		not Sampled					
S02	X			X			3'		SANDY silt, dark yellowish brown (10YR 4/4) med dense dry					
							4	CL	Sandy clay @ 3' dark yellowish brown (10YR 3/4)	–	–	–	30	70
							5		dense, moist, low plasticity					
							6		refusal sandstone @ 3'					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OC BS34 MW#: Sheet 1 of 1

Project: Groupe Datre Gap

Job #: Site: SFL-OCY

Logged By: JDolmat Reviewed By:

Drilling Contractor: NA

Drill Rig Type/Method: Hand Auger

Drillers Name: BJ Burton BStewart

Borehole Diam./Drill Bit Type: 3" Total Depth 3' Ref. Elev.

Sampler Type:

Drill Start Time/Date: 2/16/06 Drill Finish Time/Date: 11:40

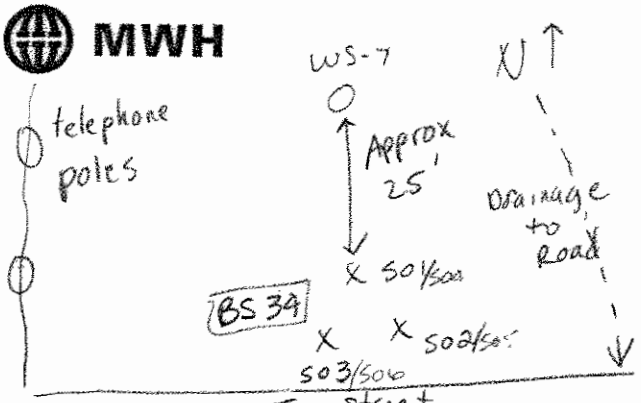
Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Well Completion Time/Date:

Soil Boring Backfill Time/Date:

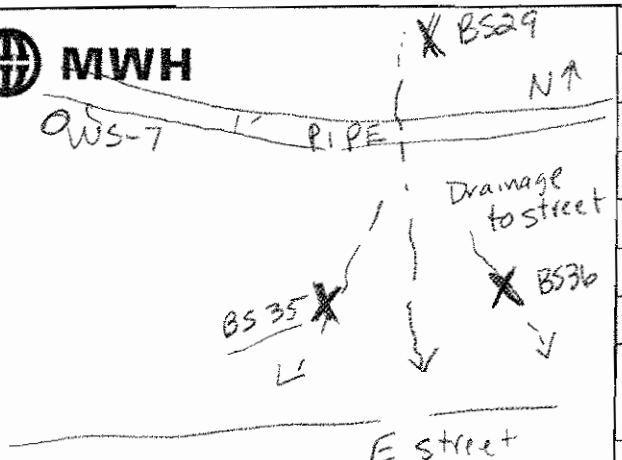


Site Sketch Map

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Pole-mtd Transformer PCB's composite					
S01,S02,S03 570 Composite	X			X			0.5'	ML	Surface grassy, sloping to G Street	–	–	–	35	65
							1		Surface ash layer 0.125 inch not sampled					
							2		very dark grayish brown (10yr 3/2)	–	–	–	35	65
S04,S05,S06 580 Composite	X			X			3'	ML	0.5' SANDY SILT dark yellowish brown (10YR 4/4) med dense, dry with trace plant roots					
							4							
							5		3' SANDY SILT dark yellowish brown (10YR 3/4) 10% CLAY dense, moist					
							6							
							7		NOT Deepened to Bedrock					
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH



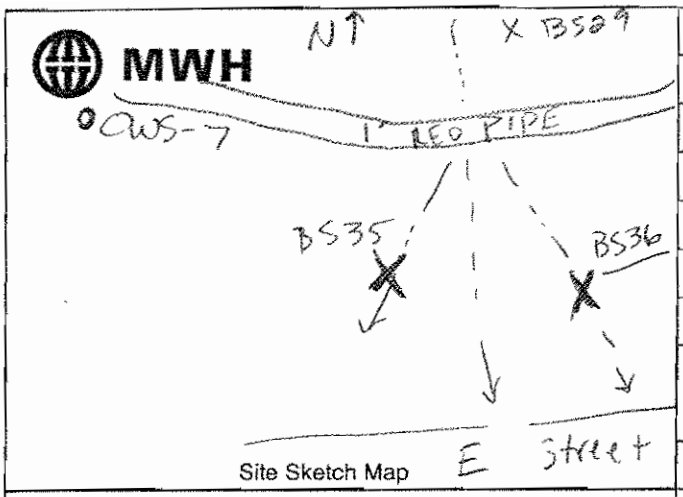
Site Sketch Map

Boring #: OC BS35 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL - OCY
Logged By: JDolmat	Reviewed By:
Drilling Contractor: NA	
Drill Rig Type/Method: Hand trowel	
Drillers Name: B Stewart	
Borehole Diam./Drill Bit Type: 3"	Total Depth 0.5' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/16/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Drainage Adj South of Debris Area					
NA	X			X			0.5'		Surface grassy, sheet flow draining/sloping South to E street	Hr	10	20	30	40
							1		surface ash (0.125"-0.25") not sampled					
							2		(10YR 3/3) dark brown					
							3	SM	0.5' SILTY SAND angular to subangular					
							4		dry med dense					
							5		trace gravel up to 2"					
									NOT augered to Bedrock					
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH



Site Sketch Map

Boring #: OC BS36 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL - OCY
Logged By: J Dolmat	Reviewed By:
Drilling Contractor: NA	
Drill Rig Type/Method: hand trowel	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth 0.5'
	Ref. Elev.
Sampler Type:	
Drill Start Time/Date: 2/10/06	Drill Finish Time/Date:
Well Completion Time/Date: —	
Soil Boring Backfill Time/Date: —	

Depth to 1st Water (▽):	Time/Date:
Depth to Water After Drilling (▼):	Time/Date:
Depth to other Water Bearing Zones:	

Drainage South/Adj to Debris Area

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
NA	X			X			0.5'		Surface grassy, sheet flow drainage/sloping	tr	10	20	30	40
							1		South to E Street					
							2		Surface ash (0.125"-0.25")					
									NOT sampled					
							3		(10YR 3/3) dark Brown					
								SM	0.5' SILTY SAND					
							4		angular to Sub Angular					
									dry med dense					
							5		trace gravel					
									NOT augered to					
							6		Bedrock					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OC BS37 MW#: Sheet 1 of 1

Project: Grayple Data Gap

Job #: Site: SSFL - OC4

Logged By: JDolmat Reviewed By:

Drilling Contractor: NA

Drill Rig Type/Method: hand trowel

Drillers Name: B Burton

Borehole Diam./Drill Bit Type: 3" Total Depth 0.5'

Ref. Elev.

Sampler Type:

Drill Start Time/Date: 2/16/06 Drill Finish Time/Date:

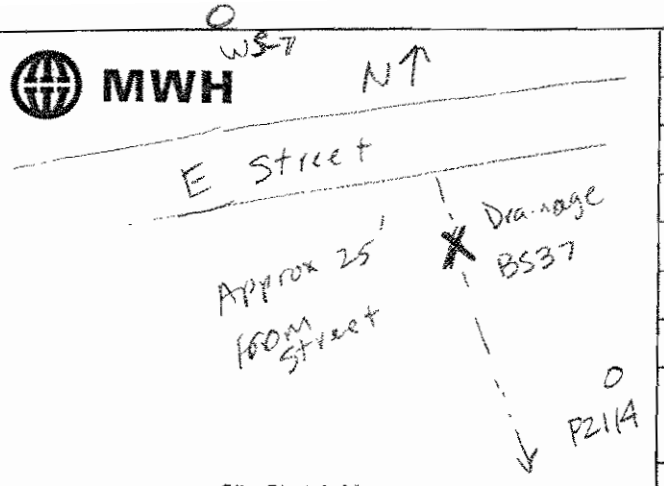
Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:



Site Sketch Map

Southern Debris Area
OC4 Drainage South of Debris Area

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
NA	X			X			0.5		In drainage (2-3' deep) 3" surface ash not sampled					
							1			tr	10	20	40	30
							2	SM	SILTY SAND, yellowish Brown (10 YR 5/4) Subangular to Subround trace gravel to 1" Dry dense					
							3							
							4							
							5		NOT augered to bedrock					
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCBS38 MW#: Sheet 1 of 1

Project: Grample Data Map

Job #: Site: SSFL - OC4

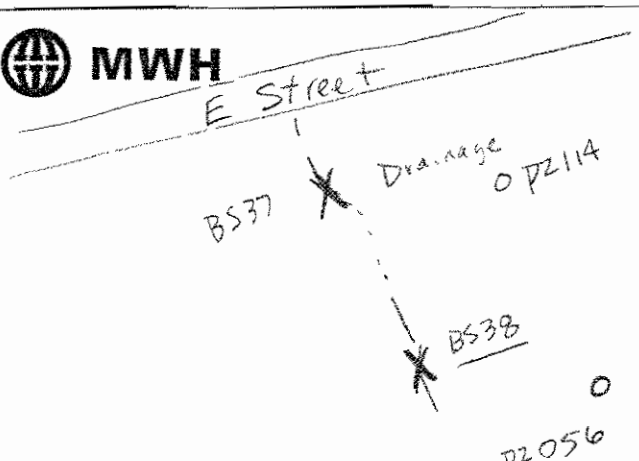
Logged By: JDolmat Reviewed By:

Drilling Contractor: NA

Drill Rig Type/Method: hand trowel

Drillers Name: B Stewart

Borehole Diam./Drill Bit Type: 3" Total Depth: Ref. Elev. 0.5'



Site Sketch Map

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Drill Start Time/Date: 2/16/06 Drill Finish Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Well Completion Time/Date: —

Depth to other Water Bearing Zones:

Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
NA	X			X			0.5'		In Drainage 2' deep drainage	—	10	30	30	30
							1		Surface Ash, leaves 4" not sampled					
							2	SM	SILTY SAND, Yellowish Brown (10YR 5/4) subangular to Subrounded dry dense					
							3							
							4							
							5		NOT augered to Bedrock					
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

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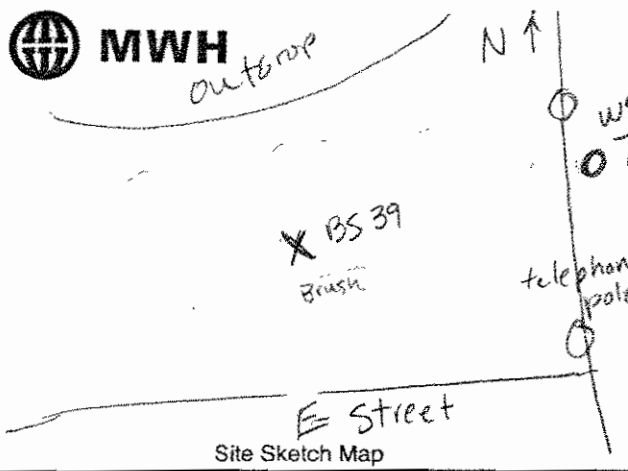


Site Sketch Map

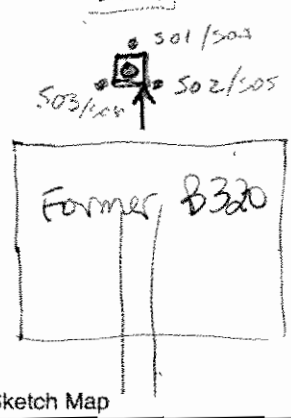
Boring #: OCBS39 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL - OCY
Logged By: J Dolmat	Reviewed By:
Drilling Contractor: N/A	
Drill Rig Type/Method: Hand Trowel	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth: 1' / Ref. Elev.:
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/16/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
							0		Conservation Yard					
									Surface dried grass, tall (4-7")					
NA	X			X			1	SM	brush disturbed soil, flat top 4" crushed asphalt and gravel	–	—	10	60	30
							2		SILTY SAND Brown (10YR4/3) subangular dense, slightly moist (4" – 1')					
							3		NOT deepened to bedrock					
							4		ash layer 0.25 inch dark brown (10YR 3/3)					
							5		NOT Sampled					
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

BS40



Site Sketch Map

Boring #: OCB340 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL - OCY
Logged By: JDolmat	Reviewed By:
Drilling Contractor: NA	
Drill Rig Type/Method: hand Auger	
Drillers Name: B Stewart	
Borehole Diam./Drill Bit Type: 3"	Total Depth: 7.5 / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Former transformer Pad in Area 737					
N.A									surface flat grassy vegetation	—	—	—	35	65
	X						1'		NO ash layer					
	X						1.5'		top 6" silty gravel fill up to 2" in size					
							2	ML	1' Sandy SILT, dark yellowish Brown (10YR 4/4) dense, dry	—	—	—	15	85
							3	CL	1.5-4' SILTY CLAY with sand very dark brown (7.5YR 2.5/2)					
SO1, SO2, SO3 composite	X			X			4.5'		dense, slightly moist	—	—	—	70	30
							5	SM	4' SILTY SAND, dark yellowish Brown, loose to med dense, dry					
							6		* SOIL fill 0-4'					
SO4, SO5 SO6 composite	X			X			7.5'	SM	7.5' Same lithology as 4'	—	—	—	70	30
							8		NOT cuttered to Bedrock					
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OC BS41 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: SSFL - OCV

Logged By: J Dolmat Reviewed By:

Drilling Contractor: NA

Drill Rig Type/Method: Hand Auger

Drillers Name: B Stewart

Borehole Diam./Drill Bit Type: 3" Total Depth 7'

Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

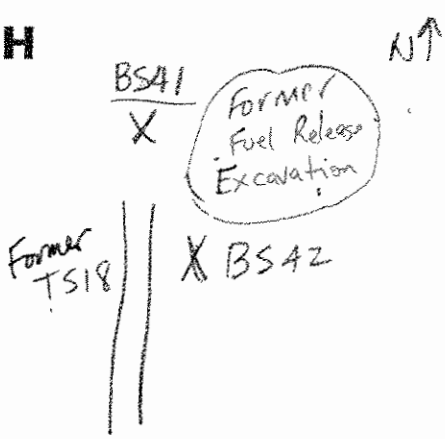
Depth to other Water Bearing Zones:

Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:

Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —

Site Sketch Map



PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Concrete Box/Sump					
NA	X							ML	0-1' sandy SILT, dark yellowish Brown (10YR 4/4) dense, dry	—	—	—	40	60
	X						1		1-7' SILTY SAND same color increase moisture with depth					
							2							
							3		Surface Flat low vegitation NO ash layer N.O. augered to Bedrock					
							4							
							5							
							6							
Soil	X			X			7	ML		—	—	—	70	30
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OC BS42 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: SSFL - OC4

Logged By: J Dolmat Reviewed By:

Drilling Contractor: NA

Drill Rig Type/Method: Hand Auger

Drillers Name: B Burton / B Stewart

Borehole Diam./Drill Bit Type: 3" Total Depth: Ref. Elev.:

Sampler Type:

Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:

Well Completion Time/Date: —

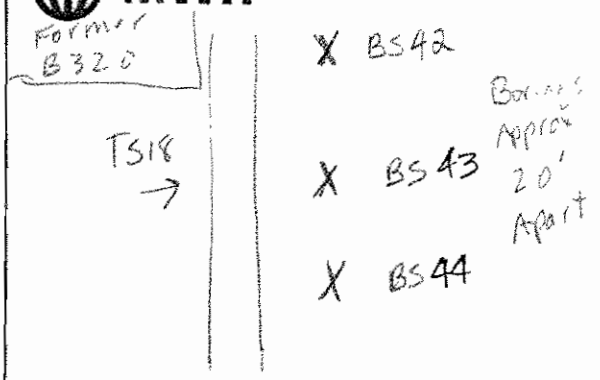
Soil Boring Backfill Time/Date: —

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Site Sketch Map



East of TS18

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X						0	ML	0-1' SANDY SILT dark yellowish Brown (10YR 4/4)	—	—	—	40	60
	X						1		dense, dry	—	—	—	10	90
							2	CL	1'-7' SILTY CLAY with sand very dark grayish Brown (10YR 3/2) dense, slightly moist, low-med. plasticity					
							3							
							4							
							5		Surface flat low vegitation NO ash layer NOT augered to bedrock					
							6							
SO1	X			X			6.5'							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Former Concrete Sump

NT

TS18

X BS42

X BS43

X BS44

Site Sketch Map ↓ to E Street

Boring #: OCBS43 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL - OCY
Logged By: JDolmat	Reviewed By:
Drilling Contractor: N/A	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Stewart	
Borehole Diam./Drill Bit Type: 3"	Total Depth 8' / Ref. Elev.
Sampler Type: —	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

East of TS18

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X								surface flat low vegetation NO ash layer					
							1	ML	0-0.5' Sandy SILT dark yellowish brown (10YR 4/4)	—	—	—	40	60
							2	CL	0.5'-4' SILTY CLAY very dark grayish Brown	—	—	—	10	90
							3		(10YR 3/2) dense, moist low-med plasticity					
	X						4	CL	4'-7' SILTY CLAY Black (10YR 2/1) dense	—	—	—	10	90
							5		moist low-med plasticity higher clay content (70%)					
							6		7'-8' distinct color change with ODOR, Pale Green	—	—	—	30	70
Soil	X			X			7'	ML	(5G 6/2) SANDY SILT med dense, moist					
							8		8' hit Bedrock Sandstone					
							9							
							10							
							11							
							12							

QA/QC

MWH

Former Concrete Sump

NT

WT-28

TS18 →

X BS42

X BS43

X BS44

↓ E Street

Site Sketch Map

Boring #: ~~BS43~~ MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL-OCY
Logged By: JDolmat	Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth 8 / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/21/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

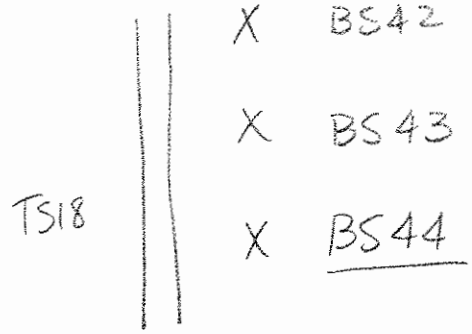
PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
							0		Reoccupied East of TS18 surface flat, low vegitation moist from recent rain					
							0.5'	ML	no ash layer 0-0.5' Sandy SILT dark yellowish brown (10YR 4/4) meddense, moist	—	—	—	40	60
	X						0.5'	CL	0.5'-3' SILTY CLAY very dark grayish brown (10YR 3/2) dense, moist low-med plasticity	—	—	—	10	90
	X			X	SO2		3.5'	CL	3'-6 SILTY CLAY Black, (10YR 2/1) dense moist low-med plasticity	—	—	—	10	90
	X			X	SO1		7'		6' 7.0'-distint color change with odor pale green (5G 6/2)					
							8	ML	SAND SILT med dense moist @ 7'-8'	—	—	—	30	70
							9		8' Bedrock sandstone					
							10							
							11							
							12							

QA/QC

Former concrete sump

NT

MWH



Site Sketch Map

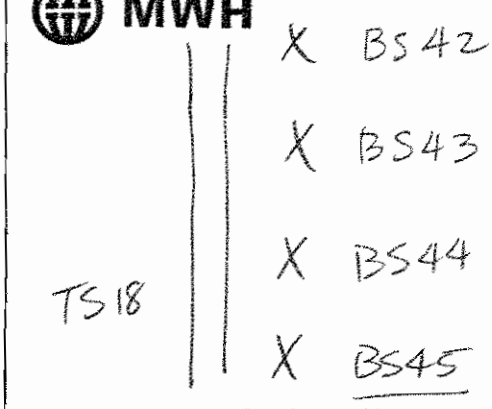
Boring #: OCBS44 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL-OCY
Logged By: JDolmat	Reviewed By:
Drilling Contractor: NA	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth: 7'
	Ref. Elev.:
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

SRE discharge Pipeline

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X								Surface flat low vegitation NO ash layer					
							1	ML	0-0.5 sandy SILT dark yellowish Brown (10YR 4/4)	—	—	—	30	70
							2	CL	0.5-5' SILTY CLAY very dark grayish Brown					
							3		(10YR 3/2) dense, moist low-med plasticity	—	—	—	10	90
							4	CL	5'-7' SILTY CLAY, dark gray (10YR 4/1) slight pale	—	—	—	10	90
	X						5		green color 7' hit bed rock					
							6							
	X			X			7'							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH



Site Sketch Map

Boring #: ~~BS45~~ MW#:	Sheet 1 of 1
Project: Groupe Data Gap	
Job #:	Site: SSFL - OCY
Logged By: JDolmat	Reviewed By:
Drilling Contractor: NA	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth 3' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									East of TS18					
									Surface Flat low vegetation					
NA									No ash layer					
							1	CL	SILTY CLAY 0'-2' very					
	X								dark grayish Brown (10YR 3/2)	–	–	–	10	90
							2		dense, slightly moist.					
	X			X			3'	SM	2'-3' SILTY SAND	–	–	10	60	30
							3		light yellowish Brown					
									(2.5 6/3) dry, dense					
							4		3' hit bedrock					
									sandstone					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Former AST-732

X BS47

Out crop

Tree

X BS46

Site Sketch Map

X BS40

Boring #: 06 BS46 MW#: Sheet 1 of 1

Project: Groupe Data Gap

Job #: Site: SSFL - OCY

Logged By: JDolmat Reviewed By:

Drilling Contractor: NA

Drill Rig Type/Method: hand trowel

Drillers Name: B Stewart

Borehole Diam./Drill Bit Type: 3" Total Depth 0.5' Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:

Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —

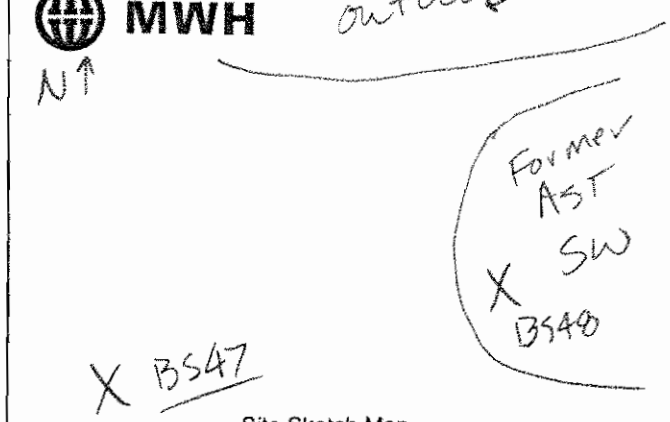
AST 732

BERM Soil spread

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
	X			X			0.5'		surface sloping 10-20 E/SE low vegitation, NO ash layer	—	—	—	60	40
							1	SM	SILTY SAND dark yellowish Brown (10YR 4/4) dense Slightly moist Boring NOT deepened to bedrock					
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH



Site Sketch Map

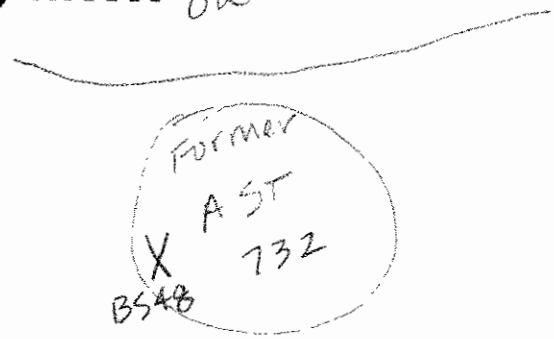
Boring #: BS47 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL-OCY
Logged By: J Dolmat	Reviewed By:
Drilling Contractor: —	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth 0.5' / Ref. Elev.
Sampler Type:	
Drill Start Time/Date: 2/17/06	Drill Finish Time/Date:
Well Completion Time/Date: —	
Soil Boring Backfill Time/Date: —	

Depth to 1st Water (▽):	Time/Date:
Depth to Water After Drilling (▼):	Time/Date:
Depth to other Water Bearing Zones:	

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
NA	X			X			0.5'	SM	Surface sloping East/SE 10-20° low vegitation	—	—	—	60	40
							1		SILTY SAND, dark yellowish brown, (10YR 4/4) dense					
							2		slightly moist					
							3		Boring NOT deepened to bedrock					
							4		no ash layer					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH Outcrop N↑



Site Sketch Map

Boring #: OC-BS48 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL -OCY
Logged By: JDolmat	Reviewed By:
Drilling Contractor: —	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Stewart	
Borehole Diam./Drill Bit Type: 3"	Total Depth 0.5' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

AST 732 Berm Spread Soils

	PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
S01	NA	X			X			0.5'		surface Flat low vegitation	—	—	—	60	40
								1	SM	SILTY SAND dark yellowish					
										Brown (10YR 4/4) dense					
								2		slightly moist					
										No ash layer					
								3		NOT deepened to bedrock					
								4							
								5							
								6							
								7							
								8							
								9							
								10							
								11							
								12							

QA/QC

MWH

NT

Boring #: OCBS49 MW#: Sheet 1 of

Project: Groupe le Data Gap

Job #: Site: SSFL - OCV

Logged By: JDalmat Reviewed By:

Drilling Contractor: —

Drill Rig Type/Method: Hand Auger

Drillers Name: B Stewart

Borehole Diam./Drill Bit Type: 3" Total Depth 0.5'

Ref. Elev.

Sampler Type:

Drill Start Time/Date: 2/17/09 Drill Finish Time/Date:

Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —

Former AST X NE

BS49

Site Sketch Map

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
	X			X			0.5'	SM	Surface flat grassy vegetation No ash layer	—	—	—	60	40
							1		SILTY SAND dark yellowish brown (10YR 4/4) dense					
							2		Slightly moist, Boring not deepened to bedrock					
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

GW00

MWH

Boring #: OCBS50 MW#: Sheet 1 of 1

Project: Groupb Data Gap

Job #: Site: SSFL - OC4

Logged By: JDoimat Reviewed By:

Drilling Contractor: —

Drill Rig Type/Method: Hand Auger

Drillers Name: B Stewart

Borehole Diam./Drill Bit Type: 3" Total Depth 1' Ref. Elev.

Sampler Type:

Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:

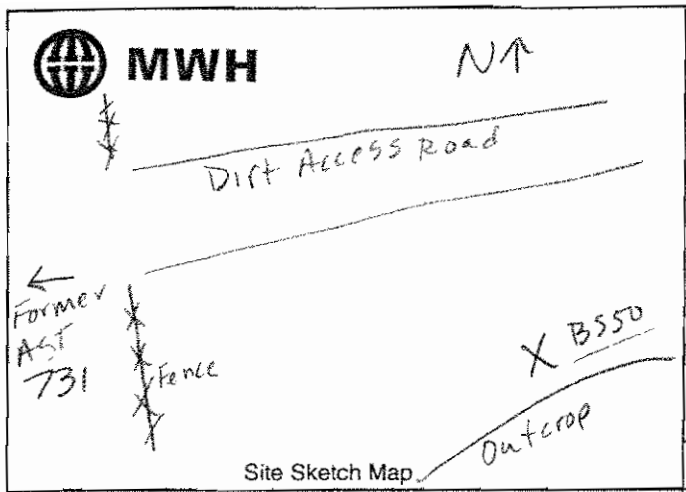
Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:



Site Sketch Map

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X			X			0.5	SM	Former Drum Storage Area Surface sloping NW 20-30° SILTY SAND - Brown (10 YR 4/3)	—	—	—	60	40
							1		dense dry, surface low vegetation					
							2		1' refusal Bedrock Sandstone					
							3		0.25D ash layer very dark gray (10 YR 3/1)					
							4		NRT Sampled					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: QC BS51 MW#: Sheet 1 of 1

Project: Grouple Data Gap

Job #: Site: SS FL - OCY

Logged By: JDolman Reviewed By:

Drilling Contractor: NA

Drill Rig Type/Method: Hand Auger

Drillers Name: B Burton

Borehole Diam./Drill Bit Type: 3" Total Depth: 3'

Ref. Elev.:

Sampler Type: —

Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:

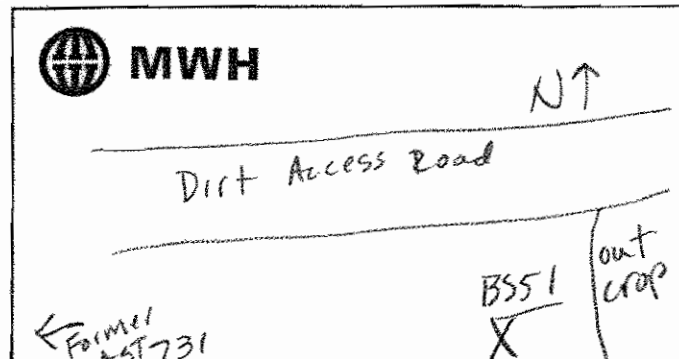
Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:



Site Sketch Map

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X			X			0.5'	SM	Former Drum Storage Area surface sloping 30-40° N					
							1		0.25" ash layer very dark gray (10YR 3/1) not sampled					
							2		low vegitation, burnt brush					
	X			X			3'	SM	0.5'-3 SILTY SAND dark yellowish brown (10YR 4/4) loose to med dense, moist, 0-2" 20-30% MICA boring not deepened to Bedrock	—	—	—	70	30
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCBS52 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: SSFL

Logged By: JDolmat Reviewed By:

Drilling Contractor: —

Drill Rig Type/Method: Hand Auger

Drillers Name: B Stewart

Borehole Diam./Drill Bit Type: 3" Total Depth 1.5' Ref. Elev.

