GROUP 8 – WESTERN PORTION OF AREA IV
RCRA FACILITY INVESTIGATION REPORT
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

VOLUME II – RFI SITE REPORTS

APPENDIX A

BUILDING 009 LEACH FIELD (AREA IV AREA OF CONCERN)

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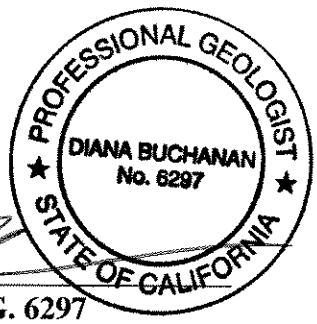

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LIST OF ACRONYMS AND ABBREVIATIONS

AESE	A.E. Schmidt Environmental
AI	Atomics International
AOC	Area of Concern
AST	aboveground storage tank
Boeing	The Boeing Company
bgs	below ground surface
B009 LF	Building 009 Leach Field
B056	Building 056
B100	Building 100
BMP	best management practice
CCR	Current Conditions Report
CFOU	Chatsworth Formation Operable Unit
CMS	Corrective Measures Study
COPC	chemical of potential concern
CPEC	chemical of potential environmental concern
CSM	conceptual site model
CTE	Central Tendency Exposure
DCA	dichloroethane
DCE	dichloroethene
DHS	Department of Health Services
Dioxins/Furans	(a) - *see table below*
DOE	United States Department of Energy
DTSC	Department of Toxic Substances Control
ECL	Environmental Chemistry Laboratory
EPC	exposure point concentration
ERA	ecological risk assessment
ESADA	Empire State Atomic Development Authority
ETEC	Energy Technology and Engineering Center
FSDF	Former Sodium Disposal Facility
Freon 113	1,1,2-trichloro-1,2,2-trifluoroethane
GRC	Groundwater Resource Consultants, Inc.
GWCC	groundwater comparison concentration
HRA	human health risk assessment
HSA	Historical Site Assessment
HQ	hazard quotient
HI	hazard index
H&A	Haley and Aldrich
HERF	high-energy rate forging

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

HSA	Historical Site Assessment
ICF	ICF Kaiser Engineers
ILCR	incremental lifetime cancer risk
ISI	In-Service Inspection
LMEC	Liquid Metal Engineering Center (LMEC)
LUFT	Leaking Underground Fuel Tank
kWt	kilowatt
MCL	Maximum Contaminant Level
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
msl	mean sea level
MW	Montgomery Watson
NA	not applicable
NAA	North American Aviation
NaK	sodium potassium
ND	not detected
NDMA	N-nitrosodimethylamine
NFA	no further action
NSGW	near-surface groundwater
Ogden	Ogden Environmental and Energy Services Company, Inc.
OMR	Organic Moderated Reactor
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
pCi/g	picocuries per gram
pg/g	picograms per gram
ppb	parts per billion (µg/kg or µg/L)
ppm	parts per million (mg/kg or mg/L)
QA	quality assurance
Rockwell	Rockwell International
RBSL	risk-based screening level
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RME	reasonable maximum exposure
Rocketdyne	Rocketdyne Propulsion and Power

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

RWQCB	Los Angeles Regional Water Quality Control Board
SAIC	Science Applications International Corporation
SGR	Sodium Graphite Reactor
SRAM	Standardized Risk Assessment Methodology
SSFL	Santa Susana Field Laboratory
Surficial OU	Surficial Operable Unit
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TCE	trichloroethene
TIC	tentatively identified compound
TPH	total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
UST	underground storage tank
µg/dl	micrograms per deciliter
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µg/Lv	micrograms per liter vapor
VCEHD	Ventura County Environmental Health Division
VOC	volatile organic compound
WPA	RFI Work Plan Addendum
WPAA	RFI Work Plan Addendum Amendments

(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

(a) Definition of dioxin/furan congeners (continued)

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 Quotient (normalized to 2,3,7,8 TCDD)

A.1 INTRODUCTION

This appendix to the Group 8 Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report presents findings and recommendations based on the results of the investigation conducted at the Building 009 Leach Field (B009 LF) RFI Site of the Santa Susana Field Laboratory (SSFL). The B009 LF RFI Site is an Area of Concern (AOC) within Area IV of the 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 B009 LF RFI Site is one of four RFI sites included in the Group 8 RFI Report. The location of the B009 LF RFI Site within the SSFL and Group 8 Reporting Area is shown on Figure A.1-1. An RFI Site is an area that includes at least one Solid Waste Management Unit (SWMU) and/or an AOC and some adjacent land for the purpose of characterization. The other three Group 8 RFI sites are the Building 056 Landfill (B056 Landfill) (SWMU 7.1), the Empire State Atomic Development Authority (ESADA) (SWMU 7.9), and the Former Sodium Disposal Facility (FSDF) (SWMU 7.3). The B009 LF RFI Site is located in the western portion of Area IV, east of the FSDF RFI Site, southwest of the B056 Landfill RFI Site, and northeast of the ESADA RFI Site (Figure A.1-1).

The B009 LF RFI Site, located in the western portion of Area IV of the SSFL, was operated by the Energy Technology and Engineering Center (ETEC) division of Rockwell International (predecessor companies of The Boeing Company [Boeing]), on behalf of the Department of Energy (DOE). Prior to 1978, ETEC was known as the Liquid Metal Engineering Center (LMEC).

The SSFL RFI was conducted to (1) characterize the presence of SSFL-operation-related chemicals in environmental media; (2) estimate risks to human health and the environment (i.e., the ecosystem); (3) gather data for the next phase of RCRA Corrective Action, the Corrective Measures Study (CMS); and (4) identify areas for further work.

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 B009 LF RFI Site characterization presented in this appendix comprises data for both the Surficial OU and the CFOU. 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. The CFOU includes Chatsworth formation bedrock and deeper groundwater that occurs within the unweathered bedrock of the Chatsworth formation.

A.1.1 Report Organization

This B009 LF RFI Site Report provides detailed sampling data and evaluation pertaining to the B009 LF RFI Site, including the 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 A.2 – Site History, Chemical Use, and Current Conditions.** Presents the site history and chemical use, and the current conditions including geology and groundwater conditions. Changes in site conditions and soil disturbance areas are described.
- **Section A.3 – Nature and Extent of Chemical Impacts.** Presents a summary of Surficial OU, NSGW, and CFOU characterization information for the B009 LF RFI Site.
- **Section A.4 – Risk Assessment Findings Summary**. Presents a summary of the human health risk assessment (HRA) and ecological risk assessment (ERA) results; the complete B009 LF RFI Risk Assessment included as Attachment F1 of Appendix F.
- **Section A.5 – Site Action Recommendations**. Presents a summary of B009 LF RFI Site areas recommended for either (1) no further action (NFA), or (2) further evaluation in the CMS. CMS Areas recommended for stabilization measures to prevent contaminant migration are also identified, if any.
- **Section A.6 – References.** Includes a summary of cited references.

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

- **Attachment A-1**: Site-specific regulatory agency documents and correspondence.
- **Attachment A-2**: Subsurface information (soil boring, trench, piezometer, and well logs).
- **Attachment A-3**: Data quality, validation and laboratory reports.

Information regarding characterization for the B009 LF RFI Site is provided in the following figures and tables:

- Figure A.1-1: Presents the location of the B009 LF RFI Site within the SSFL and the Group 8 Reporting Area.

- Figure A.2-1: Presents a plan view of the B009 LF RFI Site, showing known and potential chemical use areas. Tables A.2-1 through A.2-4 present summaries of buildings, tanks, transformers and chemicals used at the B009 LF RFI Site.
- Figure A.2-2: Presents a plan view of the B009 LF RFI Site, showing soil and vapor sampling locations, and nearby monitoring wells.
- Figure A.2-3: Presents geologic cross-sections across the B009 LF RFI Site.
- Figures A.3-1: Present characterization details for all soil and vapor sampling at the B009 LF RFI Site. Soil and vapor sampling results are shown on the maps and correlate with appropriate sections of Tables A.3-2A and Table A.3-2B.
- Table A.3-2B: Presents a summary of groundwater characterization.

Information regarding Group 8 area-wide conditions, transport and fate of chemicals between RFI sites, and other evaluations of area-wide issues are contained in the Group 8 RFI Report, and appendices. Pertinent appendices to this Group 8 RFI Report are:

- **Appendix E:** Presents information regarding groundwater conditions in the Group 8 Reporting Area, including the B009 LF 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 F:** Presents risk assessment information, including risk calculations, result tables, all transport and fate modeling (except groundwater), and a description of any methodology variances from the Standardized Risk Assessment Methodology (SRAM) Work Plan.

A.1.2 Historical Reference Documents

Historical documents for the Group 8 Reporting Area are being submitted to DTSC along with this report (Boeing, 2007a). These documents represent a compilation of information from multiple sources that were searched in an attempt to find SSFL documents relevant to the Group 8 RFI. Included in the document submittal are the available photographs, maps and drawings, manifests, memoranda, tabulations, facility records, correspondence, and reports relevant to site operations and types and sources of chemicals that may have been used, handled, or released in the Group 8 Reporting Area. Documents pertaining to the entire SSFL are also included if they have relevant information also specific to Group 8. These documents were reviewed to (1) determine the history of site operations, (2) identify areas of known or potential chemical use for evaluation in the RFI, (3) compile site characterization data, and (4) identify areas where additional data were required to adequately characterize environmental site conditions. The results of the historical document review and sampling data collected relevant to the B009 LF RFI Site are presented in this Site Report. This

document review, coupled with the site characterization data, provides a solid basis for the recommendations provided in Section A.5 of this report, including areas that are recommended for further evaluation in the CMS and areas that are recommended for NFA.

It is worth noting that information presented in this report is supplemented by other environmental reports that contain information about site and facility background, Surficial OU Program background, and methodologies/procedures. Key historical documents are listed below with brief descriptions:

- RCRA Facility Assessment (RFA) (Science Applications International Corporation [SAIC], 1991 and 1994). This report contains the following:
  - A brief description of the SSFL facility, including an operational history, physical setting information, and regulatory programs and oversight during the late 1980s and early 1990s.
  - Visual inspection records performed at facility operations.
  - Definition and description of SWMUs and AOCs identified during the assessment.
- Current Conditions Report (CCR) (ICF Kaiser Engineers [ICF], 1993). This report contains the following:
  - A general description of the SSFL facility, including an operational history, physical setting information, and regulatory programs and oversight during the late 1980s and early 1990s.
  - Description of SWMUs and AOCs, including presentation of results from environmental sampling performed to assess current conditions.
  - A draft work plan for further investigation during the RFI for selected SWMUs and AOCs.
- RFI Work Plan Addendum (WPA) [Ogden Environmental and Energy Services Company, Inc. (Ogden), 1996], and RFI Work Plan Addendum Amendments (WPAA); Ogden 2000a and b]. These reports contain the following:
  - Sampling procedures and rationale.
  - RFI site descriptions and operational history.
  - Shallow groundwater characterization sampling and analysis plan for the SSFL.
- RFI Program Report (MWH, 2004). This report contains the following:
  - 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 work plans followed, overall sampling scope, sampling methods and subcontractors used, and protocol 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.
- SRAM Work Plan, Revision 2 (MWH, 2005). This report contains the following:
  - Procedures for completing HRAs and ERAs.
  - Background soil concentrations and groundwater comparison concentrations (GWCC).
  - A biological conditions report for the SSFL.
- Near-Surface Groundwater Characterization Report (MWH, 2003b). This report describes the following:
  - 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.
- Annual and quarterly groundwater monitoring reports, including:
  - Annual Groundwater Monitoring Report (Haley & Aldrich, Inc. [H&A], 2006a).
  - First Quarter 2006 Groundwater Monitoring Report (H&A, 2006b).
  - Second Quarter 2006 Groundwater Monitoring Report (H&A, 2006c).
  - Third Quarter 2006 Groundwater Monitoring Report (H&A, 2006d).
- Historical Site Assessment (Sapere, 2005). This report contains:
  - Facility descriptions and historical operational information for all buildings in Area IV.
  - Information regarding demolition activities, radiological surveys, releases, and removal actions conducted for radiological areas within Area IV.

A.2 SITE HISTORY, CHEMICAL USE AND CURRENT CONDITIONS

The B009 LF RFI Site is approximately 4 acres and is located in the western portion of Area IV at the SSFL. The site location within the SSFL is shown on Figure A.1-1, which also shows the Group 8 Reporting Area boundary. The site layout and the locations of identified and potential chemical use areas are shown on Figure A.2-1. The sampling locations and the location of a surficial cross-section across the site are shown on Figure A.2-2.

During the RFA, various SMWUs and AOCs within the SSFL were identified. The B009 LF area was identified as an AOC in the RFA (SAIC, 1994). No other SWMUs or AOCs were identified within the boundary of the B009 LF RFI Site as it is defined in this report (Figure A.2-1).

A comprehensive review of historical documents generated during facility operations or in subsequent environmental investigations was performed to identify known or potential chemical use areas at or near the B009 LF RFI Site. As provided in the documents submitted in conjunction with this report (Boeing, 2007a), thousands of records (some dating back to 1957) were reviewed to identify areas of potential environmental concern at the Group 8 RFI sites or elsewhere within the Group 8 Reporting Area. As described in Section 1, documents reviewed included facility operational reports, maps and drawings, internal and external correspondence, regulatory compliance information, historical and aerial photographs, facility personnel interview records, and previous environmental reports. Based on a comprehensive review of this compiled information, the B009 LF RFI Site boundary was defined to include operations associated with the AOC identified above, but also nearby facilities or features that warranted assessment in the RFI. These include Building 009 and associated features near the facility, including transformer and tank locations, and the solar concentrator facility located southwest of Building 009. Known and potential chemical use areas at the B009 LF RFI Site are shown on Figure A.2-1.

The following sections describe the AOC, site history and operations, chemical uses, and current conditions at the B009 LF RFI Site.

A.2.1 SWMUs and AOCs at the B009 LF RFI Site

Building 009 was used as a nuclear test facility Rockwell, 1998), an in-service inspection (ISI) facility, for high-energy rate forging (HERF), and non-nuclear research. The B009 LF RFI Site contains only one AOC and no SWMUs. A brief description of the AOC that is included in this RFI Site Report is presented below.

B009 LF RFI Site (Area IV AOC)

The B009 LF was identified during the RFA (SAIC, 1991 and 1994) as an inactive sanitary leach field. The leach field was located approximately 50 feet north of Building 009, and comprised of six leach lines, ranging in length from 15 to 42 feet. The leach lines led north from a 2,340-gallon septic tank that was located outside the northwestern portion of Building 009. The leach field was reported to comprise approximately 300 total linear feet of leach lines (ICF, 1993). The leach field consisted of 4-inch diameter terra cotta clay piping surrounded by large gravel and buried at depths ranging from 4 to 5 feet below ground surface (bgs) (MWH, 2003c).

The leach field provided for the disposal of sanitary waste before a central sewage system was installed at the SSFL (ICF, 1993). The B009 LF also received liquid waste from Building 009 operations after the liquids were checked and determined to be within acceptable limits for radiation (Rockwell, 1979; AI, 1958a). After 1961, only operational waste would have been discharged to the leach field since a sewer system was installed. The leach field, leach lines, and septic tank were removed in 2002 (Boeing, 2007b).

A.2.2 B009 LF RFI Site History

A summary of the site chronology, including descriptions of site operations and investigation activities for the B009 LF RFI Site, is presented below. Facility correspondence, investigation reports, waste disposal records, facility maps, drawings, photographs, and personnel interview records were reviewed and evaluated to compile the site history information presented below (Boeing, 2007a). Primary sources of information include the following:

- RFA (SAIC, 1991 and 1994)
- CCR (ICF, 1993)

- Aerial Photographic Analysis (USEPA, 1997)
- Area IV HSA (Sapere, 2005)
- OMR Critical Experiment Hazards Summary (AI, 1958a)
- SGR Experiment Hazards Summary (AI, 1959b)
- Radiological Survey Results – OMR-SGR Critical Assembly Facility (Rockwell, 1979)
- Radiological Survey of Building T009 (Rockwell, 1988b)

Site Chronology

1957 - 1958	Building 009 was constructed to house two nuclear facilities in side-by-side, concrete high-bay areas. It was built in two phases, first for the Organic Moderated Reactor (OMR) in the western portion of the building during 1957. The Sodium Graphite Reactor (SGR) was added in the eastern portion of the building during 1958. Both reactors were low-power critical assemblies, in which different fuel-moderator configurations could be examined. The OMR facility consisted of a high-bay, concrete-shielded critical assembly room and a contiguous low-bay structure housing a control room, a concrete-shielded counting room, and other supporting facilities. The SGR facility consisted of a large shielded room to house the critical assembly, an adjoining fuel-and-graphite storage area, and a low-bay section used for the control room, offices, and miscellaneous supporting activities. Since each half of the Building 009 facility was built at different times, there were two separate systems installed to handle liquid and gaseous effluents (Rockwell, 1979). Two 1,000-gallon hold-up tanks were installed in reinforced concrete underground vaults outside of Building 009 to store radioactive liquid waste from the SGR and OMR, respectively (Van Dykes and Barnes, 1957b; AI 1958a, 1959a 1959b). Waste from the SGR was stored in UT-4, located to the northeast of Building 009 (AI, 1959b). Waste from the OMR was stored in UT-5, located to the west of Building 009 (AI, 1958a). A 1,200-gallon storage tank (UT-59) was installed inside Building 009 in a 10 foot-deep pit in the OMR side of the building. UT-59 was used for the storage of Santowax-R, a commercial terphenyl coolant mixture (AI, 1958a; Rockwell, 1993; Rockwell, 1994b).

1957 – 1958 (Cont)	Liquids from floor, shower, and sink drains in the building were stored in the hold-up tanks. Liquid waste from the hold-up tanks was routed to the sanitary leach field after sampling of the hold-up tanks and subsequent radiometric assay showed that the radioactive content was within acceptable levels (AI, 1958a, 1959b). UT-3 (formerly Tank 401), a 1,500-gallon capacity underground storage tank (UST) was installed near the southern corner of Building 009 to store diesel/fuel oil that could be used at the facility in case of a power outage (AI, 1958a).
1959 - 1965	A series of low power nuclear experiments involving a heterogeneous, organic-moderated reactor utilizing slightly enriched uranium metal fuel were conducted at the OMR facility. Liquid waste from these operations was stored in UT-5.
1960 - 1967	Low power experiments with graphite-moderated reactors utilizing slightly enriched uranium fuel were performed at the Building 009 SGR facility (AI, 1959b, 1968). In most cases, solid aluminum was employed in the SGR reactor core to simulate the nuclear properties of liquid sodium (AI, 1959b). A 10-foot deep, 14-foot wide hexagonal pit was located in the center of the critical cell floor to provide access to the underside of the critical assembly. A sump pump was located in the pit under the reactor in the assembly room and was connected to UT-4 (AI, 1959b, 1966).
1961	Use of septic systems and sanitary leach fields at the SSFL was discontinued following the installation of the current sanitary sewer system (ICF, 1993).
1965	All radiation-producing devices and radioactive material were removed from the OMR reactor room (AI, 1965).
1969	All reactor fuel and the graphite moderator were removed from the SGR facility (AI, 1969a).
1969	Rockwell conducted an analysis of levels of induced radioactivity in the SGR structural steel and related components to assess potential hazards associated with demolition and subsequent release of the material. The specific activities of radionuclides were sufficiently low to preclude the possibility of health hazards (AI, 1969b).

1970s	With the exception of the hold-up tanks, the remaining assembly equipment was removed and Building 009 was redesignated as the Engineering Development Facility. Sodium fire experiments, performed by intentionally exposing sodium to air, were conducted in the OMR high bay in order to develop new ways to extinguish the ensuing fires (Rockwell, 1988b). Also during this period, depleted uranium was stored in the OMR counting room under the Accident Debris program (Rockwell, 1979).
1979	A radiological survey performed at Building 009 indicated that the SGR liquid waste hold-up tank possibly contained radioactive contamination above the acceptable limit (700 picocuries per gram [pCi/g] gross beta activity). The radioactivity was thought to be thorium resulting from chemistry work involving lantern mantles (Rockwell, 1988b). All other areas of the building had radiation levels less than the acceptable limit, and the building was released for unrestricted use (Rockwell, 1979) (Attachment A-1).
1980s – early 1990s	The former SGR high-bay in Building 009 was used for the storage and under-water testing of Rocketdyne's ISI equipment, which was used for inspecting commercial power reactors offsite (Boeing, 2000; Sapere, 2005).
1985	The solar concentrator facility, including the parabolic dish and Building 425, was constructed approximately 325 feet southwest of Building 009. This facility was used in experiments aimed at harnessing solar power, and consisted of a 25 kilowatt (kWt) parabolic dish. The dish included a Sterling engine generator, a mirrored parabolic dish concentrator (10.7 meters in diameter), and a solar receiver (Sapere, 2005; Rockwell, 1985b, 1985c). An aboveground propane tank was located approximately 90 feet southwest of the parabolic dish. Propane was used to heat the lines associated with the solar concentrator facility (Boeing, 2007e). Building 425, located approximately 40 feet south of the parabolic dish, was a trailer that was used to house controls and recorders for the dish (Sapere, 2005). Sodium potassium (NaK) was used as a heat transfer fluid for the parabolic dish receiver (Boeing, 2007c).
1985	A radiological survey of Building 009 was conducted by Rockwell to clarify and identify locations needing further radiological inspection or requiring remedial action. The measurements were below the acceptable limits, and no further investigation was warranted (Rockwell, 1988b).

1986	Mercury (2 ounces) and sodium hydroxide (10 to 100 gallons) was spilled in Building 009.
1986	The OMR liquid waste hold-up tank (UT-5) was removed (Rockwell, 1994a, 1994b).
1987	UT-3 was removed. Following its removal, fuel hydrocarbons were detected in the soil, and approximately 24 tons of soil from beneath the tank area was excavated (Ogden 1998).
1988	A comprehensive radiological survey of Building 009 was conducted in the OMR portion of the building as part of a broad radiological survey being performed for the SSFL (Rockwell, 1990). Surveyed areas included the building interior, shower drains, the SGR hold-up tank and pit, and the area outside the northwest side of Building 009. Sludge from the sink clean-outs was also surveyed for radiation. The SGR interior was not surveyed because of the ongoing ISI work. Based on the survey results, the areas surveyed were suitable for release without radiological restrictions. However, it was recommended that the SGR hold-up tank be removed (Rockwell, 1990).
1988	A 200-gallon hot water heater insulated with asbestos was removed from Building 009. The asbestos waste was reportedly transported offsite by a permitted waste hauler under a hazardous waste manifest (Rockwell, 1988a).
1989	Less than 55 gallons of Turco 3878 LF-NC, a commercial solvent, were spilled in Building 009 (ICF, 1993).
1989 - 1990	The SGR liquid waste hold-up tank located northeast of Building 009 was removed (UT-4), along with a contaminated sink and drain lines (Rockwell, 1994a, 1990). Rockwell also performed a radiological survey of the drain system excavation after removal to assess soil conditions. Based on the survey results, no residual contamination was present in the soil surrounding the drain line (Rockwell, 1990).
Late 1980s	The OMR high bay at Building 009 was used for high-energy rate forging, which included handling of high-enriched uranium. Eight hundred pounds of depleted uranium were stored in the facility and shipped offsite in the early 1990s (Sapere, 2005).

1994	Following a review of historical underground tank records, the Ventura County Environmental Health Division (VCEHD) determined that the closure status of UT-3 was inconclusive, and assigned it to the Leaking Underground Fuel Tank (LUFT) Program (Attachment A-1).
1995	Two soil borings were drilled at the former location of UT-3, and samples were collected to assess soil conditions below the former tank as requested by VCEHD. Petroleum hydrocarbons (diesel and lubricant oil range) were detected at concentrations up to 710 milligrams per kilogram [mg/kg]), and volatile organic compounds (VOCs) (total xylenes and ethylbenzene) at up to 17 micrograms per kilogram [µg/kg]) were detected in the soil beneath the former UST location (AESE, 1995; Ogden, 1998).
1995	Building 009 facility diagrams indicate that in 1995, the SGR hold-up tank vault was filled to 4 inches below the top with 1:10 cement-to-sand ratio slurry and topped with 4-inch asphaltic cement (Parsons, 1995a).
1995	Rockwell performed a radiological survey to ensure that there was no residual contamination that would pose any threat to personnel working in the building. The survey results indicated that the facility was not contaminated and was a safe working environment (Sapere, 2005). The Department of Health Services (DHS) performed a survey in the same year to confirm the Rockwell survey and concluded that the facility was suitable for occupancy/use by Rockwell and their contractors (Sapere, 2005). In addition, Rockwell performed a radiological survey of the roof prior to roof removal (Sapere, 2005).
1995 - 1996	Approximately 4 cubic yards of concrete were removed from the SGR pit area (Rockwell, 1995a). The fume hood, ducting, and HEPA filter in Room 121, along the eastern side of Building 009, were removed and disposed of offsite as radiological waste. A June 1995 survey conducted after the removals indicated that all areas met the limits for unrestricted release (Boeing, 1998; Rockwell, 1995b).
1995 - 1999	The parabolic dish at the solar concentrator facility was removed. A weather station, rain gauge, and astronomical observatory were constructed in the area (Boeing, 1997a, 1997b; Boeing, 2007a). Building 425 was replaced with a storage shed.

1996	During the 1996 Area IV Radiological Characterization Survey, soil samples were taken at two different locations in the vicinity of Building 009. None of the measurements were distinguishable from background, and all measurements were below the acceptable levels (Rockwell, 1996).
1998	Water that was pooled in Building 009 during the underwater testing of Rocketdyne's ISI equipment was sampled for VOCs, metals, and waste characterization bioassay before discharge from the building (Boeing, 2007e). Only metals only were detected, at concentrations up to 0.26 milligrams per liter (mg/L) of zinc (the highest of the detected metals concentrations).
1998 - 1999	DHS conducted a final verification survey at Building 009 in 1998, and released Building 009 for unrestricted use in 1999 (DHS, 1999) (Attachment A-1).
1999	Based on additional assessment findings, UT-3 was closed by the VCEHD in 1999 (Ogden, 1998) (Attachment A-1).
2002	The leach field and septic tank at Building 009 were removed in 2002 (Boeing, 2007b). The septic tank, approximately 50 tons of soil, debris, and 18-inch leach tiles were disposed of offsite in accordance with applicable regulations. Liquids in the removed septic tank were sampled for polychlorinated biphenyls (PCBs) and metals; concentrations of these compounds were detected at concentrations up to 1.1 micrograms per liter (µg/L) of Aroclor 1254 and 68 µg/L of zinc (the highest of the detected metals concentrations). Radiological characterization of soils from the leach field and septic tank removal was conducted. No radiological contamination was detected (Boeing, 2007d).
2002	The USEPA completed a review of decommissioning work plans and final radiological survey reports prepared by Boeing-Rocketdyne for Buildings 009, 011, 019, 055, and 100. The USEPA concluded that the radiological surveys were adequately performed and that the surveys were adequately documented (Tetra Tech, 2002).

2002 - present	Until recently, Building 009 was used for non-nuclear research and development, including laser research (MWH, 2006a). Facility operations ceased in mid-2007. Building 009 and select features at the solar concentrator facility remain in place (the weather station, rain gauge, and storage shed).

Site Inventories

Inventories of buildings, tanks, transformers, and chemicals used at the B009 LF RFI Site were compiled during preparation of this RFI report. Historical reports and facility drawings were reviewed, and visual site inspections were conducted. The locations of identified buildings, tanks and transformers are shown on Figure A.2-1. The inventories are included as the following tables:

- Building inventory – Table A.2-1
- Fuel and solvent storage tank inventory – Table A.2-2
- Transformer inventory – Table A.2-3
- Documented chemical use – Table A.2-4

A.2.3 B009 LF RFI Site Chemical Use Areas

Chemical use areas are locations where chemicals were documented to have been (or potentially may have been) used, stored, spilled, discharged and/or disposed of. Chemical use areas at the B009 LF RFI Site are shown on Figure A.2-1 and described in detail in Section A.3. The five types (nine individual) of chemical use areas evaluated at or near the B009 LF RFI Site are listed below in order of chemical use area number:

- 1a and 1b –B009 LF and Septic Tank
- 2a, 2b, and 2c – Building 009, SGR Liquid Waste Hold-Up Tank and Pit, and OMR Waste Hold-up Tank and Pit
- 3 – Underground diesel fuel tank UT-3
- 4a and 4b – Transformer Areas
- 5 – Solar Concentrator Facility

The site characterization information is described relative to these chemical use areas in Section A.3. In addition to known or potential areas of chemical use, samples were collected to assess conditions in the drainages down-slope of all of these chemical use areas. Information regarding these results is also provided in Section A.3.

A.2.4 Site Conditions

This section provides summaries of site conditions near the B009 LF RFI Site, including topography, geology, soils, groundwater, surface water, seeps and springs, and biology.

General Conditions and Topography

The B009 LF RFI site is located within the western portion of Area IV. In general, the site is in a topographically flat area, consisting of paved and unpaved sections sloping gently to the north. Several bedrock outcrops are present along the northern and western portions of the site boundary. These drainages convey site runoff from the southern area of the RFI site to the north.

Current surface elevations at the B009 LF RFI Site range from a low of 1,830 feet above mean sea level (msl) at the northeastern edge of the RFI Site along the Building 009 fence area to a high of 1,880 feet msl near the solar concentrator facility. Topography for the site is shown in two geologic cross sections, one oriented south to north, and one oriented west to southeast (Surficial Cross Section A-A' and B-B; Figure A.2-3). Locations of these cross sections are shown on Figure A.2-2.

As observed in historical aerial photographs, the location of Building 009 and the solar panel area has been the site of numerous dirt roads during early SSFL operations in the 1950s and 1960s (USEPA, 1997). Other historical aerial photographs also show soil disturbance areas at and near the solar panel in the mid to late 1970s. Other historical aerial photographs indicate soil disturbance areas at the solar concentrator facility and just to its west (near the ESADA area) in the mid- to late-1970s and in 1988 (Figure A.2-4). In the western portion of this disturbance area, a soil scarp was created, and it appears that this area may have been used as a soil borrow area. Facility records do not indicate any chemical use in this area (Boeing, 2007a). These soil disturbance features predate sampling conducted for the RFI. The B009 leach field was removed in June 2002, and RFI sampling was conducted prior to

soil backfill of that excavation. Historical soil disturbance areas at the B009 LF RFI Site are shown on Figure A.2-4.

Building 009, the solar panel fenced area, including the observatory and weather station, and support structures remain onsite. The solar concentrator facility was removed between 1995 and 1999 (USEPA, 1997; Boeing, 1997a, 1997b, 2007a), and the leach field removed in 2002 (Boeing, 2007b).

Geology

The B009 LF RFI site is located north of the Burro Flats Fault, in proximity to the Upper and Lower Burro Flats members of the Upper Chatsworth formation to the north of the fault (Dibblee, 1992; MWH 2002). A series of deformation bands is also present west of the B009 LF RFI site. These deformation bands generally strike northeast-southwest and have currently been defined by geologic site mapping to comprise the western extent of the North Fault zone (MWH, 2002).

Beds of the Upper Chatsworth formation generally strike N70˚E and dip 25˚NW. The Upper Burro Flats member is predominantly comprised of medium-grained sandstone with minor interbeds of siltstone and shale. The Lower Burro Flats member is predominantly comprised of medium-grained sandstone with significant siltstone/shale interbeds. The ELV member is between the Upper and Lower Burro Flats members, and is comprised of thinly interbedded fine-grained sandstone, siltstone, and shale. Figure 2-5 of the Group 8 RFI Report (Volume I) shows the geologic units represented within the RFI site. The locations of the Burro Flats Fault and the deformation bands are shown on Plate E-1 in Appendix E. Additional geologic information is presented in Appendix E of the Group 8 RFI Report.

Soils

Throughout most of the B009 LF RFI Site, soils are generally thin, typically ranging from less than 1 foot thick at the drainage sample locations to approximately 19 feet thick at the solar concentrator facility. Based on boring logs, the upper 1 to 5 feet of soil in this area may represent fill (or graded, disturbed soil). A map depicting the distribution of alluvial soils within the Group 8 Reporting Area is provided as Figure 2-4 in the Group 8 RFI Report (Volume I). Soils consist of weathered Chatsworth formation materials consisting primarily of sandy and silty clay. Soil boring logs are included as Attachment A-2 to this appendix.

Groundwater

The groundwater system and monitoring network in RFI Group 8 is presented in detail in Appendix E. Figure A.2-1 shows the locations of these wells with respect to the B009 LF RFI Site.

Piezometer PZ-102 was installed to monitor conditions in NSGW, and well RD-91 was installed to monitor conditions in Chatsworth formation groundwater. Groundwater was first encountered at approximately 100 feet bgs during the installation of well RD-91 in 2004, but the depth to water has averaged approximately 16.6 feet bgs (1,801.4 feet msl) since May 2005. Measurable groundwater has been present in PZ-102 during only one monitoring event, however. Groundwater levels are measured in RD-91 at elevations consistent with the depth of weathered Chatsworth formation bedrock. This suggests that NSGW at this location is vertically continuous within the regional Chatsworth formation groundwater. For the purposes of risk assessment, groundwater data for RD-91 were used to represent first-encountered groundwater at the B009 LF RFI Site.

Chatsworth formation groundwater flow within the Group 8 Reporting Area is generally to the northwest. The B009 LF RFI is near a groundwater divide, so at this site lateral gradient is less than those observed at the B056 Landfill and FSDF RFI Sites.

Surface Water

Surface water flow at the B009 LF RFI Site is shown on Figure 2-7B of the Group 8 RFI Report (Volume I). Surface water exists intermittently at the B009 LF RFI Site primarily as the result of seasonal precipitation events. Surface water at the B009 LF RFI Site flows via natural and lined channels and drainages throughout the site.

Surface water flow at the B009 LF RFI Site is predominantly controlled by concrete- and asphalt-lined ditches that discharge to a natural drainage located to the west of the leach field. South of the B009 LF RFI Site, surface water discharge from the eastern boundary of the ESADA RFI Site drains via sheet flow to the solar concentrator facility, where it is directed into a gunite-lined ditch that discharges along H Street. Runoff from Building 009 is diverted into an asphalt-lined channel along its southern perimeter. This diversion ditch discharges into a storm water culvert located southeast of the building or to a concrete-lined channel to the west along the leach field. The storm water culvert to the southeast discharges into the Group 5 Reporting Area. The concrete-lined channel near the leach field drains

northward to a natural channel, which ends at bedrock outcrops located approximately 150 feet north of the leach field. Surface water appears to infiltrate at this location and may resurface north of the outcrop, where another channel carries surface water to the north. Surficial debris, including asphalt and concrete, were observed in the low spot during recent site walks.

Seeps and Springs

No seeps or springs are located within or near the B009 LF RFI Site. Seeps and springs near the Group 8 Reporting Area are described in Appendix E.

Biology

Biological conditions at the B009 LF RFI Site, including vegetation types and sensitive species, are shown on Figure 2-13 of the Group 8 RFI Report (Volume I). The majority of the area within the RFI site boundary is comprised of ruderal habitat, non-native grassland, coast live oak woodland, and developed land. Areas of rock outcrop are present on the west and northwest borders. Areas north and west of the site are primarily coast live oak woodland with rock outcrops, areas south and east of the site are primarily non-native grassland, and areas at the northeast corner of the site are ruderal and developed lands. The paved drainage located adjacent to Building 009 is dominated by ruderal species, and chaparral, coast live oak woodland, and rock outcrops characterize the drainage north of Building 009. No sensitive species have been observed at the B009 LF RFI Site.

During the September/October 2005 Topanga Fire, no vegetation within the B009 LF RFI Site boundary was burned (MWH, 2006b). However, much of the surrounding area was burned, and significant ash was deposited.

In June 2007, reconnaissance-level vegetation mapping was conducted at the Group 8 RFI Sites in support of the site-specific ecological risk assessment, and the vegetation map is included as Attachment F6 of Appendix F.

A.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 B009 LF RFI Site. The presentation includes sampling objectives, scope, key decision points related to characterization activities, and findings.

Transport and fate evaluations are discussed in the following sections of the report:

- Group 8 RFI Report, Section 5, Contaminant Transport and Fate - Potential migration via surface water flow
- Group 8 RFI Report Appendix E, Groundwater Characterization - Potential migration from soil to groundwater, and groundwater migration
- Group 8 RFI Report Appendix F, Risk Assessment - Potential volatile organic compound migration from groundwater to soil, soil to indoor air

A.3.1 Sampling Objectives

Soil and sediment samples were collected to characterize the extent of potential chemical impacts at the B009 LF RFI Site. As described in Section 1, extensive historical documents (Boeing, 2007a) were reviewed to identify potential chemical use areas for RFI sampling. The process of selecting sampling locations, depths, and analytical methods considered the following objectives:

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

To achieve these objectives, soil sampling was conducted as described in the RFI Work Plans (Ogden, 1996 and 2000a) or as directed by DTSC direction during the RFI field program. Additional sampling was also performed to achieve the objectives outlined above, considering the following:

- 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 dioxin background concentrations
- SSFL SRAM-based screening concentrations for human health and ecological receptors
- Risk assessment results and knowledge of areas recommended 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 Section A.3.2). Based on detected RFI Site chemicals, chemical distribution, and site conditions, additional groundwater sampling and analysis was also 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 1995b) and the *Shallow Zone Groundwater Investigation Work Plan* (Ogden, 2000b).

A.3.2 Sampling Scope

A total of 50 soil matrix samples and 8 soil vapor samples were collected between October 1987 and May 2007 to assess potential impact associated with the chemical use areas at the B009 LF RFI Site. Sampling locations and analytical suites were based on DTSC requests, sampling results from previous investigations, additional facility information from site inspections and/or personnel interviews, waste disposal characterization data, and historical and/or aerial photographs. Sampling schedules are presented in Table A.3-1A through A.3-1C.

Both Chatsworth formation groundwater and NSGW have been sampled and analyzed according to agency-approved work plans (GRC 1995a and 1995b, Ogden 2000b). Two monitoring wells and/or piezometers were used to characterize groundwater specifically at the B009 LF RFI Site (RD-91 and PZ-102). As described in the risk assessment, groundwater monitoring data from the entire Group 8 Reporting Area were used to characterize the potential direct exposure route for human receptors. RFI site groundwater monitoring data is used for potential indirect groundwater exposures at that site. Groundwater characterization data for the B009 LF RFI Site are presented with the entire Group 8 groundwater data set in Appendix E.

Based on a quality assurance (QA) review conducted on soil, soil vapor, sediment, and piezometer sampling results, data have been deemed usable and meet RFI program requirements as defined by DTSC-approved Quality Assurance Project Plans (Ogden, 2000a). 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. Historical samples (collected prior to the beginning of the RFI in 1996) were typically not validated for the subsequent RFI, but are deemed useable for the RFI since they were collected and reviewed according to the QA protocols for those programs. Overall data quality is described in the RFI Program Report (MWH, 2004). Site-specific data quality summaries for the B009 LF RFI Site are described by media in the sections below.

As an ongoing, additional QA measure, DTSC's Environmental Chemistry Laboratory (ECL, formerly the Hazardous Materials Laboratory) is performing independent data quality audits of up to 5 to 10 percent of the surficial media analyses performed for the RFI. The ECL data quality audits included data validation, electronic data file audits, and split sample comparisons. The ECL findings are compiled in a report for each audit and those available by 2004 are published in the Program Report (MWH, 2004). In these reports, the ECL deemed the sample results acceptable or qualified as estimated data points.

This report presents characterization results for all media sampled at the B009 LF RFI Site, including the following:

- Soil vapor
- Soil matrix
- Groundwater

A.3.3 Key Decision Points

DTSC has been an integral part of the decision-making process during the SSFL RFI program. The B009 LF RFI Site was added to the RFI Program at the request of DTSC during a comprehensive SSFL RFI site review in 2000. At that time, DTSC requested soil sampling based on review of historical operations, sampling results, and physical site inspection. Evaluation of shallow groundwater conditions was also requested by DTSC and was included in the Shallow Groundwater Work Plan (Ogden, 2000b). DTSC provided review during the SSFL RFI field sampling, selected additional step-out sample locations,

and reviewed field sampling protocols. Additional site assessment has recently been performed to address revised, DTSC-approved requirements for risk assessment (MWH, 2005) and evaluate new potential chemical use areas. Sampling of new chemical use areas and recent step-out sampling followed DTSC-approved work plan protocols for the RFI.

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) Areas where further assessment in the CMS is recommended were not characterized beyond the need for the CMS.
2) The B009 Leach Field, SGR Liquid Waste Hold-Up Tank and Pit, and SGR Waste Hold-Up Tank and Pit areas were sampled at targeted locations for VOCs, semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), PCBs, metals, fluoride and terphenyls to evaluate their presence due to the documented use of solvents, Santowax-R (a terphenyl coolant mixture), aluminum, mercury, and kerosene to support Building 009 operations.
3) Soil vapor probes were installed and sampled in adjacent areas to the north, south, and west sides of Building 009 to screen for the presence of VOCs resulting from the use of solvents in Building 009.
4) No additional sampling near UT-3 was conducted during the RFI. UT-3, along with 24 tons of contaminated soil, was removed by Rocketdyne under the oversight of VCEHD in 1987. UT-3 was closed by the VCEHD in 1999. Therefore, additional assessment was not warranted.
5) Drainage locations down slope of Building 009 were sampled to evaluate the potential migration of metals and TPH from the B009 LF RFI Site.
6) The solar concentrator facility was sampled at representative locations to evaluate for potential impacts from documented use of hydrochloric and phosphoric acid solutions used for cleaning carbon steel components at the facility (Rockwell, 1981).

A.3.4 Soil Matrix and Soil Vapor Findings

All soil sampling results and characterization findings are summarized in Table A.3-2A. The goals of the table are to:

1. Present summaries of sampling results, including nature and extent of impacts.
2. Demonstrate that soil characterization is adequate and that no further sampling is warranted.

3. For areas recommended for CMS evaluation, indicate that soil volumes are estimable within a factor of ten for comparison of remedial alternatives.

Goals 2 and 3 are achieved through an iterative evaluation process that takes into account the risk assessment results and CMS recommendations as well as the soil analytical data. For example, if detected concentrations are sufficiently high to indicate that further evaluation in the CMS will be necessary, the data are considered to be adequate for the purpose of risk assessment. Similarly, the risk assessment results can be used along with the soil analytical results to delineate CMS areas and estimate soil volumes within an order of magnitude (Goal 3). Other criteria used to evaluate characterization completeness include the sampling results compared to screening levels, the presence and magnitude of concentration gradients, the types of historical site operations and chemical uses, and analytical detection limits. Data quality summaries for the B009 LF RFI Site are provided in Tables A.3-3A (soil) and A.3-3B (soil vapor).

A.3.4.1 Soil Data Presentation

Relevant site information, sampling rationale, analytical results, and evaluation of results are presented in Table A.3-2A. This table refers to chemical results that are shown on Figure A.3-1. Table A.3-2A presents the following site characterization information by each Chemical Use Area (Figure A.2-1) for each relevant chemical group within each Chemical Use Area:

- Relevant site history, site characteristics, and activities related to chemical use for each Chemical Use Area by Chemical Use Number.
- Sampling scope and rationale for each Chemical Use Area by Chemical Use Number.
- Summary of sampling results for soil and soil vapor for each Chemical Use Area by Chemical Use Number. As appropriate, sample results are compared to established SSFL background concentrations (metals and dioxins only) and/or SSFL risk-based screening levels (RBSLs)[1]. The screening levels are also displayed on Figure A.3-1.
- Determination if characterization of chemical gradients is sufficient such that the risk assessment reflects the approximate maximum analyte concentration OR a concentration sufficiently high to result in risk requiring a recommendation for evaluation during CMS.

[1] 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 F.

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

A.3.4.2 Soil Data Summary

As detailed in Table A.3-2A, nine confirmed and potential chemical use areas were investigated at the B009 LF RFI Site. A summary of the chemicals detected above screening criteria is provided below by chemical analytical group.

VOCs

- VOCs were not detected in soil vapor samples collected at the site.
- Four VOCs, including one tentatively identified compound (TIC), were detected in soil matrix samples collected at the Building 009 Hold-Up Tanks (Chemical Use Areas 2b and 2c) and at UT-3 (Chemical Use Area 3). Detected compounds included acetone, ethylbenzene, total xylenes, and 3-methylheptyl acetate. None of the detected VOC concentrations exceeded RBSLs. The detected TIC was of 3-methylheptyl acetate at 6.38 micrograms per kilogram (µg/kg), which has no associated RBSL.

SVOCs

- Seventeen SVOCs (primarily polynuclear aromatic hydrocarbons [PAHs]) were detected at the B009 LF (Chemical Use Area 1b) and the Building 009 Hold Up Tanks (Chemical Use Areas 2b and 2c). None of the detected SVOC concentrations exceeded RBSLs. The maximum concentration detected was of naphthalene at 180 µg/kg.

TPH

- Gasoline-range TPH was detected at concentrations exceeding RBSLs in samples from the B009 LF (Chemical Use Area 1b) and the Building 009 Hold-Up Tanks (Chemical Use Areas 2b and 2c), and at UT-3 (Chemical Use Area 3).
  - All of the detected gasoline-range TPH (C8 – C11) concentrations (1.3 to 4 mg/kg), exceeded the residential RBSL (1.1 mg/kg), with two of the three reported concentrations as estimated results. Gasoline-range TPH was not detected in samples in the channel north of the RFI site. As discussed above, VOCs (including benzene) were not detected in soil vapor samples collected at the site.
  - Other TPH detected concentrations were less than RBSLs, and included diesel-range TPH up 710 mg/kg and lubricant oil-range up to 51 mg/kg in samples collected from soils beneath the former UT-3, and an estimated detection of kerosene-range TPH at the B009 LF (up to 2.2J mg/kg).

PCBs/Terphenyls

- Estimated concentrations of Aroclor 1254 (at 26.1J µg/kg) and Aroclor 1260 (19.5J µg/kg) were detected at the B009 LF (Chemical Use Area 1b). Detected PCB concentrations did not exceed the RBSLs.
- Terphenyls were detected at concentrations up to 0.955 mg/kg at one location in the leach field.

Metals

- Aluminum, antimony, sodium, and mercury were detected above background concentrations at the B009 LF (Chemical Use Area 1b) and the Building 009 Waste Hold-Up Tanks (Chemical Use Area 2b and 2c). Aluminum and antimony also exceeded ecological RBSLs.
  - Aluminum was detected exceeding background near the inlet end of the leach field at 22,400 mg/kg and at the SGR Liquid Waste Hold-Up Tank at 23,000 mg/kg. Aluminum concentrations did not exceed background in samples from the nearby location near the Building 009 OMR Waste Hold-Up Tank (Chemical Use Area 2c), or in down-slope and drainage sample locations.
  - Antimony was detected at 9.8 mg/kg, exceeding background near the inlet end of the B009 LF. All other site sample antimony results were less than background.
  - Mercury was detected at 0.53 mg/kg exceeding background near the down-slope end of the B009 LF. All other site sample mercury results were less than background.
  - Sodium was detected at concentrations exceeding background at the SGR Liquid Waste Hold-Up Tank (up to 390 mg/kg), OMR Waste Hold-Tank (up to 149 mg/kg), and at the B009 LF (up to 149 mg/kg).
- Aluminum, barium, chromium, sodium, and vanadium were detected above background near the solar concentrator facility (Chemical Use Area 5). Aluminum, barium, and vanadium also exceeded ecological RBSLs, and vanadium also exceeded the residential RBSL.
  - Aluminum (up to 28,000 mg/kg) was detected above background at two locations. There are no discernable patterns or concentration gradients in the aluminum detections above background, except that these occurrences are associated with higher concentrations of clay present in the soil. As described above and in Table A.3-2A, the clay-rich Santa Susana formation is present to the south and near the solar concentrator facility, and soil from this material will likely yield higher naturally occurring aluminum concentrations.
  - Barium (up to 243 mg/kg), chromium (at 39.7 mg/kg), and vanadium (at 78 mg/kg) were detected above background at one location only, near the center

of the solar concentrator facility. Similar to the occurrence of aluminum described above, these metal concentrations are considered naturally-occurring since they are associated with clayey soils and are either very deep (barium, immediately above bedrock), or just slightly exceed the soil background concentrations (chromium background at 36.8 mg/kg and vanadium background at 62 mg/kg).

  - Sodium (up to 240 mg/kg) was detected above background at two locations, one near the former location of the parabolic dish, and one approximately 30 feet south of the south of the former location of the parabolic dish.

- Cadmium was not detected above background in site soils.

Fluoride

- Fluoride (up to 3.5 mg/kg) was detected at the leach field and at each of the hold-up tank areas. Detected fluoride concentrations did not exceed the RBSL.

The potential contribution of the 2005 Topanga Fire to the concentrations of metals in soil has been considered in the characterization of the nature and extent of chemicals at the B009 LF RFI Site. This evaluation was done to determine if any elevated concentrations of six metals (barium, boron, copper, lead, thallium and zinc) in soil samples collected after the fire could be due to the presence of ash and burned materials deposited in surficial soil. None of the post-fire samples were analyzed for dioxins since there were no chemical use areas at the B009 LF that included the burning of materials. Only those surficial soil samples (0- to 6-inches depth) collected after the fire were considered in this evaluation. For the B009 LF RFI Site there two post-fire soil samples analyzed for metals. Neither of the two samples analyzed for metals had elevated concentrations of the six metals mentioned above, suggesting no fire-related impacts.

A.3.5 Groundwater Findings

Groundwater occurrence and impacts at the B009 LF RFI Site are described below.

A.3.5.1 Groundwater Data Presentation

Groundwater sampling results and characterization findings are summarized in Table A.3-2B. The purposes of the table are 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:
  - That groundwater characterization is appropriate for detected site chemical constituents.
  - That site soil characterization is appropriate for detected groundwater chemical constituents.

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

- Column 1 – Analytical group
- Column 2 – Summary of site soil impacts
- Column 3 – Confirmation that chemicals detected in site soil are monitored in groundwater
- Column 4 – Summary of groundwater impacts
- Column 5 – Discussion of whether chemicals are site-related
- Column 6 – Conclusion regarding adequacy of groundwater characterization

A detailed compilation of groundwater data is provided in Appendix E of this Group 8 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 the following:

- 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 and fate issues addressed in Appendix E.

A.3.5.2 Groundwater Data Summary

Groundwater conditions at the B009 LF RFI Site are characterized by one piezometer (PZ-102) and one well screened in the Chatsworth formation groundwater (RD-91). Groundwater findings from these wells are presented on Table A.3-2B.

As described in Appendix E, three VOCs were detected above their screening levels in groundwater samples from RD-91 and PZ-102, including 1,2-dichloroethane (1,2-DCA) (at 0.57 µg/L), cis-1,2-dichloroethene (cis-1,2-DCE) (up to 21 µg/L), and TCE (up to 130 µg/L). Methyl ethyl ketone (MEK) was detected at 5.6 µg/L (estimated) (this compound does not have an established screening criteria level). Groundwater VOCs are considered related to historical, incidental, small spills in the area. Current soil sample data for the B009 LF RFI Site do not indicate a significant release; however, historical releases from which no mass remains in surficial media may have occurred within the sampling area (Table A3.2-B).

Several metals were detected above GWCC screening criteria. Of these, only vanadium was detected above both background in soil and the GWCC in groundwater. Based on historical operations information and soil data (one slight exceedance of background in a single sample), vanadium is not considered site-related.

A.3.6 Surface Water Findings

No surface water samples have been collected at the B009 LF RFI Site since surface water is not present at the site except as intermittent runoff in the rainy season.

A.4 RISK ASSESSMENT FINDINGS SUMMARY

The following sections summarize the findings of the HRA and ERA performed for the B009 LF RFI Site within the Group 8 RFI Reporting Area. Details regarding how the HRA and ERA were conducted are presented in the SRAM (MWH, 2005) and in Attachment F1 of Appendix F of this Group 8 RFI Report.

A.4.1 Key Decision Points

Site-specific key decision points for the HRA and ERA are listed below and described more fully in Appendix F and Attachment F1 of Appendix F. These decisions were 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 the following:

1. While both direct (drinking water) and indirect (vapor) exposures were evaluated in the risk assessment (Appendix F), only indirect exposures are presented here because there is no current or planned future use of groundwater for drinking water.
2. Exposure Point Concentration (EPC) calculations were based on collected characterization data, as follows:
   - All groundwater EPCs were based on maximum levels detected in a single highest-concentration well at the B009 LF RFI Site (RD-91) for indirect exposure or detected within a single highest-concentration well within the Group 8 area (RS-54) for direct exposure.
   - A review of time series plots for chemical constituents, groundwater gradients, and source areas indicates maximum concentrations detected during the last consecutive three years conservatively represent potential future conditions for the purpose of estimating future risks.
   - Soil EPCs were based on maximum concentrations (either detected concentrations 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 B009 LF 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 SSFL will be presented later in a Site-Wide Large-Home Range Report.

4. Aluminum and barium were evaluated in the risk assessment. However, these are not listed as risk drivers or contributors, or included in the risk estimate totals because concentrations detected at the B009 LF RFI Site are considered to be naturally-occurring as a result of high clay-content soils. Further, the soluble and toxic forms of aluminum are only present in soil at pH values of less than 5.5 (USEPA, 2003) and soil pH at the B009 LF RFI Site ranged from 6.5 to 8.37.

A.4.2 Human Heath Risk Assessment Findings

The receptors included in the human health risk assessment are the current worker and potential trespasser and the future resident, worker, and recreator. Since the current potential trespasser and the 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 (COPC) for Human Health – Table A.4-1
- Human Health Risk Estimates – Tables A.4-2
- Human Health Risk Assessment Uncertainty Analysis – Table A.4-3
- Generalized Conceptual Site Model (CSM) of HRA Exposures – Figure A.4-1

A summary of the HRA findings is presented below. For comparison purposes, excess upper bound incremental lifetime cancer risks (ILCRs) at 10^{-6} or less associated with multimedia exposures are considered acceptable. Potential risks between 10^{-6} and 10^{-4} require risk-management decisions, and potential risks above 10^{-4} usually require remediation. Likewise, Hazard Indices (HIs) below 1 are considered acceptable, and those above 1 usually require remediation. Also, blood lead concentrations less than 10 micrograms per deciliter (µg/dl) are generally considered to be acceptable for making decisions regarding the necessity for remediation (DTSC, 1992). These criteria were used to make evaluation recommendations for the CMS.

Exposure to Surficial Media Plus Indirect Groundwater Exposure

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. The risk assessment results are summarized as follows:

- Estimated cancer risks for all receptors were below 1×10^{-6}, and HIs were less than 1. No single chemical had risks exceeding $1x10^{-6}$.

