WELL LOGS

TABLE A-84

LITHOLOGIC LOG OF WELL RD-7

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 8	CLAYEY SILT (Fill)	Brown, with some gravel
8 - 300	SANDSTONE	Alternating zones of medium brown and light grey, very fine to medium grained with some silt, with fissile siltstone interbeds NOTE: Driller noted fractures at 120' and 250'.

TOTAL DEPTH OF BOREHOLE: 300 feet

TABLE 1

WELL CONSTRUCTION DATA

Chatsworth Formation Wells	Effective Borehole Depth (feet)	Borehole		Casing		Sealed Interval (feet)	Perforated Interval (feet)	Measuring Point Elevation (ft MSL)	Date Drilling Completed
		Diameter (inches)	Interval (feet)	Diameter (inches)	Interval (feet)				
RD-74	101	17-1/2	0 - 30	12	0 - 30	0 - 30	---	1810.90	01-21-99
		6-1/2	30 - 101	---	---	---	Open Hole		

TABLE 2

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-74

LITHOLOGY			FRACTURES				
DEPTH (ft)	DESCRIPTION		DEPTH (ft) TOP	DEPTH (ft) BOTTOM	OPENNESS (inches)	TYPE	COMMENTS
0 - 4	FILL	Dark yellow-brown, silty sand, slightly moist to moist, clayey sand, silty clay, asphalt and granite rock fragments, hard, well graded, compact, dense, low to medium plasticity.					
4 - 30	CHATSWORTH FORMATION SANDSTONE	Yellow brown, fine grained sand, hard, angular, subangular to subrounded grains, dense.					
		@ 7.5 - 8.5' dark brown to yellow-brown, moist to slightly moist, clayey, sandy siltstone or clayey and sandy silt (soil?).					
		@ 8.5' light olive brown sandstone, fine grained, weathered (oxidized), hard, some silt, less clay, weak reaction to HCl.					
		@ 15' fine to medium grained sand, medium gradation, weak reaction to HCl.					
		@ 20' fine grained, poor gradation, no reaction to HCl.					
		@ 25' fine to medium grained, medium gradation, no reaction to HCl.					
		@ 26 - 26.5' clayey siltstone, dark brown to light olive brown, moist to slightly moist.					
		@ 28 - 28.5' clayey siltstone, dark brown to light olive brown, moist to slightly moist.					At 29' bottom of 12" surface casing. Hole washed out below surface casing.
30 - 101	SANDSTONE	@ 30' fine grained sandstone, light olive brown to yellow brown, poor gradation, no reaction to HCl, moist from cementing?					Cobbles fallen in from fill above.
			31.5	32	0 - 1/8	Structural?	
			32	---			
			33	33.5	1/8 - 1/2	Structural	
			34	---	0 - 1/8	Bedding?	

TABLE 2

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-74

LITHOLOGY			FRACTURES				
DEPTH (ft)	DESCRIPTION		DEPTH (ft) TOP	DEPTH (ft) BOTTOM	OPENNESS (inches)	TYPE	COMMENTS
30 - 101 (cont'd)	SANDSTONE	@ 35' yellow brown, moist, fine grained, no reaction to HCl.	35.3	35.8	0 - 1/16	Structural	
			36	---	0 - 1/8	Bedding?	
			37	?	1/8 - 1/4	Structural? High angle	
			38	---	0 - 1/8	Low angle	
			38.5	---	0 - 1/8	Low angle	
			39.5	---	0 - 1/8	Bedding	
			39.8	---	0 - 1/8	Bedding	
		@ 40' no reaction to HCl.	40.1	40.5	0 - 1/8		
			42.5	---	0 - 1/16	Bedding	
			43	---	1/16	Low angle	
		@ 45' no reaction to HCl.	43.9	45	0 - 1/8	Bedding, multiple fractures, low angle	
			46.1	46.5	1/8	Structural	
			46.5	---	1/16	Structural	
			47.5	---	1/8	Low angle	
			48	---	1/16	Low angle	
			48.5	---	1/16	Low angle	
			48.6	---	1/16	Low angle	
		@ 50' no reaction to HCl.	49.3	---	1/16	Low angle	@ 50' water level in video, poor visibility below water level.
		@ 53' very fine grained, silty and clayey, no reaction to HCl.	53.9	---	0 - 1/16	Low angle	
			54.8	---	0 - 1/16	Low angle	
			55.5	55.7	0 - 1/16	Structural	

TABLE 2

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-74

LITHOLOGY			FRACTURES				
DEPTH (ft)	DESCRIPTION		DEPTH (ft) TOP	DEPTH (ft) BOTTOM	OPENNESS (inches)	TYPE	COMMENTS
30 - 101 (cont'd)	SANDSTONE		56	---	Sealed	Structural	
			57	---	1/8 - Sealed	Structural	
			58.8	---	1/8 - Sealed		
		@ 60' yellow brown, moist, silty and clayey, no reaction to HCl.	59	60.5	Sealed	Structural	
			61	63	Sealed - 1/16	Structural, high angle	
		@ 64' cuttings "clumping" - increase in moisture? no reaction to HCl.	63	65	1/16 - 1/8	Filled structural (multiple fractures)	
			66	66.9	1/16	Structural	
			---	69	Sealed	Structural	
			70.5	---	0 - 1/16	Structural, high angle	
			70.7	72.5	0 - 1/16	Structural, high angle	
			71	---	0 - 1/16	Structural, high angle	
		@ 75' light olive brown, no reaction to HCl.					
		@ 77' color change to light grey brown, less fines.	78.2	79	0 - 1/16	Bedding?	
		@ 80' light yellow brown, silty, less fines, no reaction to HCl.					
		@ 84' light olive brown.					
		@ 86 - 87' fracture.	85.5	86.3	6 (partially filled)	Calcite in-filled, vein-like	
		@ 87' increase in clay, very clayey, compact.	89	---	0	Low angle	
		@ 91' some coarse sand to fine gravel in water, granitic, metamorphic, subrounded to subangular claystone fragments, olive brown water, wet.					First groundwater encountered during drilling, <1 gpm, not continuous.
		@ 94'					Less than 1 gpm of water being produced during drilling.

TOTAL DEPTH OF BOREHOLE: 101 FEET **TOTAL VIDEO LOG DEPTH:** 94 FEET

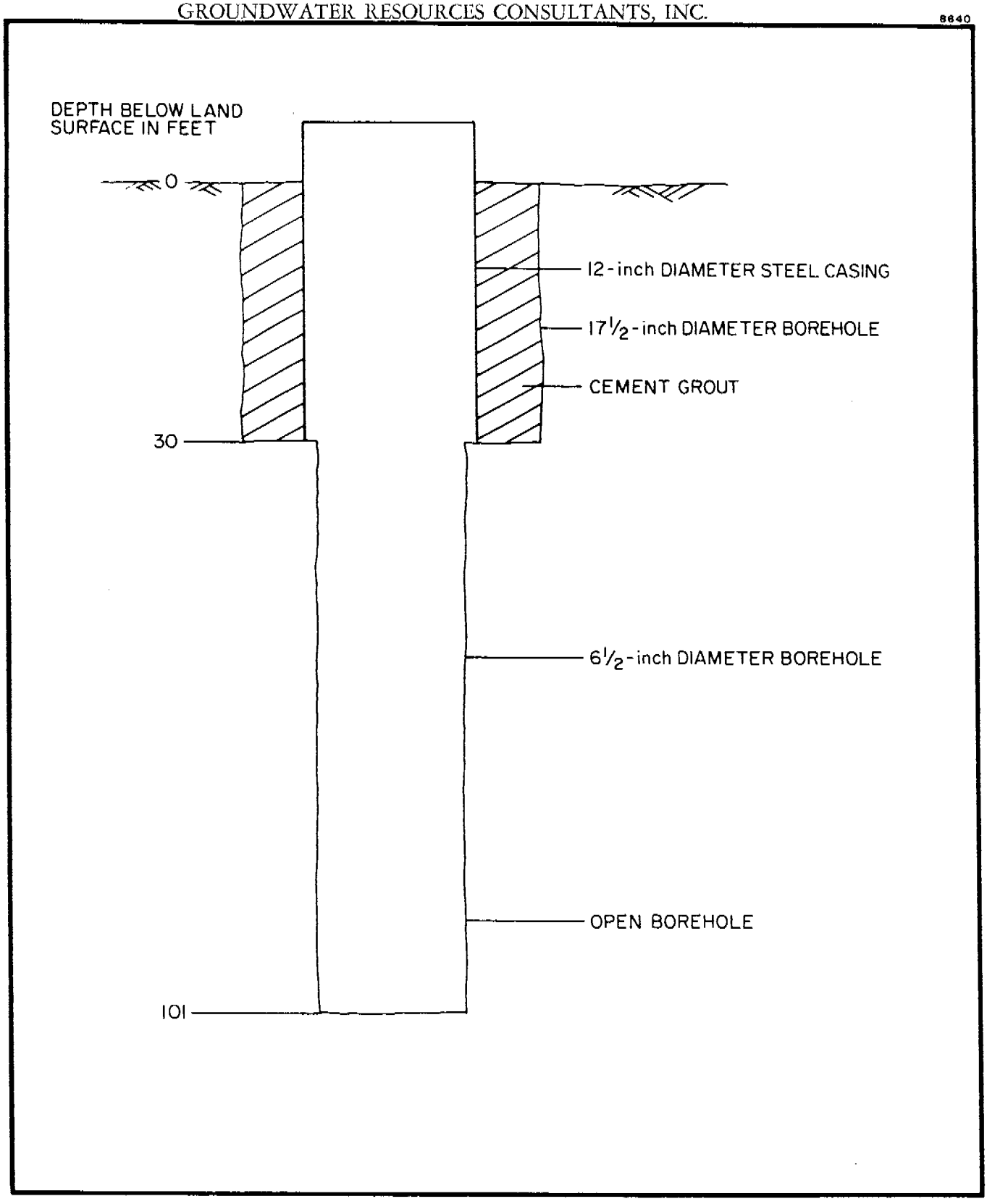

FIGURE 2
CONSTRUCTION SCHEMATIC WELL RD-74

TABLE A-27

LITHOLOGIC LOG OF MONITOR WELL RS-16

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 7.0	CLAYEY SAND	Light brown, some clay interlayers, trace gravel, dry, may be fill, no odor.
		At 2.0 feet, damp.
7.0 - 11.0	SANDY CLAY	Dark brown, some gravel, trace sandstone cobbles, no odor, may be fill.
11.0 - 18.0	SILTY SAND	Brown, some clay, trace gravel, damp, traces of concrete.
18.0 - 20.5	SANDSTONE (CHATSWORTH FORMATION)	Yellow-brown, friable, weathered, damp, no odor.

TOTAL DEPTH OF BOREHOLE: 20.5

ULS SERVICES CORPORATION
Underground Location Services For Environmental, Design & Construction Engineering

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Pocatello, ID 83201
(208) 234-1441 • (800) 528-8206
FAX (208) 234-1507

December 14, 2001

Ms. Dixie Hambrick/ Adam Norris
Montgomery Watson Harza
250 North Madison Avenue
Pasadena, California 91101

Subject: Field Documentation Report for
Land Fill Boundary and Conductive Debris Survey,
Area 1V Landfill, Rocketdyne SSFL

Dear Ms. Hambrick and Mr. Norris,

Representatives of ULS Services Corporation were present at the Area 1V Landfill site on December 10 and 11, 2001 to conduct a survey of the Area Four Landfill to determine the approximate Landfill boundary and interior lying conductive anomalies. The search area is an approximate 160 by 440 foot open area depicted on MWH Sheet FIG 1-SV Drawing, Entitled SWMU 7.1 Building 56 Landfill (Scale 1 in = 40 ft.).

METHODS

Analog Audio and/or Real Time Delayed Pulse Electromagnetic-Induction Metal Detection (DPEMIMD) method is employed. Analog Systems 104-B induction unit with four-foot coil loop antenna is utilized to search out surface projection metal - mass anomalies typically observed over metal - mass debris. A five by five foot grid path is walked throughout the survey zone. Observed anomalies are marked with red paint and one-foot length wooded stakes (painted with red paint). A base reference line trending South is staked within the southern portion of the survey area using 4-foot wooden lath. Existing Fencing is utilized for reference as well. Reference lines are plotted on Sheet Drawing. Observations are plotted on Sheet Drawing using Two-Point Triangular Intersection method.

OBSERVATIONS

Physical Site Description

The landfill site (survey zone) is located northwest of the Building 100 area. It is situated along the top of the east side of a deep northeast trending ravine. The landfill survey zone is approximately 160 by 440 feet trending north to northeast. The LF western boundary is along the top-of-slope area leading into the referenced northeast trending ravine; the eastern boundary includes the existing chain link fence, open pit area, and rock outcropping; the southern boundary is rock outcropping; and the northern boundary is rock outcropping. Most of the vegetation across the flat open areas has been removed or flattened. Ground surface varies and consists of soil and some areas with soil mixed with fine concrete, asphalt, and metal pieces.

Surface debris piles are observed near the northern – northeast boundary and near the southern boundary. A telephone pole insulator is observed along the west side at top of slope. A steep sloping side of LF area is observed from top of slope down to toe of slope at the base of the northeast trending ravine. Sides of slope wall are also covered with some concrete and asphalt debris of various sizes from small pieces to very large blocks.

Findings

Observations from the Delayed Pulse EMIMD (DP – EMIMD) survey indicate low ambient EM noise (background response) from the existing ground in the immediate area allowing for high gain setting and optimum response. Specific EMIMD results from real –time data collected, indicate conductive anomalies primarily along the top of slope areas along the western, northern and southern portions of the survey zone. Some smaller isolated anomalies are located within the east side (Refer to Fig 1). Metallic response is not observed at all surface debris areas.