Sampler Type:

Drill Start Time/Date: 2/17/09 Drill Finish Time/Date:

Well Completion Time/Date: —

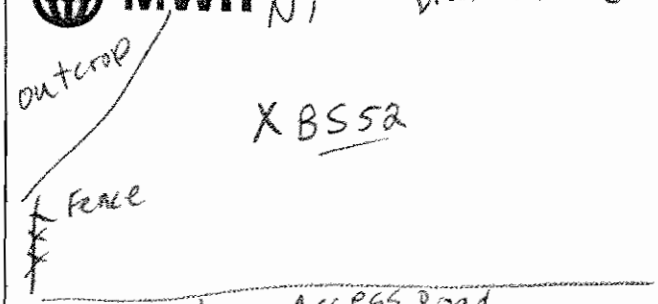
Soil Boring Backfill Time/Date: —

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

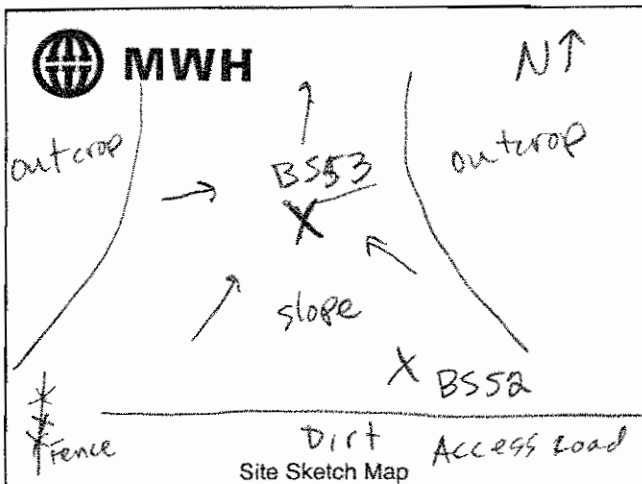
Site Sketch Map



PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Former Drum Storage					
NA	X			X			0.5'	SM	Surface sloping 20-30° N/NW, low vegitation	—	—	20	40	40
							1		0.125 ash layer Not sampled, dark gray (10YR 4/1)					
							2		0 — 1" 1/2 inch gravel					
							3	SM	1" - 1.5' SILTY SAND grayish brown (10YR 5/2) angular - subangular					
							4		loose, slightly moist					
							5		1.5' refusal asphalt					
							6							
							7							
							8							
							9							
							10							
							11							
							12							

OA/QC

MWH



Site Sketch Map

Boring #: OCBS53 MW#: Sheet 1 of 1

Project: Orange Data Gap

Job #: Site: SSFL - OC4

Logged By: J. Dolmat Reviewed By:

Drilling Contractor: —

Drill Rig Type/Method: Hand Auger

Drillers Name: B Burton

Borehole Diam./Drill Bit Type: 3" Total Depth 0.5' Ref. Elev.

Sampler Type: —

Depth to 1st Water (▽): Time/Date:

Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Well Completion Time/Date: —

Depth to other Water Bearing Zones:

Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X			X			0.5'	SM	surface slope 40-50° N/NW low vegetation 0.2-5.0 ash layer very dark grey (10yr 3/1) SILTY SAND = Dark yellow brown (10yr 4/4) loose dry boring NOT deepened to bedrock ash layer not sampled	-	—	—	60	40
							1							
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OC BS54 MW#: Sheet 1 of 1

Project: Groupe Data Gap

Job #: Site: SSFL - OCY

Logged By: JDoimt Reviewed By:

Drilling Contractor: —

Drill Rig Type/Method: Hand Auger

Drillers Name: B Stewart

Borehole Diam./Drill Bit Type: 3" Total Depth 0.5' Ref. Elev.

Sampler Type:

Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:

Well Completion Time/Date: —

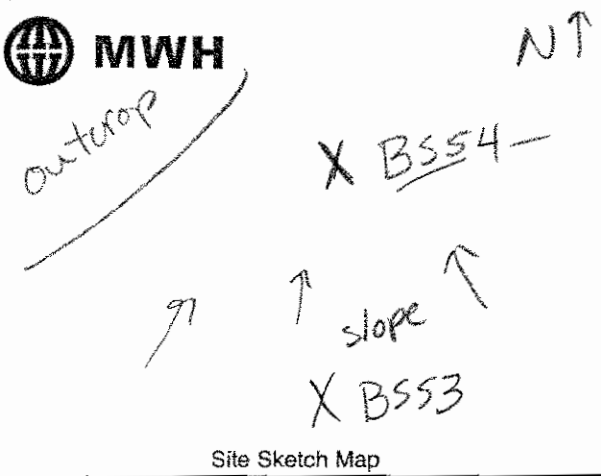
Soil Boring Backfill Time/Date: —

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Site Sketch Map



PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X			X			0.5'		surface sloping N/NW 40-50° low vegitation	—	—	—	60	40
							1		0.25D ash layer very dark gray (10YR 3/1) SILTY SAND dark yellow Brown (10YR 4/4) loose dry					
							2							
							3							
							4		Boring not deepened to bedrock ash layer not sampled					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Outcrop

X BS55

X BS52

← to Former AST 731

Dirt Access Road

Site Sketch Map

Boring #: 6C BS55 MW#:	Sheet 1 of 1
Project: Groupe Data Gap	
Job #:	Site: SSFL-OU4
Logged By: JDalmat	Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name: BStewart	
Borehole Diam./Drill Bit Type: 3"	Total Depth 0.5' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X			X			0.5'		surface sloping 30°-40° N low grassy vegetation					
							1		0-2.5a ash layer very dark gray (10yr 3/1) NOT sampled					
							2		SILTY SAND - dark yellow Brown (10yr 4/4) loose dry					
							3		Boring NOT deepened to bedrock					
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

outcrop

N ↑

BS56

X S01, S04

S03 X ○ telephone pole

X S02, S05

G street ↓

E Street

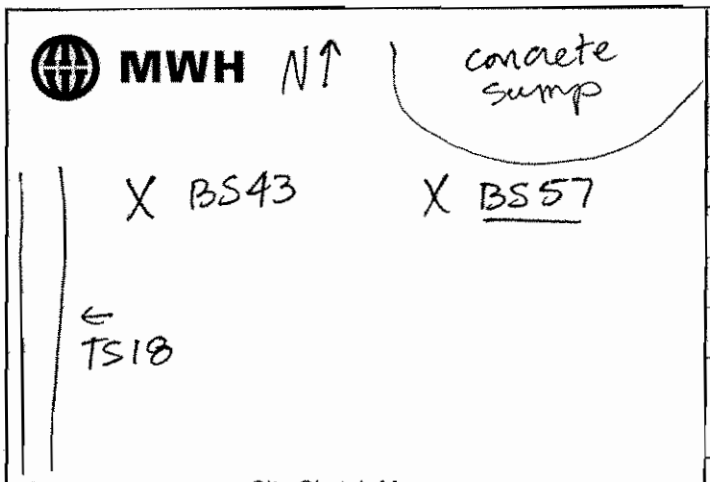
Site Sketch Map

Boring #: ~~BS56~~ MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL - ~~OU~~
Logged By: JDolmat	Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth: 3' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/17/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									SW corner Pole mtd transformer					
S01 S02 S03	X			X			0.5		Surface sloping East 10-20° low vegetation NO ASH layer					
							1	SM	0-2.5' SILTY SAND dark yellowish Brown	-	-	-	60	40
							2		dense slightly moist 2.5'-3' yellowish Brown					
S04 S05	X			X			3'		(10YR 5/6) SAND, loose moist, subangular	-	-	20	70	10
							4		3' Bedrock Sandstone @ S05 @ S04 (boring locations)					
							5							
							6		1' Bedrock Sandstone @ S03					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH N↑



Site Sketch Map

Boring #: OCBS57 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL-OCY
Logged By: J Dolmat	Reviewed By:
Drilling Contractor: —	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth 8'
	Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/21/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

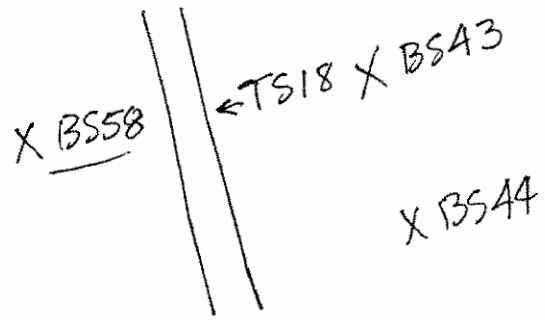
PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
									surface flat, low vegitation moist from recent rain, NO Ash					
	X						1	SM	0.-0.5' SILTY SAND dark yellowish brown (10YR 4/4) med dense moist	tr	tr	-	60	40
	X						2	CL	0.5'-4' SILTY CLAY very dark grayish brown (10YR 3/2) very stiff, moist	-	-	-	10	90
	X						3	CL	4'-5' SILTY CLAY Black (10YR 2/1) very stiff moist	-	-	-	10	90
	X						4	CL	5'-6' sandy CLAY (10YR 2/2) very dark brown, med stiff moist, trace green discoloration/odor	-	-	-	35	65
	X						5	ML	6'-6.5' SANDY SILT very dark grayish brown (10YR 3/2) soft, moist	-	-	-	45	55
	X			X			6	ML	6.5'-8' SANDY SILT dark yellowish Brown (10YR 4/4) soft, moist 8' Bedrock sandstone	-	-	-	40	60
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MS720

MWH

Boring #: OC BS58 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL - OC4
Logged By: JDolmat	Reviewed By:
Drilling Contractor: —	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth 7' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/21/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

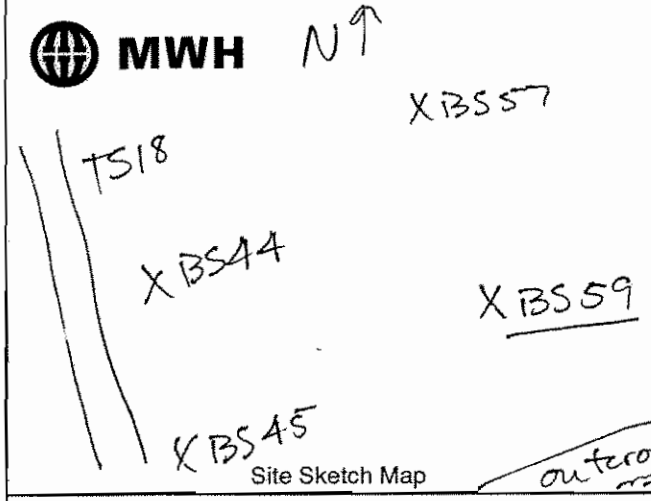


Site Sketch Map

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
							1		Surface sloping E 10° Approx low vegitation, moist recent rain, NO ash layer	—	-	-	40	60
	X						2	ML	0-0.5' SANDY SILT dark yellowish brown (10YR 4/4) soft, moist					
	X						3	CL	0.5'-3.5 SILTY CLAY very dark grayish Brown (10YR 3/2) very stiff moist low plasticity	—	-	-	10	90
	X						5	ML	3.5-4.5' SANDY SILT very dark gray (10YR 3/1) with discoloration pale green (5G 6/2) soft moist	-	-	-	40	60
SB1	X			X			7	ML	4.5-7' SANDY SILT hard yellowish Brown (10YR 4/4) med dense, moist 7' Bedrock Sand stone	—	—	—	40	60
							12							

QA/QC

MWH



Boring #: OCBS59 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: SSFL-OC4

Logged By: JDolmat Reviewed By:

Drilling Contractor: —

Drill Rig Type/Method: Hand Auger

Drillers Name: B Burton

Borehole Diam./Drill Bit Type: 3" Total Depth 3.5'

Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: 2/21/06 Drill Finish Time/Date:

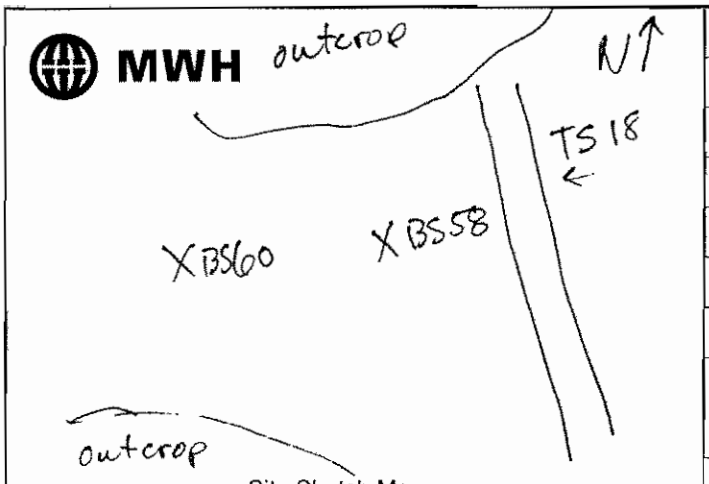
Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
									Surface sloping E 5-10° low vegitation No ash layer	tr	tr	tr	60	40
	X						1	SM	0-0.5' silty SAND dark yellowish brown (10YR 4/4) loose moist					
	X						2	CL	0.5'-3' SILTY CLAY very dark grayish brown very stiff, moist	—	—	—	10	90
	X						3	SM	3-3.5' silty SAND dark yellowish brown (10YR 3/6) trace med sand	—	—	tr	70	30
							4		3.5' bedrock sandstone					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH



Site Sketch Map

Boring #: OC B560 MW#: Sheet 1 of 1

Project: Groupie Data Gap

Job #: Site: SSFL - OC4

Logged By: JDolmat Reviewed By:

Drilling Contractor: —

Drill Rig Type/Method: Hand Auger

Drillers Name: B Burton

Borehole Diam./Drill Bit Type: 3" Total Depth 4' Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: 2/21/06 Drill Finish Time/Date:

Well Completion Time/Date:

Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
							1		Surface, low vegitation sloping E 10°-20° no ash layer					
	X						2	SM	0.-0.5' SILTY SAND (10YR 3/4)	—	—	—	60	40
	X						3	CL	0.5'-2' SILTY CLAY (10YR 3/3) dark brown	—	—	—	10	90
	X						4	SM	2'-3' SILTY SAND dk yellow Brown (10YR 4/6) loose moist	—	—	tr	70	30
	X						5	SM	3'-4' SILTY SAND very dark grayish brown (10YR 3/2) loose, moist.	—	—	—	60	40
							6		4' bedrock sandstone					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

N↑

X BS47

outcrop

Former AST 731

X BS61

Site Sketch Map

Boring #: OCBS61 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL-OCU
Logged By: JDolmat	Reviewed By:
Drilling Contractor: —	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth 6.5' / Ref. Elev.
Sampler Type: —	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/21/96 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
							0		Surface sloping E 10-20° low vegitation NO ash layer					
	X						2	ML	0 - 3' CANEY SILT (10YR 3/4) very stiff, dark yellowish Brown	—	—	—	10	90
	X						4	SM	3' - 6' SILTY SAND (10YR 4/4) dark yellowish Brown, loose moist	—	—	—	60	40
							6			—	—	tr	80	20
	X							SP-SM	6' - 6.5' SAND with silt (10YR 4/6) dark yellowish brown loose, moist weathered bedrock 6.5' bedrock Sandstone					
							8							
							10							
							12							

QA/QC

MWH

Boring #: OCBS62 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: SSFL-OCY

Logged By: JDalmat Reviewed By:

Drilling Contractor: —

Drill Rig Type/Method: Hand Auger

Drillers Name: B Burton

Borehole Diam./Drill Bit Type: 3" Total Depth 7' Ref. Elev.

Sampler Type: —

Drill Start Time/Date: 2/21/06 Drill Finish Time/Date:

Well Completion Time/Date: —

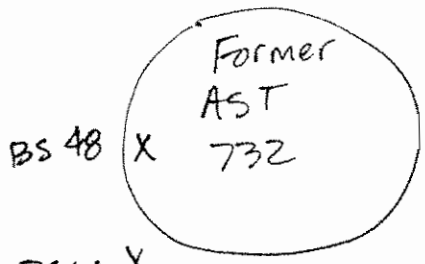
Soil Boring Backfill Time/Date: —

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Site Sketch Map



PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
									Surface flat, low vegitation no ash layer					
	X						1	SM	0 – 2' SILTY SAND (10YR4/4) dk yellowish Brown loose moist	—	—	—	65	35
	X						2	SM	2'-2.5 SILTY SAND (10YR 3/3) dark Brown loose moist	—	—	—	70	30
	X						3	SM	2.5-3' same lith color change very dark grayish brown	—	—	—	70	30
	X						4	SM	3' same as 2.5' with color change (10YR 3/4) dark yellowish Brown	—	—	—	70	30
	X						5	SM	3.5 – 7' same lith dark yellowish brown (10YR4/4) 7' bedrock sandstone	—	—	—	70	30
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

N ↑

↑ to AST 731

X BS63



Site Sketch Map

Boring #: OCBS63 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL-OCY
Logged By: JDolmat	Reviewed By:
Drilling Contractor: —	
Drill Rig Type/Method: Hand Auger	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth 6.5 / Ref. Elev.
Sampler Type: —	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/21/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Surface flat, low vegitation no ash layer					
	X						1	SM	0-2' SILTY SAND (10YR4/4) dk yellowish Brown, loose-med	—	—	—	60	40
							2		dense, moist	—	—	—	65	35
	X						2-3	SM	2-3 SILTY SAND (10YR3/3) dark brown, loose-med dense	—	—	—	65	35
	X						3	SM	3'35 color (10YR 3/4) dk yellowish Brown, same lith	—	—	—	65	35
	X						3.5	SM	3.5-4' color (10YR 3/6) same lith	—	—	—	65	35
	X						4	SM	4'-6.5 (10YR 4/4) same lith last 2" weathered bedrock	—	—	—	65	35
							6.5		bedrock sandstone					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: BS64 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: SSFL - OCY

Logged By: JDolmat Reviewed By:

Drilling Contractor: —

Drill Rig Type/Method: Hand Auger

Drillers Name: B Burton

Borehole Diam./Drill Bit Type: 3" Total Depth 2.5 Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

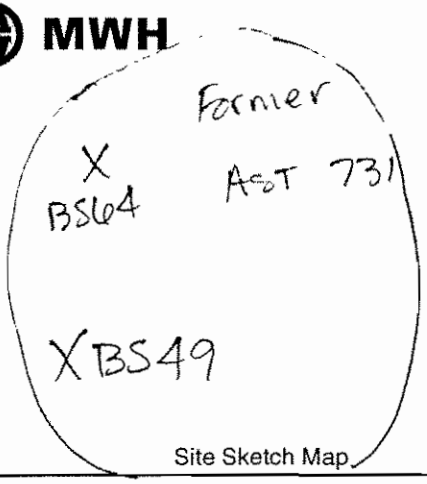
Depth to other Water Bearing Zones:

Drill Start Time/Date: 2/21/06 Drill Finish Time/Date:

Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —

Site Sketch Map



PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
									Surface flat, low vegitation No ash layer					
	X						1	SM	0-2' Silty sand (10YR4/4) dark yellow brown loose moist	-	-	-	70	30
	X						2	SP	2'-2.5' SAND (10YR 5/6) Yellowish brown, loose, moist	-	-	10	80	10
							3		2.5' Bedrock Sandstone					
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCBS65 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: OCY-SSFL

Logged By: JDalmat Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name: Ramon Roman

Borehole Diam./Drill Bit Type: 4" Total Depth 2' Ref. Elev.

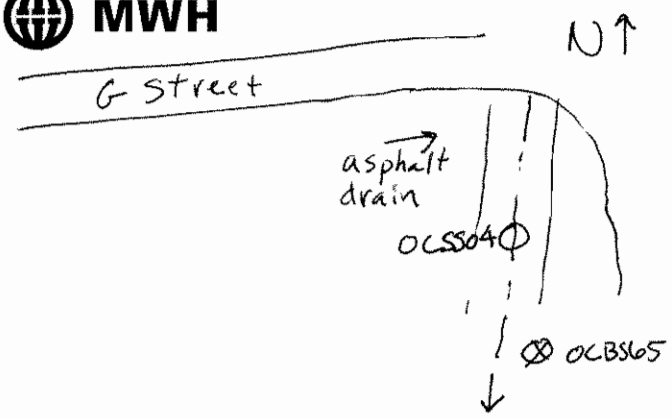
Sampler Type:

Drill Start Time/Date: 4/11/06 Drill Finish Time/Date:

Well Completion Time/Date:

Soil Boring Backfill Time/Date:

Site Sketch Map



Depth to 1st Water (▽): — Time/Date:

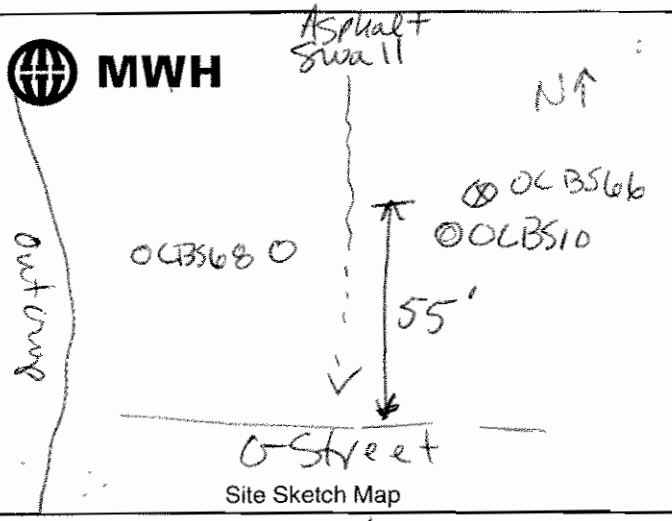
Depth to Water After Drilling (▼): — Time/Date:

Depth to other Water Bearing Zones:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Sampled under asphalt drain					
									surface cap to 2' tall grassy vegitation 0.125" surface ash not sampled					
SO1	X			X			2		silty sand 10YR 3/3 dark brown wet, soft	—	—	—	65	35

QA/QC

MWH



Site Sketch Map

Boring #: OCBS66 MW#: Sheet 1 of 1

Project:

Job #: Site: OCY-55FL

Logged By: Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name:

Borehole Diam./Drill Bit Type: 4" Total Depth 6' Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): 2.5' Time/Date:

Drill Start Time/Date: 4/11/00 Drill Finish Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Well Completion Time/Date:

Depth to other Water Bearing Zones:

Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Parallel to small pipeline 3" metal					
SO1	X			X			0.5		surface up to 3" tall vegitation ash layer					
							1		0.5" 10YR 3/2 not sampled sloping 10° S					
	X						2		silty sand (0.5)' moist soft 10YR 3/3 @1', 1" ϕ	—	—	10	45	45
SO2				X			3'		asphalt gravel	—	—	—	40	60
							4		2' sandy silt w clay 10YR 3/3 moist, soft					
							5		Bedrock @ 6' weathered chatsworth FM					
SO3				X			6'							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCBS67 MW#: Sheet 1 of 1

Project:

Job #: Site: OCY-55FL

Logged By: Reviewed By:

Drilling Contractor:

Drill Rig Type/Method:

Drillers Name:

Borehole Diam./Drill Bit Type: 4" Total Depth 0.5' Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

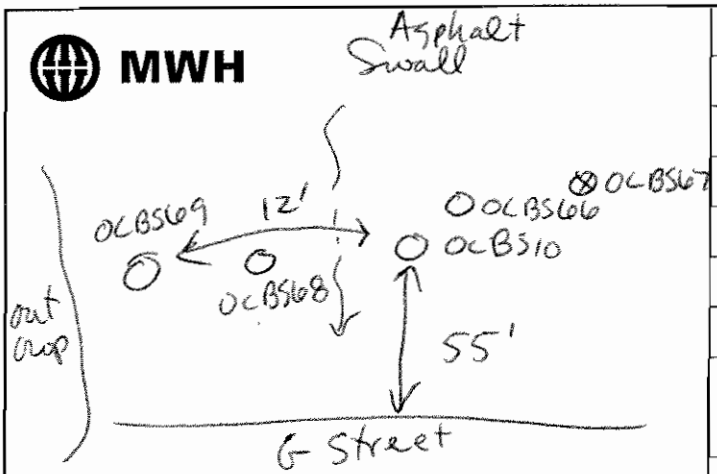
Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: Drill Finish Time/Date:

Well Completion Time/Date:

Soil Boring Backfill Time/Date:



Site Sketch Map

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
Soil	X			X			0.5'		surface 3' tall grassy vegetation 10' brush sloping 10°S	–	–	10	50	40
							1		ash layer 0.250" not sampled					
							2		SILTY SAND 10YR 3/3 dark Brown moist soft roots					
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCBS68 MW#: Sheet 1 of 1

Project: Groupe Data Gap

Job #: Site: OC4-55 FL

Logged By: SDolmat Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name:

Borehole Diam./Drill Bit Type: 4" Total Depth 6'

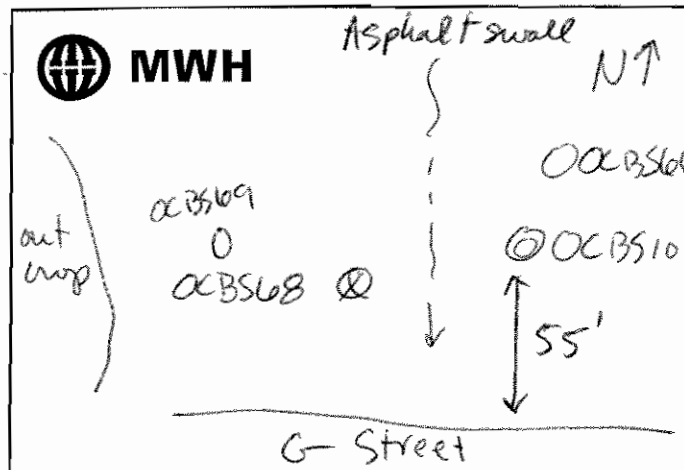
Ref. Elev.