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

A.4.3 Ecological Risk Assessment Findings

The ecological receptors representing the B009 LF RFI 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 (CPEC) – Table A.4-4
- Risk Estimates for Ecological Receptors – Table A.4-5
- Ecological Risk Assessment Uncertainty Analysis – Table A.4-6
- Graphical CSM of ERA Exposures – Figure A.4-2

A summary of the ERA findings is presented below, including Hazard Quotient (HQ) and Hazard Index (HI) information. HQs are hazard estimates for single CPECs, while HIs are cumulative hazard estimates for all CPECs. For comparison purposes, HQ or HI values less than 1 represent conditions that would not cause unacceptable ecological impacts. HQ or HI values greater than 1 typically require additional evaluation, and may be deemed acceptable or unacceptable by risk managers. The ERA findings included the following:

- Estimated HIs for the thrush and mule deer ranged from 1 to 2 at the B009 LF RFI Site. The estimated HI for the thrush is 1, and the mule deer HI is 2. These HIs are primarily associated with cadmium. The estimated HIs for the deer mouse and bobcat are less than 1.
- The deer mouse burrow air inhalation pathway does not contribute significantly to the deer mouse 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 A.4-6.

A.5 B009 LF RFI SITE ACTION RECOMMENDATIONS

This section presents a summary of RFI reporting requirements as they apply to the B009 LF RFI Site. Section A.5.1 describes RFI reporting requirements, particularly with respect to the identification of areas recommended for further work, or 'site action' recommendations. The process and criteria used for making site action recommendations is described in Section A.5.2, and site action recommendations for the B009 LF RFI Site are summarized in Section A.5.3.

A.5.1 RFI Reporting Requirements

As described in regulatory guidance documents for the SSFL RCRA Corrective Action Program (see Section 1.2.3 of Volume I), the purposes of the RFI are 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 B009 LF 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) (Tables A.3-2A and A.3.3-2B). Section A.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 E of the Group 8 RFI Site report, and other potential transport pathways in Appendix F of the Group 8 RFI Site report.
3) Identifying potential receptors and estimating potential risks at the B009 LF RFI Site (Section A.4 and Appendix F).
4) Identifying B009 LF RFI Site areas requiring further work (this Section).

A.5.2 Basis for Site Action Recommendations

In summary, site action recommendations included in the B009 LF RFI Site Report identify areas for the following:

- Further evaluation in the CMS (CMS Areas)
- No further action (NFA Areas)
- Interim corrective measures to stabilize source areas and control contaminant migration (Stabilization Areas)

Site action recommendations are based on the information in historical documents, site characterization data, and risk assessment findings. Historical document review findings are used to determine areas of potential chemical use and identify areas for additional RFI sampling and characterization. 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, estimate human health and ecological risks based on specified land use scenarios, and identify chemicals that drive or contribute to those risks.

Based on the review and evaluation of extensive historical records and environmental sampling data collected prior to and during the RFI, additional sampling was performed in areas where chemicals were potentially used, handled, stored, or released within the Group 8 Reporting Area. Samples were also collected in areas where the existing analytical data were considered to be inadequate for site characterization and/or risk assessment (including down-gradient locations). Similarly, for areas where no historical chemical use, storage, or handling was indicated in the historical documents (i.e., for areas determined to have very limited or no potential for environmental concern), no samples were collected. Based on the documents reviewed and nearby sampling results, if any, these non-chemical use areas are recommended for NFA.

NFA and CMS recommendations for the areas sampled within the Group 8 Reporting Area are based on an integrated evaluation of characterization and risk assessment results. Information in the historical documents indicating past chemical use practices and areas, coupled with site characterization data indicating environmental impacts or lack thereof, provide a solid basis for the NFA and CMS recommendations made in this report. 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. This process, which is presented in detail in Section 7.1 of the Group 8 RFI Report, is summarized as follows:

- **Site Action Evaluation Step 1.** 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 x 10^{-6}, or 1 in 1,000,000, or HI = 1.0) is used to conservatively estimate the areal extent that is recommended for site action.
- **Site Action Evaluation Step 2.** When estimated RFI site risks are greater than 1 x 10^{-6} (cancer risks) or HI values are 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 the cumulative, total risk for each receptor.
- **Site Action Evaluation Step 3.** Characterization findings from the entire RFI site are evaluated to 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 for all appropriate potential receptors or land use scenarios.
- **Site Action Evaluation Step 4.** The fourth step identifies any uncertainties in the RFI site characterization and risk assessments that may 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. As described in Step 3 above, the areas of the RFI sites proposed for further evaluation in the CMS (i.e., CMS Areas) are based on identifying chemical concentrations that are above their respective RBSL. This process results in CMS Areas that are larger than would need to be addressed during cleanup to achieve acceptable risks. This is due to comparing individual soil sample results to RBSLs as 'bright-line' criteria, instead of using an area-average concentration. Area-averaged concentrations will be used in the CMS to refine the cleanup extent at these recommended CMS Areas.

As described in Step 3 above, the areas of the RFI sites proposed for further evaluation in the CMS (i.e., CMS Areas) are based on identifying chemical concentrations that are above their respective RBSL. This process results in CMS Areas that are larger than would need to be addressed during cleanup to achieve acceptable risks. This is due to comparing individual

soil sample results to RBSLs as 'bright-line' criteria, instead of using an area-average concentration. Area-averaged concentrations will be used in the CMS to refine the cleanup extent at these recommended CMS Areas.

Site action recommendations are tabulated by chemical use area, and chemical risk drivers/contributors are identified for each appropriate receptor in Table A.5-1. As shown on this table, there are no CMS Areas recommended for the B009 LF RFI Site.

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 RFI Report.

Source Area Stabilization Site Action Evaluation Process

Chemical data collected during the RFI are evaluated to determine the potential 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 the following:

- Presence of chemical concentrations above background or RBSLs in surficial (not deeper) soils
- Proximity of surficial impacts to an active surface water drainage pathway
- Moderate to steep topography
- Absence of containment features (e.g., surface coatings, dams)
- Concentration gradients that indicate prior transport away from the source of surficial impacts

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, which include the use of best management practices (BMPs), are used to prevent migration to surface water. BMPs may include the installation of straw bales, fiber rolls, silt fencing, and/or covering of areas with plastic tarps. 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, 2006a).

A.5.3 B009 LF RFI Site Recommendations

The B009 LF RFI Site action recommendations are listed in Table A.5-1. As shown on this table, no B009 LF RFI Site areas are recommended for evaluation in the CMS since the identified potential risk contributor, cadmium, is present at concentrations less than its background comparison level. 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 will be prepared as needed.

Recommendations for further evaluation of aluminum concentrations at the B009 LF RFI Site during the CMS were not made because these concentrations are considered naturally-occurring. In addition, as described in Section C.4, estimated aluminum exposure risks for ecological receptors are based on toxicity values derived from soluble aluminum present in soil with pH values of less than 5.5 (USEPA, 2003). B009 LF RFI Site soil pH measurements ranged from 6.5 to 8.37, indicating limited (if any) ecological exposure to the soluble, toxic form of aluminum.

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TABLES

TABLE A.2-1
B009 LF RFI SITE BUILDING INVENTORY
(Page 1 of 1)

Building (a)	Chemical Use Area Location	Current Use	Former Use	Operational Status Existing/Removed	DTSC Site Visit Date
Building 009	2a	Proprietary Laser Program	Nuclear Experiment Laboratory (Organic Moderated Reactor, Sodium Graphite Reactor), Proprietary Laser Program	Existing	April 2000[(b)]
Solar Concentrator	5	NA	Solar Concentrator	Removed	Not Visited
Building 425	5	NA	Solar Concentrator Control Trailer	Removed	Not Visited
Astronomical Observatory	E of 5	Inactive	Observatory	Existing	Not Visited
Storage Shed	SW of 5	Inactive	Storage Shed for Area IV Weather Station	Existing	Not Visited
Weather Station	S of 5	Weather Station	Weather Station	Existing	Not Visited
ISI trailer	NE of 2a	NA	Control Room and Storage Container for the ISI Program	Removed	Removed prior to DTSC Site Visit in April 2000.
ISI trailer located southwest of Building 009	SE of 2a	NA	Control Room and Storage Container for the ISI Program	Removed	Removed prior to DTSC Site Visit in April 2000.

Notes:

(a) Buildings are sometimes identified with the Administrative Area number followed by the building number (e.g Building 886 vs. Building 4886).

(b) Because of proprietary work, inspection of Building 009 was limited to exterior features of the site.

Acronyms:

AI = Atomics International
B009 - Building 009
ISI - In-service Inspection
NA - Not Applicable
USEPA = United States Environmental Protection Agency

Sources:

Field inspection, aerial photographs (USEPA, 1997), historical facility photographs (Boeing, 2007a), historical reference documents (AI, 1958a, 1959b, Sapere, 2005), and historical facility drawings (Rockwell, 1985a, 1985b, 1985c; Boeing, 1997a, 1997b)

TABLE A.2-2
B009 LF RFI SITE TANK INVENTORY
(Page 1 of 1)

Tank Designator[(a)]	Chemical Use Area Location	Location	Contents	Tank Size (gallons)	Operational Status Existing / Removed
Aboveground Tanks - Other					
Propane Tank	NA	W of the solar concentrator	Propane	--	Removed
LN_2 Tank	2a	B009	LN_2	150	Removed
Sodium Pre-heat Tank	2a	B009	Sodium	--	Removed
GN2 Tank Storage	2a	B009	GN_2	--	Removed
Underground Tanks - Fuel					
UT-3	3	SE of B009	Diesel, Fuel Oil	1,500	Removed
Underground Tanks - Other					
B009 LF Septic Tank	1b	W of B009	Sanitary Waste	2,430	Removed
UT-4	2b	SGR Liquid Waste Hold-Up Tank Pit	Radioactive Waste	1,000	Removed
UT-5	2c	OMR Waste Hold-Up Tank Pit	Radioactive Waste	1,000	Removed
UT-59	2a	B009 OMR Tank Pit	Santowax-R (terphenyl mixture)	1,200	Removed

Notes:

[(a)]Tanks listed by category (fuel, solvent, other). If category not indicated on table, then that type of tank was not present on site.
-- = Tank size was not documented (Boeing, 2007a)

Acronyms:

AI = Atomics International
B009 - Building 009
LN_2 - Liquid Nitrogen
NA - Not Applicable
GN_2 - Gaseous Nitrogen
UT = Underground Tank
SGR - Sodium Graphite Reactor
OMR - Organic Moderated Reactor
USEPA = United States Environmental Protection Agency

Sources:

Field inspection, aerial photographs (USEPA, 1997), tank records (Rockwell 1994b), personal communications (Boeing, 2007e), historical facility photographs (Boeing, 2007a), historical reference documents (AI, 1958a, 1959b), and historical facility drawings (AI, 1958b, 1958c, 1958d, 1958e, 1966, 1975; Parsons, 1995b, 1995c; Van Dyke and Barne, 1957a, 1957b, 1957c, 1957d, 1957e, 1957f)

TABLE A.2-3
B009 LF RFI SITE TRANSFORMER INVENTORY
(Page 1 of 1)

SSFL Identification Number	Chem Use Area Location	Description	Location	Status	Transformer Oil Sampled for PCBs (Date/ Results)	Soil Sampled (Date/ Results)	Transformer Condition After 2005 Fire
Substation 709 Tag # 110, 162, 163	4a	2 transformers, 2 concrete pads	SE of Building 009	1 - in place 1 - removed	Yes 1983 3.8, 2.2 ppm 1987 4.5 ppm	Yes XFBS06 ND<55 µg/kg XFBS07 ND<53 µg/kg	Not affected by Fire
Pole # X-32	4b	3 transformers, 1 pole	"H" St., north of solar concentrator	Active	No	Yes XFBS31 ND<53 µg/kg	Not affected by Fire

Acronyms:

AI = Atomics International
ppm - parts per million
USEPA = United States Environmental Protection Agency

Sources:

Field inspection, aerial photographs (USEPA, 1997), historical facility photographs (Boeing, 2007a), and historical facility drawings (AI, 1959b, 1959e; Rockwell, 1985a)

TABLE A.2-4
B009 LF RFI SITE DOCUMENTED CHEMICAL USE
(Page 1 of 1)

Chemicals Used	Reference
Acetone	MWH, 2006a
Alkaline batteries	Boeing, 2006a and 2006b
Aluminum	AI, 1959
Asbestos	Rockwell, 1988a
Boron trifluoride	AI, 1960
Cadmium	AI, 1965b and 1967
Deisel	GRC, 1987 AESE, 1995
Diphenyl	AI, 1959c, 1959d
Ethanol	Boeing, 2006a and 2006b
Fuel Oil	AESE, 1995 ICF, 1993 Ogden, 1998
Hydrochloric acid	Rockwell, 1981
Isopropyl alcohol	MWH, 2006a Boeing, 2006a and 2006b
Lead	DOE, n.d
Kerosene	AI, 1959a
Mercury	ICF, 1993
Phosphoric acid	Rockwell, 1981
Polychlorinated biphenyls [(a)]	Rockwell, 1985e
Polypropylene glycol	Boeing, 2002
Santowax-R (terphenyls mixture) [(b)]	AI, 1959b; Rockwell, 1994
Sodium	AI, 1959b; 1975
Sodium hydroxide	ICF, 1993
Sodium-potassium	Beoing, 2007a
Turco 3878 LF-NC [(c)]	ICF, 1993

Notes:

[(a)] PCB-oils contained in pole-mounted transformers.

[(b)] Santowax-R is a commercial coolant comprised of ortho-, meta-, and para-terphenyl.

(c) Turco 3878 LF-NC is a commercial solvent composed of dyethylene glycol butyl ether, sodium triolyphosphate, and anionic surfactant.

Acronyms:

AESE = A.E. Schmidt Environmental

AI = Atomics International

n.d. - no date

DOE = Department of Energy

ICF = ICF Kaiser

TABLE A.3-1A
B009 LF RFI SITE SAMPLING SUMMARY

Sample Type [1,5]	Total Number of Samples (2)	Total QC Samples (3)	Total Agency Samples (4)	Total Validated Samples
Soil Vapor Samples (Table A.3-1B)	5	1	0	4
Soil Matrix Samples (Table A.3-1C)	41	6	0	30

Notes:

1. Detailed sample and analytical program information is contained in Tables A.3-1B and A.3-1C as indicated above.
2. Total samples = total primary site investigation samples, including historical samples and composite 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 and findings will be 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 E of the Group 8 RFI Report.

TABLE A.3-1B
B009 RFI SITE SOIL VAPOR SAMPLING AND ANALYTICAL SUMMARY
(Page 1 of 1)

Sample Location Identifiation	Unique Sample ID	Sample Identification	Date Collected	Sample Method	Depth (feet bgs)	Sample Type	Sample Analyses (Validated Y/N) [a] VOCs	Rationale [b]	Consultant [c]	Reference Document [d]
L0SV0001	L0SV0001S01	L0SV0001S01	03/06/07	Active	4	Primary Sample	Y	DGA	MWH	This report
L0SV0003	L0SV0003S02	L0SV0003S02	03/06/07	Active	8	Primary Sample	Y	DGA	MWH	This report
L0SV0004	L0SV0004D01	L0SV0004D01	03/06/07	Active	4	Field Duplicate	Y	DGA	MWH	This report
L0SV0004	L0SV0004S01	L0SV0004S01	03/06/07	Active	4	Primary Sample	Y	DGA	MWH	This report
SV-LF009-1	SVLF0091	SVLF0091	08/24/93	Active	4.5	Primary Sample	N	WP	ICF Kaiser	MWH, 2004
SV-LF009-2	SVLF0092	SVLF0092	08/24/93	Active	4.5	Primary Sample	N	WP	ICF Kaiser	MWH, 2004

Total Primary Samples:	5
Total QC (Duplicate) Samples:	1
Number of B009 LF RFI Site Soil Vapor Samples:	**6**

Validated:	4
Not Validated	2

Notes:

Sample Location Identification - Vapor probe number

Unique Sample ID - Laboratory reporting code

Sample Identification - RFI site and sample identifier code

(a) **Validated** indicates at least one analysis has been validated following RFI protocols; agency split samples were not validated but were reviewed for comparability.
Data collected prior to the RFI were not typically subsequently validated using RFI protocols but were collected and reviewed following QA procedures established for earlier investigation programs.

(b) **Rationale (see below):**
DGA - Indicates samples collected in 2007 as a part of the Data Gaps Analysis to address delineation with stepout samples, elevated detection limit issues, and specific DTSC resquests.
WP - Indicates samples collected based on DTSC-approved Work Plan scope.

(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 appendix and the Group 8 RFI Report (See References, Section A.6).

Laboratory Analytical Methods Represented (EPA Method No.)

VOC - 8240, 8260B

VOC - Volatile Organic Compound

TABLE A.3-1C
B009 LF RFI SITE SOIL MATRIX SAMPLING AND ANALYTICAL SUMMARY
(Page 1 of 2)

Sample Location Identification	Unique Sample ID	Sample Identification	Date Collected	Sample Method (a)	Depth (feet bgs)	Sample Type	Sample Analyses (Validated Yes/No)							Validated (b)	Rationale (c)	Consultant (d)	Reference Document (e)
							Inorganics	Metals	PCBs	SVOCs	Terphenyls	TPH	VOCs				
500000	500000P	500000P	6/28/1995	G	0	Primary Sample			N					N	Drainage	McLaren Hart	McLaren Hart, 1995 [f]
L0BS0001	L0BS0001D01	L0BS0001D01	2/20/2007	HA	1	Field Duplicate	Y	Y				Y		Y	DGA	MWH	This report
L0BS0001	L0BS0001S01	L0BS0001S01	2/20/2007	HA	1	Primary Sample	Y	Y				Y		Y	DGA	MWH	This report
L0BS0002	L0BS0002S01	L0BS0002S01	2/20/2007	HA	1	Primary Sample	Y	Y				Y		Y	DGA	MWH	This report
L0BS0003	L0BS0003S01	L0BS0003S01	2/20/2007	HA	1	Primary Sample	Y	Y						Y	DGA	MWH	This report
L0BS0003	L0BS0003S02	L0BS0003S02	2/20/2007	HA	7.5	Primary Sample	Y							Y	DGA	MWH	This report
L0BS0004	L0BS0004S01	L0BS0004S01	2/20/2007	HA	0.5	Primary Sample	Y	Y						Y	DGA	MWH	This report
L0BS0006	L0BS0006S01	L0BS0006S01	2/20/2007	HA	3.5	Primary Sample	Y	Y						Y	DGA	MWH	This report
L0BS0007	L0BS0007D01	L0BS0007D01	2/20/2007	GP	1.5	Field Duplicate	Y	Y				Y	Y	Y	DGA	MWH	This report
L0BS0007	L0BS0007S01	L0BS0007S01	2/20/2007	GP	1.5	Primary Sample	Y	Y				Y	Y	Y	DGA	MWH	This report
L0BS0007	L0BS0007S02	L0BS0007S02	2/20/2007	GP	5.5	Primary Sample	Y	Y						Y	DGA	MWH	This report
L0BS0007	L0BS0007S03	L0BS0007S03	2/20/2007	GP	10	Primary Sample	Y	Y						Y	DGA	MWH	This report
L0BS0010	L0BS0010S01	L0BS0010S01	5/16/2007	HA	7	Primary Sample	Y	Y	Y		Y			Y	DGA	MWH	This report
L0BS0010	L0BS0010S01SP	L0BS0010S01SP	5/16/2007	HA	7	Split Sample	Y	Y	Y					Y	DGA	MWH	This report
L0BS0011	L0BS0011D01	L0BS0011D01	5/16/2007	GP	7.5	Field Duplicate	Y	Y	Y		Y			Y	DGA	MWH	This report
L0BS0011	L0BS0011S01	L0BS0011S01	5/16/2007	GP	7.5	Primary Sample	Y	Y	Y		Y			Y	DGA	MWH	This report
L0BS0012	L0BS0012S01	L0BS0012S01	5/15/2007	GP	1.5	Primary Sample	Y	Y	Y	Y	Y	Y	Y	Y	DGA	MWH	This report
L0BS0012	L0BS0012S01SP	L0BS0012S01SP	5/15/2007	GP	1.5	Split Sample	Y	Y	Y	Y		Y	Y	Y	DGA	MWH	This report
L0BS0012	L0BS0012S02	L0BS0012S02	5/15/2007	GP	7.5	Primary Sample	Y	Y	Y	Y	Y	Y	Y	Y	DGA	MWH	This report
L0BS0014	L0BS0014S01	L0BS0014S01	5/16/2007	GP	1.5	Primary Sample		Y					Y	Y	DGA	MWH	This report
L0BS0014	L0BS0014S01SP	L0BS0014S01SP	5/16/2007	GP	1.5	Split Sample		Y					Y	Y	DGA	MWH	This report
L0BS0014	L0BS0014S02	L0BS0014S02	5/16/2007	GP	18	Primary Sample		Y					Y	Y	DGA	MWH	This report
L0BS0015	L0BS0015S01	L0BS0015S01	5/15/2007	HA	1.5	Primary Sample		Y					Y	Y	DGA	MWH	This report
L0BS0015	L0BS0015S02	L0BS0015S02	5/16/2007	HA	16.5	Primary Sample		Y					Y	Y	DGA	MWH	This report
L0BS0017	L0BS0017S01	L0BS0017S01	5/16/2007	GP	0.5	Primary Sample	Y	Y	Y	Y	Y	Y	Y	Y	DGA	MWH	This report
L0BS0017	L0BS0017S02	L0BS0017S02	5/16/2007	GP	5.5	Primary Sample	Y	Y	Y	Y	Y	Y	Y	Y	DGA	MWH	This report
L0TS01S01	MJ061	L0TS01S01	6/24/2002	T	7.5	Primary Sample		Y	Y	Y		Y		Y	Septic Tank Removal	MWH	MWH, 2004
L0TS01S03	MJ063	L0TS01S03	6/27/2002	T	7.5	Primary Sample	Y	Y		Y		Y		Y	Septic Tank Removal	MWH	MWH, 2004
SB_B009_T401-1 [i]	SB_B009_T401-1_10	SB_B009_T401-1_10	10/20/1987	BA	10	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-1 [i]	SB_B009_T401-1_19	SB_B009_T401-1_19	10/20/1987	BA	19	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-2 [i]	SB_B009_T401-2_10	SB_B009_T401-2_10	10/20/1987	BA	10	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-2 [i]	SB_B009_T401-2_16	SB_B009_T401-2_16	10/20/1987	BA	16	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-3 [i]	SB_B009_T401-3_10	SB_B009_T401-3_10	10/20/1987	BA	10	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-3 [i]	SB_B009_T401-3_15	SB_B009_T401-3_15	10/20/1987	BA	15	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-4 [i]	SB_B009_T401-4_10	SB_B009_T401-4_10	10/20/1987	BA	10	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-4 [i]	SB_B009_T401-4_15	SB_B009_T401-4_15	10/20/1987	BA	15	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-5 [i]	SB_B009_T401-5_10	SB_B009_T401-5_10	10/20/1987	BA	10	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-5 [i]	SB_B009_T401-5_17.5	SB_B009_T401-5_17.5	10/20/1987	BA	17.5	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-6 [i]	SB_B009_T401-6_10	SB_B009_T401-6_10	10/20/1987	BA	10	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
SB_B009_T401-6 [i]	SB_B009_T401-6_20	SB_B009_T401-6_20	10/20/1987	BA	20	Primary Sample						N	N	N	UT-3 Removal	GRC	GRC, 1987 [g]
UT-3-S7	UT-3-S7-15	UT-3-S7-15	7/18/1995	HSA	15	Primary Sample						N	N	N	LUFT WP	AE Schmidt	AESE, 1995 [h]
UT-3-S7	UT-3-S7-20	UT-3-S7-20	7/18/1995	HSA	20	Primary Sample						N	N	N	LUFT WP	AE Schmidt	AESE, 1995 [h]
UT-3-S8	UT-3-S8-10	UT-3-S8-10	7/18/1995	HSA	10	Primary Sample						N	N	N	LUFT WP	AE Schmidt	AESE, 1995 [h]
UT-3-S8	UT-3-S8-15	UT-3-S8-15	7/18/1995	HSA	15	Primary Sample						N	N	N	LUFT WP	AE Schmidt	AESE, 1995 [h]
XFBS06	MT836	XFBS06S01	9/22/2003	HA	0.5	Composite Sample			Y					Y	WP	MWH	MWH, 2004
XFBS07	MT837	XFBS07S01	9/22/2003	HA	0.5	Composite Sample			Y					Y	WP	MWH	MWH, 2004
XFBS31	WD203	XFBS31S70	9/23/2005	HA	0.5	Composite Sample			Y					Y	WP	MWH	This report

Total Primary Samples:	41	**Validated:**	21	26	13	7	7	12	12	**30**
Total QC (Duplicate, Split) Samples:	6	**Not Validated**	0	0	1	0	0	16	16	**17**
Total Number of B009 LF RFI Site Soil Samples:	**47**									

Sample Location Identification - Boring or trench number
Unique Sample ID - Laboratory reporting code
Sample Identification - RFI site and sample identifier code

TABLE A.3-1C
B009 LF RFI SITE SOIL MATRIX SAMPLING AND ANALYTICAL SUMMARY
(Page 2 of 2)

(a) **Sample Method:**

HA = Hand Auger sample
BA = Bucket Auger
GP = Geoprobe - using direct push core barrel.
HSA = Hollow Stem Auger
T = Trench sample
G = Grab sample

(b) **Validated:** "Y" indicates that a minimum of one analysis has been validated following RFI protocols; agency split samples were not validated but were reviewed for comparabilit
Data collected prior to the RFI were not typically subsequently validated using RFI protocols but were collected and reviewed following QA procedures established for earlier investigation programs.

(c) **Rationale (see below):**

Drainage - Indicates sample was detected by McLaren Hart in 1995 to characterize the drainage channel north of Building 009.
DGA - Indicates samples collected in 2007 as a part of the Data Gaps Analysis to address delineation with stepout samples, elevated detection limit issues, and specific DTSC resquests.
WP - Indicates samples collected based on DTSC-approved Work Plan scope.
Septic Tank Removal - indicates sample was collected during the 2002 removal of the Building 009 septic tank and leach field.
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.
LUFT WP - Indicates samples collected based on VCEHD-approved work plan.
UT-3 Removal - Indicates samples collected to delineate diesel presence in soils following UT-3 removal.

(d) **Consultant:** Contractor responsible for sampling and reporting for each location.

(e) **Reference Document:** Document containing published data; "This report" includes the RFI site appendix and the Group 8 RFI Report. Refer to Section A.6 (References) for complete citation.

(f) **McLaren Hart, 1995** - FSDF Offsite Drainage Characterization Report

(g) **GRC, 1987** - Rocketdyne/SSFL, Building 009, Tank 401 Soils Investigation

(h) **AESE, 1995** - Site Assessment Report for Underground Storage Tank UT-3 (VCEHD Site# C94044)

(i) Sample locations SB_B009_401-1 to SB_B009_401-6 are identified as S1 to S6 in the source document (GRC, 1987). Sample location and sample idenfications were revised for database management purposes.

Laboratory Analytical Methods Represented (EPA Method No.)

Inorganics - 9045C, 300.0, 9056
Metals - 6010B, 6020, 7471A
PCB - 8080, 8082
SVOCs - 8270C SIM
Terphenyls - 8015B
TPH - 8015, 8015B, 8015M
VOCs - 8020, 8260B

Inorganics - pH and Fluoride
PCB - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compound
TPH - Total Petroleum Hydrocarbons
VOCs - Volatile Organic Compound

TABLE A.3-2A (PAGE 1 OF 9)

DESCRIPTION OF CHEMICAL USE AREAS AT THE B009 LF 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 Scope and Rationale**[1] [See Figure A.2-1 for sampling locations]	**Sampling Results** Chemical concentrations detected greater than background and/or risk screening levels?[1]	**Potential concentration gradients sufficiently evaluated for risk assessment?**[2,3]	**Is delineation sufficient to estimate soil volume in CMS?**[4] [see Figure A.5-1 for CMS areas]
1(a,b)	**Building 009 Leach Field and Septic Tank** The B009 LF was comprised a 2,340-gallon septic tank and six leach lines ranging in length from 15 to 42 feet (a total of about 300 linear feet) and was operated from 1959 to 1961. The LF was located approximately 50 feet northwest of B009 and was used for the disposal of sanitary and liquid waste from B009 (see Chemical Use Area 2). The septic tank and leach lines were removed in 2002, along with some soil and debris associated with the leach lines. The components of the septic system, including septic tank, manhole covers, and leach lines were surveyed during the 2002 removal and were deemed suitable for unrestricted use, except recycling. One water sample was collected from inside the septic tank during the 2002 removal and analyzed for VOCs, PCBs, and metals. Surface water flow at the B009 LF RFI Site is predominantly controlled by concrete- and asphalt-lined ditches that discharge to a natural drainage located to the west of the leach field. The concrete-lined channel near the leach field drains northward to a natural channel, which ends at a rock outcrop located approximately 150 feet north of the leach field. Soils at the LF are primarily sandy and silty clay. Bedrock at the LF is at approximately 8 feet bgs.	**VOCs** Small amounts of solvents such as isopropyl alcohol, ethanol, and acetone were used for hand wipe operations and cleaning of equipment.	Sample at targeted locations to evaluate potential VOCs related to historical solvent use. Two soil vapor probes were installed and sampled at 4.5 feet bgs, one each near the inlet (SV-LF009-1) and downslope (SV-LF009-2) ends of the LF.	VOC results are shown in Figure A.3-1. No VOCs were detected in either of the targeted locations or in the water sample collected from inside the septic tank; therefore, no further characterization is warranted.	**Yes.** No VOCs detected in soil vapor. VOCs were not detected in water sample collected from septic tank during its 2002 removal. Potential presence of VOCs adequately defined by targeted sampling locations.	**Yes.** VOCs were not detected and area is not recommended for further evaluation in CMS.
		SVOCs No documented generation of SVOCs at the B009 LF and septic tank.	Sample at targeted locations to evaluate potential SVOCs. Two trench samples were collected at 7.5 feet bgs to target leach lines during the 2002 septic tank removal: • L0TS01S01 near the inlet end of the LF; • L0TS01S03 near the downslope end of the LF.	SVOC results are shown in Figure A.3-1. Low concentrations of SVOCs were detected in sample L0TS01S03: • Phthalates were not detected. • PAHs were detected at up to 180 µg/kg naphthalene; benzo(a)pyrene was not detected and all other detected PAHs were below 30 µg/kg. All detected SVOCs were below RBSLs. Based on the low concentrations of SVOCs detected in targeted samples from the LF, no further characterization is warranted.	**Yes.** Only low concentrations detected. Potential SVOC distribution adequately defined by targeted sample locations.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling and risk assessment results.
		TPH Kerosene was used to clean pipes and valves of the organic moderated reactor (OMR) in B009 (see Chemical Use Area 2a for operations in B009).	Sample at targeted locations to evaluate potential TPH. Two trench samples were collected as described above for SVOCs. Note: Additional TPH sampling was conducted in adjacent areas, the SGR Liquid Waste Hold-Up Tank & Pit (Chemical Use Area 2b) and the OMR Waste Hold-Up Tank & Pit (Chemical Use Area 2c). Based on shallow TPH results at these two locations, samples were collected downslope of the leach field (L0BS0001 and L0BS0002, both at 1 foot bgs) These results are discussed below.	TPH results are shown in Figure A.3-1. Gasoline and kerosene range hydrocarbons were detected in the LF: • Gasoline was detected at 4 mg/kg in L0TS01S03, above the residential RBSL of 1.1 mg/kg. • Kerosene was detected (2.2 mg/kg) at L0TS01S03, well below the residential RBSL (1,400 mg/kg). TPH was not detected in downslope locations L0BS0001 and L0BS0002 Based on low TPH concentrations at targeted leach field sample locations, no further characterization is warranted.	**Yes.** TPH distribution adequately assessed by targeted sample locations.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling and risk assessment results.

TABLE A.3-2A (PAGE 2 OF 9)

DESCRIPTION OF CHEMICAL USE AREAS AT THE B009 LF 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 Scope and Rationale**[1] [See Figure A.2-1 for sampling locations]	**Sampling Results** Chemical concentrations detected greater than background and/or risk screening levels?[1]	**Potential concentration gradients sufficiently evaluated for risk assessment?**[2,3]	**Is delineation sufficient to estimate soil volume in CMS?**[4] [see Figure A.5-1 for CMS areas]
		PCBs/Terphenyls PCB or Terphenyl coolants potentially associated with OMR.	Sample at targeted locations to evaluate potential PCBs or terphenyls from the use of coolants in B009. Note: Aroclor 1254 was detected at 1.1 µg/L in the water sample collected from inside the septic tank during removal. One trench location (L0TS01S01 at 7.5 feet bgs) was collected to target inlet end leach lines and analyzed for PCBs during septic tank removal. Two deep soil samples were collected for PCB and terphenyl analysis: • L0BS0010 at 7 feet bgs, downslope end of the LF. • L0BS0011 at 7.5 feet bgs, inlet end of the LF. During the 1995 FSDF drainage characterization, one onsite surface soil sample (500000P) was collected from the drainage channel that intercepts Channel "C" leading from FSDF. The sample was collected approximately 750 feet downslope of the leach field and approximately 75 feet upstream of the confluence with Channel C.	PCB results are shown in Figure A.3-1. PCBs were not detected in the leach field inlet location. PCBs were not detected in L0BS0010. PCBs were detected at low concentrations in L0BS0011: • Aroclor 1254 at 26.1 µg/kg) and • Aroclor 1260 at 19.5 µg/kg) Detected PCBs were below RBSL. Two terphenyls (up to 0.955 mg/kg p-terphenyl) were detected in L0BS0011. Terphenyls were not detected anywhere in L0BS0010, or any other locations at the B009 LF RFI Site (below). PCBs were not detected in sample 500000P. Based on low PCB concentrations detected in one of three targeted locations and low terphenyl concentrations detected in one of two targeted locations, no further characterization is warranted.	**Yes.** Low concentrations of PCBs and terphenyls detected. Distribution adequately defined by targeted samples.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling and risk assessment results.
		Metals Reported use of aluminum and sodium in B009 to cool the reactor cores in the SGR experiments. Additional use and storage of mercury, cadmium, lead, and boron trifluoride in the SGR system was reported. **Fluoride** The use of boron trifluoride gas in the SGR system was reported.	Sample at targeted and representative locations to evaluate potential metals from B009 operations. Two targeted deep trench samples were collected as described above for SVOCs. Based on reported use of boron trifluoride, two deep soil samples were collected from boring locations L0BS0010 and L0BS0011 for boron analysis as described above for PCBs/terphenyls. Note: low concentrations of metals were detected in the water sample collected from inside the septic tank during the 2002 removal. Detected concentrations were: barium (0.060 mg/L), chromium (0.030 mg/L), copper (0.030 mg/L), lead (0.0099 mg/L), and zinc (0.068 mg/L). These results are less than groundwater comparison values for the SSFL. Collect deep samples at targeted locations to evaluate potential fluoride from the use of boron trifluoride in B009. Two deep soil samples were collected from boring locations L0BS0010 and L0BS0011 as described above for PCBs/terphenyls.	Metals results are shown in Figure A.3-1. Four metals were detected above background within the leach field: Aluminum (22,400 mg/kg), mercury (0.53 J mg/kg), and sodium (246 J mg/kg) in inlet sample L0TS01S01. Aluminum concentrations are considered to be naturally occurring since high aluminum concentrations are common in clay-rich soils, which are present at the B009 LF • Antimony (9.8 mg/kg) and sodium (203 mg/kg) in downslope sample L0TS01S03 Boron was detected within background range in both L0BS0010 and L0BS0011. The pH range in leach field samples was 6.77 to 7.41 indicating normal conditions. Based on sample results for targeted leach field locations, no further characterization is warranted. Fluoride results are shown in Figure A.3-1. Fluoride was detected up to 3.48 mg/kg, within the background range. Based on background concentrations in targeted samples, no further characterization is warranted.	**Yes.** Metals distribution adequately defined by targeted samples. **Yes.** Potential fluoride distribution adequately assessed by targeted sample locations.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling and risk assessment results. **Yes.** Area is not recommended for further evaluation CMS.

TABLE A.3-2A (PAGE 3 OF 9)

DESCRIPTION OF CHEMICAL USE AREAS AT THE B009 LF 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 Scope and Rationale**[1] [See Figure A.2-1 for sampling locations]	**Sampling Results** Chemical concentrations detected greater than background and/or risk screening levels?[1]	**Potential concentration gradients sufficiently evaluated for risk assessment?**[2,3]	**Is delineation sufficient to estimate soil volume in CMS?**[4] [see Figure A.5-1 for CMS areas]
2a	**B009** B009 housed two nuclear facilities, an organic moderated reactor (OMR) and a sodium graphite reactor (SGR), in side-by-side, concrete high-bay areas. Since each half of the B009 facility was built at different times, there were two completely separate systems installed to handle liquid and gaseous effluents. Two 1,000-gallon hold-up tanks were installed to store radioactive liquid waste: • The SGR Hold-up Tank (UT-4) (Chemical Use Area 2b) • The OMR Hold-up Tank (UT-5) (Chemical Use Area 2c) Liquids from floor, shower, and sink drains in B009 drained into these tanks. Radioactive liquid waste from the hold-up tanks was routed to the sanitary leach field after sampling of the hold-up tanks, and subsequent radiometric assay showed that the radioactive content was within permissible levels. A 1,200-gallon storage tank (UT-59) was located inside 10-foot deep concrete-lined pit in the OMR side facility. The tank was used to store Santowax-R, a terphenyl coolant mixture. B009 was used as a sodium for the storage of Rocketdyne's In-Service Inspection (ISI) Equipment and for high-energy rate forging (HERF) that included the handling of enriched uranium. The hold-up tanks have been removed. B009 is still in place and is currently inactive. Runoff from B009 is diverted into an asphalt-lined channel along its southern perimeter. This diversion ditch discharges into a storm water culvert located southeast of the building or to a concrete-lined channel to the west along the leach field. The storm water culvert to the southeast discharges into the Group 5 Reporting Area. The concrete-lined channel near the leach field drains northward to a natural channel, which ends at a rock outcrop located approximately 150 feet north of the leach field. Soils around B009 are primarily sandy and silty clay.	**VOCs** Small amounts of solvents such as isopropyl alcohol, ethanol, and acetone were used for hand wipe operations and cleaning of equipment.	Sample at representative locations to evaluate the potential VOCs from solvent use in B009. Four samples from three soil vapor probes were collected: • L0SV0001 (including field duplicate) near the northeast side of B009 at 4 feet bgs; • L0SV0003 near the southwest side of B009 at 8 feet bgs; • L0SV0004 near the western part of B009 at 4 feet bgs.	VOC results are shown in Figure A.3-1. VOCs were not detected at the representative locations; no further characterization is warranted.	**Yes.** VOCs not detected in samples from representative locations. Potential VOC presence adequately assessed.	**Yes.** Area is not recommended for evaluation in the CMS.

TABLE A.3-2A (PAGE 4 OF 9)

DESCRIPTION OF CHEMICAL USE AREAS AT THE B009 LF 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 Scope and Rationale[1] [See Figure A.2-1 for sampling locations]	Sampling Results Chemical concentrations detected greater than background and/or risk screening levels?[1]	Potential concentration gradients sufficiently evaluated for risk assessment?[2,3]	Is delineation sufficient to estimate soil volume in CMS?[4] [see Figure A.5-1 for CMS areas]
2b	**SGR Liquid Waste Hold-Up Tank & Pit** Liquid waste holdup tank (UT-4) northeast of B009. See description for Chemical Use 2a above. UT-4 was contained inside a 10'-8" wide x 13'-8" long x 8'-6" deep concrete-lined pit. The pit floor sloped towards a 4'-6" deep sump located towards the northwest side of the pit. A motorized pump was used to circulate waste from the tank to leach field through 2" diameter cast iron pipes.	**VOCs** Solvent use associated with B009.	Collect samples at targeted location to evaluate potential of VOCs from the use of solvents in B009. Collect soil samples at one boring location (L0BS0012 at 1.5 and 7.5 feet bgs) at the SGR Liquid Waste Hold-Up Tank & Pit. As described above for Chemical Use Area 2, one soil vapor sample was collected at nearby L0SV0001.	VOC results are shown in Figure A.3-1. No VOCs were detected in samples from the targeted hold up tank location or nearby soil vapor sample; therefore, no further characterization is warranted.	**Yes.** No VOCs were detected in soil samples from targeted location or the nearby soil vapor sample. Potential VOCs adequately defined by targeted sample locations.	**Yes.** Area is not recommended for further evaluation in CMS
		SVOCs No documented generation of SVOCs at the B009 LF and septic tank.	Collect samples at targeted location to evaluate potential SVOCs. Collect shallow and deep soil samples as described above for VOCs.	SVOC results are shown in Figure A.3-1. Low concentrations of SVOCs were detected in samples from L0BS0012: • In sample L0BS0012S01SP (1.5 feet bgs), PAHs up to 21 µg/kg fluoranthene; benzo(a)pyrene at 13 µg/kg; PAHs were not detected in the sample at 7.5 feet bgs • Di-n-butyl phthalate at 9.01 µg/kg in L0BS0012S02 (7.5 feet bgs) Detected SVOCs were below RBSLs Based on the low concentrations of SVOCs detected in targeted hold up tank samples, no further characterization is warranted.	**Yes.** Detected SVOC concentrations were low. Potential SVOCs adequately defined by targeted sample location.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling and risk assessment results.
		TPH Kerosene was used to clean pipes and valves of the organic moderated reactor (OMR) in B009 (see Chemical Use Area 2a for operations in B009).	Collect samples at targeted location to evaluate the potential petroleum hydrocarbons. Collect shallow and deep soil samples as described above for VOCs. Based on detected TPH at the SGR and OMR hold up tanks, two samples were collected at downslope (L0BS0001) and drainage (L0BS0002) locations (both at 1 foot bgs).	TPH results are shown in Figure A.3-1. Lubricant oil and gasoline range hydrocarbons were detected at L0BS0012: • Lubricant oil range hydrocarbons up to 21 mg/kg at 1.5 feet bgs • Lubricant oil range (2.97 mg/kg) and gasoline range (1.3 mg/kg) hydrocarbons at 7.5 feet bgs The gasoline range hydrocarbons concentration was slightly above the residential RBSL of 1.1 mg/kg. Lubricant oil hydrocarbons were well below RBSLs (ResRBSL 1,400 mg/kg). TPH was not detected in downslope or drainage locations. Only low TPH concentrations were detected at the targeted location and TPH was not detected in downslope/drainage samples; no further characterization is warranted.	**Yes.** TPH concentrations were low at the targeted location. Potential TPH adequately defined by targeted sample location.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling and risk assessment results.
		PCBs/Terphenyls PCB or Terphenyl coolants potentially associated with OMR.	Collect samples at targeted location to evaluate potential PCB/terphenyl coolants in B009. Collect shallow and deep soil samples as described above for VOCs.	PCB/Terphenyls results are shown in Figure A.3-1. No PCBs or terphenyls were detected in the targeted location; therefore, no further characterization is warranted.	**Yes.** PCB and terphenyls were not detected. Potential presence adequately defined by the targeted samples.	**Yes.** Area is not recommended for further evaluation in CMS.

TABLE A.3-2A (PAGE 5 OF 9)

DESCRIPTION OF CHEMICAL USE AREAS AT THE B009 LF 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 Scope and Rationale**[1] [See Figure A.2-1 for sampling locations]	**Sampling Results** Chemical concentrations detected greater than background and/or risk screening levels?[1]	**Potential concentration gradients sufficiently evaluated for risk assessment?**[2,3]	**Is delineation sufficient to estimate soil volume in CMS?**[4] [see Figure A.5-1 for CMS areas]
		Metals Reported use of aluminum and sodium in B009 to cool the reactor cores in the SGR experiments. Additional use and storage of mercury, cadmium, lead, and boron trifluoride in the SGR system was reported.	Collect samples at targeted location to evaluate the potential metals from B009. Collect shallow and deep soil samples as described above for VOCs. To evaluate potential downslope migration from B009, four shallow soil samples collected at representative intervals downslope and within drainage: • L0BS0001 (1 foot bgs), just north of the B009 Leach Field • L0BS0002 (1 foot bgs), approximately 150 feet north of the leach field. • L0BS0003 (1 foot bgs), approximately 500 feet north of the LF. • L0BS0004 (0.5 feet), approximately 750 feet north of the LF.	Metals results are shown in Figure A.3-1. Two metals were detected above background at L0BS0012: • Aluminum at 23,000 mg/kg in shallow split sample. The primary shallow sample and the deep sample contained aluminum below background. • Sodium up to 390 mg/kg; sodium was above background in both shallow and deep samples. All metals were detected within background ranges in downslope and drainage samples. Based on a single split sample containing aluminum above established background with a corresponding primary sample below background, aluminum is considered naturally occurring in a clayey silt sample. Targeted samples contained sodium above background, but otherwise background concentrations. No further characterization is warranted.	**Yes.** Potential metals adequately defined by targeted samples.	**Yes.** Area is not recommended for further evaluation in CMS.
		Fluoride Boron trifluoride potentially associated with SGR system.	Collect samples at targeted location to evaluate the presence of impacts from the use of boron trifluoride in B009. Collect shallow and deep soil samples as described above for VOCs.	Fluoride results are shown in Figure A.3-1. Detected fluoride concentrations at targeted location (up to 3.5 mg/kg) within background range (6.7 mg/kg): no further characterization warranted.	**Yes.** Detected fluoride within background range. Potential fluoride adequately defined by targeted sample.	**Yes.** Area is not recommended for further evaluation in CMS.
2c	**OMR Waste Hold-Up Tank & Pit** Liquid waste holdup tank (UT-5) northeast of B009. See description for Chemical Use 2a above. UT-5 was contained inside a 14'-5" wide x 12'-5" long x 2'-6" deep concrete lined pit. A 24" deep sump was located near the southwest portion of the pit. A motorized pump was used to circulate waste from the tank to leach field through 2" diameter cast iron pipes.	**VOCs** Solvent use associated with B009.	Collect samples at targeted location to evaluate potential VOCs from solvent use in B009. Collect shallow and deep soil samples at location targeting the OMR Waste Hold-Up Tank & Pit (ESBS0017 at01.5 and 5.5 feet bgs). As described above for Chemical Use Area 2, one soil vapor sample was collected at nearby L0SV0004.	VOC results are shown Figure A.3-1. Acetone (4.94 µg/kg) was detected in the shallow sample; no VOCs were detected in the 5.5 foot sample. Acetone was detected well below RBSLs. VOCs also were not detected in nearby soil vapor sample. No further characterization is warranted.	**Yes.** Detected VOC concentration is low in targeted soil sample and were not detected in the nearby soil vapor sample. . Potential VOCs adequately defined by targeted samples.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling and risk assessment results.
		SVOCs No documented use of SVOCs at the OMR Waste Hold-Up Tank & Pit.	Collect samples at targeted location to evaluate potential SVOCs. Collect shallow and deep soil samples as described above for VOCs.	SVOCs results are shown in Figure A.3-1. Low concentrations of SVOCs detected at ESBS0017: • Anthracene detected at 4.2 µg/kg in shallow sample; benzo(a)pyrene not detected. • Di-n-butyl phthalate detected up to 5.91 µg/kg in both shallow and deep samples. Detected SVOCs are below RBSLs. Low concentrations detected at targeted location; no further characterization is warranted.	**Yes.** Detected SVOC concentration is low. Potential SVOCs adequately defined by targeted samples.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling and risk assessment results.

TABLE A.3-2A (PAGE 6 OF 9)

DESCRIPTION OF CHEMICAL USE AREAS AT THE B009 LF 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 Scope and Rationale**[1] [See Figure A.2-1 for sampling locations]	**Sampling Results** Chemical concentrations detected greater than background and/or risk screening levels?[1]	**Potential concentration gradients sufficiently evaluated for risk assessment?**[2,3]	**Is delineation sufficient to estimate soil volume in CMS?**[4] [see Figure A.5-1 for CMS areas]
		TPH Kerosene was used to clean pipes and valves of the organic moderated reactor (OMR) in B009 (see Chemical Use Area 2a for operations in B009).	Collect samples at targeted location to evaluate the potential TPH. Collect shallow and deep soil samples as described above for VOCs. As described above for Chemical Use Area 2b, downslope/drainage samples were collected for TPH analysis. TPH was not detected.	TPH results are shown in Figure A.3-1. • Gasoline (1.71 mg/kg), diesel (1.82 mg/kg), and lubricant oil (34.4 mg/kg) hydrocarbon ranges were detected in the 0.5 foot bgs sample • Lubricant oil range hydrocarbons were detected in the 5.5 feet bgs sample Only gasoline range is slightly above RBSL (1.1 mg/kg). Based on low concentrations detected in targeted samples, no further characterization is warranted.	**Yes.** Detected TPH concentrations low. Potential TPH adequately defined by targeted samples.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling and risk assessment results.
		PCBs/Terphenyls PCBs/terphenyl coolants potentially associated with OMR.	Collect samples at targeted location to evaluate the potential PCB/terphenyl from coolants used at B009. Collect shallow and deep soil samples as described above for VOCs.	PCB/Terphenyl results are shown in Figure A.3-1. PCBs and terphenyls were not detected at the targeted location samples; no further characterization is warranted	**Yes.** PCBs and terphenyls were not detected. Potential presence adequately defined by targeted samples	**Yes.** Area is not recommended for further evaluation in CMS based on sampling and risk assessment results.
		Metals Reported use of aluminum and sodium in B009 to cool the reactor cores in the SGR experiments. Use and storage of mercury, cadmium, and lead reported.	Collect samples at targeted location to evaluate the potential metals from B009. Collect shallow and deep soil samples as described above for VOCs. As described above for Chemical Use Area 2b, downslope/drainage samples were collected for metals analysis. Metals were detected within background ranges.	Metals results are shown in Figure A.3-1. Sodium (149 µg/L) was detected above background (110 mg/kg) in the shallow sample. All other metals were below background. Based on low concentration of sodium and otherwise background range metals concentrations, no further characterization is warranted.	**Yes.** Detected metals concentrations were low or below background. Potential metals adequately defined by targeted samples.	**Yes.** Area is not recommended for further evaluation in CMS.
		Fluoride Boron trifluoride associated with SGR system.	Collect samples at targeted location to evaluate the presence of impacts from the use of BF_3 in B009. Collect shallow and deep soil samples as described above for VOCs.	Fluoride results are shown in Figure A.3-1. Detected fluoride concentrations (up to 1.09 mg/kg) did not exceed background (6.7 mg/kg): no further characterization warranted.	**Yes.** Potential fluoride presence adequately assessed by targeted sample location.	**Yes.** Area is not recommended for further evaluation in CMS.

TABLE A.3-2A (PAGE 7 OF 9)

DESCRIPTION OF CHEMICAL USE AREAS AT THE B009 LF 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 Scope and Rationale**[1] [See Figure A.2-1 for sampling locations]	**Sampling Results** Chemical concentrations detected greater than background and/or risk screening levels?[1]	**Potential concentration gradients sufficiently evaluated for risk assessment?**[2,3]	**Is delineation sufficient to estimate soil volume in CMS?**[4] [see Figure A.5-1 for CMS areas]
3	**UT-3** UT-3 (formerly Tank 401) was a 1,500-gallon capacity underground storage tank (UST) located outside the southeast area of B009. Stored diesel/fuel oil for onsite activities. UT-3 was removed by Rocketdyne under the oversight of VCEHD in 1987. It was determined during UT-3 excavation that a release had occurred. A total of 24 tons of soil were excavated during tank removal. The LUFT case for UT-3 was closed by VCEHD in 1999. See Chemical Use 2a for surface water flow description. Soil thickness at the UT-3 area ranges from 15 – 25 feet bgs.	**VOC** Diesel/fuel oil stored in UT-3.	Evaluate VOCs in soil surrounding the former UT-3excavation. Following the removal of UT-3 and the excavation of the impacted soil beneath the former tank in 1987, 12 samples were collected for BTEX and chlorinated benzene analysis at 6 borehole locations adjacent to the former tank location: • SB_B009_T401-1 at 10 and 19 feet bgs; • SB_B009_T401-2 at 10 and 16 feet bgs; • SB_B009_T401-3 at 10 and 15 feet bgs; • SB_B009_T401-4 at 10 and 15 feet bgs; • SB_B009_T401-5 at 10 and 17.5 feet bgs; • SB_B009_T401-6 at 10 and 20 feet bgs. Note: Sample IDs as entered in database; source document IDs are S1 – S6. Based on a request by VCEHD indicating that 1987 sampling was outside the tank area, four additional soil samples were collected in 1995 for BTEX analysis at two boring locations (UT-3-7 and UT-3-8) within the former tank excavation: • UT-3-7 at 15 and 20 feet bgs; • UT-3-8 at 10 and 15 feet bgs.	VOC results are shown in Figure A.3-1. VOCs were not detected in 1987 samples. Ethylbenzene (5 µg/kg at) and total xylenes (17 µg/kg) were detected in one of the four 1995 samples, UT-3-7-15. Detected VOC concentrations were well below RBSLs (1,200 µg/kg for ethylbenzene, 150 µg/kg for total xylenes). Based on low detected concentrations of VOCs at targeted UT-3 locations, no further characterization is warranted.	**Yes.** Detected VOCs low. Potential VOCs adequately defined by targeted sample locations.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling results and letter of closure from VCEHD.
		TPH Diesel/fuel oil stored in UT-3.	Evaluate TPH in soil surrounding the former UT-3excavation. Collect shallow and deep soil samples as described above for VOCs.	TPH results are shown in Figure A.3-1. TPH was not detected in 1987 samples. Petroleum hydrocarbons were detected in 1995 samples: • Diesel range organics at 710 mg/kg in UT-3-S7; • Oil range organics up to 51 mg/kg in UT-3-S7 and UT-3-S8. Detected hydrocarbons were well below RBSLs (Residential 1,400 mg/kg). Based on low TPH concentrations detected at targeted locations from the UT-3 area, no further characterization is warranted.	**Yes.** Low concentrations detected. Potential TPH adequately defined by targeted sample locations.	**Yes.** Area is not recommended for further evaluation in CMS based on sampling results and letter of closure from VCEHD.
4a	**B009 LF Transformer Pads (Substation 709)** Two transformers located on separate concrete pads in the area adjacent to eastern side of B009. One of the transformers has been removed.	**PCBs** Oils potentially containing PCBs.	Eight shallow samples were collected adjacent to the perimeter of each transformer pad and combined for composite analysis in two samples (XFBS06 and XFBS07).	PCB results are shown in Figure A.3-1. PCBs were not detected in composite samples from targeted locations. No further characterization is warranted.	**Yes.** PCBs not detected in targeted composite samples.	**Yes.** Area is not recommended for further evaluation in CMS.
4b	**Transformer Pole X-32** Three pole-mounted transformers located just north of the solar concentrator facility, just south of “H” St. All transformers are still in place.	**PCBs** Oils potentially containing PCBs.	Three soil samples were collected at targeted locations adjacent to the transformer pole and combined for composite analysis.	PCB results are shown in Figure A.3-1. PCBs were not detected in composite sample from targeted location. No further characterization warranted.	**Yes.** PCBs not detected. Potential PCBs adequately defined by targeted samples.	**Yes.** Area is not recommended for further evaluation in CMS.