SUMMARY AND CONCLUSIONS

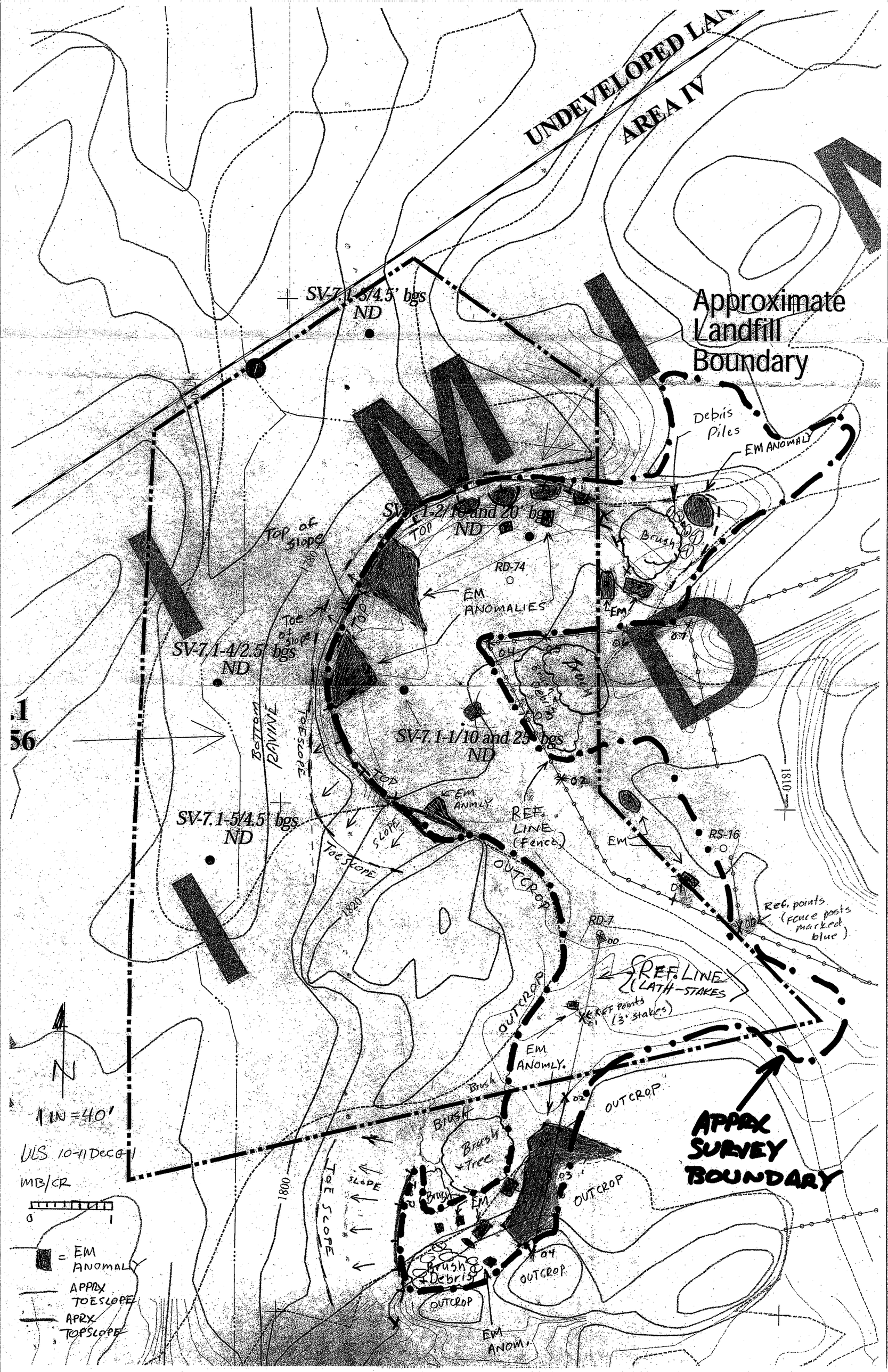
EMIMD response at this site is good. EMIMD response may indicate conductive or metallic near surface to relative deeper debris material associated with past landfill operations. Metallic response is not observed at all surface debris pile locations; therefore non-metallic debris may also be buried at unknown depth below this site. Most surface debris and metallic anomaly observations are noted near the top of slope areas and along the sloping sidewall areas. Deeper burial material located back away from the top of slope may exist; however; this material may be out of detection range. Careful exploratory trenching or borehole sampling may be needed to determine the exact nature of subsurface below this site.

If you have any questions about this report or referenced data please feel free to call at: (800) 528-8206.

Sincerely,

ULS Services Corporation

Michael W. Benedict
Field Survey Representative
President and Director


UNDEVELOPED LAND
AREA IV
Approximate Landfill Boundary
SV-7.1-5/4.5' bgs ND
SV-7.1-2/10 and 20' bgs ND
SV-7.1-4/2.5' bgs ND
SV-7.1-1/10 and 25' bgs ND
SV-7.1-5/4.5' bgs ND
Debris Piles
EM ANOMALY
Brush
RD-74
EM ANOMALIES
TOP of SLOPE
Toe of Slope
BOTTOM RAVINE
TOE SLOPE
TOP
SLOPE
EM ANOMLY
REF. LINE (Fence)
OUTCROP
RS-16
RD-7
Ref. points (Fence posts marked blue)
REF. LINE (LATH-STAKES)
REF Points (3' stakes)
EM ANOMLY.
Brush + Tree
Brush + Debris
1800
1810
1820
APPRX SURVEY BOUNDARY
N
1 IN = 40'
ULS 10-11 Dec 91
MB/CR
= EM ANOMALY
APPRX TOESLOPE
APRX TOPSLOPE

ULS SERVICES CORPORATION
9061 Calle Del Verde Santee, Ca 92071 800 528-8206 www.ulsservices.com

August 30, 2002

Ms. Dixie Hambrick
Montgomery Watson Harza
250 North Madison Avenue
Pasadena, California 91101

Subject: Field Documentation Report for Additional Work
Land Fill Boundary and Conductive Debris Survey,
Area 1V Landfill, Rocketdyne SSFL

Dear Ms. Hambrick,

A representative of ULS Services Corporation was present at the Area 1V Landfill site on August 29, 2002 to verify/remark staked conductive anomalies (observed during our work efforts last December 2001) and to further investigate areas recently cleared of brush that were not investigated during previous efforts. Recent brush clearing efforts destroyed a few stakes, but for the majority the previous markings are intact. Additional areas not surveyed last time due to excessive brush were checked. These areas include the area east of the fence line (I-shaped fence used as baseline) and the upward trending hill-slope located to the south or south of RD-7. This area was heavily brushed at the time and was thought to be native material or bedrock. No conductive anomalies are observed in these areas. ULS staff walked site with MWH staff and helped place proposed trench marker stakes relative to conductive anomalies observed and marked and depicted on MWH drawing.

If you have any questions about this report or referenced data please feel free to call at: (800) 528-8206.

Sincerely,

ULS Services Corporation

Michael W. Benedict
Field Survey Representative
Cc: Glen Jaffe

APPENDIX B

ATTACHMENT B-3

DATA QUALITY, VALIDATION AND LABORATORY REPORTS
(Electronic Copy)

APPENDIX B, ATTACHMENT B-3
BUILDING 056 LANDFILL (SWMU 7.1)
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 included in Attachment B-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 B056 Landfill RFI (SWMU 7.1). All data in the tables and documents included in this section were used for the RFI characterization and/or risk assessment of B056 Landfill of the Group 8 – Western Portion of Area IV RFI Report.

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

1. Data Quality Report

This report was prepared to describe data quality of samples collected for the B056 Landfill Group 8 Reporting Area.

2. "Soil" Folder

This folder contains sampling and analytical information for soil samples collected at the B056 Landfill 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 B056 Landfill Data Table (see description in section 5 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. Asbestos results contained in this folder are not included in the B056 Data Table.

3. "Soil Vapor" Folder

The Soil Vapor folder contains sampling and analytical information for soil vapor samples collected at B056 Landfill 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. "Surface Water" Folder

The Surface Water folder contains sampling and analytical information for surface water samples collected at B056 Landfill RFI Site. The folder contains two 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

5. B056 Data Table

This table is a sampling and analytical results table for B056 samples included in the B056 Landfill 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 B056 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 B056 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 B056 Landfill. 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 B056 Landfill. 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 B, ATTACHMENT B-3

BUILDING 056 LANDFILL (SWMU 7.1)

LABORATORY DATA QUALITY REPORT

Prepared For:

THE UNITED STATES DEPARTMENT OF ENERGY

Prepared by:

MEC^X, LLC
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Elizabeth A. Wessling
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PROGRAM QA/QC MANAGER

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618 Michillinda Ave., Suite 200
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Lisa Tucker
MWH
PROJECT CHEMIST

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

September 2007

TABLE OF CONTENTS

APPENDIX B, ATTACHMENT 3

Section No. **Page No.**

LIST OF ACRONYMS AND ABBREVIATIONS

CAS	Columbia Analytical Services
CEL	Calscience Environmental Laboratory
DTSC	Department of Toxic Substances Control
EDL	Estimated Detection Limit
GC/MS	Gas Chromatography/Mass Spectroscopy
GEL	General Engineering Laboratories
ICSA	Interference Check Sample A
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.
OCDD	Octachlorodibenzo-p-dioxin
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
TCDF	Tetrachlorodibenzofuran
TIC	Tentatively Identified Compound
TPH	Total Petroleum Hydrocarbons

USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

B3.1 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). Samples were analyzed for a variety of compounds including those analyzed in the Group 8 Building 056 Landfill (B056) sampling effort:

- Volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) SW-846 Method 8260B
- Semivolatile organic compounds (SVOCs) by USEPA SW-846 Method 8270C
- Polynuclear Aromatic Hydrocarbons (PAHs) by USEPA SW-846 Methods 8270C and 8270C Selected Ion Monitoring (SIM)
- n-Nitrosodimethylamine by USEPA SW-846 Method 8270C SIM
- Polychlorinated biphenyls (PCBs) by USEPA SW-846 Method 8082
- Total petroleum hydrocarbons (TPH) by USEPA SW-846 Method 8015B, modified
- Metals by USEPA SW-846 Methods 6010B and 6020
- Mercury by USEPA SW-846 Methods 7471A (soil samples) and 7470A (water samples)
- Dioxins and furans by USEPA Method 1613B
- Energetic compounds (Energetics) by USEPA SW-846 Method 8330
- General Minerals - pH by USEPA SW-846 Method 9045C, fluoride by USEPA Method 300, perchlorate by USEPA Method 314.0 modified for soils, and hexavalent chromium by USEPA SW-846 Method 7199.

The resulting data was validated by qualified chemists following United States Environmental Protection Agency (USEPA) guidelines as described in the RFI Quality Assurance 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 B056 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 one field blank, one equipment rinsate, two trip blanks, and one field duplicate. Unless otherwise noted, field QC samples were collected according to the Santa Susana Field Laboratory RFI QAPPs.

Data from all samples collected in support of the Group 8 B056 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 folders located in Attachment B-3.

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, 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 B056 sampling effort was not a complete field project, but an action intended to eliminate gaps in the Building 56 Landfill 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 B056 data quality is acceptable for the purposes of the RFI, with qualifications as needed based on review by MEC^X.

B3.2 QUALITY ASSURANCE FINDINGS FOR HISTORIC AND PRIMARY DATA

The quality of historic and primary data collected from the Group 8 B056 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 B056 site samples. In general, however, the quality of the historic and primary data was acceptable, except as summarized in the sections below.

B3.2.1 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, SVOCs, TPH, PCBs, and VOCs. As the samples comprising the historic data set were collected by other consulting firms, not all QC data were available; however, validation was performed to the extent possible. Historic data that was not validated is not addressed in this report. In no instance did the lack of QC data invalidate the use of the historic data for the RFI.

B3.2.2 PRIMARY DATA

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

B3.2.2.1 INTERFERENCE IN SOIL METAL ANALYSES

While not all laboratories exhibited soil matrix interference in their 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 were 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.

B3.2.2.2 COLUMBIA ANALYTICAL SERVICES VOLATILE ORGANIC COMPOUND ANALYSES

Samples were analyzed for VOCs by Columbia Analytical Services (CAS) (Canoga Park, CA) from September 1997 to September 1999. Four samples were analyzed at CAS by USEPA SW-846 Method 8260. These analyses were validated at QC Level IV and all Method 8260 results were qualified as rejected due to inappropriate manual integration of the calibration data.

The remaining VOCs analyses performed by CAS were analyzed by USEPA SW-846 Method 8021. Due to deficiencies in manual integration, the following Department of Toxic Substances Control (DTSC)-approved actions were taken:

- All reported detects were raised by 2× to account for the possible under-reporting.
- The reporting limits for bromoform and chloroform were elevated to 10 micrograms per kilogram (µg/kg), or 10 parts per billion (ppb), and qualified. As the reporting limits for soil sample target compounds were already at levels above the calibration levels affected, most reporting limits were unaffected.
- As the reporting limits for water samples were much lower, the water reporting limits were elevated to levels equivalent to the soils, 10 micrograms per liter (µg/L), or 10 ppb.

- All target compounds in all samples analyzed by CAS by 8021 were qualified as estimated detects and nondetects.