Sampler Type:

Drill Start Time/Date: 4/11/06 Drill Finish Time/Date:

Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —



Site Sketch Map

Depth to 1st Water (▽): 2-3' Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
S01	X			X			0.5		Surface up to 3' tall grassy vegitation	—	—	—	65	35
							1		ash layer 0.5" 10YR3/2 not sampled sloping 10° S					
							2		Sandy silt 10YR 3/2 moist soft					
S02	X			X			3'		3' Sandy SILT w. CLAY wet, very soft	—	—	—	30	70
							4		Bedrock @ 6' Chatsworth Fm					
							5							
S03				X			6' 6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCBS69 MW#: | Sheet 1 of 1

Project:

Job #: | Site: OCY-55 FL

Logged By: | Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name:

Borehole Diam./Drill Bit Type: 4" | Total Depth 0.5' | Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): | Time/Date:

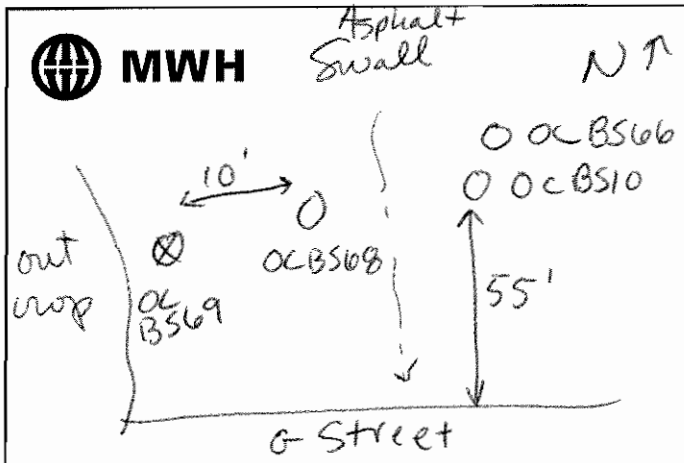
Depth to Water After Drilling (▼): | Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: | Drill Finish Time/Date:

Well Completion Time/Date:

Soil Boring Backfill Time/Date:

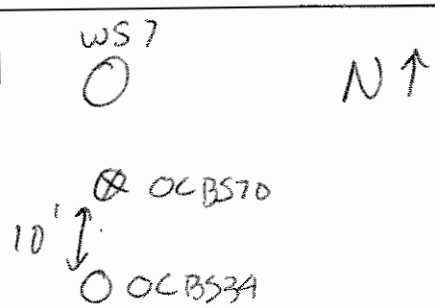


Site Sketch Map

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
SOI	X			X			0.5'		Surface vegitation grasses up to 3' tall sloping 10°E ash layer 0.250" not sampled	—	—	—	40	60
							1							
							2	ML	Sandy SILT 10 YR 3/3 wet, soft, metal debris (nuts) with rust, roots					
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH



Site Sketch Map G Street

Boring #: OCBS70 MW#:	Sheet 1 of 1
Project:	
Job #:	Site: OCY-SSFL
Logged By: J Dolmat	Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name:	
Borehole Diam./Drill Bit Type: 4"	Total Depth 3'
	Ref. Elev.
Sampler Type:	
Drill Start Time/Date: 4/11/06	Drill Finish Time/Date:
Well Completion Time/Date:	
Soil Boring Backfill Time/Date:	

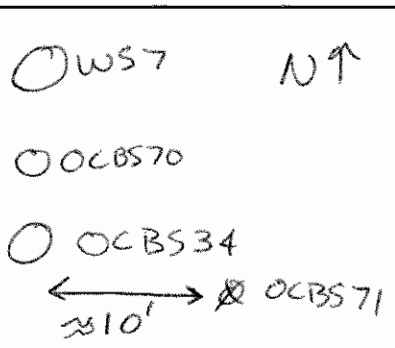
Depth to 1st Water (▽):	Time/Date:
Depth to Water After Drilling (▼):	Time/Date:
Depth to other Water Bearing Zones:	

sporatic asphalt layers

	PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
S01		X			X			0.5		Surface grassy vegetation 0.125 ash layer not sampled sloping 10°-15° to S silty sand 10YR 3/3 dk Brown moist soft	—	—	10	55	35
								1							
								2							
								3							
S02		X			X			3'		3' color change 10YR 4/4 dark yellow brown					
								4							
								5							
								6							
								7							
								8							
								9							
								10							
								11							
								12							

QA/QC

MWH



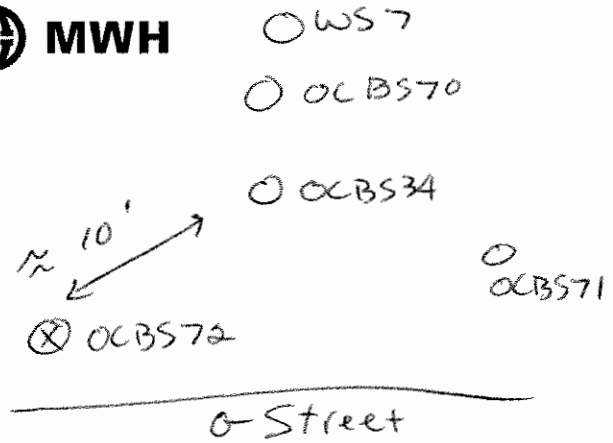
Site Sketch Map G Street

Boring #: OCBS71 MW#:	Sheet 1 of 1
Project:	
Job #:	Site: OCY-SSFL
Logged By:	Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name:	
Borehole Diam./Drill Bit Type: 4"	Total Depth 3' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 4/11/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

	PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
										sporatic asphalt layers					
SO1		X			X			0.5'		Surface vegitation 2' grasses sloping 10-15° S	–	–	–	65	35
								1		~0.125" ash layer not sampled					
								2		(0.5') silty sand 10YR 3/3 moist, soft					
SO2		X			X			3'		color change @ 2' 10YR 4/4 dark yellow brown					
								4							
								5							
								6							
								7							
								8							
								9							
								10							
								11							
								12							

QA/QC

MWH



Site Sketch Map

Boring #: OCBS72 MW#: Sheet 1 of 1

Project:

Job #: Site: OCY – SSFL

Logged By: Reviewed By:

Drilling Contractor:

Drill Rig Type/Method:

Drillers Name:

Borehole Diam./Drill Bit Type: 4" Total Depth 3'

Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: 4/11/06 Drill Finish Time/Date:

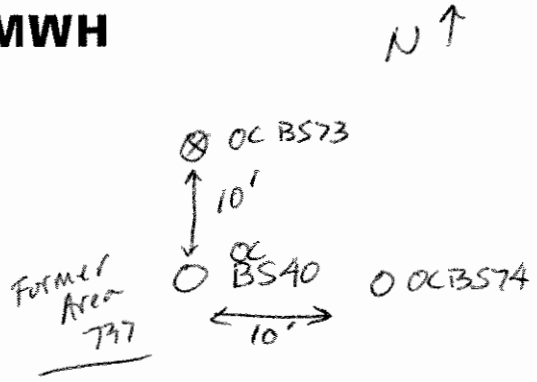
Well Completion Time/Date:

Soil Boring Backfill Time/Date:

	PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
										Sporatic asphalt layers					
SO1		X			X			0.5		surface vegetation 2' grassy sloping 15° S	—	—	-	60	40
								1		1.25" ash layer not sampled					
								2		SILTY SAND 10YR 3/3 moist, soft, color change					
SO2		X			X			3		@ 2' 10YR 4/4 dark yellow brown					
								4							
								5							
								6							
								7							
								8							
								9							
								10							
								11							
								12							

QA/QC

MWH



Site Sketch Map

Boring #: OCBS73 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: OCY-SSFL
Logged By: JDolmat	Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name: BStewart	
Borehole Diam./Drill Bit Type: 4"	Total Depth 7.5
	Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 4/11/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

Former Area 737

	PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
~~S01~~		X			~~X~~			0.5'		Surface flat, grassy vegitation 2' tall < ~~[illegible]~~ 0.125 ash layer not sampled					
								1		CLAYEY SILT W SAND 40% CLAY	–	–	–	30	70
								2		10YR 3/3 moist, dense color change @ 2' increase					
~~S02~~		X			~~X~~			3		in sand (10YR 3/2) very dark greyish Brown	–	–	–	40	60
S01		X			X			4.5		4.5' SILTY SAND (10YR4/4) moist soft dk yellow Brown	–	–	–	70	30
								5							
								6							
S02		X			X			7.5		~~same lith~~ color change to 10YR 4/6 dark yellow Brown	–	–	30	40	30
								8							
								9							
								10							
								11							
								12							

QA/QC

MWH

Boring #: OCBS74 MW#: Sheet 1 of 1

Project: Data Gap Group

Job #: Site: OCY - SSFL

Logged By: JDolmat Reviewed By:

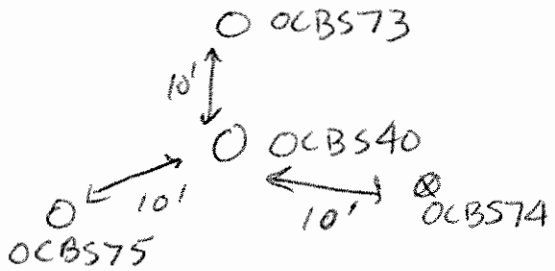
Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name: B Stewart

Borehole Diam./Drill Bit Type: 4" Total Depth 8'

Ref. Elev.



Site Sketch Map

Sampler Type:

Depth to 1st Water (▽): — Time/Date:

Drill Start Time/Date: 4/11/06 Drill Finish Time/Date:

Depth to Water After Drilling (▼): — Time/Date:

Well Completion Time/Date:

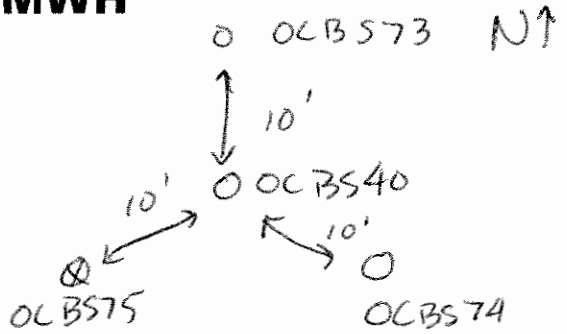
Depth to other Water Bearing Zones:

Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Former Area 737					
									Surface flat 2' tall vegetation grassy, ~0.125" ash layer					
							1		not sampled					
	X						2		CLAYEY SILT with SAND 10YR 3/3 moist med dense dark Brown	—	—	—	15	85
							3							
							4							
SO1	X			X			4.5		Same with					
	X						5		SILTY CLAY 10YR 3/3 dark Brown moist dense	—	—	—	10	90
							6							
							7		gravel FILL @ 7' 1"-2" possible native lense					
SO2	X			X			8' 8		SILTY CLAY with SAND 10YR 3/3 moist dense	—	—	—	15	85
							9							
							10							
							11							
							12							

QA/QC

MWH



Site Sketch Map

Boring #: OCBS75	MW#:
Sheet 1 of 1	
Project: Group 6 Data Gap	
Job #:	Site: OCY-SSFL
Logged By: JDdmat	Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name: Ramon Roman	
Borehole Diam./Drill Bit Type: 4"	Total Depth 7.5
	Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): —	Time/Date:
Drill Start Time/Date: 4/11/06	Drill Finish Time/Date:
Depth to Water After Drilling (▼): —	Time/Date:
Well Completion Time/Date: —	
Depth to other Water Bearing Zones:	
Soil Boring Backfill Time/Date: —	

Former 737 Area

	PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
										surface flat vegitation 2' tall ash layer <0.125" not sampled					
		X						1		CLAYEY SILT 10YR 3/2 very dark Brown moist dense	—	—	—	20	80
								2		3' increase in sand to 30%	—	—	—	30	70
		X						3							
S01					X			4.5			—	—	—	40	60
		X						5		5' SANDY SILT 10YR 3/3 dark Brown dry med dense					
								6							
S02		X			X			7.5		7.5' SILTY CLAY w SAND 10YR 3/3 moist med dense	—	—	—	30	70
								8							
								9							
								10							
								11							
								12							

QA/QC

MJ781

MWH

Boring #: OCB576 MW#: Sheet 1 of 1

Project: Grayson Data Gap

Job #: Site: OCY-SSFL

Logged By: JDolma Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name: Ramon Roman

Borehole Diam./Drill Bit Type: 3 ¾" Total Depth 1'

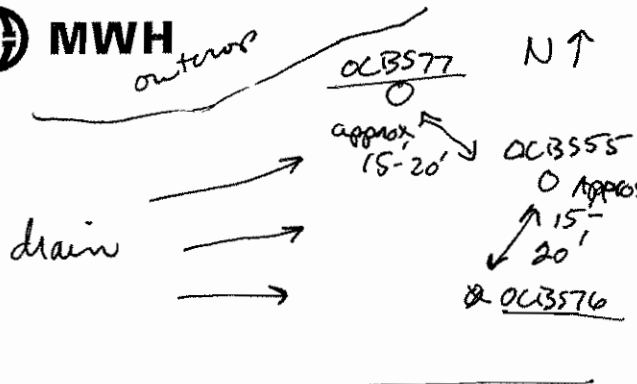
Ref. Elev.

Sampler Type:

Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:

Well Completion Time/Date:

Soil Boring Backfill Time/Date:



Site Sketch Map

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

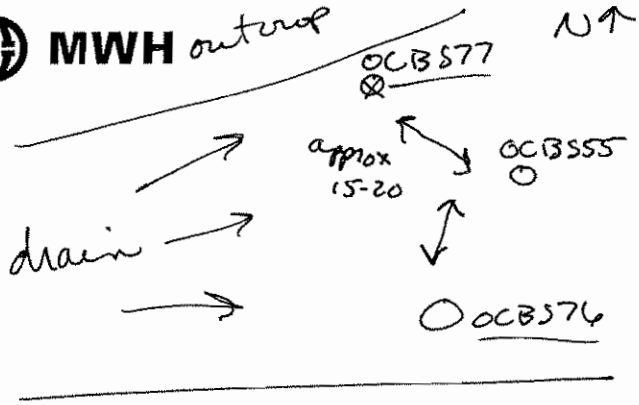
Depth to other Water Bearing Zones:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
Soil	X			X			0		Surface 2-3' grassy vegetation sloping 20°-30° NE/E ∠.250 ash layer not sampled	—	—	10	60	30
							1		SILTY SAND 10YR 3/3 very dark gr brown moist soft					
							2		refusal @ 1' Bedrock					
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MW782

MWH outcrop



Site Sketch Map

Boring #: OCB577 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: OC4-SSFL

Logged By: JDolmat Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name: B Stewart

Borehole Diam./Drill Bit Type: 3 ¼" Total Depth ~~5~~ 1'

Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:

Well Completion Time/Date:

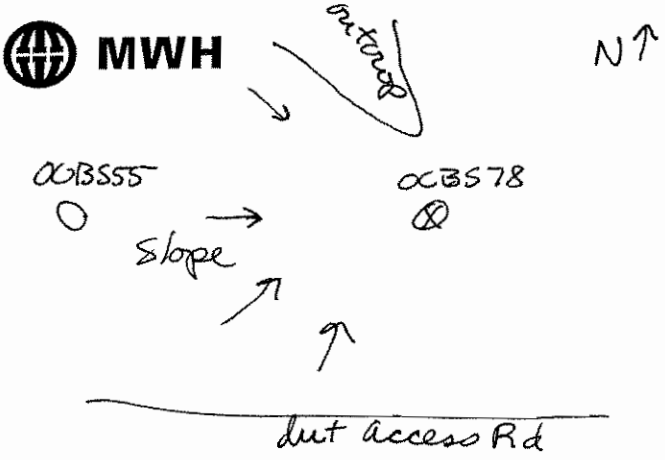
Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
Soil	X			X			0.5'		Surface 2-3' grassy vegetation Sloping 20°-30° NE/E	—	—	10	60	30
							1		SILTY SAND 10YR 3/2 very dark grayish Brown (Munsell)					
							2		ash layer ~.250" not sampled					
							3		Refusal @ ~~5~~ 1' Bedrock Chatsworth Fm					
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MJ783

MWH



Site Sketch Map

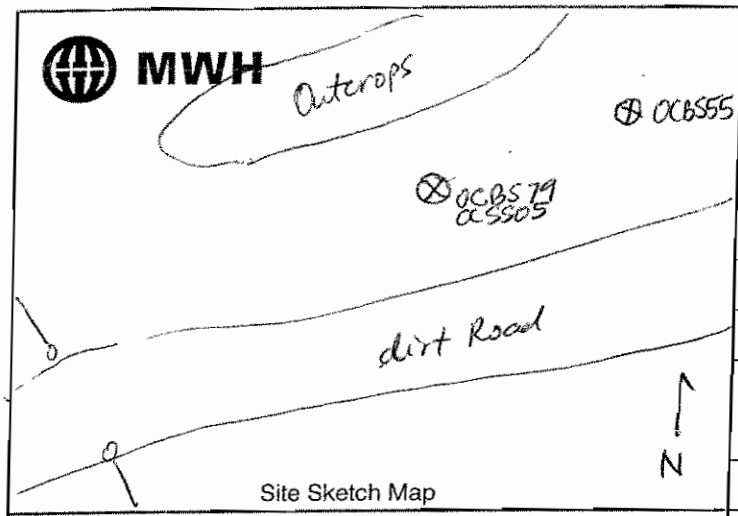
Boring #: OCB578 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: OCY-SSFL
Logged By: J Dolmat Reviewed By:	
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name: Ramon Roman	
Borehole Diam./Drill Bit Type: 3 1/4"	Total Depth 1' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	approx 50' E of OCB555 Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
SOIL	X			X			0.5	SP	Surface 2'-3' grassy vegetation burned bushes up to 6' tall Slope NE/E 30°-40° SILTY SAND 10yR 3/3 very dark grayish brown moist soft refusal @ 1' Bedrock chatsworth Fm ∠.250" ash layer not sampled	—	—	10	60	30
							1							
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

4/12/06

MWH



Site Sketch Map

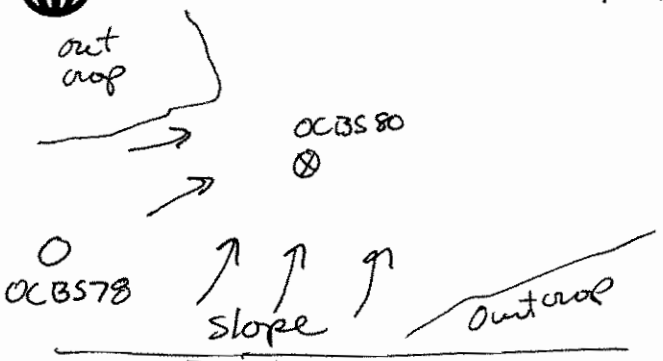
Boring #: OCBS79 MW#: –	Sheet 1 of 1
Project: SSFL - Group 6 Data Gap Sampling	
Job #:	Site: Old Con Yard
Logged By: SV	Reviewed By: TB/BS
Drilling Contractor: MWH	
Drill Rig Type/Method: Trowel	
Drillers Name: Ramon Roman	
Borehole Diam./Drill Bit Type: 3"	Total Depth 0.5' / Ref. Elev. —
Sampler Type: Trowel	
Depth to 1st Water (▽): — Time/Date: —	Drill Start Time/Date: 1050 Drill Finish Time/Date: 1150
Depth to Water After Drilling (▼): — Time/Date: —	Well Completion Time/Date: —
Depth to other Water Bearing Zones: —	Soil Boring Backfill Time/Date: 1115 4/12/06

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Removed first 2" inches of ash and sediment					
	X	OCSS05 501 OCBS79 501 @1100						Sm	Silty SAND (Sm), olive brown 10YR5/3, 30% silt, 50% medium sand, 20% fine sand, moist, loose. @0.5' bedrock weathered. Sandstone, yellow, 10YR7/6. Total Depth = 0.5' bgs			50	~~50~~ 20 SV	30
							1							
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA 20

MJ786

MWH



Site Sketch Map

Boring #: OCBS80 MW#: Sheet 1 of 1

Project: Gaps & Data Gap

Job #: Site:

Logged By: J Dolmat Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name:

Borehole Diam./Drill Bit Type: 3 1/4" Total Depth 0.5' Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:

Well Completion Time/Date:

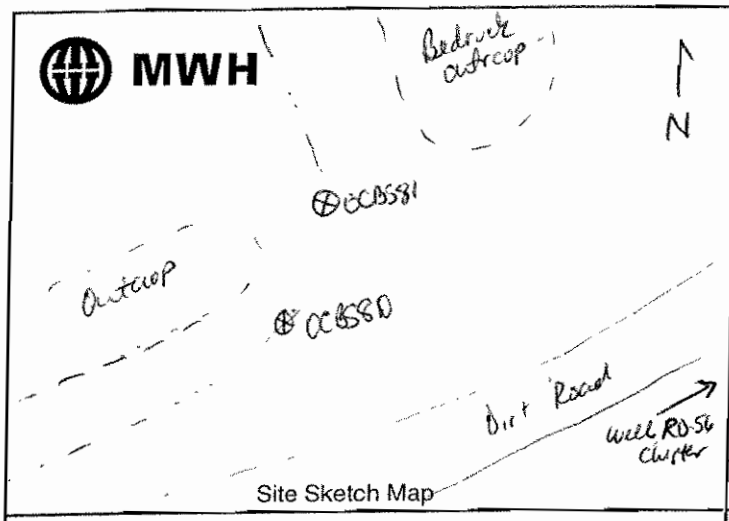
Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
	X			X			0.5		Surface 2'-3' grassy vegitation Burned Brush 6' tall	—	—	20	45	35
							1		Slope NE/E 30°-40°					
									Surface ash layer <.25					
							2		not sampled					
									SILTY SAND (10YR 3/2)					
							3		dark grey Brown Moist Soft					
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

4/12/06

MWH



Site Sketch Map

Boring #: OCBS81 MW#: Sheet 1 of 1

Project: SFL - Group 6 Data Gap

Job #: Site: Old Con Yard.

Logged By: SV Reviewed By: TB/BS

Drilling Contractor: MWH

Drill Rig Type/Method: Trowel

Drillers Name: MWH

Borehole Diam./Drill Bit Type: 3" Total Depth: 0.5' Ref. Elev.: —

Sampler Type: Trowel

Depth to 1st Water (▽): — Time/Date: —

Depth to Water After Drilling (▼): — Time/Date: —

Depth to other Water Bearing Zones: —

Drill Start Time/Date: 1110 Drill Finish Time/Date: 1120

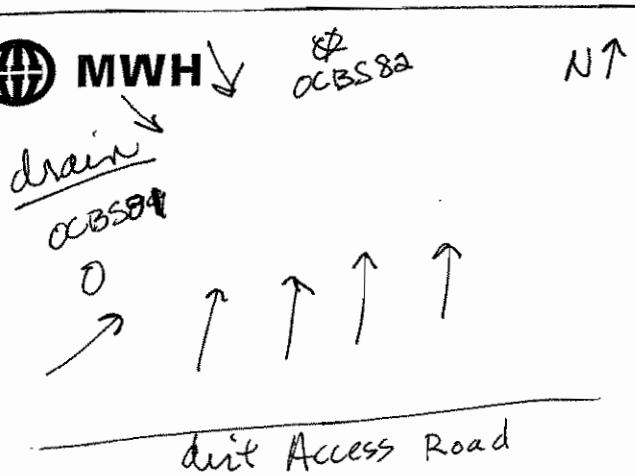
Well Completion Time/Date: —

Soil Boring Backfill Time/Date: 1120 4/11/06

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X	X	OCBS81	SOIL	@1110			ML	Removed first 1-2" of ash + sediment					
									Sandy SILT (ML), 10YR 6/3 light yellowish brown, 30% fine Sand, 70% silt, loose, moist, some organic material.				30	70
							1		@ 0.5' bedrock weathered Sandstone, dense, moist, medium Sand, yellow 10YR 7/6.					
							2							
							3		Total Depth = 0.5' bgs.					
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH



Site Sketch Map

Boring #: OCBS82 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: OCY-SSFL
Logged By: SDolmat Reviewed By:	
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name:	
Borehole Diam./Drill Bit Type: 3"	Total Depth 0.5' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Approx 30'-40' N/NE of OCBS81					
SO1	X			X					Surface 1'-2' sporadic grassy vegitation	–	–	20	45	35
							1		Chatsworth Fm 50% of Area outcroping					
							2		SILTY SAND 10YR 3/2 very dark gr brown moist soft roots					
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

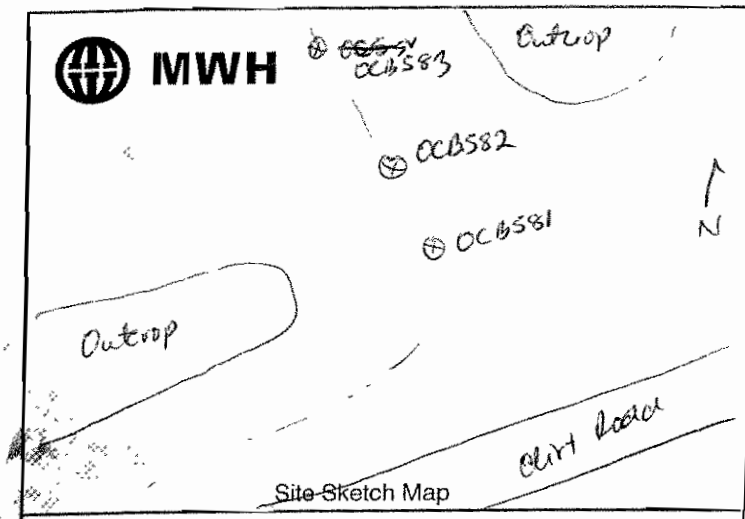
QA/QC

4/12/06

MWH

Boring #: OCBS83 MW#: —	Sheet 1 of 1
Project: SSFL - Group 6 Data Gap Sampling	
Job #:	Site: Old Con Yard
Logged By: SV	Reviewed By: TB/BS
Drilling Contractor: MWH	
Drill Rig Type/Method: Trowel	
Drillers Name: Ramon Roman	
Borehole Diam./Drill Bit Type: 3"	Total Depth 0.5 / Ref. Elev. —
Sampler Type: Trowel	
Depth to 1st Water (▽): — Time/Date: —	Drill Start Time/Date: 1120 Drill Finish Time/Date: 1125
Depth to Water After Drilling (▼): — Time/Date: —	Well Completion Time/Date: —
Depth to other Water Bearing Zones: —	Soil Boring Backfill Time/Date: 1125 4/12/06

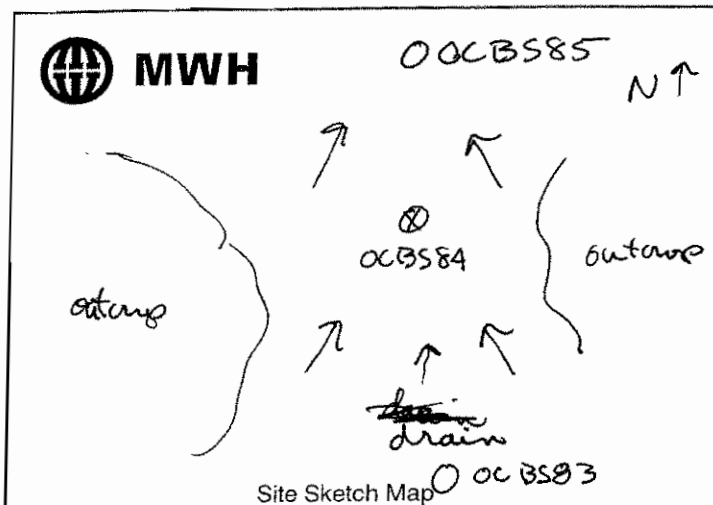
Site Sketch Map



PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X	X	OCBS83 S01 @ 1120				1	SM	Silty SAND (SM), dark grayish brown 10YR 3/2, 40% silt, 60% fine-grain sand, trace medium sand, some organic material, wet, loose. @0.5' bedrock weathered Sandstone, yellow 10YR ~~5/6~~ 7/6, dense, medium sand. Total Depth = 0.5' bgs.			Tr	60	40
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH



Site Sketch Map

Boring #: OCBS84 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: OCY-SSFL

Logged By: JDalmat Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name:

Borehole Diam./Drill Bit Type: 3 3/4" Total Depth 0.5'

Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:

Well Completion Time/Date:

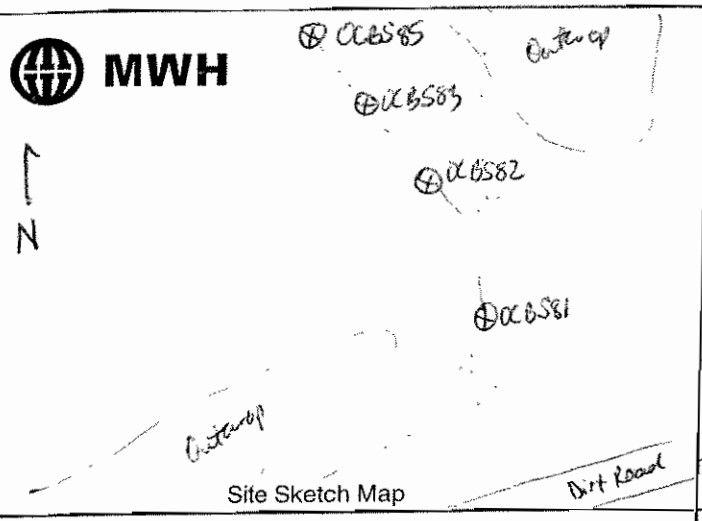
Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Approx 25'-30' N from OCBS83					
Soil	X			X			0.5'		surface 2'-3' grassy flowering vegitation drainage sloping 20°-30° average flat @ OCBS84 (here) ash layer ~.250" not sampled steep outcrops of Chatsworth Fm	–	–	20	45	35
							1		SILTY SAND 10YR 3/2 very dk gr brown moist soft, roots					
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

4/12/09

MWH



Site Sketch Map

Boring #: CCBS85 MW#: — Sheet 1 of 1

Project: SSFL - Group 6 Data Gap Sampling

Job #: Site: Old Con Yard

Logged By: BV Reviewed By: TB / BS

Drilling Contractor: MWH

Drill Rig Type/Method: Trowel

Drillers Name: Ramon Roman

Borehole Diam./Drill Bit Type: 3" Total Depth: 0.5

Ref. Elev.: —

Sampler Type: Trowel

Depth to 1st Water (▽): — Time/Date: —

Depth to Water After Drilling (▼): — Time/Date: —

Depth to other Water Bearing Zones: —

Drill Start Time/Date: 1125 Drill Finish Time/Date: 1135

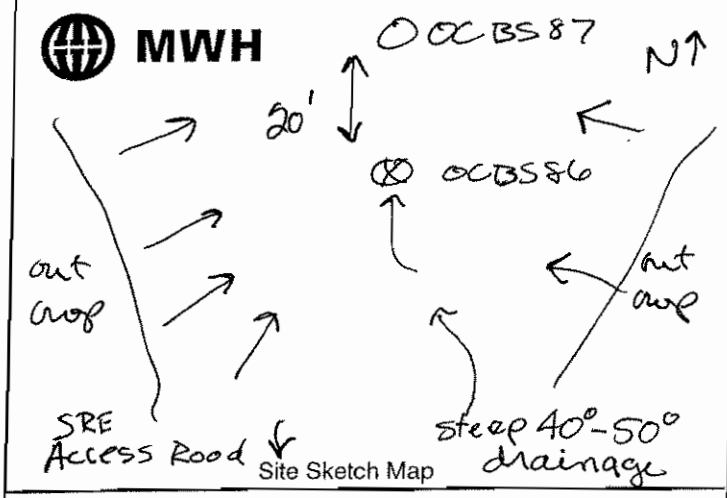
Well Completion Time/Date: —

Soil Boring Backfill Time/Date: 1135 4/12/09

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X	X	CCBS85-SCR@1130				0	SM	Remove first 1-2" of ash + sediment. Silty SAND (SM), dark grayish brown 10YR4/2, 30% silt, 60% fine sand, 10% medium sand, moist, loose. Some @0.5' Organic material. @0.5' weathered bedrock sandstone, yellow 10YR7/6, moist, dense. Total Depth = 0.5' bgs.			10	60	30
							1							
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH



Site Sketch Map

Boring #: OCBS86 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: OCY-55FL
Logged By: JDolmat	Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name: BStewart	
Borehole Diam./Drill Bit Type: 3 ~~3~~"	Total Depth 0.5' / Ref. Elev.
Sampler Type:	
Depth to 1st Water (▽): — Time/Date: —	Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): — Time/Date: —	Well Completion Time/Date: —
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
Sol	X			X			0.5		surface grassy flowering vegitation 2'-3' tall	—	10	30	40	20
							1		Burned stumb Slope 20°-30° N					
							2		0.25ø ash layer not sampled					
							3		SILTY SAND 10yR 3/2 DK gry Brown moist, soft roots					
							4		chatsworth fm outcropping abundant					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCBS87 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: OU4-SSFT

Logged By: JDolmat Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Augers

Drillers Name: B Stewart

Borehole Diam./Drill Bit Type: 3 ~~3/4~~" Total Depth 0.5'

Ref. Elev.