TABLE A.3-2A (PAGE 8 OF 9)

DESCRIPTION OF CHEMICAL USE AREAS AT THE B009 LF 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 Scope and Rationale[1] [See Figure A.2-1 for sampling locations]	Sampling Results Chemical concentrations detected greater than background and/or risk screening levels?[1]	Potential concentration gradients sufficiently evaluated for risk assessment?[2,3]	Is delineation sufficient to estimate soil volume in CMS?[4] [see Figure A.5-1 for CMS areas]
5	**Solar Concentrator Facility** The solar concentrator test facility is located approximately 325 feet southwest of B009. It was constructed in 1985 and was used in experiments aimed at harnessing solar power. The facility consisted of a 25 kilowatt (kWt) parabolic dish -- Sterling engine generator, which consisted of a mirrored parabolic dish concentrator, 10.7 meters in diameter, and a solar receiver. Building 425 (B425), located approximately 40 feet south of the parabolic dish, was a trailer that was used to house controls and recorders for the dish. South of the B009 RFI Site, surface water discharge from the eastern boundary of the ESADA RFI Site drains via sheet flow to the solar concentrator facility, where it is directed into a gunite-lined ditch that discharges along H Street. Surface water flows north via sheet flow towards B009. A concrete-lined drainage that originates south of the ESADA RFI Site runs through the center of the solar concentrator facility and continues to a low spot near a rock outcrop north of the LF. Soils at the solar concentrator facility are primarily sandy and silty clay. Soil thickness at the solar concentrator facility ranges from 10 to 18.5 feet bgs. The upper portion of the soil at site (approximately 0 to 5 feet bgs) is considered disturbed and possibly fill soils.	**VOCs** No documented use of VOCs at the solar concentrator facility.	Sample at representative locations to evaluate potential VOCs Collect five samples from three representative locations to evaluate potential VOCs: • L0BS0007 at 1.5 feet bgs; • L0BS0014 at 1.5 and 18 feet bgs; • L0BS0015 at 1.5 and 15.5 feet bgs. Soil vapor probes were not sampled near the solar concentrator facility due to soil compactness and the high clay content.	VOC results are shown in Figure A.3-1. • One tentatively identified compound (TIC), 3-Methylheptyl acetate, was detected at 6.38 µg/kg in the 18 foot bgs sample collected from L0BS0014. • Acetone was detected at 9.99 µg/kg in the 1.5 foot bgs sample from L0BS0015. No other VOCs were detected in the five representative samples. Detected acetone well below RBSLs. No further characterization warranted.	**Yes.** VOCs detected at very low concentrations in two of five samples. Potential VOCs adequately defined by targeted samples	**Yes.** Targeted VOCs not detected, area is not recommended for further evaluation in CMS.
		TPH No documented use of TPH at the solar concentrator facility.	Sample at representative locations to evaluate potential TPH. Sample at one location, L0BS0007 at 1.5 feet bgs.	TPH results are shown in Figure A.3-1. TPH was not detected in one sample from representative location. No further characterization warranted.	**Yes.** TPH not detected in representative sample. Potential TPH adequately defined by representative sample.	**Yes.** TPH was not detected. Area is not recommended for further evaluation in CMS.
		Metals Weak solutions of phosphoric and phosphoric and hydrochloric acid were used for cleaning the carbon steel components of the solar concentrator. Sodium-potassium was used as a heat transfer fluid for the parabolic dish receiver. Sodium-potassium (NaK) was used as a heat transfer fluid for the parabolic dish.	Sample at representative locations to evaluate potential metals. Sample at three representative locations as described for VOCs. Due to elevated aluminum concentrations, collect two additional deep samples at L0BS0007 at 5.5 and 10 feet bgs.	Metals results are shown in Figure A.3-1. Four metals were detected above background: • Aluminum up to 28,000 mg/kg at L0BS0007 and L0BS0014, with the maximum concentration at 10 feet bgs in L0BS007. However, aluminum at the solar concentrator facility are considered naturally occurring since: ➢ There is no suspected source of aluminum associated with solar concentrator facility operations; ➢ The facility is situated at the base of a slope comprised of the Santa Susana formation, from which the highest aluminum concentration of the background dataset was detected (Sample BG04). ➢ The maximum concentration was detected in a sample from 10 feet bgs. ➢ High aluminum concentrations are common in clay rich soils. • Barium up to 243 mg/kg (background 140 mg/kg) at 18 feet bgs, chromium up to 39.7 (background 36.8), and vanadium up to 78 mg/kg (background 62 mg/kg) at L0BS0014. Barium is considered naturally occurring based on the depth at which the maximum was detected; chromium and vanadium are slightly above background in one of three samples. • Sodium up to 240 mg/kg (background 110 mg/kg) at L0BS0014 and L0BS0015. Aluminum and barium are elevated above established background but are considered naturally occurring. Remaining metals are either below background or slightly above. Based on lack of potential metals source and metals distribution at representative locations, no further characterization is warranted. pH range = 7.47 – 8.37.	Yes. Potential metals distribution adequately defined by representative locations.	**Yes.** Area is not recommended for further evaluation in CMS.

Sources: AI, 1959b, 1960; Boeing 2006a, 2006b, 2007a, 2007b, 2007c; Diblee, 1992; MWH, 2002; SAIC, 1994; ICF, 1993; Ogden, 1996; Ogden, 1998; Rockwell, 1981, 1988b, 1990, 1996b; Sapere, 2005.

TABLE A.3-2A (PAGE 9 OF 9)

DESCRIPTION OF CHEMICAL USE AREAS AT THE B009 LF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY

Notes:

1. Map Key refers to numbered chemical use area as shown on Figures A.2-1 and A.3-1.
2. 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.
3. Complete sample analytical results are presented in Attachment A-3.
4. The use of the SRAM-based screening levels for comparison purposes does not serve as a risk assessment. These screening levels are not used to determine if a chemical use area will be recommended for further consideration in the CMS, but only as a tool to evaluate the characterization data. The SRAM-based screening levels represent conservative concentrations that pose a low level of risk.
5. Concentration gradients must be defined such that the risk assessment reflects the approximate maximum analyte concentration OR a concentration sufficiently high to result in risk requiring a recommendation for evaluation during CMS. .
6. Chemicals listed as a basis for CMS recommendations include both chemical drivers (above 1 x 10-6 risk and HI of 1.0) and significant chemical contributors to overall risk.
7. Volumes for CMS evaluation must be estimable within a factor of ten for comparison of remedial alternatives.

ACRONYMS

AI = Atomics International
B009 LF = B009 Leach Field
CMS = corrective measures study
HERF = high-energy rate forging
ISI = In-service inspection
kWt = kilowatt
mg/kg = milligrams per kilogram
OMR = organic moderated reactor
PCB = polychlorinated biphenyls
RBSL = risk-based screening level
SGR = sodium graphite reactor
SRAM = standardized risk assessment methodology
SVOC = semi-volatile organic compound
TIC = tentatively identified compound
µg/kg = micrograms per kilogram
µg/L = micrograms per liter
VOC = volatile organic compound

TABLE A.3-2B
B009 LF RFI SITE SUMMARY AND EVALUATION OF GROUNDWATER SAMPLING RESULTS
(PAGE 1 OF 4)

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts)[1]	Monitored in Groundwater? (Number of Samples/Date Range)[2]	Constituents Detected in Groundwater? (Above GWCC or Regulatory Criteria?)[3]	RFI Site Related?	Groundwater Characterized Sufficiently for Risk Assessment?
VOCs	Low concentrations of VOCs were detected in soils at the OMR hold-up tank and near the former UST UT-3. Ethylbenzene at 5 µg/kg, total xylenes at 17 µg/kg, acetone at 9.99 µg/kg, and 3-methylheptyl acetate, which was tentatively identified at 6.38 µg/kg.	YES Three samples were collected and analyzed for VOCs in 2003 and 2004 in piezometer PZ-102 (one sample) and Chatsworth formation well RD-91 (two samples).	YES Three VOCs were detected above regulatory criteria: • 1,2-DCA up to 0.57 µg/L in RD-91. • cis-1,2-DCE up to 21 µg/L in RD-91. • TCE in PZ-102 and RD-91, up to 130 µg/L. • MEK at 5.6 µg/L in RD-91 (No MCL) Toluene was detected at 1.2 µg/L.	NO Groundwater VOCs are considered related to historical, incidental, small spills in the area. Current soil sample data at B009 LF RFI Site do not indicate a significant release; however, historical releases may have occurred within the sampling area from which no mass remains in surficial media.	NSGW - YES Perched NSGW very infrequently present at site. CFGW - YES
SVOCs	SVOCs were detected in soil in several areas within the B009 LF RFI Site. Detected PAHs included: naphthalene (180 µg/kg), fluoranthene (up to 21µg/kg), and benzo(a)pyrene (13 µg/kg). Phthalates were detected up to 9.01 µg/kg (di-n-butyl phthalate).	YES One sample has been collected and analyzed for SVOCs in 2003 in perched piezometer PZ-102.	YES Naphthalene was detected in PZ-102 at 0.07 µg/L (estimated), below screening criteria; no other SVOCs were detected.	UNLIKELY Detected SVOCs in soil were low, and only one SVOC, naphthalene, was detected in groundwater at a low (estimated) concentration. Based on low mobility for PAHs, significant SVOC impacts to groundwater from B009 are considered unlikely; however, low groundwater naphthalene may be related to soil concentrations detected at the site.	NSGW - YES Perched NSGW very infrequently present at site. CFGW - YES Potential for presence of SVOCs is low given low site soil detections.
TPH	Petroleum hydrocarbons were detected in soil in several area within the B009 LF RFI Site, primarily at former UST UT-3. Gasoline range hydrocarbons (C8 – C11) at up to 4 mg/kg, kerosene range hydrocarbons (C11 – C14) at 2.2 mg/kg, diesel range hydrocarbons (C15 – 20) at 1.82 mg/kg, and lubricant oil range hydrocarbons (C21 – C30) at up to 34.4 mg/kg were detected. “Diesel range organics” at 710 mg/kg and “oil range organics” at up to 510 mg/kg were detected in the UT-3 excavation area. Approximately 24 tons of soil was removed from the former tank excavation based on hydrocarbon staining observed.	YES One sample was collected and analyzed for TPH in 2003 in perched piezometer PZ-102.	NO TPH was not detected.	NO Detected concentrations of petroleum hydrocarbons in soil were low. Petroleum hydrocarbons were not detected in groundwater.	NSGW - YES Perched NSGW very infrequently present at site. CFGW - YES

TABLE A.3-2B
B009 LF RFI SITE SUMMARY AND EVALUATION OF GROUNDWATER SAMPLING RESULTS
(PAGE 2 OF 4)

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts)[1]	Monitored in Groundwater? (Number of Samples/Date Range)[2]	Constituents Detected in Groundwater? (Above GWCC or Regulatory Criteria?)[3]	RFI Site Related?	Groundwater Characterized Sufficiently for Risk Assessment?
PCBs/Terphenyls	PCBs were detected up to 26.1µg/kg at the B009 LF. Terphenyls were detected up to 0.955 mg/kg.	NO Based on low mobility of PCBs and low detected concentrations at the B009 LF, the potential for migration to groundwater has been considered low and PCB groundwater analysis has not been conducted. However, PCBs were analyzed in groundwater from other SSFL RFI sites, targeting soil containing high PCB concentrations in recharge areas (see MWH, 2006b), and PCBs not been detected in groundwater.	PCBs/terphenyls not analyzed in groundwater.	UNLIKELY Although groundwater samples have not been analyzed for PCBs, detected PCB concentrations in soil were low and do not readily migrate to groundwater based on low solubility.	NSGW - YES Perched NSGW very infrequently present at site. CFGW - YES Potential presence of PCBs in groundwater is low. However, PCBs will be analyzed in Group 8 wells to confirm lack of PCB groundwater impacts.
Dioxins	Dioxins are not considered potentially related to the B009 LF operations and were not analyzed.	NO	Dioxins not analyzed in groundwater.	NO Although groundwater samples have not been analyzed for dioxins, dioxins are not suspected in soil and do not readily migrate to groundwater based on low solubility.	NSGW - YES Perched NSGW very infrequently present at site; potential presence low. CFGW - YES Potential presence of Dioxins in groundwater is low.

TABLE A.3-2B
B009 LF RFI SITE SUMMARY AND EVALUATION OF GROUNDWATER SAMPLING RESULTS
(PAGE 3 OF 4)

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts)[1]	Monitored in Groundwater? (Number of Samples/Date Range)[2]	Constituents Detected in Groundwater? (Above GWCC or Regulatory Criteria?)[3]	RFI Site Related?	Groundwater Characterized Sufficiently for Risk Assessment?
Metals	Aluminum, antimony, barium, chromium, mercury, sodium, and vanadium were detected in soil above background ranges at the B009 LF. • Aluminum was detected up to 28,000 mg/kg (background 20,000 mg/kg) at four locations • Antimony at 9.8 (background 8.7 mg/kg) at one location • Barium up to 243 (background 140 mg/kg) at one location • Chromium at 39.7 (background 36.8 mg/kg) at one location • Mercury at 0.53 mg/kg (background 0.09 mg/kg) at one location • Sodium up to 390 mg/kg (background 100 mg/kg) at six locations • Vanadium at 78 mg/kg (background 62 mg/kg) in one shallow sample (L0BS0014S01 at 1.5 feet bgs) near the solar concentrator facility.	YES Five samples have been collected and analyzed for metals between 2003 and 2007 in perched piezometer PZ-102 and Chatsworth formation well RD-91.	YES Several metals were detected above GWCCs (all dissolved results) in RD-91: • Copper at 6.4 µg/L. • Cobalt at 2.6 µg/L • Molybdenum at 3.3 µg/L • Selenium at 2.4 µg/L • Thallium at 3.7 µg/L • Vanadium at 3.9 µg/L Note: NSGW has been present at PZ-102 on a sporadic basis and was analyzed for total (unfiltered) metals once during April 2003. Since total metals results are not directly comparable with dissolved GWCCs no comparison is made. Total metals data are presented in Table E-22. Dissolved data will be collected when groundwater is present in this piezometer.	UNLIKELY Only vanadium was detected above background in soil and above the GWCC in groundwater. Based on reviewed site documentation, and soil data (one slight exceedance of background in a single sample) vanadium is not considered site related.	NSGW - YES Perched NSGW very infrequently present at site. However, dissolved metals will be analyzed in PZ-102 samples obtainable. CFGW - YES
Inorganic Compounds	Fluoride was detected in soil at up to 3.5 mg/kg near the two hold-up tanks and the leach field at the B009 LF. Nitrate was not analyzed in soil.	YES Two samples were collected and analyzed for inorganics in 2004 in Chatsworth formation well RD-91.	YES Nitrate-NO3 was detected up to 47 mg/L.	NO Detected concentrations for fluoride in soil were low. Nitrate not considered target analyte for soil.	NSGW - YES Perched NSGW very infrequently present at site. CFGW - YES
Perchlorate	Perchlorate is not considered related to B009 LF operations and was not analyzed.	YES Two samples were collected and analyzed for perchlorate in 2004 in Chatsworth formation well RD-91	NO Perchlorate was not detected	NO	NSGW - YES Perched NSGW very infrequently present at this site. CFGW - YES

TABLE A.3-2B
B009 LF RFI SITE SUMMARY AND EVALUATION OF GROUNDWATER SAMPLING RESULTS
(PAGE 4 OF 4)

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts)[1]	Monitored in Groundwater? (Number of Samples/Date Range)[2]	Constituents Detected in Groundwater? (Above GWCC or Regulatory Criteria?)[3]	RFI Site Related?	Groundwater Characterized Sufficiently for Risk Assessment?
NDMA and formaldehyde (indicators of hydrazine)	NDMA was not detected in soil at the B009 LF.	YES One sample was collected and analyzed for NDMA in 2003 in perched piezometer PZ-102.	NO NDMA was not detected in the PZ-102 groundwater sample, however, the detection limit was above the screening value	NO NDMA was not detected in soil or groundwater.	NSGW - YES CFGW - YES. Potential for presence of NDMA is low.
1,4-Dioxane	1,4-Dioxane is not considered potentially related to the B009 LF operations and was not analyzed.	NO	1,4-dioxane not analyzed in groundwater.	NO Although soil and groundwater samples have not been analyzed for 1,4-Dioxane, no documentation exists of TCA or 1,4-Dioxane use at the B009 LF.	NSGW - YES Perched NSGW very infrequently present at this site; potential presence low. CFGW - YES Potential presence of 1,4-Dioxane is low.

Notes:

[1] See Table A.3-2A for a complete summary of soil impacts.

[2] Groundwater data are compared to Groundwater Comparison Concentrations and/or drinking water standards (e.g., Maximum Contaminant Levels [MCLs]).

[3] See Tables E-8 through E-27 for Groundwater Results.

4. All B009 Leach Field RFI Site groundwater monitoring locations are shown on Figure E-4 in Appendix E.

5. Groundwater comparison concentrations (GWCCs) were developed through a conservative process and approved by DTSC to be equal to or below naturally occurring background levels.

Acronyms:

AOC = Area of Concern
B009 LF = Building 009 Leach Field
CMS = Corrective Measures Study
NDMA = N-nitrosodimethylamine
NFA = No further action
OMR = Organic Moderated Reactor
PAH = Polynuclear aromatic hydrocarbons
PCB = polychlorinated biphenyls
SVOC = Semivolatile organic compound
TPH = total petroleum hydrocarbons
GWCC = Groundwater Comparison Concentrations
NDMA = N-nitrosodimethylamine

TABLE A.3-3A
B009 LF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SOIL)
(Page 1 of 3)

			Screening Levels (1)				Detect Data Summary						Non-Detect Data Summary							
Analyte Group	Constituent	Units	Residential (ResRBSL)	Ecological (EcoRBSL)	Background (2)	Total Number Samples Analyzed	Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Number of Detected Concentrations > Background	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	NumberDL > EcoRBSL	Number DL > Background	Data Issue (5)	Issue Resolution (6)
Inorganics																				
	Fluoride	mg/kg	4600	NA (4)	6.7	9	9	1.68	3.5	0	NA (4)	0	0						--	--
	pH	pH Units	NA (4)	NA (4)	NA (3)	12	12	6.5	8.37	NA (4)	NA (4)	NA (3)	0						--	--
METALS (mg/kg)																				
	Aluminum	mg/kg	75000	14	20000	21	21	10900	28000	0	21	8	0						--	--
	Antimony	mg/kg	30	0.096	8.7	10	9	0.046	9.8	0	6	1	1	0.072	0.072	0	0	0	--	--
	Arsenic	mg/kg	0.095	0.26	15	20	20	1.9	5.9	20	20	0	0						--	--
	Barium	mg/kg	15000	15	140	19	19	55	243	0	19	2	0						--	--
	Beryllium	mg/kg	150	5.9	1.1	19	19	0.35	0.95	0	0	0	0						--	--
	Boron	mg/kg	15000	9.3	9.7	21	16	1.1	6	0	0	0	5	1.09	1.2	0	0	0	--	--
	Cadmium	mg/kg	2.6	0.0026	1	19	17	0.081	0.46	0	17	0	2	0.33	0.34	0	2	0	Elevated DLs	b
	Calcium	mg/kg	NA (4)	NA (4)	NA (3)	2	2	2140	3630	NA (4)	NA (4)	NA (3)	0						--	--
	Chromium	mg/kg	3400	940	36.8	19	19	12	39.7	0	0	1	0						--	--
	Cobalt	mg/kg	1500	10	21	19	19	3.9	11.5	0	4	0	0						--	--
	Copper	mg/kg	3000	1.1	29	19	18	6.2	19.8	0	18	0	1	4	4	0	1	0	Elevated DLs	b
	Iron	mg/kg	NA (4)	NA (4)	NA (3)	2	2	20200	24600	NA (4)	NA (4)	NA (3)	0						--	--
	Lead	mg/kg	150	0.063	34	19	19	4.7	11	0	19	0	0						--	--
	Lithium	mg/kg	1522	43	37	17	17	16.7	27.5	0	0	0	0						--	--
	Magnesium	mg/kg	NA (4)	NA (4)	NA (3)	2	2	3860	4430	NA (4)	NA (4)	NA (3)	0						--	--
	Manganese	mg/kg	9500	79	495	2	2	145	158	0	2	0	0						--	--
	Mercury	mg/kg	23	0.88	0.09	20	11	0.0027	0.53	0	0	1	9	0.00245	0.019	0	0	0	--	--
	Molybdenum	mg/kg	380	0.11	5.3	19	15	0.16	2.5	0	15	0	4	0.15	0.6	0	4	0	Elevated DLs	b
	Nickel	mg/kg	1500	0.1	29	19	19	6.8	23.4	0	19	0	0						--	--
	Potassium	mg/kg	NA (4)	NA (4)	6400	19	19	1380	5100	NA (4)	NA (4)	0	0						--	--
	Selenium	mg/kg	380	0.18	0.655	19	5	0.25	0.54	0	5	0	14	0.21	0.579	0	14	0	Elevated DLs	b
	Silver	mg/kg	380	0.55	0.79	19	11	0.045	0.082	0	0	0	8	0.043	6.8	0	2	2	Elevated DLs	c
	Sodium	mg/kg	NA (4)	NA (4)	110	19	18	70	390	NA (4)	NA (4)	10	1	443	443	NA (4)	NA (4)	1	Elevated DLs	d
	Thallium	mg/kg	6.1	3.2	0.46	19	17	0.22	0.39	0	0	0	2	6.6	6.8	2	2	2	Elevated DLs	a
	Tin	mg/kg	NA (4)	NA (4)	NA (3)	2	0						2	2.34	2.41	NA (4)	NA (4)	NA (3)	--	--
	Vanadium	mg/kg	76	1.6	62	19	19	25	78	1	19	1	0						--	--
	Zinc	mg/kg	23000	22	110	19	19	40	87.3	0	19	0	0						--	--
	Zirconium	mg/kg	NA (4)	NA (4)	8.6	17	8	2	5.1	NA (4)	NA (4)	0	9	1.6	6	NA (4)	NA (4)	0	--	--
PCB (ug/kg)																				
	Aroclor 1016	ug/kg	3900	1600	NA (3)	14	0						14	3.65	55	0	0	NA (3)	--	--
	Aroclor 1221	ug/kg	350	1600	NA (3)	14	0						14	3.65	75	0	0	NA (3)	--	--
	Aroclor 1232	ug/kg	350	79	NA (3)	14	0						14	3.65	55	0	0	NA (3)	--	--
	Aroclor 1242	ug/kg	350	80	NA (3)	14	0						14	3.65	55	0	0	NA (3)	--	--
	Aroclor 1248	ug/kg	350	16	NA (3)	14	0						14	3.65	55	0	11	NA (3)	Elevated DLs	a, c
	Aroclor 1254	ug/kg	350	79	NA (3)	14	1	26.1	26.1	0	0	NA (3)	13	3.65	55	0	0	NA (3)	--	--
	Aroclor 1260	ug/kg	350	79	NA (3)	14	1	19.5	19.5	0	0	NA (3)	13	3.65	55	0	0	NA (3)	--	--
SVOC (ug/kg)																				
	1-Methyl naphthalene	ug/kg	230000	230000	NA (3)	5	0						5	6	19.9	0	0	NA (3)	--	--
	2-Methylnaphthalene	ug/kg	230000	230000	NA (3)	7	2	0.42	28	0	0	NA (3)	5	4	19.9	0	0	NA (3)	--	--
	Acenaphthene	ug/kg	3400000	2500	NA (3)	7	1	2	2	0	0	NA (3)	6	0.35	19.9	0	0	NA (3)	--	--
	Acenaphthylene	ug/kg	1700000	810000	NA (3)	7	1	7	7	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
	Anthracene	ug/kg	17000000	2400	NA (3)	7	2	2.2	4.2	0	0	NA (3)	5	4	19.9	0	0	NA (3)	--	--
	Benzo(a)anthracene	ug/kg	600	1400	NA (3)	7	1	11	11	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
	Benzo(a)pyrene	ug/kg	60	4700	NA (3)	7	1	13	13	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
	Benzo(b)fluoranthene	ug/kg	600	4600	NA (3)	7	1	20	20	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
	Benzo(ghi)perylene	ug/kg	NA (4)	6200	NA (3)	7	1	8.1	8.1	NA (4)	0	NA (3)	6	4	19.9	NA (4)	0	NA (3)	--	--
	Benzo(k)fluoranthene	ug/kg	600	3600	NA (3)	6	0						6	4	19.9	0	0	NA (3)	--	--
	bis(2-Ethylhexyl) phthalate	ug/kg	250000	4900	NA (3)	7	0						7	10	900	0	0	NA (3)	--	--
	Butyl benzyl phthalate	ug/kg	11000000	370000	NA (3)	5	0						5	6	19.9	0	0	NA (3)	--	--
	Chrysene	ug/kg	6000	2400	NA (3)	7	1	14	14	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
	Dibenzo(a,h)anthracene	ug/kg	170	1700	NA (3)	7	1	3.5	3.5	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
	Diethyl phthalate	ug/kg	46000000	5200000	NA (3)	7	0						7	0.63	19.9	0	0	NA (3)	--	--
	Dimethyl phthalate	ug/kg	570000000	7500000	NA (3)	5	0						5	6	19.9	0	0	NA (3)	--	--
	Di-n-butyl phthalate	ug/kg	5700000	490	NA (3)	7	3	5.45	9.01	0	0	NA (3)	4	3.5	19.9	0	0	NA (3)	--	--
	Di-n-octyl phthalate	ug/kg	2300000	1600000	NA (3)	5	0						5	6	19.9	0	0	NA (3)	--	--
	Fluoranthene	ug/kg	2300000	130000	NA (3)	7	1	21	21	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
	Fluorene	ug/kg	2300000	1600	NA (3)	7	1	3	3	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
	Indeno(1,2,3-cd)pyrene	ug/kg	600	3900	NA (3)	7	1	7.6	7.6	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
	Naphthalene	ug/kg	6000	230000	NA (3)	7	1	180	180	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
	n-Nitrosodimethylamine	ug/kg	45	60000	NA (3)	7	0						7	4	60	1	0	NA (3)	Elevated DLs	c

TABLE A.3-3A
B009 LF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SOIL)
(Page 2 of 3)

			Screening Levels (1)				Detect Data Summary						Non-Detect Data Summary							
Analyte Group	**Constituent**	**Units**	**Residential (ResRBSL)**	**Ecological (EcoRBSL)**	**Background (2)**	**Total Number Samples Analyzed**	**Total Samples w/ Detections**	**Minimum Detected Concentration**	**Maximum Detected Concentration**	**Number of Detected Concentrations > Res RBSL**	**Number of Detected Concentrations > Eco RBSL**	**Number of Detected Concentrations > Background**	**Total Samples ND**	**Minimum Detection Limit**	**Maximum Detection Limit**	**Number DLs > ResRBSL**	**NumberDL > EcoRBSL**	**Number DL > Background**	**Data Issue (5)**	**Issue Resolution (6)**
	Phenanthrene	ug/kg	1700000	1300	NA (3)	7	2	4	7.5	0	0	NA (3)	5	4	19.9	0	0	NA (3)	--	--
	Pyrene	ug/kg	1700000	79000	NA (3)	7	1	19	19	0	0	NA (3)	6	4	19.9	0	0	NA (3)	--	--
Terphenyls (mg/kg)																				
	m-Terphenyl	mg/kg	NA (4)	NA (4)	NA (3)	7	1	0.449	0.449	NA (4)	NA (4)	NA (3)	6	0.18	0.199	NA (4)	NA (4)	NA (3)	--	--
	o-Terphenyl	mg/kg	NA (4)	NA (4)	NA (3)	7	0						7	0.18	0.199	NA (4)	NA (4)	NA (3)	--	--
	p-Terphenyl	mg/kg	NA (4)	NA (4)	NA (3)	7	1	0.955	0.955	NA (4)	NA (4)	NA (3)	6	0.18	0.199	NA (4)	NA (4)	NA (3)	--	--
TPH (mg/kg)																				
	Diesel Range Organics	mg/kg	1400	NA (4)	NA (3)	4	1	710	710	0	NA (4)	NA (3)	3	10	10	0	NA (4)	NA (3)	--	--
	Diesel Range Organics (C14-C20)	mg/kg	1400	NA (4)	NA (3)	2	0						2	4	4	0	NA (4)	NA (3)	--	--
	Diesel Range Organics (C15-C20)	mg/kg	1400	NA (4)	NA (3)	10	1	1.82	1.82	0	NA (4)	NA (3)	9	3.72	6.2	0	NA (4)	NA (3)	--	--
	Gasoline Range Organics (C6-C12)	mg/kg	1.1	NA (4)	NA (3)	4	0						4	10	20	4	NA (4)	NA (3)	Elevated DLs	a
	Gasoline Range Organics (C8-C11)	mg/kg	1.1	NA (4)	NA (3)	12	3	1.3	4	3	NA (4)	NA (3)	9	3.72	6.2	9	NA (4)	NA (3)	Elevated DLs	a
	Kerosene Range Organics (C11-C14)	mg/kg	1400	NA (4)	NA (3)	2	1	2.2	2.2	0	NA (4)	NA (3)	1	4	4	0	NA (4)	NA (3)	--	--
	Kerosene Range Organics (C12-C14)	mg/kg	1400	NA (4)	NA (3)	10	0						10	3.6	6.2	0	NA (4)	NA (3)	--	--
	Lubricant Oil Range Organics (C20-C30)	mg/kg	1400	NA (4)	NA (3)	2	0						2	4	4	0	NA (4)	NA (3)	--	--
	Lubricant Oil Range Organics (C21-C30)	mg/kg	1400	NA (4)	NA (3)	10	5	2.97	34.4	0	NA (4)	NA (3)	5	5.4	6.2	0	NA (4)	NA (3)	--	--
	Lubricant Oil Range Organics (C25-C36)	mg/kg	1400	NA (4)	NA (3)	4	2	49	51	0	NA (4)	NA (3)	2	40	40	0	NA (4)	NA (3)	--	--
	Total Petroleum Hydrocarbons	mg/kg	1400	NA (4)	NA (3)	12	0						12	5	5	0	NA (4)	NA (3)	--	--
	Total Petroleum Hydrocarbons (as Kerosene	mg/kg	1400	NA (4)	NA (3)	4	0						4	10	20	0	NA (4)	NA (3)	--	--
VOC (ug/kg)																				
	1,1,1,2-Tetrachloroethane	ug/kg	0.25	82000	NA (3)	12	0						12	0.916	5.6	12	0	NA (3)	Elevated DLs	a
	1,1,1-Trichloroethane	ug/kg	490	2100000	NA (3)	12	0						12	0.916	5.3	0	0	NA (3)	--	--
	1,1,2,2-Tetrachloroethane	ug/kg	1.4	6400	NA (3)	12	0						12	0.916	5.3	4	0	NA (3)	Elevated DLs	c
	1,1,2-Trichloro-1,2,2-trifluoroethane	ug/kg	16000	230000	NA (3)	12	0						12	4.58	21	0	0	NA (3)	--	--
	1,1,2-Trichloroethane	ug/kg	1.2	9000	NA (3)	12	0						12	0.916	5.3	5	0	NA (3)	Elevated DLs	c
	1,1-Dichloroethane	ug/kg	1.6	230000	NA (3)	12	0						12	0.916	5.3	4	0	NA (3)	Elevated DLs	c
	1,1-Dichloroethene	ug/kg	23	320	NA (3)	12	0						12	0.916	5.6	0	0	NA (3)	--	--
	1,1-Dichloropropene	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.3	NA (4)	NA (4)	NA (3)	--	--
	1,2,3-Trichlorobenzene	ug/kg	120	68000	NA (3)	12	0						12	0.916	5.6	0	0	NA (3)	--	--
	1,2,3-Trichloropropane	ug/kg	0.051	13000	NA (3)	12	0						12	0.916	11	12	0	NA (3)	Elevated DLs	a
	1,2,4-Trichlorobenzene	ug/kg	120	68000	NA (3)	12	0						12	0.916	5.6	0	0	NA (3)	--	--
	1,2,4-Trimethylbenzene	ug/kg	35	140000	NA (3)	12	0						12	0.916	5.3	0	0	NA (3)	--	--
	1,2-Dibromo-3-chloropropane	ug/kg	29	23000	NA (3)	12	0						12	0.916	11	0	0	NA (3)	--	--
	1,2-Dibromoethane	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.3	NA (4)	NA (4)	NA (3)	--	--
	1,2-Dichlorobenzene	ug/kg	1800	390000	NA (3)	24	0						24	0.916	300	0	0	NA (3)	--	--
	1,2-Dichloroethane	ug/kg	0.5	76000	NA (3)	12	0						12	0.916	5.3	12	0	NA (3)	Elevated DLs	a
	1,2-Dichloropropane	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.3	NA (4)	NA (4)	NA (3)	--	--
	1,3,5-Trimethylbenzene	ug/kg	36	140000	NA (3)	12	0						12	0.916	5.3	0	0	NA (3)	--	--
	1,3-Dichlorobenzene	ug/kg	1700	350000	NA (3)	24	0						24	0.916	300	0	0	NA (3)	--	--
	1,3-Dichloropropane	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.3	NA (4)	NA (4)	NA (3)	--	--
	1,4-Dichlorobenzene	ug/kg	10	170000	NA (3)	24	0						24	0.916	300	12	0	NA (3)	Elevated DLs	a
	2-Chloro-1,1,1-trifluoroethane	ug/kg	NA (4)	NA (4)	NA (3)	4	0						4	0	11	NA (4)	NA (4)	NA (3)	--	--
	2-Chloroethylvinyl ether	ug/kg	0.0096	780	NA (3)	12	0						12	4.58	53	12	0	NA (3)	Elevated DLs	a
	2-Hexanone	ug/kg	NA (4)	2600000	NA (3)	12	0						12	4.58	21	NA (4)	0	NA (3)	--	--
	3-Methylheptyl acetate	ug/kg	NA (4)	NA (4)	NA (3)	1	1	6.38	6.38	NA (4)	NA (4)	NA (3)	0						--	--
	Acetone	ug/kg	51000	46000	NA (3)	12	2	4.94	9.99	0	0	NA (3)	10	4.83	21	0	0	NA (3)	--	--
	Benzene	ug/kg	0.13	4600	NA (3)	28	0						28	0.916	300	28	0	NA (3)	Elevated DLs	h
	Bromobenzene	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.6	NA (4)	NA (4)	NA (3)	--	--
	Bromochloromethane	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.6	NA (4)	NA (4)	NA (3)	--	--
	Bromodichloromethane	ug/kg	0.31	16000	NA (3)	12	0						12	0.916	5.3	12	0	NA (3)	Elevated DLs	a
	Bromoform	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.6	NA (4)	NA (4)	NA (3)	--	--
	Bromomethane	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	11	NA (4)	NA (4)	NA (3)	--	--
	Carbon Tetrachloride	ug/kg	0.042	1600	NA (3)	12	0						12	0.916	5.6	12	0	NA (3)	Elevated DLs	a
	Chlorobenzene	ug/kg	97	94000	NA (3)	24	0						24	0.916	300	12	0	NA (3)	Elevated DLs	a
	Chloroethane	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	11	NA (4)	NA (4)	NA (3)	--	--
	Chloroform	ug/kg	0.77	260	NA (3)	12	0						12	0.916	11	12	0	NA (3)	Elevated DLs	a
	Chloromethane	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	11	NA (4)	NA (4)	NA (3)	--	--
	Chlorotrifluoroethylene	ug/kg	NA (4)	17000	NA (3)	4	0						4	0	11	NA (4)	0	NA (3)	--	--
	cis-1,2-Dichloroethene	ug/kg	14	74000	NA (3)	12	0						12	0.916	2.6	0	0	NA (3)	--	--
	cis-1,3-Dichloropropene	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.3	NA (4)	NA (4)	NA (3)	--	--
	Cumene	ug/kg	380	447000	NA (3)	12	0						12	0.916	5.3	0	0	NA (3)	--	--
	Dibromochloromethane	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.3	NA (4)	NA (4)	NA (3)	--	--
	Dibromomethane	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.3	NA (4)	NA (4)	NA (3)	--	--
	Dichlorodifluoromethane	ug/kg	15	69000	NA (3)	12	0						12	0.916	11	0	0	NA (3)	--	--

TABLE A.3-3A
B009 LF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SOIL)
(Page 3 of 3)

			Screening Levels (1)				Detect Data Summary						Non-Detect Data Summary							
Analyte Group	Constituent	Units	Residential (ResRBSL)	Ecological (EcoRBSL)	Background (2)	Total Number Samples Analyzed	Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Number of Detected Concentrations > Background	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	NumberDL > EcoRBSL	Number DL > Background	Data Issue (5)	Issue Resolution (6)
	Ethylbenzene	ug/kg	1200	220000	NA (3)	28	1	5	5	0	0	NA (3)	27	0.916	300	0	0	NA (3)	--	--
	Hexachlorobutadiene	ug/kg	9200	920	NA (3)	12	0						12	0.916	5.6	0	0	NA (3)	--	--
	Methyl ethyl ketone	ug/kg	62000	8200000	NA (3)	12	0						12	4.58	21	0	0	NA (3)	--	--
	Methyl isobutyl ketone (MIBK)	ug/kg	20000	2625000	NA (3)	12	0						12	4.58	21	0	0	NA (3)	--	--
	Methyl tert-butyl ether	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	21	NA (4)	NA (4)	NA (3)	--	--
	Methylene chloride	ug/kg	4	27000	NA (3)	12	0						12	4.58	23	12	0	NA (3)	Elevated DLs	a
	m-Xylene & p-Xylene	ug/kg	150	140000	NA (3)	12	0						12	1.83	2.6	0	0	NA (3)	--	--
	Naphthalene	ug/kg	6000	230000	NA (3)	12	0						12	0.916	5.6	0	0	NA (3)	--	--
	n-Butylbenzene	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.6	NA (4)	NA (4)	NA (3)	--	--
	n-Propylbenzene	ug/kg	200	447000	NA (3)	12	0						12	0.916	5.3	0	0	NA (3)	--	--
	o-Chlorotoluene	ug/kg	1222000	345000	NA (3)	12	0						12	0.916	5.6	0	0	NA (3)	--	--
	o-Xylene	ug/kg	190	140000	NA (3)	12	0						12	0.916	2.6	0	0	NA (3)	--	--
	p-Chlorotoluene	ug/kg	1222000	345000	NA (3)	12	0						12	0.916	5.6	0	0	NA (3)	--	--
	p-Cymene	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.3	NA (4)	NA (4)	NA (3)	--	--
	sec-Butylbenzene	ug/kg	77000	447000	NA (3)	12	0						12	0.916	5.6	0	0	NA (3)	--	--
	sec-Dichloropropane	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.3	NA (4)	NA (4)	NA (3)	--	--
	Styrene	ug/kg	7200	690000	NA (3)	12	0						12	0.916	5.3	0	0	NA (3)	--	--
	tert-Butylbenzene	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.6	NA (4)	NA (4)	NA (3)	--	--
	Tetrachloroethene	ug/kg	0.43	2300	NA (3)	12	0						12	0.916	5.3	12	0	NA (3)	Elevated DLs	a
	Toluene	ug/kg	300	2700	NA (3)	28	0						28	0.916	300	0	0	NA (3)	--	--
	trans-1,2-Dichloroethene	ug/kg	16	1000000	NA (3)	12	0						12	0.916	2.6	0	0	NA (3)	--	--
	trans-1,3-Dichloropropene	ug/kg	NA (4)	NA (4)	NA (3)	12	0						12	0.916	5.3	NA (4)	NA (4)	NA (3)	--	--
	Trichloroethene	ug/kg	2.2	3200	NA (3)	12	0						12	0.916	5.3	3	0	NA (3)	Elevated DLs	c
	Trichlorofluoromethane	ug/kg	110	320000	NA (3)	12	0						12	0.916	11	0	0	NA (3)	--	--
	Vinyl chloride	ug/kg	0.0096	780	NA (3)	12	0						12	0.916	5.3	12	0	NA (3)	Elevated DLs	a
	Xylenes, Total	ug/kg	150	140000	NA (3)	16	1	17	17	0	0	NA (3)	15	10	300	12	0	NA (3)	Elevated DLs	a

Notes:

(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) Reference: Soil Background Report (MWH 2005)
(3) Not applicable - Background values only established for naturally occuring constituents.
(4) RBSL not available for this constituent.
(5) Elevated DLs are DLs that are above one or both of the RBSLs. For metals and dioxins, elevated DLs are DLs that are above background, EcoRBSL, or ResRBSL. In cases that DLs are below background but above an RBSL, the DL is not considered to be elevated.

(6) The following statements indicate standard DL issue resolutions throughout the group. Each issue resolution note listed for each analyte do not apply to all elevated DLs for that analyte. Instead, each issue resolution note may only apply to a subset of samples with elevated DLs for the analyte, but taken as a whole, the list of issue resolutions addresses all of the elevated DLs.

Data Issue Resolution Notes:

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

(a) 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.
(b) DL are below background levels.
(c) The MDL is less than the RBSL, so if the compound was present at concentrations greater than the RBSL but less that the DL, it would have been reported.
(d) Elevated DL for sodium is not significant because there is no RBSL associated with this metal.
(e) Sample diluted due to matrix effect
(f) Sample diluted due to high concentrations of other constituents
(g) Sample contains high TPH levels which may have caused elevated DLs
(h) Compound is a commonly used laboratory solvent and often has elevated DLs due to laboratory contamination.
(i) Duplicate samples and recollected samples at representative locations had adequate DLs; Results do not indicate that elevated DLs in earlier samples are an issue.
(j) DLs are elevated for SVOCs analyzed by method 8270C rather than 8270CSIM, which was used to target the presence of tentatively identified compounds (TICs). Elevated detection limits are typical for this method.
(k) Elevated DLs are located within an area recommended for further evaluation in CMS.
(l) Elevated DLs were observed group-wide in areas with no indications of a source.
(m) Site history does not indicate a source; results of other analytes in the same area suggest low concentrations.

Acronyms

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

TABLE A.3-3B
B009 LF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SOIL VAPOR)
(Page 1 of 1)

Analyte Group	Constituent	Units	Screening Levels (1)		Total Number Samples Analyzed	Detect Data Summary					Non-Detect Data Summary					Data Issue (3)	Issue Resolution (4)
			Residential (ResRBSL)	Ecological (EcoRBSL)		Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	Number DLs > EcoRBSL		
VOC (ug/L)																	
	1,1,1,2-Tetrachloroethane	ug/L	0.048	NA (2)	4	0					4	1	1	4	NA (2)	Elevated DLs	a
	1,1,1-Trichloroethane	ug/L	640	38	4	0					4	1	1	0	0	--	--
	1,1,2,2-Tetrachloroethane	ug/L	0.048	NA (2)	4	0					4	2	2	4	NA (2)	Elevated DLs	a
	1,1,2-Trichloro-1,2,2-trifluoroethane	ug/L	8800	NA (2)	4	0					4	5	5	0	NA (2)	--	--
	1,1,2-Trichloroethane	ug/L	0.17	0.057	4	0					4	1	1	4	4	Elevated DLs	a
	1,1-Dichloroethane	ug/L	1.7	36	4	0					4	1	1	0	0	--	--
	1,1-Dichloroethene	ug/L	58	0.6	4	0					4	1	1	0	4	Elevated DLs	a
	1,2-Dichloroethane	ug/L	0.13	42	4	0					4	1	1	4	0	Elevated DLs	a
	Benzene	ug/L	0.095	0.57	4	0					4	1	1	4	4	Elevated DLs	a
	Carbon Tetrachloride	ug/L	0.063	0.63	4	0					4	1	1	4	4	Elevated DLs	a
	Chloroethane	ug/L	NA (2)	NA (2)	4	0					4	1	1	NA (2)	NA (2)	--	--
	Chloroform	ug/L	0.5	0.24	4	0					4	1	1	4	4	Elevated DLs	a
	cis-1,2-Dichloroethene	ug/L	10	1.9	4	0					4	1	1	0	0	--	--
	Dichlorodifluoromethane	ug/L	58	91	4	0					4	1	1	0	0	--	--
	Ethylbenzene	ug/L	290	23	4	0					4	1	1	0	0	--	--
	Methylene chloride	ug/L	2.7	0.87	4	0					4	50	50	4	4	Elevated DLs	a
	m-Xylene & p-Xylene	ug/L	NA (2)	NA (2)	4	0					4	2	2	NA (2)	NA (2)	--	--
	o-Xylene	ug/L	29	15	4	0					4	1	1	0	0	--	--
	Tetrachloroethene	ug/L	0.45232	24	4	0					4	1	1	4	0	Elevated DLs	a
	Toluene	ug/L	110	0.084	4	0					4	1	1	0	4	Elevated DLs	a
	trans-1,2-Dichloroethene	ug/L	20	1.9	4	0					4	1	1	0	0	--	--
	Trichloroethene	ug/L	1.4	6.4	4	0					4	1	1	0	0	--	--
	Trichlorofluoromethane	ug/L	200	91	4	0					4	1	1	0	0	--	--
	Vinyl chloride	ug/L	0.035	0.56	4	0					4	2	2	4	4	Elevated DLs	a
	VOC in vapor screen (All ND)	ug/L	NA (2)	NA (2)	2	0					2	0	0	NA (2)	NA (2)	--	--

Notes:

(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) RBSL not available for this constituent.

(3) Elevated DLs are DLs that are above one or both of the RBSLs. For metals and dioxins, elevated DLs are DLs that are above background, EcoRBSL, or ResRBSL. In cases that DLs are below background but above an RBSL, the DL is not considered to be elevated.

(4) The following statements indicate standard DL issue resolutions throughout the group. Each issue resolution note listed for each analyte do not apply to all elevated DLs for that analyte. Instead, each issue resolution note may only apply to a subset of samples with elevated DLs for the analyte, but taken as a whole, the list of issue resolutions addresses all of the elevated DLs.

Data Issue Resolution Notes:

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

(a) 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.

Chemicals of Potential Concern for Human Health
B009 LF RFI Site

Chemical	Soil (0 to 2 feet bgs)	Soil (0 to 10 feet bgs)	B009 LF RFI Site Near Surface Groundwater (Indirect Pathway)[a]	Group 8 Perched Groundwater (Direct Pathway)[a]	Soil Vapor
Inorganic Compounds					
Aluminum	X	X			
Barium	X	X			
Cadmium	X	X		X	
Cobalt				X	
Copper				X	
Mercury		X			
Molybdenum				X	
Nickel				X	
Perchlorate				X	
Thallium	X	X			
VOCs					
1,1,1-Trichloroethane				X	
1,1,2-Trichloro-1,2,2-trifluoroethane				X	
1,1-Dichloroethane				X	
1,1-Dichloroethene				X	
1,2-Dichloroethane			X	X	
2-Butanone			X		
Acetone	X	X	X		X
Benzene	X	X			X
cis-1,2-Dichloroethene			X	X	
Ethylbenzene	X	X			X
m,p-Xylene	X	X			X
Methylene chloride				X	
o-Xylene	X	X		X	X
Tetrachloroethene				X	
Toluene	X	X	X		X
Trichloroethene			X	X	
SVOCs					
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			
Di-n-butylphthalate	X	X			
Fluoranthene	X	X			
Fluorene	X	X			
Indeno(1,2,3-cd)pyrene	X	X			
m-Terphenyl		X			
Naphthalene	X	X			
Perylene	X	X			
Phenanthrene	X	X			
p-Terphenyl		X			
Pyrene	X	X			
Total Petroleum Hydrocarbons					
C08-C11(Gasoline Range)	X	X			
C11-C14(Kerosene Range)		X			
C14-C20(Diesel Range)	X	X			
C20-C30(Lubricant Oil Range)	X	X			
PCBs					
Aroclor-1254		X			
Aroclor-1260		X			
PCB-105		X			
PCB-114		X			
PCB-118		X			
PCB-123		X			
PCB-126		X			
PCB-156		X			
PCB-157		X			
PCB-167		X			
PCB-169		X			
PCB-189		X			
PCB-77		X			
PCB-81		X			

Notes:
VOC - volatile organic compound
SVOC - semi-volatile organic compound
bgs - below ground surface

Table A.4-2 (1 of 1)

Human Health Risk Estimates[1]
B009 LF 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	0.003 - 0.01		3E-09 - 7E-08		<0.001 - <0.001		1E-08 - 1E-07		0.003 - 0.01		2E-08 - 2E-07	
Future Adult Recreator	<0.001 - 0.001		3E-11 - 4E-09		<0.001 - <0.001		3E-11 - 1E-10		<0.001 - 0.001		6E-11 - 4E-09	
Future Child Recreator	0.004 - 0.004		4E-10 - 2E-09		<0.001 - <0.001		1E-10 - 6E-10		0.004 - 0.004		5E-10 - 3E-09	
Future Adult Resident	0.004 - 0.01		5E-09 - 6E-08		<0.001 - 0.002		5E-08 - 3E-07		0.005 - 0.01		5E-08 - 4E-07	
Future Child Resident	0.04 - 0.1		3E-08 - 1E-07		0.004 - 0.006		2E-07 - 3E-07		0.04 - 0.1		2E-07 - 4E-07	

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.
6. Total risk estimates do not include aluminum or barium since these chemicals were considered naturally-occurring.

CD = Chemical risk driver
COPC = Chemical of potential concern
HI = Hazard index
NA = Not Applicable

Table A.4-3 (1 of 1)

Human Health Risk Assessment Uncertainty Analysis
B009 LF RFI Site

Assessment Element	Uncertainty	Magnitude of Impact	Direction of Impact
COPC Selection	One inorganic (mercury) that was demonstrated to be consistent with background concentrations through Wilcoxon Rank Sum test was included as a COPC because the maximum detected concentration was substantially above the maximum detected background concentration.	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
	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
	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 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 mean is greater than the RME EPC for some chemicals when there are elevated DL for ND, therefore the maximum detected concentration was used as the CTE EPC.	Moderate	Uncertain
	The maximum detected concentration of each COPC detected in groundwater was used as the EPC.	Moderate	Conservative
	The evaluation of metals concentrations in groundwater was based on both filtered and unfiltered samples. Additional unfiltered groundwater data is being collected per DTSC direction that might affect this evaluation.	Moderate	Conservative
	Soil vapor concentrations for ND soil vapor samples were estimated to be 1/2 the DL.	Moderate	Conservative
	Soil vapor concentrations extrapolated from soil matrix concentrations were used to calculate soil vapor EPC.	High	Conservative
	When VOC soil vapor samples were available, soil matrix to soil vapor extrapolations were only conducted for non-co-located soil matrix samples with detects.	Low	Conservative
	Soil matrix to soil vapor extrapolations for BTEX were only conducted in detected soil matrix samples.	Moderate	Conservative
	Indoor and ambient air m,p-xylene concentrations were determiend to be the higher of the estimated m-xylene or p-xylene concentrations.	Low	Conservative
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
Risk Calculations	Terphenyls were detected in 1 sample at the B009 LF RFI Site (<1 mg/kg) but since toxicity criteria not available, risk values were not calculated.	Low	Not Conservative

Notes:
COPC - chemical of potential concern
PAH - polycyclic aromatic hydrocarbon
COPC - chemical of potential concern
PAH - polycyclic aromatic hydrocarbon
TPH - total petroleum hydrocarbons
BTEX - benzene, toluene, ethylbenzene, and xylenes
HRA - human health risk assessment
CSF = cancer slope factor
RfD = reference dose
EPC - exposure point concentration
UCL - upper confidence limit
HRA - human health risk assessment
DL - detection limit

Summary of Chemicals of Potential Ecological Concern
B009 LF 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				
Aluminum	X	X	X	
Barium	X	X	X	
Cadmium	X	X	X	
Thallium	X	X	X	
VOCs				
1,1-Dichloroethane				X
2-Butanone				X
Acetone	X	X	X	X
Benzene	X	X	X	X
cis-1,2-Dichloroethene				X
Ethylbenzene	X	X	X	X
m,p-Xylene	X	X	X	X
o-Xylene	X	X	X	X
Toluene	X	X	X	X
Trichloroethene				X
SVOCs				
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	
Di-n-butylphthalate	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	
C14-C20(Diesel Range)	X	X	X	
C20-C30(Lubricant Oil Range)	X	X	X	
PCBs				
Aroclor-1248			X	

Notes:
X - selected as a chemical of potential ecological concern
VOC - volatile organic compound
SVOC - semi-volatile organic compound
CPEC - chemical of potential ecological concern
bgs - below ground surface

Table A.4-5 (1 of 1)

Risk Estimates for Ecological Receptors
B009 LF RFI Site

Receptor	Total for Site Media (Soil Only)	
	HI Range[1]	CD[2]
Deer Mouse	0.7 - 0.9	None
without inhalation pathway	0.7 - 0.9	None
Thrush	**1 - 1**	Cadmium
Hawk	0 - 0	None
Using Large-home Range Factor[3]	0 - 0	None
Bobcat	0.007 - 0.01	None
Using Large-home Range Factor[3]	< .001 - < .001	None
Mule Deer	2 - 2	Cadmium
Using Large-home Range Factor[3]	0.03 - 0.05	None

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,

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.

4. Total risk estimates do not include aluminum or barium since these chemicals were considered naturally-occurring. Barium was detected above its comparison level in one location. Aluminum exposure risks based on soluble aluminum. Since soil pH at the B009 FL RFI Site is between 6.5 to 8.37, soluble aluminum not likely present (see Section A.4).