B3.2.2.3 COLUMBIA ANALYTICAL SERVICES SEMIVOLATILE ORGANIC COMPOUNDS

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

B3.2.2.4 COLUMBIA ANALYTICAL SERVICES TOTAL PETROLEUM HYDROCARBONS

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

B3.2.2.5 DIOXIN ANALYSES BY EPA METHOD SW-846 8290

Dioxin data quality was affected by practices at three different laboratories; Alta Analytical (Alta) (El Dorado Hills, CA), Pace Analytical (Pace) (Minneapolis, MN) and Triangle Laboratory (Triangle) (Durham, NC). Alta data with octachlorodibenzo-p-dioxin (OCDD) concentrations that exceeded the linear range of the calibration were qualified as estimated. Alta and Pace detects for 2,3,7,8-tetrachlorodibenzo-p-furan (TCDF) detected below the calibration range were qualified as estimated. Triangle's estimated detection limits (EDLs) were not compound-specific for each sample and are not comparable to EDLs generated according to the method and reported by other laboratories.

B3.2.2.6 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 throughout 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.

B3.3 QUALITY ASSURANCE FINDINGS FOR GROUP 8 B056 SAMPLES

Samples were collected for the Group 8 B056 in two events, one in February 2007 and another in May 2007. Soil samples collected as part of the Group 8 sampling effort at the B056 site include 6 samples for dioxin analysis, 2 samples for energetics, 38 samples for general minerals (perchlorate, pH, fluoride, and hexavalent chromium), 23 samples for metals including mercury, 11 samples for PAHs, 10 samples for PCBs, 14 samples for SVOCs, 22 samples for TPH analysis, 5 samples for VOC soil vapor constituents.

Equipment rinsate and field blank samples were collected for all analyses performed for all applicable analyses. (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.) Six field duplicate pairs were collected specific to the Group 8 B056 site.

B3.3.1 DIOXINS

SGS (formerly Paradigm), located in Wilmington, North Carolina, analyzed 4 soil samples, 1 field duplicate, 1 equipment rinsate, 1 field blank sample, and 1 laboratory split sample for 19 dioxin and furan compounds by USEPA Method 1613B. All data are usable as no results were

rejected. No results were reported at raised method detection limits (MDLs) or reporting limits (RLs).

Most target compounds were detected. OCDD in one sample exceeded the linear range of the calibration and was qualified as estimated. The laboratory did not perform a confirmation analysis for 2,3,7,8-TCDF in one sample and the results was qualified as estimated, A few target compounds in most samples were qualified as estimated nondetects due to method blank contamination. A couple target compounds were qualified as estimated detects due to target compounds reported in a field QC sample.

SGS analyzed one field duplicate pair for dioxins. The pair contained 13 common detects, all with relative percent differences (RPDs) greater than 100%. The pair was not considered to be in good agreement.

SGS also analyzed a laboratory split sample; however, as SGS also analyzed the primary sample, the laboratory split pair were regarded as field duplicates. There were 5 common detects in the pair and all RPDs were greater than 100%. There were several detects in each sample not in common between the duplicate pair. The pair was not considered to be in agreement.

B3.3.2 ENERGETICS

TestAmerica-Irvine subcontracted the energetics analyses to TestAmerica-Denver (Formerly Severn Trent Laboratories – Denver). TestAmerica-Denver analyzed 2 soil samples, 1 equipment rinsate, and 1 field blank for 18 energetic compounds by SW-846 Method 8330. All results are usable as no results were rejected. No results were reported at elevated MDLs or RLs. There were no target compounds detected in the soil samples. The reviewer noted that the results were not adjusted to account for the actual amount of soil extracted; therefore, the reviewer hand-corrected the sample results.

B3.3.3 GENERAL MINERALS AND OTHER ANALYTES

TestAmerica-Irvine analyzed 1 soil sample, 1 equipment rinsate, and one field blank for perchlorate by UEPA Method 314.0, modified for soil analysis, 1 soil sample, 1 field duplicate, 1

equipment rinsate, and 1 field blank for hexavalent chromium by USEPA SW-846 Method 7199, and 11 soil samples and 2 field duplicates for pH by USEPA SW-846 Method 9045C. All data are usable as no results were rejected. No results were reported at elevated MDLs or RLs.

Perchlorate and hexavalent chromium were not detected in the soil samples. One hexavalent chromium result was qualified as nondetected due to hexavalent chromium detected in a method blank. No other results were qualified.

One field duplicate pair for hexavalent chromium and pH and 1 field duplicate pairs for pH were collected and analyzed by TestAmerica-Irvine. Hexavalent chromium was not detected in either sample and all pH RPDs were less than 100%. The pairs were considered to be in agreement.

General Engineering Laboratories (GEL), located in Charleston, South Carolina analyzed 13 soil samples, 1 field duplicate, 1 equipment rinsate, and one field blank for fluoride by USEPA Method 300.0 and 5 soil samples for pH by SW-846 Method 9045C. All data are usable as no results were rejected. No results were reported at raised MDLs or RLs. No pH results were qualified. Fluoride was detected in all samples and a few fluoride results were qualified as estimated detects due to high MS/MSD recoveries and a laboratory duplicate RPD that exceeded the control limit.

One field duplicate pair was collected and analyzed by GEL for fluoride. Fluoride was detected in both samples with an RPD of less than 100%. The pair was considered to be in agreement.

TestAmerica-Denver analyzed 3 laboratory split samples for fluoride and 2 laboratory split samples for pH. The RPD for fluoride in one pair was marginally above the QC limit of 100%, at 107%. All other fluoride and all pH RPDs were less than 100%. Except for the one fluoride pair with the elevated RPD, the pairs were considered to be in agreement.

B.3.3.4 METALS

TestAmerica-Irvine analyzed 4 soil samples for sodium by SW-846 Method 6010B and 7 soil samples, 1 field duplicate, 1 field blank, and 1 equipment rinsate sample for 12 metals by SW-846 Methods 6010B and 6020. All data are usable as no results were rejected. No results were reported at elevated MDLs or RLs.

Most metals were detected in most of the site samples. Some metals were detected in the associated method blanks. A couple boron results were qualified as estimated due to boron detected in the method blank and a couple boron results were qualified as estimated due to boron detected in the Interference Check Sample A (ICSA). There were no field QC qualifications although some metals were detected in the equipment rinsate. Detects and nondetects for selenium were evaluated to ensure that the lowest detection limits were attained. Detection limits were consistent with the achievable sensitivities published for the method. Potential false positives and false negatives were eliminated through the review of the continuing calibration blanks and QC samples.

One field duplicate pair was collected and analyzed for metals by TestAmerica-Irvine. Silver was detected in the primary sample but was not detected in the duplicate. The pair was considered to be in agreement.

TestAmerica-Irvine subcontracted the mercury analyses to Weck Laboratories (Weck), located in City of Industry, California. Weck analyzed 7 soil samples, and 1 field duplicate, 1 equipment rinsate, and 1 field blank sample for mercury by SW-846 Methods 7470A and 7471A. All data are usable as no results were rejected. No results were reported with elevated method detection limits MDLs or RLs. No results were qualified.

GEL analyzed 5 soil samples for sodium by SW-846 Method 6010B and 3 soil samples, 1 field duplicate sample, 1 equipment rinsate, and 1 field blank for 22 metals by SW-846 Methods 6010B, 6020, 7470A, and 7471A. All data are usable as no results were rejected. Due to matrix interference, all Method 6020 analytes were reported from 2× or 10× dilutions.

Most metal analytes were detected in most of the samples. A few mercury results were qualified as estimated detects due to a negative mercury result in the associated method blank. One molybdenum result was qualified as nondetected due to molybdenum detected in a method blank. A few thallium results were qualified as estimated due to equipment rinsate contamination. Detects and nondetects for selenium were evaluated to ensure that the lowest detection limits were attained. Detection limits were consistent with the achievable sensitivities published for the method. Potential false positives and false negatives were eliminated through the review of the continuing calibration blanks and QC samples.

One field duplicate pair was collected and analyzed for metals by GEL. Boron, molybdenum, and sodium were detected in the primary sample but were not detected in the duplicate sample. All remaining detects were in common and all relative percent differences (RPDs) were less than or equal to 100 percent. The duplicate pair was considered to be in reasonable agreement.

Two laboratory split samples were analyzed by TestAmerica-Denver for metals. Antimony was rejected in both samples analyzed by TestAmerica-Denver, due to low MS/MSD recoveries; therefore, the antimony results were not assessed against the primary results. In one pair, boron was not detected in the split sample but was detected in the primary sample and zirconium was detected in the split but was not detected in the primary sample. In the other pair, boron and mercury were qualified as estimated nondetects in the split sample due to method blank contamination but were detected in the primary sample and zirconium was detected in the split but was not detected in the primary sample. All other detects were in common and all RPDs were less than 100%. The pairs were considered to be in reasonable agreement.

B3.3.5 PAHS

TestAmerica-Irvine subcontracted the PAH analyses to Calscience Environmental Laboratories (CEL), located in Garden Grove, California. CEL analyzed 6 soil samples, 1 field blank, and 1 equipment rinsate sample for 18 PAH compounds, n-nitrosodimethylamine, and added phthalates by USEPA SW-846 Method 8270C SIM. All data are useable as no data were rejected. No results were reported at elevated RLs. A few target compounds were detected in most samples. A couple samples had results for naphthalene qualified as estimated due to equipment rinsate contamination.

GEL analyzed 3 soil samples, 1 field duplicate, 1 equipment rinsate, and 1 field blank 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 RLs. A couple phthalate compounds were detected in most of the samples. A couple bis(2-ethylhexyl)phthalate results were qualified as nondetected due to a detect in the method blank.

GEL analyzed one field duplicate pair for PAH compounds. The pair had one common detect with an RPD of less than 100%. The pair was considered to be in good agreement.

One laboratory split sample was analyzed by TestAmerica-Denver for PAH compounds by 8270C SIM. One phthalate compound was detected in the primary sample that was not detected in the split sample. The split sample had four detects below the reporting limit that were not reported in the primary sample. In most cases, these detects were at concentrations below CEL's MDLs. The pair was considered to be in reasonable agreement. 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.

B3.3.6 PCBS

TestAmerica-Irvine analyzed 4 soil samples, 1 filed duplicate, 1 field blank, and 1 equipment rinsate sample for seven Aroclors by USEPA SW-846 Method 8082. All results are usable as no results were rejected. All results from three samples were reported from 2× dilutions due to matrix effects. No other results were reported at raised MDLs or RLs. There were no Aroclors detected in any of the samples. No results were qualified. One field duplicate pair was collected and analyzed for PCBs by TestAmerica-Irvine. There were no target compounds detected in either sample. The reviewer noted, however, that the duplicate sample was analyzed at a 2× dilution due to matrix interference. The pair was considered to be in reasonable agreement.

GEL analyzed 3 soil samples, 1 field duplicate, 1 equipment rinsate, and 1 field blank for seven Aroclors by SW-846 Method 8082. All results are usable as no results were rejected. In order to report target compounds within the linear range of the calibrations, all results from 2 samples were reported from 10× dilutions. A couple Aroclors were detected in most of the samples. One result for Aroclor 1248 was qualified as estimated due to an elevated intercolumn percent

difference (%D). One field duplicate pair was collected and analyzed for PCBs by GEL. There were common detects for two target compounds, both with RPDs less than 100%. The pair was considered to be in good agreement.

One laboratory split sample was analyzed by TestAmerica-Denver for seven Aroclors by SW-8082. No target compounds were detected in either sample.. The pair was considered to be in reasonable agreement. 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.

B.3.3.6 SVOCS

GEL analyzed 13 soil samples, 1 field duplicate, 1 equipment rinsate, and one field blank for 69 SVOC compounds and tentatively identified compounds (TICs). All data are usable as no results were rejected. All results from one sample were reported from a 4× dilution due to matrix interference. No other results were reported at elevated MDLs or RLs. A couple phthalate compounds were detected in a few of the samples. No target compound results were qualified. Some TIC results were rejected as they were indicative of column breakdown, extraction contamination, or were detected in an associated method blank. GEL analysts and MEC^X data validators reviewed the TIC data for specific semivolatile compounds and classes of compounds, such as glycols, and none were identified.

One field duplicate pair was collected and analyzed for SVOCs and TICs by GEL. There were no target compounds detected in either sample. The pair was considered to be in agreement. 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.

B.3.3.7 TPH

TestAmerica-Irvine analyzed 3 soil samples, 1 field blank, and 1 equipment rinsate sample for four hydrocarbon ranges by USEPA SW-846 Method 8015B, modified. All data are usable as no results were rejected. All results were reported from 2× dilutions due to matrix interference. A detect in one target range was reported below the RL in one sample. No results were qualified.

GEL analyzed 13 soil samples, 1 field duplicate, 1 equipment rinsate, and 1 field blank for terphenyl compounds and 3 soil samples, 1 field duplicate, 1 field blank, and 1 equipment rinsate sample for four hydrocarbon ranges by USEPA SW-846 Method 8015B, modified. All data are usable as no results were rejected. All terphenyl results in four samples were reported from 10× dilutions due to the oily nature of the sample extracts. No other results were reported at elevated RLs or MDLs. No terphenyl compounds were detected. A couple of detects in target ranges were reported in most samples. All results for target range C8-C11 were qualified as nondetected due to method blank contamination. Results for a couple target ranges on one sample were qualified as estimated detects due to a surrogate recovery above the QC limits.

One field duplicate pair was collected and analyzed by GEL for terphenyl compounds and one field duplicate pair was collected and analyzed for TPH. Terphenyl compounds were not detected in either sample and the pair was considered to be in good agreement. There was a common detect for one target range in the other field duplicate pair, with an RPD of less than 100%. One target range was detected below the reporting limit in the duplicate sample only. The pair was considered to be in reasonable agreement.

One laboratory split sample was analyzed by TestAmerica-Denver for TPH by SW-846 Method 8015B. There were no target ranges reported in either sample. The pair was considered to be in good agreement. 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.