Sampler Type:

Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:

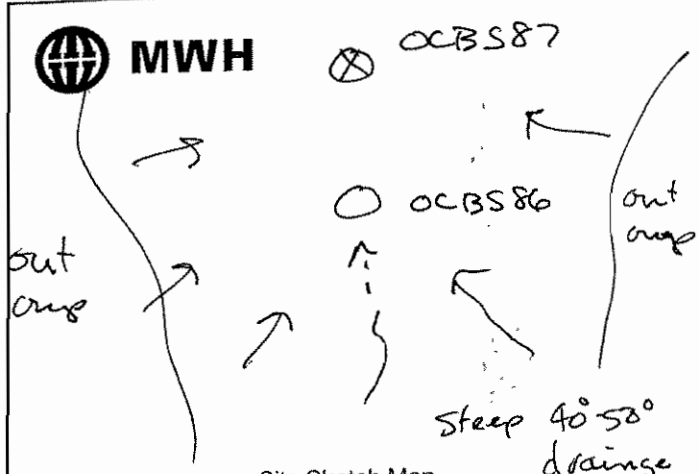
Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —

Depth to 1st Water (▽): — Time/Date:

Depth to Water After Drilling (▼): — Time/Date:

Depth to other Water Bearing Zones:

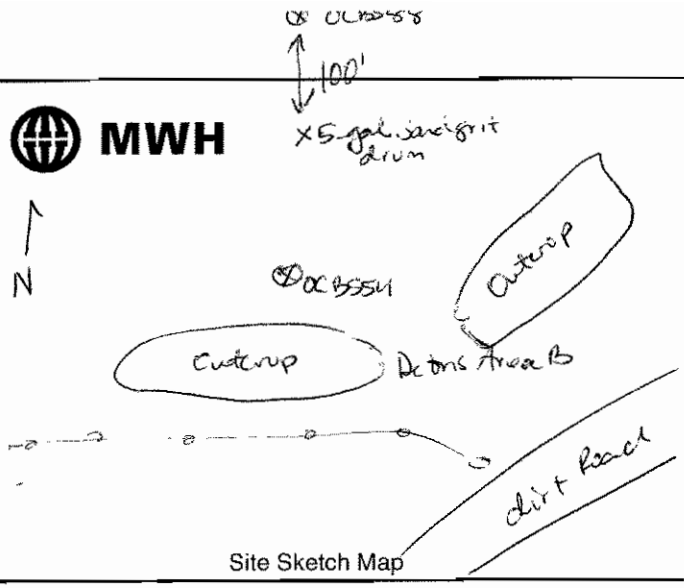


Site Sketch Map

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
SO1	X			X			0.5		Surface 2-3' grassy flowering vegitation burned shrubs	—	10	30	40	20
							1		Slope 20°-30° N					
									0.25ft ash layer not sampled					
							2		SILTY SAND 10YR 3/2					
									Dk grey Brown					
							3		charcoal from abundant					
									outcropping					
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

4/12/06



Site Sketch Map

Boring #: OCBS88 MW#: —	Sheet 1 of 1
Project: SSFL - Group 6 Data Gap Sampling	
Job #:	Site: Old Con Yard
Logged By: SV	Reviewed By: TB/BS
Drilling Contractor: MWH	
Drill Rig Type/Method: Trowel	
Drillers Name: MWH	
Borehole Diam./Drill Bit Type: 3"	Total Depth: 0.5
	Ref. Elev.: —
Sampler Type: Trowel	
Depth to 1st Water (▽): — Time/Date: —	Drill Start Time/Date: 1210 Drill Finish Time/Date: 1215
Depth to Water After Drilling (▼): — Time/Date: —	Well Completion Time/Date: —
Depth to other Water Bearing Zones: —	Soil Boring Backfill Time/Date: 1215 4/12/06

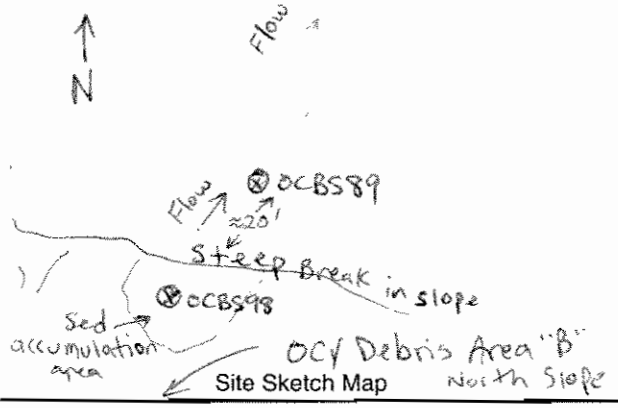
PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Removed first 1-2" of Ash & sediment					
	X	X	OCBS	88	SO	1@	~~1250~~ 1215	SM	Silty SAND (SM), dark grayish brown 10YR 3/2, 70% sand (50% medium, 20% fine grain sand) 30% silt, moist, loose. @0.5' bedrock, weathered sandstone, yellow 10YR 7/6, dense.			50	20	30
							1							
							2							
							3							
							4		Total Depth = 0.5' bgs.					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

OCBS89

MONTGOMERY WATSON

Boring #:	MW#: Sheet 1 of
Project:	
Job #:	Site:
Logged By: T. Burton	Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method:	
Drillers Name:	
Borehole Diam./Drill Bit Type:	Total Depth 3-4' / Ref. Elev.
Sampler Type: trowel / jar	
Depth to 1st Water (▽):	Time/Date:
Depth to Water After Drilling (▼):	Time/Date:
Depth to other Water Bearing Zones:	
Drill Start Time/Date: 4/12/06	Drill Finish Time/Date:
Well Completion Time/Date:	
Soil Boring Backfill Time/Date:	



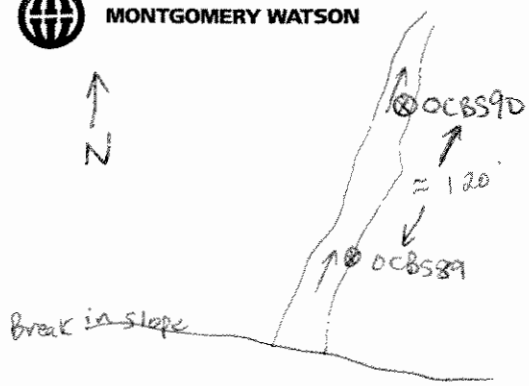
Site Sketch Map

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X			X			1 2 3	SM	Surface: loose sediment along steep drainage, approx. 15' down from break in slope (Bedrock crops out along drainage) @ 0' Silty sand (SM), Very dark gray, moist to wet, fine to coarse grained, some fine organics, very loose, trace bedrock frags, trace plant material in sample	tr	20	30	20	30

QA/QC

OCBS90

MONTGOMERY WATSON



Site Sketch Map

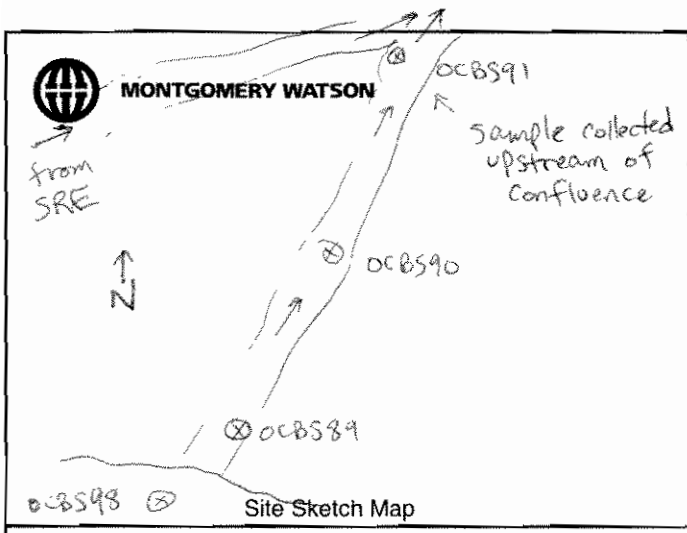
Boring #:	MW#:	Sheet 1 of	
Project:	SSFL G6 DGA		
Job #:	Site:		
Logged By: T. Burton	Reviewed By:		
Drilling Contractor:			
Drill Rig Type/Method:	scoop w/trowel / jar		
Drillers Name:			
Borehole Diam./Drill Bit Type:	Total Depth	3-4"	
	Ref. Elev.		
Sampler Type:			
Depth to 1st Water (▽):	Time/Date:	Drill Start Time/Date: 9/12/06	Drill Finish Time/Date:
Depth to Water After Drilling (▼):	Time/Date:	Well Completion Time/Date:	
Depth to other Water Bearing Zones:		Soil Boring Backfill Time/Date:	

PID/OVA	Sample interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X			X				SM	Surface: loose seds along bedrock drainage (steep)	tr	10	40	20	30
							1		@ 0' Silty sand (SM), dark gray, moist, very loose, fine to					
							2		coarse sand, trace organic fines					
							3		and gravels (sandstone bedrock fragments), some plant material in sample					

QA/QC

OCBS91

MONTGOMERY WATSON



Site Sketch Map

Boring #:	MW#:	Sheet 1 of	
Project:			
Job #:	Site:		
Logged By: T. Burton	Reviewed By:		
Drilling Contractor:			
Drill Rig Type/Method:			
Drillers Name:			
Borehole Diam./Drill Bit Type:	Total Depth	0.5'	
	Ref. Elev.		
Sampler Type: trowel / jar			
Depth to 1st Water (▽):	Time/Date:	Drill Start Time/Date: 4/12/06	Drill Finish Time/Date:
Depth to Water After Drilling (▼):	Time/Date:	Well Completion Time/Date:	
Depth to other Water Bearing Zones:		Soil Boring Backfill Time/Date:	

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of				
										Gravel	Sand			Silt/clay
											Coarse	Medium	Fine	
	X			X					Surface: bedrock drainage; sample collected from sidewall sediment approx 8" thick @ 0.5' Silty sand	5	15	30	20	30

QA/QC

MWH

Boring #: OCB592 MW#: Sheet 1 of 1

Project: Group 6 Data Gap

Job #: Site: OCY - SSFL

Logged By: JDolmat Reviewed By:

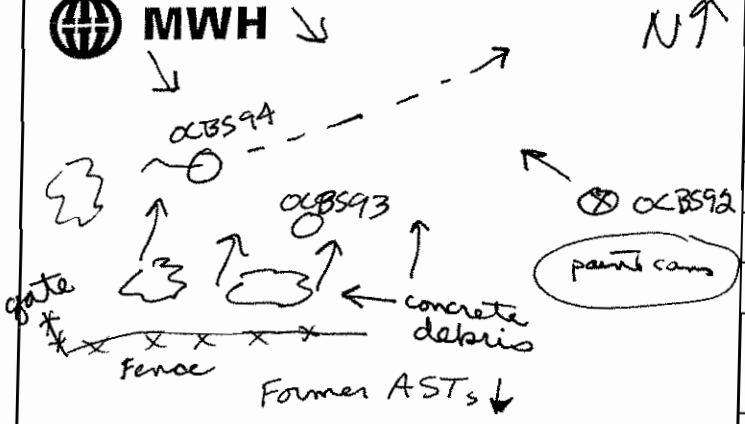
Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name: S Valenzuela

Borehole Diam./Drill Bit Type: 3" Total Depth 1'

Ref. Elev.



Site Sketch Map

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Well Completion Time/Date:

Depth to other Water Bearing Zones:

Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Downslope of Paint cans					
SO1	X			X					Surface grassy flowering vegitation 2'-3' tall	—	20	40	20	20
							1		Slope 40°-50° N/NW					
							2		SAND with SILT moist, soft					
									10YR 3/3 dk gry brown					
							3		roots					
									increase grain size @					
							4		0.5'-1' color change					
									10YR 4/6 dk yellow Brown					
							5		native material					
									weathered bedrock					
							6		Surface ash layer .250" NOT sampled					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCB592 MW#: Sheet 1 of 1

Project: Orange Data Gap

Job #: Site: OCY - SSFL

Logged By: JDolmat Reviewed By:

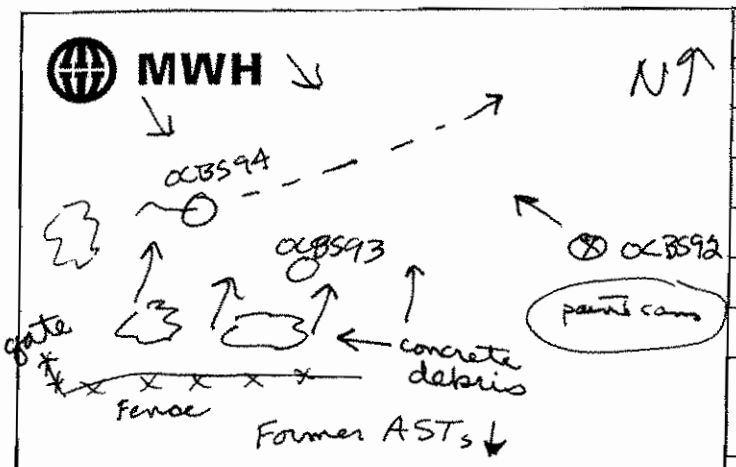
Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name: S Valenzuela

Borehole Diam./Drill Bit Type: 3" Total Depth 1'

Ref. Elev.



Site Sketch Map

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Well Completion Time/Date:

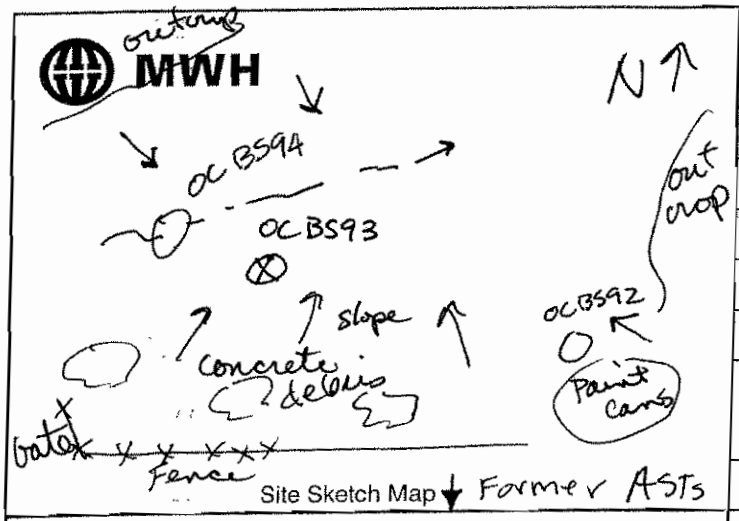
Depth to other Water Bearing Zones:

Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
									Downslope of Paint cans					
SOI	X			X					Surface grassy flowering vegitation 2'-3' tall	—	20	40	20	20
							1		Slope 40°-50° N/NW					
									SAND with SILT moist, soft					
							2		10YR 3/3 dk grey brown					
									roots					
							3		increase grain size @					
									0.5'-1' color change					
							4		10YR 4/6 dk yellow Brown					
									native material					
							5		weathered bedrock					
									surface ash layer .250" not sampled					
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH



Site Sketch Map — Former ASTs

Boring #: OCBS93 MW#: Sheet 1 of 1

Project:

Job #: Site: OCY-55FL

Logged By: JDolmat Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name:

Borehole Diam./Drill Bit Type: 3" Total Depth 1' Ref. Elev.

Sampler Type:

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:

Well Completion Time/Date:

Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Debris Area C Concrete, Metal, Asphalt					
Soil	X			X				SW	surface grass & flowering vegetation 2'-3' tall	—	20	40	20	20
							1		Slope 20°-30° N/NE					
							2		SAND with silt 10YR 3/3					
									moist, soft					
							3		increase grain size @ 0.5'-1' color change					
							4		10YR 4/6 dk yellow Brown native material weathered Bedrock					
							5		auger refusal .250" not sampled					
							6		refusal 1' Bedrock					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCB594 MW#: Sheet 1 of 1

Project:

Job #: Site: OCI-SSFL

Logged By: JDolmat Reviewed By:

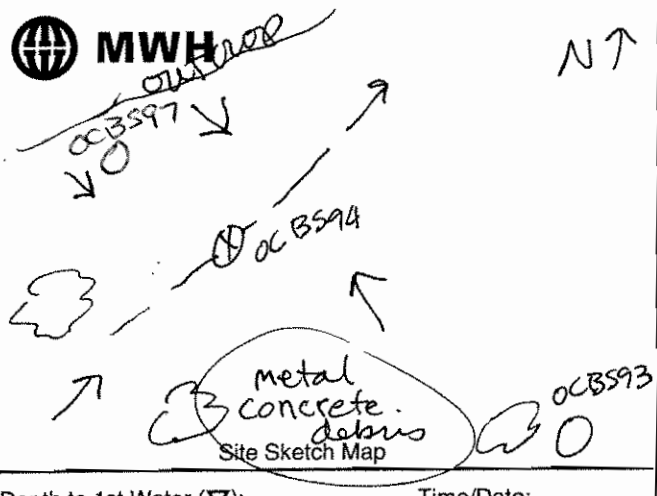
Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name:

Borehole Diam./Drill Bit Type: 3" Total Depth 1' Ref. Elev.

Sampler Type:



Site Sketch Map

Depth to 1st Water (▽): — Time/Date:

Depth to Water After Drilling (▼): — Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: 4/12/06 Drill Finish Time/Date:

Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
									Debris Area C Concrete, Metal, Asphalt					
SO1	X			X				SW	Surface grass, flowering vegitation	—	10	30	40	20
							1		slope ≈ 30° N/NE					
									Surface ash .25D" not sampled					
							2		SAND with silt 10YR 3/3					
									Dk grey brown					
							3		0.5'-1' w/a orange					
									10YR 4/6 dk yellow Brn					
							4		weathered Bedrock					
									Refusal @ 1' Bedrock					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OC13595 MW#: Sheet 1 of 1

Project:

Job #: Site: DC4-55 FL

Logged By: JDolmat Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand travel

Drillers Name: R Roman

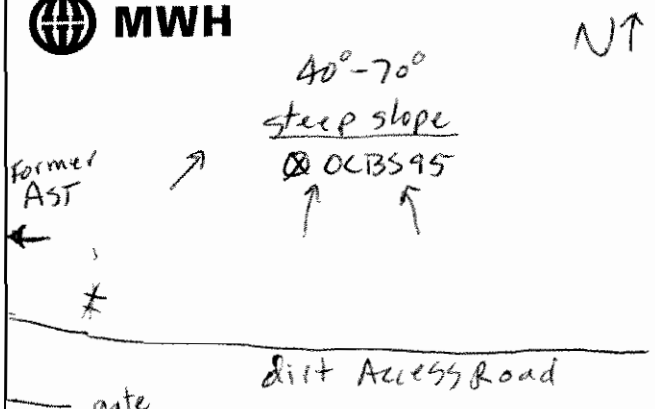
Borehole Diam./Drill Bit Type: 3" Total Depth 0.5' Ref. Elev.

Sampler Type:

Drill Start Time/Date: 4/13/06 Drill Finish Time/Date:

Well Completion Time/Date: —

Soil Boring Backfill Time/Date: —



Site Sketch Map

Depth to 1st Water (▽): — Time/Date:

Depth to Water After Drilling (▼): — Time/Date:

Depth to other Water Bearing Zones:

Debris Area B

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
	X			X			0.5	SW	Surface 2'-3' tall grassy flowering vegetation burned brush up to 8' tall surface slope 40°-70° N, ash layer, .250" not sampled ~~SILTY SAND~~ SAND W SILT 10YR 3/3 dark Brown moist, loose soft subround	—	10	30	40	20

SO1

QA/QC

MWH

Boring #: OCBS96 MW#: Sheet 1 of 1

Project:

Job #: Site: OCY-SSFL

Logged By: JDolmat Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Trowel

Drillers Name: R Roman

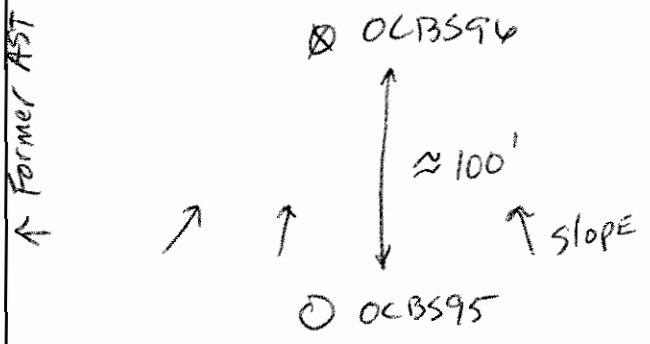
Borehole Diam./Drill Bit Type: 3" Total Depth 0.5' Ref. Elev.

Sampler Type:

Drill Start Time/Date: 4/13/06 Drill Finish Time/Date:

Well Completion Time/Date:

Soil Boring Backfill Time/Date:



Site Sketch Map

Depth to 1st Water (▽): - Time/Date:

Depth to Water After Drilling (▼): — Time/Date:

Depth to other Water Bearing Zones:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
Soil	X			X			0.5	SW	Debris Area B surface flowering grasses vegitation 2-3" SLOPE 40°-70° N ash layer .250" NOT sampled SILTY SAND 10YR 3/3 DK Brown moist, soft/loose sub round, sub angular	—	10	30	40	20
							1							
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCBS97 MW#: Sheet 1 of 1

Project: Grab & Data Gap

Job #: Site: OCY-SFL

Logged By: JDolmat Reviewed By:

Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name:

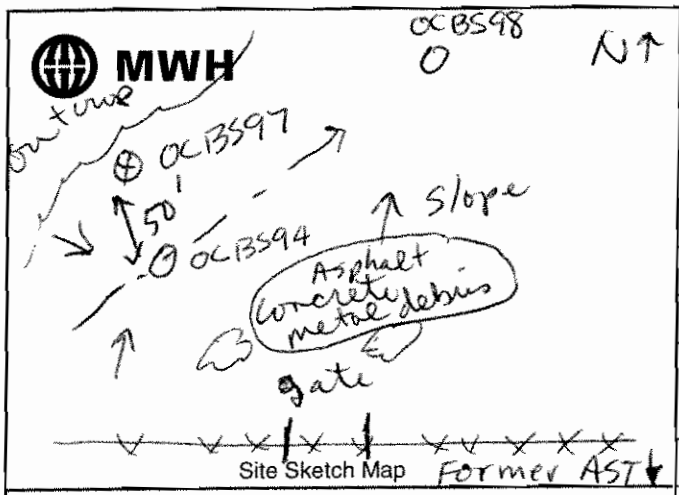
Borehole Diam./Drill Bit Type: 3" Total Depth 1.5' Ref. Elev.

Sampler Type:

Drill Start Time/Date: 4/13/06 Drill Finish Time/Date:

Well Completion Time/Date:

Soil Boring Backfill Time/Date:



Depth to 1st Water (▽): — Time/Date:

Depth to Water After Drilling (▼): — Time/Date:

Depth to other Water Bearing Zones:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Debris Area C Concrete, Metal, Asphalt					
SO1/D01	X			X				SW	Surface sporatic grassy flowering Vegitation	—	20	40	20	20
							1		2'-3' tall burned brush up to 8' tall, sloping 30°-40° N/NE					
							2		Surface ash, 250" not sampled					
							3		SAND W SILT 10YR 3/3					
							4		Dk Brown moist, Sg+loose					
							5		sub round sub angular					
									refusal Bedrock @1.5'					
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

MWH

Boring #: OCBS98 MW#: Sheet 1 of 1

Project:

Job #: Site: OCY - SSFL

Logged By: JDolmat Reviewed By:

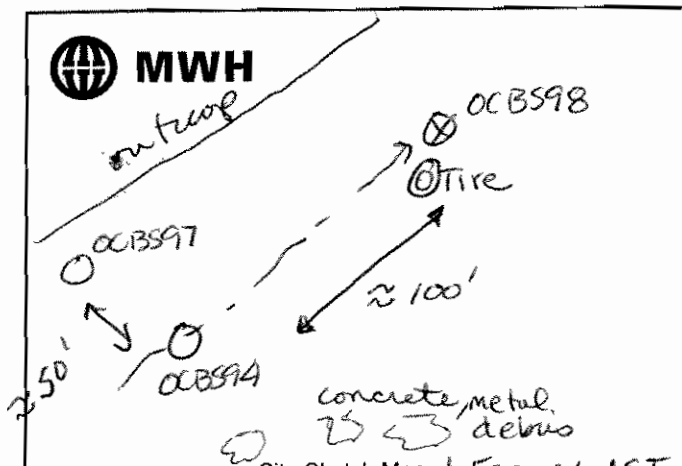
Drilling Contractor:

Drill Rig Type/Method: Hand Auger

Drillers Name: R Roman

Borehole Diam./Drill Bit Type: 3" Total Depth 1.5'

Ref. Elev.