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

Ecological Risk Assessment Uncertainty Analysis
B009 LF RFI Site

Assessment Element	Uncertainty	Magnitude of Impact	Direction of Impact
CPEC Selection	Aroclor 1248 was not detected but included as a CPEC because the ESL<SQL and the chemical is site related.	Low	Conservative
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. Because several samples collected for SVOCs did not detect PAHs, the uncertainty associated with this procedure is low.	Low	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 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
	Soil vapor concentrations for ND soil vapor samples were estimated to be 1/2 the DL.	Moderate	Conservative
	Soil vapor concentrations extrapolated from soil matrix and groundwater concentrations were used to calculate soil vapor EPC.	High	Conservative
	Estimation of soil vapor concentrations overstates actual burrow concentrations: 1. Model is conservative 2. Model does not account for attenuation between 13 feet bgs depth to groundwater and 0 to 6 feet bgs interval for burrows 2. Air flow in burrows is not accounted for	Low	Conservative
Wildlife Exposure Factors	Some wildlife exposure factors were based on allometric adjustments or taxonmically similar species	Low	Conservative
Exposure Pathways	Dermal and inhalation (for surface-dwelling animals) exposure pathway not quantified	Low	Not Conservative
	Although risks were estimated for aluminum, these risks may represent the risk from naturally-occurring concentrations rather than site-related concentrations. The distribution o elevated aluminum concentrations in soil is not consistent with the presence of an on-site source, and high concentrations of aluminum are common in clayey soil, which is common at the B009 FL RFI Site.	High	Conservative
	Although risks were estimated for barium the concentrations detected in the B009 LF samples are believed to be naturally-occurring.	High	Conservative
Toxicity Reference Value	High degree of uncertainty in extrapolation of dose-response data from laboratory animals to representative receptors.	High	Uncertain
	Avian toxicity values are only available for a limited number of chemicals. For the types of chemicals observed at the Delta RFI site, there is likely little difference in the degree of toxicity between mammals and avian species.	Moderate	Not conservative
	Use of acute/subchronic-to-chronic and endpoint-to-NOAEL uncertainty factors to estimate chronic NOAEL-equivalent TRVs.	Moderate	Conservative
	Lack of TRVs for amphibians and reptiles -- note that no threatened or endangered amphibians or reptiles are known to reside at SSFL	Moderate	Not conservative
	Use of chronic NOAEL-equivalent TRVs	High	Conservative
	Aluminum exposures are based upon toxicity values derived from soluble aluminum. However, the soluble and toxic forms of aluminum are only present in soil under soil pH values of less than 5.5 (USEPA, 2003), and pH for the soils at B009 ranged from 6.5 to 8.37.	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 A.5-1
B009 LF RFI SITE SURFICIAL MEDIA SITE ACTION RECOMMENDATIONS
(Page 1 of 1)

Area	Associated Chemical Use Area Number	CMS Areas (Figure C.5-1) (1)	Recommended for Further Consideration in CMS Based On:			
			Residential Receptor (2)	Industrial Receptor (2)	Recreational Receptor (2)	Ecological Receptor (2)
B009 Leach Field	1a	--	--	--	--	(3)
B009 Septic Tank	1b	--	--	--	--	(3)
Building 009	2a	--	--	--	--	(3)
SGR Liquid Waste Hold-Up Tank and Pit	2b	--	--	--	--	(3)
OMR Waste Hold-Up Tank and Pit	2c	--	--	--	--	(3)
UT-3	3	--	--	--	--	(3)
B009 Transformer Pads (Substation 709)	4a	--	--	--	--	--
Transformer Pole X-32	4b	--	--	--	--	--
Solar Concentrator Facility	5	--	--	--	--	(3)

General Notes:

- '--' Indicates area is recommended for No Further Action (NFA) for respective receptor, or parameter not applicable; Not recommended for CMS evaluation.

Notes:

(1) As indicated above and described in Section A.5, no B009 LF RFI site areas are recommended for further evaluation in the CMS. Also, aluminum present in site soils at concentrations exceeding its background comparison level, and included in risk assessment. Estimated aluminum exposure risks for ecological receptors are based on toxicity factors derived from soluble aluminum. Since site soil pH is greater than 5.5, soluble aluminum is unlikely (see Section A.4).

(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) Although cadmium was identified as a risk contributor for the thrush and mule deer, the maximum detected soil concentration is less than background (0.51 mg/kg vs 1 mg/kg); thus, areas not recommended for further evaluation in the CMS.

Acronyms:

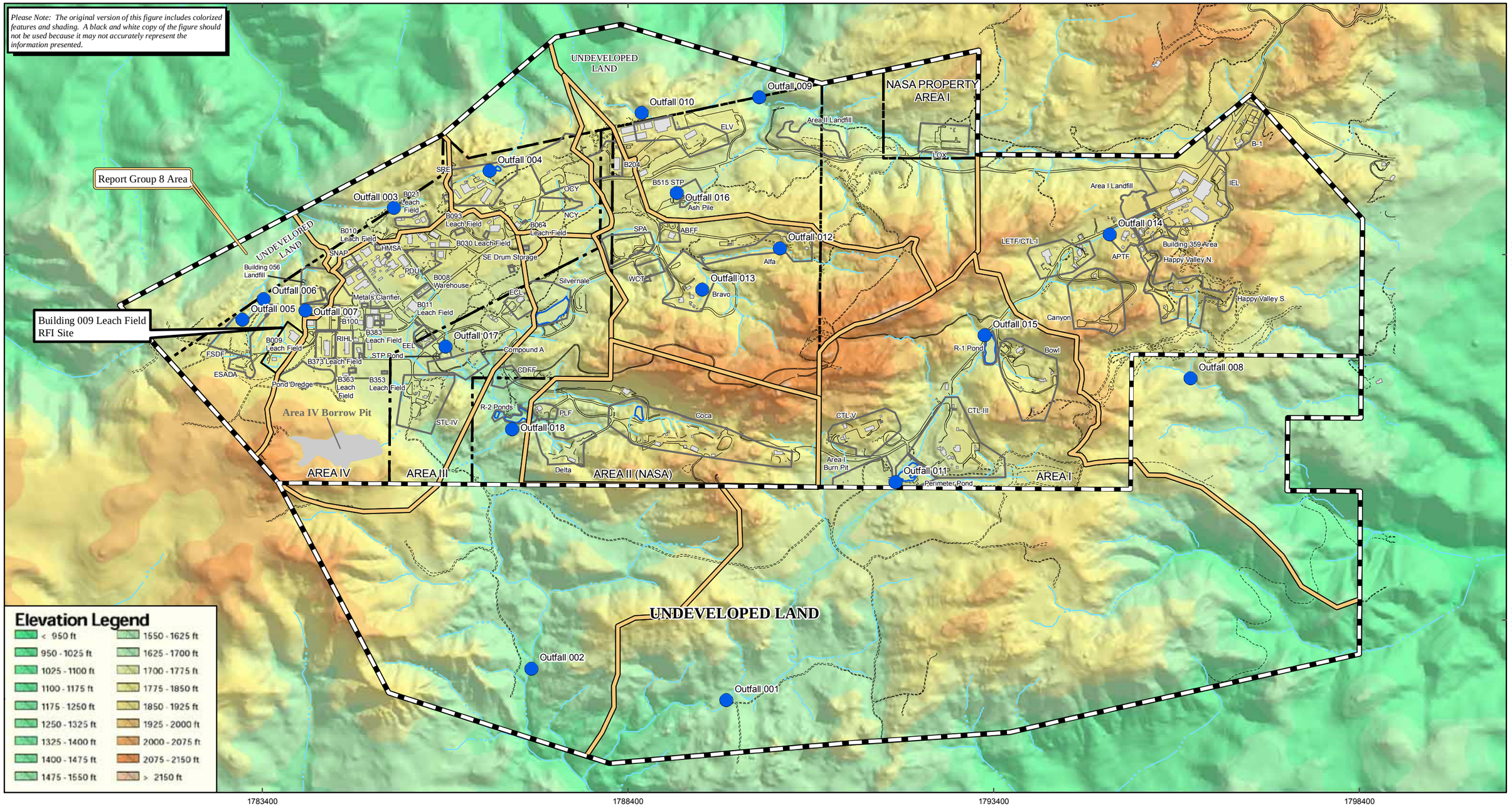
AOC = Area of Concern

B009 LF = Building 009 Leach Field

CMS = Corrective Measures Study

NFA = No further action

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
AOC - Building 224 Leach Field

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 Area IV Leach Fields
AOC - DOE Area IV Leach Fields

Legend
- SSFL Property Boundary
- Report Group Boundary
- Administrative Boundary
- RFI Site Boundary
- Building 009 Leach Field
- Building
- Pond
- Drainage
- Dirt Road
- Road
- NPDES Outfall

Building 009 Leach Field RFI Site Location Map

SANTA SUSANA FIELD LABORATORY

Date: Sep 26, 2007

Document: RFI-Report-Group8_B009_RFI.mxd

MWH

FIGURE A.1-1

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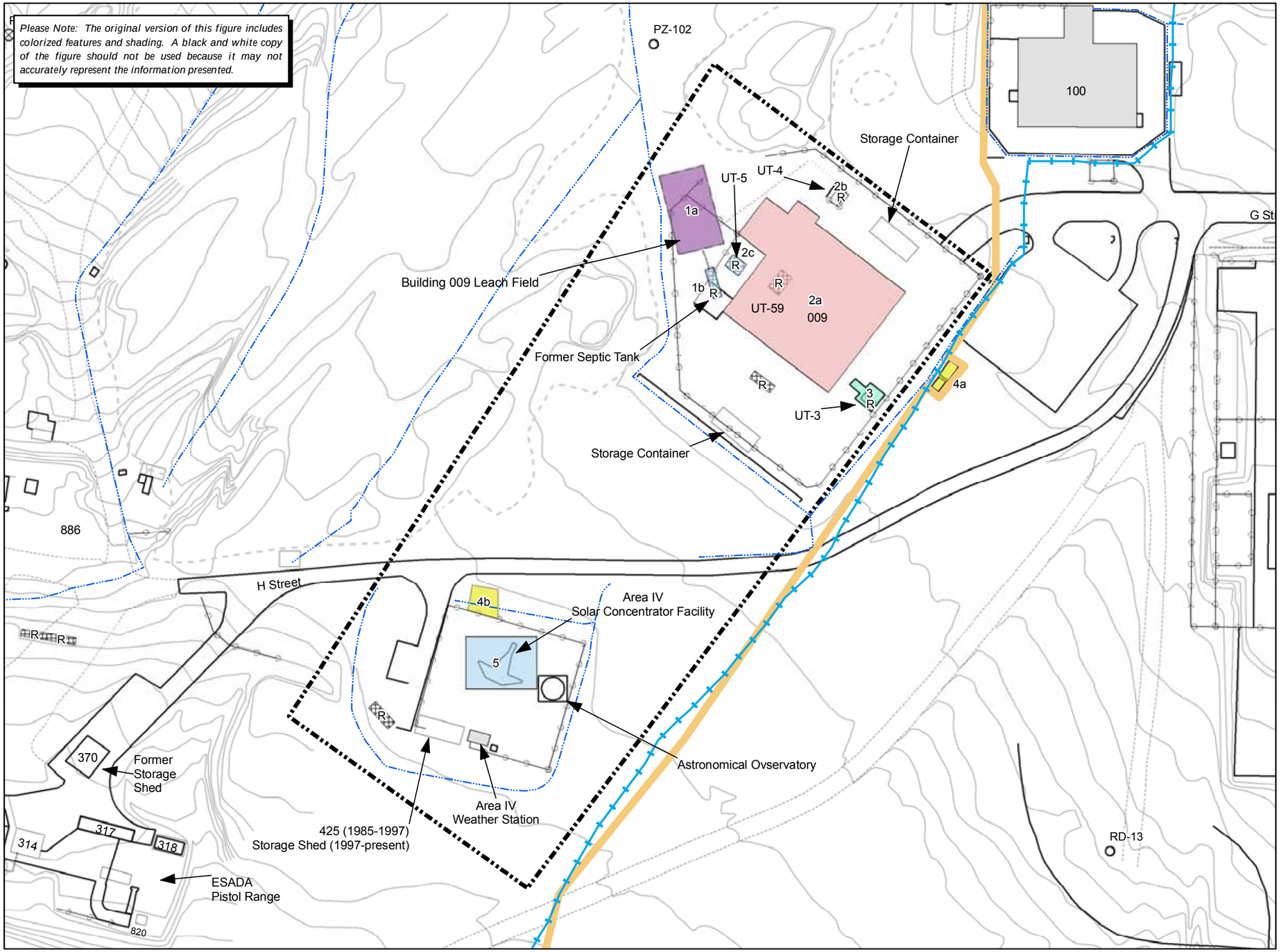

Base Map Legend

- Report Group Boundary
- RFI Site 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
- Drainage
- Pond
- Possible Pond
- Leach Field
- Pipe
- Well
- Abandoned Well

Note: R = Removed Tank

Chemical Use Areas

- Multiple Use
- Solvent
- Petroleum
- Oils / PCBs
- Metal
- Perchlorate
- Hydrazine
- Debris
- Landfill
- Leach Field
- Potential

(* Chemical Use Area present in this RFI site)

CODE	CATEGORY	Chemical Use Area Name
1a	Leach Field	B009 Leach Field
1b	Potential	B009 Septic Tank
2a	Mutiple	Building 009
2b	Potential	SGR Liquid Waste Hold-Up Tank & Pit
2c	Potential	OMR Waste Hold-Up Tank and Pit
3	Petroleum	UT-3
4a	Oils/PCBs	B009 Transformer Pads (Substation 709)
4b	Oils/PCBs	Transformer Pole X-32
5	Potential	Solar Concentrator Facility

Chemical Use Areas
Building 009 Leach Field RFI Site

Date: Sep 27, 2007

Document: RFI-Report-Group8_B009_Chem_Use_11x17.mxd

1 inch equals 90 feet

0 90 180 Feet

SANTA SUSANA FIELD LABORATORY

MWH

FIGURE
A.2-1

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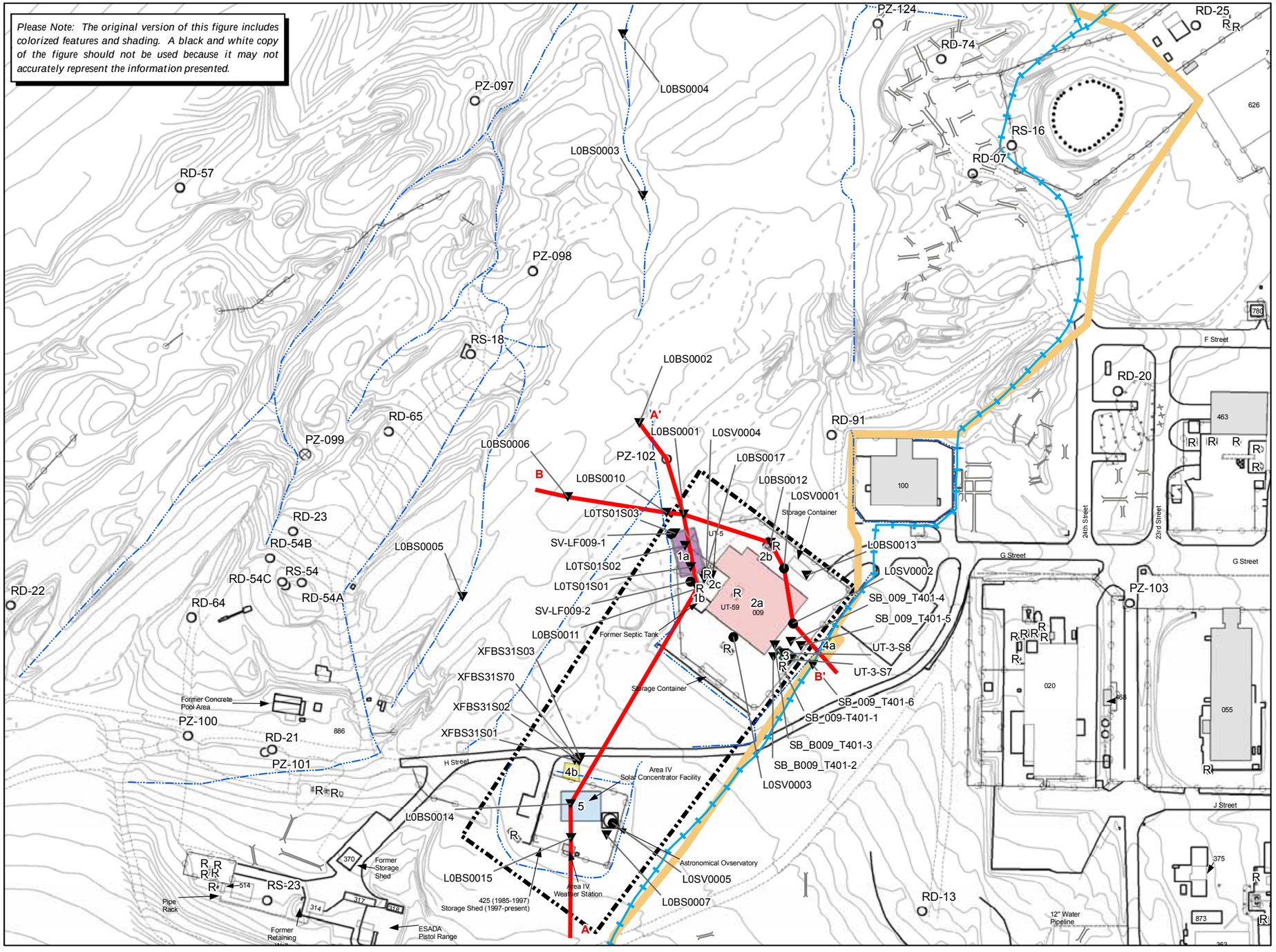

Sample Location

▼ Soil Matrix Sample ● Soil Vapor Sample

Base Map Legend

- Report Group Boundary
- RFI Site 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
- Drainage
- Pond
- Possible Pond
- Leach Field
- Pipe
- Well
- Abandoned Well
- Cross Section
- Trench

Note: R = Removed Tank

Chemical Use Areas

- Multiple Use
- Solvent
- Petroleum
- Oils / PCBs
- Metal
- Perchlorate
- Hydrazine
- Debris
- Landfill
- Leach Field
- Potential

(* Chemical Use Area present in this RFI site)

CODE	CATEGORY	Chemical Use Area Name
1a	Leach Field	B009 Leach Field
1b	Potential	B009 Septic Tank
2a	Mutiple	Building 009
2b	Potential	SGR Liquid Waste Hold-Up Tank & Pit
2c	Potential	OMR Waste Hold-Up Tank and Pit
3	Petroleum	UT-3
4a	Oils/PCBs	B009 Transformer Pads (Substation 709)
4b	Oils/PCBs	Transformer Pole X-32
5	Potential	Solar Concentrator Facility

Sample and Trench Locations B009 Leach Field RFI Site

Date: Sep 27, 2007

Document: RFI-Report-Group8_B009_Samples_11x17.mxd

1 inch equals 160 feet

0 160 320 Feet

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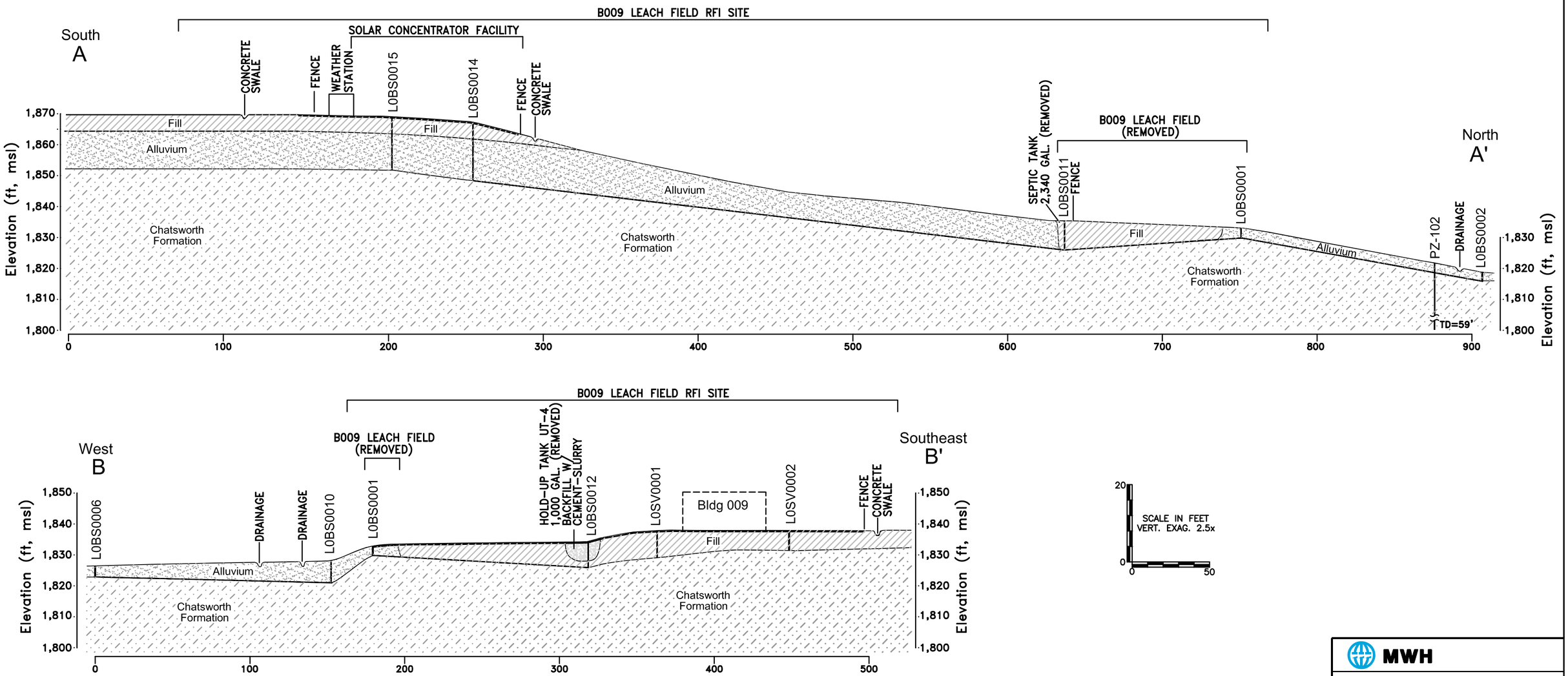
FIGURE A.2-2



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MWH

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
SEPTEMBER 2007

SURFICIAL CROSS SECTIONS
A-A' & B-B'
B009 RFI SITE

FIGURE A.2-3

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B009 Leach Field

Report Group 8

Report Group 5

B

PZ-102

RD-23

RD-54B

RD-54C

RD-54A

RS-54

RD-21

PZ-101

RD-50

RS-23

RD-13

100

886

370

514

314

317

318

820

009

UT-3

UT-4

UT-5

UT-59

Storage Container

Building 009 Leach Field

Former Septic Tank

Storage Container

H Street

Area IV
Solar Concentrator Facility

Astronomical Ovservatory

Area IV
Weather Station

425 (1985-1997)
Storage Shed (1997-present)

Former
Storage
Shed

Former
Retaining
Wall

ESADA
Pistol Range

Potential Soil Borrow Area

1783125 1783350 1783575 1783800 1784025

266400 266175 265950 265725

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Dirt Road
- A/C Curbing
- Fence

- Rock Outcrop
- Elevation Contour
- Surface Water Divide
- Drainage
- Lined Drainage
- Pond
- Possible Pond
- Leach Field
- Pipe
- NPDES Outfall

Groundwater Wells

- Near Surface
- Chatsworth
- Abandoned Well

Note: R = Removed Tank

Approximate Areas of Soil Disturbance

- Excavation
- Excavation-Backfill
- Grading
- Other Soil Disturbance Area

Note: Disturbed soils around buildings and/or structures are approximate and are assumed to extend 2 feet around edges of the pad.

Soil Disturbance Areas
B009 Leach Field RFI Site

Date: Sep 27, 2007

Document: RFI-Report-Group8_B009_Dist.mxd

1 inch equals 100 feet

0 100 200 Feet

SANTA SUSANA FIELD LABORATORY

MWH

FIGURE
A.2-4

Soil Sample Location Symbol Legend

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

Comparison Levels

Inorganics	Background	Res RBSL	Eco RBSL
Fluoride (mg/kg)	6.7	4600	- -
pH	- -	- -	- -
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	0.26
Barium	140	15000	15
Beryllium	1.1	150	5.9
Boron	9.7	15000	9.3
Cadmium	1	2.6	0.0026
Calcium	- -	- -	- -
Chromium	36.8	3400	940
Cobalt	21	1500	10
Copper	29	3000	1.1
Iron	- -	- -	- -
Lead	34	150	0.063
Lithium	37	1522	43
Magnesium	- -	- -	- -
Manganese	495	9500	79
Mercury	0.09	23	0.88
Molybdenum	5.3	380	0.11
Nickel	29	1500	0.1
Potassium	6400	- -	- -
Selenium	0.655	380	0.18
Silver	0.79	380	0.55
Sodium	110	- -	- -
Thallium	0.46	6.1	3.2
Vanadium	62	76	1.6
Zinc	110	23000	22
Zirconium	8.6	- -	- -
PCBs	**Background (µg/kg)**	**Res RBSL (µg/kg)**	**Eco RBSL (µg/kg)**
Aroclor 1254	- -	350	79
Aroclor 1260	- -	350	79
SVOCs	**Background (µg/kg)**	**Res RBSL (µg/kg)**	**Eco RBSL (µg/kg)**
2-Methylnaphthalene	- -	230000	230000
Acenaphthene	- -	3400000	2500
Acenaphthylene	- -	1700000	810000
Anthracene	- -	17000000	2400
Benzo(a)anthracene	- -	600	1400
Benzo(a)pyrene	- -	60	4700
Benzo(b)fluoranthene	- -	600	4600
Benzo(ghi)perylene	- -	- -	6200
Chrysene	- -	6000	2400
Dibenzo(a,h)anthracene	- -	170	1700
Di-n-butyl phthalate	- -	5700000	490
Fluoranthene	- -	2300000	130000
Fluorene	- -	2300000	1600
Indeno(1,2,3-cd)pyrene	- -	600	3900
Naphthalene	- -	6000	230000
Phenanthrene	- -	1700000	1300
Pyrene	- -	1700000	79000
Terphenyls	**Background (mg/kg)**	**Res RBSL (mg/kg)**	**Eco RBSL (mg/kg)**
m-Terphenyl	- -	- -	- -
p-Terphenyl	- -	- -	- -
TPH	**Background (mg/kg)**	**Res RBSL (mg/kg)**	**Eco RBSL (mg/kg)**
Diesel Range Organics	- -	1400	- -
Diesel Range Organics (C14-C20)	- -	1400	- -
Diesel Range Organics (C15-C20)	- -	1400	- -
Gasoline Range Organics (C6-C12)	- -	1.1	- -
Gasoline Range Organics (C8-C11)	- -	1.1	- -
Kerosene Range Organics (C11-C14)	- -	1400	- -
Kerosene Range Organics (C12-C14)	- -	1400	- -
Lubricant Oil Range Organics (C20-C30)	- -	1400	- -
Lubricant Oil Range Organics (C21-C30)	- -	1400	- -
Lubricant Oil Range Organics (C25-C36)	- -	1400	- -
VOCs (soil)	**Background (µg/kg)**	**Res RBSL (µg/kg)**	**Eco RBSL (µg/kg)**
Acetone	- -	51000	46000
Ethylbenzene	- -	1200	220000
Naphthalene	- -	6000	230000
Xylenes, Total	- -	150	140000
VOCs (vapor)	**Background (µg/L)**	**Res RBSL (µg/L)**	**Eco RBSL (µg/L)**
Ethylbenzene	- -	290	23

Data Date: 20070919

Note: (mg/kg) = milligrams per kilogram
(µg/kg) = micrograms per kilogram
(µg/L) = micrograms per liter

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

Data Box Information

Sample Location ID — B9BS01
1.00 — Depth in Feet
Primary — Sample Type
B9BS01S01 — Unique Sample Identifier
7/10/2005 — Date

(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
NA	Analysis not conducted
[#]	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

(* Chemical Use Area present in this RFI site)

- * Multiple Use
- Solvent
- * Petroleum
- * Oils / PCBs
- Metal
- Perchlorate
- Hydrazine
- Debris
- Landfill
- * Leach Field
- * Potential

Base Map Legend

- Administrative Area Boundary
- RFI Site 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
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Abandoned Well
- Pond
- Possible Pond
- Drainage
- Surface Water Divide
- Elevation Contour
- Rock Outcrop
- Trench

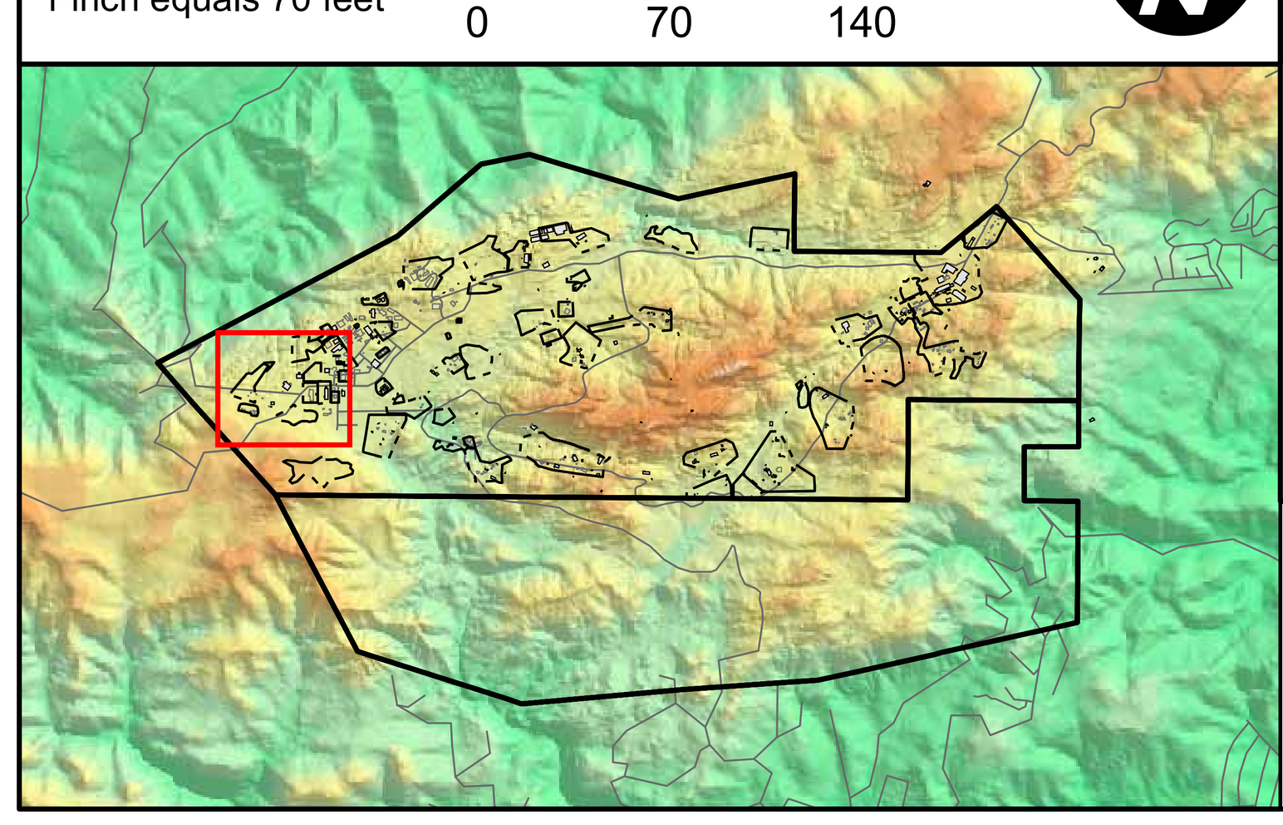
Note: R = Removed Tank

Date: Sep 26, 2007 Document: RFI-Report-Group8_B009_Chemicals_E.mxd

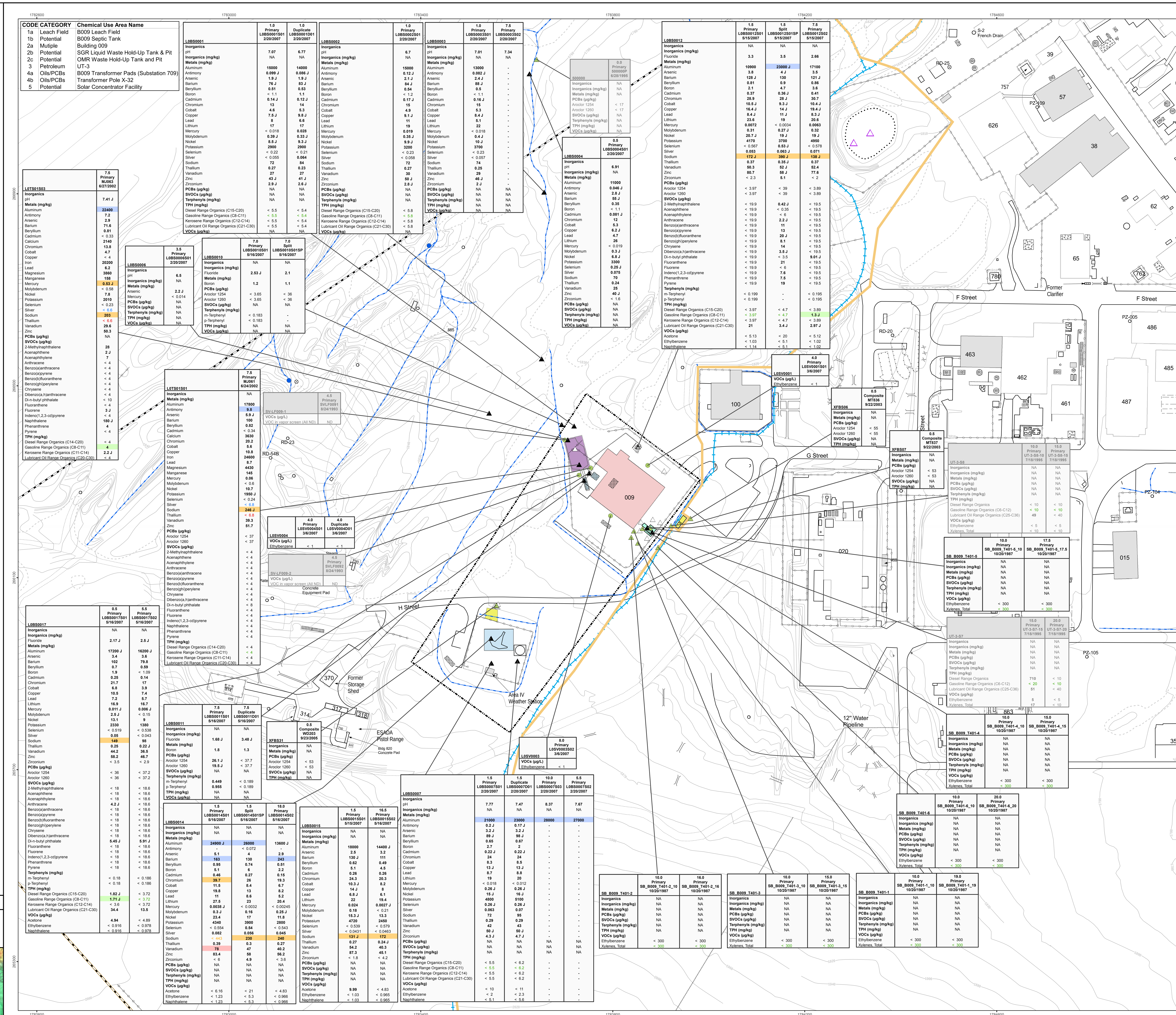
ANSI E 44x34

1 inch equals 70 feet — 0 70 140 Feet

N



CODE	CATEGORY	Chemical Use Area Name
1a	Leach Field	B009 Leach Field
1b	Potential	B009 Septic Tank
2a	Mutiple	Building 009
2b	Potential	SGR Liquid Waste Hold-Up Tank & Pit
2c	Potential	OMR Waste Hold-Up Tank and Pit
3	Petroleum	UT-3
4a	Oils/PCBs	B009 Transformer Pads (Substation 709)
4b	Oils/PCBs	Transformer Pole X-32
5	Potential	Solar Concentrator Facility



MWH

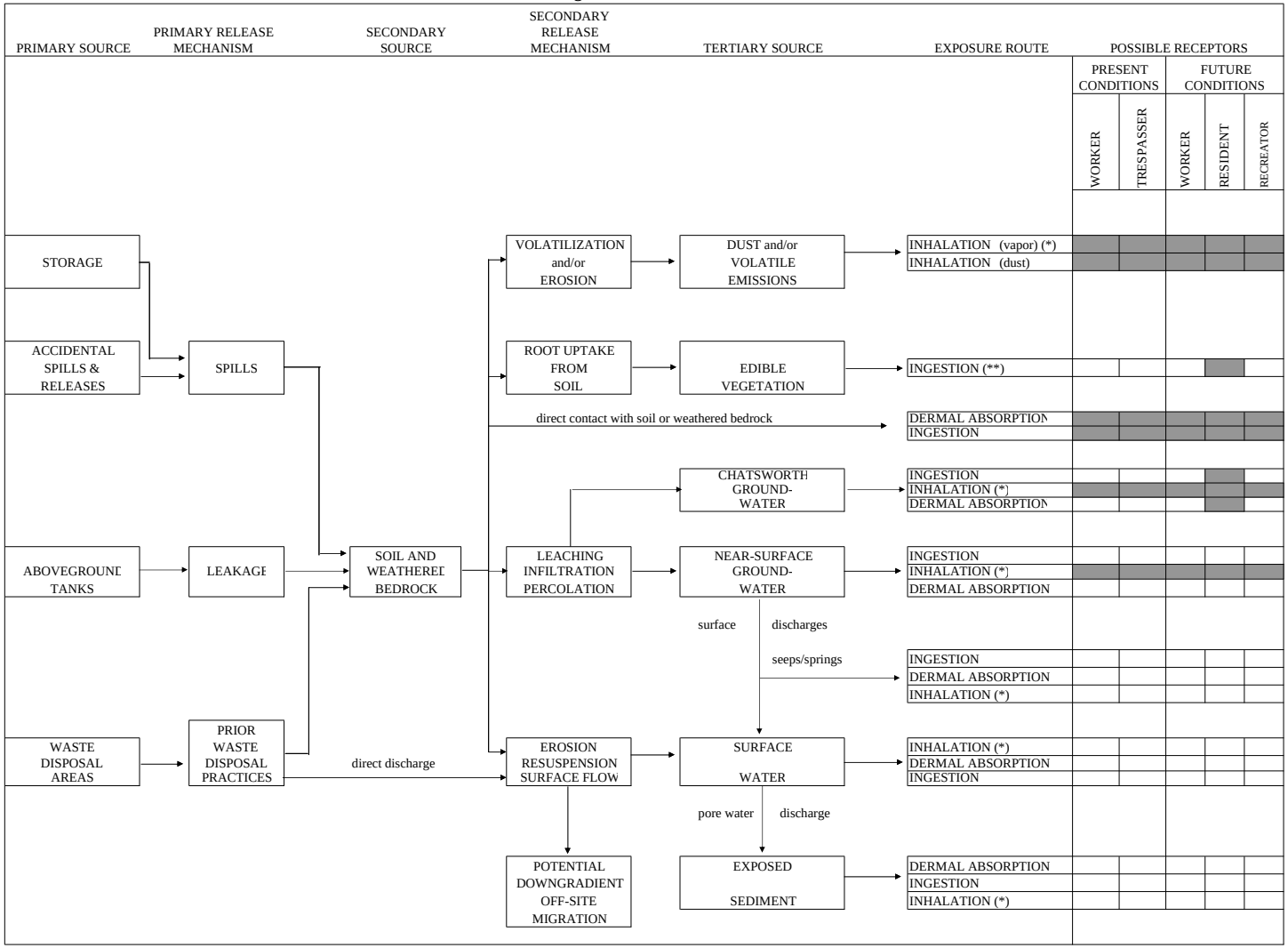
Santa Susana Field Laboratory

Chemical Data Results
B009 Leach Field RFI Site

FIGURE A.3-1

Figure A.4-1 (1 of 1)

Human Health Risk Assessment Conceptual Site Model
Building 009 Leach Field 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. For residents, exposures to near surface groundwater includes pathways associated with migration to indoor and outdoor air.

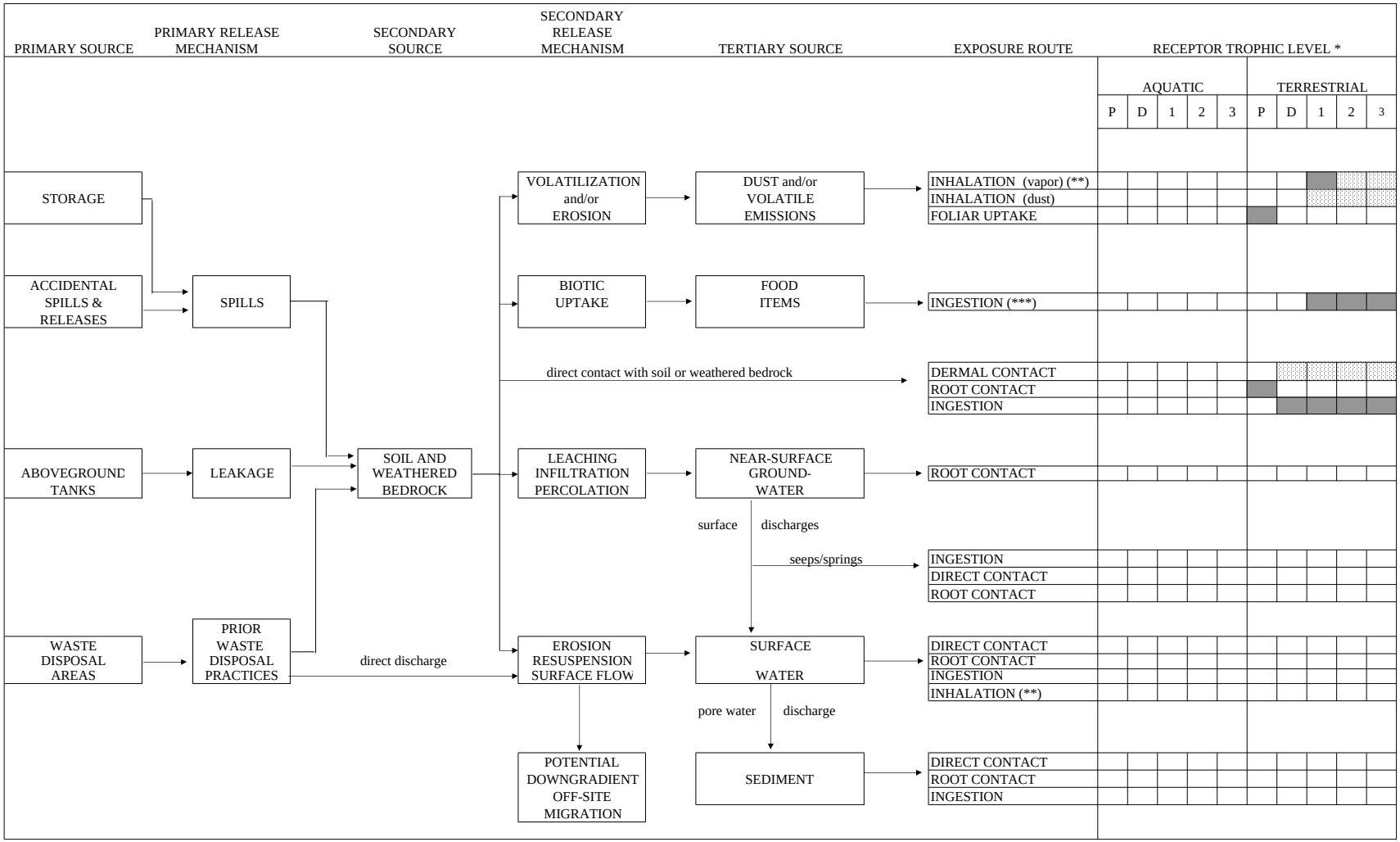
(**) Exposure limited to bioaccumulatable compounds as described in the text.

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

- incomplete exposure pathways not evaluated in this risk assessment

Figure A.4-2 (1 of 1)

Ecological Risk Assessment Conceptual Site Model
Building 009 Leach Field 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

APPENDIX A

ATTACHMENT A-1 Through A-3
(Electronic Copy)

A-1: REGULATORY AGENCY CORRESPONDENCE
A-2: SUBSURFACE INFORMATION
A-3: DATA QUALITY, VALIDATION AND LABORATORY REPORTS

APPENDIX A

ATTACHMENT A-1

REGULATORY AGENCY CORRESPONDENCE
(Electronic Copy)

Department of Energy
Oakland Operations Office
1301 Clay Street, N700
Oakland, CA 94612-5208

Majelle Jensen
Program Manager
Environmental Programs
Energy Technology Engineering Center
Rocketdyne Division
Rockwell International Corporation
P.O. Box 7930
Canoga Park, CA 91309-7930

Subject: Completion of Projects Outside of DOE Area

Dear Ms. Jensen:

There are three facilities, owned by Rocketdyne, that were used to support Department of Energy nuclear research programs during the early 1950's to late 1970's which are located outside the DOE portion of Area IV. These facilities were surveyed for radiological contamination and subsequently decontaminated by the Department of Energy. Achievement of the decontamination goals was documented in the form of final surveys by Rocketdyne and verifications by the California Department of Health Services for unrestricted release.

o Old Conservation Yard - From 1952 until 1977, the OCY and surrounding land areas were used for the storage of excess equipment, some of which was contaminated with either uranium or mixed fission products. The 1988 radiological survey of the OCY identified elevated concentrations of Cs-137 in soil, with assumed equivalent concentrations of Sr-90. The source of contamination was believed to have been the result of an undocumented contaminated liquid spill. The area was investigated to delineate the areal extent of contamination (400 sq ft x 6 in depth) for remediation. A Cs-137 clean-up guideline was established using the DOE computer code RESRAD. Contaminated soil was excavated, and post-remedial action measurements and sampling were performed. DHS performed a verification survey and issued a statement releasing the property for unrestricted use.

o Building 373 - This facility was used for the first SNAP reactor criticality tests from 1957 to 1963. All SNAP components were removed at the completion of the program. A radiological survey was performed for removable alpha and beta activity. The measured activity was far less than the acceptable limit of 1000dpm/sq cm, therefore it was concluded that the facility was not contaminated. This facility was released for unrestricted use by DHS on May 9, 1995.

- Building 009 - The Organic Moderated Reactor and Sodium Graphite Reactor critical test facilities were operated in adjacent high bays in Building 009. During their operation, there were no incidents of contamination. When the programs ended, all associated equipment was removed. Later, some additional test work was done in a laboratory in this building. It resulted in some radioactive contamination in the liquid waste holding tank system which was later removed.

The Department believes that its responsibilities for decontamination of these facilities has been completed. We request your concurrence that these facilities met the unrestricted release requirements, have been verified by Cal DHS, and DOE's responsibility has ended.

Please sign three copies of this concurrence, retain 1 copy for your file, and send 2 copies to me.

Sincerely,

Michael Lopez

Michael Lopez
ETEC PM
Environmental
Restoration Division

Majelle Lee

Majelle ~~Jensen~~ Lee, Manager
Environmental Programs

Steve Lafflam

Steve Lafflam, Division Director
Environmental Health & Safety

STATE OF CALIFORNIA—HEALTH AND HUMAN SERVICES AGENCY GRAY DAVIS, *Governor*

DEPARTMENT OF HEALTH SERVICES
714/744 P STREET
P.O. BOX 942732
SACRAMENTO, CA 94234-7320

January 20, 1999

James G. Barnes
Radiation Safety Officer
Boeing North American/Rocketdyne Division
P. O. Box 7922, MS-T100
Canoga Park, CA 91309-7922

Dear Mr. Barnes:

Enclosed is Amendment No. 102 to your License 0015-19 releasing for unrestricted use Building 009. In addition, Building 020 has been removed from the license. Please note that Building 020 is still under the jurisdiction of DOE.

Should you have any questions or comments please call me directly at (916) 445-1884.

David Wesley
Senior Health Physicist
Radiologic Health Branch

Enclosure

RESOURCE MANAGEMENT AGENCY

county of ventura

Environmental Health Division
Donald W. Koepp
Director

REMEDIAL ACTION COMPLETION CERTIFICATION

March 1, 1999

Mr. Art Lenox
Boeing North American, Inc.
Rocketdyne Propulsion and Power
6633 Canoga Avenue
Canoga Park, CA 91303

VCEHD File #94044

Site Name/Address: **Rockwell/Santa Susana Field Laboratory, Woolsey Canyon Road, Building 780, Simi Valley, California**

This letter confirms the completion of a site investigation and remedial action for the underground storage tank formerly located at the above-described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tank are greatly appreciated.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, no further action related to the underground tank release is required. A copy of the Case Closure Summary for this site is enclosed for your records.

This notice is issued pursuant to a regulation contained in Section 2721(e) of Title 23 of the California Code of Regulations.

If you have any questions regarding this matter, please contact Ms. Diane Wahl of the LUFT Program staff at (805) 654-2460.

DONALD W. KOEPP, DIRECTOR
ENVIRONMENTAL HEALTH DIVISION
RESOURCE MANAGEMENT AGENCY

DWK/sg/2rckwel.doc 03-04-99A11:20 RCVD

Enclosure 001714 RC

c: Mark Pumford, Los Angeles Regional Water Quality Control Board
Mike Mosbacher, State Water Resources Control Board

Case Closure Summary
Leaking Underground Fuel Storage Tank Program

I. Agency Information

Date: 2/24/99

Agency name: Ventura County Environmental Health Div	Address: 800 South Victoria Avenue
City/State/ZIP: Ventura, CA 93009-1730	Phone: (805) 654-2460
Responsible staff person: Diane Wahl	Title: Environmental Health Specialist III

II. Case Information

Site facility name: Rocketdyne/Santa Susana Field Lab. (B2d .009) (UT-3)		
Site facility address: Woolsey Canyon Road, Simi Valley		
RB LUSTIS Case No:	Local Case No: C940084	LOP Case No: C940084
URF filing date:	SWEEPS No:	
Responsible Parties	Addresses	Phone Numbers
c/o Mr. Art Leonox	6633 Canoga Avenue	(818) 586-5695
Boeing North American, Inc.	Canoga Park, CA 91303	
Rocketdyne Propulsion & Power		

Tank No	Size in Gal	Contents	Closed In-place/Removed?	Date
1	1500	diesel/fuel oil	removed	8/31/87
2				
3				

III. Release and Site Characterization Information

Cause and type of release: UST system			
Site characterization complete? (Yes) No	Date approved by oversight agency: 2/24/99		
Monitoring Wells installed? Yes (No)	Number:	Proper screened interval? Yes No	
Highest GW depth below ground surface: 15'	Lowest depth: 50'	Flow direction: N to NW	
Most sensitive current use: Not used due to a large scale VOCs impacts (non-LUFT)			
Are drinking water wells affected? Yes No N/A	Aquifer name: Chatsworth formation		
Is surface water affected? Yes (No)	Nearest/affected SW name: N/A		
Off-site beneficial use impacts (addresses/locations): N/A			
Report(s) on file? (Yes) No	Where is report(s) filed? Ventura County Environmental Health		

Treatment and Disposal of Affected Material

Material	Amount (Include Units)	Action (Treatment or Disposal w/Destination)	Date
Tank	1500 G steel	Removed (Destination Unknown)	8/97
Piping		Information not provided	
Free Product	None	Not applicable	
Soil	24 Tons	Removed & disposed to USPCI, Utah	5/16/88
Groundwater	None	Not applicable	
Barrels	None	Not applicable	

RESOURCE MANAGEMENT AGENCY
county of ventura

Environmental Health Division
Donald W. Koepp
Director

10/03/94

SITE NO: C94044

ART LENOX
ROCKWELL INTERNATIONAL
6633 CANOGA AVE
CANOGA PARK CA 91303

Underground Tank Release at:
ROCKWELL/SANTA SUSANA FIELD LB
BLDG 9, TANK 3
SIMI VALLEY CA.

On 09/29/94 , a hazardous materials release was reported at this underground tank facility. Ventura County Ordinance Code Section 4527 et seq. requires that approval be obtained from Ventura County Environmental Health Division (VCEHD) before any work at an underground tank site is undertaken. This approval requires that a preliminary site assessment plan be submitted within 30 days of the release discovery. A preliminary site assessment plan includes the following:

1. A description of work to be completed that will determine extent of soil and/or groundwater contamination. This usually requires soil borings, groundwater monitoring wells and laboratory analysis of samples.

2. A list of type, quantity and concentration of hazardous substances released.

3. Results of any investigations and work completed to date.

This work is considered highly technical and should be carried out by a qualified engineering or geotechnical firm experienced in underground tank release site work. Information concerning selection of a qualified consultant is enclosed for your reference. All work must be completed according to the California Leaking Underground Fuel Tank (LUFT) Manual standards and the VCEHD LUFT Guidance Manual. The VCEHD LUFT Manual is available at our public counter in the Ventura County Government Center during regular business hours.

09697 RC

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

Cert# P869143>80

Until cleanup is complete, you are required to submit status reports every three months updating the information in the original report. All written correspondence must include file number and site address.

An extension of the 30-day period to submit the preliminary site assessment plan may be granted for good cause by the VCEHD upon written application (form enclosed).

This site may be eligible for the State Underground Tank Cleanup Fund. Enclosed for your information is a brochure describing this State program.

Failure to comply may result in legal action such as suspension of operating permits for remaining tanks at this site. Non-compliance may also jeopardize eligibility for the State Underground Tank Cleanup Fund. If you have any questions, please contact the undersigned at 805-654-3518 between the hours of 7:00 AM and 5:30 PM, Monday through Thursday.

Michael C. McFadden

LUFT PROGRAM
ENVIRONMENTAL HEALTH DIVISION

Enclosures

c: Ventura County Public Works Agency, Water Resources Dept.
Al Novak, L.A. Regional Water Quality Control Board

State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program

NOTICE OF RESPONSIBILITY

CERTIFIED MAIL #P869143280

RESPONSIBLE PARTY

Contact Person: ART LENOX
Company Name: ROCKWELL INTERNATIONAL
Address: 6633 CANOGA AVENUE
City/State/Zip: CANOGA PARK CA 91303

Site Code: 94044 Date First Reported: 09/29/94
Site Name: ROCKWELL/SANTA SUSANA FIELD LB
Address: BLDG 9, TANK 3
City/State/Zip: SIMI VALLEY CA 91303

Substance: 12034

The State Underground Storage Tank Cleanup Fund (Cleanup Fund) provides funding to pay the local and state agency administrative and oversight costs associated with the cleanup of releases from underground storage tanks. The Legislature has authorized funds to pay the local and state agency administrative and oversight costs associated with the cleanup of releases from underground storage tanks. The direct and indirect costs of overseeing site investigation or remedial action at the above site are funded, in whole or in part, from the State Cleanup Fund. The above individual(s) or entity(ies) have been identified as the party or parties responsible for investigation and cleanup of the above site. YOU ARE HEREBY NOTIFIED that pursuant to Section 25297.1 of the California Health and Safety Code, the above site has been placed in the Local Oversight Program.