B3.3.8 VOCS IN SOIL VAPOR SAMPLES

Centrum Analytical, located in Riverside, California, used a mobile lab to analyze 4 soil vapor samples, 1 field duplicate, and one field blank for 24 VOCs by USEPA SW-846 Method 8260B modified for soil vapor constituents. All data are usable as no data were rejected. No results were reported at elevated RLs or MDLs. All results for chloroethane was qualified as estimated nondetects due to a continuing calibration recovery below the QC limits and all results for 1,1-dichloroethene were qualified as estimated nondetects due to an LCS recovery below QC limits.

Centrum Analytical analyzed one field duplicate pair for VOCs. There were no target compounds detected in either sample and the pair was considered to be in good agreement.

B3.4 REFERENCES

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

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

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SOIL

SOIL CASE NARRATIVES AND COCS

CEIMIC
Corporation

"Analytical Chemistry for Environmental Management"

October 17, 2003

Ms. Lisa Tucker
MWH, Inc.
1230 Columbia Street, Suite 750
San Diego, CA 92101-8536

Dear Ms. Tucker:

Enclosed are the results for the analyses performed in support of MWH's Boeing SSFL project, SDG No. MF003. The 1 soil and 2 water samples were received at Ceimic Corporation on September 19, 2003.

This sample is reported under Ceimic Project Number 031290, 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,

Ines Bauer
Laboratory Manager

T = 5°C
Collected = 9/17/03
Analyzed = 9/30/03 "J"
COC: Uninitialed corrections. Accts
LCS: 1 std - OK

Enclosures

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

SDG Narrative

The enclosed data package is in response to MWH's Boeing SSFL project, SDG No. MF003. Under this SDG, there are 2 VOA, 1 TPH-DRO, 1 PCB, and 1 SIM analysis for the samples received at Ceimic Corporation on September 19, 2003.

This data package includes the analysis for the following sample from SDG No. MF003, which is billable:

(1)

Client ID	Ceimic ID	Analysis
MF004	031290-02	VOA
MF005	031290-03	VOA, TPH-DRO, PCB, SIM

Sample Receipt

Cooler Temperatures upon receipt were 5°C.

(2) **Instrumentation and Column Identification**

The following instruments were used for the analyses:

GC/MS Analysis

A. VOA

MS15 HP5970B GC/MS,105m, 0.53mm ID, 3 um, RTX-VOL megabore column
OI trap #10 (8cm Tenax, 8cm silica gel, 8cm carbon molecular sieve)

B. SIM

MS1 HP5890SeriesII GC, HP5972MS,30 m,25 mm ID, ZB-5 fused silica capillary column

C. TPH-DRO

AD23_1: HP5890II (GC9) using 30m x 0.53mm ID, DB5 capillary column

D. PCB

AD8: HP5890II (GC7) using 30m x 0.53mm ID, DB5 megabore column
AD9: HP5890II (GC7) using 30m x 0.53mm ID, DB5 megabore column

(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. VOA

The %moisture of the soil sample was:

Client ID:	Ceimic ID:	%M:
MF005	031290-03	13

The pH of the water sample was:

Client ID:	Ceimic ID:	pH:
MF004	031290-02	1

Manual quantitations were performed on one or more of the process files associated with this SDG, including sample MF005. 1,1-Dichloroethene did not meet percent difference (%D) criteria (maximum of 20.0) in the associated continuing calibration. 1,1-Dichloroethene had a %D of 26.45 (high). This analyte was not recovered in either sample and holding times had expired; therefore, we are reporting the initial analyses of these samples.

B. SIM

The pH and %moisture of the soil sample as:

Client ID:	Ceimic ID:	pH	%M
MF005	031290-03	6.7	13

The soil sample was re-analyzed at a dilution:

Client ID:	Ceimic ID:	Dilution:
MF005	031290-03	20:1

The concentration of bis(2-ethylhexyl)phthalate in SBLKAK exceeded contamination criteria limits. The sample associated with this method blank, MF005, contained high levels of bis(2-ethylhexyl)phthalate.

C. TPH-DRO (Method 8015B)

All samples were extracted and analyzed within their respective holding times.

n-Decane recovery was marginally high in F0923-LCS4 (105%). All other recoveries were within the QC limits.

p-Terphenyl responses were low in CCVs TPHA0B (-31.9%) and TPHA0C (-26.4%). Since the responses of the other two surrogates were in control and the p-Terphenyl recoveries were all within the QC limits, the samples were not re-analyzed.

No other non-compliances were noted.

D. PCB (Method 8082)

All samples were extracted and analyzed within their respective holding times.

The following responses were high in CCVs (in %D):

CCV	AR1016	AR1260	TCX	DCB
AR1660M0C	19.9	21.0	23.9	21.8
AR1660M0D	18.5	18.9	23.5	22.7
AR1660M1C			15.9	27.4
AR1660M1D			16.8	35.3

The sample showed no positive detects.

No other non-compliances were noted.

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.

Ines Bauer, Laboratory Manager

10/17/03

Date

Inorganic Chemistry SDG Narrative

Laboratory Name: Ceimic Corporation
Case No.: BOEING
SDG No.: MF003
Contract: 1890812.0116
Ceimic Project No.: 031290

The following soil sample was received at Ceimic Corporation on September 19, 2003:

Client ID	Ceimic ID
MF003	031290-03

Comments on Data Package

This sample was received for total metal analysis by SW846 Method 6010B, mercury by SW846 7471, and pH by method 9045.

QA/QC Samples:

A spike and duplicate analysis was not designated by the client, therefore these analyses were not performed.

Observations:

For Metals, a "U" flag in the C column on the sample result forms (Form I-IN) indicates that the concentration of that analyte in the sample is undetected at the method detection limit (MDL). If analytes are detected in either the initial calibration blank or the continuing calibration blanks at concentrations between the MDL and that of the CRQL check (CRI) standard, a "B" flag is shown in the C column on the Form I-IN and Form III.

Deviations from Contract:

For 6010B Metals, lead response is low (89%) in the final continuing calibration verification standard. The limits of response are 90-110%. The only samples associated with this standard are the final CRQL check (CRI) standard and the interference check standards (ICS).

End of Case 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 has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Ryan C. Montalbano

Ryan Montalbano
Supervisor, Inorganic Laboratories

10/17/03
Date

031290
3,100

MWH MONTGOMERY WATSON HARZA

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

Chain of Custody

Control Number: COC ~~MT 742~~ MT 003

Date 9 / 17 / 03 Page 1 of 1

Project Manager:	~~Dixie Hambuck~~ GLENN JAPPS
Project Name:	Boeing SSFL
Project Number:	1890818.0116
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~~ 300 N. LAKE AVE, SUITE 1200

Sample Disposal Instructions:	Laboratory Disposal
Shipment Method:	LAB PICK-UP
Comment:	B56 LANDFILL

Cooler No.
QC Level:
TAT: NORMAL

Sample ID	Description (for MWH use only)	SWMU	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	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)	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
1 ~~MT 742~~ MF003	BLLS38S01	7.1		9/17/03	1022				X																X				1
2 ~~MT 743~~ MF004	BLQW16T01	↓		9/16/03	1500				X		X																		2
3 ~~MT 744~~ MF005	BLTS26S01	↓	6	9/17/03	1010			X			X	X	X					X		X	X								5

BU 9/17/03

	Date	Time
Samplers Signature: [signature]	9/17/03	1620
Relinquished By:	Date	Time
Received By: Elizabeth Astuvig	9/19/03	10:00
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

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:

CEIMIC
Corporation
"Analytical Chemistry for Environmental Management"

October 8, 2003

Ms. Lisa Tucker
MWH, Inc.
1230 Columbia Street, Suite 750
San Diego, CA 92101-8536

Dear Ms. Tucker:

Enclosed are the results for the analyses performed in support of MWH's Boeing SSFL project, SDG No. MF001. The 1 soil and 1 water sample were received at Ceimic Corporation on September 6, 2003.

This sample is reported under Ceimic Project Number 031213, 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,

Ines Bauer
Laboratory Manager

Enclosures

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

SDG Narrative

The enclosed data package is in response to MWH's Boeing SSFL project, SDG No. MF001. Under this SDG, there are 2 VOA, 1 TPH-DRO, 1 PCB, and 1 SIM analysis for the samples received at Ceimic Corporation on September 6, 2003.

This data package includes the analysis for the following sample from SDG No. MF001, which is billable:

(1)

Client ID	Ceimic ID	Analysis
MF001	031213-01	VOA, TPH-DRO, PCB, SIM
MF002	031213-02	VOA

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. VOA

MS15 HP5970B GC/MS,105m, 0.53mm ID, 3 um, RTX-VOL megabore column
OI trap #10 (8cm Tenax, 8cm silica gel, 8cm carbon molecular sieve)

B. SIM

MS11 HP6890 GC, HP5973MS,30 m,25 mm ID, ZB-5 fused silica capillary column

C. TPH-DRO

AD23_1: HP5890II (GC9) using 30m x 0.53mm ID, DB5 capillary column

D. PCB

AD8: HP5890II (GC7) using 30m x 0.53mm ID, DB5 megabore column
AD9: HP5890II (GC7) using 30m x 0.53mm ID, DB5 megabore column

(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. VOA

The %moistures of the soil sample was:

Client ID:	Ceimic ID:	%M:
MF001	031213-01	5

The pHs of the water sample was:

Client ID:	Ceimic ID:	pH:
MF001	031213-02	1

In the initial analysis of MF001, the recovery of the System Monitoring Compound (SMC), bromofluorobenzene, failed quality control criteria. The sample was re-analyzed and the SMC again failed recovery criteria. We have attributed the failing SMC recoveries to the particular matrix of the sample. Therefore we have reported both analyses of MF001. Due to the limited sample received for MF001 and MF002, no matrix spike duplicates were prepared and analyzed. There is no Form VII in the deliverables package for the batch analyzed on instrument MS#15 on 09/17/03 associated with the BFB injected at 1623. This batch included an initial calibration and the relevant relative response factors are all displayed on the appropriate Form VI. The initial calibration met all acceptance criteria and therefore samples could be analyzed without having to inject a continuing calibration verification standard.

B. SIM

The %moisture of the soil sample was:

Client ID:	Ceimic ID:	%M
MF001	031213-01	5

The sample was reanalyzed at a dilution:

Client ID:	Ceimic ID:	Dilution:
MF001	031213-01	100:1

Manual quantitations were performed on one or more of the process files associated with this SDG, including sample MF001DL. The concentration of bis(2-ethylhexyl)phthalate in SBLKKW exceeded contamination criteria limits. The sample associated with this method blank, MF001, did contain similar levels of bis(2-ethylhexyl)phthalate. The associated Laboratory Control Sample (LCS) met overall accuracy criteria. The recovery of the spike compound bis(2-ethylhexyl)phthalate was flagged as an outlier (high) in SLCSKW.

C. TPH-DRO (Method 8015B)

All samples were extracted and analyzed within their respective holding times.

The following Surrogate recoveries were outside the QC limits:

Sample	% n-Decane	% n-Eicosane	% p-Terphenyl
MF001	31	46	45

The low surrogate recoveries are most likely due to matrix effects caused by high molecular weight components in the sample material. The sample extract showed a deep brown color and also high viscosity, which would be a further indication of the presence of non-volatile matrix. The recoveries in the associated blank and laboratory control sample are well within the QC limits.

No other non-compliances were noted.

D. PCB (Method 8082)

All samples were extracted and analyzed within their respective holding times.

The following recoveries were slightly high in PLCS01: TCX (108%) and Aroclor-1016 (106%). There were no Aroclor hits detected in the sample.

The following responses were high in CCVs (in %D):

CCV	TCX
AR1660M0C	16.5
AR1660M0D	16.4
AR1660M1D	17.7

No other non-compliances were noted.

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.

Ines Bauer, Laboratory Manager

10/9/03

Date

Inorganic Chemistry SDG Narrative

Laboratory Name: Ceimic Corporation
Case No.: BOEING
SDG No.: MF001
Contract: 1890812.0116
Ceimic Project No.: 031213

The following one soil sample were received at Ceimic Corporation on September 6, 2003:

Client ID	Ceimic ID
MF001	031213-01

Comments on Data Package

These samples were received for total metal analysis by US EPA Method 6010B, mercury by USEPA 7471, and pH by method 9045.

QA/QC Samples:

Thallium failed in the CCV following the original sample analysis. The sample was reanalyzed a second time for thallium in a subsequent analytical sequence.

Observations:

The CCB and ICB standards had a negative result for Sodium ranging from –252 ppb to -484 ppb.

Deviations from Contract:

A spike and duplicate analysis was not designated by the client, therefore these analyses were not performed.

End of Case 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 has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Henry Leibovitz
Technical Laboratory Director

10/02/03
Date

Inorganic SDG Narrative

Client Case ID: Boeing SSFL
Ceimic Project No.: 031213
SDG No.: MF001

The following sample was received at Ceimic Corporation on September 6, 2003:
MF001
The above sample was analyzed for Perchlorate (314.0).

Comments on Data Package:
Sample Receipt:

All samples were received at a reduced temperature and were intact and properly preserved.

Observations:

None.

Deviations from SOW:

None.

End of case 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. The Laboratory Manager or his designee, as verified by the following signature, has authorized release of the data contained in this hardcopy data package.