Site Sketch Map ↓ Former AST

Sampler Type:

Depth to 1st Water (▽): — Time/Date:

Drill Start Time/Date: 4/13/06 Drill Finish Time/Date:

Depth to Water After Drilling (▼): — Time/Date:

Well Completion Time/Date: —

Depth to other Water Bearing Zones:

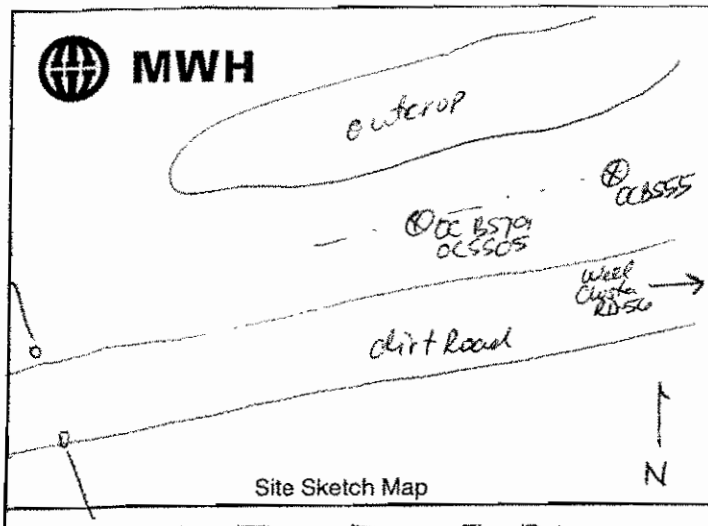
Soil Boring Backfill Time/Date: —

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Debris Area C metal Concrete Asphalt					
SO1	X			X			0.5'	SW	Surface Sporatic grassy flowering vegetation 2'-3' burned brush up to 8' surface ash, 250" not sampled, sloping 30°-40° N/NE	–	20	40	30	20
							1		SAND w SILT moist loose sgt 10YR 3/3 DK Brown Sub round					
							2		refusal 1.5' Bedrock					
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

4/12/06

MWH



Site Sketch Map

Boring #: OCSS05 MW#:	Sheet 1 of 1
Project: SSFL - Group 6 Data Gap	
Job #:	Site: Old Con Yard
Logged By: SV	Reviewed By: TB/BS.
Drilling Contractor: MWH	
Drill Rig Type/Method: Trowel	
Drillers Name: Ramon Roman	
Borehole Diam./Drill Bit Type: 3"	Total Depth 0.05' / Ref. Elev. —
Sampler Type: Trowel	
Depth to 1st Water (▽): — Time/Date: —	Drill Start Time/Date: 1050 Drill Finish Time/Date: 1105
Depth to Water After Drilling (▼): — Time/Date: —	Well Completion Time/Date: —
Depth to other Water Bearing Zones: —	Soil Boring Backfill Time/Date: 1115 4/12/06

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
			OCSS05S01					SM	Silty SAND (SM), dark grayish brown 10YR 4/2, 80% sand (50% medium 15% fine, 15% coarse sand), 20% silt, moist, loose, some burnt vegetation. Total Depth = 0.05' bgs.		15	50	15	20
							1							
							2							
							3							
							4		Note: sample contains charred debris and sediment overlying native soil					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

OGDEN

Surface and Shallow Soil Sample Log

Project Number	Project Name	Date	Time
313150004	DOE	1/27/98	0945

Sample Identification Number and Time	Checked by
OCSSØ15Ø1DØ	

Sampled by	Recorded by
T. Burton	T. Burton

Method of Collection: Scoop

Surface Description: Oil-stained bedrock (weathered)

Notes: ULS 14b

Soil Sample Data

Location: OLD CON

Coordinates	Elevation

Lithology	Depth (in.)	Soil Description	Est. % of G	Est. % of S	Est. % of F	Comments
		Weathered siltstone bedrock	—	10	90	@ 0940
	3	Silt w/sand (ML), yellow brn. (7.5YR 5/6),				OCSSØ15Ø1DØ
		dry, stiff				90% Full
		T.D. 3"				

OGDEN Surface and Shallow Soil Sample Log

oject Number	Project Name	Date	Time
313150004	DOE	6/17/99	1345

Sample Identification Number and Time	Checked by
OCSS02 SS01 DP	

Sampled by	Recorded by
T. Burton	T. B.

Method of Collection: Scoop

Surface Description: dry, 15° slope

Notes: UCS 20, downslope from road leading N from tank berm areas

Stake has wrong Ogden ID (OCBS24?)

Soil Sample Data

Location: Old Con

Coordinates	Elevation

Lithology	Depth (in.)	Soil Description	Est. % of G	Est. % of S	Est. % of F	Comments
	3	Silt w/ sand (ML), brown (7.5 yr 4/2),	-	20	80	
	6	dry v. loose, fine - vf. sand, no plast,				
		dry vegetation @ surface (grass, etc.)				

OGDEN

Surface and Shallow Soil Sample Log

Project Number	Project Name	Date	Time
	DOE SSFL	5/24/00	

Sample Identification Number and Time	Checked by
OCSS03 SØ1	

Sampled by	Recorded by
David King	* T. Burton 10/30/02

Method of Collection: Grab

Surface Description: Surficial coating of tar/asphalt-like substance mixed w/soil (2-4" thick)

Notes: RB Ø77, composite sample

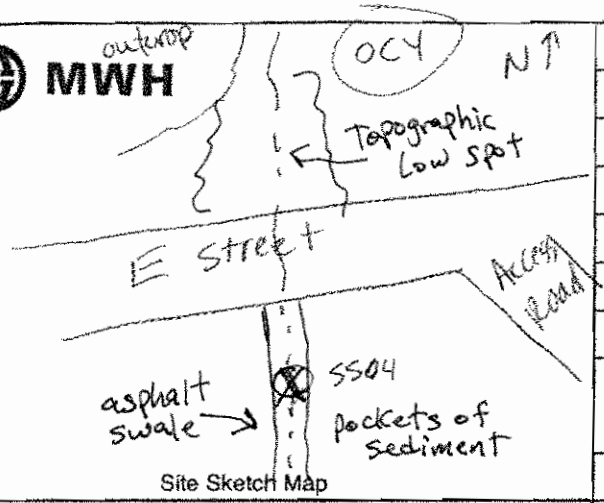
Soil Sample Data

Location: Old Con Yard near OCTS22

Coordinates | Elevation

Lithology	Depth (in.)	Soil Description	Est. % of G	S	F	Comments
		*Log not completed by sampler at time of sample collection				

MWH



Site Sketch Map

Boring #: OC SS04 MW#:	Sheet 1 of 1
Project: Group 6 Data Gap	
Job #:	Site: SSFL - OCY
Logged By: J Dolmat	Reviewed By:
Drilling Contractor: N A	
Drill Rig Type/Method: hand trowel	
Drillers Name: B Burton	
Borehole Diam./Drill Bit Type: 3"	Total Depth: 0.5' / Ref. Elev.:
Sampler Type:	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 2/16/06 Drill Finish Time/Date:
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date:
Depth to other Water Bearing Zones:	Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
NA	X			X			0.5'		In Surface drainage Asphalt lined					
							1		<6" of sediment					
									*ash surface 0.125"					
							2	SM	Silty SAND yellowish brown 10YR 5/4 loose dry	-	20	20	30	30
							3		Subangular to Subrounded					
							4							
									* not sampled					
							5							
									NOT augered to Bedrock					
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

FIELD TRENCH LOG

OGDEN

Project Name				Location: Old Con Pipeline, UCS46	Sheet 1 of 1
Trench Number: OCTS01	Project Number: 313150004	Elev. / Datum		Date and Time Started: 5/7/99 0630	Date and Time Completed: 5/7/99 1145
Equipment Supplier: Lopez	Operator: I			Total Depth: 4'	Total Number of Samples: 1
Equipment Type: Case 500L BackHoe	Trench Orientation: N62E			Bucket Width: 2'	Trench Length: 25'
Trench Width: 2'	No. of Samples: Bulk: Grab:	Drive: 1	Hand Auger	Geologist or Hydrogeologist/Date: T. Burton 5/7/99	Checked by/Date

Refusal? (Circle One) Yes / No — If Yes Depth = 4'

Photo (Circle One) Yes / No — No.

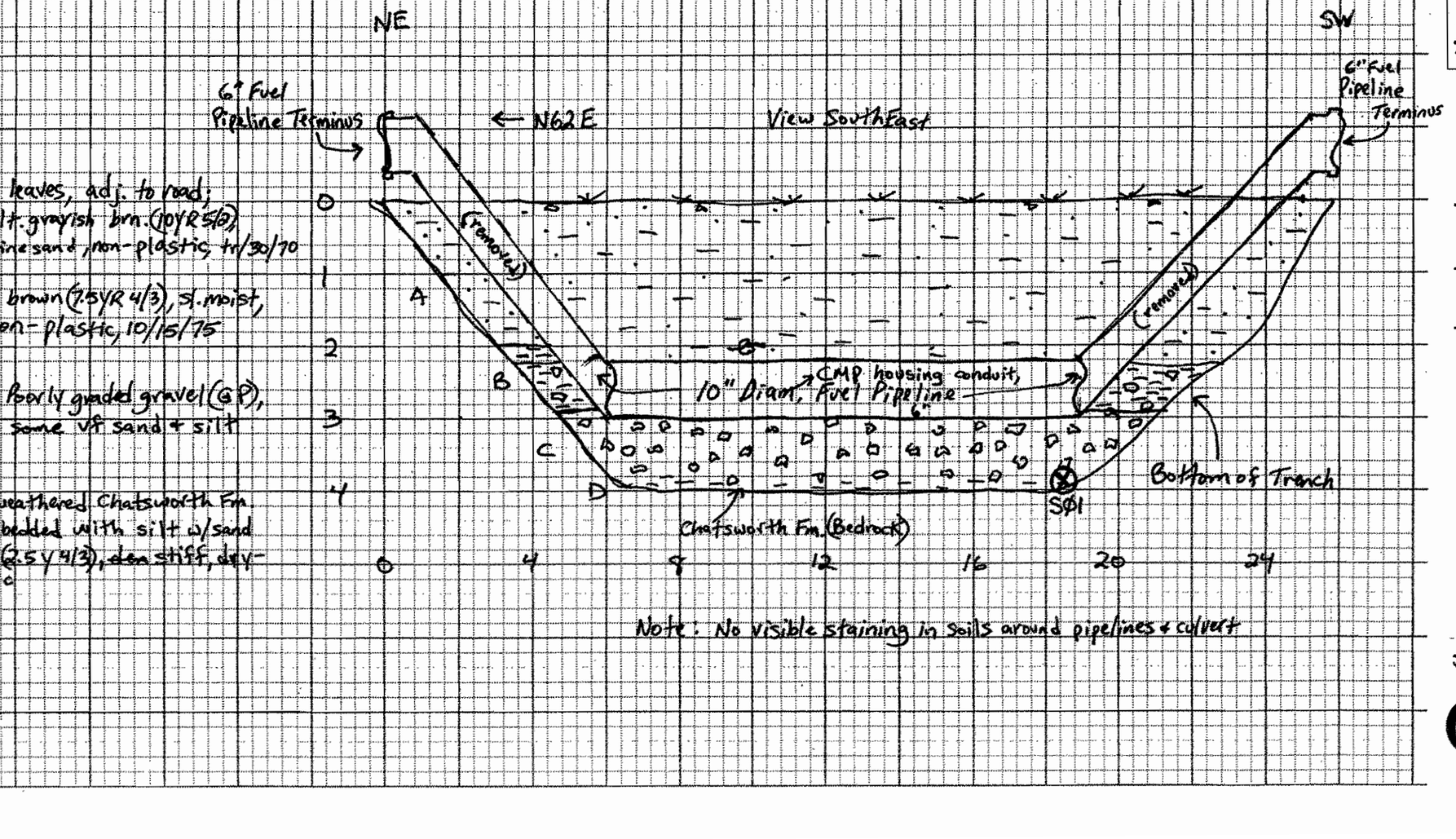
% Man-Made Debris: 5-10

Wall of Trench Shown (Circle One): N (X) E W NE NW (SE) SW

LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 4' Horiz.
1" = 2' Vert.



Surface: flat, dry leaves, adj. to road;

A Sandy silt (ML), lt. grayish brn. (10YR 5/2), dry, v. loose, vf-fine sand, non-plastic, tr/30/70

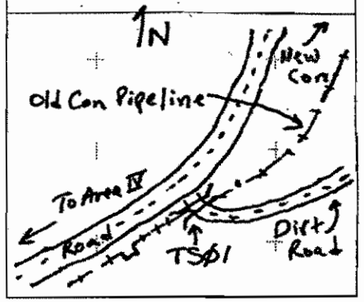
B silt w/sand (ML), brown (7.5YR 4/3), sl. moist, stiff, v. soft, non-plastic, 10/15/75

C Artificial Fill - Poorly graded gravel (GP), fine (pea gravel), some vf sand + silt 90/5/5

D Sandy silt (ML), weathered Chatsworth Fm. siltstone, interbedded with silt w/sand (ML), olive brown (2.5Y 4/3), dense stiff, dry-moist, non-plastic

Note: No visible staining in soils around pipelines & culvert

Plan View-Site Location
(Provide Sketch)



EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBI OUT TO SIDE)
- G — GEOTECHNICAL SAMPL LOCATION (WRITE SAMPLE NUMBI OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS ANC TYPES OF ALL MAJOR DEBRIS

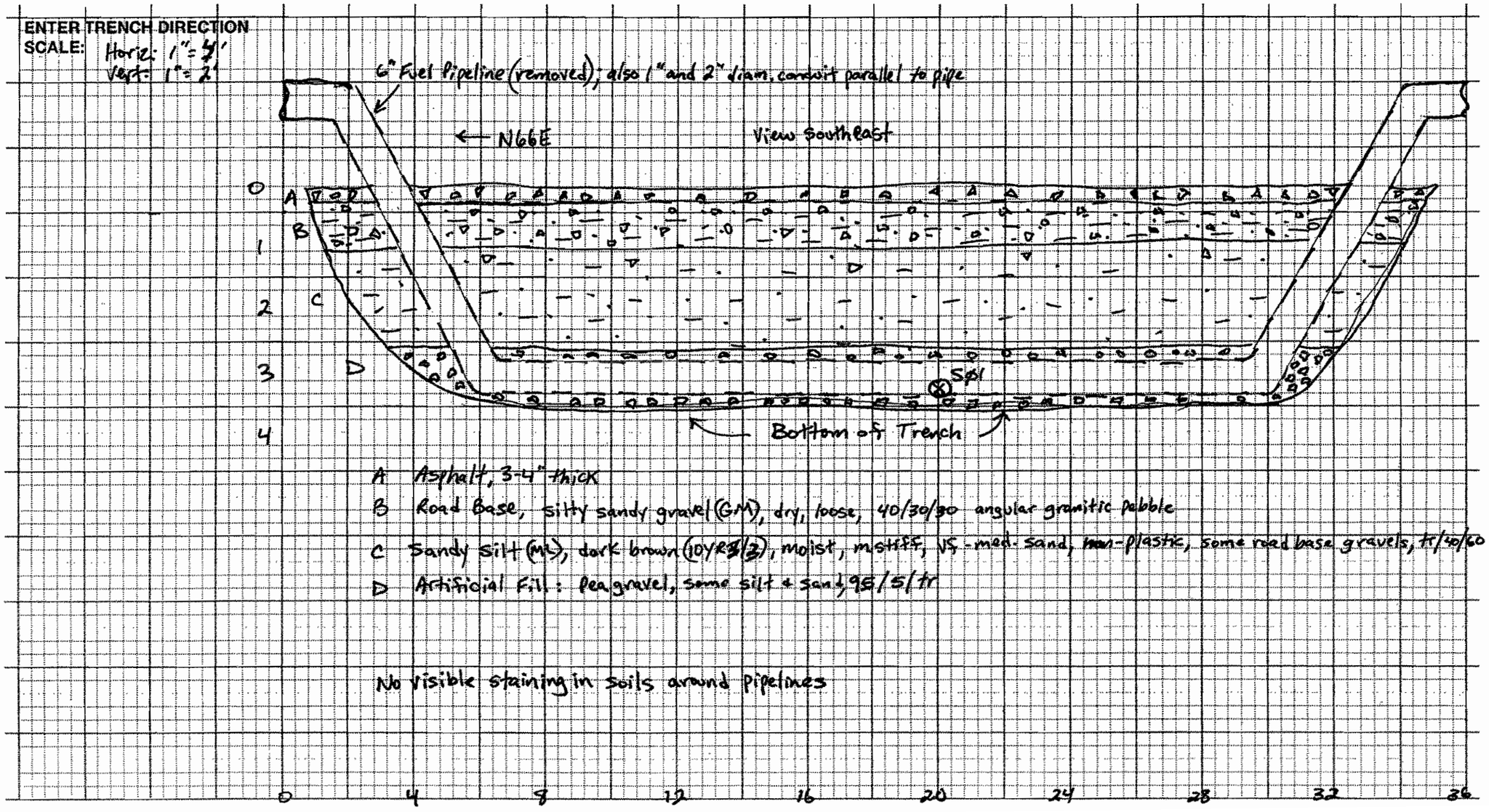
Project Name				**FIELD TRENCH LOG**	
Trench Number: OCTSØa	Project Number: 313150004	Elev. / Datum		Location: Old Con Pipeline, ULS 47	Sheet 1 of 1
Equipment Supplier: Lopez	Operator	Date and Time Started: 5/7/99 1245		Date and Time Completed: 5/7/99 1345	Refusal? (Circle One) Yes (No) If Yes Depth =
Equipment Type: Case Backhoe	Trench Orientation: NE-SW (N66E)	Total Depth: 3.5'		Total Number of Samples: 1	Photo (Circle One) (Yes) No No.
Bucket Width: 2' / Trench Length: 33'	Trench Width: 2.5'	No. of Samples: Bulk: Grab:		Drive: 1 / Hand Auger	% Man-Made Debris: 5-10
Geologist or Hydrogeologist/Date: T. Burton 5/7/99		Checked by/Date			Wall of Trench Shown (Circle One) N (E) W NE NW (SE) SW

LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION

SCALE: Horiz: 1" = 4'
Vert: 1" = 2'



A Asphalt, 3-4" thick

B Road Base, silty sandy gravel (GM), dry, loose, 40/30/30 angular granitic pebble

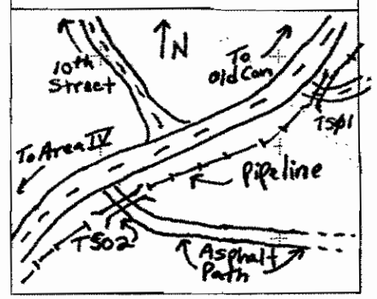
C Sandy Silt (ML), dark brown (10YR3/3), moist, mottled, VS - med. sand, non-plastic, some road base gravels, tr/40/60

D Artificial Fill: pea gravel, some silt + sand, 95/5/tr

No visible staining in soils around pipelines

OGDEN

Plan View-Site Location
(Provide Sketch)



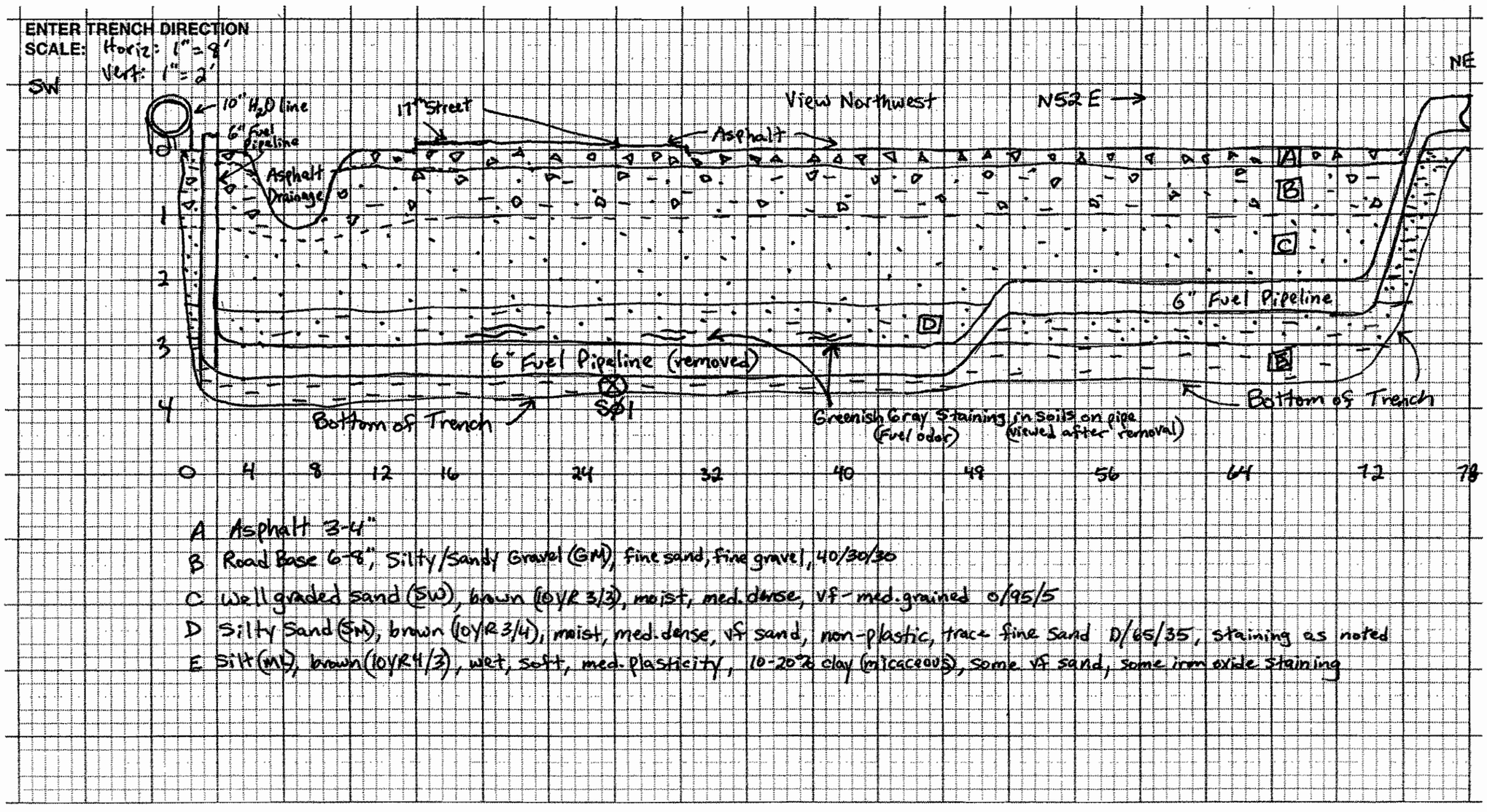
EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPL LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

Project Name: Dr				**FIELD TRENCH LOG**	
Trench Number: OCT503	Project Number: 313150004	Elev. / Datum		Location: Old Con Pipeline, ULS 49	Sheet 1 of 1
Equipment Supplier: Lopez	Operator	Date and Time Started: 5/11/99 0710		Date and Time Completed: 5/11/99 0930	Refusal? (Circle One) Yes (No) If Yes Depth =
Equipment Type: Gesse Backhoe	Trench Orientation: NE-SW (N52E)	Total Depth: 4'		Total Number of Samples: 1	Photo (Circle One) (Yes) No No.
Bucket Width: 2' / Trench Length: 74'	Trench Width: 2.5'	No. of Samples / Bulk / Grab		Drive: 1 / Hand Auger	% Man-Made Debris: 5-10
Geologist or Hydrogeologist/Date: T. Burton		Checked by/Date			Wall of Trench Shown (Circle One) N S E W NE (NW) SE SW

OGDEN

LENGTH (FEET)



A Asphalt 3-4"

B Road Base 6-8", Silty/Sandy Gravel (GM), fine sand, fine gravel, 40/30/30

C Well graded sand (SW), brown (10YR 3/3), moist, med. dense, vf-med. grained 0/95/5

D Silty Sand (SM), brown (10YR 3/4), moist, med. dense, vf sand, non-plastic, trace fine Sand D/65/35, staining as noted

E Silt (ML), brown (10YR 4/3), wet, soft, med. plasticity, 10-20% clay (micaceous), some vf sand, some iron oxide staining

Plan View-Site Location
(Provide Sketch)

EXPLANATION

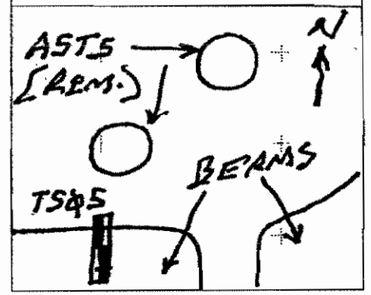
- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG
- FILL/NATIVE BOUNDAR
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMB OUT TO SIDE)
- G — GEOTECHNICAL SAMPI LOCATION (WRITE SAMPLE NUMB OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS ANI TYPES OF ALL MAJOR DEBRIS

FIELD TRENCH LOG

Project Name: DOE					
Trench Number: OC 505 ULS #36	Project Number: 313150004	Elevation/Datum	Location: OLDCON		Sheet 1 of 1
Equipment Supplier: TYREE	Operator: DAVE	Date and Time Started: 6/17/99; 0925	Date and Time Completed		Refusal? (Circle One) Yes (No) If Yes, Depth =
Equipment Type: CASE 580 L	Trench Orientation: N30W	Total Depth	Total Number of Samples: 1		Photo (Circle One) Yes No No.
Bucket Width: 2' / Trench Length: 14'	Trench Width: 4'	No. of Samples / Bulk / Grab	Drive / Hand Auger		% Man-Made Debris: 0
Geologist or Hydrogeologist/Date: D. BARRIE		Checked by/Date			Wall of Trench Shown (Circle One) N S (E) W NE NW SE SW

OGDEN

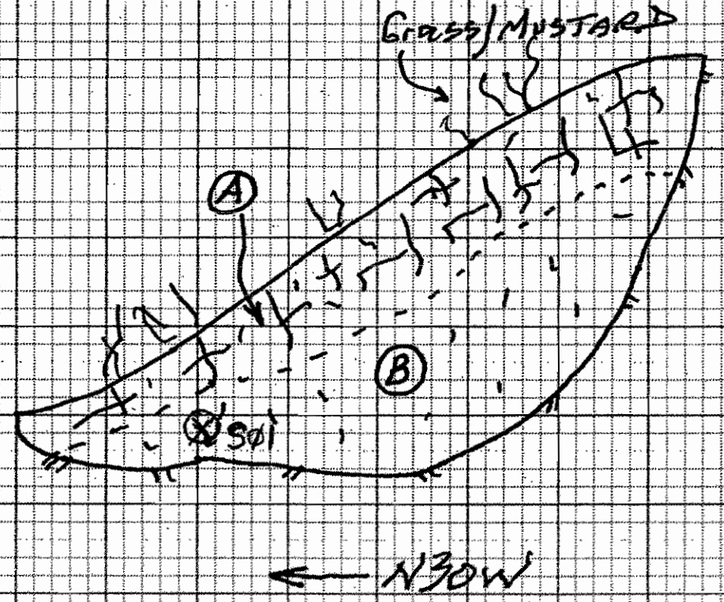
Plan View-Site Location
(Provide Sketch)



LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION: N30W
SCALE: 1" = 4'



GRAV/S/F: (TR/10/90)

UNIT (A): LEAN CLAY (CL); DK. YEL. BRN (10YR 3/4); DRY-MOIST; V. STIFF; BLOCKY TEXTURE; ABUN. ROOTS IN UPPER FT (BERM FILL)

UNIT (B): AS ABOVE (CL) BUT V. STIFF-HARD; MOIST; MORE INTACT/ LESS BLOCKY; GRAD. CONTACT W/ UNIT (A) (BERM FILL)

@ 1040 TS@5SØ1 (From Unit B)

EXPLANATION

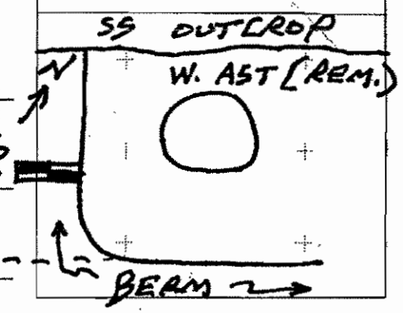
- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPLI LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

FIELD TRENCH LOG

OGDEN

Project Name					
Trench Number: CTS06 (#35)	Project Number: 313150004	Elevation/Datum	Location: OLDCON		Sheet 1 of 1
Equipment Supplier	Operator: DAVE	Date and Time Started: 6/17/99; 0940	Date and Time Completed: 6/17/99; 1110		Refusal? (Circle One) Yes (No) If Yes Depth =
Equipment Type: CASE 580B HOE	Trench Orientation: N42E	Total Depth	Total Number of Samples: 1		Photo (Circle One) Yes No No.
Bucket Width: 2' / Trench Length: 15'	Trench Width: 4'	No. of Samples / Bulk / Grab	Drive: 1	Hand Auger	% Man-Made Debris: 0
Geologist or Hydrogeologist/Date: D. BARRIE		Checked by/Date			Wall of Trench Shown (Circle One) N (S) E W NE NW SE SW

Plan View-Site Location (Provide Sketch)

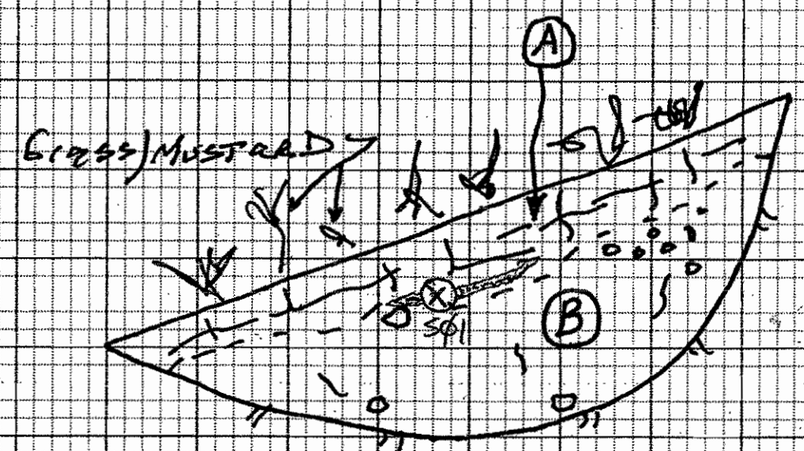


LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 4' H&V

N42E →



UNIT (A): LEAN clay (CL); DK. Yel. BRN (10 YR 3/6); AS IN OCTS05; Tr/10/90; DRY-MOIST; SOFT-STIFF; BLOCKY TEXTURE; ABUN. ROOTS, UPPER 6" (BERM FILL)

UNIT (B): LEAN clay (CL); AS ABOVE BUT MOIST; V. STIFF;

Q = SS BEDROCK FRAG.