Contract Project Director:

William Goth
Signature

Tel: 805-654-3518 Date: 10/03/94

RESOURCE MANAGEMENT AGENCY

county of ventura

Environmental Health Division
Donald W. Koepp
Director

On July 1, 1988, Ventura County signed a contract with the State Water Resources Control Board which allows the County to oversee assessment and cleanup of the above-named site. As a result of this agreement, the Environmental Health Division has formed the Leaking Underground Fuel Tank (LUFT) program with whom you will be working during remediation of this site. Under the terms of this contract, the State will bill you for time spent working on your case by the LUFT program staff, and also requires the enclosed notice be sent informing you of this fact.

If you have any questions regarding this notice, please contact the LUFT program staff at (805) 654-3518, Monday through Thursday.

Douglas A Beach

DOUGLAS A. BEACH, MANAGER
HAZARDOUS MATERIALS SECTION
ENVIRONMENTAL HEALTH DIVISION

DAB/sw/luft

Enclosure

c: Julian Perez, SWRCB

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

APPENDIX A

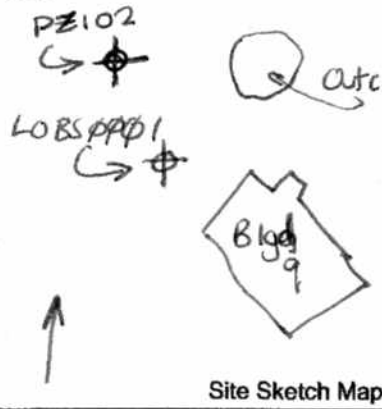
ATTACHMENT A-2

SUBSURFACE INFORMATION
(Electronic Copy)

SOIL BORING LOGS

Date: 02/20/07

MONTGOMERY WATSON



Site Sketch Map MJS

Boring #: LOBSPPP1	Sheet 1 of 1
Project: Group 8 RFI Data Gap Sampling	
Job #: 1891263.0111811/ 1891264.0111811	Site: SSFL
Logged By: M DAVIS	Reviewed By: SRV
Drilling Contractor:	
Drill Rig Type/Method: Hand Auger	
Drillers Name:	
Borehole Diam./Drill Bit Type: 2" ϕ	Total Depth 3.0 / Ref. Elev.
Sampler Type: Hand Auger	
Depth to 1st Water (▽): N/A	Time/Date: N/A
Drill Start Time/Date: 02/20/07 1030	Drill Finish Time/Date: 1050
Depth to Water After Drilling (▼):	Time/Date: N/A
Well Completion Time/Date: N/A	
Depth to other Water Bearing Zones: N/A	
Soil Boring Backfill Time/Date: 1050 (02/20/07)	

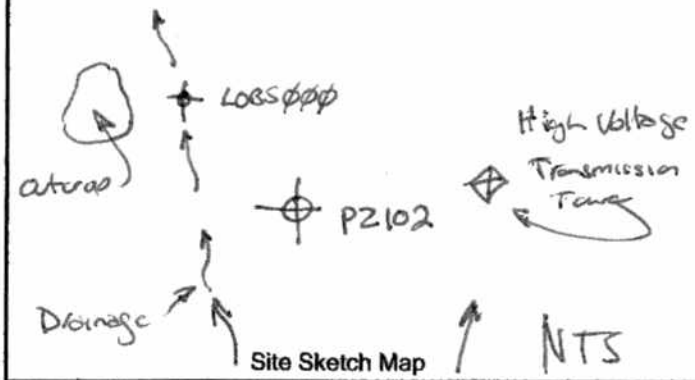
PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of: Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
									Surface - minor to mod growth of weeds + grasses					
1035 0.0			0.5 / 1.0	X			0.5		Dk yellowish brown (10YR 3/4) v. sandy SILT, moist, soft				40	60
							1							
							1.5		Dk yellowish brown (10YR 4/4) silty fine SAND, (slightly moist, loose)				60	40
							2							
							3.5							
							3		Yellowish brown (10YR 5/8) fine - med SANDSTONE (highly weathered)			30	50	20
							4							
									SO1 collected @ 0.5' - 1.0'					
							5		DO1 collected					
									NAD					
							6		TD ~~2.5~~ 3.0					
									Refusal - Bedrock (Chatsworth Fm)					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

Date: 02/20/07

MONTGOMERY WATSON

Boring #: LOBS 0002	Sheet 1 of 1
Project: Group 8 RFI Data Gap Sampling	
Job #: 1891263.0111811/ 1891264.0111811	Site: SSFL
Logged By: M DAVIS	Reviewed By: SRV
Drilling Contractor: N/A	
Drill Rig Type/Method: Hand Auger	
Drillers Name: N/A	
Borehole Diam./Drill Bit Type: 2" ø	Total Depth 2.5 / Ref. Elev.
Sampler Type: Hand Auger	
Drill Start Time/Date: 02/20/07 1100	Drill Finish Time/Date: 1140
Well Completion Time/Date: N/A	
Soil Boring Backfill Time/Date: 02/20/07 1145	



Site Sketch Map

Depth to 1st Water (▽): N/A Time/Date: N/A

Depth to Water After Drilling (▼): Time/Date: N/A

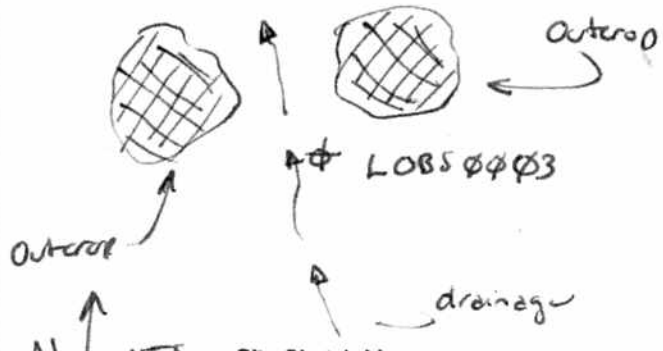
Depth to other Water Bearing Zones: N/A

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: mod growth of weeds & grasses.					
1120 0.0			0.5 / 10	X			0.5		Dk brown (10YR 3/3) fine sandy SILT w/ clay, (moist to wet.) (common organics (roothairs) soft				30	70
							1							
							2							
							2.5		Dk yellowish brown (10YR 4/4) fine sandy SILT w/ clay, (moist, soft)				30	70
							3							
							4							
							5		Dk yellowish brown 10YR (4/6) fine SAND w/ minor silt. dry to slightly moist, med dense)				80	20
							6							
							7		Refusal @ 2.5 Bedrock (Chatsworth Fm)					
							8							
							9							
							10							
							11		SO1 & SO1MS/MSD collected @ 0.5 - 1.0'					
							12							

QA/QC

Date: 02/20/07

MONTGOMERY WATSON



Site Sketch Map

Boring #: LOBS00003	Sheet 1 of 1
Project: Group 8 RFI Data Gap Sampling	
Job #: 1891263.0111811/ 1891264.0111811	Site: SSFL
Logged By: M DAVIS	Reviewed By: SRV
Drilling Contractor: N/A	
Drill Rig Type/Method: Hand Auger	
Drillers Name: N/A	
Borehole Diam./Drill Bit Type: 2" ø	Total Depth: 10.25' / Ref. Elev.
Sampler Type: Hand Auger	
Depth to 1st Water (▽): N/A	Time/Date: N/A
Drill Start Time/Date: 1250 02/20/07	Drill Finish Time/Date: 1350
Depth to Water After Drilling (▼):	Time/Date: N/A
Well Completion Time/Date: N/A	
Depth to other Water Bearing Zones: N/A	
Soil Boring Backfill Time/Date: 1350 02/20/07	

Surface - mod to heavy growth of weeds, brush & poison oak.

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
1300 0.0			0.5	X			0.25		Dk brown (10YR 3/3) fine sandy SILT, trace (moist, ssft) common organics (rootlets)				35	65
			1.0				1							
							2		Dk yellowish brown (10YR 4/6) silty fine - med SAND, moist, (loose)				65	35
							3							
							4		- Silt content decreasing w/ depth. - Becoming med dense w/ depth				75	25
1335 0.0			7.0	X			7							
			7.5				8							
							9							
							10							
						10.25	11		Light yellowish brown 10YR fine - med SANDSTONE Mod weathered, (Chatsworth Fm)			40	50	10
							12							

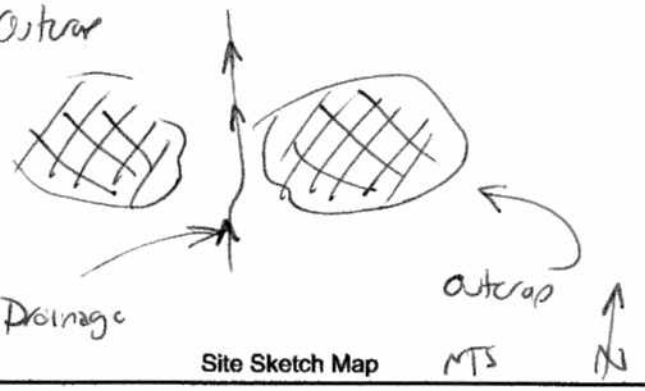
TD 10.25'
Refusal

QA/QC

Date: 02/20/07

MONTGOMERY WATSON

Boring #: LOBS0004	Sheet 1 of 1
Project: Group 8 RFI Data Gap Sampling	
Job #: 1891263.0111811/ 1891264.0111811	Site: SSFL
Logged By: M DAVIS	Reviewed By: SRV
Drilling Contractor: N/A	
Drill Rig Type/Method: Hand Auger	
Drillers Name: N/A	
Borehole Diam./Drill Bit Type: 2" ø	Total Depth: 0.5 / Ref. Elev.
Sampler Type: Hand Auger	
Drill Start Time/Date: 02/20/07 1415	Drill Finish Time/Date: 1425
Well Completion Time/Date: N/A	
Soil Boring Backfill Time/Date: 02/20/07 1425	



Site Sketch Map

Depth to 1st Water (▽): N/A Time/Date: N/A

Depth to Water After Drilling (▼): Time/Date: N/A

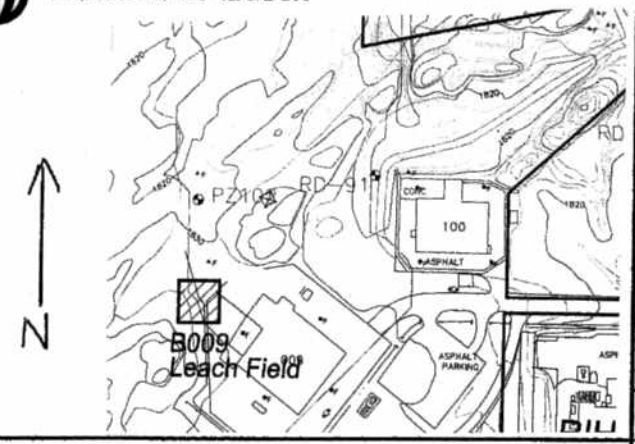
Depth to other Water Bearing Zones: N/A

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
1420 0.4			0.0 0.5	X			0.2 0.5 1		Surface - boulder & bedrock outcrops & mod growth of brush, weeds, & moss Black fine sandy SILT, (moist, soft) organic rich				25	75
							2		Dk yellowish brown (10YR4/6) fine to med SAND w/ minor silt (slightly moist, loose)		silt.	40	45	15
							3							
							4							
							5		TD 0.5' Refusal on Bedrock (0.5') Chatsworth Fm					
							6							
							7		SOIL collected @ 0.0 - 0.5					
							8							
							9							
							10							
							11							
							12							

QA/QC

Date: 02/20/07

MONTGOMERY WATSON



Boring #: LOBS 0005 Sheet 1 of 1

Project: Group 8 RFI Data Gap Sampling

Job #: 1891263.0111811/ 1891264.0111811 Site: SSFL

Logged By: M DANS Reviewed By: SRV

Drilling Contractor: NA

Drill Rig Type/Method: Hand Auger

Drillers Name: N/A

Borehole Diam./Drill Bit Type: 2"ø Hand Auger Total Depth: ~~0~~ 1.75

Ref. Elev.:

Sampler Type: Hand Auger

Depth to 1st Water (▽): N/A Time/Date: N/A

Drill Start Time/Date: 02/20/07 0845 Drill Finish Time/Date: 02/20/07 0900

Depth to Water After Drilling (▼): Time/Date: N/A

Well Completion Time/Date: N/A

Depth to other Water Bearing Zones: N/A

Soil Boring Backfill Time/Date: 02/20/07 0900

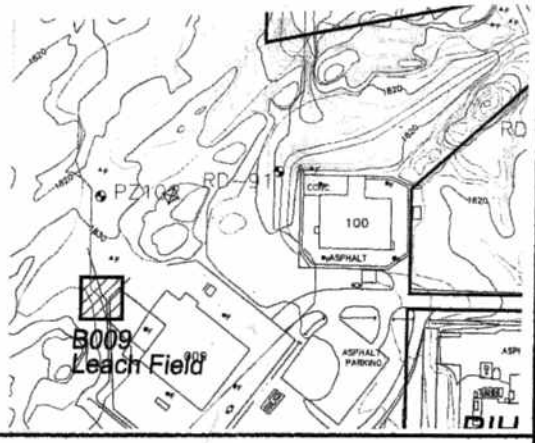
PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
NA				NO			0		Surface - mod growth of weeds & grasses					
							1		Dk Brown (10YR) silty fine - med SAND (Moist, soft)			30	30	40
							1.5		common organics (rootlets) in upper 6".					
							1.75 2							
							3		Dk yellow brown (10YR) fine - med SAND w/ silt					
							4		Highly weathered SANDSTONE (chatsworth Fm					
							5		Sample not collected - could not get to depth. Tried 3X in this area - no success					
							6							
							7		TD = ~~0.75~~ NO 1.75					
							8							
							9							
							10							
							11							
							12							

QA/QC

Date: 02/20/07

MONTGOMERY WATSON

See Main Map



Boring #: LOBS6009 6	Sheet 1 of 1
Project: Group 8 RFI Data Gap Sampling	
Job #: 1891263.0111811/ 1891264.0111811	Site: SSFL
Logged By: M DAVIS	Reviewed By: SRV
Drilling Contractor: N/A	
Drill Rig Type/Method: Hand Auger	
Drillers Name: N/A	
Borehole Diam./Drill Bit Type: 2" ϕ	Total Depth: 3.5 / Ref. Elev.:
Sampler Type: Hand Auger	
Drill Start Time/Date: 02/20/07 0920	Drill Finish Time/Date: 02/20/07 0945
Well Completion Time/Date: N/A	
Soil Boring Backfill Time/Date: 02/20/07 0945	
Depth to 1st Water (▽): N/A Time/Date: N/A	
Depth to Water After Drilling (▼): Time/Date: N/A	
Depth to other Water Bearing Zones: N/A	

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 - mild weeds + grasses					
							1		DK brown (10YR 3/3) very sandy SILT (moist, soft)			10	30	60
							1.75 2		Sand is f.c. fine - med grained common organics in upper foot (rootlets, rootlets)					
0940 0.0			3.0 3.5	X			3 3.5		DK yellowish brown (10YR 4/4) silty fine SAND (slightly moist to dry, loose to med dense			10	50	40
							4 5		Becoming dense to v. dense w/ depth, silt content decreasing w/ depth					1
							6 7							
							8		TD 3.5 (Refusal) (Bedrock) Collected SO1 @ 3-3.5					
							9 10 11 12							

QA/QC

LOBS0007 2-20-07

MONTGOMERY WATSON

Boring #: MW#: Sheet 1 of 1

Project: Group 8 RFI

Job #: 189263.011811 Site: SSFL

Logged By: Nevison Reviewed By: SRV

Drilling Contractor: Hydro GeoSpectrum

Drill Rig Type/Method: Geoprobe

Drillers Name: Alex

Borehole Diam./Drill Bit Type: Total Depth 10 / Ref. Elev.

Sampler Type: Geoprobe

Drill Start Time/Date: 2-20-07 1355 Drill Finish Time/Date: 2-20-07 1431

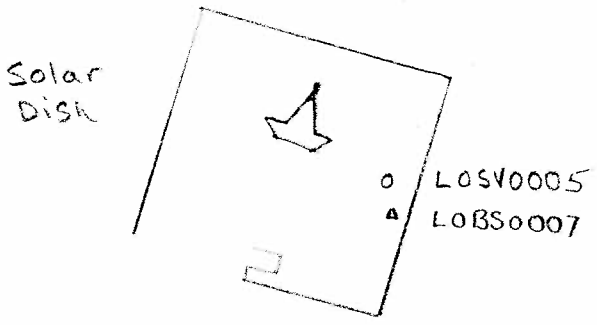
Well Completion Time/Date: N/A

Soil Boring Backfill Time/Date: 2-20-07 1438

Depth to 1st Water (▽): — Time/Date: —

Depth to Water After Drilling (▼): — Time/Date: —

Depth to other Water Bearing Zones: —



Site Sketch Map

Each: 2 Sleeves, 3 encore + Dup. Soil

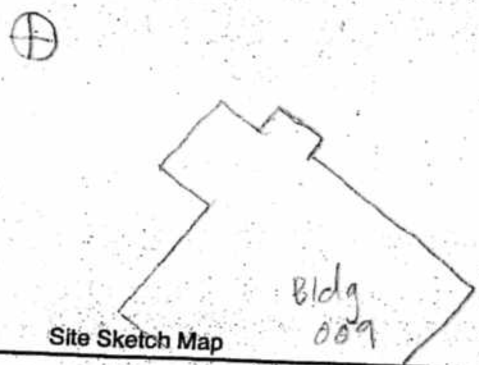
TOTAL: 8 ×12

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
1402	☒						SO1 DO1	SM	Silty Sand (SM) brown F-M, Loose, moist		tr	15	60	25
	☒						1	CL	Clay (CL) Very dark greyish brown (10yr 3/2), clay w/ trace			tr	10	90
							2		sand. medium stiff, medium					
							3		plastic, moist					
							4							
1408	☒						SO2							
	☒						5							
							6	SC	Sandy Clay (SC) brown (10yr 4/3), Sandy, stiff, medium			tr	20	80
							7		plastic, moist					
							8							
	☒						9		weathered bedrock,					
1431	☒						SO3 10		Bedrock @ 10' Refusal					
							11							
							12							

QA/QC

MONTGOMERY WATSON

L0BS0010



Site Sketch Map

Date: 5/16/07

Boring #: L0BS0010	Sheet 1 of 1
Project: Group 8 RFI Data Gap Sampling	
Job #: 1891306.0111811/ 1891307.0111811	Site: SSFL
Logged By: Seaver	Reviewed By: SRV
Drilling Contractor: —	
Drill Rig Type/Method: —	
Drillers Name: Seaver	
Borehole Diam./Drill Bit Type: 3"	Total Depth: 7.0'
	Ref. Elev.
Sampler Type: Hand auger Hand Auger	
Drill Start Time/Date: 5/16/07	Drill Finish Time/Date: 5/16/07
Well Completion Time/Date: N/A	
Soil Boring Backfill Time/Date: 5/16/07	

Depth to 1st Water (▽): N/A Time/Date: N/A

Depth to Water After Drilling (▼): N/A Time/Date: N/A

Depth to other Water Bearing Zones: N/A

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	Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
							0	CL	SILTY CLAY, dark brown, some fine sands, moist, plastic, no odor					
							1	SM	SILTY SAND, tan, fg to mg, damp, non-plastic, no odor					
							2	SC	CLAYEY SAND, red-brown, fg to mg, damp, slightly plastic, no odor					
							3							
							4							
							5							
							6		CLAYEY SAND, tan, reddish brown, brown, fg to mg, slightly plastic, no odor					
	☒ SO1S0159 -1245													
							7		BEDROCK HIT @ 7.0' bgs					
							8							
							9							
							10							
							11							
							12							

QA/QC

MONTGOMERY WATSON

Date: 5/16/07

Boring #: LOBS0011 Sheet 1 of 1

Project: Group 8 RFI Data Gap Sampling

Job #: 1891306.0111811/ 1891307.0111811 Site: SSFL

Logged By: Baumgardner Reviewed By: SRV

Drilling Contractor: HGS

Drill Rig Type/Method: Geoprobe

Drillers Name: Morse

Borehole Diam./Drill Bit Type: 3" Total Depth: 9.0' Ref. Elev.

Sampler Type: Geoprobe

Drill Start Time/Date: 0956 5/16/07 Drill Finish Time/Date: 1050 5/16/07

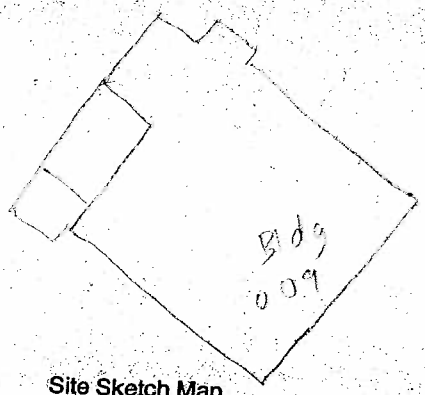
Well Completion Time/Date: N/A

Soil Boring Backfill Time/Date: 5/16/07 1056

Depth to 1st Water (▽): N/A Time/Date: N/A

Depth to Water After Drilling (▼): Time/Date: N/A

Depth to other Water Bearing Zones: N/A



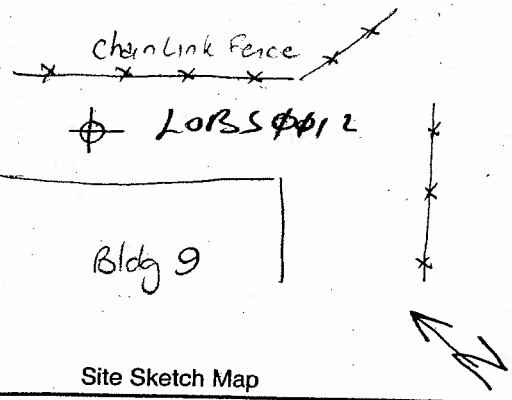
Site Sketch Map

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
							0	CL	Fill: Sandy Clay, Dark brown (10YR 3/3), fine to medium grained, damp mod stiff.			15	75	60
							1							
							2							
							3	SP	Sand, Light olive brown (2.5YR 5/4), damp, med. dense			30	65	5
							4	SC	Clayey Sand, Yellowish brown (10YR 5/6), fine to medium grained, damp, med. dense.			20	40	40
							5							
							6							
31	X						7							
							8							
							9		Refusal on bedrock @ 9'					
							10							
							11							
							12							

QA/QC

2085012 5/15/07

MONTGOMERY WATSON



NTS Site Sketch Map

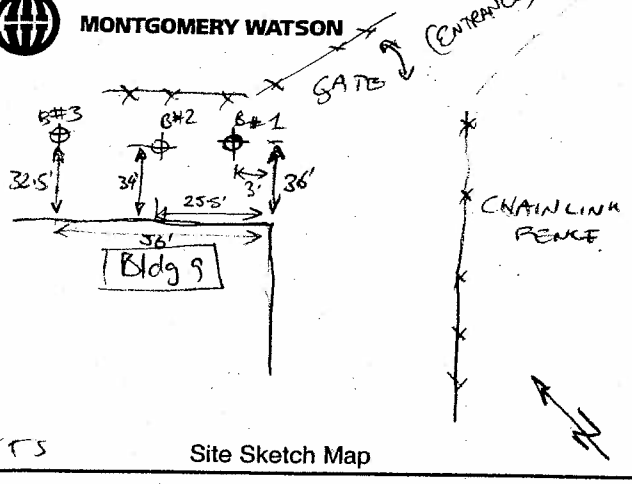
Boring #:	MW#:
Sheet	1 of 1
Project:	SSFL
Job #:	2085012 Site: SSFL
Logged By:	M Davis Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method:	Hydrogeospectrum
Drillers Name:	M Davis
Borehole Diam./Drill Bit Type:	2 1/4"
Total Depth	8.0'
Ref. Elev.	
Sampler Type:	Macro sample
Depth to 1st Water (▽):	Time/Date:
Depth to Water After Drilling (▼):	Time/Date:
Depth to other Water Bearing Zones:	
Drill Start Time/Date:	1210 Drill Finish Time/Date: 1330
Well Completion Time/Date:	
Soil Boring Backfill Time/Date:	1330 5/15/07

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
1230 (SO1) (SO1SP)			1.0 1.5	X			0.2		Surface: Asphalt. Asphalt					
							1	ML	Dk yellowish brown (10YR 4/4) clayey SILT w/ minor fine sand (moist, med stiff)				5	95
							2	ML						
							3		Yellowish brown fine med sandy SILT, moist, med stiff				30	70
							4	ML	Dk yellowish brown (10YR 4/4) clayey SILT w/ minor fine sand, moist, (med stiff - stiff)				10	90
							5							
							6							
1245 (SO2)	0.0		7.0 7.5	X			7	ML	Dk yellowish brown (10YR 4/6) clayey SILT w/ minor fine sand, moist, med stiff-stiff				10	90
							8							
							9							
							10		TD 8.0' Refusal on bedrock WD					
							11		Stepped at 4 times to get sufficient sample volume. Hit concrete @ 0.5' on 1st attempt.					
							12							

QA/QC

05/15/07

MONTGOMERY WATSON



NTS Site Sketch Map

Boring #: MW#:	Sheet 1 of 1
Project: SSFL	
Job #:	Site: Bldg 9
Logged By: M Davis	Reviewed By:
Drilling Contractor: Hydro Geo Spectrum	
Drill Rig Type/Method: Direct Push	
Drillers Name: Tom Morris	
Borehole Diam./Drill Bit Type: 2 1/4"	Total Depth 8' / Ref. Elev.
Sampler Type: N/A	
Depth to 1st Water (▽): Time/Date:	Drill Start Time/Date: 1130 Drill Finish Time/Date: 1200
Depth to Water After Drilling (▼): Time/Date:	Well Completion Time/Date: N/A
Depth to other Water Bearing Zones: N/A	Soil Boring Backfill Time/Date: 1210

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 - Asphalt					
							1		Probed for septic tank on NE side of Bldg 9. Probed in 3 locations w/ push-rig, to 8' TD @ each location. Did not encounter septic tank or other obstruction.					
							2							
							3							
							4		(See map for boring locations)					
							5		(No soil collected or logged - no Shelby (mWA))					
							6		TD = 8'					
							7		no refusal					
							8		no sampler collected					
							9							
							10		LOG DONE					
							11							
							12							

QA/QC

Date: 5/16/07

MONTGOMERY WATSON

Site Sketch Map

Boring #:	L0BS0014
Sheet	1 of 2
Project:	Group 8 RFI Data Gap Sampling
Job #:	1891306.0111811/ 1891307.0111811
Site:	SSFL
Logged By:	Baumgardner
Reviewed By:	SRV
Drilling Contractor:	HGS
Drill Rig Type/Method:	Geoprobe
Drillers Name:	Morse
Borehole Diam./Drill Bit Type:	3"
Total Depth	18.5'
Ref. Elev.	
Sampler Type:	Geoprobe
Drill Start Time/Date:	0733 5/16/07
Drill Finish Time/Date:	0824 5/16/07
Well Completion Time/Date:	N/A
Soil Boring Backfill Time/Date:	5/16/07 0830
Depth to 1st Water (▽):	N/A
Time/Date:	N/A
Depth to Water After Drilling (▼):	N/A
Time/Date:	N/A
Depth to other Water Bearing Zones:	N/A

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	Gravel	Sand: Coarse	Sand: Medium	Sand: Fine	Silt/clay
								CL	Silty Clay, Dark brown (10YR 4/2) trace fine sand, damp, very stiff.					
0737 →	⊠						Soil SP 1						5	95
							2							
							3							
							4							
							5	SC	Clayey Sand, Dark Yellowish brown (10YR 3/4), fine to medium grained, damp, dense.			20	40	40
							6							
							7							
							8							
							9	ML	Clayey Silt, Very Pale brown (10YR [illegible]) damp, [illegible] stiff.					
							10							
							11							
							12							

QA/QC

5-16-07

Boring #: LOBS0014 MW#: Project: Group 8 RFI Data Gap Sampling Sheet 2 of 2

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: Med.	Sand: Fine	Silt/Clay
							12	CL	Silty Clay Strong Brown (7.5YR 4/6) mottled w/ Very Pale Brown (10YR 7/4), have fine sand, damp very stiff.				5	95
							13							
							14							
							15							
							16	SC	Clayey Sand, Strong Brown (7.5YR 4/6) mottled with Very Pale Brown (10YR 7/4) fine grained sand, damp, dense.				65	35
OB21	☒						17							
							18	SC2						
							19		Refusal @ 18.5'					
							20							
							1							
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							0							
							1							
							2							

QA/QC

MWH

MONTGOMERY WATSON

Date: 5-15-07

Boring #: LOBS0015	Sheet 1 of 2
Project: Group 8 RFI Data Gap Sampling	
Job #: 1891306.0111811/ 1891307.0111811	Site: SSFL
Logged By: Baumgardner	Reviewed By: SRV
Drilling Contractor: —	
Drill Rig Type/Method: —	
Drillers Name: Seaver	
Borehole Diam./Drill Bit Type: 3"	Total Depth: 17'
	Ref. Elev.:
Sampler Type: hand auger - slide hammer	
Drill Start Time/Date: 1310 5/15/07	Drill Finish Time/Date: 8:40 5/16
Well Completion Time/Date: N/A	
Soil Boring Backfill Time/Date: 8:46 5/15/07	

Site Sketch Map

Depth to 1st Water (∇): N/A Time/Date: N/A

Depth to Water After Drilling (▼): Time/Date: N/A

Depth to other Water Bearing Zones: N/A

5/15/07 1316

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	Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
								CL	Silty Clay, Dark brown (10YR 3/3), damp, very stiff					100
	☒						1 SO1							
							2							
							3							
							4	SC	Clayey Fine Sand, Yellowish brown (10YR 5/6), damp, very stiff.				70	30
							5							
							6							
							7	ML	Clayey silt, Very Pale Brown (10YR 7/4), damp, very stiff					100
							8							
							9							
							10							
							11							
							12							

QA/QC

5-16-07

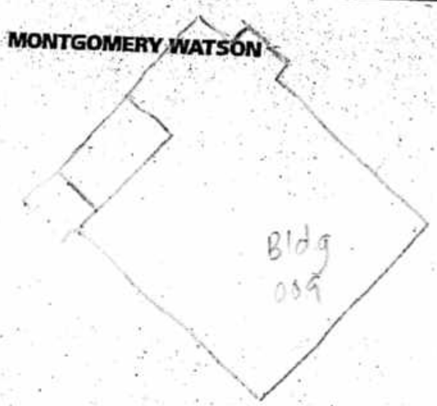
Boring #: LOBS0015 MW#: Project: Group 8 RFI Data Gap Sampling Sheet 2 of 2

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 Sand: Gravel	Coarse	Med.	Fine	Silt/Clay
							2							
	Bagging Sampling						3	CL	Silty Clay Strong Brown (7.5YR 4/6), damp, very stiff.					100
@ 14' on 5/10/07							4							
							5							
5/11/07 0829	X						6							
							7		Refusal on Bedrock @ 17'					
							8							
							9							
							20							
							1							
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							30							
							1							
							2							

QA/QC

MWH

MONTGOMERY WATSON



Site Sketch Map

Date: 5/16/07

Boring #: LOBS0017	Sheet 1 of 1
Project: Group 8 RFI Data Gap Sampling	
Job #: 1891306.0111811/ 1891307.0111811	Site: SSFL
Logged By: Baumgardner	Reviewed By: SRV
Drilling Contractor: HGS	
Drill Rig Type/Method: Geoprobe	
Drillers Name: Morse	
Borehole Diam./Drill Bit Type: 1.3"	Total Depth: 6.0'
	Ref. Elev.
Sampler Type: Geoprobe	
Drill Start Time/Date: 0906 5/16/07	Drill Finish Time/Date: 0950 5/16/07
Well Completion Time/Date: N/A	
Soil Boring Backfill Time/Date: 5/16/07 0952	

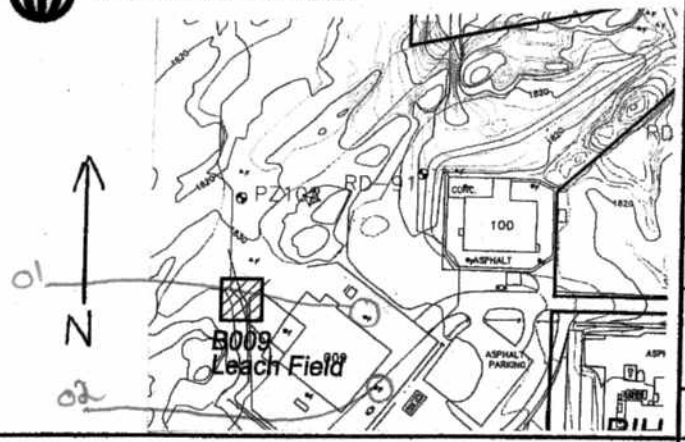
Depth to 1st Water (▽): N/A	Time/Date: N/A
Depth to Water After Drilling (▼):	Time/Date: N/A
Depth to other Water Bearing Zones: N/A	

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	Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
0912	X						Soil	CL	Fill: Silty Clay, Dark brown (10YR 3/3), damp, very stiff.					100
							1							
							2	SC	Alluvium: Clayey Sand, Dark Yellowish brown (10YR 4/6), fine grained sand, damp, dense.				65	35
							3							
							4							
918	X						5 SO2							
							6		Refusal on Bedrock @ 6'					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

Date: 2-20-07

MONTGOMERY WATSON



Boring #: LOSV0001	Sheet 1 of 1
Project: Group 8 RFI Data Gap Sampling	
Job #: 1891263.0111811/ 1891264.0111811	Site: SSFL
Logged By: NEVISON	Reviewed By: SRV
Drilling Contractor: Hydro Geo Spectrum	
Drill Rig Type/Method: Geoprobe	
Drillers Name: Alex	
Borehole Diam./Drill Bit Type: Push 1 1/2"	Total Depth: 8.25 / Ref. Elev.:
Sampler Type: ~~Geoprobe~~ N/A	
Drill Start Time/Date: 2.20.07 0930	Drill Finish Time/Date: 2.20.07 0936
Well Completion Time/Date: [redacted] 2.20.07	0941
Soil Boring Backfill Time/Date:	0941

Depth to 1st Water (▽): N/A	Time/Date: N/A
Depth to Water After Drilling (▼):	Time/Date: N/A
Depth to other Water Bearing Zones: N/A	

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: Asphalt					
									NO Samples / NO Logging					
							1		Install vapor probe					
							2							
							3		benseal 0-3					
							4		4' brown probe 3-4'					
									Sand 3-4'					
							5		benseal 4-7'					
							6							
							7		Sand 7-8.25					
									8' Yellow probe 7-8					
							8							
							9		Bedrock @ 8.25' Refusal					
							10							
							11							
							12							

QA/QC

Date: 2-20-07

MONTGOMERY WATSON

Boring #: LOSV0002	Sheet 1 of 1
Project: Group 8 RFI Data Gap Sampling	
Job #: 1891263.0111811/ 1891264.0111811	Site: SSFL
Logged By: NEVISON	Reviewed By: SRV
Drilling Contractor: Hydro Geo Spectrum	
Drill Rig Type/Method: Geo probe	
Drillers Name: Alex	
Borehole Diam./Drill Bit Type: push 1 1/2"	Total Depth: 6' / Ref. Elev.:
Sampler Type: ~~Geoprobe~~ N/A	
Depth to 1st Water (▽): N/A Time/Date: N/A	Drill Start Time/Date: 2·20·07 0944 Drill Finish Time/Date: 2·20·07 0948
Depth to Water After Drilling (▽): Time/Date: N/A	Well Completion Time/Date: [redacted] 2·20·07 0951
Depth to other Water Bearing Zones: N/A	Soil Boring Backfill Time/Date: 0951

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: asphalt					
									NO Samples / NO logging					
							1		Install vapor probe					
							2							
							3							
							4		bensea l 0-4'					
									5' Brown probe 4-5'					
							5		Sand 4-5'					
							6		Bedrock @ 6' Refusal					
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

Date: 2-20-07

MONTGOMERY WATSON

Boring #: LOSV0003 Sheet 1 of 1

Project: Group 8 RFI Data Gap Sampling

Job #: 1891263.0111811/ 1891264.0111811 Site: SSFL

Logged By: Nevison Reviewed By: SRV

Drilling Contractor: Hydro Geo Spectrum

Drill Rig Type/Method: Geoprobe

Drillers Name: Alex

Borehole Diam./Drill Bit Type: push 1½" Total Depth: 8.5 Ref. Elev.:

Sampler Type: ~~Geoprobe~~ N/A

Depth to 1st Water (▽): N/A Time/Date: N/A

Depth to Water After Drilling (▽): Time/Date: N/A

Depth to other Water Bearing Zones: N/A

Drill Start Time/Date: 2·20·07 0952 Drill Finish Time/Date: 2·20·07 0956

Well Completion Time/Date: 2·20·07 1001

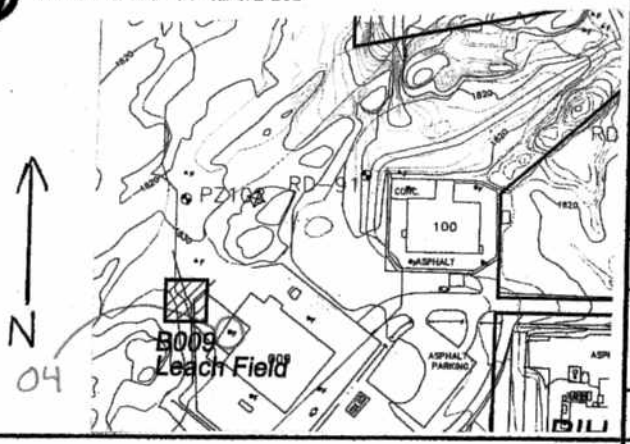
Soil Boring Backfill Time/Date: 1001

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: Asphalt					
									No samples / No logging					
							1		Install vapor probes					
							2							
							3							
							4		benseal 0-3'					
									4' brown probe 3-4					
							5		Sand 3-4					
									benseal 4-7					
							6							
							7		Sand 7-8.5					
									8' Yellow probe 7-8					
							8							
							9		Bedrock @ 8.5 Refusal					
							10							
							11							
							12							

QA/QC

Date: 2-20-07

MONTGOMERY WATSON



Boring #: LOSV0004 Sheet 1 of 1

Project: Group 8 RFI Data Gap Sampling

Job #: 1891263.0111811/ 1891264.0111811 Site: SSFL

Logged By: NEVISON Reviewed By: SRV

Drilling Contractor: Hydro Geo Spectrum

Drill Rig Type/Method: Geoprobe

Drillers Name: Alex

Borehole Diam./Drill Bit Type: Push/1½" Total Depth 4.5

Ref. Elev.

Sampler Type: ~~Geoprobe~~ N/A

Depth to 1st Water (▽): N/A Time/Date: N/A

Depth to Water After Drilling (▼): Time/Date: N/A

Depth to other Water Bearing Zones: N/A

Drill Start Time/Date: 2-20-07 1004 Drill Finish Time/Date: 2-20-07 1006

Well Completion Time/Date: 2-20-07 1010

Soil Boring Backfill Time/Date: 1010

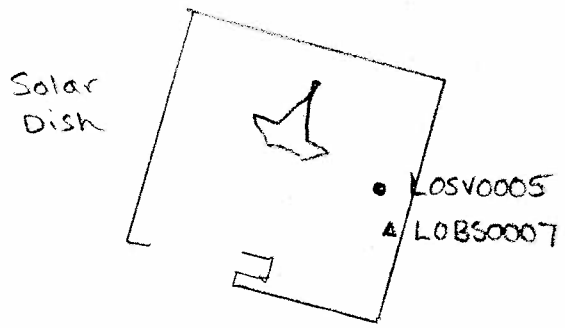
PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
									Surface: Asphalt					
									No Samples / No Logging					
							1		Install vapor probes					
							2							
									benseal 0-3'					
							3		4" Brown Probe 3-4'					
									Sand 3-4.5'					
							4							
									Bedrock @ 4.5', Refusal					
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

LOSV0005 2-20-07

MONTGOMERY WATSON

Boring #: LOSV0005 MW#:	Sheet 1 of
Project: Group 8 RFI	
Job #: 18912263.011181 Site: SSFL	
Logged By: Nevison Reviewed By: SRV	
Drilling Contractor: Hydro Geo Spectrum	
Drill Rig Type/Method: Geoprobe	
Drillers Name: Alex	
Borehole Diam./Drill Bit Type: 1 1/4"	Total Depth 10' / Ref. Elev.
Sampler Type: N/A	
Depth to 1st Water (▽): — Time/Date: —	Drill Start Time/Date: 2-20-07 1342 Drill Finish Time/Date: 2-20-07 1347
Depth to Water After Drilling (▼): — Time/Date: —	Well Completion Time/Date: 2-20-07 1354
Depth to other Water Bearing Zones: —	Soil Boring Backfill Time/Date: 1354



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 Vegetation					
									No samples / No Logging					
							1		Install Vapor probes					
							2							
							3							
							4		benseal 0-4					
							5		5' Brown Probe 4-5					
									Sand 4-5					
							6		benseal 5-9					
							7							
							8							
							9		Sand 9-10					
									10' Yellow Probe 9-10					
							10		Bedrock @ 10' Refusal					
							11							
							12							

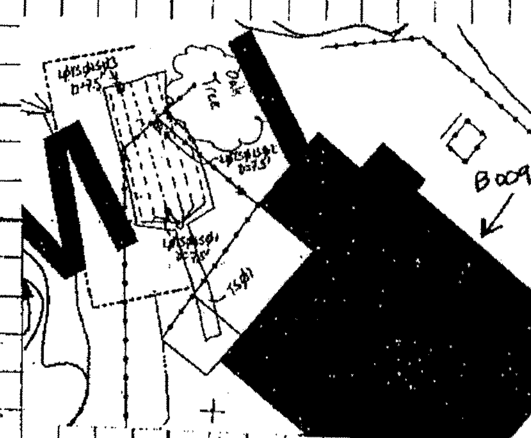
QA/QC

MWH
MONTGOMERY WATSON HARZA

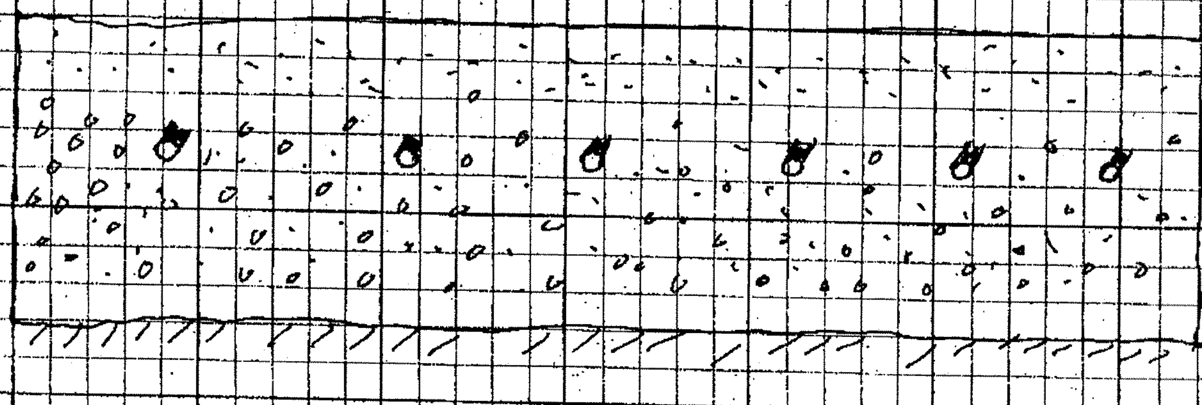
BY____ DATE____ CLIENT____ SHEET____ OF____
CHKD. BY____ DESCRIPTION____ JOB NO.____

Project Site	B009 LF	Trench Length 100 ft	Trench Width ~~8~~ 35 ft	No. Samples	3	
Trench Number	LØTSØ1	Total Depth	8 ft	Refusal? (Yes) No	If Yes, Depth = 8 ft	
Equipment Type	Back-hoe	Date/Time Started	N/A	Photo No	No. Yes	
Bucket Width 2 ft	Trench Orient.	Date/Time Finished	N/A	Wall of Trench Shown (N) S E W NE NW SE SW		
Geologist/Date B. Stewart / 6/27/02						

Plan View - Site Location



N 70 E →



Alluvium
Coarse Leach Field Gravel
Sandstone

Scale:
H = 1" = 5'
V = 1" = 5'

* Sample locations shown in Plan View above - All samples taken @ 7.5'

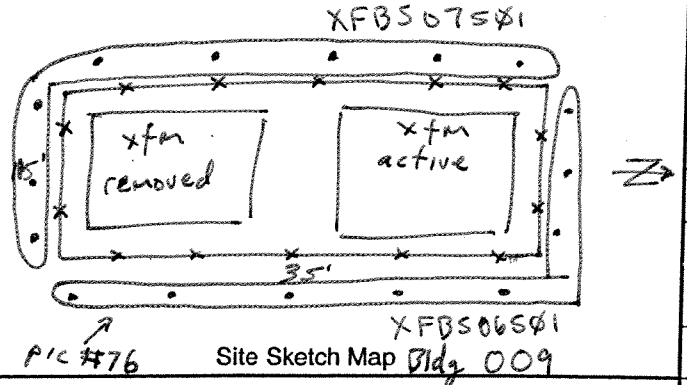
EN 18-12/93

XFBS06, 07

MONTGOMERY WATSON

Bldg 009

Boring #:	MW#:
Sheet	1 of 1
Project:	xfm : 05
Job #:	Site: pic # 7b
Logged By:	J. P. Reviewed By:
Drilling Contractor:	
Drill Rig Type/Method:	
Drillers Name:	
Borehole Diam./Drill Bit Type:	Total Depth / Ref. Elev.
Sampler Type:	s.s. sleeve
Depth to 1st Water (▽):	Time/Date:
Depth to Water After Drilling (▼):	Time/Date:
Depth to other Water Bearing Zones:	
Drill Start Time/Date: 9/22/03	Drill Finish Time/Date:
Well Completion Time/Date:	
Soil Boring Backfill Time/Date:	



Site Sketch Map Bldg 009

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		no visual staining.					
							1		Two concrete pads 1 xfm removed, 1 active still in place.					
							2		silty sand w/ gravel, dry loose.					
							3		1145 collect XFBS06SØ1 @ 8 pts 6" deep.					
							4		1200 collect XFBS07SØ1 @ 8 pts. 6" deep.					
							5		Each sample is a lateral composite					
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

9/23/05

MONTGOMERY WATSON

← FSDF

Boring #: XFBS31 MW#: NA Sheet 1 of 1

Project: SSFL Transformers / Area IV

Job #: 189084 .011209 Site: FSDF Rd, near observatory

Logged By: SV Reviewed By: TB

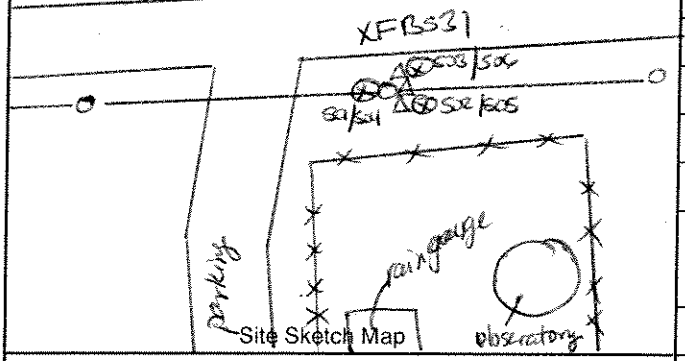
Drilling Contractor: B.L. Hall

Drill Rig Type/Method: Hand Auger

Drillers Name: Steve Huggett

Borehole Diam./Drill Bit Type: 4" Total Depth 25' Ref. Elev. 0

Sampler Type: Hand-operated slam bar with 6" sampler



Site Sketch Map

Depth to 1st Water (▽): NA Time/Date: NA

Depth to Water After Drilling (▼): NA Time/Date: NA

Depth to other Water Bearing Zones: NA

Drill Start Time/Date: 0830 Drill Finish Time/Date: 0900

Well Completion Time/Date: NA

Soil Boring Backfill Time/Date: 0900 9/23/05

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	CL	Silty CLAY (CL), very dark brown 10YR3/3, medium plasticity, moderate dry strength, high dilatancy, medium stiff, dry.				100	100
							1	SP	@0.5-10', Poorly-graded SAND (SP), reddish brown, 10YR5/6, fine to coarse grain sand, moist, loose.				↓	
							2							
							3		Total Depth = 25' bgs.					
							4							
							5							
							6							
							7							
							8							
							9							
							10							
							11							
							12							

QA/QC

PIEZOMETER LOGS

Boring #: PT-109 MW#: PZ-102 Project: DOE Shallow GW Investigation Sheet 3 of 34

PID/OVA ppm	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 Sand: Gravel	Coarse	Med.	Fine	Silt/Clay
							2		Soft to medium hard 3-4 drilling					
							3							
							4							
NA	↓	1"	100/1"				35		well cemented fine sand-stone, moist (saturated?), micaceous, oxidized dk. yellowish brown			10	10 80	
							6							
							7		Medium Hard drilling 4-5					
							8							
							9							
ø	↓	3	100/3"				40		As above, mod. well cemented, oxidized dk. yellowish brn., moist			10	10 80	
							1							
							2		Becomes harder @ 42' 6-7					
							3							
							4							
NA	↓	2	100/2"				45		As above, moist, dk. yellow-brown, well cemented				10 90	
							6		Harder still @ 46' 7-8					
							7							
							8		Very Hard @ 48.5 9					
							9							
ø	↓	6	27				50		Saturated silt & sand, highly Oxidized, possible fault gouge				20	80
ø	↓	6	100/6"										20	8
							1							
							2							

Casing: 2" SCH 40 BLANK PVC TO SURFACE; 2" 0.02" SCREEN

Annulus Filler: CEMENT GROUT TO 2 FT BGS; BENTONITE; RMC #3 SAND

QA/QC

Boring #: PT-109 MW#: PZ-102 Project: DOE Shallow GW Investigation Sheet 4 of 4

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 Sand: Gravel	Coarse	Med.	Fine	Silt/Clay
10/19/01							2							
							3		Hard Drilling 49-54' & Hole is tight. H_2O added to cool bit.					
							4							
Ø	↓	4	100/4"				55		As above, wet clayey silt (d K. gray) and oxidized fine sands, dry-moist; possible fault gouge along frx. zone; some shalestone fragments mod. well cemented			tr	40	60
					Cal 2" DIAM Screen (0.020" SLOTS)	RMC #3 SAND	6							
							7							
							8							
							9		Very Hard Drilling @ 58' 9-10					
NA	↓	Ø	100/1"				60		Sample contained slough + a small piece of oxidized fine sandstone - well cemented (2 attempts)					
							1							
							2		Total Depth 59.2'					
							3		Materials: RMC Lonestar #3 Sand					
							4		Enviroplug Medium Bentonite Chips					
							5		Portland cement Type ~~II~~/V					
							6		Sch-40 PVC 2" diam, 0.020" slot					
							7							
							8							
							9							
							0							
							1							
							2							

QA/QC

WELL LOGS

TABLE B-2
RD-91 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks / Eric Pigati		Client: Boeing - SSFL ETEC	Page 1 of 5
Boring Number/Location: RD-91		Drilling Co: WDC Exploration	Job No: 26411-019
Length, Kelly: 10 ft.	Rods: 20 ft. Collars:	Subs: 5.7 ft. Bit: 0.5	Height of K.B.: Date Started: 03/11/04
Type/Diameter of Bit: 6 in. Hammer		Drilling Fluid: Air	Rig Type: Speedstar 30K Date Finished: 03/12/04

Depth (feet)	Time		Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution %					Sorting			Grain Shape				Apparent Density					Plasticity				Odor Gas, etc (Air Rotary)	Reaction w/ HCL			
	Begin	End						Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High		None	Weak	Moderate	Strong
0																																	
																													None				
5			7.5YR 5/2	sl. moist	x	very dark brown loamy soil, clayey SILT					5	95	x									x			x								
			5YR 3/2			at 8' transitions into dark reddish brown																											
						WEATHERED SANDSTONE below 10'																											
10				sl. moist	x	becoming harder from 13-15'					90	10		x								x			x							x	
15			10YR 6/4	sl. moist	x	light yellowish brown, WEATHERED SANDSTONE	1/24				90	10		x								x			x							x	
						primarily fine sand with silt to 20'																											
20			10YR 5/6	sl. moist	x	SANDSTONE, fine to medium grained					90	10		x									x		x							x	
25			10YR 5/6	sl. moist	x	SANDSTONE, light brown, fine to medium grained	1/16				95	5		x									x		x							x	
						slightly moist, trace silt																											

Total Depth of Borehole (feet):	140 ft.
Groundwater, Depth Encountered:	~100 ft.
Static Water Level:	80 ft.

TABLE B-2
RD-91 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks		Client: Boeing - SSFL ETEC	
Boring Number/Location: RD-91		Drilling Co: WDC Exploration	Job No: 26411-019
Length, Kelly: 10 ft. Rods: 20 ft.	Collars:	Subs: 5.7 ft. Bit: 0.5 Height of K.B.:	Date Started: 03/11/04
Type/Diameter of Bit: 6 in. Hammer		Drilling Fluid: Air Rig Type: Speedstar 30K	Date Finished: 03/12/04

Depth (feet)	Time		Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution %					Sorting			Grain Shape				Apparent Density					Plasticity				Odor Gas, etc (Air Rotary)	Reaction w/ HCL			
	Begin	End						Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High		None	Weak	Moderate	Strong
30			10YR 5/6	sl. moist	x	SANDSTONE, light brown, fine to medium grained	1/16				95	5		x					x				x		x								x
						slightly moist, some silt																							None				
35			2.5Y 5/2	sl. moist	x	SANDSTONE, color change to grayish brown,					95	5		x					x				x		x								x
						slightly moist, predominantly fine to medium grained, with some coarse																											
						at 8' transitions into dark reddish brown																											
						WEATHERED SANDSTONE below 10'																											
40			GL2 5/1	sl. moist	x	SANDSTONE, bluish gray, fine to coarse grained, slightly moist	1/8				95	5		x					x				x		x							x	
						predominantly fine to medium grained																											
						thin mudstone partings from 42-43'																											
						possible healed bedding plane fracture ~42.8'																											
						faint oxidation staining below to ~46'																											
45			GL2 5/1	sl. moist	x	SANDSTONE, fine to medium grained, bluish gray, slightly moist					95	5		x					x				x		x								x
50			GL2 5/1	sl. moist	x	SANDSTONE, bluish gray, fine to medium grained, slightly moist	1/16				95	5		x					x				x		x							x	
55			GL2 5/1	sl. moist	x	same as above, moisture content increasing slightly					95	5		x					x				x		x							x	

Total Depth of Borehole (feet): 140 ft.
Groundwater, Depth Encountered: ~100 ft.
Static Water Level: 80 ft.