Thomas Sawyer
Analytical Chemist

9/16/03
Date

031213
6, VOA

MWH
MONTGOMERY WATSON HARZA

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

Chain of Custody

Control Number: COC MF001

Date 9 / 05 / 03 Page 1 of 1

Project Manager: ~~Dixie Hambrick~~ GLENN JAFFE
Project Name: Boeing SSFL
Project Number: 1890812.0116
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~~ 300 N. LAKE AVE, SUITE 1200

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: FED EX
Comment: B56 LANDFILL

Cooler No.
QC Level:
TAT: NORMAL

Preservatives: HCL, pH<2 4°C (8260B VOC); HCL, pH<2 4°C (8015BM TPH); 4°C (8270CSIM SVOC); 4°C (8270C SVOC); 4°C (8290 DIOXINS); H2SO4, pH<2 4°C (8315A FORMALDEHYDE); 4°C (8330 ORDNANCE); HNO3, pH<2 4°C (6000/7000 METALS); 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)

Sample Data

	Sample ID	Description (for MWH use only)	SWMU	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product
01	MF001	BLBS22S01	7.1	2	9/5/03	1310			X		
02	MF002	BLQW1035T01	7.1		9/6/03	1500				X	

BK 9/5/03

Sample ID	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
MF001	X	X	X					X		X	X				X					5
MF002	X																			2

	Date	Time
Samplers Signature: [signature]	9/5/03	1500
Relinquished By:		
Received By:		
Relinquished By:		
Received By (LAB): Elizabeth [signature]	9/6/03	10:00

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: No! per L. Tucker, 9/10/03
~~ANALYZE FOR TCLP AND/OR STLC AS NEEDED FOR WASTE CHARACTERIZATION~~ K.R.
* VOC COLLECTED W/ ENCORE SAMPLER

L9902672

Monday, August 23, 1999

Lisa Arrasmith
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9902672

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 6/14-17/99.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296A, expiration August 2000).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

00001

CAS CSR #L9902672

Table of Contents

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9702672
Project:	Rocketdyne SSFL 313150002	**Date Received:**	6/14-17/99
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Internal Login Summary Report" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses.

The following changes were requested via fax from Lisa Arrasmith on 7/7/99:
Added PCBs to RS293 & RS294.
The following changes were requested via fax from Lisa Arrasmith on 7/12/99:
Added PCBs to RS288 (outside of holding time).
The following changes were requested via fax from Lisa Arrasmith on 7/14/99:
Requested re-extract/re-analysis of RS875 for PCBs (outside of holding time).

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

The following difficulties were experienced during analysis of this batch:

8270SIM surrogate diluted out and not reportable for RS288DL

8021VOC acetone did not confirm for RS880

Aluminum MS/MSD not calculated due to high target concentration. Selenium MS was below range, however MSD and LCS were within range, therefore data was approved

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 8/23/99

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
14-AUG-99 11:38

Service Req. No. L9902672 | Project No. 313150002 | Bottles: 20 - Canisters/Decore
Client No. 154375 | Project Name Rocketdyne
Client Name Ogden Environmental

Bill To: Ogden Environmental
Attn: Accounts Payable
5510 Morehouse Dr.
San Diego, CA 92121

Report To: Ogden Environmental
Lisa Arrasmith
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No. RS870 | Site ID
Logged In By SMALONE | Project Chemist Leo Raab
ISR Num
COC Received Y
Samples Submitted 14-JUN-99 thru 17-JUN-99 | Note: This Service Request has been invoiced - # 508233 | Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	8021	ICP-2	PH	TPH-FC-CA	TS GEN	SIM-PP	PCB-8080	DIGEST	TITLE 22 METALS
L9902672-001	RS874	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III	III	III	III	III
L9902672-002	RS875	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III	III	III	III	III
L9902672-003	RS876	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III	III	III	III	III
L9902672-004	RS287	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III	III		III	III
L9902672-005	RS288	SOIL	17-JUN-99	28-JUL-99		III	III	III	III	III	III	III	III
L9902672-006	RS289	SOIL	17-JUN-99	28-JUL-99		III	III	III	III	III		III	III
L9902672-007	RS290	SOIL	17-JUN-99	28-JUL-99		III	III	III	III	III		III	III
L9902672-008	RS291	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III	III		III	III
L9902672-009	RS292	SOIL	17-JUN-99	28-JUL-99		III	III	III	III	III		III	III
L9902672-010	RS293	SOIL	17-JUN-99	28-JUL-99				III	III		III		
L9902672-011	RS294	SOIL	17-JUN-99	28-JUL-99				III	III		III		
L9902672-012	RS295	SOIL	17-JUN-99	28-JUL-99				III	III				
L9902672-013	RS296	SOIL	17-JUN-99	28-JUL-99				III	III				
L9902672-014	RS297	SOIL	17-JUN-99	28-JUL-99				III	III				
L9902672-015	RS298	SOIL	17-JUN-99	28-JUL-99				III	III				
L9902672-016	RS299	SOIL	17-JUN-99	28-JUL-99		HOLD	HOLD		HOLD			HOLD	HOLD
L9902672-017	RS878	SOIL	17-JUN-99	28-JUL-99		III	III	III	III	III		III	III
L9902672-018	RS879	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III	III		III	III
L9902672-019	RS880	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III	III		III	III
L9902672-020	RS881	SOIL	17-JUN-99	28-JUL-99				III	III				
L9902672-021	RS875RE	SOIL	14-JUN-99	28-JUL-99							III		

03034

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By:_____

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
14-AUG-99 11:38

Service Req. No. L9902672 | Project No. 313150002 | Bottles: 20 - Canisters/Decore
Client No. 154375 | Project Name Rocketdyne
Client Name Ogden Environmental

Bill To: Ogden Environmental
Attn: Accounts Payable
5510 Morehouse Dr.
San Diego, CA 92121

Report To: Ogden Environmental
Lisa Arrasmith
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No. RS870 | Site ID
Logged In By SMALONE | Project Chemist Leo Raab
ISR Num
COC Received Y
Samples Submitted 14-JUN-99 thru 17-JUN-99 | Note: This Service Request has been invoiced - # 508233 | Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	TITLE 22 METALS AS/GFAA	TITLE 22 METALS HG/CVAA	TITLE 22 METALS SE/GFAA	TITLE 22 METALS TL/GFAA	TITLE 22 METALS ICP-13
L9902672-001	RS874	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-002	RS875	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-003	RS876	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-004	RS287	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-005	RS288	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-006	RS289	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-007	RS290	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-008	RS291	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-009	RS292	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-010	RS293	SOIL	17-JUN-99	28-JUL-99					
L9902672-011	RS294	SOIL	17-JUN-99	28-JUL-99					
L9902672-012	RS295	SOIL	17-JUN-99	28-JUL-99					
L9902672-013	RS296	SOIL	17-JUN-99	28-JUL-99					
L9902672-014	RS297	SOIL	17-JUN-99	28-JUL-99					
L9902672-015	RS298	SOIL	17-JUN-99	28-JUL-99					
L9902672-016	RS299	SOIL	17-JUN-99	28-JUL-99	HOLD	HOLD	HOLD	HOLD	HOLD
L9902672-017	RS878	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-018	RS879	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-019	RS880	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-020	RS881	SOIL	17-JUN-99	28-JUL-99					
L9902672-021	RS875RE	SOIL	14-JUN-99	28-JUL-99					

Comments:

L9902672	DRY WT
L9902672	EDD
L9902672	Expect more samples Thursday 6/17.
L9902672	ICP-2: Al & B
L9902672	PCB-8080: -010 & 011: Added 7/8/99.
L9902672	SIM-PP: 8270 SIM
L9902672-005	PCB-8080: Added 7/12/99.
L9902672-021	PCB-8080: Added Previously -002 Re-extract/Re-Run

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__ | Reviewed By:_____

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

L9902672
L9902687
Control Number: COC RS874
Date 6/14/99 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Demey~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment: RS877 = trip blank
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:
QC Level: Level4 TAT: 28 - Day

Analysis	8260M VOC	8015 HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	6010 METALSA(AL,B)	7196 CrVI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*
Preservatives	HCL, pH<2 4°C	H2SO4, pH<2 4°C	4°C	4°C	4°C	4°C	H2SO4,pH<2 4°C	4°C	HNO3, pH<2 4°C	HNO3, pH<2 4°C	4°C	4°C	4°C	4°C

DLS#	Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	8260M VOC	8015 HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	6010 METALSA(AL,B)	7196 CrVI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*			Extra Volume MS/MSD	HOLD	Total # of Bottles
13	RS874	BLBS12S01	1.0	6/14/99	1145	1	HA	7.1	X				X	X	X	X		X			X					X					
14	RS875	BLBS13S01	1.0	↓	1200	2	↓	↓	X				X	X	X	X		X			X					X					
15	RS876	BLBS14S01	1.0	↓	1215	3	↓	↓	X				X	X	X	X		X			X					X					
—	RS877	BLQW03T01	—	6/14/99	—	4 (SH)	—	—		X			X																		1

JB 6/14/99

	Date	Time
Samplers Signature: [signature]	6-14-99	12:30
Relinquished By: Thomas J [signature]	6/14/99	1400
Received By: Sharon Malone	6/14/99	1400
Relinquished By:		
Received By (LAB):		

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 N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 4°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

000006

L9902612
L9902687
RS 287

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC
Date 6/17/99 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment: TPH only on RS293
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No: R12
QC Level: Level4 TAT: 28 - Day

Preservatives: HCL, pH<2 4°C | H_2SO_4, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C

ULS#	Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	~~8260M~~ 8021 VOC	8015MG/M HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	6010 METALSA(AL,B)	7196 CrVI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*			Extra Volume MS/MSD	HOLD	Total # of Bottles
36	RS287	OCTS@5S@1	3'	6/17/99	1040	4	HA	7.4	X				X	X	X	X					X					X					4
35	RS288	OCTS@6S@1	2'		1100	5							X	X	X						X					X					4
37	RS289	OCTS@7S@1	2.5'		1125	6							X	X	X						X					X					4
38	RS290	OCTS@8S@1	2'		1155	7							X	X	X						X					X					4
120 TB	RS291	OCTS@9S@1	1'		1435	8							X	X	X						X					X					4
40	RS292	OCTS10S@1	1'		1440	9							X	X	X						X					X					4
41	RS293	OCTS11S@1	0.75'		1455	10							X	X	X																4
43	RS294	OCTS12S@1	1.5'		1505	11							X	X																	4
42	RS295	OCTS13S@1	2'		1605	12							X	X																	4
44	RS296	OCTS14S@1	1.0'		1610	13							X	X																	4
27	RS297	OCTS15S@1	4'		1640	14							X	X																	4
28	RS298	OCTS15S@2	4'		1645	15							X	X																	4

Samplers Signature	Date 6/17/99	Time 1700
Relinquished By:	Date 6/17/99	Time 19:30
Received By:	Date 6/18/99	Time 19:30
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number: L9902687

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, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 2°C

No VOC's on RS 288, 289, 290, 292, 293
=
No SVOCs on RS287

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L9902612
L9902687

RS878

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC

Date 6/17/99 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

DXB

Bill To:	~~Mark Denley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:	R12		
QC Level:	Level4	TAT:	28 - Day

Preservatives	HCL, pH<2 4°C	H_2SO_4, pH<2 4°C	4°C	4°C	4°C	4°C	H_2SO_4,pH<2 4°C	4°C	HNO_3, pH<2 4°C	HNO_3, pH<2 4°C	4°C	4°C	4°C	4°C					

Sample Data						Field Data		Matrix				~~8260M~~ 8021 VOC	8015OG HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	6010 METALSA(AL,B)	7196 CrVI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*			Extra Volume MS/MSD	HOLD	Total # of Bottles
Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge																			
RS878	OCSS02S01	0	6/17/99	1345	17	HA	7.4	X				X		X						X					X					
RS879	OCBS23S01	0.5	"	1400	18	"	"	"				X	X	X						X					X					
RS880	OCBS24S01	1.0	"	1535	19	"	"	"				X	X	X						X					X					
RS881	OCBS07S01	1.0	"	1705	20	"	"	"					X																	
RS882	OCQW02T02	—	"	1815		—	"		X			X																		

JB. 6/17/99

ULS
20
21
24
4
1

Samplers Signature	Date	Time
Thomas L. Sato	6/17/99	1830
Relinquished By:	Date	Time
	6/17/99	19:30
Received By:	Date	Time
	6/17/99	19:30
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number: L9902128

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, Ogden contacted: Y or N

Date contacted: ___/___/___

Temperature °C 2°C

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L9902687
L9902672
RS299

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC
Date 6/17/99 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Denley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:	6R35		
QC Level:	Level4	TAT:	28 - Day

Preservatives: HCL, pH<2 4°C; H_2SO_4, pH<2 4°C; 4°C; 4°C; 4°C; 4°C; H_2SO_4,pH<2 4°C; 4°C; HNO_3, pH<2 4°C; HNO_3, pH<2 4°C; 4°C; 4°C; 4°C; 4°C

Sample Data						Field Data		Matrix																									
Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	~~8260B~~ 8260B VOC	8015OG HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	6010 METALSA(AL,B)	7196 CrVI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*			Extra Volume MS/MSD	HOLD	Total # of Bottles
RS299	DCTS16S01	3'	6/17/99	1720	16	HA	7.4	X				X								X					X				X	
RS300	DCQW02E01	—	6/17/99	1815		—	7.4		X			X		X						X					X					6
RS301	DCQW02T01	—	↓	1815		—	7.4		X			X																		2
~~RS302~~	~~DCQW02T02~~			1815			7.4		X			X																		2

JS, 6/17/99

Sampler's Signature	Date 6/17/99	Time 1830
Relinquished By:	Date 6/17/99	Time 19:30
Received By:	Date 6/17/99	Time 19:30
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number: L9902728

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, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 2°C

* HOLD RS299

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN ENVIRONMENTAL AND ENERGY SERVICES

5510 Morehouse Drive
San Diego, CA 92121-1709
(619) 458-9044
fax: (619) 458-0943

FACSIMILE

To: Mr. Leo Raab/Columbia Analytical Services
Fax No.: (818) 587-5555

From: Lisa Arrasmith *sign:* Lisa Arrasmith

Date: 7/7/99 There are 1 Page to transmit including this cover page

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

Dupes ok to run outside of hold time 7/8/99 am

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.
These changes supersede the previous C-O-C Analysis Request Change 6/12/98.