N42E →

NOTE: NO VISUAL IMPACTS REL. TO HYDROCARBONS

@1100 TS06S01 from 1" black layer (asphaltic) between Units A&B; layer pinches out in trench

EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

FIELD TRENCH LOG

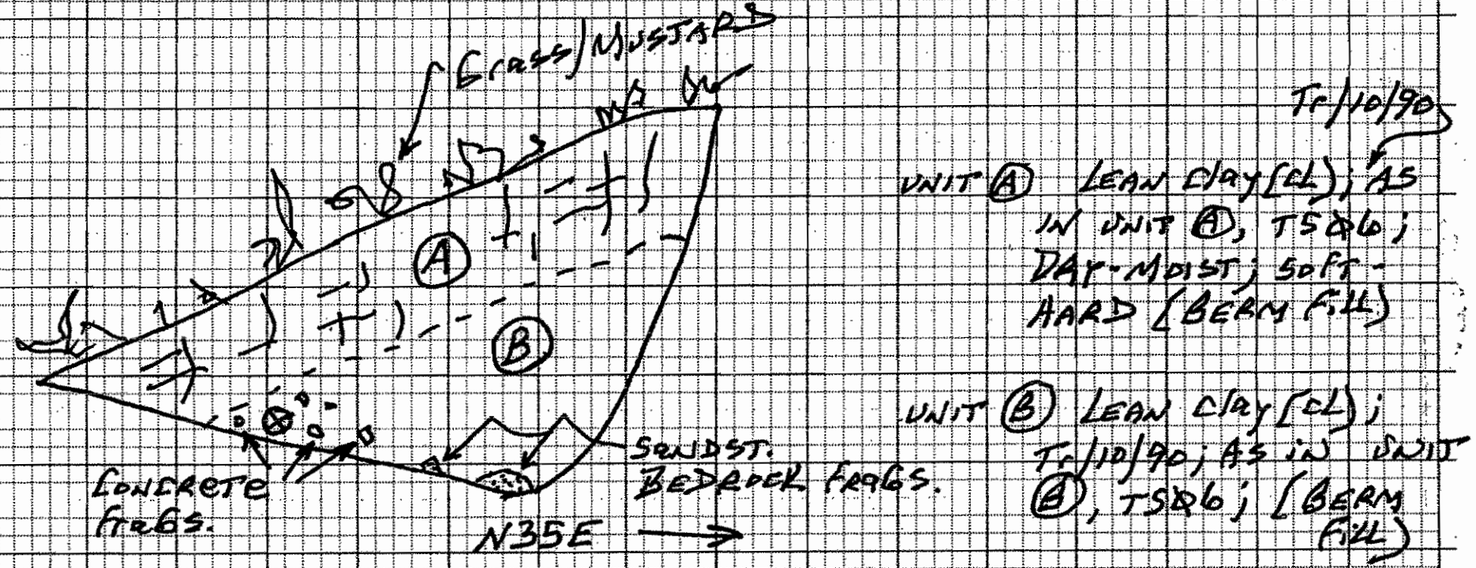
OGDEN

Project Name: DOE				Location: OLD Con	Sheet 1 of 1
Trench Number: CTS07 ULS37	Project Number:	Elevation/Datum:		Date and Time Completed: 6/17/99 1148	Refusal? (Circle One) Yes / No — If Yes Depth =
Equipment Supplier: Tyree	Operator: DAVE	Date and Time Started: 6/17/99		Total Number of Samples: 1	Photo (Circle One) Yes / No — No.
Equipment Type: Case 580 B Hoe	Trench Orientation: N35E	Total Depth:			
Bucket Width:	Trench Length: 15'	Trench Width: 4'	No. of Samples / Bulk / Grab:	Drive: 1 / Hand Auger:	% Man-Made Debris: Tr
Geologist or Hydrogeologist/Date: D. BARRIE		Checked by/Date:			Wall of Trench Shown (Circle One) N S E W NE NW SE SW

LENGTH (FEET)

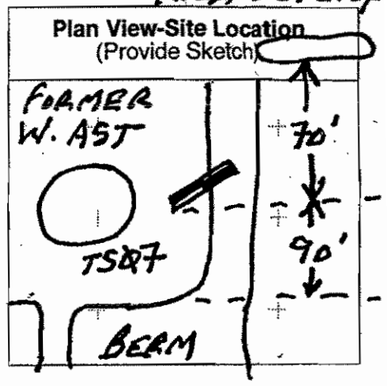
DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE:



N

Plan View-Site Location
(Provide Sketch)



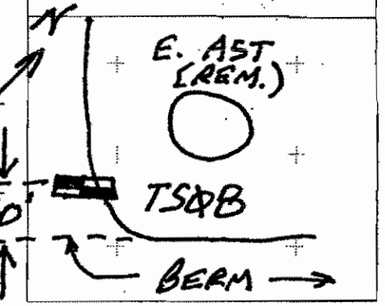
EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPLI LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

Project Name				FIELD TRENCH LOG	
Trench Number DCTS@B	Project Number 313150004	Elevation Datum		Location DLDCON	Sheet 1 of 1
Equipment Supplier TYREE	Operator DAVE	Date and Time Started 6/17/99		Date and Time Completed 6/17/99 1225	Refusal? (Circle One) Yes / No — If Yes Depth =
Equipment Type LaSE 580B HDE	Trench Orientation S50W	Total Depth		Total Number of Samples 1	Photo (Circle One) Yes / No — No.
Bucket Width 2' / Trench Length 10'	Trench Width 4'	No. of Samples	Bulk / Grab	Drive 1 / Hand Auger	% Man-Made Debris
Geologist or Hydrogeologist/Date D. Baillie		Checked by/Date			Wall of Trench Shown (Circle One) (N) S E W NE NW SE SW

OGDEN

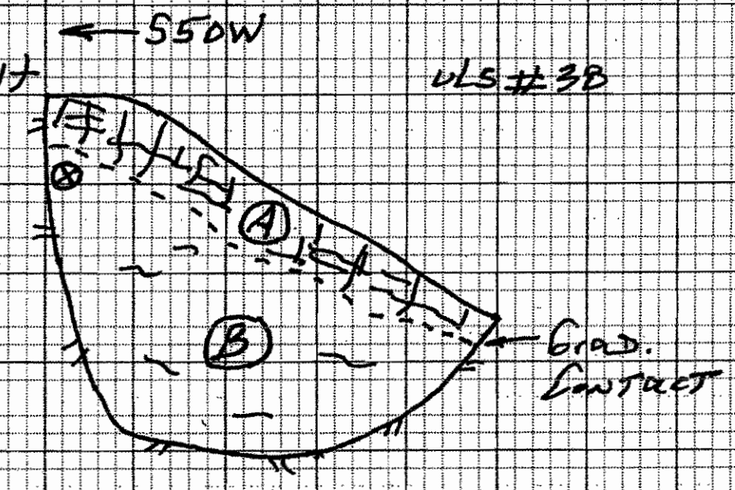
Plan View-Site Location
(Provide Sketch)



LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION S50W
SCALE: 1" = 4' H&V



NOTE: ABUN. Asphalt frags. on Top of BERM (left over from former Asphalt surface now removed)

UNIT (A): LEAN CLAY (CL); AS IN UNIT (A), DCTS@7; MOIST; BLOCKY TEXTURE; SOFT-HARD (BERM FILL)

UNIT (B): LEAN CLAY (CL); AS IN UNIT (B), DCTS@7; V. STIFF-HARD; MOIST; LESS BLOCKY; (BERM FILL)

NOTE: NO VISUAL EVIDENCE OF HYDROCARBON IMPACTS

EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPLI LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

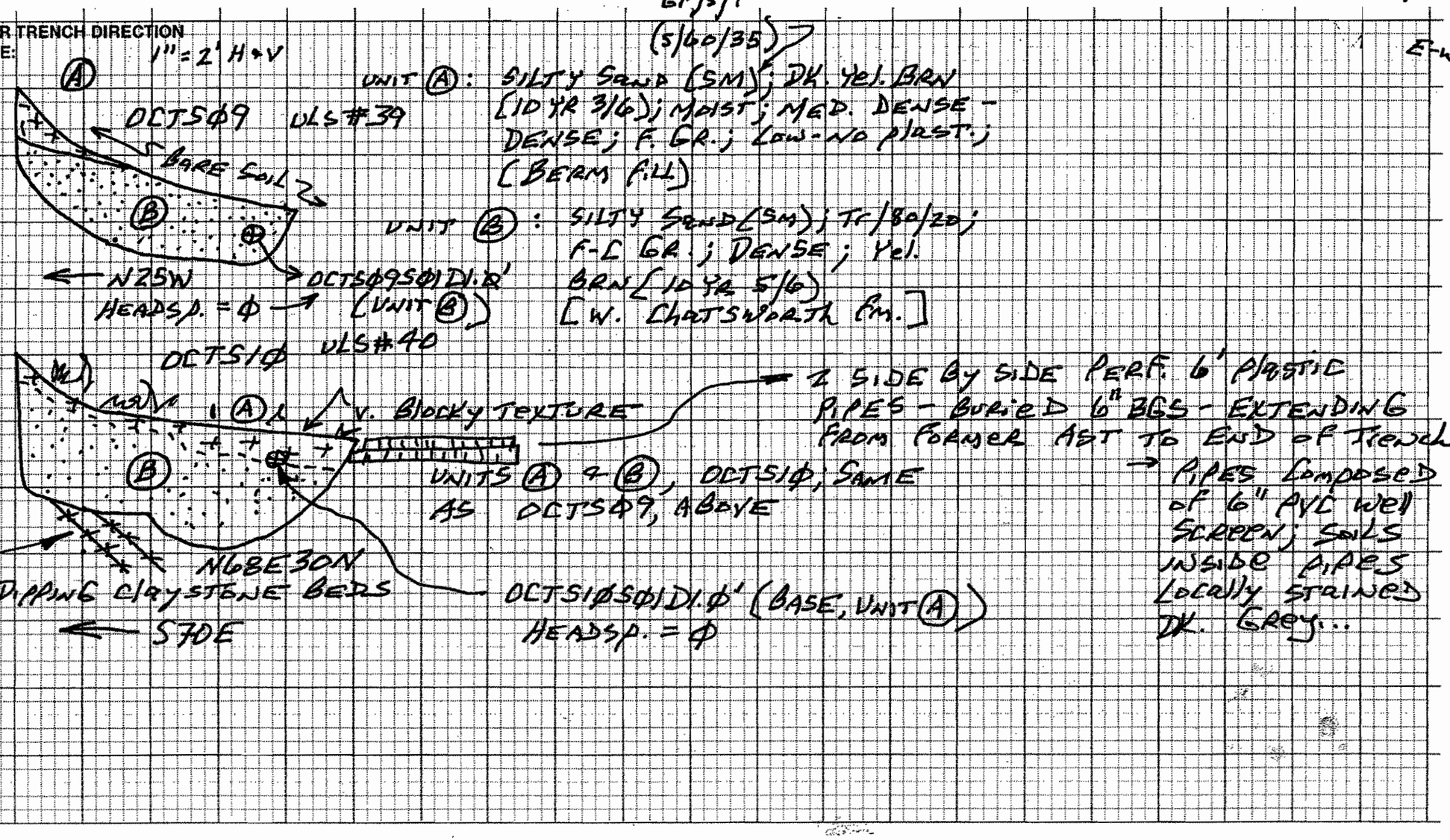
FIELD TRENCH LOG

OGDEN

Project Name: DOE — OCTS1Φ (ULS #40)			Location: OLDLON	Sheet 1 of ___
Trench Number: OCT-Φ9 (ULS#39) +	Project Number: 313150004	Elevation/Datum		Refusal? (Circle One) Yes / No — If Yes Depth =
Equipment Supplier: TYREE	Operator: DAVE	Date and Time Started: 6/17/99 1330	Date and Time Completed: 6/17/99	
Equipment Type: CASE 580 B HOE	Trench Orientation	Total Depth	Total Number of Samples: 1	Photo (Circle One) Yes / No — No.
Bucket Width: 2' — Trench Length	Trench Width: 4'	No. of Samples — Bulk — Grab	Drive: 1 — Hand Auger	% Man-Made Debris: Φ
Geologist or Hydrogeologist/Date: D. BARRIE		Checked by/Date		Wall of Trench Shown (Circle One) N S E W NE NW SE SW

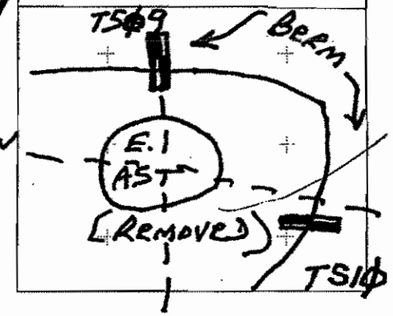
LENGTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 2' H+V



DEPTH (FEET)

Plan View-Site Location
(Provide Sketch)



EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

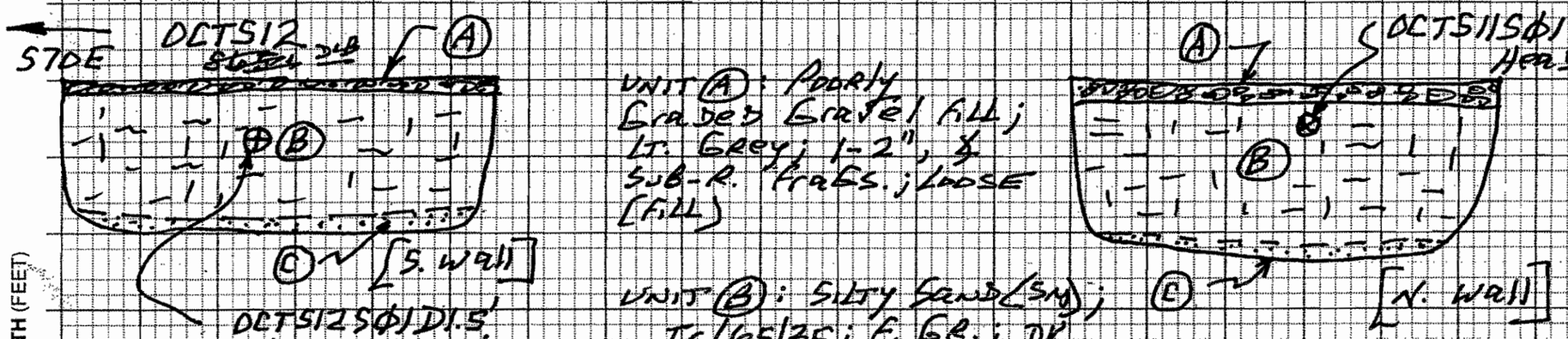
Project Name: [illegible]E + OCTS12 (ULS # 43)			FIELD TRENC[illegible]OG		
Trench Number: OCTS11 (ULS#41)	Project Number: 31315000 4	Elevati[illegible]atum	Location: OLDCON		Sheet 1 of 1
Equipment Supplier: TYREE	Operator: Dave	Date and Time Started	Date and Time Completed: 6/17/99; 1530		Refusal? (Circle One) Yes (No) If Yes Depth =
Equipment Type: Case 580B HOE	Trench Orientation	Total Depth	Total Number of Samples: 2		Photo (Circle One) (Yes) No No.
Bucket Width / Trench Length: 11'	Trench Width: 4'	No. of Samples / Bulk / Grab	Drive: 2	Hand Auger	% Man-Made Debris
Geologist or Hydrogeologist/Date: D. Barrie		Checked by/Date			Wall of Trench Shown (Circle One) N S E W NE NW SE SW

OGDEN

LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 4' H+V



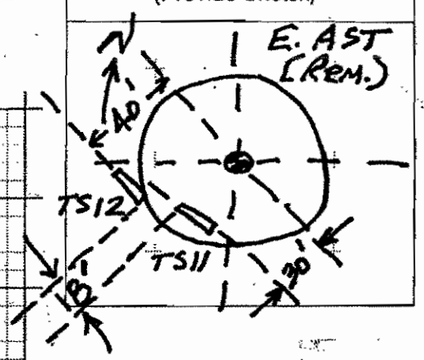
UNIT (A): Poorly Graded Gravel fill; Lt. Grey; 1-2", ∡ Sub-R. Frags.; Loose [Fill]

UNIT (B): Silty Sand (SM); Tr/65/35; F. Gr.; Dk Yel. Brn (10YR 4/6); Moist; Loose - Dense; Sl. Petro. Hyd. odor & Dark staining Locally (W. Bedrock)

UNIT (C): Poorly Graded Sand w/Silt [SP-SM]; Tr/90/10; Yel. Brn (10 YR 5/8); Friable; Poorly indurated; (Chatsworth Fm. - Less W. Than above)

UNIT (B): Dk. Brn (7.5YR 3/4); Appears stained w/ Hydrocarbons - otherwise, same as unit (B), OCTS11

Plan View-Site Location
(Provide Sketch)



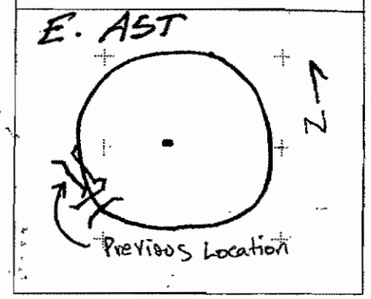
EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

Project Name: DOE			FIELD TRENC[illegible]G		
Trench Number: DCT512E	Project Number:	Elev[illegible]atum:	Location: OLDCON ULS 43		Sheet 1 of 1
Equipment Supplier: TYREE	Operator:	Date and Time Started: 9/21/99;	Date and Time Completed: 9/21/99;		Refusal? (Circle One) Yes No — If Yes Depth =
Equipment Type: Case 580L HOE	Trench Orientation: N45W	Total Depth: 4.7'	Total Number of Samples:		Photo (Circle One) Yes No No.
Bucket Width: / Trench Length:	Trench Width:	No. of Samples: / Bulk: / Grab:	Drive:	Hand Auger:	% Man-Made Debris: TR.
Geologist or Hydrogeologist/Date: D. Barrie		Checked by/Date:			Wall of Trench Shown (Circle One) N S E W NE NW SE SW

OGDEN

Plan View-Site Location
(Provide Sketch)

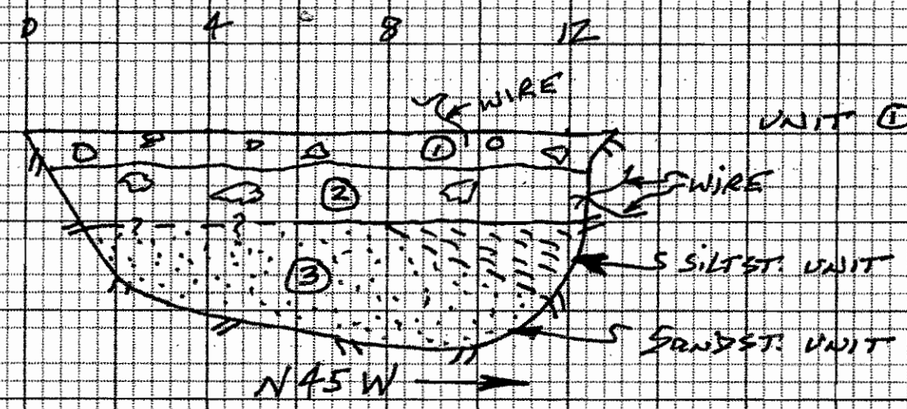


LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 4' H & V

Note: Trench Re-excavated from 6/17/99



UNIT ①: Silty Sand (SM); DK. Yel. Brn (10YR 4/6); Dry-Moist; Loose; F-M. Gr.; Contains Abun. SS Bedrock Frags; 20/65/15

UNIT ②: Silty Sand (SM); DK. Yel. Brn (10YR 3/4); Darker than Units ① & ③ - Poss. Hydrocarbon Staining; However, no Hydrocarbon Odor; Moist; F-M Gr.

UNIT ③: Interbedded Sandst. & Sltst. Bedrock; Yel. Brn (10YR 5/6); Sandst. = Med. Gr.; Fe-oxide stained, locally

EXPLANATION

- SOIL TYPE CONTACT (SHARP)
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- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

FIELD TRENCH LOG

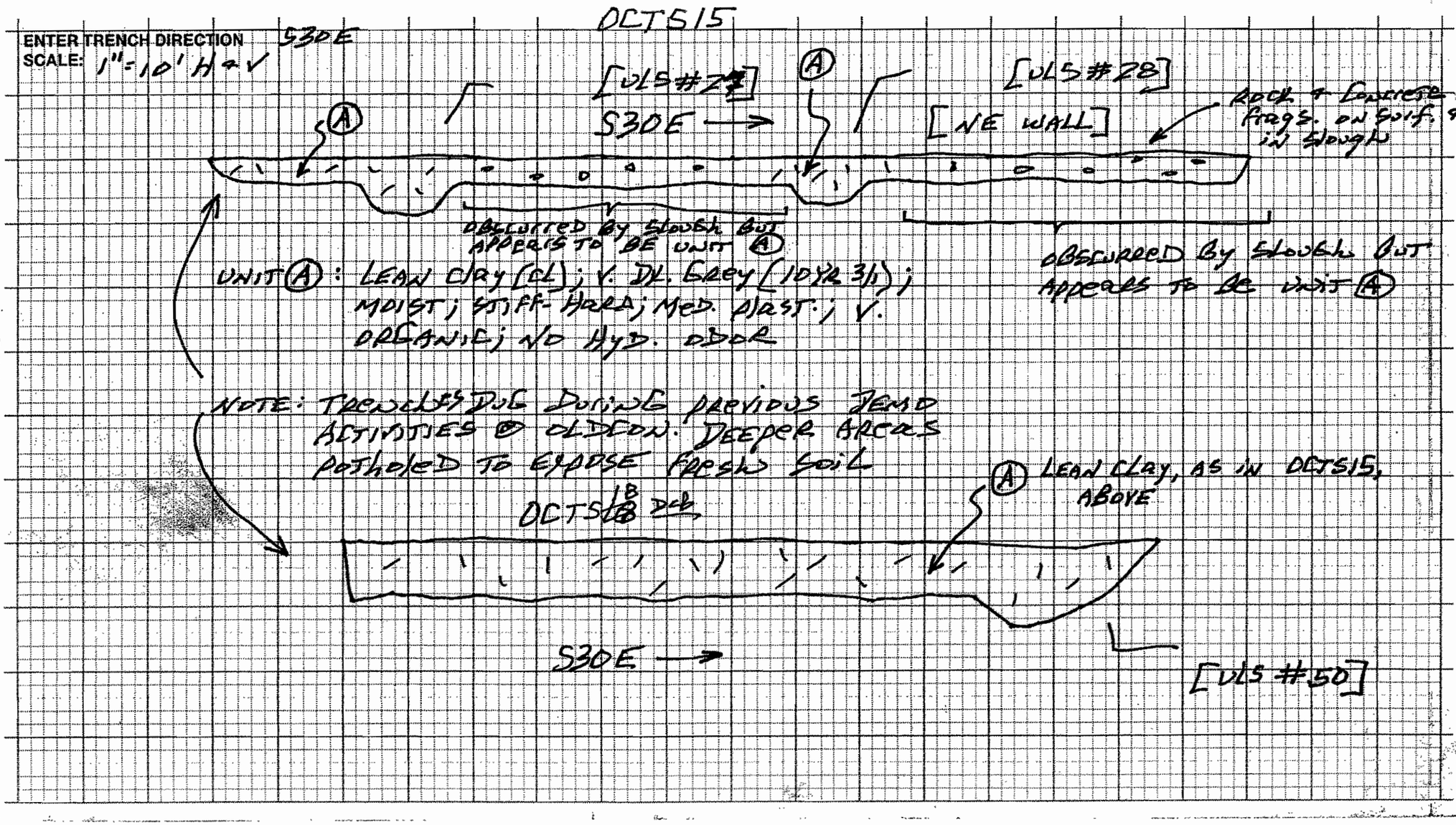
OGDEN

Project Name: DOE					
Trench Number: OCT515 [ULS #28 & 29] & OCT5~~16~~ 10 DCB	Project Number: 31315 0004	Elevation/Datum:	Location: OLDCON		Sheet 1 of 1
Equipment Supplier: TYREE	Operator: DAVE	Date and Time Started: 6/17/99;	Date and Time Completed: 6/18/99;		Refusal? (Circle One) Yes (No) If Yes Depth =
Equipment Type: CASE 580 B HOE	Trench Orientation: S30E	Total Depth:	Total Number of Samples: 2		Photo (Circle One) (Yes) No No.
Bucket Width: 2' Trench Length: 80'	Trench Width: 6'	No. of Samples: Bulk: Grab: 2	Drive:	Hand Auger:	% Man-Made Debris
Geologist or Hydrogeologist/Date: D. BARRIE		Checked by/Date:			Wall of Trench Shown (Circle One) N S E W (NE) NW SE SW

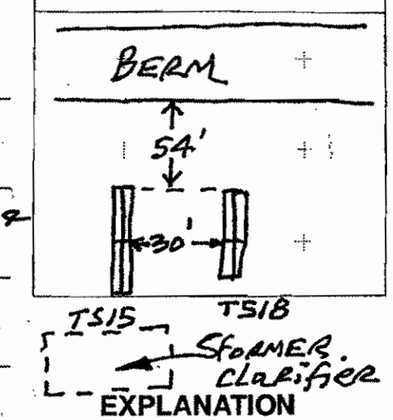
LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION S30E
SCALE: 1" = 10' H & V



Plan View-Site Location
(Provide Sketch)