TABLE B-2
RD-91 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks		Client: Boeing - SSFL ETEC	Page 3 of 5
Boring Number/Location: RD-91		Drilling Co: WDC Exploration	Job No: 26411-019
Length, Kelly: 10 ft.	Rods: 20 ft. Collars:	Subs: 5.7 ft. Bit: 0.5 Height of K.B.:	Date Started: 03/11/04
Type/Diameter of Bit: 6 in. Hammer		Drilling Fluid: Air Rig Type: Speedstar 30K	Date Finished: 03/12/04

Depth (feet)	Time		Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution %					Sorting			Grain Shape				Apparent Density					Plasticity				Odor Gas, etc (Air Rotary)	Reaction w/ HCL			
	Begin	End						Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High		None	Weak	Moderate	Strong
60			GL2 5/1	sl. moist	**x**	SANDSTONE, bluish gray, slightly moist					95	5	x						x				x		x						x		
						predominantly fine grained																							None				
65			GL2 5/1	sl. moist	**x**	SANDSTONE, bluish gray, slightly moist	1/20				95	5	x						x				x		x							x	
						predominantly fine grained																											
						at 8' transitions into dark reddish brown																											
						WEATHERED SANDSTONE below 10'																											
70			GL2 5/1	sl. moist	**x**	SANDSTONE, bluish gray, slightly moist					95	5	x						x				x		x								x
						predominantly fine grained with some medium grained																											
75			GL2 5/1	sl. moist	**x**	SANDSTONE, bluish gray, slightly moist	1/16				95	5	x						x				x		x						x		
						predominantly fine grained with some medium grained																											
80			GL2 5/1	sl. moist	**x**	SANDSTONE, bluish gray, slightly moist					95	5	x						x				x		x						x		
						predominantly fine grained with some medium grained																											
85			GL2 5/1	sl. moist	**x**	SANDSTONE, bluish gray, slightly moist	1/16				95	5	x						x				x		x								x
						predominantly fine grained with increase in medium grained																											
						slightly darker, increase in fines from 88-90'																											

Total Depth of Borehole (feet):	140 ft.
Groundwater, Depth Encountered:	~100 ft.
Static Water Level:	80 ft.

TABLE B-2
RD-91 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks		Client: Boeing - SSFL ETEC	Page 4 of 5
Boring Number/Location: RD-91		Drilling Co: WDC Exploration	Job No: 26411-019
Length, Kelly: 10 ft. Rods: 20 ft.	Collars:	Subs: 5.7 ft. Bit: 0.5 Height of K.B.:	Date Started: 03/11/04
Type/Diameter of Bit: 6 in. Hammer		Drilling Fluid: Air	Rig Type: Speedstar 30K Date Finished: 03/12/04

Depth (feet)	Time		Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution %					Sorting			Grain Shape				Apparent Density					Plasticity				Odor Gas, etc (Air Rotary)	Reaction w/ HCL			
	Begin	End						Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High		None	Weak	Moderate	Strong
90			GL2 5/1	sl. moist	x	SANDSTONE, bluish gray, slightly moist	1/24				95	5	x						x				x		x							x	
						predominantly fine grained, slight increase in moisture content																							None				
						light and dark bluish gray banding from 90-105'																											
95			GL2 5/1	sl. moist	x	SANDSTONE, bluish gray, slightly moist					95	5	x						x				x		x							x	
						predominantly fine grained, increase in medium grained																											
						at 8' transitions into dark reddish brown																											
						WEATHERED SANDSTONE below 10'																											
100			GL2 5/1	moist	x	same as above, slightly darker gray due to increased moisture	1/16				95	5	x						x				x		x							x	
105			GL2 5/1	sl. moist	x	same as above					95	5	x						x				x		x								x
						predominantly fine grained																											
110			GL2 5/1	moist	x	same as above	1/16				95	5	x						x				x		x								x
115			GL2 5/1	moist	x	same as above					95	5	x						x				x		x							x	

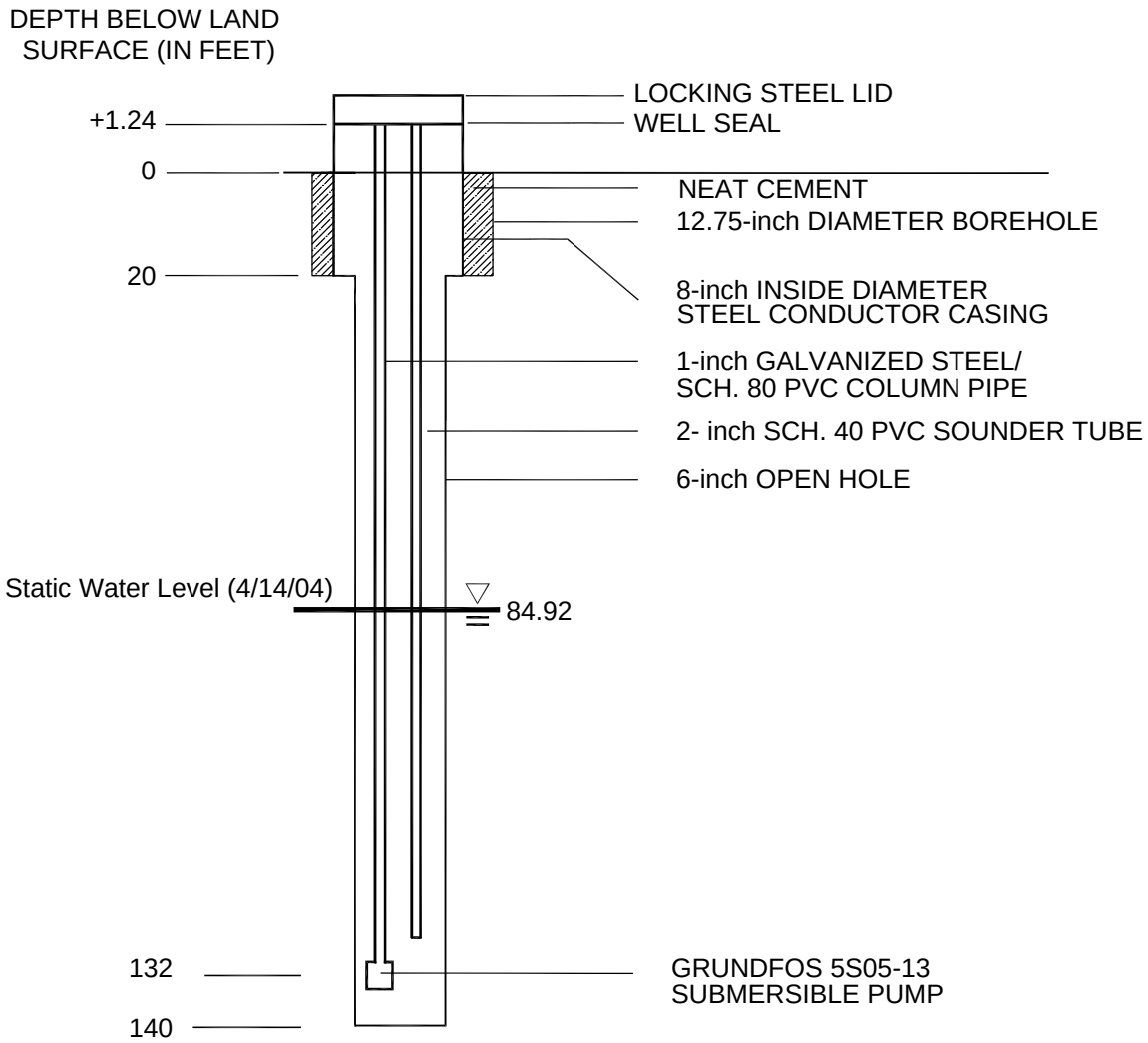
Total Depth of Borehole (feet): 140 ft.
Groundwater, Depth Encountered: ~100 ft.
Static Water Level: 80 ft.

TABLE B-2
RD-91 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks	Client: Boeing - SSFL ETEC		Page 5 of 5
Boring Number/Location: RD-91	Drilling Co: WDC Exploration		Job No: 26411-019
Length, Kelly: 10 ft. Rods: 20 ft. Collars:	Subs: 5.7 ft. Bit: 0.5	Height of K.B.:	Date Started: 03/11/04
Type/Diameter of Bit: 6 in. Hammer	Drilling Fluid: Air	Rig Type: Speedstar 30K	Date Finished: 03/12/04

Depth (feet)	Time		Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution %					Sorting			Grain Shape				Apparent Density					Plasticity				Odor Gas, etc (Air Rotary)	Reaction w/ HCL			
	Begin	End						Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High		None	Weak	Moderate	Strong
120			GL2 6/1	moist	x	SANDSTONE, bluish gray, moist	1/16				95	5	x						x				x		x							x	
						predominantly fine grained																							None				
125			GL2 6/1	moist	x	SANDSTONE, bluish gray, moist					95	5	x						x				x		x							x	
						predominantly fine grained																											
						at 8' transitions into dark reddish brown																											
						WEATHERED SANDSTONE below 10'																											
130			GL2 6/1	moist	x	SANDSTONE, bluish gray, moist	1/24				95	5	x						x				x		x								x
						predominantly fine grained																											
						increased fines below 130'																											
						predominantly mudstone from 132-138'																											
						very dark bluish gray, slightly moist																											
135			GL2 3/1	sl. moist	x	predominantly SANDSTONE from 138-140', but significant					70	30		x					x			x			x								x
						mudstone																											
140			GL2 3/1	sl. moist	x		1/24				85	15		x					x				x		x						x		

Total Depth of Borehole (feet):	140 ft.
Groundwater, Depth Encountered:	~100 ft.
Static Water Level:	80 ft.



HALEY & ALDRICH

UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

THE BOEING COMPANY
ROCKETDYNE PROPULSION AND POWER
SANTA SUSANA FIELD LABORATORY

WELL SCHEMATIC
FOR RD-91

SCALE: AS SHOWN

JUNE 2004

26473-024 A66

FIGURE A-2

APPENDIX A

ATTACHMENT A-3

DATA QUALITY, VALIDATION AND LABORATORY REPORTS
(Electronic Copy)

APPENDIX A, ATTACHMENT A-3
BUILDING 009 LEACH FIELD (AREA IV AREA OF CONCERN)
Electronic Copy of Validation Reports, COCs, and Case Narratives
Readme File

This Readme file contains information and instructions regarding the electronic copies of the Data Quality Report, validation reports, chain-of-custody forms, case narratives, and data tables Attachment A-3 of the *Group 8-Western Portion of Area IV RCRA Facility Investigation (RFI) Report Santa Susana Field Laboratory* (MWH 2007), and is provided electronically on the compact disc (CD) that comprises this attachment.

This read-only CD contains a summary data table and electronic copies of validation reports, chain-of-custody (COC) forms, and case narratives for samples collected at the B009 Leachfield RFI (Area IV AOC). All data in the tables and documents included in this section were used for the RFI characterization and/or risk assessment of B009 Leachfield of the Group 8 – Western Portion of Area IV RFI Report.

There are four main components to this attachment (the Laboratory Data Quality Report, two folders and one summary data table):

1. Data Quality Report

This report was prepared to describe data quality of samples collected for the B009 Leachfield Group 8 Reporting Area.

2. "Soil" Folder

This folder contains sampling and analytical information for soil samples collected at the B009 Leachfield RFI Site. The folder is divided into three subfolders:

- **COC – Case Narratives:** This subfolder contains COCs, analytical request change forms (where applicable), and analytical report case narratives. The electronic files are scanned images of hard copy documents presented in Portable Document Format (PDF) files, which can be viewed using Adobe Acrobat software. The electronic files are grouped and organized in this subfolder by the sample delivery group (SDG) number, a tracking and reporting number used by the laboratory to group up to 20 samples upon receipt.

  The COCs were generated in the field at the time of sample collection to document the handling and chain of custody for the samples.

  The case narrative is text typically found at the beginning of the laboratory report. Laboratories use the case narrative to describe any deviation from standard handling or analytical procedures for a sample or SDG.

Change Forms are generated for samples subsequent to shipment to the laboratory. Generally, change forms were generated when changes or corrections to a COC were needed (e.g., when additional analyses were requested for a sample).

- **Validation Reports:** Validation reports include laboratory results and a data assessment form completed by AMEC Earth and Environmental, Inc. (AMEC) or MEC^X, LLC (MEC^X) data validators. The validation report summaries identify the analytical method and target compounds for each sample. Additionally, the report indicates whether each compound was detected, the concentration (or detection limit if not detected), and applicable laboratory and data validation qualifiers. With the exception of field QC samples (field blanks, equipment rinsates), all analytical data generated from background field samples were validated by AMEC or MEC^X. Data validation report PDFs are sorted by their validation report numbers, which can be associated with results of interest in the B009 Leachfield Data Table (see description in section 4 below).

- **Not Validated:** This folder contains Lab reports (with copy of COC when available) or copies of Results Table from previous site investigations that were not covered by this program.

3. "Soil Vapor" Folder

The Soil Vapor folder contains sampling and analytical information for soil vapor samples collected at B009 Leachfield RFI Site. The folder contains three subfolders:

- **COC – Case Narrative:** See the analogous description for this subfolder in the Soil Matrix section above.
- **Validation Reports:** See the analogous description for this subfolder in the Soil Matrix section
- **Not Validated:** See the analogous description for this subfolder in the Soil Matrix section

4. B009 Data Table

This table is a sampling and analytical results table for B009 samples included in the B009 Leachfield RFI site characterization. The table is provided in PDF format. The data was queried from the SSFL database, which has been maintained throughout the history of the RFI program.

Results included in the B009 RFI risk assessment are populated with a "yes" in the "Included in Risk Assessment" column of the table.

This table can be used as a correlation look-up table to make documents in this appendix easier to access.

The B009 RFI Site Data Table is sorted (in order) by:
Matrix Type

Collection Date
Object Name
Sample Identification
Analytical Method
Analyte

The structure and directions for use of this table is described below.

A. Table Structure

- **Object Name** –Identifier assigned to a unique location point. Samples collected at various depths at a single location will carry the same Object Name.
- **Sample Name** – Prior to June 15, 2006 this represented a unique 5 character identifier assigned in the field to samples to identify analytical laboratory and facilitate database management. For samples collected after June 15, 2006, a single unique ID was applied which substituted for both 'Sample Name' and "Sample Identification". This new identifier is presented in both columns as it is more consistent with 'Sample Identification' conventions but also replaces the 'Sample Name' as the unique identifier.
- **Sample Identification** –Identification assigned to sample to denote RFI site, sample collection method and sample matrix type, sample location, and sample number. Naming conventions are described in Table 4-1 of the RCRA Facility Investigation Program Report (MWH 2004). For samples colleted after June 15, 2006, this column is populated with the "Sample Name".
- **Collection Date** – Date of sample collection.
- **Matrix** – Surficial sample matrix. See Sample Collection and Matrix Type section of Table 4-1 of the RFI Program Report (MWH, 2004).
- **Sample Type** – Sample type indicates whether the samples is a primary, field duplicate, or split sample. A more detailed description of the different sample types can be found in the Quality Assurance Project Plan (QAPP) contained in the RCRA Facility Investigation Work Plan Addendum Amendment (Ogden. 2000a).
- **Result Type** – Result type indicates whether the results is a primary, a lab repeat analysis or a tentatively identified compound
- **Analytical Method** – Analytical method use to analyze sample.
- **Analyte** – Chemical for which the sample is analyzed.
- **Concentration** – The concentration of a detected analyte or, if the analyte was not detected, the appropriate detection limit for that analytical method.
- **Units** – Unit of measurement for analyte (e.g., milligrams per kilogram [mg/kg]).
- **Validated –** Indicates the validation status of the individual result (see "Project Qualifier")**.**
- **Project Qualifier** – If "Validated" column is populated with "Yes". Project Qualifier represents a validation qualifier code assigned by data reviewer at AMEC or MEC^{X} during the validation process. These codes are defined in Table 1.2 of Appendix A of the RFI Program Report (MWH, 2004).

If "Validated" column is populated with "No" then Project Qualifier represents a Laboratory qualifier code assigned by the analytical laboratory who performed the analysis.

- **PQL** – The Practical Quantitation Limit (PQL) is the concentration that can be reliably measured within specified limits during routine laboratory operating conditions using approved methods. Under the SSFL RFI program organics and perchlorate are validated and reported to the PQL.
- **MDL** – The Method Detection Limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. Under the SSFL RFI program metals are validated and reported to the MDL.
- **Sample Delivery Group** – Sample Delivery Group (SDG) number is assigned by the laboratory upon receipt of samples. A single SDG number is assigned to all samples on one COC form (up to 20 samples), and each laboratory report includes one SDG.
- **Excavated** – Indicates whether the soil from which the sample was collected has been excavated. If the sample was excavated, this column is populated with "yes". Samples that have not been excavated are designated with "no" in this column.
- **Analytical Laboratory** – Analytical laboratory where the sample was analyzed.
- **Validation Report Number** – Tracking number assigned by AMEC or MEC^X. The validation report number provides a system to associate the data in the RFI database with the hard copy version of the validation report. Validation report number assignments and method associations are defined in Table B-1-2 of Appendix B-1 in the RFI Program Report (MWH, 2004).
- **Northings and Eastings** – Map Coordinates (State Plane, NAD 27 Zone V).
- **Included in Risk Assessment** – Populated with either a "yes" or a "no". A "yes" in this column indicates the result was included in the risk assessment for B009 Leachfield. See Appendix F of the Group 8 Bundle Report for more information regarding risk assessments.
- **Rationale for Risk Exclusion –** provides justification for not including a result in the risk assessment for B009 Leachfield. This applies only to samples that were not included in the risk assessment. Results with no value in this column were included in the risk assessment. See Appendix F of the Group 8 Bundle Report for more information regarding risk assessments.

B. Instructions for use as look-up tables

These tables are configured to facilitate the search for a document in any of the folders described above. To locate documents for samples associated with a particular result:

1. Using the table's sorting priority described earlier in this section, locate the sample identification and laboratory method.

2. Scroll right to the SDG and validation report number columns.

3. Note the appropriate SDG and validation report number.

Locate the document of interest under the appropriate folder as described above. Validation reports are organized by the validation report numbers.

DATA QUALITY REPORT

GROUP 8 – WESTERN PORTION OF AREA IV
RCRA FACILITY INVESTIGATION REPORT
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

VOLUME II – RFI SITE REPORTS

APPENDIX A, ATTACHMENT A-3

BUILDING 009 LEACH FIELD (AREA IV AREA OF CONCERN)

LABORATORY DATA QUALITY REPORT

Prepared For:

THE UNITED STATES DEPARTMENT OF ENERGY

Prepared by:

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Patti Meeks, Ph.D.
MEC^X, LLC
PROJECT CHEMIST

September 2007

TABLE OF CONTENTS

ATTACHMENT A-3

Section No. **Page No.**

LIST OF ACRONYMS AND ABBREVIATIONS

CAS	Columbia Analytical Services
GC/MS	Gas Chromatography/Mass Spectroscopy
GEL	General Engineering Laboratories
ICP	Inductively Coupled Plasma
LCS	Laboratory Control Sample
MDL	Method Detection Limit
MEC^X	MEC^X, LLC
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MWH	Montgomery Watson Harza, Inc.
PAH	Polynuclear Aromatic Hydrocarbon
PARCC	Precision, Accuracy, Representativeness, Completeness and Comparability
PCB	Polychlorinated Biphenyl
PE	Performance Evaluation
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RL	Reporting Limit
RPD	Relative Percent Difference
SIM	Selective Ion Monitoring
SOP	Standard Operating Procedure
SSFL	Santa Susana Field Laboratory
SVOC	Semivolatile Organic Compound
TIC	Tentatively Identified Compound
TPH	Total Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

A3.1 OVERALL QUALITY ASSURANCE PROGRAM

The Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at the Santa Susana Field Laboratory (SSFL) includes soil, groundwater, surface water, and biota sampling and analysis, as well as passive and active soil gas sampling and analysis following agency-approved work plans (Ogden 1996, 2000). Group 8 samples were analyzed by one or more of the following methods:

- Volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) SW-846 Method 8260B,
- Polynuclear aromatic hydrocarbons (PAHs) by USEPA SW-846 Methods 8270C and 8270C selective ion monitoring (SIM),
- Polychlorinated biphenyls (PCBs) by USEPA SW-846 Method 8082,
- Total petroleum hydrocarbons (TPH) by USEPA SW-846 Method SW8015B, modified,
- Metals by USEPA SW-846 Methods 6010B and 6020,
- Mercury by USEPA SW-846 Methods 7471A (soil) and 7470A (water),
- Fluoride by USEPA SW-846 Method 9056 and EPA Method 300.0 and pH by Method SW9045C.

The resulting data were validated by qualified chemists following USEPA guidelines as described in the RFI Quality Assurance Project Plans (QAPPs) (Ogden 1996 and 2000) and data validation standard operating procedures (SOPs). These data validation procedures are based on USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) and National Functional Guidelines for Inorganic Data Review (February 1994).

The Group 8 Building 009 Leach Field (B009) sampling effort collected and analyzed soil samples following RFI protocols. Field Quality Control (QC) samples provide a means of evaluating the quality of field sampling procedures, the effectiveness of equipment decontamination procedures, and the potential for introduction of contaminants unrelated to the project. Field QC samples collected during the project included field blanks, equipment rinsates, trip blanks, field duplicates, and split samples. Unless otherwise noted, field QC samples were collected according to the SSFL RFI QAPPs.

Data from all samples collected in support of the Group 8 B009 sampling effort were subsequently validated at either USEPA Level IV or V by MEC^X. The associated data validation reports, annotated laboratory result forms, and data tables are included in Attachments A-4 and A-5.

According to the established data validation protocols, analytical results were annotated following validation with the following qualifications: "U" (nondetected), "J" (estimated), "UJ" (estimated nondetect), "N" (tentative identification), "NJ" (estimated and tentatively identified), and "R" (rejected). Data with "U," "J," "UJ," "NJ," or "N" qualifiers are usable; data with an "R" qualifier are unusable for any purpose. The data are additionally annotated with codes indicating the reason for the qualification. The following items were reviewed during the Level V validation process: sample management (collection techniques, sample containers, preservation, handling, transport, chain-of-custody, holding times); method blank sample results; blank spike and laboratory control sample (LCS) results; surrogate recoveries, if applicable; matrix spike/matrix duplicate (MS/MSD) recoveries and precision; laboratory duplicate precision, if applicable; serial dilution precision, if applicable; field quality assurance / quality control (QA/QC) sample results; and other QC indicators as applicable. Level IV validation included review of the following: sample management, gas chromatography/mass spectroscopy (GC/MS) instrument performance, initial and continuing calibration, method blank results, continuing calibration blank results, MS/MSD recoveries and precision, matrix spike sample results, surrogate results, laboratory and field QC sample results, internal standard performance, target compound identification, compound quantification, reported detection limits, and a definitive review of the raw data.

As the Group 8 B009 sampling effort was not a complete field project, but an action intended to eliminate gaps in the Building 009 Leach Field data set, a precision, accuracy, representativeness, completeness, and comparability (PARCC) parameter assessment was not performed.

As discussed below in Sections 2 and 3, the Group 8 B009 data quality is acceptable for the purposes of the RFI, with qualifications as needed based on review by MEC^X.

A3.2 QUALITY ASSURANCE FINDINGS FOR HISTORIC AND PRIMARY DATA

The quality of historic and primary data collected from the Group 8 B009 RFI Site was reviewed as part of the overall data quality assessment in the RFI Program Report (MWH 2004) and details regarding specific samples and analyses are found therein. The RFI Program Report was not site specific, but a programmatic data review. As such, the quality concerns listed below may or may not affect the Group 8 B009 site samples. In general, however, the quality of the historic and primary data was acceptable, except as summarized in the sections below.

A3.2.1 HISTORIC DATA

Historic data validated for the RFI consist of samples collected by ICF Kaiser, McLaren/Hart, and Groundwater Resource Consultants, Inc. from 1987 to 1995. These soil samples were analyzed for dioxins, general minerals, metals, semivolatile organic compounds (SVOCs), TPH, PCBs, and VOCs. As the samples comprising the historic data were collected by other consulting firms, not all QC data were available; however, validation was performed to the extent possible. In no instance did the lack of QC data invalidate the use of the historic data for the RFI. Historic data that was not validated is not addressed in this report.

A3.2.2 PRIMARY DATA

Primary samples were collected for the RFI from 1995 to May 2007. These soil samples were analyzed for general minerals, metals, PAHs, PCBs, TPH, and VOCs. The quality of the primary data was acceptable with the exceptions noted in the sections below.

A3.2.2.1 INTERFERENCE IN SOIL METAL ANALYSES

While not all laboratories exhibited soil matrix interference in their inductively coupled plasma (ICP) metals analyses, most soil analyses were affected by high concentrations of the interfering analytes, specifically iron, aluminum, and vanadium. Antimony was the most consistently affected analyte; however, some other elements were affected.

To account for these interferences, the corrective actions taken resulted in the reporting limits (RLs) of the affected analytes being raised to a concentration equivalent to or greater than the interference in the sample. Detects reported below these levels were qualified as nondetected or

as estimated nondetects. Detects reported above these levels were reviewed and their validity was determined on a case-by-case basis. Some detects reported above the raised reporting limits were found to have been affected by interference and were qualified as estimated nondetects.

A3.2.2.2 COLUMBIA ANALYTICAL SERVICES SEMIVOLATILE ORGANIC COMPOUNDS

Samples were analyzed by Columbia Analytical Services (CAS) for SVOCs by EPA SW-846 Method 8270. CAS also analyzed one performance evaluation (PE) sample at a dilution. Of the 21 spiked compounds, CAS reported nine as nondetected and five others were recovered outside the PE sample performance acceptance limits provided by the sample supplier. Additionally, CAS reported eight compounds as detected that were not present in the PE sample. Although CAS reanalyzed the sample to determine the source of the discrepancies, the reanalysis results were inconclusive. Level IV review of any CAS semivolatile data was recommended where critical decisions were made.

A3.2.2.3 COLUMBIA ANALYTICAL SERVICES TOTAL PETROLEUM HYDROCARBONS

Samples were analyzed for TPH by CAS by modified EPA SW-846 Method 8015B. TPH was reported in four hydrocarbon ranges; gasoline (C8-C11), kerosene (C11-C14), diesel (C14-C20), and lubricant oil (C20-C30). Due to inadequate integration and overlapping target compound hydrocarbon range retention time windows, all results were qualified as estimated detects or nondetects.

A3.2.2.4 SOIL VAPOR INCOMPLETE BULB DECONTAMINATION AND INSTRUMENT CARRYOVER

Early in the soil vapor sampling effort, detects in some samples were traced back to incomplete decontamination of bulbs used for sample collection. Additional decontamination procedures were therefore added for sample bulbs containing concentrations of VOCs greater than 1,000 micrograms per liter (µg/L). Results for 46 site samples through the SSFL site were rejected due to incomplete bulb decontamination.

Due to very high concentrations of target compounds in some of the samples, effective dilutions were difficult to determine. The laboratory, Centrum (Riverside, CA), reported a few target

compounds above the linear range of the calibration, even from dilution analyses. Further dilutions were not performed, resulting in instrument carryover. As a result, 16 compound results were qualified as estimated detects.

A3.3 QUALITY ASSURANCE FINDINGS FOR GROUP 8 B009 SAMPLES

Samples were collected for the Group 8 B009 in two events, one in February 2007 and another in May 2007. Soil samples collected as part of the Group 8 B009 sampling effort consist of 9 samples for pH, 6 samples for fluoride, 15 samples for metals (including mercury), 4 samples for PAHs, 7 samples for PCBs, 9 samples for TPH, 9 samples for VOCs, and 3 samples for VOC soil vapor constituents.

Equipment rinsate samples and field blank samples were collected in association with all applicable analyses performed for Group 8 B009. (As equipment rinsate and field blank samples may apply to more than one Group 8 site, the equipment rinsate or field blank sample may be presented in another Appendix.) Four field duplicate and three laboratory split samples were collected specific to the Group 8 B009 RFI Site.

A3.3.1 GENERAL MINERALS AND OTHER ANALYTES

TestAmerica-Irvine, located in Irving, California, analyzed nine samples and two field duplicates for pH by SW-846 Method 9045C. All data are usable as no data were rejected. No results were qualified. The field duplicate RPDs were less than 100% and the field duplicate pairs were considered to be in good agreement.

General Engineering Laboratory (GEL), located in Charleston, South Carolina, analyzed 6 soil samples, 1 field duplicate, 1 field blank, and 1 equipment rinsate for fluoride by EPA Method 300.0. All data are usable as no data were rejected. No results were reported with elevated method detection limits (MDLs) or reporting limits (RLs). There were no method blank or field QC qualifications as fluoride was not detected in the method blanks or field QC samples. Most results were qualified as estimated detects due to matrix spike recovered below the QC limits. One field duplicate sample was collected and analyzed by GEL for fluoride. Fluoride was

detected in both samples with an RPD less than 100%. The pair was considered to be in good agreement.

TestAmerica-Denver (formerly Severn Trent Laboratories), located in Denver, Colorado, analyzed 2 laboratory split sample for fluoride by SW-846 Method 9056. Fluoride was detected in all samples with both RPDs less than 100%. The pairs were considered to be in good agreement.

A3.3.2 METALS

TestAmerica-Irvine analyzed 2 soil samples for aluminum by SW-846 Method 6010B, 1 sample for arsenic by SW-846 Method 6020, and 5 soil samples, 2 field duplicates, one field blank, and one equipment rinsate sample for 21 metals by SW-846 Methods 6010B, and 6020. All data are usable as no results were rejected. No results were reported with elevated method detection limits MDLs or RLs. Most metals were detected in most of the samples. There were no method blank contamination qualifications, although there were analytes detected in the method blanks. Most arsenic results were qualified as estimated detects due to arsenic detected in a field QC sample. Results for several analytes in most samples were qualified as estimated detects and nondetects due to low MS/MSD recoveries.

Two field duplicate pairs were collected and analyzed for metals by TestAmerica. Silver was detected in one primary sample but not in the duplicate and boron was detected in the other primary sample but not in the duplicate. All other detects were in common and all relative percent differences (RPDs) were less than 100%. The pairs were considered to be in good agreement.

TestAmerica-Irvine subcontracted the mercury analyses to Weck Laboratories (Weck), located in City of Industry, California. Weck analyzed 6 soil samples and 2 field duplicate samples for mercury by SW-846 Method 7471A. All data are usable as no results were rejected. No results were reported with elevated method detection limits MDLs or RLs. Most detected mercury results were qualified as estimated nondetects due to method blank contamination.

Two field duplicate pairs were collected and analyzed for mercury by Weck. Mercury was not detected in either sample in one duplicate pair. In the primary sample of the other duplicate pair,

mercury was qualified as an estimated nondetect due to method blank contamination. Mercury detected in the field duplicate, however, was at a concentration greater than 5× the method blank concentration and was not qualified as an estimated nondetect. The pairs were considered to be in reasonable agreement.

GEL analyzed 8 soil samples, 1 field blank, and 1 equipment rinsate for 22 metals by SW-846 Methods 6010B, 6020, 7470A, and 7471A. All nondetected antimony results were rejected due to low MS/MSD recoveries. All remaining data are usable as no other results were rejected. Due to matrix interference, all 6020 analytes were reported from 2× or 10× dilution. Most metals were detected in most samples. Most mercury results were qualified as estimated nondetects or detects due to negative blank results. A few molybdenum and zirconium detects were qualified as estimated nondetects due to method blank contamination. A few results for several analytes were qualified as estimated detects and nondetects due to MS/MSD recoveries outside of the QC limits. A few results for cobalt, copper, and lead were qualified as estimated detects laboratory duplicate RPDs that exceeded the QC limit. A few aluminum results were qualified as estimated detects due to a serial dilution percent difference (%D) that exceeded the control limit.

TestAmerica-Denver analyzed 1 laboratory split sample for aluminum by SW-846 Method 6010B and 2 field split samples for 22 metals by SW-846 Methods 6010B, 6020, and 7471A. Mercury and zirconium were detected in the split samples and qualified as estimated nondetects in the primary samples due to method blank contamination. Selenium was not detected in either primary sample but was detected in both split samples at concentrations below the MDL of the primary laboratory. In one pair, sodium was not detected in the primary sample but was detected in the split sample at a concentration below the MDL of the primary laboratory. The split sample pairs were considered to be in reasonable agreement.

A3.3.3 PAHS

GEL analyzed 4 soil samples, 1 field blank, and one equipment rinsate for 18 PAH compounds, n-nitrosodimethylamine, and added phthalates by SW-846 Method 8270C. The analyses were not performed using SW-846 8270C SIM as GEL was able to achieve the necessary reporting limits by 8270C in the full scan mode. All data are useable as no results were rejected. No results were reported at elevated MDLs or RLs. One phthalate compound was detected in most

samples and anthracene was detected in one sample. One phthalate compound was qualified as nondetected due to method blank contamination.

TestAmerica-Denver analyzed one laboratory split sample for 18 PAH compounds, n-nitrosodimethylamine, and added phthalates by SW-846 Method 8270C SIM. All nondetected Test-America-Denver sample summary results were reported to the MDL. The reviewer hand-corrected these results to correctly report them to the RL. There were no common detects in the split sample pair. The pair was not considered to be in agreement.

A3.3.4 PCBS

TestAmerica-Irvine analyzed 1 soil sample for seven Aroclors by SW-846 Method 8082. All data are usable as no results were rejected. No results were reported at elevated MDLs or RLs. No target compounds were detected and no results were qualified.

GEL analyzed 6 soil samples, 1 field duplicate, 1 field blank, and 1 equipment rinsate for seven Aroclors by SW-846 Method 8082. All data are usable as no data were rejected. Due to the high sulfur content of the samples, results for 4 samples were reported from 10× dilutions although clean-up procedures were performed in an attempt to remove the sulfur contamination. A couple of target compounds were detected in a one of the samples. There were no method blank or field QC sample qualifications as there were no detects in the associated method blanks or field QC samples. One field duplicate pair was analyzed for PCBs by GEL. The primary sample had two target compounds detected between the reporting limit and the detection limit while the duplicate sample had no target compound detects. The pair was considered to be in reasonable agreement.

TestAmerica-Denver analyzed 2 laboratory split samples for PCBs by SW-846 Method 8082. All nondetected Test-America-Denver sample summary results were reported to the MDL. The reviewer hand-corrected these results to correctly report them to the RL. There were no target compounds detected in either sample and the pair was considered to be in good agreement.

A3.3.5 TPH

TestAmerica-Irvine analyzed 3 soil samples, 2 field duplicate, 1 field blank, and 1 equipment rinsate sample for four hydrocarbon ranges by SW-846 Method 8015B, modified. All data are acceptable as no data were rejected. No results were reported at elevated MDLs or RLs. There

were no target compounds detected in the samples and no results were qualified. Two field duplicate samples were collected and analyzed by TestAmerica-Irvine for four hydrocarbon ranges by SW-846 Method 8015B, modified. There were no target compounds detected in any of the samples and the pairs were considered to be in good agreement.

GEL analyzed 4 soil samples, 1 field duplicate, 1 field blank, and 2 equipment rinsate samples for four hydrocarbon ranges and added terphenyls by SW-846 Method 8015B, modified. GEL also reported total TPH (C8-C30). As the total TPH result was represented by the four separate ranges, all totals were rejected as duplicate data. All data are acceptable as no data were rejected. No data were reported at elevated MDLs or RLs.

A few target compound range detects were reported in most of the samples. A few results were qualified as nondetected due to method blank contamination. There were no field QC sample qualifications as there were no detects in the associated field QC samples. One field duplicate pair was collected and analyzed for TPH. The pair had one common detect with a relative percent difference (RPD) of less than 100%. The pair had another common detect with an RPD of 110%. One target compound detect was reported in the primary sample but was not detected in the duplicate sample. The pair was considered to be in reasonable agreement.

A3.3.6 VOCS

TestAmerica-Irvine analyzed 1 soil sample, 1 field duplicate, 1 trip blank, 1 field blank, and 1 equipment rinsate sample for 68 VOC compounds by SW-846 Method 8260B. All results are usable as no results were rejected. No results were reported at elevated MDLs or RLs. Results for 2-chloro-1,1,1-trifluoroethane and chlorotrifluoroethene were qualified as estimated nondetects as TestAmerica-Irvine did not calibrate for these compounds but searched for them as tentatively identified compounds (TICs). One field duplicate pair was collected and analyzed for VOCs. There were no target compounds reported in either sample and the pair was considered to be in agreement.

GEL analyzed 8 soil samples, 1 trip blank, 1 field blanks, and 1 equipment rinsate sample for 66 VOC compounds and tentatively identified compounds (TICs) by SW-846 8260B. 2-Chloro-1,1,1-trifluoroethane and chlorotrifluoroethene were evaluated by reviewing the TIC data and neither compound was detected. All results are usable as no results were rejected. No results were reported at elevated MDLs or RLs. Acetone was detected in a couple of target samples and

one named TIC was reported in one sample. Naphthalene detected in one sample was qualified as nondetected due to method blank contamination. There were no field QC sample qualifications although there were a couple target compounds detected in the field QC samples.

TestAmerica-Denver analyzed two laboratory split samples for 68 VOC compounds by SW-846 Method 8260B. There were no target compounds detected in any of the spilt samples or primary samples and the pairs were considered to be in good agreement.

A3.3.7 VOCS IN SOIL VAPOR SAMPLES

Centrum Analytical, located in Riverside, California, used a mobile lab to analyze 3 soil vapor samples, 1 field duplicate, and 1 field blank for 24 VOC compounds by SW-846 Method 8260B modified for soil vapor constituents. All data are usable as no data were rejected. No results were reported at elevated MDLs or RLs. No target compounds were rejected as no results were qualified. One field duplicate pair was collected and analyzed for soil vapor constituents by Centrum analytical. There were no target compounds detected in the duplicate or the primary sample and the pair was considered to be in good agreement.

A3.4 REFERENCES

MWH. 2004. RCRA Facility Investigation Program Report, Santa Susana Field Laboratory, Ventura County. July.

Ogden Environmental and Energy Services, Company, Inc. (Ogden). 1996. RCRA Facility Investigation Work Plan Addendum, Santa Susana Field Laboratory, Ventura County, California. September.

Ogden Environmental and Energy Services, Company, Inc. (Ogden). 2000. RCRA Facility Investigation Work Plan Addendum Amendment, Santa Susana Field Laboratory, Ventura County, California. June.

United States Environmental Protection Plan (USEPA). 1994. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. February.

United States Environmental Protection Plan (USEPA). 1994. Contract Laboratory Program National Functional Guidelines for Organic Data Review. February.

SOIL

SOIL CASE NARRATIVES AND COCS

CEIMIC
Corporation
"Analytical Chemistry for Environmental Management"

T702

July 31, 2002

David Bean
Montgomery Watson
1340 Treat Boulevard
Suite 300
Walnut Creek, CA 94596

Dear Mr. Bean:

Enclosed are the results for the analyses performed in support of Montgomery Watson's Boeing Project, SDG No. MJ062. The 1 soil sample was received at Ceimic Corporation on June 27, 2002.

This sample is reported under Ceimic Project Number 020647, which can be referenced when inquiring about this project.

If you have any questions or concerns regarding this data, please call me at the telephone number listed below.

Sincerely,

Alfred Kwolek
GC/MS Specialist

AK/klw

Enclosures

10 Dean Knauss Drive, Narragansett, RI 02882 • Tel: (401) 782-8900 • Fax: (401) 782-8905

Project Narrative

SDG Narrative

The enclosed data package is in response to Montgomery Watson's Boeing Project, SDG No. MJ062. Under this SDG there is 1 SIM and 1 TPH-DRO analyses for 1 sample which was received at Ceimic Corporation on June 27, 2002.

This data package includes the analyses for the following samples from SDG No. MJ062, all of which are billable:

(1)	EPA ID	Ceimic ID	Analyses
	MJ063	020647-01	SIM, TPH-DRO

Sample Receipt

Cooler Temperatures upon receipt were 3°C.

(2) Instrumentation and Column Identification

The following instruments were used for the analyses:

GC/MS Analysis

A. SIM

MS9: HP5970B GC/MS,30 m,25 mm ID, ZB-5 fused silica capillary column

B. TPH-DRO

AD23_1: HP5890II GC/MS,30 m, 0.25 mm ID, DB-5 capillary column, GC9

(3) Sample Information

An "x" qualifier is flagged by Target Thru-put software whenever the data is manually edited. The letters "M" for GC/MS and "FF" for GC are used on the raw data of the quantitation report whenever a manual integration is performed. Manual integrations are performed on GC/MS and GC standards and samples when computer generated integration picks up only a portion of the chromatographic peak, due to software limitations. When manual integrations are required, these integrations are performed using sound defensible professional judgment, in order to report accurate data. Each manual integration is signed and dated, and reviewed by both the lab supervisor and the GC/MS Interpretation Specialist for GC/MS or the Organic Lab Manager for Pest/PCB.

A. SIM Fraction (Method 8270)

The following sample was analyzed by SIM (Selective Ion Monitoring) for low detection of PAH's N-Nitrosodimethylamine, and phthalates. This sample was reanalyzed at a dilution:

Client ID:	CEIMIC ID:	DILUTION:
MJ063	020647-02	1:5

The sample, method blank, and LCS were contaminated with bis(2-Ethylhexyl) phthalate and Di-n-butylphthalate above the reporting limit and naphthalene, 2-Methylnaphthalene and diethylphthalate below the reporting limit.

B. TPH-DRO Fraction (Method 8015B)

The sample was extracted and analyzed within its respective holding times.

All surrogate compound recoveries are within acceptable QC limits.

The matrix spike solution used for the LCS contains 10,000 µg/mL diesel fuel, which elutes across all four carbon ranges. The addition of 100 µL of MS to a 30-gram sample is equivalent to a 33 mg/Kg addition.

Deviations from the SOW

None other than specified above.

End of SDG Narrative

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature.

Alfred Kwolek, GC/MS Specialist

7/31/02
Date

Chain-of-Custody

MWH
MONTGOMERY WATSON HARZA

250 N. Madison Avenue
Pasadena, CA 91101
(626) 568-6310

020647
(20)

Chain of Custody

Control Number: COC MJ062

Date 6/27/02 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Boeing SSFL
Project Number:	
Deliver the results to the address above or as stated in contract	

Bill To:	Lowell Moffitt
Company:	MWH
Address:	250 N. Madison Avenue, Pasadena, CA, 91101

Sample Disposal Instructions:	Laboratory Disposal
Shipment Method:	Fed-Ex
Comment:	

Cooler No.

QC Level:

TAT:

Sample Data

Sample ID	Description (for MWH use only)	SWMU	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product
MJD62	LØTSØ1SØ2	AI Aoc	7.5'	6/27/02	0745			X		
MJD63	LØTSØ1SØ3	AII Aoc	7.5'	↓	0800			X		

Analyses (Preservatives row shown beneath each method)

	8260B VOC	8015BM TPH	8270CSIM SVOC	8270C SVOC	8290 DIOXINS	8315A FORMALDEHYDE	8330 ORDNANCE	6000/7000 METALS	7196A HEX CHROMIUM	8082 PCBs	9040B/9045C pH	340.2 FLUORIDE	300M ANIONS	300M HYDRAZINE	300M PERCHLORATES		Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
Preservatives	HCL, pH<2 4°C	HCL, pH<2 4°C	4°C	4°C	4°C	H2SO4, pH<2 4°C	4°C	HNO3, pH<2 4°C	4°C	4°C	4°C	4°C	4°C	4°C	4°C					
MJD62		X	X					X			X								X	2
MJD63		X	X					X			X								X	2

	Date	Time
Samplers Signature: [signature]	6/27/02	1600
Relinquished By: [signature]	6/27/02	1600
Received By:		
Relinquished By:		
Received By (LAB): Maggie Pichelso	6/28/02	10:00

CR

White Copy:Original Yellow:Lab Copy Pink:Field Copy

For Lab Use

Lab Number:

Does COC match samples: Y or N

Broken container: Y or N

Received within holding time: Y or N

COC Seal Intact: Y or N

Any other problems: Y or N

If any YES, MWH contacted: Y or N

Date Contacted: __/__/__

Temperature °C

Comments:

Note: Run TPH for all four ranges.

Fax results to D. Hambrick 818.842.4345

Sample Receiving Checklist

LIMS #: _____ Cooler Number: 1

Client: MWH Number of Coolers: 1

Project: Bixby Date Received: 6/28/02

A. PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 6/28/02

1. Have designated person initial here to acknowledge receipt of cooler: MP (date): 6/28/02

2. Did cooler come with a shipping slip (airbill, etc.)? ..... (YES) NO

If YES, enter carrier name & airbill number here: FX 811685371944

3. Were custody seals on outside of cooler? ..... YES (NO)

How many & where: _____ seal date: ____/____/____ seal name:

4. Were custody seals unbroken and intact at the date and time of arrival ..... YES NO

5. Did you screen samples for radioactivity using a Geiger Counter? ..... Reading: 0 (YES) NO

6. Chain of Custody #: MJ062

7. Were custody papers sealed in a plastic bag & taped inside to the lid? ..... (YES) NO

8. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO

9. Did you sign custody papers in the appropriate place? ..... (YES) NO

10. Was project identifiable from custody papers? ..... (YES) NO

11. If required, was enough ice used? ..... Cooler Temperature: 3 °C Type of ice: CUBE YES NO

B. LOG-IN PHASE: Date samples were logged-in: 6/28/02

by (print): Magda Pucbala (sign): Magda Pucbala

12. Describe type of packing in cooler: plastic bags

13. Were all bottles sealed in separate plastic bags? ..... (YES) NO

14. Did all bottles arrive unbroken and were labels in good condition? ..... (YES) NO

15. Were all bottle labels complete (ID, date, time, signature, preservative, etc.)? ..... (YES) NO

16. Did all bottle labels agree with custody papers? ..... (YES) NO

17. Were correct containers used for the tests indicated? ..... (YES) NO

18. Were samples received at the correct pH? ..... (YES) NO

19. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

20. Were bubbles absent in VOA samples? If NO, list by sample#: N/A YES NO

21. Are the lot numbers of the bottleware consistent with those of the bottleware shipped to the client? ..... YES NO

22. Laboratory labelling verified by: (Initials): MP (date): 6/28/02

FAX

MWH
MONTGOMERY WATSON HARZA

1230 Columbia Street, Suite 750
San Diego, California 92101-8536

Tel: 619-699-4144
Fax: 619-239-3895

Date: 07/01/02

To: Ms. Karen Williamsen / Ceimic Corporation **Fax No:** (401) 782-8905

From: Edmund Sarao
sign: Edmund Sarao

Subject: **Chain-of-Custody Form Analytical Request Change**

No. of Pages: 2
(including cover)

As per requested:
Please make the changes listed below to the chain-of-custody analytical request form. Include this form with the final data deliverables for these samples.

COC No.	EPA Sample ID	MWH Sample ID	Date Collected	Method (s) Originally Requested	Method (s) Now Requested*
MJ062	MJ063	L0TS01S03	6/27/02	HOLD	**8015BM, 8270CSIM, 6010B/7000, 9045C**

*Please Run for Requested Analyses Only. 8015BM to be reported under the four Carbon chains as was previously done.
The reason for these changes is:

Incorrectly marked on COC form _____
Lack of sample volume _____
MWH office personnel require this change X
Other: Containers mislabeled _____
Thank you.

CEIMIC
Corporation

"Analytical Chemistry for Environmental Management"

July 31, 2002

David Bean
Montgomery Watson
1340 Treat Boulevard
Suite 300
Walnut Creek, CA 94596

Dear Mr. Bean:

Enclosed are the results for the analyses performed in support of Montgomery Watson's Boeing Project, SDG No. MJ061. The 1 soil sample was received at Ceimic Corporation on June 24, 2002.

This sample is reported under Ceimic Project Number 020633, which can be referenced when inquiring about this project.

If you have any questions or concerns regarding this data, please call me at the telephone number listed below.

Sincerely,

Alfred Kwolek
GC/MS Specialist

AK/klw

Enclosures

702

10 Dean Knauss Drive, Narragansett, RI 02882 • Tel: (401) 782-8900 • Fax: (401) 782-8905

PROJECT NARRATIVE

SDG Narrative

The enclosed data package is in response to Montgomery Watson's Boeing Project, SDG No. MJ061. Under this SDG there is 1 SIM, 1 PCB and 1 TPH-DRO analyses for 1 sample which was received at Ceimic Corporation on June 24, 2002.

This data package includes the analyses for the following samples from SDG No. MJ061, all of which are billable:

(1)	EPA ID	Ceimic ID	Analyses
	MJ061	020633-01	SIM, PCB, TPH-DRO

Sample Receipt

Cooler Temperatures upon receipt were 6°C.

(2) Instrumentation and Column Identification

The following instruments were used for the analyses:

GC/MS Analysis

A. SIM

MS9: HP5970B GC/MS,30 m,25 mm ID, ZB-5 fused silica capillary column

B. PCB

AD8: HP5890II GC/MS,30 m, 0.53 mm ID, DB-5 megabore column, GC7

AD9: HP5890II GC/MS,30 m, 0.53 mm ID, DB1701 megabore column, GC7

C. TPH-DRO

AD23_1: HP5890II GC/MS,30 m, 0.25 mm ID, DB-5 capillary column, GC9

(3) Sample Information

An "x" qualifier is flagged by Target Thru-put software whenever the data is manually edited. The letters "M" for GC/MS and "FF" for GC are used on the raw data of the quantitation report whenever a manual integration is performed. Manual integrations are performed on GC/MS and GC standards and samples when computer generated integration picks up only a portion of the chromatographic peak, due to software limitations. When manual integrations are required, these integrations are performed using sound defensible professional judgment, in order to report accurate data. Each

manual integration is signed and dated, and reviewed by both the lab supervisor and the GC/MS Interpretation Specialist for GC/MS or the Organic Lab Manager for Pest/PCB.

A. SIM Fraction (Method 8270)

The following sample was analyzed by SIM (Selective Ion Monitoring) for low detection of PAH's, N-Nitrosodimethylamine and phthalates:

Client ID:	CEIMIC ID:
MJ061	020633-01

The associated method blank was contaminated with phthalates and the sample had similar phthalate concentrations.

The LCS was grossly contaminated with phthalates.

B. PCB Fraction (Method 8082)

No non-compliances are noted.

C. TPH-DRO Fraction (Method 8015B)

The sample was extracted and analyzed within its respective holding times.

All surrogate compound recoveries are within acceptable QC limits.

The matrix spike solution used for the LCS contains 10,000 µg/mL diesel fuel, which elutes across all four carbon ranges. The addition of 100 µL of MS to a 30-gram sample is equivalent to a 33 mg/Kg addition.

Deviations from the SOW

None other than specified above.

End of SDG Narrative

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature.

Alfred Kwolek, GC/MS Specialist

7/31/02

Date

CHAIN OF CUSTODY

020633

20

MWH
MONTGOMERY WATSON HARZA

250 N. Madison Avenue
Pasadena, CA 91101
(626) 568-6310

Chain of Custody

Control Number: COC MJ061

Date 6/24/02 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Boeing SSFL
Project Number:	
Deliver the results to the address above or as stated in contract	

Bill To:	Lowell Moffitt
Company:	MWH
Address:	250 N. Madison Avenue, Pasadena, CA, 91101

Sample Disposal Instructions:	Laboratory Disposal
Shipment Method:	Fed-Ex
Comment:	

Cooler No.	
QC Level:	TAT: Standard

Preservatives	HCL, pH<2 4°C	HCL, pH<2 4°C	4°C	4°C	4°C	H2SO4, pH<2 4°C	4°C	HNO3, pH<2 4°C	4°C	4°C	4°C	4°C	4°C	4°C	4°C	4°C	4°C					

Sample Data								Matrix				8260B VOC	8015BM TPH	8270CSIM SVOC	8270C SVOC	8290 DIOXINS	8315A FORMALDEHYDE	8330 ORDNANCE	6000/7000 METALS	7196A HEX CHROMIUM	8082 PCBs	9040B/9045C pH	340.2 FLUORIDE	300M ANIONS	300M HYDRAZINE	300M PERCHLORATES		Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
Sample ID	Description (for MWH use only)	SWMU	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product																						
MJ061	LOTS01.S01	AOC	7.5	6/24/02	1315			X					X	X					X		X	X						G			2

Samplers Signature:	Date 6/25/02	Time 1600
Relinquished By:	Date 6/25/02	Time 1600
Received By:	Date	Time
Relinquished By:	Date	Time
Received By (LAB): Elizaleth Astorga	Date 6/26/02	Time 10:00

White Copy:Original Yellow:Lab Copy Pink:Field Copy

For Lab Use

Lab Number:	Comments: Fax results to D. Hambrick 818.842.4395
Does COC match samples: Y or N	
Broken container: Y or N	
Received within holding time: Y or N	
COC Seal Intact: Y or N	
Any other problems: Y or N	
If any YES, MWH contacted: Y or N	
Date Contacted: __/__/__	
Temperature °C	

Sample Receiving Checklist

LIMS #: _____ Cooler Number: 1

Client: MWH Number of Coolers: 1

Project: Boeing SSFL Date Received: 6/26/02

A. PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 6/26/02

1. Have designated person initial here to acknowledge receipt of cooler: EA (date): 6/26/02

2. Did cooler come with a shipping slip (airbill, etc.)? ..... (YES) NO

If YES, enter carrier name & airbill number here: FY811685371933

3. Were custody seals on outside of cooler? ..... YES (NO)

How many & where: _____ seal date: ___/___/___ seal name:

4. Were custody seals unbroken and intact at the date and time of arrival ..... YES NO

5. Did you screen samples for radioactivity using a Geiger Counter? ..... Reading: 0 (YES) NO

6. Chain of Custody #: MJ0061

7. Were custody papers sealed in a plastic bag & taped inside to the lid? ..... YES (NO)

8. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO

9. Did you sign custody papers in the appropriate place? ..... (YES) NO

10. Was project identifiable from custody papers? ..... (YES) NO

11. If required, was enough ice used? ..... Cooler Temperature: 6 °C Type of ice: cube pack (YES) NO

B. LOG-IN PHASE: Date samples were logged-in: 6/26/02

by (print): Elizabeth Asting (sign): Elizabeth Asting

12. Describe type of packing in cooler: EA

13. Were all bottles sealed in separate plastic bags? ..... (YES) NO

14. Did all bottles arrive unbroken and were labels in good condition? ..... (YES) NO

15. Were all bottle labels complete (ID, date, time, signature, preservative, etc.)? ..... (YES) NO

16. Did all bottle labels agree with custody papers? ..... (YES) NO

17. Were correct containers used for the tests indicated? ..... (YES) NO

18. Were samples received at the correct pH? ..... (YES) NO

19. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

20. Were bubbles absent in VOA samples? If NO, list by sample#: N/A YES NO

21. Are the lot numbers of the bottleware consistent with those of the bottleware shipped to the client? ..... (YES) NO

22. Laboratory labelling verified by: (Initials): EA (date): 6/26/02

TestAmerica
ANALYTICAL TESTING CORPORATION

17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

LABORATORY REPORT

Prepared For: MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project: SSFL Group 8 - DOE
1891264

Sampled: 02/20/07
Received: 04/04/07
Issued: 04/10/07 16:07

NELAP #01108CA California ELAP#1197 CSDLAC #10256

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica. The Chain(s) of Custody, 3 pages, are included and are an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

LABORATORY ID	CLIENT ID	MATRIX
IQD0376-01	L0BS0007S03	Soil

Reviewed By:

TestAmerica - Irvine, CA
Michele Chamberlin
Project Manager

TestAmerica
ANALYTICAL TESTING CORPORATION
17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQD0376

Sampled: 02/20/07
Received: 04/04/07

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7D05093 Extracted: 04/05/07											
Blank Analyzed: 04/06/2007 (7D05093-BLK1)											
Aluminum	ND	10	5.0	mg/kg wet							
LCS Analyzed: 04/06/2007 (7D05093-BS1)											
Aluminum	52.9	10	5.0	mg/kg wet	50.0		106	80-120			
Matrix Spike Analyzed: 04/06/2007 (7D05093-MS1)						**Source: IQD0318-01**					
Aluminum	12100	10	5.0	mg/kg wet	49.8	8800	6627	75-125			*MHA*
Matrix Spike Dup Analyzed: 04/06/2007 (7D05093-MSD1)						**Source: IQD0318-01**					
Aluminum	12200	10	5.0	mg/kg wet	49.8	8800	6827	75-125	1	20	*MHA*

TestAmerica - Irvine, CA
Michele Chamberlin
Project Manager

TestAmerica
ANALYTICAL TESTING CORPORATION
17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE 1891264
Report Number: IQD0376

Sampled: 02/20/07
Received: 04/04/07

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7D04166 Extracted: 04/04/07											
Blank Analyzed: 04/04/2007 (7D04166-BLK1)											
Percent Solids	ND	0.10	0.10	%							
Duplicate Analyzed: 04/04/2007 (7D04166-DUP1)						**Source: IQD0376-01**					
Percent Solids	65.4	0.10	0.10	%		71			8	20	

TestAmerica - Irvine, CA
Michele Chamberlin
Project Manager

TestAmerica
ANALYTICAL TESTING CORPORATION
17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQD0376

Sampled: 02/20/07
Received: 04/04/07

DATA QUALIFIERS AND DEFINITIONS

H-1 Sample analysis performed past the method-specified holding time per client's approval.