COC No.	EPA Sample ID	Date Collected	Method (s) Originally Requested[a]	Method (s) Now Requested[a]
RS287	RS293	6/17/99	OG	OG & PCBs
RS287	RS294	6/11/98	OG	OG & PCBs

(a) OG = 8015OG, TPH PCBs= Polychlorinated Biphenyls, 8080

The reason for these changes is:

L9902672-010
-011

Incorrectly marked on COC form ____
Lack of sample volume ____
Ogden office personnel require this change X
Other: Containers mislabeled ____

Thank you.

00010

OGDEN *ENVIRONMENTAL AND ENERGY SERVICES*

5510 Morehouse Drive
San Diego, CA 92121-1709
(619) 458-9044
fax: (619) 458-0943

FACSIMILE

To: Mr. Leo Raab/Columbia Analytical Services
Fax No.: (818) 587-5555

From: Lisa Arrasmith *sign:* Lisa Arrasmith

Date: 7/12/99 There are 1 Page to transmit including this cover page

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

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.
These changes supersede the previous C-O-C Analysis Request Change 6/12/98.

COC No.	EPA Sample ID	Date Collected	Method (s) Originally Requested[(a)]	Method (s) Now Requested[(a)]
RS287	RS288	6/17/99	OG, S, M & pH	OG OG, S, M, pH & PCBs

(a) OG = 8015OG, TPH PCBs= Polychlorinated Biphenyls, 8080
S = SVOCs, 8270SIM
M = MetalsRT

L9902672-5

Please run RS288 for PCBs even though holding time has expired.
The reason for these changes is:

Incorrectly marked on COC form _____
Lack of sample volume _____
Ogden office personnel require this change X
Other: Containers mislabeled ___ _____

Thank you.

00011

OGDEN *ENVIRONMENTAL AND ENERGY SERVICES*

5510 Morehouse Drive
San Diego, CA 92121-1709
(619) 458-9044
fax: (619) 458-0943

FACSIMILE

To: Mr. Leo Raab/Columbia Analytical Services
Fax No.: (818) 587-5555

From: Lisa Arrasmith *sign:* Lisa Arrasmith

Date: 7/14/99 There are 1 Page to transmit including this cover page

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

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.
These changes supersede the previous C-O-C Analysis Request Change 6/12/98.

COC No.	EPA Sample ID	Date Collected	Method (s) Originally Requested[a]	Method (s) Now Requested[a]
RS874	RS875	6/17/99	OG, V, S, M, Ph & PCBs	OG, V, S, M, pH & PCBs

(a) OG = 8015OG, TPH PCBs= Polychlorinated Biphenyls, 8080
S = SVOCs, 8270SIM V = 8021, Volatiles
M = MetalsRT

L9902672-002

Please reextract and rerun RS875 for PCBs even though holding time has expired.
The reason for these changes is:

Relog As

Incorrectly marked on COC form ____
Lack of sample volume ____ L9902672-021
Ogden office personnel require this change X
Other: Containers mislabeled ____ " RS875RE "

Thank you.

00312

Columbia Analytical Services inc.
An Employee-Owned Company

Monday, August 23, 1999

Lisa Arrasmith
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9902672

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 6/14-17/99.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296A, expiration August 2000).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

00001

CAS CSR #L9902672

Table of Contents

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9702672
Project:	Rocketdyne SSFL 313150002	**Date Received:**	6/14-17/99
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Internal Login Summary Report" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses.

The following changes were requested via fax from Lisa Arrasmith on 7/7/99:
Added PCBs to RS293 & RS294.
The following changes were requested via fax from Lisa Arrasmith on 7/12/99:
Added PCBs to RS288 (outside of holding time).
The following changes were requested via fax from Lisa Arrasmith on 7/14/99:
Requested re-extract/re-analysis of RS875 for PCBs (outside of holding time).

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

The following difficulties were experienced during analysis of this batch:

8270SIM surrogate diluted out and not reportable for RS288DL

8021VOC acetone did not confirm for RS880

Aluminum MS/MSD not calculated due to high target concentration. Selenium MS was below range, however MSD and LCS were within range, therefore data was approved

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 8/23/99

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
14-AUG-99 11:38

Service Req. No. L9902672
Client No. 154375
Client Name Ogden Environmental

Project No. 313150002
Project Name Rocketdyne

Bottles: 20 - Canisters/Decore

Bill To: Ogden Environmental
Attn: Accounts Payable
5510 Morehouse Dr.
San Diego, CA 92121

Report To: Ogden Environmental
Lisa Arrasmith
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No. RS870
Logged In By SMALONE
ISR Num
COC Received Y
Samples Submitted 14-JUN-99 thru 17-JUN-99

Site ID
Project Chemist Leo Raab

Note: This Service Request has been invoiced - # 508233

Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	8021	ICP-2	PH	TPH-FC-CA	TS GEN	SIM-PP	PCB-8080	~DIGEST	TITLE 22 METALS
L9902672-001	RS874	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III	III	III	III	III
L9902672-002	RS875	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III	III	III	III	III
L9902672-003	RS876	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III	III	III	III	III
L9902672-004	RS287	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III	III		III	III
L9902672-005	RS288	SOIL	17-JUN-99	28-JUL-99		III	III	III	III	III	III	III	III
L9902672-006	RS289	SOIL	17-JUN-99	28-JUL-99		III	III	III	III	III		III	III
L9902672-007	RS290	SOIL	17-JUN-99	28-JUL-99		III	III	III	III	III		III	III
L9902672-008	RS291	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III	III		III	III
L9902672-009	RS292	SOIL	17-JUN-99	28-JUL-99		III	III	III	III	III		III	III
L9902672-010	RS293	SOIL	17-JUN-99	28-JUL-99				III	III		III		
L9902672-011	RS294	SOIL	17-JUN-99	28-JUL-99				III	III		III		
L9902672-012	RS295	SOIL	17-JUN-99	28-JUL-99				III	III				
L9902672-013	RS296	SOIL	17-JUN-99	28-JUL-99				III	III				
L9902672-014	RS297	SOIL	17-JUN-99	28-JUL-99				III	III				
L9902672-015	RS298	SOIL	17-JUN-99	28-JUL-99				III	III				
L9902672-016	RS299	SOIL	17-JUN-99	28-JUL-99		HOLD	HOLD		HOLD			HOLD	HOLD
L9902672-017	RS878	SOIL	17-JUN-99	28-JUL-99		III	III	III	III	III		III	III
L9902672-018	RS879	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III	III		III	III
L9902672-019	RS880	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III	III		III	III
L9902672-020	RS881	SOIL	17-JUN-99	28-JUL-99				III	III				
L9902672-021	RS875RE	SOIL	14-JUN-99	28-JUL-99							III		

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By:_____

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
14-AUG-99 11:38

Service Req. No. L9902672 | Project No. 313150002 | Bottles: 20 - Canisters/Decore
Client No. 154375 | Project Name Rocketdyne
Client Name Ogden Environmental

Bill To: Ogden Environmental
Attn: Accounts Payable
5510 Morehouse Dr.
San Diego, CA 92121

Report To: Ogden Environmental
Lisa Arrasmith
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No. RS870 | Site ID
Logged In By SMALONE | Project Chemist Leo Raab
ISR Num
COC Received Y
Samples Submitted 14-JUN-99 thru 17-JUN-99 | Note: This Service Request has been invoiced - # 508233 | Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	TITLE 22 METALS AS/GFAA	TITLE 22 METALS HG/CVAA	TITLE 22 METALS SE/GFAA	TITLE 22 METALS TL/GFAA	TITLE 22 METALS ICP-13
L9902672-001	RS874	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-002	RS875	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-003	RS876	SOIL	14-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-004	RS287	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-005	RS288	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-006	RS289	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-007	RS290	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-008	RS291	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-009	RS292	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-010	RS293	SOIL	17-JUN-99	28-JUL-99					
L9902672-011	RS294	SOIL	17-JUN-99	28-JUL-99					
L9902672-012	RS295	SOIL	17-JUN-99	28-JUL-99					
L9902672-013	RS296	SOIL	17-JUN-99	28-JUL-99					
L9902672-014	RS297	SOIL	17-JUN-99	28-JUL-99					
L9902672-015	RS298	SOIL	17-JUN-99	28-JUL-99					
L9902672-016	RS299	SOIL	17-JUN-99	28-JUL-99	HOLD	HOLD	HOLD	HOLD	HOLD
L9902672-017	RS878	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-018	RS879	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-019	RS880	SOIL	17-JUN-99	28-JUL-99	III	III	III	III	III
L9902672-020	RS881	SOIL	17-JUN-99	28-JUL-99					
L9902672-021	RS875RE	SOIL	14-JUN-99	28-JUL-99					

Comments:

L9902672	DRY WT
L9902672	EDD
L9902672	Expect more samples Thursday 6/17.
L9902672	ICP-2: Al & B
L9902672	PCB-8080: -010 & 011: Added 7/8/99.
L9902672	SIM-PP: 8270 SIM
L9902672-005	PCB-8080: Added 7/12/99.
L9902672-021	PCB-8080: Added Previously -002 Re-extract/Re-Run

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By:_____

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

L9902672
L9902687
Control Number: COC RS874
Date 6/14/99 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment: RS877 = trip blank
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:			
QC Level:	Level4	TAT:	28 - Day

ULS#	Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge
13	RS874	BLBS12S01	1.0	6/14/99	1145	1	HA	7.1	X			
14	RS875	BLBS13S01	1.0	↓	1200	2	↓	↓	X			
15	RS876	BLBS14S01	1.0	↓	1215	3	↓	↓	X			
—	RS877	BLQW03T01	—	6/14/99	—	~~4~~ SM	—	—		X		

Preservatives	HCL, pH<2 4°C	H2SO4, pH<2 4°C	4°C	4°C	4°C	4°C	H2SO4,pH<2 4°C	4°C	HNO3, pH<2 4°C	HNO3, pH<2 4°C	4°C	4°C	4°C	4°C					
Sample ID	8260M VOC	8015 HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	6010 METALSA(AL,B)	7196 CrVI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*			Extra Volume MS/MSD	HOLD	Total # of Bottles
RS874	X	X	X	X		X			X					X					
RS875	X	X	X	X		X			X					X					
RS876	X	X	X	X		X			X					X					
RS877	X																		1

TB 6/14/99

	Date	Time
Samplers Signature: [signature]	6-14-99	12:30
Relinquished By: Thomas J [signature]	6/14/99	1400
Received By: Sharon Malone	6/14/99	1400
Relinquished By:		
Received By (LAB):		

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 N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 4°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

00006

L9902672
L9902687
RS 287

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: **COC**
Date 6/17/99 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:	Laboratory Disposal
Shipment Method:	Federal Express
Comment:	TPH only on RS293

* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:	R12		
QC Level:	Level4	TAT:	28 - Day

Preservatives: 8260M VOC: HCL, pH<2 4°C; 8015 HYDROCARBON: H_2SO_4, pH<2 4°C; 8270SIM PAH: 4°C; 8270R SVOC: 4°C; 8290 DIOXIN: 4°C; 8081C PCBs: 4°C; 3500 FORMALDEHYDE: H2SO4,pH<2 4°C; 8330 ORDINANCE: 4°C; 6010/7000 METALSRT: HNO3, pH<2 4°C; 6010 METALSA(AL,B): HNO3, pH<2 4°C; 7196 CrVI: 4°C; 340.2 FLUORIDE*: 4°C; 300 ANIONS*: 4°C; 9045/9040 pH*: 4°C

ULS#	Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	8260M VOC	8015 HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	6010 METALSA(AL,B)	7196 CrVI	340.2 FLUORIDE*	300 ANIONS*	9045/9040 pH*			Extra Volume MS/MSD	HOLD	Total # of Bottles
36	RS287	OCTS05S01	3'	6/17/99	1040	4	HA	7.4	X				X	X	X	~~X~~					X					X					
35	RS288	OCTS06S01	2'	↓	1100	5	↓	↓	↓				~~X~~	X	X						X					X					
37	RS289	OCTS07S01	2.5'	↓	1125	6	↓	↓	↓				~~X~~	X	X						X					X					
38	RS290	OCTS08S01	2'	↓	1155	7	↓	↓	↓				~~X~~	X	X						X					X					
39 ~~40~~ TB	RS291	OCTS09S01	1'	↓	1435	8	↓	↓	↓				X	X	X						X					X					
40	RS292	OCTS10S01	1'	↓	1440	9	↓	↓	↓				~~X~~	X	X						X					X					
41	RS293	OCTS11S01	0.75'	↓	1455	10	↓	↓	↓				~~X~~	X	~~X~~																
43	RS294	OCTS12S01	1.5'	↓	1505	11	↓	↓	↓					X																	
42	RS295	OCTS13S01	2'	↓	1605	12	↓	↓	↓					X																	
44	RS296	OCTS14S01	1.0'	↓	1610	13	↓	↓	↓					X																	
27	RS297	OCTS15S01	4'	↓	1640	14	↓	↓	↓					X																	
28	RS298	OCTS15S02	4'	↓	1645	15	↓	↓	↓					X																	

	Date	Time
Samplers Signature: [signature]	6/17/99	1700
Relinquished By: [signature]	6/17/99	19:30
Received By: [signature]	6/17/99	19:30
Relinquished By:		
Received By (LAB):		

For Lab Use

Lab Number: L9902458

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, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 2°C

No VOC's on RS 288, 289, 290, 292, 293

No SVOCs on RS287

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

00007

L9902687
L9902672
RS299

OGDEN
5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: **COC** RS299
Date 6/17/99 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Detfley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No: 6835
QC Level: Level4 TAT: 28 - Day