EXPLANATION

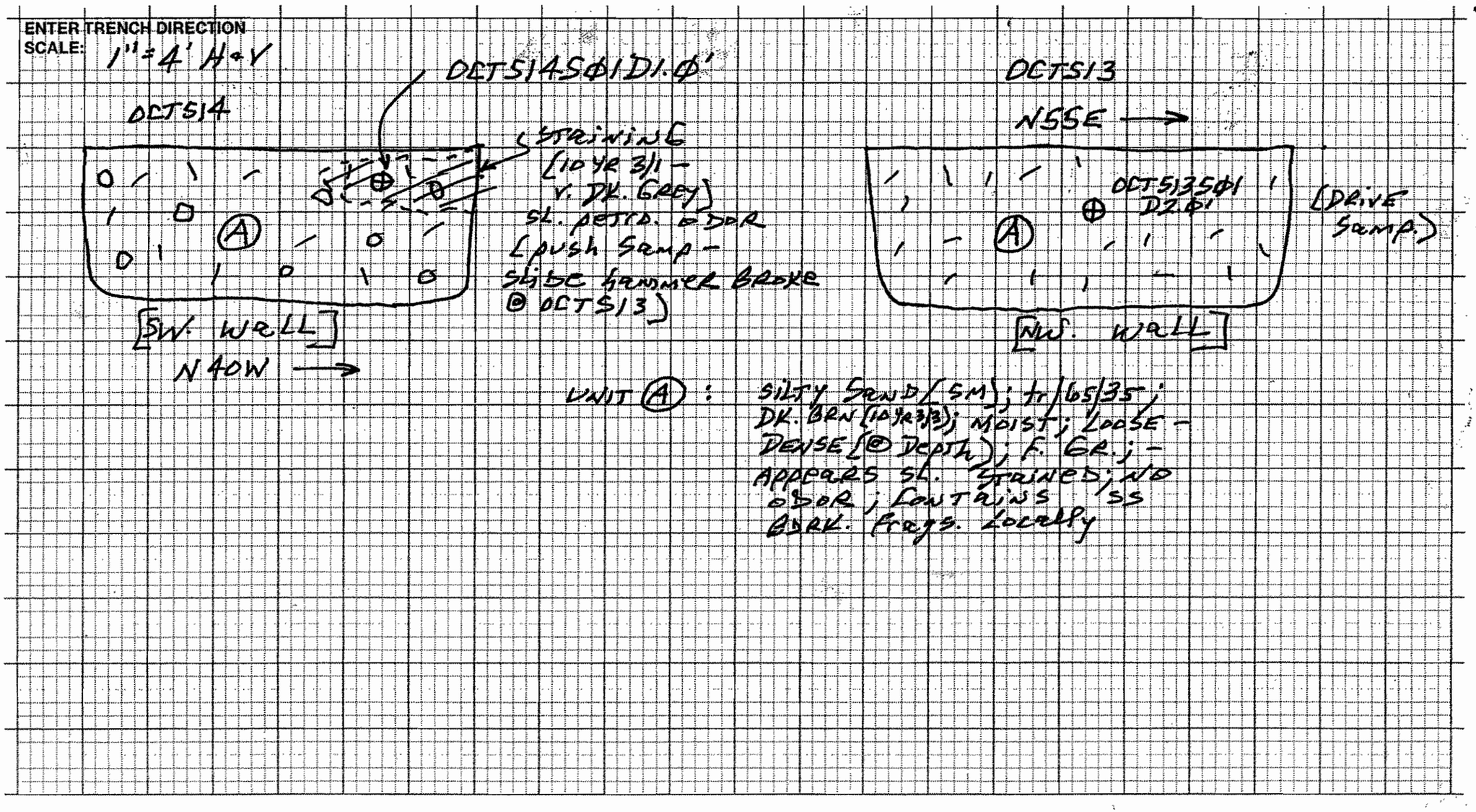
- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPLI LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

Project Name: DOE OCTS13 (ULS #42)							FIELD TRENCH LOG		
Trench Number: OCTS14 (ULS#44) &	Project Number		Elevation/Datum				Location		Sheet 1 of 1
Equipment Supplier: TYREE	Operator: DAVE		Date and Time Started				Date and Time Completed: 6/17/99 1645		Refusal? (Circle One) Yes / No — If Yes Depth =
Equipment Type: CASE 580B HOE	Trench Orientation		Total Depth				Total Number of Samples: 2		Photo (Circle One) Yes / No — No.
Bucket Width: 2'	Trench Length	Trench Width: 4'	No. of Samples	Bulk	Grab: 1		Drive: 1	Hand Auger	% Man-Made Debris: Former W. AST
Geologist or Hydrogeologist/Date: D. BARRIE			Checked by/Date						Wall of Trench Shown (Circle One) N S E W NE NW SE SW

LENGTH (FEET)

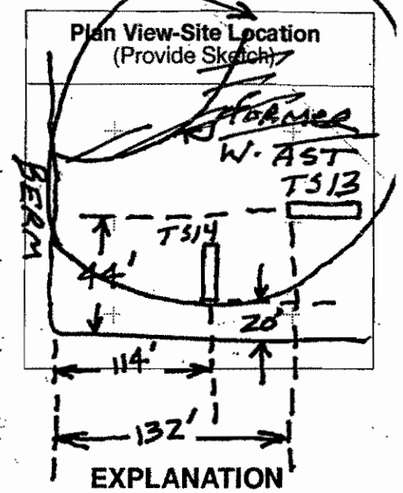
DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 4' H & V



OGDEN

Plan View-Site Location
(Provide Sketch)



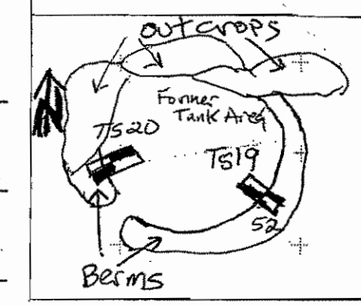
EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

Project Name			FIELD TRENCH LOG	
Trench Number: OCTS 19, OCTS20	Project Number: 313150004	Elev. Datum	Location: Old Con - Former AST (West)	Sheet 1 of 1
Equipment Supplier: Tyree	Operator: Dave Y.	Date and Time Started: 6/18/99 1035	Date and Time Completed: 6/18/99 1240	Refusal? (Circle One) Yes No; If Yes Depth = see log
Equipment Type: Case 580 B.hoe	Trench Orientation: TS19: N45W, TS20: N45E	Total Depth: TS19 = 5'; TS20 = 5'	Total Number of Samples: 2	Photo (Circle One) Yes No No.
Bucket Width: 24" / Trench Length: 9' (TS19), 6.5' (TS20)	Trench Width: 24" (both)	No. of Samples / Bulk / Grab: 2	Drive / Hand Auger	% Man-Made Debris: 5%
Geologist or Hydrogeologist/Date: T. Burton 6/18/99		Checked by/Date		Wall of Trench Shown (Circle One): N S E W NE NW SE SW

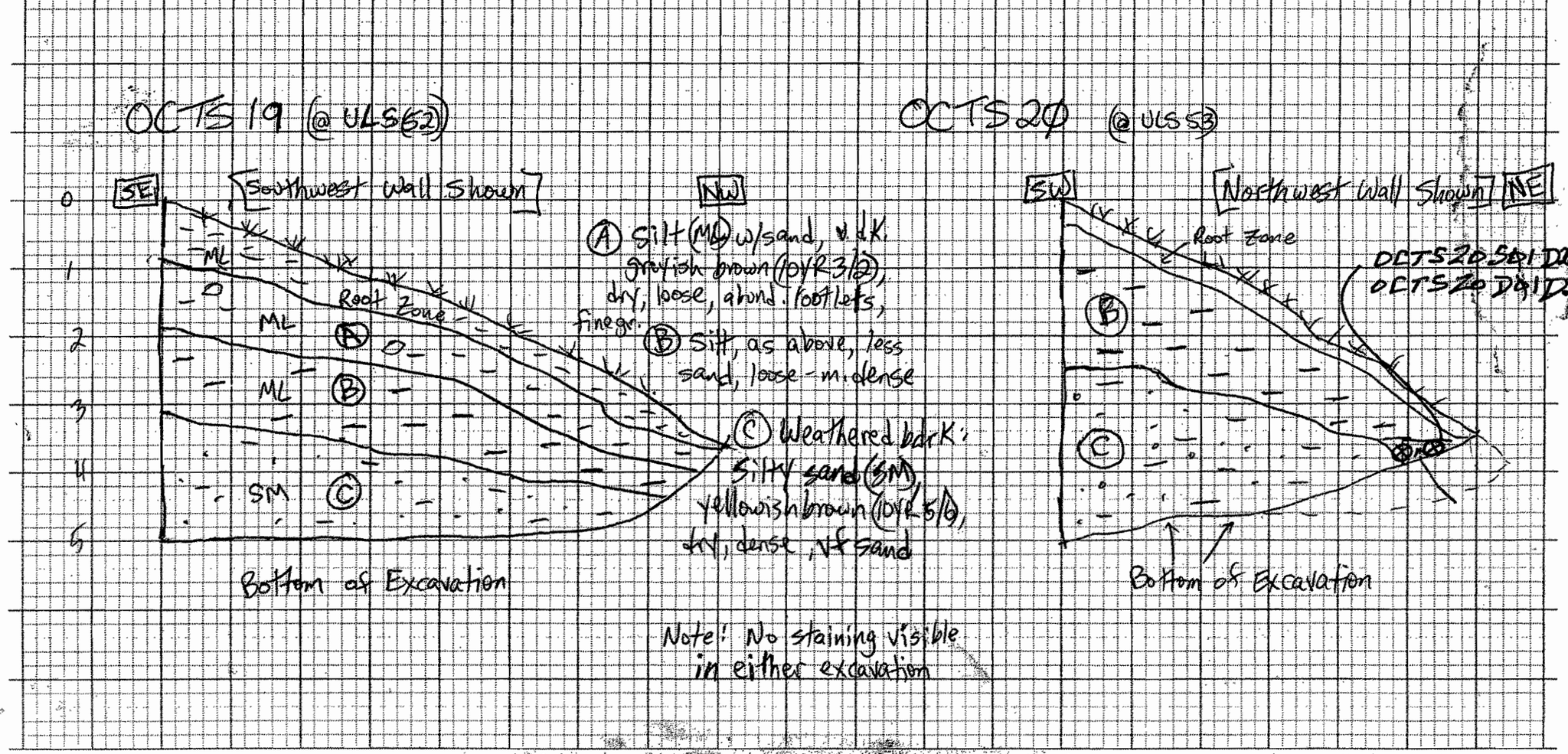
OGDEN

Plan View-Site Location (Provide Sketch)



LENGTH (FEET)

ENTER TRENCH DIRECTION
SCALE: Horiz. = Vert. 1" = 2'



Note! No staining visible in either excavation

EXPLANATION

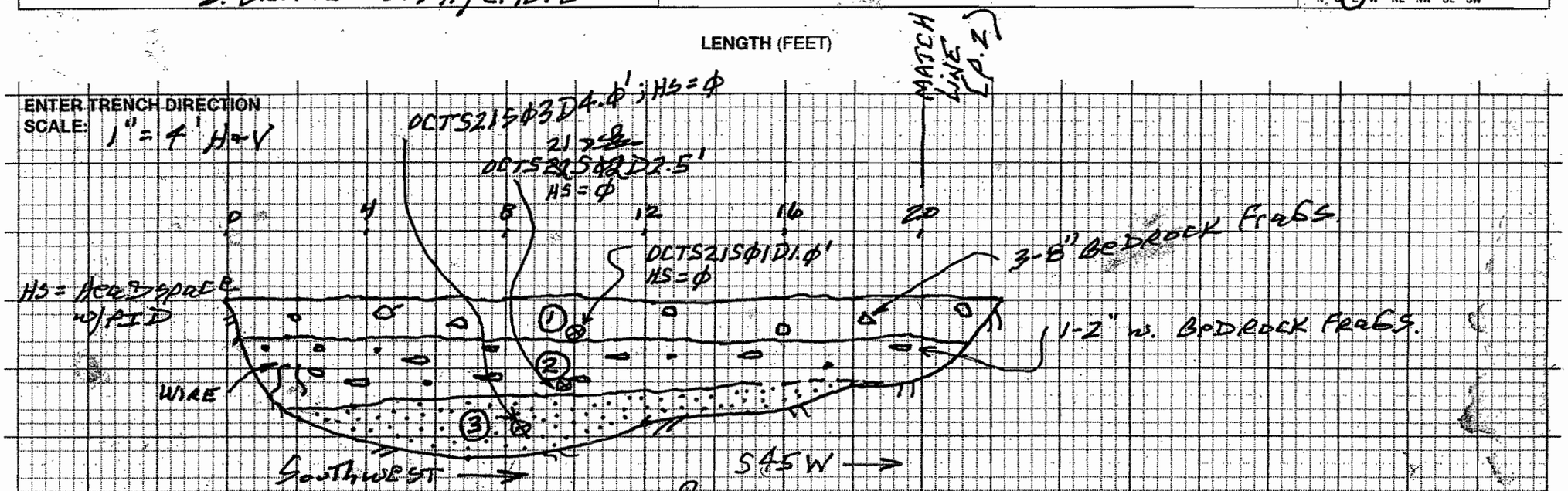
- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G GEOTECHNICAL SAMPL LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

Project Name: [illegible] DoE				FIELD TRENCH LOG	
Trench Number: OCTS21	Project Number: 313150004	Elevation and Datum	Location: DLDCON		Sheet 1 of 2
Equipment Supplier: TYREE	Operator	Date and Time Started: 9/21/99; 1100	Date and Time Completed: 9/21/99; 1430		Refusal? (Circle One) Yes / No — If Yes, Depth = 2.5-4'
Equipment Type: CASE 580 L HOE	Trench Orientation: NE-SW	Total Depth: 4'	Total Number of Samples: 3		Photo (Circle One) Yes / No — No.
Bucket Width: 24" — Trench Length	Trench Width: 3.5'	No. of Samples — Bulk — Grab	Drive: 3 — Hand Auger		% Man-Made Debris: 2% TR.
Geologist or Hydrogeologist/Date: D. BRARIE & S. MIYAMOTO	Checked by/Date				Wall of Trench Shown (Circle One): N, S, E, W, NE, NW, SE, SW

LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 4' H=V



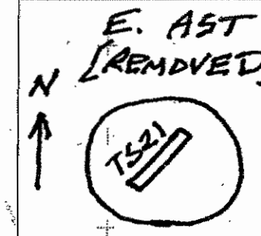
UNIT ①: SILTY SAND [SM]; LT. OLIVE BRN [2.5Y 5/6]; MOIST; LOOSE-MED. DENSE; F-M GR.; CONTAINS ABUN. SS BEDROCK FRAGS. w/GRAVEL

UNIT ②: SILTY SAND [SM]; DK. YEL BRN [10YR 3/6 - 4/6]; MOIST; MED. DENSE; F. GR.; CONTAINS MORE FINES THAN ABOVE (Tr/65/35); [POSS. LT. HYDROCARBON STAINING THROUGHOUT UNIT; HOWEVER, NO ODOR, NO HEADSPACE READING].

UNIT ③: [SANDSTONE BEDROCK], BREAKS DOWN TO SILTY SAND [SM]; LT. OLIVE BRN [2.5Y 5/6]; MOIST; FRIABLE; V. WEATH. IN UPPER FOOT; (Tr/80/20)

OGDEN

Plan View-Site Location
(Provide Sketch)



EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPLI LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

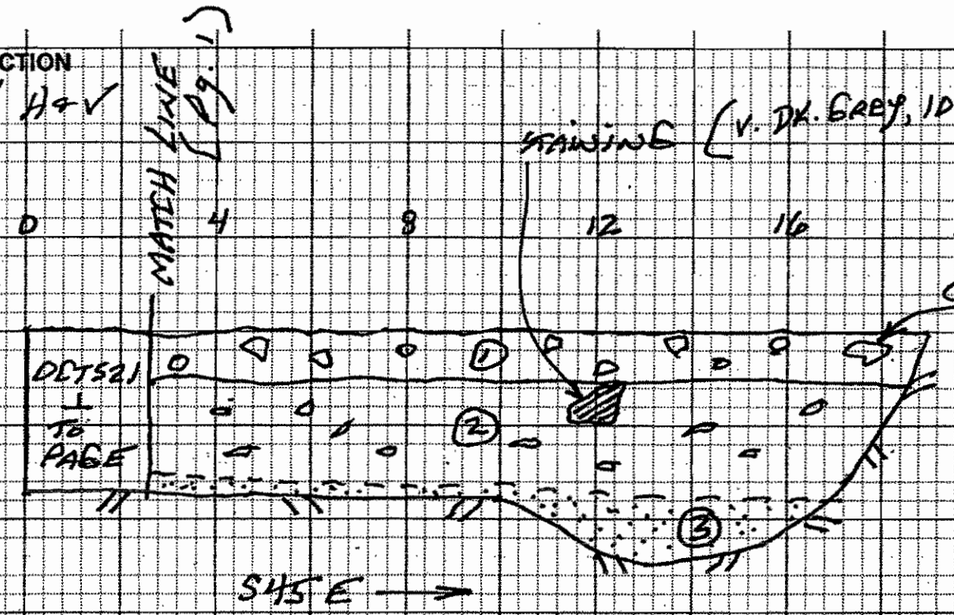
FIELD TRENCH LOG

Project Name: DOE					
Trench Number: OCTS21 ~~6~~ 7&8	Project Number: 313150004	Elevation Datum:	Location: OLDCON		Sheet 2 of 2
Equipment Supplier: TYREE	Operator:	Date and Time Started: 9/21/99; 1415	Date and Time Completed: 9/21/99;		Refusal? (Circle One) Yes No — If Yes Depth =
Equipment Type: CASE 580L HOE	Trench Orientation: S45E	Total Depth:	Total Number of Samples: ϕ		Photo (Circle One) Yes No No.
Bucket Width: / Trench Length:	Trench Width: 3.5'	No. of Samples: / Bulk: / Grab:	Drive:	Hand Auger:	% Man-Made Debris: TR.
Geologist or Hydrogeologist/Date: D. BARRIE & S. MIYAMOTO		Checked by/Date:			Wall of Trench Shown (Circle One) N S E W NE NW SE SW

LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 4' H&V



UNIT 1: SEE DESC. FOR OCTS21
UNIT 2: " " " "
UNIT 3: " " " "

NOTE: NO SAMPLES COLLECTED - THIS TRENCH ≡ 90° BEND/CONTINUATION OF OCTS21

Plan Vi
(Provi
N
E. AS
TS21
TS21b

EXPLANAT

SOIL TYP (SHARP)

OTHER C (AS INDIC

FILL/NAT

X ANALYIC LOCATIC (WRITE S OUT TO

G GEOTEC LOCATIC (WRITE S OUT TO

SHADING STAINING

BASE OF

SHOW L TYPES C DEBRIS

Project Name: DOE				**FIELD TRENCH**	
Trench Number: LTS22	Project Number: 313150004	Elevation Datum		Location: OLDCON	Sheet 1 of 1
Equipment Supplier: TYREE	Operator: MATT	Date and Time Started: 9/21/99 1530		Date and Time Completed: 9/21/99 1630	Refusal? (Circle One) Yes / No — If Yes Depth =
Equipment Type: CASE 580L HDE	Trench Orientation: N-S	Total Depth: 2'		Total Number of Samples: 2	Photo (Circle One) Yes / No — No.
Bucket Width: 2' — Trench Length: 10'	Trench Width: 3.5'	No. of Samples: Bulk — Grab: 1		Drive: 1 — Hand Auger	% Man-Made Debris
Geologist or Hydrogeologist/Date: D. Barrie		Checked by/Date			Wall of Trench Shown (Circle One) N S E W NE NW SE SW

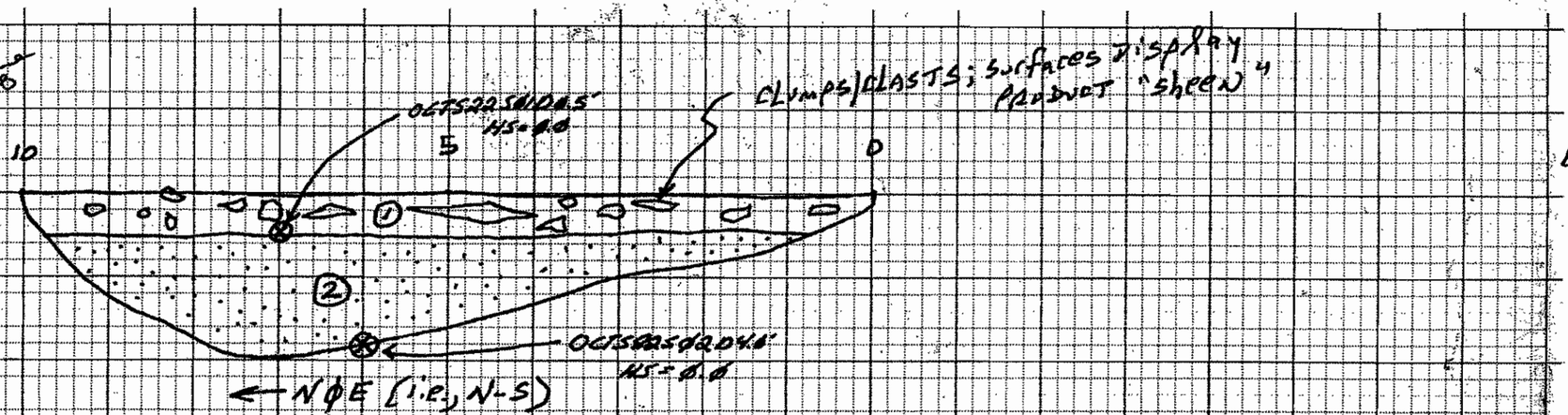
OGDEN

LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION

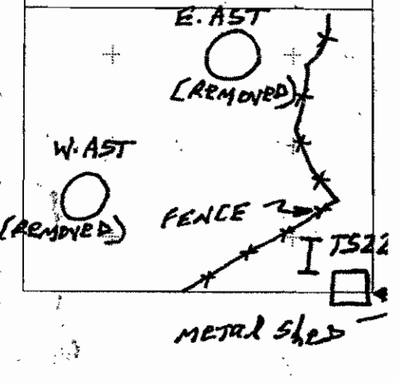
SCALE: 1" = 2' H & 1" = 4' V



UNIT ①: SILTY SAND (SM); V. DUSKY RED (10R 2.5/2); MOIST; LOOSE - MED. DENSE; V. BRITTLE; STRONG HYDROCARBON ODOR - APPEARS TO BE COMPOSED OF 2-3 LAYERS OF APPLIED (SPRAYED-ON ?) PRODUCT (SHEEN ON FRACT. SURFS.)

UNIT ②: SILTY SAND (SM); STRONG BRN (7.5YR 4/6); MOIST; MED. DENSE; F. GR.; VISIBLE (i.e., PINHOLE - SIZE) PORS. (0/80/20); NO STAINING VISIBLE.

Plan View-Site Location
(Provide Sketch)



EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPL LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

MWH
MONTGOMERY WATSON HARZA

BY T. Burton DATE 10/31/00 CLIENT _____ SHEET _____ OF _____

CHKD. BY _____ DESCRIPTION _____ JOB NO. _____

Description of Soil Units - OCY Northern/Southern Debris Area Trenches

(A) Silty sand, SM, brown to dark brown (10YR 4/4 to 4/2), dry, loose to very loose, well graded, gravelly in places w/ sandstone fragments and/or anthropogenic (artificial fill) 1" road gravels

(B) Ash-burn layer: silt w/gravel (ML), grayish brown to brown (10YR 4/3 to 3/3), dry, loose to very loose (soft), with 15-25% sandstone and or artificial fill gravels (up to 1").

(C) Silty sand (SM), brownish yellow 10YR 6/6, dry, loose to med. dense, well graded, fine to coarse sands, weathered products of Chatsworth Fm. bedrock

(M) Metallic Debris: miscellaneous pipes and material in various lengths/sizes; debris is burnt + rusted; soil darkened

(T) Transite/asbestos-containing material (ACM) - most buried transite fragments intact + not friable

Note: All trenches excavated to bedrock in debris areas.

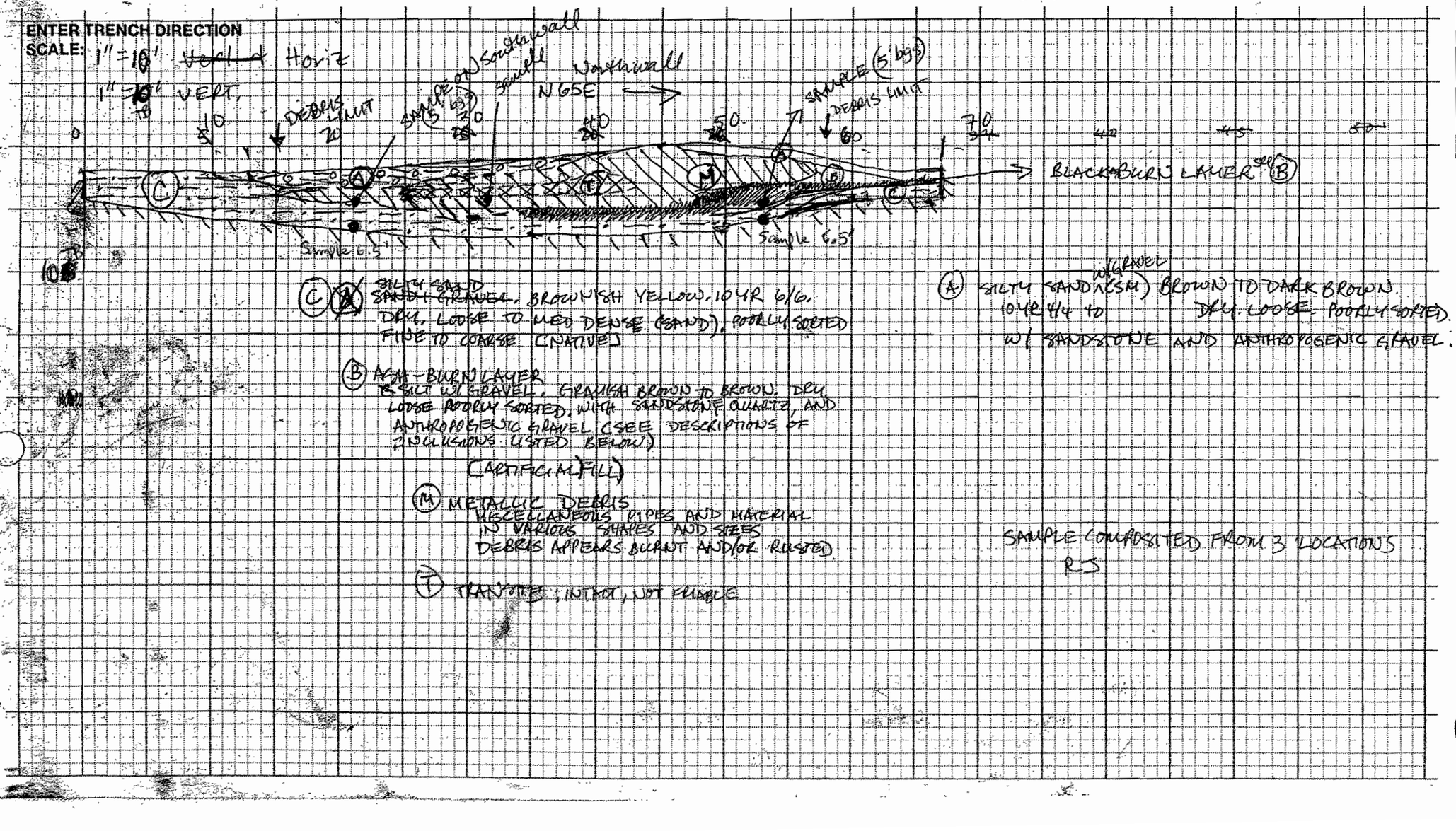
FIELD TRENCH LOG

OGDEN

Project Name: ROCKETDYNE				
Trench No.: OCTS23	Project Number: 31319000 4	Location and Datum:	Location: OLD CON	Sheet 1 of 1
Equipment Supplier: DEERE	Operator: GREG. MANOLY	Date and Time Started: 10/31/00 0815	Date and Time Completed: 10/31/00 0910	Refusal? (Circle One) Yes (No) If Yes Depth =
Equipment Type: BACKHOE	Trench Orientation: N65 ~~70~~ W	Total Depth: MAX DEPTH (CENTER) 4' bgs	Total Number of Samples:	Photo (Circle One) Yes No No.
Bucket Width: 24" / Trench Length: 67'	Trench Width: 30"	No. of Samples / Bulk / Grab	Drive / Hand Auger	% Man-Made Debris
Geologist or Hydrogeologist/Date: C DOMINGO 10/31/00		Checked by/Date: D BARRIE 10/31/00	T. Burton 9/21/06	Wall of Trench Shown (Circle One) (N) S E W (NE) NW SE SW

LENGTH (FEET)

Note: Log augmented to show sample locations within trench.



(C) (A) SILTY SAND ~~SANDY GRAVEL~~, BROWNISH YELLOW, 10YR 6/6. DRY, LOOSE TO MED DENSE (SAND), POORLY SORTED FINE TO COARSE [NATIVE]

(B) ASH-BURN LAYER
SILT W/ GRAVEL, GRAYISH BROWN TO BROWN. DRY, LOOSE POORLY SORTED, WITH SANDSTONE, QUARTZ, AND ANTHROPOGENIC GRAVEL (SEE DESCRIPTIONS OF INCLUSIONS LISTED BELOW)
[ARTIFICIAL FILL]

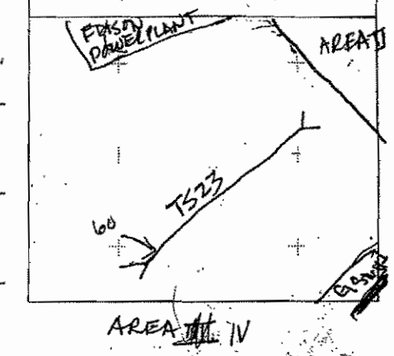
(M) METALLIC DEBRIS
MISCELLANEOUS PIPES AND MATERIAL IN VARIOUS SHAPES AND SIZES
DEBRIS APPEARS BURNT AND/OR RUSTED

(T) TRANSITE; INTACT, NOT FRIABLE

(A) SILTY SAND W/ GRAVEL (SM) BROWN TO DARK BROWN. 10YR 4/4 to DRY. LOOSE. POORLY SORTED. W/ SANDSTONE AND ANTHROPOGENIC GRAVEL.