MHA Due to high levels of analyte in the sample, the MS/MSD calculation does not provide useful spike recovery information. See Blank Spike (LCS).

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

RPD Relative Percent Difference

TestAmerica - Irvine, CA
Michele Chamberlin
Project Manager

TestAmerica
ANALYTICAL TESTING CORPORATION
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MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQD0376

Sampled: 02/20/07
Received: 04/04/07

Certification Summary

TestAmerica - Irvine, CA

Method	Matrix	Nelac	California
EPA 160.3 MOD	Soil	N/A	N/A
EPA 6010B	Soil	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for TestAmerica may be obtained by contacting the laboratory or visiting our website at www.testamericainc.com

TestAmerica - Irvine, CA
Michele Chamberlin
Project Manager

Del Mar Analytical

2852 Alton Ave., Irvine, CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

IQD0376

ADDITIONAL ANALYSIS REQUEST FORM

Today's Date: 4/4/07 Del Mar Analytical Project Manager: MC

Request via: ____ telephone ____ chain of custody form ____ fax transmission X E-mail ____ other

Client: MWH - San Diego/Boeing Contact: Lisa Tucker

Project: Group 8 - Building 009 - DOE

Date Sampled: 2/20/07 Date Received: 2/21/07

Status: ____ in progress ____ completed ____ received today ____ received yesterday X on hold ____ other

SAMPLE NUMBER	SAMPLE DESCRIPTION	ANALYSIS REQUESTED	SPECIAL REQUIREMENTS
IQB2309-11	LOBS0007S03	% solids and Al	

* Add-on with new WO # *

JB
4/4
17:45

TURNAROUND STATUS: ____ Same Day ____ 24hr ____ 48hr ____ 3days

X 5days ____ Standard ____ No Rush Charge

due 4/11/07

g:\dmai\misc\forms\add-req.doc

Del Mar Analytical

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

IQD0376

ADDITIONAL ANALYSIS REQUEST FORM

Today's Date: 4/4/07 Del Mar Analytical Project Manager: MC

Request via: ____ telephone ____ chain of custody form ____ fax transmission X E-mail ____ other

Client: MWH - San Diego/Boeing Contact: Lisa Tucker

Project: Group 8 - Building 009 - DOE

Date Sampled: 2/20/07 Date Received: 2/21/07

Status: ____ in progress ____ completed ____ received today ____ received yesterday X on hold ____ other

SAMPLE NUMBER	SAMPLE DESCRIPTION	ANALYSIS REQUESTED	SPECIAL REQUIREMENTS
IQB2309-11	LOBS0007S03	% solids and Al	

* Add-on with new WO # *

JB 4/4 17:45

TURNAROUND STATUS: ____ Same Day ____ 24hr ____ 48hr ____ 3days

X 5days ____ Standard ____ No Rush Charge

due 4/11/07

g:\dmai\misc\forms\add-req.doc

CHAIN OF CUSTODY RECORD

COC #: MWHSV20070220_DC

Page: 1 of 2

Customer Information		Project Information		Project Information	
Site:	SSFL	Client Name:	DOE	Collector:	Shelby Valenzuela
Company:	MWH	Sampling Event:	Group 8 Data Gaps-Soil	Contact #:	
Report to:	Lisa Tucker	Project Number:	1891264		
Address:	9444 Farnham Street	Project Manager:	Diana Buchanan		
	Suite 300	PM Phone #:	(626) 568-6897		
	San Diego	Field Contact:			
	CA	Field Contact #:			
	92123	Lab Name:	Test America, Inc.		
Email:	beesingedms@ch2m.com	Lab Contact:	Michele Chamberlin		
	Lisa.Tucker@mwhglobal.com	Lab Address:	17461 Derian Ave, Suite 100		
			Irvine, CA 92606		
		Lab Phone:	(949) 261-1022		

Boeing PM:

Requested Analyses

Sample Name	Matrix	Date	Time	No. of Containers	% Solids - Soil	Metals 6010B/6020 Soil Group 8	Metals 7471A Soil Mercury	PCBs by SW8082 - Soil	pH by SW9045C - Soil	SVOCs by SW8270C SIM - Soil	TPH by SW8015BM - Soil	VOC 8260B Soil Full	METALS 6020 SOIL ARSENIC	Comments
L0BS0006S01	Soil	2/20/2007	9:40	2	10		10		10				10	Sleeve(2), ADD As
L0BS0001D01	Soil	2/20/2007	10:35	4	10	10	10	EH	10	EH	10			S(4)
L0BS0001S01	Soil	2/20/2007	10:35	2	10	10	10	EH	10	EH	10			S(2)
L0BS0002S01	Soil	2/20/2007	11:20	8	10	10	10	EH	10	EH	10			Homogenize and run MS/MSD. See notes below. S(8).
L0BS0003S01	Soil	2/20/2007	13:00	2	10	10	10		10					S(2)
L0BS0003S02	Soil	2/20/2007	13:35	2	H	H	H		10					Hold all analysis except for pH. S(2)
L0BS0007D01	Soil	2/20/2007	14:02	5	10	10	10	EH	10	EH	10	10		Sleeve (2), Encore (3)
L0BS0007S01	Soil	2/20/2007	14:02	5	5	10	10	EH	10	EH	10	5		Sleeve (2), Encore (3)

Instructions/TAT

Legend:
Numerical values for analyses equate to turn around time in days

H - Hold
EH - Extract Hold

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
	2-20-07		02/21/07		2/21/07		02/21/07
Company: MWH	Time: 1550	Company: TESTAMERICA-IRVINE	Time: 1550	Company: TESTAMERICA IRV	Time: 1915	Company: TAI	Time: 1915

Comments: Homogenize all sample sleeves of sample L0BS0002S01 before analysis, run Method Spike/Spike Duplicate.

Geotracker EDF ☐

Data Validation Package ☑ Level IV

163

0.5/0.0°C HE 2-21-07 2125

CHAIN OF CUSTODY RECORD

COC #:

Customer Information		Project Information		Project Information	
Site:	SSFL	Client Name:	DOE	Collector:	Shelby Valenzuela
Company:	MWH	Sampling Event:	Group 8 Data Gaps-Soil	Contact #:	
Report to:	Lisa Tucker	Project Number:	1891264	Boeing PM:	
Address:	9444 Farnham Street	Project Manager:	Diana Buchanan		
	Suite 300	PM Phone #:	(626) 568-6897		
	San Diego	Field Contact:			
	CA	Field Contact #:			
	92123	Lab Name:	Test America, Inc.		
Email:	boeingedms@ch2m.com	Lab Contact:	Michele Chamberlin		
	Lisa.Tucker@mwhglobal.com	Lab Address:	17461 Derian Ave, Suite 100		
			Irvine, CA 92606		
		Lab Phone:	(949) 261-1022		

Instructions/TAT

Legend.
Numerical values for analyses equate to turn around time in days

H - Hold
EH - Extract, Hold

Requested Analyses

Sample Name	Matrix	Date	Time	No. of Containers	% Solids - Soil	Metals 6010B/6020 Soil Group 8	Metals 7471A Soil Mercury	PCB by SW8082 - Soil	pH by SW9045C - Soil	SVOCs by SW8270C SIM - Soil	TPH by SW8015DM - Soil	VOC 8260B Soil Full	METALS 6010B SOIL ALUMINUM		Comments
L0BS0007S02	Soil	2/20/2007	14:08	5	~~H~~ 10	H	H	EH	10	EH	EH	H	10	e.m. 3/16/07	~~Hold all analysis except for pH. 8(2), 8(3)~~ ADD Al
L0BS0004S01	Soil	2/20/2007	14:20	2	10	10	10		10						8(2)
L0BS0007S03	Soil	2/20/2007	14:31	5	~~H~~ 5	H	H	EH	10	EH	EH	H	5	2ms 4/4/07	~~Hold all analysis except for pH. 8(2), 8(3)~~ ADD Al

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
[signature]	2-21-07	[signature]	02/21/07	[signature]	02/21/07	[signature]	2/21/07
Company: MWH	Time: 1550	Company: TESTAMERICA-IRV	Time: 1550	Company: TESTAMERICA-IRV	Time: 1915	Company: TAI	Time: 1915

Comments: Homogenize all sample sleeves of sample L0BS0002S01 before analysis, run Method Spike/Spike Duplicate.

Geotracker EDF ☐
Data Validation Package ☑ Level IV

0.5/6.0 °C

167

TestAmerica
ANALYTICAL TESTING CORPORATION

17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

LABORATORY REPORT

Prepared For: MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project: SSFL Group 8 - DOE
1891264

Sampled: 02/20/07
Received: 03/20/07
Issued: 03/28/07 15:16

NELAP #01108CA California ELAP#1197 CSDLAC #10256

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

LABORATORY ID	CLIENT ID	MATRIX
IQC2077-01	L0BS0006S01	Soil
IQC2077-02	L0BS0007S02	Soil

Reviewed By:

TestAmerica - Irvine, CA
Michele Chamberlin
Project Manager

TestAmerica
ANALYTICAL TESTING CORPORATION
17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQC2077

Sampled: 02/20/07
Received: 03/20/07

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7C20108 Extracted: 03/20/07											
Blank Analyzed: 03/20/2007 (7C20108-BLK1)											
Aluminum	ND	10	5.0	mg/kg wet							
LCS Analyzed: 03/20/2007 (7C20108-BS1)											
Aluminum	50.3	10	5.0	mg/kg wet	50.0		101	80-120			
Matrix Spike Analyzed: 03/20/2007 (7C20108-MS1)						**Source: IQC2099-01**					
Aluminum	12900	10	5.0	mg/kg wet	50.0	12000	1800	75-125			*MHA*
Matrix Spike Dup Analyzed: 03/20/2007 (7C20108-MSD1)						**Source: IQC2099-01**					
Aluminum	13000	10	5.0	mg/kg wet	50.0	12000	2000	75-125	1	20	*MHA*
Batch: 7C20121 Extracted: 03/20/07											
Blank Analyzed: 03/21/2007 (7C20121-BLK1)											
Arsenic	ND	0.50	0.25	mg/kg wet							
LCS Analyzed: 03/21/2007 (7C20121-BS1)											
Arsenic	44.9	0.50	0.25	mg/kg wet	50.0		90	80-120			
Matrix Spike Analyzed: 03/21/2007 (7C20121-MS1)						**Source: IQC2079-07**					
Arsenic	49.4	0.59	0.29	mg/kg dry	58.8	4.2	77	75-125			
Matrix Spike Dup Analyzed: 03/21/2007 (7C20121-MSD1)						**Source: IQC2079-07**					
Arsenic	49.4	0.59	0.29	mg/kg dry	58.8	4.2	77	75-125	0	20	

TestAmerica - Irvine, CA
Michele Chamberlin
Project Manager

TestAmerica
ANALYTICAL TESTING CORPORATION
17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQC2077

Sampled: 02/20/07
Received: 03/20/07

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B26122 Extracted: 02/26/07											
Blank Analyzed: 02/27/2007 (7B26122-BLK1)											
Percent Solids	ND	0.10	0.10	%							
Duplicate Analyzed: 02/27/2007 (7B26122-DUP1)						**Source: IQB2309-04**					
Percent Solids	86.4	0.10	0.10	%		86			1	20	
Batch: 7C20148 Extracted: 03/20/07											
Blank Analyzed: 03/20/2007 (7C20148-BLK1)											
Percent Solids	ND	0.10	0.10	%							
Duplicate Analyzed: 03/20/2007 (7C20148-DUP1)						**Source: IQC2184-01**					
Percent Solids	4.70	0.10	0.10	%		4.7			0	20	

TestAmerica - Irvine, CA
Michele Chamberlin
Project Manager

TestAmerica
ANALYTICAL TESTING CORPORATION
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MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQC2077

Sampled: 02/20/07
Received: 03/20/07

DATA QUALIFIERS AND DEFINITIONS

MHA Due to high levels of analyte in the sample, the MS/MSD calculation does not provide useful spike recovery information. See Blank Spike (LCS).

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

RPD Relative Percent Difference

TestAmerica - Irvine, CA
Michele Chamberlin
Project Manager

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MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQC2077

Sampled: 02/20/07
Received: 03/20/07

Certification Summary

TestAmerica - Irvine, CA

Method	Matrix	Nelac	California
EPA 160.3 MOD	Soil	N/A	N/A
EPA 6010B	Soil	X	X
EPA 6020	Soil	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for TestAmerica may be obtained by contacting the laboratory or visiting our website at www.testamericainc.com

TestAmerica - Irvine, CA
Michele Chamberlin
Project Manager

Del Mar Analytical

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

IQC 2077

ADDITIONAL ANALYSIS REQUEST FORM

Today's Date: 3-19-07 Del Mar Analytical Project Manager: Michelle Champlin

Request via: ____ telephone ____ chain of custody form ____ fax transmission ____ E-mail ____ other

Client: MWH - San Diego / Boeing Contact: _____

Project: SSPL - Group 8 - DOE

Date Sampled: _____ Date Received: _____

Status: ____ in progress ____ completed ____ received today ____ received yesterday ____ on hold ____ other

SAMPLE NUMBER	SAMPLE DESCRIPTION	ANALYSIS REQUESTED	SPECIAL REQUIREMENTS
IQB2309-01	LOBS 0006 S01	% Solids, Arsenic	report % solids from 7B26122
IQB2309-09	LOBS 0007 S02	% Solids, Aluminum	

Add in new work order

3/20/07
740

TURNAROUND STATUS: _____Same Day _____24hr _____48hr _____3days

_____ 5days _____Standard _____No Rush Charge

Due 3-30

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

IQC 2077

ADDITIONAL ANALYSIS REQUEST FORM

Today's Date: 3-19-07 Del Mar Analytical Project Manager: Michelle Champlin

Request via: ____ telephone ____ chain of custody form ____ fax transmission ____ E-mail ____ other

Client: MWH - San Diego / Boeing Contact: _____

Project: SSPL - Group 8 - DOE

Date Sampled: _____ Date Received: _____

Status: ____ in progress ____ completed ____ received today ____ received yesterday ____ on hold ____ other

SAMPLE NUMBER	SAMPLE DESCRIPTION	ANALYSIS REQUESTED	SPECIAL REQUIREMENTS
IQB2309-01	LOBS 0006 S01	% Solids, Arsenic	report % solids from 7B26122
IQB2309-09	LOBS 0007 S02	% Solids, Aluminum	

Add in new work order

3/20/07
740

TURNAROUND STATUS: _____Same Day _____24hr _____48hr _____3days

_____ 5days _____Standard _____No Rush Charge

Due 3-30

CHAIN OF CUSTODY RECORD

COC #: MWHSV20070220_0C

Page: 1 of 2

Customer Information		Project Information		Project Information	
Site:	SSFL	Client Name:	DOE	Collector:	Shelby Valenzuela
Company:	MWH	Sampling Event:	Group 8 Data Gaps-Soil	Contact #:	
Report to:	Lisa Tucker	Project Number:	1691264	Boeing PM:	
Address:	9444 Farnham Street	Project Manager:	Diane Buchanan		
	Suite 300	PM Phone #:	(626) 568-6697		
	San Diego	Field Contact:			
	CA	Field Contact #:			
	92123	Lab Name:	Test America, Inc.		
Email:	boeingedms@ch2m.com	Lab Contact:	Michele Chamberlin		
	Lisa.Tucker@mwhglobal.com	Lab Address:	17461 Derian Ave, Suite 100		
			Irvine, CA 92606		
		Lab Phone:	(949) 261-1022		

Sample Name	Matrix	Date	Time	No. of Containers	% Solids - Soil	Metals 6010B/6020 Soil Group 8	Metals 7471A Soil Mercury	PCB by SW8082 - Soil	pH by SW9045C - Soil	SVOCs by SW8270C SIM - Soil	TPH by SW8015BM - Soil	VOC 8260B Soil Full	METALS 6020 SOIL ARSENIC						Comments
L0BS0006S01	Soil	2/20/2007	9:40	2	10		10		10				10						Sleeve(2), ADD As
L0BS0001D01	Soil	2/20/2007	10:36	4	10	10	10	EH	10	EH	10								8(4)
L0BS0001S01	Soil	2/20/2007	10:36	2	10	10	10	EH	10	EH	10								8(2)
L0BS0002S01	Soil	2/20/2007	11:20	8	10	10	10	EH	10	EH	10								Homogenize and run MS/MSD. See notes below. 8(8).
L0BS0003S01	Soil	2/20/2007	13:00	2	10	10	10		10										8(2)
L0BS0003S02	Soil	2/20/2007	13:35	2	H	H	H		10										Hold all analyte except for pH. 8(2)
L0BS0007D01	Soil	2/20/2007	14:02	5	10	10	10	EH	10	EH	10	10							Sleeve (2), Encore (3)
L0BS0007S01	Soil	2/20/2007	14:02	5	5	10	10	EH	10	EH	10	5							Sleeve (2), Encore (3)

Instructions/TAT

Legend:
Numerical values for analyses equals to turn around time in days

H - Hold
EH - Extract Hold

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
	2-20-07		02/21/07		2/21/07		02/21/07
Company: MWH	Time: 1550	Company: TESTAMERICA-IRVINE	Time: 1550	Company: TESTAMERICA IRV	Time: 1915	Company: TAI	Time: 1715

Comments: Homogenize all sample sleeves of sample L0BS0002S01 before analysis, run Method Spike/Spike Duplicate.

Geotracker EDF ☐

Data Validation Package ☑ Level IV

163

0.5/0.0°C HE 2-21-07 2125

CHAIN OF CUSTODY RECORD

COC #: MWHSV2C070220_01

Page: 2 of 2

Customer Information		Project Information		Project Information	
Site:	SSFL	Client Name:	DOE	Collector:	Shelby Valenzuela
Company:	MWH	Sampling Event:	Group 8 Data Gaps-Soil	Contact #:	
Report to:	Lisa Tucker	Project Number:	1691264		
Address:	9444 Farnham Street	Project Manager:	Diana Buchanan		
	Suite 300	PM Phone #:	(626) 568-6897		
	San Diego	Field Contact:			
	CA	Field Contact #:			
	92123	Lab Name:	Test America, Inc.		
Email:	bosingedms@ch2m.com	Lab Contact:	Michele Chamberlin		
	Lisa.Tucker@mwhglobal.com	Lab Address:	17461 Derian Ave, Suite 100		
			Irvine, CA 92606		
		Lab Phone:	(949) 261-1022		

Boeing PM:

Requested Analyses

Sample Name	Matrix	Date	Time	No. of Containers	% Solids - Soil	Metals 6010B/6020 Soil Group B	Metals 7471A Soil Mercury	PCB by SW8082 - Soil	pH by SW9045C - Soil	SVOCs by SW8270C SIM - Soil	TPH by SW8015BM - Soil	VOC 8260B Soil Full	METALS 6010B SOIL ALUMINUM							Instructions/TAT
L0BS0007S02	Soil	2/20/2007	14:08	5	H	H	H	EH	10	EH	EH	H	10	emb 3/16/07						Hold all analysis except for pH. 8(2), 8(3) ADDAL
L0BS0004S01	Soil	2/20/2007	14:20	2	10	10	10		10											8(2)
L0BS0007S03	Soil	2/20/2007	14:31	5	H	H	H	EH	10	EH	EH	H								Hold all analysis except for pH. 8(2), 8(3)

Legend:
Numerical values for analyses equate to turn around time in days

H - Hold
EH - Extract. Hold

Comments

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
E/ Sanchez	2/21/07		2/21/07		2/21/07		2/21/07
Company: MWH	Time: 1550	Company: TESTAMERICA-IRV.	Time: 1550	Company: TESTAMERICA-IRV	Time: 1915	Company: TAI	Time: 1915

Comments: Homogenize all sample sleeves of sample L0BS0002S01 before analysis, run Method Spike/Spike Duplicate.

Geotracker EDF ☐

Data Validation Package ☑ Level IV

163

0.5/6.0°C

TestAmerica
ANALYTICAL TESTING CORPORATION

17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

LABORATORY REPORT

Prepared For: MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project: SSFL Group 8 - DOE
1891264

Sampled: 02/20/07
Received: 02/21/07
Issued: 03/21/07 13:48

NELAP #01108CA California ELAP#1197 CSDLAC #10256

CASE NARRATIVE

SAMPLE RECEIPT:	Samples were received intact, at 0°C, on ice and with chain of custody documentation.
HOLDING TIMES:	All samples were analyzed within prescribed holding times and/or in accordance with the TestAmerica Sample Acceptance Policy unless otherwise noted in the report.
PRESERVATION:	Samples requiring preservation were verified prior to sample analysis.
QA/QC CRITERIA:	All analyses met method criteria, except as noted in the report with data qualifiers.
COMMENTS:	Results that fall between the MDL and RL are 'J' flagged.
SUBCONTRACTED:	Refer to the last page for specific subcontract laboratory information included in this report.
ADDITIONAL INFORMATION:	Enclosed are complete final results. The results for Mercury have been added.

LABORATORY ID	CLIENT ID	MATRIX
IQB2309-01	L0BS0006S01	Soil
IQB2309-02	L0BS0001D01	Soil
IQB2309-03	L0BS0001S01	Soil
IQB2309-04	L0BS0002S01	Soil
IQB2309-05	L0BS0003S01	Soil
IQB2309-06	L0BS0003S02	Soil
IQB2309-07	L0BS0007D01	Soil
IQB2309-08	L0BS0007S01	Soil
IQB2309-09	L0BS0007S02	Soil
IQB2309-10	L0BS0004S01	Soil

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Project Manager

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LABORATORY ID	CLIENT ID	MATRIX
IQB2309-11	L0BS0007S03	Soil

Reviewed By:

Nicholas Marz

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SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: L0BS0006S01 (IQB2309-01) - Soil					
EPA 9045C	1	02/20/2007 09:40	02/21/2007 19:15	02/22/2007 12:50	02/22/2007 14:15
Sample ID: L0BS0001D01 (IQB2309-02) - Soil					
EPA 9045C	1	02/20/2007 10:35	02/21/2007 19:15	02/22/2007 12:50	02/22/2007 14:15
Sample ID: L0BS0001S01 (IQB2309-03) - Soil					
EPA 9045C	1	02/20/2007 10:35	02/21/2007 19:15	02/22/2007 12:50	02/22/2007 14:15
Sample ID: L0BS0002S01 (IQB2309-04) - Soil					
EPA 9045C	1	02/20/2007 11:20	02/21/2007 19:15	02/22/2007 17:35	02/22/2007 18:05
Sample ID: L0BS0003S01 (IQB2309-05) - Soil					
EPA 9045C	1	02/20/2007 13:00	02/21/2007 19:15	02/22/2007 12:50	02/22/2007 14:15
Sample ID: L0BS0003S02 (IQB2309-06) - Soil					
EPA 9045C	1	02/20/2007 13:35	02/21/2007 19:15	02/22/2007 12:50	02/22/2007 14:15
Sample ID: L0BS0007D01 (IQB2309-07) - Soil					
EPA 9045C	1	02/20/2007 14:02	02/21/2007 19:15	02/22/2007 12:50	02/22/2007 14:15
Sample ID: L0BS0007S01 (IQB2309-08) - Soil					
EPA 9045C	1	02/20/2007 14:02	02/21/2007 19:15	02/22/2007 12:50	02/22/2007 14:15
Sample ID: L0BS0007S02 (IQB2309-09) - Soil					
EPA 9045C	1	02/20/2007 14:08	02/21/2007 19:15	02/22/2007 12:50	02/22/2007 14:15
Sample ID: L0BS0004S01 (IQB2309-10) - Soil					
EPA 9045C	1	02/20/2007 14:20	02/21/2007 19:15	02/22/2007 12:50	02/22/2007 14:15
Sample ID: L0BS0007S03 (IQB2309-11) - Soil					
EPA 9045C	1	02/20/2007 14:31	02/21/2007 19:15	02/22/2007 12:50	02/22/2007 14:15

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METHOD BLANK/QC DATA

EXTRACTABLE FUEL HYDROCARBONS (CADHS/8015 Modified)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B28113 Extracted: 02/28/07											
Blank Analyzed: 02/28/2007 (7B28113-BLK1)											
EFH (C8 - C30)	ND	5.0	3.5	mg/kg wet							
EFH (C8 - C11)	ND	5.0	3.5	mg/kg wet							
EFH (C12 - C14)	ND	5.0	3.5	mg/kg wet							
EFH (C15 - C20)	ND	5.0	3.5	mg/kg wet							
EFH (C21 - C30)	ND	5.0	3.5	mg/kg wet							
Surrogate: n-Octacosane	*4.56*			*mg/kg wet*	*6.67*		*68*	*40-125*			
LCS Analyzed: 02/28/2007 (7B28113-BS1)											
EFH (C8 - C30)	24.0	5.0	3.5	mg/kg wet	33.3		72	40-115			
Surrogate: n-Octacosane	*4.63*			*mg/kg wet*	*6.67*		*69*	*40-125*			
Matrix Spike Analyzed: 02/28/2007 (7B28113-MS1)						**Source: IQB2309-04**					
EFH (C8 - C30)	29.9	5.8	4.0	mg/kg dry	38.5	4.2	67	40-120			
Surrogate: n-Octacosane	*5.55*			*mg/kg dry*	*7.71*		*72*	*40-125*			
Matrix Spike Dup Analyzed: 02/28/2007 (7B28113-MSD1)						**Source: IQB2309-04**					
EFH (C8 - C30)	29.9	5.8	4.0	mg/kg dry	38.5	4.2	67	40-120	0	30	
Surrogate: n-Octacosane	*5.82*			*mg/kg dry*	*7.71*		*75*	*40-125*			

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METHOD BLANK/QC DATA

VOLATILE ORGANICS by GC/MS (EPA 5035/8260B)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B24028 Extracted: 02/24/07											
Blank Analyzed: 02/24/2007 (7B24028-BLK1)											
Acetone	ND	10	8.0	ug/kg wet							
Benzene	ND	2.0	0.50	ug/kg wet							
Bromobenzene	ND	5.0	0.84	ug/kg wet							
Bromochloromethane	ND	5.0	0.90	ug/kg wet							
Bromodichloromethane	ND	2.0	0.42	ug/kg wet							
Bromoform	ND	5.0	0.80	ug/kg wet							
Bromomethane	ND	5.0	0.92	ug/kg wet							
2-Butanone (MEK)	ND	10	6.0	ug/kg wet							
n-Butylbenzene	ND	5.0	0.72	ug/kg wet							
sec-Butylbenzene	ND	5.0	0.67	ug/kg wet							
tert-Butylbenzene	ND	5.0	0.62	ug/kg wet							
Carbon tetrachloride	ND	5.0	0.50	ug/kg wet							
Chlorobenzene	ND	2.0	0.52	ug/kg wet							
Chloroethane	ND	5.0	1.5	ug/kg wet							
2-Chloroethyl vinyl ether	ND	5.0	3.8	ug/kg wet							
Chloroform	ND	2.0	0.50	ug/kg wet							
Chloromethane	ND	5.0	1.0	ug/kg wet							
2-Chlorotoluene	ND	5.0	0.87	ug/kg wet							
4-Chlorotoluene	ND	5.0	0.74	ug/kg wet							
Dibromochloromethane	ND	2.0	0.56	ug/kg wet							
1,2-Dibromo-3-chloropropane	ND	5.0	1.5	ug/kg wet							
1,2-Dibromoethane (EDB)	ND	2.0	0.80	ug/kg wet							
Dibromomethane	ND	2.0	0.90	ug/kg wet							
1,2-Dichlorobenzene	ND	2.0	0.95	ug/kg wet							
1,3-Dichlorobenzene	ND	2.0	0.84	ug/kg wet							
1,4-Dichlorobenzene	ND	2.0	0.94	ug/kg wet							
Dichlorodifluoromethane	ND	5.0	1.5	ug/kg wet							
1,1-Dichloroethane	ND	2.0	0.50	ug/kg wet							
1,2-Dichloroethane	ND	2.0	0.80	ug/kg wet							
1,1-Dichloroethene	ND	5.0	0.60	ug/kg wet							
cis-1,2-Dichloroethene	ND	2.0	0.83	ug/kg wet							
trans-1,2-Dichloroethene	ND	2.0	0.70	ug/kg wet							
1,2-Dichloropropane	ND	2.0	0.35	ug/kg wet							
1,3-Dichloropropane	ND	2.0	0.63	ug/kg wet							
2,2-Dichloropropane	ND	2.0	0.45	ug/kg wet							

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Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B24028 Extracted: 02/24/07											
Blank Analyzed: 02/24/2007 (7B24028-BLK1)											
1,1-Dichloropropene	ND	2.0	0.40	ug/kg wet							
cis-1,3-Dichloropropene	ND	2.0	0.44	ug/kg wet							
trans-1,3-Dichloropropene	ND	2.0	0.61	ug/kg wet							
Ethylbenzene	ND	2.0	0.50	ug/kg wet							
Hexachlorobutadiene	ND	5.0	0.73	ug/kg wet							
2-Hexanone	ND	10	9.1	ug/kg wet							
Isopropylbenzene	ND	2.0	0.54	ug/kg wet							
p-Isopropyltoluene	ND	2.0	0.72	ug/kg wet							
Methylene chloride	ND	20	6.5	ug/kg wet							
4-Methyl-2-pentanone (MIBK)	ND	5.0	3.2	ug/kg wet							
Methyl-tert-butyl Ether (MTBE)	ND	5.0	1.0	ug/kg wet							
Naphthalene	ND	5.0	1.1	ug/kg wet							
n-Propylbenzene	ND	2.0	0.61	ug/kg wet							
Styrene	ND	2.0	0.58	ug/kg wet							
1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/kg wet							
1,1,2,2-Tetrachloroethane	ND	2.0	0.86	ug/kg wet							
Tetrachloroethene	ND	2.0	0.49	ug/kg wet							
Toluene	ND	2.0	0.50	ug/kg wet							
1,2,3-Trichlorobenzene	ND	5.0	1.0	ug/kg wet							
1,2,4-Trichlorobenzene	ND	5.0	1.0	ug/kg wet							
1,1,1-Trichloroethane	0.940	2.0	0.70	ug/kg wet							*J*
1,1,2-Trichloroethane	ND	2.0	0.87	ug/kg wet							
Trichloroethene	ND	2.0	0.50	ug/kg wet							
Trichlorofluoromethane	ND	5.0	0.54	ug/kg wet							
1,2,3-Trichloropropane	ND	10	1.0	ug/kg wet							
1,2,4-Trimethylbenzene	ND	2.0	0.78	ug/kg wet							
1,3,5-Trimethylbenzene	ND	2.0	0.63	ug/kg wet							
Vinyl chloride	ND	2.0	0.91	ug/kg wet							
o-Xylene	ND	2.0	0.50	ug/kg wet							
m,p-Xylenes	ND	2.0	0.80	ug/kg wet							
Trichlorotrifluoroethane (Freon 113)	ND	5.0	4.0	ug/kg wet							
Surrogate: Dibromofluoromethane	*47.6*			*ug/kg wet*	*50.0*		*95*	*80-125*			
Surrogate: Toluene-d8	*49.7*			*ug/kg wet*	*50.0*		*99*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*49.2*			*ug/kg wet*	*50.0*		*98*	*80-120*			

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Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B24028 Extracted: 02/24/07											
LCS Analyzed: 02/24/2007 (7B24028-BS1)											
Acetone	86.6	10	8.0	ug/kg wet	50.0		173	25-145			*L*
Benzene	50.4	2.0	0.50	ug/kg wet	50.0		101	65-120			
Bromobenzene	52.6	5.0	0.84	ug/kg wet	50.0		105	75-120			
Bromochloromethane	49.3	5.0	0.90	ug/kg wet	50.0		99	70-135			
Bromodichloromethane	51.4	2.0	0.42	ug/kg wet	50.0		103	70-135			
Bromoform	40.9	5.0	0.80	ug/kg wet	50.0		82	55-135			
Bromomethane	48.7	5.0	0.92	ug/kg wet	50.0		97	60-145			
2-Butanone (MEK)	69.2	10	6.0	ug/kg wet	50.0		138	40-145			
n-Butylbenzene	57.8	5.0	0.72	ug/kg wet	50.0		116	70-130			
sec-Butylbenzene	55.3	5.0	0.67	ug/kg wet	50.0		111	70-125			
tert-Butylbenzene	54.7	5.0	0.62	ug/kg wet	50.0		109	70-125			
Carbon tetrachloride	53.1	5.0	0.50	ug/kg wet	50.0		106	65-140			
Chlorobenzene	52.9	2.0	0.52	ug/kg wet	50.0		106	75-120			
Chloroethane	53.5	5.0	1.5	ug/kg wet	50.0		107	60-140			
2-Chloroethyl vinyl ether	32.4	5.0	3.8	ug/kg wet	50.0		65	25-170			
Chloroform	48.4	2.0	0.50	ug/kg wet	50.0		97	70-130			
Chloromethane	66.7	5.0	1.0	ug/kg wet	50.0		133	45-145			
2-Chlorotoluene	53.6	5.0	0.87	ug/kg wet	50.0		107	70-125			
4-Chlorotoluene	54.2	5.0	0.74	ug/kg wet	50.0		108	75-125			
Dibromochloromethane	53.7	2.0	0.56	ug/kg wet	50.0		107	65-140			
1,2-Dibromo-3-chloropropane	45.3	5.0	1.5	ug/kg wet	50.0		91	50-135			
1,2-Dibromoethane (EDB)	52.3	2.0	0.80	ug/kg wet	50.0		105	70-130			
Dibromomethane	52.4	2.0	0.90	ug/kg wet	50.0		105	70-130			
1,2-Dichlorobenzene	53.4	2.0	0.95	ug/kg wet	50.0		107	75-120			
1,3-Dichlorobenzene	54.2	2.0	0.84	ug/kg wet	50.0		108	75-125			
1,4-Dichlorobenzene	53.3	2.0	0.94	ug/kg wet	50.0		107	75-120			
Dichlorodifluoromethane	63.0	5.0	1.5	ug/kg wet	50.0		126	35-160			
1,1-Dichloroethane	47.8	2.0	0.50	ug/kg wet	50.0		96	70-130			
1,2-Dichloroethane	52.4	2.0	0.80	ug/kg wet	50.0		105	60-140			
1,1-Dichloroethene	47.6	5.0	0.60	ug/kg wet	50.0		95	70-125			
cis-1,2-Dichloroethene	48.4	2.0	0.83	ug/kg wet	50.0		97	70-125			
trans-1,2-Dichloroethene	49.7	2.0	0.70	ug/kg wet	50.0		99	70-125			
1,2-Dichloropropane	51.8	2.0	0.35	ug/kg wet	50.0		104	70-130			
1,3-Dichloropropane	53.8	2.0	0.63	ug/kg wet	50.0		108	70-125			
2,2-Dichloropropane	54.7	2.0	0.45	ug/kg wet	50.0		109	60-145			

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METHOD BLANK/QC DATA

VOLATILE ORGANICS by GC/MS (EPA 5035/8260B)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B24028 Extracted: 02/24/07											
LCS Analyzed: 02/24/2007 (7B24028-BS1)											
1,1-Dichloropropene	53.1	2.0	0.40	ug/kg wet	50.0		106	70-130			
cis-1,3-Dichloropropene	47.5	2.0	0.44	ug/kg wet	50.0		95	75-125			
trans-1,3-Dichloropropene	47.6	2.0	0.61	ug/kg wet	50.0		95	70-135			
Ethylbenzene	55.6	2.0	0.50	ug/kg wet	50.0		111	70-125			
Hexachlorobutadiene	54.6	5.0	0.73	ug/kg wet	50.0		109	60-135			
2-Hexanone	66.8	10	9.1	ug/kg wet	50.0		134	40-150			
Isopropylbenzene	61.9	2.0	0.54	ug/kg wet	50.0		124	75-130			
p-Isopropyltoluene	56.7	2.0	0.72	ug/kg wet	50.0		113	75-125			
Methylene chloride	42.1	20	6.5	ug/kg wet	50.0		84	55-135			
4-Methyl-2-pentanone (MIBK)	52.2	5.0	3.2	ug/kg wet	50.0		104	40-145			
Methyl-tert-butyl Ether (MTBE)	49.3	5.0	1.0	ug/kg wet	50.0		99	60-140			
Naphthalene	52.7	5.0	1.1	ug/kg wet	50.0		105	55-135			
n-Propylbenzene	57.5	2.0	0.61	ug/kg wet	50.0		115	70-130			
Styrene	55.0	2.0	0.58	ug/kg wet	50.0		110	75-130			
1,1,1,2-Tetrachloroethane	54.4	5.0	0.57	ug/kg wet	50.0		109	70-130			
1,1,2,2-Tetrachloroethane	55.6	2.0	0.86	ug/kg wet	50.0		111	55-140			
Tetrachloroethene	50.5	2.0	0.49	ug/kg wet	50.0		101	70-125			
Toluene	52.2	2.0	0.50	ug/kg wet	50.0		104	70-125			
1,2,3-Trichlorobenzene	52.7	5.0	1.0	ug/kg wet	50.0		105	60-130			
1,2,4-Trichlorobenzene	52.5	5.0	1.0	ug/kg wet	50.0		105	70-135			
1,1,1-Trichloroethane	51.3	2.0	0.70	ug/kg wet	50.0		103	65-135			
1,1,2-Trichloroethane	52.2	2.0	0.87	ug/kg wet	50.0		104	65-135			
Trichloroethene	52.4	2.0	0.50	ug/kg wet	50.0		105	70-125			
Trichlorofluoromethane	55.3	5.0	0.54	ug/kg wet	50.0		111	60-145			
1,2,3-Trichloropropane	44.2	10	1.0	ug/kg wet	50.0		88	60-135			
1,2,4-Trimethylbenzene	54.6	2.0	0.78	ug/kg wet	50.0		109	70-125			
1,3,5-Trimethylbenzene	56.5	2.0	0.63	ug/kg wet	50.0		113	70-125			
Vinyl chloride	55.8	2.0	0.91	ug/kg wet	50.0		112	55-135			
o-Xylene	54.6	2.0	0.50	ug/kg wet	50.0		109	70-125			
m,p-Xylenes	112	2.0	0.80	ug/kg wet	100		112	70-125			
Surrogate: Dibromofluoromethane	*48.1*			*ug/kg wet*	*50.0*		*96*	*80-125*			
Surrogate: Toluene-d8	*50.4*			*ug/kg wet*	*50.0*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*52.6*			*ug/kg wet*	*50.0*		*105*	*80-120*			

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Sampled: 02/20/07
Received: 02/21/07

METHOD BLANK/QC DATA

VOLATILE ORGANICS by GC/MS (EPA 5035/8260B)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B24028 Extracted: 02/24/07											
Matrix Spike Analyzed: 02/24/2007 (7B24028-MS1)						**Source: IQB2400-20**					
Acetone	67.8	7.6	6.0	ug/kg wet	37.8	ND	179	20-145			*M7*
Benzene	36.3	1.5	0.38	ug/kg wet	37.8	ND	96	65-130			
Bromobenzene	37.0	3.8	0.63	ug/kg wet	37.8	ND	98	65-140			
Bromochloromethane	34.7	3.8	0.68	ug/kg wet	37.8	ND	92	65-145			
Bromodichloromethane	35.7	1.5	0.32	ug/kg wet	37.8	ND	94	65-145			
Bromoform	28.8	3.8	0.60	ug/kg wet	37.8	ND	76	50-145			
Bromomethane	33.8	3.8	0.69	ug/kg wet	37.8	ND	89	60-155			
2-Butanone (MEK)	51.6	7.6	4.5	ug/kg wet	37.8	ND	137	25-170			
n-Butylbenzene	41.7	3.8	0.54	ug/kg wet	37.8	ND	110	55-145			
sec-Butylbenzene	40.6	3.8	0.51	ug/kg wet	37.8	ND	107	60-135			
tert-Butylbenzene	40.1	3.8	0.47	ug/kg wet	37.8	ND	106	60-140			
Carbon tetrachloride	38.4	3.8	0.38	ug/kg wet	37.8	ND	102	60-145			
Chlorobenzene	37.8	1.5	0.39	ug/kg wet	37.8	ND	100	70-130			
Chloroethane	38.1	3.8	1.1	ug/kg wet	37.8	ND	101	60-150			
2-Chloroethyl vinyl ether	23.2	3.8	2.9	ug/kg wet	37.8	ND	61	25-170			
Chloroform	33.9	1.5	0.38	ug/kg wet	37.8	ND	90	65-135			
Chloromethane	49.1	3.8	0.76	ug/kg wet	37.8	ND	130	40-145			
2-Chlorotoluene	39.4	3.8	0.66	ug/kg wet	37.8	ND	104	60-135			
4-Chlorotoluene	39.5	3.8	0.56	ug/kg wet	37.8	ND	104	65-135			
Dibromochloromethane	38.0	1.5	0.42	ug/kg wet	37.8	ND	101	60-145			
1,2-Dibromo-3-chloropropane	33.3	3.8	1.1	ug/kg wet	37.8	ND	88	40-150			
1,2-Dibromoethane (EDB)	36.7	1.5	0.60	ug/kg wet	37.8	ND	97	65-140			
Dibromomethane	36.1	1.5	0.68	ug/kg wet	37.8	ND	96	65-140			
1,2-Dichlorobenzene	37.9	1.5	0.72	ug/kg wet	37.8	ND	100	70-130			
1,3-Dichlorobenzene	38.8	1.5	0.63	ug/kg wet	37.8	ND	103	70-130			
1,4-Dichlorobenzene	38.4	1.5	0.71	ug/kg wet	37.8	ND	102	70-130			
Dichlorodifluoromethane	47.1	3.8	1.1	ug/kg wet	37.8	ND	125	30-160			
1,1-Dichloroethane	34.3	1.5	0.38	ug/kg wet	37.8	ND	91	65-135			
1,2-Dichloroethane	35.8	1.5	0.60	ug/kg wet	37.8	ND	95	60-150			
1,1-Dichloroethene	35.9	3.8	0.45	ug/kg wet	37.8	ND	95	65-135			
cis-1,2-Dichloroethene	34.4	1.5	0.63	ug/kg wet	37.8	ND	91	65-135			
trans-1,2-Dichloroethene	35.9	1.5	0.53	ug/kg wet	37.8	ND	95	70-135			
1,2-Dichloropropane	36.3	1.5	0.26	ug/kg wet	37.8	ND	96	65-130			
1,3-Dichloropropane	38.0	1.5	0.48	ug/kg wet	37.8	ND	101	65-140			
2,2-Dichloropropane	39.8	1.5	0.34	ug/kg wet	37.8	ND	105	65-150			

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Project ID: SSFL Group 8 - DOE 1891264
Report Number: IQB2309

Sampled: 02/20/07
Received: 02/21/07

METHOD BLANK/QC DATA

VOLATILE ORGANICS by GC/MS (EPA 5035/8260B)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B24028 Extracted: 02/24/07											
Matrix Spike Analyzed: 02/24/2007 (7B24028-MS1)						**Source: IQB2400-20**					
1,1-Dichloropropene	39.0	1.5	0.30	ug/kg wet	37.8	ND	103	65-135			
cis-1,3-Dichloropropene	32.7	1.5	0.33	ug/kg wet	37.8	ND	87	70-135			
trans-1,3-Dichloropropene	33.2	1.5	0.46	ug/kg wet	37.8	ND	88	60-145			
Ethylbenzene	40.5	1.5	0.38	ug/kg wet	37.8	ND	107	70-135			
Hexachlorobutadiene	35.5	3.8	0.55	ug/kg wet	37.8	ND	94	50-145			
2-Hexanone	50.0	7.6	6.9	ug/kg wet	37.8	ND	132	35-160			
Isopropylbenzene	46.0	1.5	0.41	ug/kg wet	37.8	ND	122	70-145			
p-Isopropyltoluene	41.5	1.5	0.54	ug/kg wet	37.8	ND	110	60-140			
Methylene chloride	28.9	15	4.9	ug/kg wet	37.8	ND	76	55-145			
4-Methyl-2-pentanone (MIBK)	37.9	3.8	2.4	ug/kg wet	37.8	ND	100	40-155			
Methyl-tert-butyl Ether (MTBE)	34.4	3.8	0.76	ug/kg wet	37.8	ND	91	55-155			
Naphthalene	37.3	3.8	0.83	ug/kg wet	37.8	ND	99	40-150			
n-Propylbenzene	42.5	1.5	0.46	ug/kg wet	37.8	ND	112	65-140			
Styrene	39.0	1.5	0.44	ug/kg wet	37.8	ND	103	70-140			
1,1,1,2-Tetrachloroethane	38.3	3.8	0.43	ug/kg wet	37.8	ND	101	65-145			
1,1,2,2-Tetrachloroethane	40.0	1.5	0.65	ug/kg wet	37.8	ND	106	40-160			
Tetrachloroethene	37.2	1.5	0.37	ug/kg wet	37.8	ND	98	65-135			
Toluene	37.7	1.5	0.38	ug/kg wet	37.8	ND	100	70-130			
1,2,3-Trichlorobenzene	35.7	3.8	0.76	ug/kg wet	37.8	ND	94	45-145			
1,2,4-Trichlorobenzene	37.5	3.8	0.76	ug/kg wet	37.8	ND	99	50-140			
1,1,1-Trichloroethane	37.1	1.5	0.53	ug/kg wet	37.8	0.57	97	65-145			
1,1,2-Trichloroethane	36.3	1.5	0.66	ug/kg wet	37.8	ND	96	65-140			
Trichloroethene	38.1	1.5	0.38	ug/kg wet	37.8	ND	101	65-140			
Trichlorofluoromethane	41.0	3.8	0.41	ug/kg wet	37.8	ND	108	55-155			
1,2,3-Trichloropropane	32.1	7.6	0.76	ug/kg wet	37.8	ND	85	50-150			
1,2,4-Trimethylbenzene	40.1	1.5	0.59	ug/kg wet	37.8	ND	106	65-140			
1,3,5-Trimethylbenzene	41.1	1.5	0.48	ug/kg wet	37.8	ND	109	65-135			
Vinyl chloride	42.3	1.5	0.69	ug/kg wet	37.8	ND	112	55-140			
o-Xylene	39.6	1.5	0.38	ug/kg wet	37.8	ND	105	65-130			
m,p-Xylenes	81.8	1.5	0.60	ug/kg wet	75.5	ND	108	70-130			
Surrogate: Dibromofluoromethane	*35.5*			*ug/kg wet*	*37.8*		*94*	*80-125*			
Surrogate: Toluene-d8	*38.0*			*ug/kg wet*	*37.8*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*39.7*			*ug/kg wet*	*37.8*		*105*	*80-120*			

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Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQB2309

Sampled: 02/20/07
Received: 02/21/07

METHOD BLANK/QC DATA

VOLATILE ORGANICS by GC/MS (EPA 5035/8260B)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B24028 Extracted: 02/24/07											
Matrix Spike Dup Analyzed: 02/24/2007 (7B24028-MSD1)						**Source: IQB2400-20**					
Acetone	68.4	8.4	6.7	ug/kg wet	41.9	ND	163	20-145	1	40	*M7*
Benzene	40.7	1.7	0.42	ug/kg wet	41.9	ND	97	65-130	11	20	
Bromobenzene	42.0	4.2	0.70	ug/kg wet	41.9	ND	100	65-140	13	25	
Bromochloromethane	39.1	4.2	0.76	ug/kg wet	41.9	ND	93	65-145	12	25	
Bromodichloromethane	40.8	1.7	0.35	ug/kg wet	41.9	ND	97	65-145	13	20	
Bromoform	30.0	4.2	0.67	ug/kg wet	41.9	ND	72	50-145	4	30	
Bromomethane	41.2	4.2	0.77	ug/kg wet	41.9	ND	98	60-155	20	25	
2-Butanone (MEK)	50.9	8.4	5.0	ug/kg wet	41.9	ND	121	25-170	1	40	
n-Butylbenzene	45.6	4.2	0.60	ug/kg wet	41.9	ND	109	55-145	9	30	
sec-Butylbenzene	44.5	4.2	0.56	ug/kg wet	41.9	ND	106	60-135	9	25	
tert-Butylbenzene	44.0	4.2	0.52	ug/kg wet	41.9	ND	105	60-140	9	25	
Carbon tetrachloride	43.1	4.2	0.42	ug/kg wet	41.9	ND	103	60-145	12	25	
Chlorobenzene	42.3	1.7	0.44	ug/kg wet	41.9	ND	101	70-130	11	25	
Chloroethane	43.7	4.2	1.3	ug/kg wet	41.9	ND	104	60-150	14	25	
2-Chloroethyl vinyl ether	23.9	4.2	3.2	ug/kg wet	41.9	ND	57	25-170	3	30	
Chloroform	39.0	1.7	0.42	ug/kg wet	41.9	ND	93	65-135	14	20	
Chloromethane	53.4	4.2	0.84	ug/kg wet	41.9	ND	127	40-145	8	25	
2-Chlorotoluene	43.5	4.2	0.73	ug/kg wet	41.9	ND	104	60-135	10	25	
4-Chlorotoluene	43.8	4.2	0.62	ug/kg wet	41.9	ND	105	65-135	10	25	
Dibromochloromethane	41.6	1.7	0.47	ug/kg wet	41.9	ND	99	60-145	9	25	
1,2-Dibromo-3-chloropropane	33.7	4.2	1.3	ug/kg wet	41.9	ND	80	40-150	1	30	
1,2-Dibromoethane (EDB)	39.9	1.7	0.67	ug/kg wet	41.9	ND	95	65-140	8	25	
Dibromomethane	40.3	1.7	0.76	ug/kg wet	41.9	ND	96	65-140	11	25	
1,2-Dichlorobenzene	42.3	1.7	0.80	ug/kg wet	41.9	ND	101	70-130	11	25	
1,3-Dichlorobenzene	43.5	1.7	0.70	ug/kg wet	41.9	ND	104	70-130	11	25	
1,4-Dichlorobenzene	42.8	1.7	0.79	ug/kg wet	41.9	ND	102	70-130	11	25	
Dichlorodifluoromethane	51.6	4.2	1.3	ug/kg wet	41.9	ND	123	30-160	9	35	
1,1-Dichloroethane	38.9	1.7	0.42	ug/kg wet	41.9	ND	93	65-135	13	25	
1,2-Dichloroethane	40.3	1.7	0.67	ug/kg wet	41.9	ND	96	60-150	12	25	
1,1-Dichloroethene	39.7	4.2	0.50	ug/kg wet	41.9	ND	95	65-135	10	25	
cis-1,2-Dichloroethene	39.2	1.7	0.70	ug/kg wet	41.9	ND	94	65-135	13	25	
trans-1,2-Dichloroethene	40.8	1.7	0.59	ug/kg wet	41.9	ND	97	70-135	13	25	
1,2-Dichloropropane	41.8	1.7	0.29	ug/kg wet	41.9	ND	100	65-130	14	20	
1,3-Dichloropropane	41.6	1.7	0.53	ug/kg wet	41.9	ND	99	65-140	9	25	
2,2-Dichloropropane	44.5	1.7	0.38	ug/kg wet	41.9	ND	106	65-150	11	25	

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Project ID: SSFL Group 8 - DOE 1891264
Report Number: IQB2309