Preservatives: HCL, pH<2 4°C (8260M VOC); H_2SO_4, pH<2 4°C (8015OG HYDROCARBON); 4°C (8270SIM PAH); 4°C (8270R SVOC); 4°C (8290 DIOXIN); 4°C (8081C PCBs); H2SO4,pH<2 4°C (3500 FORMALDEHYDE); 4°C (8330 ORDINANCE); HNO3, pH<2 4°C (6010/7000 METALSRT); HNO3, pH<2 4°C (6010 METALSA(AL,B)); 4°C (7196 CrVI); 4°C (340.2 FLUORIDE *); 4°C (300 ANIONS*); 4°C (9045/9040 pH*)

VLS #

	Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	~~8260M~~ 8021 VOC	8015OG HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	6010 METALSA(AL,B)	7196 CrVI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*			Extra Volume MS/MSD	HOLD	Total # of Bottles
23	RS299	OCTS16S01	3'	6/17/99	1720	16	HA	7.4	X												X					X				X	
—	RS300	OCQW02E01	—	6/17/99	1815		—	7.4		X			X		X						X					X					6
—	RS301	OCQW02T01	—	↓	1815		—	7.4		X			X																		2
13	~~RS302~~	~~OCQW02T02~~		↓	1815			7.4		X			X																		2

JB 6/17/99

	Date	Time
Samplers Signature: [signature]	6/17/99	1830
Relinquished By: [signature]	6/17/99	19:30
Received By: [signature]	6/17/99	19:30
Relinquished By:		
Received By (LAB):		

For Lab Use

Lab Number: L9902728

* HOLD RS299

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, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 2°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L9902672
L9902687

RS878

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC

Date 6/17/99 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

DB

Bill To:	~~Mark Denley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:	R12		
QC Level:	Level4	TAT:	28 - Day

Preservatives	HCL, pH<2 4°C	H_2SO_4, pH<2 4°C	4°C	4°C	4°C	4°C	H_2SO_4, pH<2 4°C	4°C	HNO_3, pH<2 4°C	HNO_3, pH<2 4°C	4°C	4°C	4°C	4°C					

Sample Data						Field Data		Matrix				8260M VOC	8015OG HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	6010 METALSA(AL,B)	7196 Cr-VI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*			Extra Volume MS/MSD	HOLD	Total # of Bottles
Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge																			
RS878	OCSS02S01	0	6/17/99	1345	17	HA	7.4	X					X	X						X					X					
RS879	OCBS23S01	9.5	"	1400	18	"	"	"				X	X	X						X					X					
RS880	OCBS24S01	1.0	"	1535	19	"	"	"				X	X	X						X					X					
RS881	OCBS07S01	1.0	"	1705	20	"	"	"					X																	
RS882	OCQW02T02	—	"	1815		—	—		X			X																		

ULS
20
21
24
4
—

JB. 6/17/99

Samplers Signature	Thomas L. Smith	Date 6/17/99	Time 1830
Relinquished By:		Date 6/17/99	Time 19:30
Received By:		Date 6/18/99	Time 19:30
Relinquished By:		Date	Time
Received By (LAB):		Date	Time

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use	
Lab Number:	L9902128
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, Ogden contacted:	Y or N
Date contacted:	___/___/___
Temperature °C	2°C

REV: 1

OGDEN *ENVIRONMENTAL AND ENERGY SERVICES*

5510 Morehouse Drive
San Diego, CA 92121-1709
(619) 458-9044
fax: (619) 458-0943

FACSIMILE

To: Mr. Leo Raab/Columbia Analytical Services
Fax No.: (818) 587-5555

Dupes OK to run outside of hold time 7/8/99 ath

From: Lisa Arrasmith *sign:* Lisa Arrasmith

Date: 7/7/99 There are 1 Page to transmit including this cover page

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

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.
These changes supersede the previous C-O-C Analysis Request Change 6/12/98.

COC No.	EPA Sample ID	Date Collected	Method (s) Originally Requested[a]	Method (s) Now Requested[a]
RS287	RS293	6/17/99	OG	OG & PCBs
RS287	RS294	6/11/98	OG	OG & PCBs

(a) OG = 8015OG, TPH PCBs= Polychlorinated Biphenyls, 8080

The reason for these changes is:

L9902672-010
-011

Incorrectly marked on COC form ____
Lack of sample volume ____
Ogden office personnel require this change X
Other: Containers mislabeled ____

Thank you.

00010

OGDEN *ENVIRONMENTAL AND ENERGY SERVICES*

5510 Morehouse Drive
San Diego, CA 92121-1709
(619) 458-9044
fax: (619) 458-0943

FACSIMILE

To: Mr. Leo Raab/Columbia Analytical Services
Fax No.: (818) 587-5555

From: Lisa Arrasmith *sign:* Lisa Arrasmith

Date: 7/12/99 There are 1 Page to transmit including this cover page

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

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.
These changes supersede the previous C-O-C Analysis Request Change 6/12/98.

COC No.	EPA Sample ID	Date Collected	Method (s) Originally Requested[a]	Method (s) Now Requested[a]
RS287	RS288	6/17/99	OG, S, M & pH	OG OG, S, M, pH & PCBs

(a) OG = 8015OG, TPH PCBs= Polychlorinated Biphenyls, 8080
S = SVOCs, 8270SIM
M = MetalsRT

L9902672-5

Please run RS288 for PCBs even though holding time has expired.
The reason for these changes is:

Incorrectly marked on COC form ____
Lack of sample volume ____
Ogden office personnel require this change X
Other: Containers mislabeled ____

Thank you.

00011

OGDEN ENVIRONMENTAL AND ENERGY SERVICES

5510 Morehouse Drive
San Diego, CA 92121-1709
(619) 458-9044
fax: (619) 458-0943

FACSIMILE

To: Mr. Leo Raab/Columbia Analytical Services
Fax No.: (818) 587-5555

From: Lisa Arrasmith *sign:* Lisa Arrasmith

Date: 7/14/99 There are 1 Page to transmit including this cover page

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

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.
These changes supersede the previous C-O-C Analysis Request Change 6/12/98.

COC No.	EPA Sample ID	Date Collected	Method (s) Originally Requested[a]	Method (s) Now Requested[a]
RS874	RS875	6/17/99	OG, V, S, M, Ph & PCBs	OG, V, S, M, pH & PCBs

(a) OG = 8015OG, TPH PCBs= Polychlorinated Biphenyls, 8080
S = SVOCs, 8270SIM V = 8021, Volatiles
M = MetalsRT

L9902672-002

Please reextract and rerun RS875 for PCBs even though holding time has expired.
The reason for these changes is:

Relog As

Incorrectly marked on COC form	
Lack of sample volume	
Ogden office personnel require this change	X
Other: Containers mislabeled	

L9902672-021

"RS875RE"

Thank you.

00012

Columbia Analytical Services inc.

Wednesday, May 20, 1998

MAY 26 1998

Anne Freed
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9801054

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 4/8/98.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296, expiration August 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

Stuart Sigman
Quality Assurance Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

001

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9801054
Project:	Rocketdyne SSFL 313150002	**Date Received:**	4/8/98
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Internal Login Summary Report" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses.

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

MS/MSD analysis for 8270SIM was performed on sample RS753 from SDG L9801075.

The following difficulties were experienced during analysis of this batch:
For method 8270SIM, 2 of 3 surrogates for method blank were slightly above acceptance range (which would indicate a high bias) with all target compounds not detected in the blank. All other sample and QC surrogates were within acceptance range, so data was accepted. For method 8021VOC, surrogates for sample RS735 were out of range. 4-Bromochlorobenzene was slightly below range, while Fluorobenze was above range. This sample was analyzed twice with unacceptable results apparently due to matrix effects. All other samples and QC had acceptable surrogate recoveries. Confirmation of cis-1,2-Dichloroethene was confirmed for RS225 but not for RS227. For both samples, the levels found were 3-4 times the PQL, when confirmation analysis was performed several days later, one sample hit was confirmed between MDL & PQL (J flagged) and the other not most probably due to loss of volatiles.

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 5/20/98

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
19-MAY-98 10:09

Service Req. No. L9801054
Client No. 154375
Client Name Ogden Environmental

Project No. 313150002
Project Name Rocketdyne

Bottles: 20 - Canisters/Decore

Bill To: Ogden Environmental
Attn: Accounts Payable
5510 Morehouse Dr.
San Diego, CA 92121

Report To: Ogden Environmental
Anne Freed
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No.
Logged In By JWICKER
ISR Num
COC Received Y
Samples Submitted 08-APR-98

Site ID
Project Chemist Leo Raab

Note: This Service Request has been invoiced - # 503793

Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	8021	CU/ICP	SIM-PP	TCLP EXT	TPH-FC-CA	HOLD	TCLP-DIGEST	TS GEN	-DIGEST
L9801054-001	RS747	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-002	RS748	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-003	RS749	SOIL	08-APR-98	06-MAY-98				III			III		III
L9801054-004	RS232	SOIL	08-APR-98	06-MAY-98		III						III	III
L9801054-005	RS233	SOIL	08-APR-98	06-MAY-98						III			
L9801054-006	RS234	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-007	RS235	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-008	RS236	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-009	RS220	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-010	RS221	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-011	RS222	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-012	RS223	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-013	RS224	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-014	RS225	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-015	RS226	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-016	RS227	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-017	RS228	SOIL	08-APR-98	06-MAY-98								III	
L9801054-018	RS229	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-019	RS230	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-020	RS735	SOIL	08-APR-98	06-MAY-98	III	III	III					III	III
												III	

004

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By:_____

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
19-MAY-98 10:09

Service Req. No. L9801054
Client No. 154375
Client Name Ogden Environmental

Project No. 313150002
Project Name Rocketdyne

Bottles: 20 - Canisters/Decore

Bill To: Ogden Environmental
Attn: Accounts Payable
5510 Morehouse Dr.
San Diego, CA 92121

Report To: Ogden Environmental
Anne Freed
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No.
Logged In By JWICKER
ISR Num
COC Received Y
Samples Submitted 08-APR-98

Site ID
Project Chemist Leo Raab

Note: This Service Request has been invoiced - # 503793

Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	TITLE 22 METALS	TITLE 22 METALS AS/GFAA	TITLE 22 METALS HG/CVAA	TITLE 22 METALS TL/GFAA	TITLE 22 METALS ICP-13
L9801054-001	RS747	SOIL	08-APR-98	06-MAY-98					
L9801054-002	RS748	SOIL	08-APR-98	06-MAY-98					
L9801054-003	RS749	SOIL	08-APR-98	06-MAY-98	III	III	III	III	III
L9801054-004	RS232	SOIL	08-APR-98	06-MAY-98					
L9801054-005	RS233	SOIL	08-APR-98	06-MAY-98					
L9801054-006	RS234	SOIL	08-APR-98	06-MAY-98					
L9801054-007	RS235	SOIL	08-APR-98	06-MAY-98					
L9801054-008	RS236	SOIL	08-APR-98	06-MAY-98					
L9801054-009	RS220	SOIL	08-APR-98	06-MAY-98					
L9801054-010	RS221	SOIL	08-APR-98	06-MAY-98					
L9801054-011	RS222	SOIL	08-APR-98	06-MAY-98					
L9801054-012	RS223	SOIL	08-APR-98	06-MAY-98					
L9801054-013	RS224	SOIL	08-APR-98	06-MAY-98					
L9801054-014	RS225	SOIL	08-APR-98	06-MAY-98					
L9801054-015	RS226	SOIL	08-APR-98	06-MAY-98					
L9801054-016	RS227	SOIL	08-APR-98	06-MAY-98					
L9801054-017	RS228	SOIL	08-APR-98	06-MAY-98					
L9801054-018	RS229	SOIL	08-APR-98	06-MAY-98					
L9801054-019	RS230	SOIL	08-APR-98	06-MAY-98					
L9801054-020	RS735	SOIL	08-APR-98	06-MAY-98					

005

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By:_____

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
19-MAY-98 10:09

Service Req. No. L9801054
Client No. 154375
Client Name Ogden Environmental

Project No. 313150002
Project Name Rocketdyne

Bottles: 20 - Canisters/Decore

Bill To: Ogden Environmental
Attn: Accounts Payable
5510 Morehouse Dr.
San Diego, CA 92121

Report To: Ogden Environmental
Anne Freed
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No.
Logged In By JWICKER
ISR Num
COC Received Y
Samples Submitted 08-APR-98

Site ID
Project Chemist Leo Raab

Note: This Service Request has been invoiced - # 503793

Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	TITLE 22 METALS SE/GFAA
L9801054-001	RS747	SOIL	08-APR-98	06-MAY-98	
L9801054-002	RS748	SOIL	08-APR-98	06-MAY-98	
L9801054-003	RS749	SOIL	08-APR-98	06-MAY-98	III
L9801054-004	RS232	SOIL	08-APR-98	06-MAY-98	
L9801054-005	RS233	SOIL	08-APR-98	06-MAY-98	
L9801054-006	RS234	SOIL	08-APR-98	06-MAY-98	
L9801054-007	RS235	SOIL	08-APR-98	06-MAY-98	
L9801054-008	RS236	SOIL	08-APR-98	06-MAY-98	
L9801054-009	RS220	SOIL	08-APR-98	06-MAY-98	
L9801054-010	RS221	SOIL	08-APR-98	06-MAY-98	
L9801054-011	RS222	SOIL	08-APR-98	06-MAY-98	
L9801054-012	RS223	SOIL	08-APR-98	06-MAY-98	
L9801054-013	RS224	SOIL	08-APR-98	06-MAY-98	
L9801054-014	RS225	SOIL	08-APR-98	06-MAY-98	
L9801054-015	RS226	SOIL	08-APR-98	06-MAY-98	
L9801054-016	RS227	SOIL	08-APR-98	06-MAY-98	
L9801054-017	RS228	SOIL	08-APR-98	06-MAY-98	
L9801054-018	RS229	SOIL	08-APR-98	06-MAY-98	
L9801054-019	RS230	SOIL	08-APR-98	06-MAY-98	
L9801054-020	RS735	SOIL	08-APR-98	06-MAY-98	