SAMPLE COMPOSITED FROM 3 LOCATIONS
RJ

Plan View-Site Location
(Provide Sketch)



EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG
- FILL/NATIVE BOUNDARY
- X ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G GEOTECHNICAL SAMPL LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

FIELD TRENCH LOG

OGDEN

Project Name: ROCKETDYNE			
Trench Number: OCTS24 ; #63 and OCTS35 #63	Project Number: 31315000114	Elevation and Datum:	Location: OLD CON (OC)
Equipment Supplier: DEERE	Operator:	Date and Time Started: 10/31/00 0920	Date and Time Completed: 10/31/00 1135
Equipment Type: BACKHOE	Trench Orientation: SEE LOGS	~~Total Depth~~ MAX DEPTH CENTER 6' bgs	Total Number of Samples:
Bucket Width: 24" / Trench Length: 75'	Trench Width: 30"	No. of Samples: / Bulk: / Grab:	Drive: / Hand Auger:
Geologist or Hydrogeologist/Date:		Checked by/Date: T. Burton 9/21/06	

Sheet 1 of 1

Refusal? (Circle One) Yes (No) If Yes Depth =

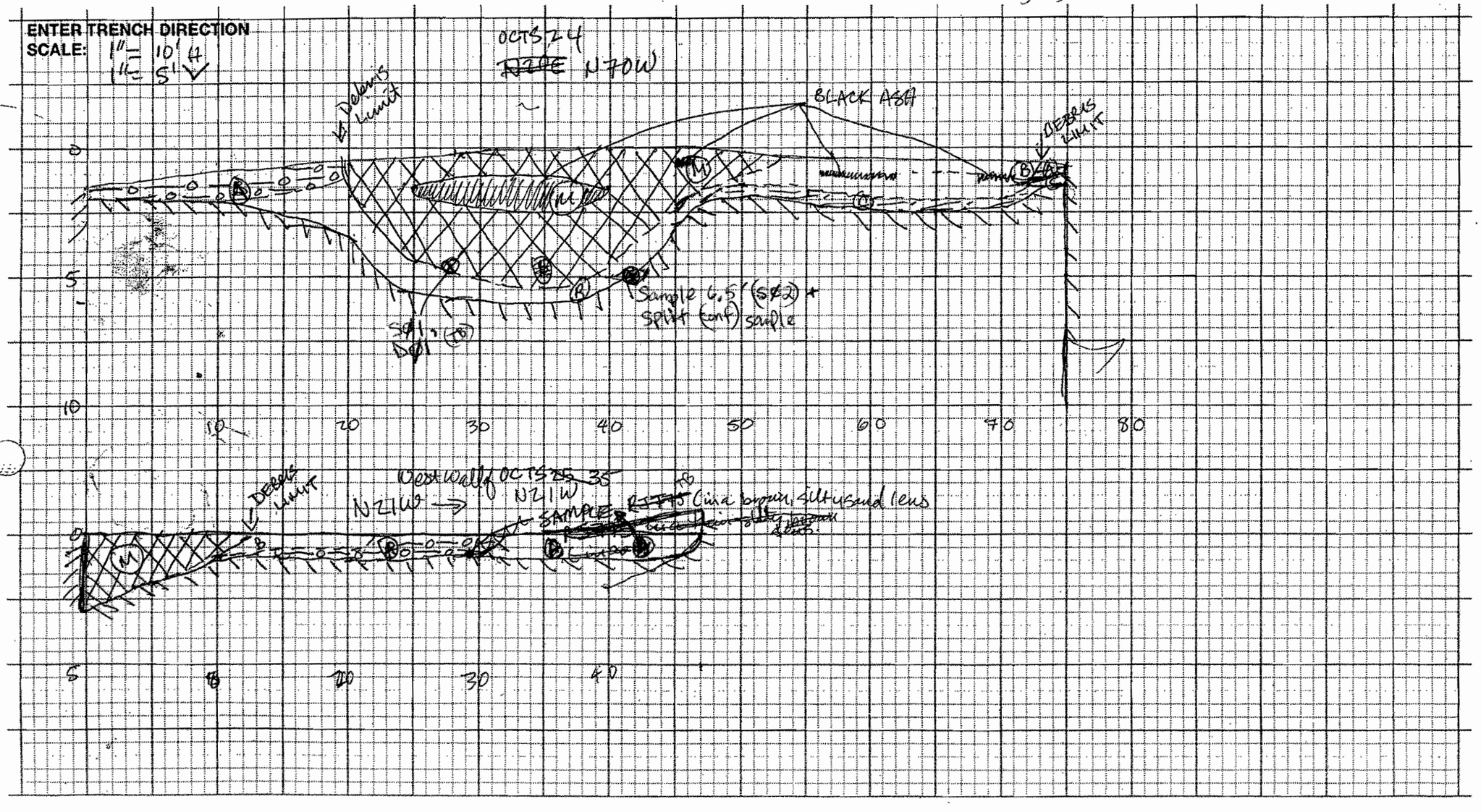
Photo (Circle One) Yes No No.

% Man-Made Debris

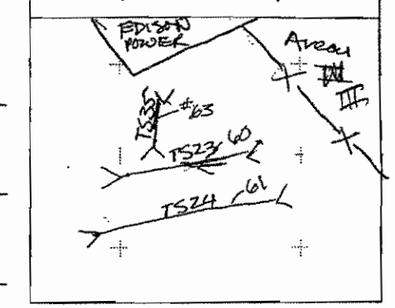
Wall of Trench Shown (Circle One) (N) S E W (NE) NW SE SW

LENGTH (FEET)

Note: Log augmented to show sample locations within trench.



Plan View-Site Location
(Provide Sketch)



AREA III

EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPLI LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

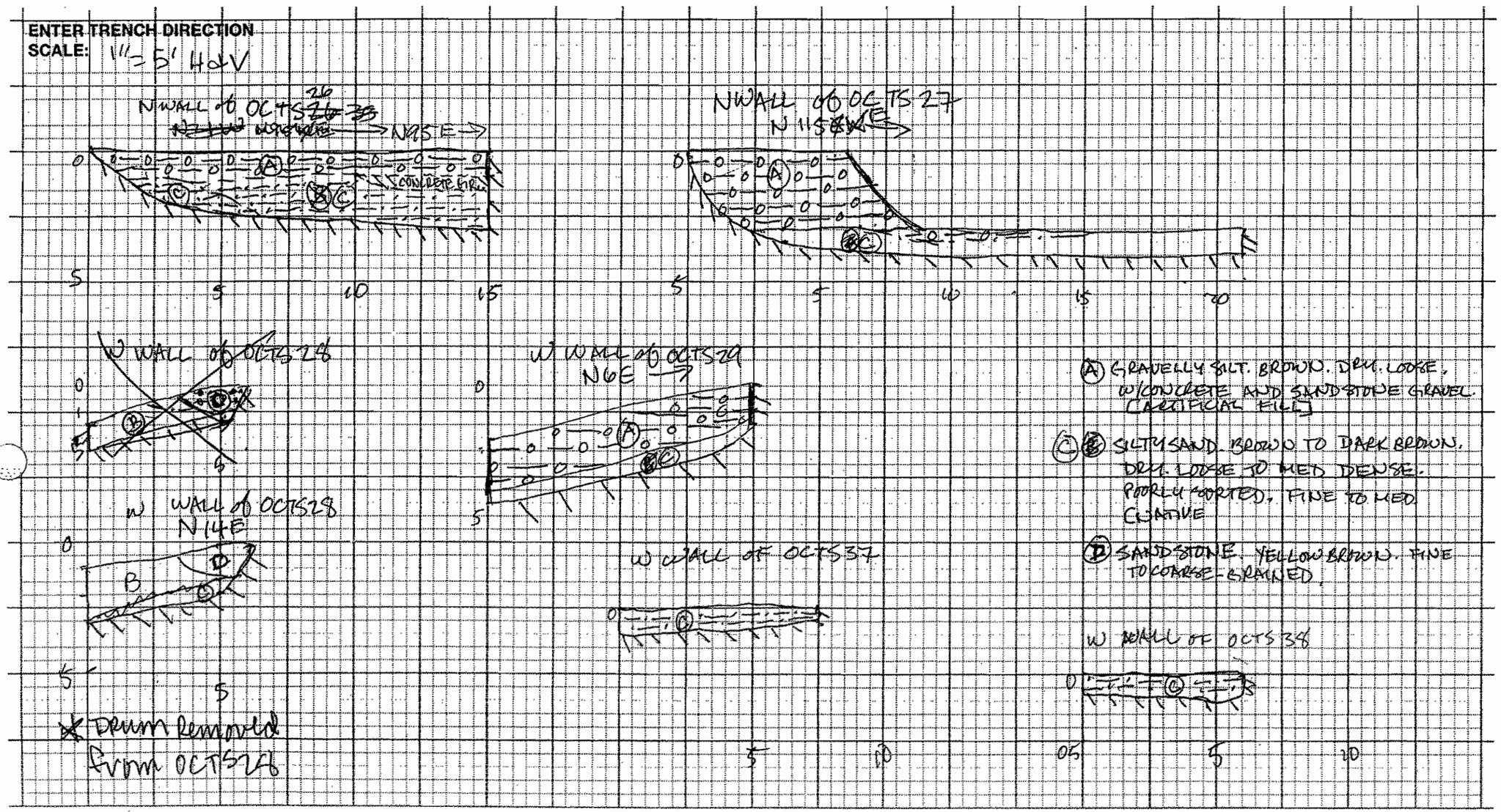
Project Name: ROCKETDYNE				**FIELD TRENCH LOG**	
Trench: TS26-29, 37, 38	Project Number: 31315000 #4	Datum	Location: OLD CON		Sheet 1 of 1
Equipment Supplier: DEERE	Operator	Date and Time Started: 10/31/00	Date and Time Completed: 10/31/00		Refusal? (Circle One) Yes (No) If Yes Depth =
Equipment Type: BACKHOE	Trench Orientation: SEE LOGS	Total Depth	Total Number of Samples		Photo (Circle One) Yes No No.
Bucket Width: 24" / Trench Length: 80'	Trench Width: 30"	No. of Samples / Bulk / Grab	Drive / Hand Auger		% Man-Made Debris
Geologist or Hydrogeologist/Date		Checked by/Date			Wall of Trench Shown (Circle One) (N) S E W NE NW SE SW

OGDEN

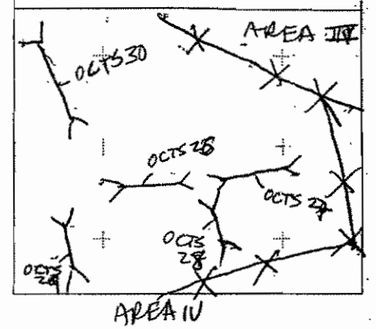
LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 5' H&V



Plan View-Site Location
(Provide Sketch)



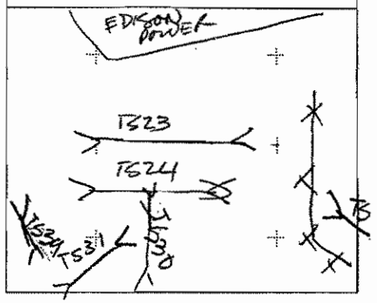
EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG)
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- G — GEOTECHNICAL SAMPL LOCATION (WRITE SAMPLE NUMBE OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

Project Name: DYNE				**FIELD TRE H LOG**	
Trench: ~~530 to~~ OCTS30,31,39,40	Project Number: 3131500024	Datum:		Location: OLD CON	Sheet 1 of 1
Equipment Supplier: DEERE	Operator:	Date and Time Started: 10/31/00		Date and Time Completed: 10/31/00	Refusal? (Circle One) Yes No — If Yes Depth =
Equipment Type: BACKHOE	Trench Orientation: SEE LOGS	Total Depth: SEE LOGS		Total Number of Samples:	Photo (Circle One) Yes No — No.
Bucket Width: 24"	Trench Length: ~~10'~~ SEE LOGS	Trench Width: 30"	No. of Samples / Bulk / Grab	Drive / Hand Auger	% Man-Made Debris
Geologist or Hydrogeologist/Date: COMINGO 10/31/00		Checked by/Date: D BARRIE 10/31/00			Wall of Trench Shown (Circle One) N S E (W) NE (NW) SE SW

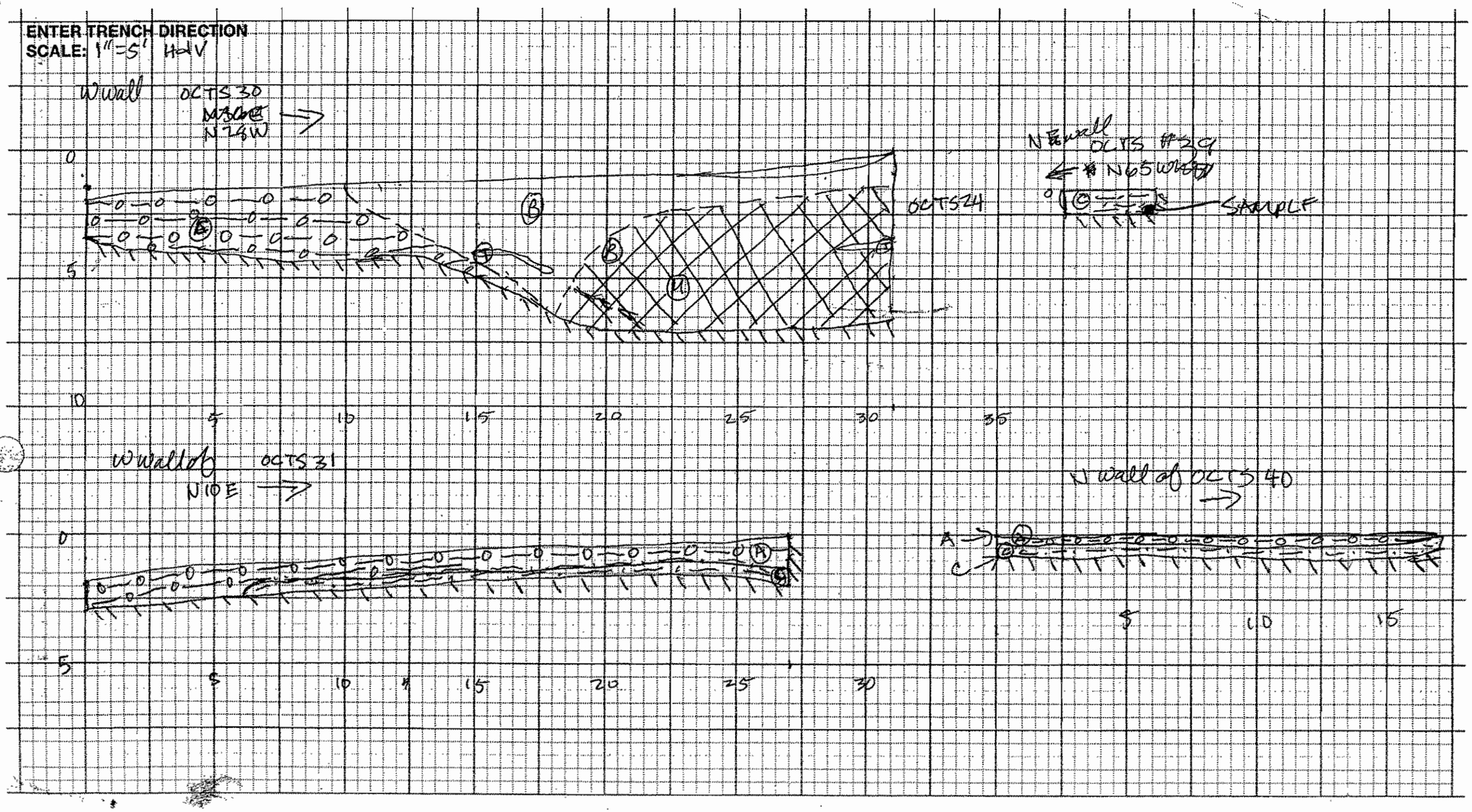
OGDEN

Plan View-Site Location
(Provide Sketch)



LENGTH (FEET)

DEPTH (FEET)



EXPLANATION

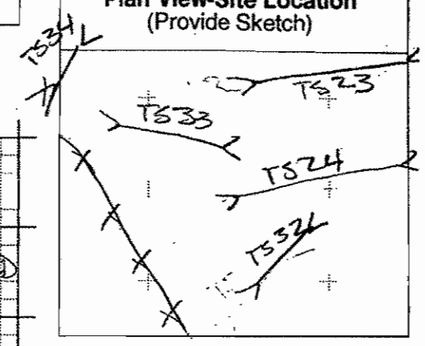
- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMBI OUT TO SIDE)
- G — GEOTECHNICAL SAMPL LOCATION (WRITE SAMPLE NUMBI OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS AND TYPES OF ALL MAJOR DEBRIS

FIELD TRE[illegible]H LOG

OGDEN

Project Name: [illegible]CKETDYNE					
Trench [illegible] log OCTS32-34	Project Number: 31315000 [illegible]4	[illegible]d Datum	Location: OLD CON		Sheet ___ of ___
Equipment Supplier: DEERE	Operator	Date and Time Started: 11/01/00	Date and Time Completed: 11/01/00		Refusal? (Circle One) Yes No — If Yes Depth =
Equipment Type: BACKHOE	Trench Orientation: See log	Total Depth: See log	Total Number of Samples		Photo (Circle One) Yes No No.
Bucket Width: 24" — Trench Length: ~~24"~~	Trench Width: 36"	No. of Samples — Bulk — Grab	Drive — Hand Auger		% Man-Made Debris
Geologist or Hydrogeologist/Date: C DOMINGO 11/01/00		Checked by/Date: D. BARRIE 11/01/00			Wall of Trench Shown (Circle One) N S E W NE NW SE SW

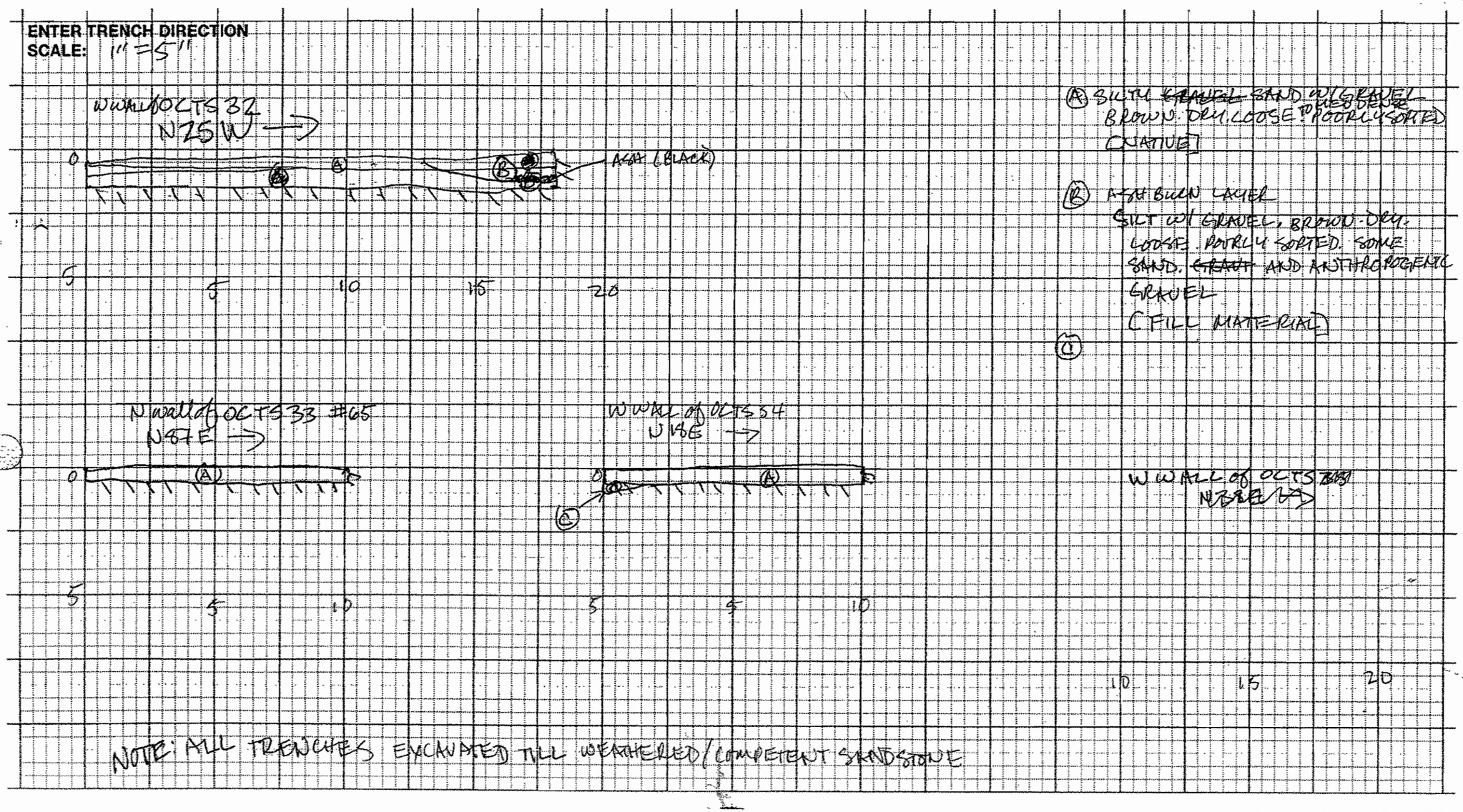
Plan View-Site Location
(Provide Sketch)



LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 5"



(A) SILTY ~~GRAVEL~~ SAND W/ GRAVEL BROWN DRY LOOSE TO MED DENSE POORLY SORTED [NATIVE]

(B) ASH BURN LAYER SILT W/ GRAVEL, BROWN DRY LOOSE POORLY SORTED SOME SAND ~~GRAVEL~~ AND ANTHROPOGENIC GRAVEL [FILL MATERIAL]

(C)

NOTE: ALL TRENCHES EXCAVATED TILL WEATHERED/COMPETENT SANDSTONE

EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG
- FILL/NATIVE BOUNDAR
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMB OUT TO SIDE)
- G — GEOTECHNICAL SAMP LOCATION (WRITE SAMPLE NUMB OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS ANI TYPES OF ALL MAJOR DEBRIS

FIELD TRENCH LOG

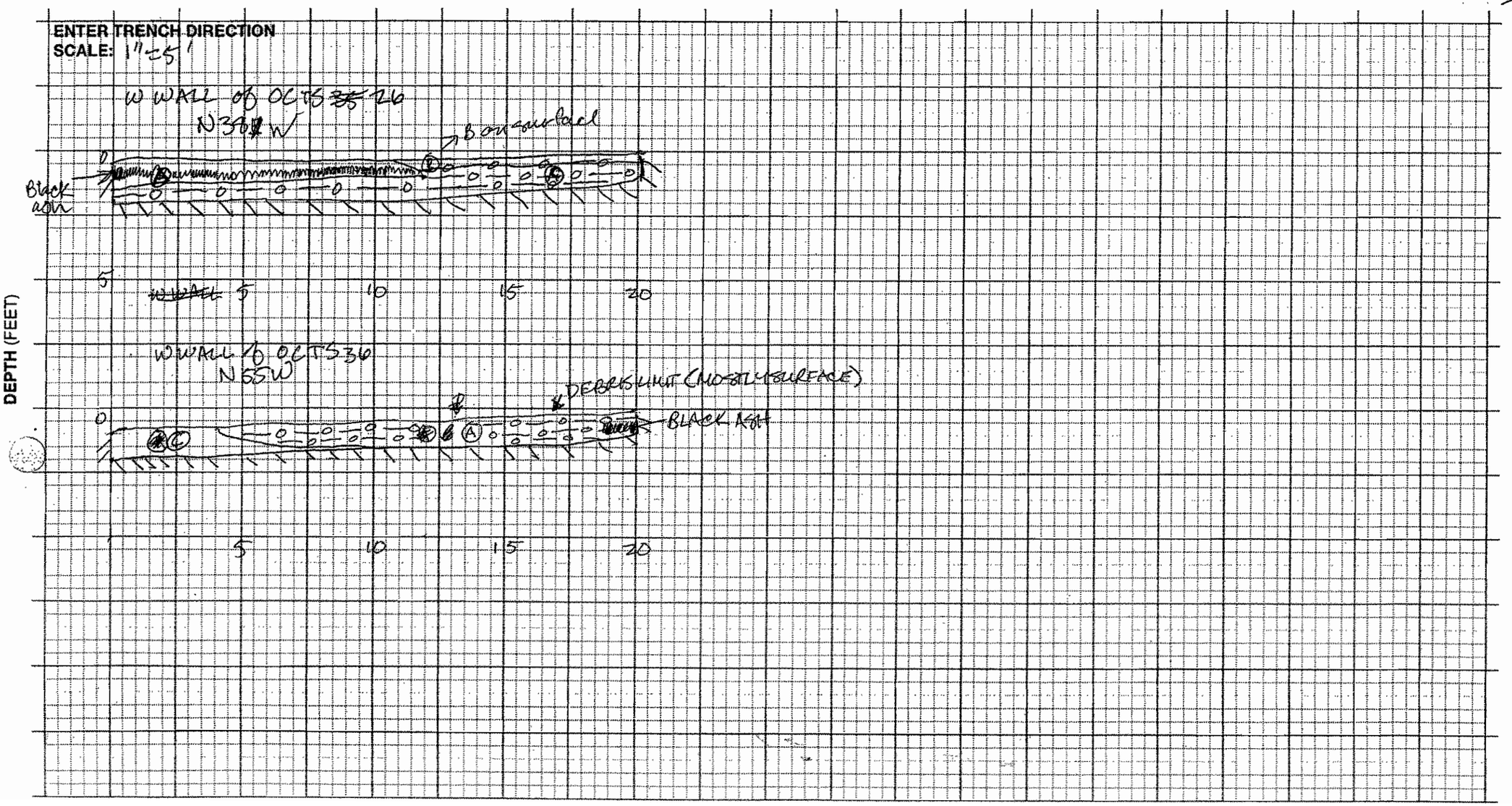
OGDEN

Project Name: [illegible]STONE			Datum	Location: OLD CON	Sheet ____ of ____
Trench No.: SEE G OCTS26, 36	Project Number: 313150000[illegible]4				
Equipment Supplier: DEERE	Operator		Date and Time Started: 10/01/00	Date and Time Completed: 11/01/00	Refusal? (Circle One) Yes No — If Yes Depth =
Equipment Type: BACKHOE	Trench Orientation: SEE LOG		Total Depth	Total Number of Samples	Photo (Circle One) Yes No — No.
Bucket Width: 24"	Trench Length: SEE LOG	Trench Width: 30"	No. of Samples / Bulk / Grab	Drive / Hand Auger	% Man-Made Debris
Geologist or Hydrogeologist/Date			Checked by/Date		Wall of Trench Shown (Circle One) N S E W NE NW SE SW

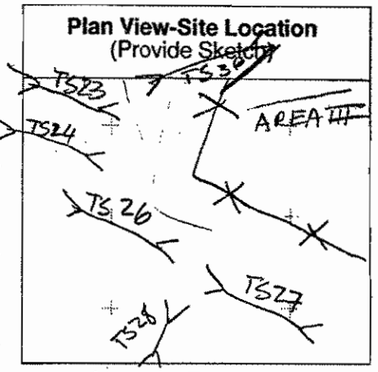
LENGTH (FEET)

DEPTH (FEET)

ENTER TRENCH DIRECTION
SCALE: 1" = 5'



Plan View-Site Location
(Provide Sketch)



EXPLANATION

- SOIL TYPE CONTACT (SHARP)
- OTHER CONTACT (AS INDICATED ON LOG
- FILL/NATIVE BOUNDARY
- X — ANALYICAL SAMPLE LOCATION (WRITE SAMPLE NUMB OUT TO SIDE)
- G — GEOTECHNICAL SAMPL LOCATION (WRITE SAMPLE NUMB OUT TO SIDE)
- SHADING TO DENOTE STAINING
- BASE OF EXCAVATION
- SHOW LOCATIONS ANI TYPES OF ALL MAJOR DEBRIS