Sampled: 02/20/07
Received: 02/21/07

METHOD BLANK/QC DATA

VOLATILE ORGANICS by GC/MS (EPA 5035/8260B)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B24028 Extracted: 02/24/07											
Matrix Spike Dup Analyzed: 02/24/2007 (7B24028-MSD1)						**Source: IQB2400-20**					
1,1-Dichloropropene	43.2	1.7	0.34	ug/kg wet	41.9	ND	103	65-135	10	20	
cis-1,3-Dichloropropene	37.2	1.7	0.37	ug/kg wet	41.9	ND	89	70-135	13	25	
trans-1,3-Dichloropropene	37.2	1.7	0.51	ug/kg wet	41.9	ND	89	60-145	11	25	
Ethylbenzene	44.7	1.7	0.42	ug/kg wet	41.9	ND	107	70-135	10	25	
Hexachlorobutadiene	38.4	4.2	0.61	ug/kg wet	41.9	ND	92	50-145	8	35	
2-Hexanone	51.1	8.4	7.6	ug/kg wet	41.9	ND	122	35-160	2	40	
Isopropylbenzene	50.5	1.7	0.45	ug/kg wet	41.9	ND	121	70-145	9	25	
p-Isopropyltoluene	45.9	1.7	0.60	ug/kg wet	41.9	ND	110	60-140	10	25	
Methylene chloride	33.6	17	5.5	ug/kg wet	41.9	ND	80	55-145	15	25	
4-Methyl-2-pentanone (MIBK)	39.5	4.2	2.7	ug/kg wet	41.9	ND	94	40-155	4	40	
Methyl-tert-butyl Ether (MTBE)	38.5	4.2	0.84	ug/kg wet	41.9	ND	92	55-155	11	35	
Naphthalene	39.1	4.2	0.92	ug/kg wet	41.9	ND	93	40-150	5	40	
n-Propylbenzene	46.7	1.7	0.51	ug/kg wet	41.9	ND	111	65-140	9	25	
Styrene	43.8	1.7	0.49	ug/kg wet	41.9	ND	105	70-140	12	25	
1,1,1,2-Tetrachloroethane	43.1	4.2	0.48	ug/kg wet	41.9	ND	103	65-145	12	20	
1,1,2,2-Tetrachloroethane	41.3	1.7	0.72	ug/kg wet	41.9	ND	99	40-160	3	30	
Tetrachloroethene	41.7	1.7	0.41	ug/kg wet	41.9	ND	100	65-135	11	25	
Toluene	42.6	1.7	0.42	ug/kg wet	41.9	ND	102	70-130	12	20	
1,2,3-Trichlorobenzene	38.9	4.2	0.84	ug/kg wet	41.9	ND	93	45-145	9	30	
1,2,4-Trichlorobenzene	41.5	4.2	0.84	ug/kg wet	41.9	ND	99	50-140	10	30	
1,1,1-Trichloroethane	42.1	1.7	0.59	ug/kg wet	41.9	0.57	99	65-145	13	20	
1,1,2-Trichloroethane	40.4	1.7	0.73	ug/kg wet	41.9	ND	96	65-140	11	30	
Trichloroethene	43.3	1.7	0.42	ug/kg wet	41.9	ND	103	65-140	13	25	
Trichlorofluoromethane	45.2	4.2	0.45	ug/kg wet	41.9	ND	108	55-155	10	25	
1,2,3-Trichloropropane	33.3	8.4	0.84	ug/kg wet	41.9	ND	79	50-150	4	30	
1,2,4-Trimethylbenzene	44.3	1.7	0.65	ug/kg wet	41.9	ND	106	65-140	10	25	
1,3,5-Trimethylbenzene	45.9	1.7	0.53	ug/kg wet	41.9	ND	110	65-135	11	25	
Vinyl chloride	47.4	1.7	0.76	ug/kg wet	41.9	ND	113	55-140	11	30	
o-Xylene	43.4	1.7	0.42	ug/kg wet	41.9	ND	104	65-130	9	25	
m,p-Xylenes	91.2	1.7	0.67	ug/kg wet	83.9	ND	109	70-130	11	25	
Surrogate: Dibromofluoromethane	*40.1*			*ug/kg wet*	*41.9*		*96*	*80-125*			
Surrogate: Toluene-d8	*42.5*			*ug/kg wet*	*41.9*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*43.9*			*ug/kg wet*	*41.9*		*105*	*80-120*			

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METHOD BLANK/QC DATA

PURGEABLES BY GC/MS, TENTATIVELY IDENTIFIED COMPOUNDS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B24028 Extracted: 02/24/07											
Blank Analyzed: 02/24/2007 (7B24028-BLK1)											
2-Chloro-1,1,1-trifluoroethane	ND	10	N/A	ug/kg wet							
Chlorotrifluoroethene	ND	10	N/A	ug/kg wet							

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METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B22114 Extracted: 02/22/07											
Blank Analyzed: 02/22/2007 (7B22114-BLK1)											
Antimony	ND	1.0	0.030	mg/kg wet							
Arsenic	ND	0.50	0.25	mg/kg wet							
Barium	ND	0.50	0.080	mg/kg wet							
Beryllium	ND	0.30	0.040	mg/kg wet							
Cadmium	ND	0.50	0.025	mg/kg wet							
Chromium	ND	1.0	0.35	mg/kg wet							
Cobalt	ND	0.50	0.080	mg/kg wet							
Copper	ND	1.0	0.20	mg/kg wet							
Lead	ND	0.50	0.050	mg/kg wet							
Molybdenum	ND	1.0	0.10	mg/kg wet							
Nickel	ND	1.0	0.45	mg/kg wet							
Selenium	ND	1.0	0.20	mg/kg wet							
Silver	ND	0.50	0.050	mg/kg wet							
Thallium	ND	0.50	0.10	mg/kg wet							
Vanadium	ND	1.0	0.40	mg/kg wet							
Zinc	ND	10	1.3	mg/kg wet							
LCS Analyzed: 02/22/2007 (7B22114-BS1)											
Antimony	42.6	1.0	0.030	mg/kg wet	50.0		85	80-120			
Arsenic	42.2	0.50	0.25	mg/kg wet	50.0		84	80-120			
Barium	43.1	0.50	0.080	mg/kg wet	50.0		86	80-120			
Beryllium	44.9	0.30	0.040	mg/kg wet	50.0		90	80-120			
Cadmium	43.1	0.50	0.025	mg/kg wet	50.0		86	80-120			
Chromium	43.4	1.0	0.35	mg/kg wet	50.0		87	80-120			
Cobalt	43.6	0.50	0.080	mg/kg wet	50.0		87	80-120			
Copper	45.0	1.0	0.20	mg/kg wet	50.0		90	80-120			
Lead	42.3	0.50	0.050	mg/kg wet	50.0		85	80-120			
Molybdenum	42.3	1.0	0.10	mg/kg wet	50.0		85	80-120			
Nickel	43.6	1.0	0.45	mg/kg wet	50.0		87	80-120			
Selenium	41.0	1.0	0.20	mg/kg wet	50.0		82	80-120			
Silver	22.4	0.50	0.050	mg/kg wet	25.0		90	80-120			
Thallium	42.9	0.50	0.10	mg/kg wet	50.0		86	80-120			
Vanadium	42.6	1.0	0.40	mg/kg wet	50.0		85	80-120			
Zinc	43.7	10	1.3	mg/kg wet	50.0		87	80-120			

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TestAmerica
ANALYTICAL TESTING CORPORATION
17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQB2309

Sampled: 02/20/07
Received: 02/21/07

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B22114 Extracted: 02/22/07											
Matrix Spike Analyzed: 02/22/2007 (7B22114-MS1)						**Source: IQB2309-02**					
Antimony	12.5	1.1	0.032	mg/kg dry	53.6	0.086	23	75-125			*M2*
Arsenic	40.4	0.54	0.27	mg/kg dry	53.6	1.9	72	75-125			*M2*
Barium	113	0.54	0.086	mg/kg dry	53.6	83	56	75-125			*M2*
Beryllium	41.3	0.32	0.043	mg/kg dry	53.6	0.53	76	75-125			
Cadmium	39.0	0.54	0.027	mg/kg dry	53.6	0.12	73	75-125			*M2*
Chromium	54.8	1.1	0.38	mg/kg dry	53.6	14	76	75-125			
Cobalt	45.3	0.54	0.086	mg/kg dry	53.6	5.3	75	75-125			
Copper	46.5	1.1	0.21	mg/kg dry	53.6	9.8	68	75-125			*M2*
Lead	48.2	0.54	0.054	mg/kg dry	53.6	6.6	78	75-125			
Molybdenum	38.1	1.1	0.11	mg/kg dry	53.6	0.33	70	75-125			*M2*
Nickel	48.4	1.1	0.48	mg/kg dry	53.6	9.3	73	75-125			*M2*
Selenium	37.4	1.1	0.21	mg/kg dry	53.6	ND	70	75-125			*M2*
Silver	20.1	0.54	0.054	mg/kg dry	26.8	0.064	75	75-125			
Thallium	43.6	0.54	0.11	mg/kg dry	53.6	0.23	81	75-125			
Vanadium	67.4	1.1	0.43	mg/kg dry	53.6	27	75	75-125			
Zinc	75.6	11	1.4	mg/kg dry	53.6	41	65	75-125			*M2*
Matrix Spike Dup Analyzed: 02/22/2007 (7B22114-MSD1)						**Source: IQB2309-02**					
Antimony	12.8	1.1	0.032	mg/kg dry	53.6	0.086	24	75-125	2	20	*M2*
Arsenic	42.5	0.54	0.27	mg/kg dry	53.6	1.9	76	75-125	5	20	
Barium	124	0.54	0.086	mg/kg dry	53.6	83	76	75-125	9	20	
Beryllium	43.3	0.32	0.043	mg/kg dry	53.6	0.53	80	75-125	5	20	
Cadmium	41.3	0.54	0.027	mg/kg dry	53.6	0.12	77	75-125	6	20	
Chromium	57.7	1.1	0.38	mg/kg dry	53.6	14	82	75-125	5	20	
Cobalt	47.9	0.54	0.086	mg/kg dry	53.6	5.3	79	75-125	6	20	
Copper	49.2	1.1	0.21	mg/kg dry	53.6	9.8	74	75-125	6	20	*M2*
Lead	52.4	0.54	0.054	mg/kg dry	53.6	6.6	85	75-125	8	20	
Molybdenum	40.6	1.1	0.11	mg/kg dry	53.6	0.33	75	75-125	6	20	
Nickel	51.9	1.1	0.48	mg/kg dry	53.6	9.3	79	75-125	7	20	
Selenium	39.4	1.1	0.21	mg/kg dry	53.6	ND	74	75-125	5	20	*M2*
Silver	21.0	0.54	0.054	mg/kg dry	26.8	0.064	78	75-125	4	20	
Thallium	46.5	0.54	0.11	mg/kg dry	53.6	0.23	86	75-125	6	20	
Vanadium	70.6	1.1	0.43	mg/kg dry	53.6	27	81	75-125	5	20	
Zinc	81.5	11	1.4	mg/kg dry	53.6	41	76	75-125	8	20	

TestAmerica - Irvine, CA
Nicholas Marz For Michele Chamberlin
Project Manager

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MWH-San Diego/Boeing
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE 1891264
Report Number: IQB2309

Sampled: 02/20/07
Received: 02/21/07

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B22115 Extracted: 02/22/07											
Blank Analyzed: 02/23/2007 (7B22115-BLK1)											
Aluminum	ND	10	5.0	mg/kg wet							
Boron	ND	5.0	1.0	mg/kg wet							
Lithium	ND	6.3	3.8	mg/kg wet							
Potassium	ND	50	19	mg/kg wet							
Sodium	ND	50	24	mg/kg wet							
Zirconium	ND	25	1.5	mg/kg wet							
LCS Analyzed: 02/23/2007 (7B22115-BS1)											
Aluminum	45.3	10	5.0	mg/kg wet	50.0		91	80-120			
Boron	47.3	5.0	1.0	mg/kg wet	50.0		95	80-120			
Lithium	48.4	6.3	3.8	mg/kg wet	50.0		97	80-120			
Potassium	516	50	19	mg/kg wet	500		103	80-120			
Sodium	496	50	24	mg/kg wet	500		99	80-120			
Zirconium	52.4	25	1.5	mg/kg wet	50.0		105	80-120			
Matrix Spike Analyzed: 02/23/2007 (7B22115-MS1)						**Source: IQB2309-02**					
Aluminum	17000	11	5.4	mg/kg dry	53.6	14000	5597	75-125			*MHA*
Boron	45.6	5.4	1.1	mg/kg dry	53.6	1.1	83	75-125			
Lithium	64.1	6.8	4.1	mg/kg dry	53.6	17	88	75-125			
Potassium	3350	54	20	mg/kg dry	536	2900	84	75-125			*MHA*
Sodium	606	54	26	mg/kg dry	536	84	97	75-125			
Zirconium	42.9	27	1.6	mg/kg dry	53.6	2.6	75	75-125			
Matrix Spike Dup Analyzed: 02/23/2007 (7B22115-MSD1)						**Source: IQB2309-02**					
Aluminum	17600	11	5.4	mg/kg dry	53.6	14000	6716	75-125	3	20	*MHA*
Boron	46.1	5.4	1.1	mg/kg dry	53.6	1.1	84	75-125	1	20	
Lithium	64.8	6.8	4.1	mg/kg dry	53.6	17	89	75-125	1	20	
Potassium	3450	54	20	mg/kg dry	536	2900	103	75-125	3	20	*MHA*
Sodium	601	54	26	mg/kg dry	536	84	96	75-125	1	20	
Zirconium	41.5	27	1.6	mg/kg dry	53.6	2.6	73	75-125	3	20	*M2*

TestAmerica - Irvine, CA
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Project Manager

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Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQB2309

Sampled: 02/20/07
Received: 02/21/07

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7B22122 Extracted: 02/22/07											
Duplicate Analyzed: 02/22/2007 (7B22122-DUP1)						**Source: IQB2309-01**					
pH	6.47	NA	N/A	pH Units		6.50			1	5	
Duplicate Analyzed: 02/22/2007 (7B22122-DUP2)						**Source: IQB2309-04**					
pH	6.61	NA	N/A	pH Units		6.70			1	5	
Batch: 7B26122 Extracted: 02/26/07											
Blank Analyzed: 02/27/2007 (7B26122-BLK1)											
Percent Solids	ND	0.10	0.10	%							
Duplicate Analyzed: 02/27/2007 (7B26122-DUP1)						**Source: IQB2309-04**					
Percent Solids	86.4	0.10	0.10	%		86			1	20	

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Attention: Lisa J. Tucker

Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQB2309

Sampled: 02/20/07
Received: 02/21/07

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
L	Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was above the acceptance limits. Analyte not detected, data not impacted.
M2	The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).
M7	The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).
MHA	Due to high levels of analyte in the sample, the MS/MSD calculation does not provide useful spike recovery information. See Blank Spike (LCS).
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

ADDITIONAL COMMENTS

For 8260 analyses:

Due to the high water solubility of alcohols and ketones, the calibration criteria for these compounds is <30% RSD. The average % RSD of all compounds in the calibration is 15%, in accordance with EPA methods.

For TICs:

All identifications are tentative and concentrations are estimates based upon spectral comparison to the EPA/NIH library.

For Extractable Fuel Hydrocarbons (EFH, DRO, ORO) :

Unless otherwise noted, Extractable Fuel Hydrocarbons (EFH, DRO, ORO) are quantitated against a Diesel Fuel Standard.

TestAmerica - Irvine, CA
Nicholas Marz For Michele Chamberlin
Project Manager

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Project ID: SSFL Group 8 - DOE
1891264
Report Number: IQB2309

Sampled: 02/20/07
Received: 02/21/07

Certification Summary

TestAmerica - Irvine, CA

Method	Matrix	Nelac	California
EPA 160.3 MOD	Soil	N/A	N/A
EPA 3545/8081A	Soil	X	X
EPA 3545/8082	Soil	X	X
EPA 6010B	Soil	X	X
EPA 6020	Soil	X	X
EPA 8015B	Soil	X	X
EPA 8260B	Soil	X	X
EPA 9045C	Soil	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for TestAmerica may be obtained by contacting the laboratory or visiting our website at www.testamericainc.com

Subcontracted Laboratories

Calscience-SUB *California Cert #1230*
7440 Lincoln Way - Garden Grove, CA 92841
Analysis Performed: Extract/Hold-8270C-SIM
Samples: IQB2309-02, IQB2309-03, IQB2309-04, IQB2309-07, IQB2309-08, IQB2309-09, IQB2309-11

Weck Laboratories, Inc
14859 E. Clark Avenue - City of Industry, CA 91745
Analysis Performed: Mercury-7471 (dry wt)
Samples: IQB2309-01, IQB2309-02, IQB2309-03, IQB2309-04, IQB2309-05, IQB2309-07, IQB2309-08, IQB2309-10

TestAmerica - Irvine, CA
Nicholas Marz For Michele Chamberlin
Project Manager

Weck Laboratories, Inc.
Analytical Laboratory Services - Since 1964

14859 E. Clark Ave., Industry, CA 91745
Phone 626.336.2139 Fax 626.336.2634
info@wecklabs.com www.wecklabs.com

CERTIFICATE OF ANALYSIS

Client: TestAmerica, Inc. - Irvine
17461 Derian Ave, Suite 100
Irvine, CA 92614
Attention: Michele Chamberlin

Phone: (949) 261-1022
Fax: (949) 260-3297

Report Date: 03/19/07 15:49
Received Date: 02/22/07 09:00
Turn Around: Normal

Work Order #: 7022209

Client Project: IQB2309

NELAP #04229CA ELAP#1132 NEVADA #CA211 HAWAII LACSD #10143

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. Weck Laboratories, Inc. certifies that the test results meet all NELAC requirements unless noted in the case narrative. This analytical report is confidential and is only intended for the use of Weck Laboratories, Inc. and its client. This report contains the Chain of Custody document, which is an integral part of it, and can only be reproduced in full with the authorization of Weck Laboratories, Inc.

Dear Michele Chamberlin :

Enclosed are the results of analyses for samples received 02/22/07 09:00 with the Chain of Custody document. The samples were received in good condition, at 4.9 °C and on ice. All analysis met the method criteria except as noted below or in the report with data qualifiers.

Reviewed by:

Joe Chau For Taylor Maligmat
Project Manager

ACCREDITED IN ACCORDANCE WITH

Weck Laboratories, Inc.
14859 E. Clark Ave.
Industry, CA 91745
Phone 626.336.2139 Fax 626.336.2634

TestAmerica, Inc. - Irvine
17461 Derian Ave, Suite 100
Irvine CA, 92614

Report ID: 7022209
Project ID: IQB2309

Date Received: 02/22/07 09:00
Date Reported: 03/19/07 15:49

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sampled by:	Sample Comments	Laboratory	Matrix	Date Sampled
IQB2309-01	client		7022209-01	Solid	02/20/07 09:40
IQB2309-02	client		7022209-02	Solid	02/20/07 10:35
IQB2309-03	client		7022209-03	Solid	02/20/07 10:35
IQB2309-04	client	Homogenize and Run MS/MSD	7022209-04	Solid	02/20/07 11:20
IQB2309-05	client		7022209-05	Solid	02/20/07 13:00
IQB2309-07	client		7022209-06	Solid	02/20/07 14:02
IQB2309-08	client		7022209-07	Solid	02/20/07 14:02
IQB2309-10	client		7022209-08	Solid	02/20/07 14:20

Weck Laboratories, Inc
14859 E. Clark Ave.
Industry, CA 91745
Phone 626.336.2139 Fax 626.336.2634

TestAmerica, Inc. - Irvine 17461 Derian Ave, Suite 100 Irvine CA, 92614	Report ID: 7022209 Project ID: IQB2309	Date Received: 02/22/07 09:00 Date Reported: 03/19/07 15:49

QUALITY CONTROL SECTION

Weck Laboratories, Inc.
14859 E. Clark Ave.
Industry, CA 91745
Phone 626.336.2139 Fax 626.336.2634

TestAmerica, Inc. - Irvine
17461 Derian Ave, Suite 100
Irvine CA, 92614

Report ID: 7022209
Project ID: IQB2309

Date Received: 02/22/07 09:00
Date Reported: 03/19/07 15:49

Metals (Non-Aqueous) by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch W7B1093 - EPA 7471A										
Blank (W7B1093-BLK1)				Analyzed: 03/10/07						
Mercury, Total	0.00400	0.010	mg/kg wet							J
LCS (W7B1093-BS1)				Analyzed: 03/10/07						
Mercury, Total	0.0842	0.010	mg/kg wet	0.0833		101	80-120			
Matrix Spike (W7B1093-MS1)		Source: 7022607-01		Analyzed: 03/10/07						
Mercury, Total	0.139	0.012	mg/kg dry	0.0992	0.039	101	70-130			
Matrix Spike Dup (W7B1093-MSD1)		Source: 7022607-01		Analyzed: 03/10/07						
Mercury, Total	0.165	0.012	mg/kg dry	0.0992	0.039	127	70-130	17.1	25	
Batch W7C0475 - EPA 7471A										
Blank (W7C0475-BLK1)				Analyzed: 03/13/07						
Mercury, Total	0.00375	0.010	mg/kg wet							J
LCS (W7C0475-BS1)				Analyzed: 03/13/07						
Mercury, Total	0.0892	0.010	mg/kg wet	0.0833		107	80-120			
Matrix Spike (W7C0475-MS1)		Source: 7022209-04		Analyzed: 03/13/07						
Mercury, Total	0.117	0.012	mg/kg dry	0.0932	0.019	105	70-130			
Matrix Spike Dup (W7C0475-MSD1)		Source: 7022209-04		Analyzed: 03/13/07						
Mercury, Total	0.110	0.012	mg/kg dry	0.0932	0.019	97.6	70-130	6.17	25	

Weck Laboratories, Inc.
14859 E. Clark Ave.
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Phone 626.336.2139 Fax 626.336.2634

TestAmerica, Inc. - Irvine 17461 Derian Ave, Suite 100 Irvine CA, 92614	Report ID: 7022209 Project ID: IQB2309	Date Received: 02/22/07 09:00 Date Reported: 03/19/07 15:49

Notes and Definitions

J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
ND	NOT DETECTED at or above the Reporting Limit. If J-value reported, then NOT DETECTED at or above the Method Detection Limit (MDL)
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
% Rec	Percent Recovery
Sub	Subcontracted analysis, original report available upon request
MDL	Method Detection Limit
MDA	Minimum Detectable Activity

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

An Absence of Total Coliform meets the drinking water standards as established by the California Department of Health Services.

The Reporting Limit (RL) is referenced as the Laboratory's Practical Quantitation Limit (PQL) or the Detection Limit for Reporting Purposes (DLR).

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

BOEING

CHAIN OF COUSTODY RECORD

COC #: MWHSV20070220_00

Customer Information		Project Information		Project Information			
Site:	SSFL	Client Name:	DOE	Collector:	Shelby Valenzuela	Boeing PM:	
Company:	MWH	Sampling Event:	Group 8 Data Gaps-Soil	Contact #:			
Report to:	Lisa Tucker	Project Number:	1891264				
Address:	9444 Farnham Street	Project Manager:	Diana Buchanan				
	Suite 300	PM Phone #:	(626) 568-6897				
	San Diego	Field Contact:					
	CA	Field Contact #:					
	92123	Lab Name:	Test America, Inc.				
Email:	boeingedms@ch2m.com	Lab Contact:	Michele Chamberlin				
	Lisa.Tucker@mwhglobal.com	Lab Address:	17461 Derian Ave, Suite 100				
			Irvine, CA 92606				
		Lab Phone:	(949) 261-1022				

Requested Analyses

Instructions/TAT: Legend: Numerical values for analyses equate to turn around time in days. H - Hold. EH - Extract, Hold

Sample Name	Matrix	Date	Time	No. of Containers	% Solids - Soil	Metals 6010B/6020 Soil Group 8	Metals 7471A Soil Mercury	PCB by SW8082 - Soil	pH by SW9045C - Soil	SVOCs by SW8270C SIM - Soil	TPH by SW8015BM - Soil	VOC 8260B Soil Full	Comments
L0BS0006S01	Soil	2/20/2007	9:40	2	10		10		10				Sleeve(2)
L0BS0001D01	Soil	2/20/2007	10:35	4	10	10	10	EH	10	EH	10		S(4)
L0BS0001S01	Soil	2/20/2007	10:35	2	10	10	10	EH	10	EH	10		S(2)
L0BS0002S01	Soil	2/20/2007	11:20	6	10	10	10	EH	10	EH	10		Homogenize and run MS/MSD. See notes below. S(6).
L0BS0003S01	Soil	2/20/2007	13:00	2	10	10	10		10				S(2)
L0BS0003S02	Soil	2/20/2007	13:35	2	H	H	H		10				Hold all analysis except for pH. S(2)
L0BS0007D01	Soil	2/20/2007	14:02	5	10	10	10	EH	10	EH	10	10	Sleeve (2), Encore (3)
L0BS0007S01	Soil	2/20/2007	14:02	5	5	10	10	EH	10	EH	10	5	Sleeve (2), Encore (3)

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
[signature]	2-21-07	[signature]	02/21/07	[signature]	2/21/07	[signature]	02/21/07
Company: MWH	Time: 1550	Company: TESTAMERICA-IRVINE	Time: 1550	Company: TESTAMERICA IRV	Time: 1915	Company: TAI	Time: 1915

Comments: Homogenize all sample sleeves of sample L0BS0002S01 before analysis, run Method Spike/Spike Duplicate.

Geotracker EDF ☐

Data Validation Package ☑ Level IV

163

0.5/0.0°C HE 2-21-07 2125

BOEING

CHAIN OF CUSTODY RECORD

COC #: MWHSV20070220_00

Customer Information		Project Information		Project Information			
Site:	SSFL	Client Name:	DOE	Collector:	Shelby Valenzuela	Boeing PM:	
Company:	MWH	Sampling Event:	Group 8 Data Gaps-Soil	Contact #:			
Report to:	Lisa Tucker	Project Number:	1891264				
Address:	9444 Farnham Street	Project Manager:	Diana Buchanan				
	Suite 300	PM Phone #:	(626) 568-6897				
	San Diego	Field Contact:					
	CA	Field Contact #:					
	92123	Lab Name:	Test America, Inc.				
Email:	boeingedms@ch2m.com	Lab Contact:	Michele Chamberlin				
	Lisa.Tucker@mwhglobal.com	Lab Address:	17461 Derian Ave, Suite 100				
			Irvine, CA 92606				
		Lab Phone:	(949) 261-1022				

Sample Name	Matrix	Date	Time	No. of Containers	% Solids - Soil	Metals 6010B/6020 Soil Group 8	Metals 7471A Soil Mercury	PCB by SW8082 - Soil	pH by SW9045C - Soil	SVOCs by SW8270C SIM - Soil	TPH by SW8015BM - Soil	VOC 8260B Soil Full	Instructions/TAT / Comments
L0BS0007S02	Soil	2/20/2007	14:08	5	H	H	H	EH	10	EH	EH	H	Hold all analysis except for pH. S(2), E(3)
L0BS0004S01	Soil	2/20/2007	14:20	2	10	10	10		10				S(2)
L0BS0007S03	Soil	2/20/2007	14:31	5	H	H	H	EH	10	EH	EH	H	Hold all analysis except for pH. S(2), E(3)

Requested Analyses

Instructions/TAT

Legend:
Numerical values for analyses equate to turn around time in days

H - Hold
EH - Extract Hold

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
[signature]	2-21-07	[signature]	02/21/07	[signature]	02/21/07	[signature]	2/21/07
Company: MWH	Time: 1550	Company: TESTAMERICA-IRV.	Time: 1550	Company: TESTAMERICA-IRV	Time: 1915	Company: TAI	Time: 1915

Comments: Homogenize all sample sleeves of sample L0BS0002S01 before analysis, run Method Spike/Spike Duplicate.

Geotracker EDF ☐

Data Validation Package ☑ Level IV

163

0.5/0.0 °C

Del Mar Analytical

17461 Derian Ave., Suite 100, Irvine, CA 92614 (949) 261-1022 FAX (949) 260-3297
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

LABORATORY REPORT

Prepared For: MWH-San Diego
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project: Transformer Sampling
Boeing SSFL

Sampled: 09/23/05
Received: 09/23/05
Issued: 10/06/05 20:18

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain(s) of Custody, 2 pages, are included and are an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

LABORATORY ID	CLIENT ID	MATRIX
IOI1786-01	WD203	Soil
IOI1786-03	WD211	Soil
IOI1786-05	WD219	Soil

Reviewed By:

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-San Diego
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: Transformer Sampling
Boeing SSFL
Report Number: IOI1786

Sampled: 09/23/05
Received: 09/23/05

METHOD BLANK/QC DATA

POLYCHLORINATED BIPHENYLS (EPA 8082)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5J04048 Extracted: 10/04/05										
Blank Analyzed: 10/04/2005 (5J04048-BLK1)										
Aroclor 1016	ND	50	ug/kg wet							
Aroclor 1221	ND	50	ug/kg wet							
Aroclor 1232	ND	50	ug/kg wet							
Aroclor 1242	ND	50	ug/kg wet							
Aroclor 1248	ND	50	ug/kg wet							
Aroclor 1254	ND	50	ug/kg wet							
Aroclor 1260	ND	50	ug/kg wet							
Surrogate: Decachlorobiphenyl	*27.6*		*ug/kg wet*	*33.3*		*83*	*45-120*			
LCS Analyzed: 10/04/2005 (5J04048-BS1)										
Aroclor 1016	240	50	ug/kg wet	267		90	60-115			
Aroclor 1260	258	50	ug/kg wet	267		97	60-115			
Surrogate: Decachlorobiphenyl	*27.6*		*ug/kg wet*	*33.3*		*83*	*45-120*			
LCS Dup Analyzed: 10/04/2005 (5J04048-BSD1)										
Aroclor 1016	227	50	ug/kg wet	267		85	60-115	6	20	
Aroclor 1260	247	50	ug/kg wet	267		93	60-115	4	20	
Surrogate: Decachlorobiphenyl	*26.5*		*ug/kg wet*	*33.3*		*80*	*45-120*			
Matrix Spike Analyzed: 10/04/2005 (5J04048-MS1)					**Source: IOI1786-05**					
Aroclor 1016	239	51	ug/kg dry	273	ND	88	50-120			
Aroclor 1260	241	51	ug/kg dry	273	ND	88	50-120			
Surrogate: Decachlorobiphenyl	*26.7*		*ug/kg dry*	*34.2*		*78*	*45-120*			
Matrix Spike Dup Analyzed: 10/04/2005 (5J04048-MSD1)					**Source: IOI1786-05**					
Aroclor 1016	218	51	ug/kg dry	273	ND	80	50-120	9	30	
Aroclor 1260	223	51	ug/kg dry	273	ND	82	50-120	8	30	
Surrogate: Decachlorobiphenyl	*24.4*		*ug/kg dry*	*34.2*		*71*	*45-120*			

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-San Diego
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: Transformer Sampling
Boeing SSFL
Report Number: IOI1786

Sampled: 09/23/05
Received: 09/23/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5I29080 Extracted: 09/29/05										
Blank Analyzed: 09/29/2005 (5I29080-BLK1)										
Percent Solids	ND	0.10	%							
Duplicate Analyzed: 09/29/2005 (5I29080-DUP1)					**Source: IOI1850-01**					
Percent Solids	89.6	0.10	%		88			2	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-San Diego	Project ID: Transformer Sampling	
9444 Farnham Street, Suite 300	Boeing SSFL	Sampled: 09/23/05
San Diego, CA 92123	Report Number: IOI1786	Received: 09/23/05
Attention: Lisa J. Tucker		

DATA QUALIFIERS AND DEFINITIONS

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

RPD Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-San Diego
9444 Farnham Street, Suite 300
San Diego, CA 92123
Attention: Lisa J. Tucker

Project ID: Transformer Sampling
Boeing SSFL
Report Number: IOI1786

Sampled: 09/23/05
Received: 09/23/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 160.3 MOD	Soil	N/A	N/A
EPA 3545/8082	Soil	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Del Mar Analytical, Irvine
Michele Harper
Project Manager

MWH
MONTGOMERY WATSON HARZA

300 N. Lake Avenue, Suite 1200
Pasadena, CA 91101
(626) 568-6600

452 — 30I1786

Chain of Custody

Project: Transformer
Control Number: COC WD200
Date 9/23/05 Page 1 of 2

Project Manager:	Dixie Hambrick
Project Name:	Boeing SSFL
Project Number:	18710865.011207
Deliver the results to the address above or as stated in contract	

Bill To:	Lowel Moffit
Company:	MWH
Address:	300 N. Lake Avenue, Suite 1200 Pasadena, CA, 91101

Sample Disposal Instructions:	Laboratory Disposal
Shipment Method:	COOLER
Comment:	Lab Pick-up

Cooler No.
QC Level: Normal
TAT: Standard

Preservatives: None

Sample ID	Description (for MWH use only)	SWMU	Depth	Date Collected	Time Collected	ULS Number	Lab ID
WD200	XFBS31501	—	0.5	9/23/05	0815		
WD201	XFBS31502	—	0.5		0830		
WD202	XFBS31503	—	0.5		0840		
WD203	XFBS31570	—	—		—		
WD204	XFBS31504	—	2.5		0845		
WD205	XFBS31505	—	2.5		0850		
WD206	XFBS31506	—	2.5		0855		
WD207	XFBS31580	—	—		—		
WD208	XFBS32501	—	0.5		0915		
WD209	XFBS32502	—	0.5		0925		
WD210	XFBS32503	—	0.5		0935		
WD211	XFBS32570	—	—		—		

Matrix: Soil, Water, Product

Analyses / Preservatives: 8260B VOC (HCL, pH<2, 4°C); 8015BM TPH (HCL, pH<2, 4°C); 8270CSIM SVOC (4°C); 8270C SVOC (4°C); 8290 DIOXINS (4°C); 8315A FORMALDEHYDE (H2SO4, pH<2, 4°C); 8330 ORDNANCE (4°C); 6000/7000 METALS (HNO3, pH<2, 4°C); 7196A HEX CHROMIUM (4°C); 8082 PCBs (4°C); 9040B/9045C pH (4°C); 340.2 FLUORIDE (4°C); 300M ANIONS (4°C); 300M HYDRAZINE (4°C); 314.0 PERCHLORATE (4°C); Sampling Method; Extra Volume MS/MSD; HOLD; Total # of Bottles

Samplers Signature:	Date 9/23/05	Time 1200
Relinquished By:	Date 9/23/05	Time 12:55
Received By:	Date 9/23/05	Time 12:55
Relinquished By:	Date 9/23/05	Time 1535
Received By (LAB):	Date 9/23/05	Time 1535

White Copy:Original Yellow:Lab Copy Pink:Field Copy

For Lab Use (MB)

Lab Number:
Does COC match samples: Y or N
Broken container: Y or N
Received within holding time: Y or N
COC Seal intact: Y or N
Any other problems: Y or N
If any YES, MWH contacted: Y or N
Date Contacted: __/__/__
Temperature °C 3°C

Comments:
1. WD200, WD201 & WD202 to be composited after each aliquot is homogenized. WD203 will be the composite.
2. WD204, WD205, WD206, same procedure WD207 will be the composite.
3. WD208, WD209, WD210, same procedure. WD211 will be the composite.
4. HOLD individual sleeves pending analysis of composites.
5. HOLD deeper composites (5805) pending analysis of shallow composites.

MWH
MONTGOMERY WATSON HARZA

300 N. Lake Avenue, Suite 1200
Pasadena, CA 91101
(626) 568-6600

IOI1706

Chain of Custody

Project: Transformers
Control Number: COCWD212
Date 9/23/05 Page 2 of 2

Project Manager:	Dixie Hambrick
Project Name:	Boeing SSFL
Project Number:	105563.011209
Deliver the results to the address above or as stated in contract	

Bill To:	Lowel Moffit
Company:	MWH
Address:	300 N. Lake Avenue, Suite 1200 Pasadena, CA, 91101

Sample Disposal Instructions:	Laboratory Disposal
Shipment Method:	Collect
Comment:	Lab Pickup

Cooler No.
QC Level: Standard
TAT: Normal

Preservatives: None

Sample ID	Description (for MWH use only)	SWMU	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260B VOC	8015BM TPH	8270CSIM SVOC	8270C SVOC	8290 DIOXINS	8315A FORMALDEHYDE	8330 ORDNANCE	6000/7000 METALS	7196A HEX CHROMIUM	8082 PCBs	9040B/9045C pH	340.2 FLUORIDE	300M ANIONS	300M HYDRAZINE	314.0 PERCHLORATE		Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
WD212	XFBS32504	—	2.5	9/23/05	0940			/												/									/	1
WD213	XFBS32505	—	2.5		0945			/												/									/	1
WD214	XFBS32506	—	2.5		0955			/												/									/	1
WD215	XFBS32580	—	—		—			/												/									/	0
WD216	SLBS36501	6.5	0.5		1030			/												/									/	1
WD217	SLBS36502		0.5		1040			/												/									/	1
WD218	SLBS36503		0.5		1050			/												/									/	1
WD219	SLBS36570		—		—			/												/										0
									9/23/05																					

Sampler's Signature: — Date 9/23/05 Time 1700

	Date	Time
Relinquished By:	9/23/05	12:55
Received By:	9/23/05	12:55
Relinquished By:	9/23/05	1535
Received By (LAB):	9/23/05	1535

White Copy: Original Yellow: Lab Copy Pink: Field Copy

For Lab Use

Lab Number:
Does COC match samples: Y or N
Broken container: Y or N
Received within holding time: Y or N
COC Seal intact: Y or N
Any other problems: Y or N
If any YES, MWH contacted: Y or N
Date Contacted: / /
Temperature °C 3C

Comments:
1. WD212, WD213 & WD214 to be composited after each sleeve is homogenized. WD215 will be the composite.
2. WD216, WD217, WD218 same procedure ~~composite~~ WD219 will be the composite.
3. HOLD, individual sleeves pending analysis of composites.
4. HOLD deeper composites (WD215) pending analysis of shallow composites.

Del Mar Analytical

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LABORATORY REPORT

Prepared For: MWH-San Diego
1230 Columbia Street, Suite 750
San Diego, CA 92101
Attention: Lisa J. Tucker

Project: SSFL Transformer Sampling
Boeing SSFL

Sampled: 09/19/03-09/22/03
Received: 09/22/03
Issued: 09/30/03

NELAP #01108CA CA ELAP #1197

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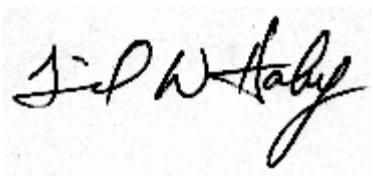
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

LABORATORY ID	CLIENT ID	MATRIX
IMI1288-01	MT832	Soil
IMI1288-02	MT833	Soil
IMI1288-03	MT834	Soil
IMI1288-04	MT835	Soil
IMI1288-05	MT836	Soil
IMI1288-06	MT837	Soil



Del Mar Analytical, Irvine
Fred Haley For Michele Harper
Project Manager

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-San Diego
1230 Columbia Street, Suite 750
San Diego, CA 92101
Attention: Lisa J. Tucker

Project ID: SSFL Transformer Sampling
Boeing SSFL
Report Number: IMI1288

Sampled: 09/19/03-09/22/03
Received: 09/22/03

DATA QUALIFIERS AND DEFINITIONS

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

RPD Relative Percent Difference

Del Mar Analytical, Irvine
Fred Haley For Michele Harper
Project Manager

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-San Diego
1230 Columbia Street, Suite 750
San Diego, CA 92101
Attention: Lisa J. Tucker

Project ID: SSFL Transformer Sampling
Boeing SSFL
Report Number: IMI1288

Sampled: 09/19/03-09/22/03
Received: 09/22/03

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	NELAP	CA
EPA 160.3 MOD	Soil	N/A	N/A
EPA 3545/8082	Soil	X	X

NV and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Del Mar Analytical, Irvine
Fred Haley For Michele Harper
Project Manager

MWH MONTGOMERY WATSON HARZA

250 N. Madison Avenue
Pasadena, CA 91101
(626) 568-6310

"SSFL Transformer Sampling"

MT832

Chain of Custody

Control Number: COC
Date 9/22/03 Page 1 of 1

Project Manager: Dixie Hambrick
Project Name: Boeing SSFL
Project Number:
Deliver the results to the address above or as stated in contract

Bill To: Lowell Moffitt
Company: MWH
Address: 250 N. Madison Avenue, Pasadena, CA, 91101

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment: IMI1288

Cooler No.
QC Level:
TAT: Normal

Preservatives: 8260B VOC – HCL, pH<2 4°C; 8015BM TPH – HCL, pH<2 4°C; 8270CSIM SVOC – 4°C; 8270C SVOC – 4°C; 8290 DIOXINS – 4°C; 8315A FORMALDEHYDE – H2SO4, pH<2 4°C; 8330 ORDNANCE – 4°C; 6000/7000 METALS – HNO3, pH<2 4°C; 7196A HEX CHROMIUM – 4°C; 8082 PCBs – 4°C; 9040B/9045C pH – 4°C; 340.2 FLUORIDE – 4°C; 300M ANIONS – 4°C; 300M HYDRAZINE – 4°C; 300M PERCHLORATES – 4°C

Sample ID	Description (for MWH use only)	Bldg #/ SWMU	Depth	Date Collected	Time Collected	XFMR Number	Lab ID	Soil	Water	Product	8260B VOC	8015BM TPH	8270CSIM SVOC	8270C SVOC	8290 DIOXINS	8315A FORMALDEHYDE	8330 ORDNANCE	6000/7000 METALS	7196A HEX CHROMIUM	8082 PCBs	9040B/9045C pH	340.2 FLUORIDE	300M ANIONS	300M HYDRAZINE	300M PERCHLORATES		Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
MT 832	EVBXØ15Ø1	202	0.5'	9/19/03	0930	/		X												X							G			1
MT 833	XFBS035Ø1	780	0.5'	9/19/03	1420	03		X												X							G			1
MT 834	XFBS045Ø1	780	0.5	9/19/03	1430	03		X												X							G			1
MT 835	XFBS055Ø1	100	0.5	9/22/03	1100	04		X												X							G			1
MT 836	XFBS065Ø1	009	0.5	9/22/03	1145	05		X												X							G			1
MT 837	XFBS075Ø1	009	0.5	9/22/03	1200	05		X												X							G			1

	Signature	Date	Time
Samplers Signature:	[signature]	9/22/03	1500
Relinquished By:	[signature]	9/22/03	1500
Received By:	[signature]	9-22-03	1500
Relinquished By:	[signature]	9-22-03	1730
Received By (LAB):	K. [signature]	9-22-03	1730

White Copy:Original Yellow:Lab Copy Pink:Field Copy

For Lab Use

Lab Number:
Does COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC Seal intact: Y or (N)
Any other problems: Y or (N)
If any YES, MWH contacted: Y or N
Date Contacted: __/__/__
Temperature °C 0° C

Comments: "Aerochlors only"

STL

STL Denver
4955 Yarrow Street
Arvada, CO 80002

Tel: 303 736 0100 Fax: 303 431 7171
www.stl-inc.com

ANALYTICAL REPORT

SSFL / Boeing Group 8

Lot D7E170359

Lisa Tucker
MWH Americas
9444 Farnham Street, Suite 300
San Diego, CA 92123

Severn Trent Laboratories, Inc. / STL Denver

Michael P. Phillips
Project Manager

June 15, 2007

Case Narrative

Enclosed is the report for two samples received at STL Denver on May 17, 2007. The results included in this report have been reviewed for compliance with STL's Laboratory Quality Manual. The test results shown in this report meet all requirements of NELAC and any exceptions are noted below.

This report may include reporting limits (RLs) less than STL Denver's standard reporting limit. The reported sample results and associated reporting limits are being used specifically to meet the needs of this project. Note that data are not normally reported to these levels without qualification because they are inherently less reliable and potentially less defensible than required by the latest industry standards.

Dilution factors and footnotes have been provided to assist in the interpretation of the results. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at concentrations above the linear calibration curve, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

STL utilizes USEPA approved methods in all analytical work. The sample presented in this report was analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. A summary of quality control parameters is provided below.

Quality Control Summary for Lot D7E170359

Sample Receiving

The cooler temperature for the samples received on May 17, 2007 at the Denver laboratory was 4.2°C.

All sample containers were received in acceptable condition.

GC/MS Volatile Organics – SW846 8260B

No MS/MSD was analyzed for QC batch 7142159; however, a LCS/LCSD was performed to demonstrate method precision and accuracy.

No other anomalies were encountered.

PCBs – SW846 8082

No anomalies were encountered.

Total Metals – SW846 6010B/6020/7471A

The serial dilutions associated with QC batches 7142590 and 7142591 indicate that physical and chemical interferences are present for Aluminum, Arsenic, Chromium, Cobalt, Copper, Nickel, Vanadium, and Zinc. Results in the analytical report have been flagged with an "L".

Low levels of Chromium and Zinc were present in the method blank associated with QC batch 7142590. Because the concentrations in the method blank were not present at levels greater than the reporting limits, corrective action was deemed unnecessary.

Lead was detected in the method blank associated with QC batch 7142590 at a level above the project established reporting limit. However, because the associated sample contained Lead at a concentration greater than 10X the level found in the method blank, no corrective action was required.

The MS/MSD performed using a sample from another client and/or lot for QC batch 7142591 exhibited a percent recovery outside the QC control limits for Sodium. In addition, percent recoveries and RPD data could not be calculated for Aluminum due to the sample concentration reading greater than four times the spike amount. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action was deemed unnecessary.

The MS/MSD performed using a sample from another client and/or lot for QC batch 7142590 exhibited percent recoveries outside the QC control limits for Antimony, Arsenic, Cadmium, Cobalt, Copper, Lead, Molybdenum, Nickel, Selenium, Silver, and Thallium. In addition, percent recoveries and RPD data could not be calculated for Barium, Chromium, Vanadium, and Zinc due to the sample concentrations reading greater than four times the spike amounts. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action was deemed unnecessary.

The MS/MSD performed using a sample from another client and/or lot for QC batch 7141529 exhibited a MSD percent recovery and RPD outside the QC control limits for Mercury. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action was deemed unnecessary.

The Post Digestion Spike (PDS) associated with QC batch 7142590 exhibited a percent recovery outside the QC control limits for Barium, Chromium, Copper, Nickel, Vanadium, and Zinc. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action was deemed unnecessary.

No other anomalies were encountered.

Fluoride – SW846 9056

The MS/MSD performed using a sample from another client and/or lot for QC batch 7144342 exhibited a percent recovery outside the QC control limits. The acceptable LCS and method blank data indicated that the analytical system was operating within control; therefore, corrective action was deemed unnecessary.

No other anomalies were encountered.

Total Solids – EPA 160.3

No anomalies were encountered.

EXECUTIVE SUMMARY - Detection Highlights

D7E170359

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
L0BS0014S01SP 05/16/07 07:37 001				
Silver	56 J	110	ug/kg	SW846 6020
Arsenic	4000 L	680	ug/kg	SW846 6020
Barium	130000	230	ug/kg	SW846 6020
Beryllium	740	110	ug/kg	SW846 6020
Cadmium	270	110	ug/kg	SW846 6020
Cobalt	8400 L	110	ug/kg	SW846 6020
Chromium	26000 B,L	230	ug/kg	SW846 6020
Copper	13000 L	290	ug/kg	SW846 6020
Molybdenum	160 J	230	ug/kg	SW846 6020
Nickel	17000 L	170	ug/kg	SW846 6020
Lead	8600 B	170	ug/kg	SW846 6020
Selenium	540 J	570	ug/kg	SW846 6020
Thallium	300	110	ug/kg	SW846 6020
Vanadium	47000 L	570	ug/kg	SW846 6020
Zinc	58000 B,L	1100	ug/kg	SW846 6020
Aluminum	26000 L	11	mg/kg	SW846 6010B
Boron	6.0 J	11	mg/kg	SW846 6010B
Potassium	3900	340	mg/kg	SW846 6010B
Lithium	23	5.7	mg/kg	SW846 6010B
Sodium	230 J	570	mg/kg	SW846 6010B
Zirconium	4.9	3.4	mg/kg	SW846 6010B
Total Solids	88	0.10	%	MCAWW 160.3 MOD
L0BS0010S01SP 05/16/07 12:45 002				
Boron	1.1 J	11	mg/kg	SW846 6010B
Fluoride	2.1 J	11	mg/kg	SW846 9056
Total Solids	92	0.10	%	MCAWW 160.3 MOD

METHODS SUMMARY

D7E170359

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Fluoride	SW846 9056	SW846 9056
Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 3050B
ICP-MS (6020)	SW846 6020	SW846 3050B
Mercury in Solid Waste (Manual Cold-Vapor)	SW846 7471A	SW846 7471A
PCBs by SW-846 8082	SW846 8082	SW846 3550B/366
Total Residue as Percent Solids	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Volatile Organics by GC/MS	SW846 8260B	SW846 5035

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

METHOD / ANALYST SUMMARY

D7E170359

ANALYTICAL METHOD	ANALYST	ANALYST ID
MCAWW 160.3 MOD	Kevin Bloom	006134
SW846 6010B	Lynn-Anne Trudell	006645
SW846 6010B	Lynn-Anne Trudell	6645
SW846 6020	Thomas Lill	006929
SW846 7471A	David Wells	5099
SW846 8082	Teresa L. Williams	002510
SW846 8260B	Dan Appelhans	001008
SW846 9056	Grant Henshaw	004878

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D7E170359

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
JW7D9	001	L0BS0014S01SP	05/16/07	07:37
JW7EE	002	L0BS0010S01SP	05/16/07	12:45

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

QC DATA ASSOCIATION SUMMARY

D7E170359

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	SO	SW846 6020		7142590	7142326
	SO	SW846 7471A		7141529	7141331
	SO	SW846 8260B		7142159	
	SO	SW846 6010B		7142591	7142327
	SO	MCAWW 160.3 MOD		7141589	7145113
002	SO	SW846 9056		7144342	7144213
	SO	SW846 8082		7138114	7138081
	SO	SW846 6010B		7142591	7142327
	SO	MCAWW 160.3 MOD		7141589	7145113

STL Denver

Sample Receiving Checklist

Lot #: D7E170359 Date/Time Received: 5/17/07 1230

Company Name & Sampling Site: MWH SSFL Group 8

PM to Complete This Section:	*Yes*	*No*		*Yes*	*No*
Residual chlorine check required:	☐	☐	Quarantined :	☐	☐

Quote #: 74421

Special Instructions: Include Metals forms for 1st sample.

Time Zone:
• EDT/EST • CDT/CST • MDT/MST • PDT/PST • OTHER

Unpacking Checks:

Cooler #(s): 1

Temperatures (°C): 4.2

N/A	*Yes*	*No*		*Initials*
☐	☑	☐	1. Cooler seals intact? (N/A if hand delivered) If no, document on CUR.	
	☑	☐	2. Chain of custody present? If no, document on CUR.	
	☐	☑	3. Bottles broken and/or are leaking? If yes, document on CUR.	
	☐	☑	4. Multiphasic samples obvious? If yes, document on CUR.	
	☑	☐	5. Proper container & preservatives used? (ref. Attachment D of SOP# DEN-QA-0003) If no, document on CUR.	
☑	☐	☐	6. pH of all samples checked and meet requirements? If no, document on CUR.	
	☑	☐	7. Sufficient volume provided for all analysis requested? (ref. Attachment D of SOP# DEN-QA-0003) If no, document on CUR, and contact PM before proceeding.	
	☑	☐	8. Did chain of custody agree with labels ID and samples received? If no, document on CUR.	
☑	☐	☐	9. Were VOA samples without headspace? If no, document on CUR.	
☑	☐	☐	10. Were VOA vials preserved? Preservative ☐HCl ☐4±2°C ☐Sodium Thiosulfate ☐ Ascorbic Acid	
	☐	☑	11. Did samples require preservation with sodium thiosulfate?	
☑	☐	☐	12. If yes to #11, did the samples contain residual chlorine? If yes, document on CUR.	
☑	☐	☐	13. Sediment present in dissolved/filtered bottles? If yes, document on CUR.	
☑	☐	☐	14. Is sufficient volume provided for client requested MS, MSD or matrix duplicates? If no, document on CUR, and contact PM before proceeding.	
	☐	☑	15. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	16. Are analyses with short holding times requested?	
	☐	☑	17. Was a quick Turn Around (TAT) requested?	

STL Denver

Sample Receiving Checklist

Lot # D7E170359

Login Checks:

N/A	Yes	No		Initials
	☒	☐	18. Sufficient volume provided for all analysis requested? (ref. Attachment D of SOP# DEN-QA-0003) If no, document on CUR, and contact PM before proceeding.	MB
☒	☐	☐	19. Is sufficient volume provided for client requested MS, MSD or matrix duplicates? If no, document on CUR, and contact PM before proceeding.	
	☒	☐	20. Did the chain of custody includes "received by" and "relinquished" by signatures, dates, and times?	
☐	☒	☐	21. Were special log in instructions read and followed?	
☒	☐	☐	22. Were AFCEE metals logged for refrigerated storage?	
	☒	☐	23. Were tests logged checked against the COC? Which samples were confirmed? 1	
☒	☐	☐	24. Was a Rush form completed for quick TAT?	
☐	☒	☐	25. Was a Short Hold form completed for any short holds?	
	☐	☒	26. Were special archiving instructions indicated in the General Comments? If so, what were they?	

5 months

Labeling and Storage Checks:

				Initials
☐	☐	☐	28. Was the subcontract COC signed and sent with samples to bottle prep?	MT
	☒	☐	29. Were sample labels double-checked by a second person?	
☒	☐	☐	30. Were sample bottles and COC double checked for dissolved/filtered metals by a second person?	
	☒	☐	31. Did the sample ID, Date, and Time from label match what was logged?	
☐	☒	☐	32. Were stickers for special archiving instructions affixed to each box and to the ICOC? See #27	
☐	☐	☐	33. Were AFCEE metals stored refrigerated?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR).

BOEING

CHAIN OF CUSTODY RECORD

COC #: MWHSV20070516_03

Customer Information		Project Information		Project Information			
Site:	SSFL	Client Name:	DOE	Collector:	Shelby Valenzuela	Boeing PM:	
Company:	MWH	Sampling Event:	Group 8 Hastings Data Gaps-Sc	Contact #:			
Report to:	Lisa Tucker	Project Number:	1891307	Requested Analyses			Instructions/TAT
Address:	9444 Farnham Street	Project Manager:	Diana Buchanan				Legend: Numerical values for analyses equate to turn around time in days H - Hold EH - Extract Hold
	Suite 300	PM Phone #:	(626) 568-6897				
	San Diego	Field Contact:					
	CA	Field Contact #:					
	92123	Lab Name:	STL-Denver				
Email:	lisa.tucker@mwhglobal.com	Lab Contact:	Michael Phillips				
	boeingedms@ch2m.com	Lab Address:	4955 Yarrow				
			Arvada, CO 80002				
		Lab Phone:	(303) 736-0100				

Sample Name	Matrix	Date	Time	No. of Containers	% Solids - Soil	Fluoride by 300 - Soil	Metals 6010B Soil Boron	Metals 6010B/6020 Soil Group 8	Metals 7471A Soil Mercury	PCB by SW8082 - Soil	VOC by SW8260B - Soil	Comments
L0BS0014S01SP	Soil	5/16/2007	7:37	4	5			5	5		5	
L0BS0010S01SP	Soil	5/16/2007	12:45	1	5	5	5			5		

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
Cf Sanchez	5/16/2007	Aaron Bindl	5/17/07				
Company: MWH	Time: 1600	Company: STL	Time: 1230	Company:	Time:	Company:	Time:

Comments:

Geotracker EDF ☐

Data Validation Package ☑ Level IV