Comments:

L9801054	SB/GFAA: Use SPLP extract.
L9801054	SIM-PP: 8270
L9801054	TCLP: SPLP
L9801054	TITLE 22 METALS:

900

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By:_____

L9801054

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 747
Date 4 / 8 / 98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment: BLUE CAP = TOP OF SLEEVE

* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:
QC Level: Level4 TAT: 28 - Day

ULS
62
14
1
-

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge
RS747	ABBS15DØ1	7	4/8/98	1750	-1	HA	A II AOC	X			
RS748	SNBS15SØ1	0.5	↓	1815	-2	↓	6.8	X			
RS749	BLBSØ1SØ1	0.5	↓	1830	-3	↓	7.1	X			
RS750	EVQWØ2EØ1	-	↓	1930		G	5.2		X		

Sample ID	8260M VOC (HCL, pH<2 4°C)	8015OG HYDROCARBON (H_2SO_4, pH<2 4°C)	8270SIM PAH (4°C)	8270R SVOC (4°C)	8290 DIOXIN (4°C)	8081C PCBs (4°C)	3500 FORMALDEHYDE (H2SO4,pH<2 4°C)	8330 ORDINANCE (4°C)	~~6010/7000~~ ILM02 ISR METALSRT (HNO3, pH<2 4°C)	6010 METALSA(AL,B) (HNO3, pH<2 4°C)	7196 CrVI (4°C)	340.2 FLUORIDE * (4°C)	300 ANIONS* (4°C)	9045/9040 pH* (4°C)	METHOD 1312 SPLP/FULL METALS		Extra Volume MS/MSD	HOLD	Total # of Bottles
RS747		X																	1
RS748		X																	↓
RS749									~~X~~ ↑5J						X				↓
RS750									X										↓

LCR 4/9/98 1230 PER DIXIE H.

KM 4/8/98

	Date	Time
Samplers Signature: KMT	4/8/98	1800
Relinquished By: KMT	4/8/98	2110
Received By: [signature]	4/8/98	2110
Relinquished By:		
Received By (LAB):		

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, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 7°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

007

L9801054

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 232
Date 4/8/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:

* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:
QC Level: Level4 TAT: 28 - Day

Preservatives: HCL, pH<2 4°C (8260M VOC); H_2SO_4, pH<2 4°C (8015OG HYDROCARBON); 4°C (8270SIM PAH); 4°C (8270R SVOC); 4°C (8290 DIOXIN); 4°C (8081C PCBs); H_2SO_4, pH<2 4°C (3500 FORMALDEHYDE); 4°C (8330 ORDINANCE); HNO_3, pH<2 4°C (6010/7000 METALSRT); HNO_3, pH<2 4°C (6010 METALSA(AL,B)); 4°C (7196 CrVI); 4°C (340.2 FLUORIDE*); 4°C (300 ANIONS*); 4°C (9045/9040 pH*)

ULS	Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	8260M VOC	8015OG HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	~~6010/7000~~ METALSRT [illegible]	6010 METALSA(AL,B)	7196 CrVI	340.2 FLUORIDE*	300 ANIONS*	9045/9040 pH*	COMMENT	Extra Volume MS/MSD	HOLD	Total # of Bottles
10	RS232	LXBS10S02	10	4/8/98	1530	-4		4.5	X												X						*			
10	RS233	LXBS10S03	14	↓	1545	-5		4.5	X												X						*		⊗	
18	RS234	CDBS21S01	0.5	↓	1715	-6		AIAOC	X					X																
18	RS235	CDBS21S02	3.0	↓	1720	-7		↓	X					X																
10b	RS236	CDBS20S02	5.0	↓	1735	-8		↓	X					X																

ON HOLD PER DIXIE -LCR 4/9/98 @1230

T.B. 4/8/98

	Date	Time
Samplers Signature: Thomas J. B[illegible]	4/8/98	1800
Relinquished By: Thomas J. B[illegible]	4/8/98	2035
Received By: KMJ	4/8/98	2035
Relinquished By: KMJ	4/8/98	2110
Received By (LAB): [illegible]	4/8/98	2110

1 Original, 2 Lab Copy, 3 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 N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: __/__/__
Temperature °C 1°

* Copper only

REV: 1

008

L9801054

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: **COC** RS220
Date 4/8/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ TB Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:
QC Level: Level4 TAT: 28 - Day

ULS	Sample ID	Description (for Ogden use only)	(ft.) Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	~~8260M~~ 8021a VOC	8015OG HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	~~6010~~ 6010 11 MO2.1R METALSA~~(AL,B)~~	7196 CrVI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*	COMMENT		Extra Volume MS/MSD	HOLD	Total # of Bottles
Preservatives													HCL, pH<2 4°C	H_2SO_4, pH<2 4°C	4°C	4°C	4°C	4°C	H2SO4, pH<2 4°C	4°C	HNO3, pH<2 4°C	HNO3, pH<2 4°C	4°C	4°C	4°C	4°C					
68	RS220	CLBS55S01	1.5	4/8/98	0935	-9	B	4.7	X				X																		
68	RS221	CLBS55S02	10.5	↓	1015	-10	↓	↓	↓				X																		
68	RS222	CLBS55S03	16		1035	-11							X																		
69	RS223	CLBS56S01	2		1100	-12							X																		
69	RS224	CLBS56S02	10.5		1130	-13							X																		
69	RS225	CLBS56S03	14.5		1145	-14							X																		
69	RS226	CLBS56S04	18		1155	-15							X																		
5	RS227	CLBS27S03	0.5		1215	-16							X																		
70	RS228	CLBS57S01	0.5		1230	-17								X																	
59	RS229	CLBS50S02	5.5		1240	-18								X																	
9	RS230	LXBS09S04	13.5		1430	-19		4.5														X					*				
10	RS231	LXBS10S01	5.0	↓	1520		↓	↓														X					*			(X)	

ON HOLD PER DIXIE 4/9/98 @ 1230 —LER

	Date	Time
Samplers Signature: Thomas J. Burton	4/8/98	1800
Relinquished By: Thomas J. Burton	4/8/98	2035
Received By: KMJ	4/8/98	2035
Relinquished By: KMJ	4/8/98	2110
Received By (LAB): Juliet Bricker	4/8/98	2110

1 Original, 2 Lab Copy, 3 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 N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 7°

* Copper only

600

REV: 1

L98D1054

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 735
Date 4 / 8 /98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment: DECANT SLUDGE SAMPLES PRIOR TO TESTING; BLUE CAP = TOP OF SLEEVE

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary
28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

Sample Data

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID
RS 735	ILBS49 SØ1	0.5	4/8/98	1000	466	-20
RS 736	ILBS 49 DØ1	0.5		1030	466	
RS 737	BSBS 30 SØ1			1050	30	
RS 738	BS BS 31 SØ1			1100	31	
RS 739	EVBS 32 SØ1			1145	30	
RS 740	EVBS11SØ1			1230	22	
RS 741	EVBS 30 SØ1			1400	32	
RS 742	EVBS30 DØ1			1405	32	
RS 743	EVBS 31 SØ1			1415	31	
RS 744	APBSØ3SØ1			1600	8	
RS 745	ABBS1BSØ1			1630	56a	
RS 746	ABBS15SØ3	7		1745	162	

Matrix: Soil | Water | Product | SLUDGE

Soil	Water	Product	SLUDGE
X			
↓			
			X
			X
X			

Sample ID	8260B VOC 8021	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	COMMENT	SIWMU	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS 735	X		X													4.3	HA			1
RS 736	X															4.3				
RS 737								X							*	AI ARC				
RS 738								X							*	AI ARC				
RS 739	X							X								5.2				
RS 740								X							†					
RS 741	X	X						X				X			☆					
RS 742	X	X						X												
RS 743								X							†	↓			X	
RS 744								X							→	5.6			X	
RS 745		X														AI ARC				
RS 746		X														↓	↓		↓	

Samplers Signature: KMJ	Date: 4/8/98	Time: 1015
Relinquished By: KMJ	Date: 4/8/98	Time: 2110
Received By: Janet Dickey	Date: 4/8/98	Time: 2110
Relinquished By:	Date:	Time:
Received By (LAB):	Date:	Time:

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 7°

* TEST FOR Pb & Hg ONLY
† TEST FOR Hg ONLY
☆ FAX RESULTS TO DIXIE ASAP
→ TEST FOR Ba & Ag ONLY

NOT ON HOLD PER DIXIE 4/9/98@1230 JR

010

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

Columbia Analytical Services, Inc.

Wednesday, May 20, 1998

Anne Freed
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9801054

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 4/8/98.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296, expiration August 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

Stuart Sigman
Quality Assurance Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

001

CAS CSR #L9801054

Table of Contents

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9801054
Project:	Rocketdyne SSFL 313150002	**Date Received:**	4/8/98
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Internal Login Summary Report" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses.

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

MS/MSD analysis for 8270SIM was performed on sample RS753 from SDG L9801075.

The following difficulties were experienced during analysis of this batch:
For method 8270SIM, 2 of 3 surrogates for method blank were slightly above acceptance range (which would indicate a high bias) with all target compounds not detected in the blank. All other sample and QC surrogates were within acceptance range, so data was accepted. For method 8021VOC, surrogates for sample RS735 were out of range. 4-Bromochlorobenzene was slightly below range, while Fluorobenze was above range. This sample was analyzed twice with unacceptable results apparently due to matrix effects. All other samples and QC had acceptable surrogate recoveries. Confirmation of cis-1,2-Dichloroethene was confirmed for RS225 but not for RS227. For both samples, the levels found were 3-4 times the PQL, when confirmation analysis was performed several days later, one sample hit was confirmed between MDL & PQL (J flagged) and the other not most probably due to loss of volatiles.

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 5/20/98

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
19-MAY-98 10:09

Service Req. No. L9801054
Client No. 154375
Client Name Ogden Environmental

Project No. 313150002
Project Name Rocketdyne

Bottles: 20 - Canisters/Decore

Bill To: Ogden Environmental
Attn: Accounts Payable
5510 Morehouse Dr.
San Diego, CA 92121

Report To: Ogden Environmental
Anne Freed
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No.
Logged In By JWICKER
ISR Num
COC Received Y
Samples Submitted 08-APR-98

Site ID
Project Chemist Leo Raab

Note: This Service Request has been invoiced - # 503793

Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	8021	CU/ICP	SIM-PP	TCLP EXT	TPH-FC-CA	HOLD	TCLP-DIGEST	TS GEN	-DIGEST
L9801054-001	RS747	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-002	RS748	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-003	RS749	SOIL	08-APR-98	06-MAY-98				III			III		III
L9801054-004	RS232	SOIL	08-APR-98	06-MAY-98		III						III	III
L9801054-005	RS233	SOIL	08-APR-98	06-MAY-98						III			
L9801054-006	RS234	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-007	RS235	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-008	RS236	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-009	RS220	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-010	RS221	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-011	RS222	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-012	RS223	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-013	RS224	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-014	RS225	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-015	RS226	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-016	RS227	SOIL	08-APR-98	06-MAY-98	III							III	
L9801054-017	RS228	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-018	RS229	SOIL	08-APR-98	06-MAY-98					III			III	
L9801054-019	RS230	SOIL	08-APR-98	06-MAY-98		III						III	III
L9801054-020	RS735	SOIL	08-APR-98	06-MAY-98	III		III					III	

004

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By:_____

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
19-MAY-98 10:09

Service Req. No. L9801054
Client No. 154375
Client Name Ogden Environmental

Project No. 313150002
Project Name Rocketdyne

Bottles: 20 - Canisters/Decore

Bill To: Ogden Environmental
Attn: Accounts Payable
5510 Morehouse Dr.
San Diego, CA 92121

Report To: Ogden Environmental
Anne Freed
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No.
Logged In By JWICKER
ISR Num
COC Received Y
Samples Submitted 08-APR-98

Site ID
Project Chemist Leo Raab

Note: This Service Request has been invoiced - # 503793

Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	TITLE 22 METALS	TITLE 22 METALS AS/GFAA	TITLE 22 METALS HG/CVAA	TITLE 22 METALS TL/GFAA	TITLE 22 METALS ICP-13
L9801054-001	RS747	SOIL	08-APR-98	06-MAY-98					
L9801054-002	RS748	SOIL	08-APR-98	06-MAY-98					
L9801054-003	RS749	SOIL	08-APR-98	06-MAY-98	III	III	III	III	III
L9801054-004	RS232	SOIL	08-APR-98	06-MAY-98					
L9801054-005	RS233	SOIL	08-APR-98	06-MAY-98					
L9801054-006	RS234	SOIL	08-APR-98	06-MAY-98					
L9801054-007	RS235	SOIL	08-APR-98	06-MAY-98					
L9801054-008	RS236	SOIL	08-APR-98	06-MAY-98					
L9801054-009	RS220	SOIL	08-APR-98	06-MAY-98					
L9801054-010	RS221	SOIL	08-APR-98	06-MAY-98					
L9801054-011	RS222	SOIL	08-APR-98	06-MAY-98					
L9801054-012	RS223	SOIL	08-APR-98	06-MAY-98					
L9801054-013	RS224	SOIL	08-APR-98	06-MAY-98					
L9801054-014	RS225	SOIL	08-APR-98	06-MAY-98					
L9801054-015	RS226	SOIL	08-APR-98	06-MAY-98					
L9801054-016	RS227	SOIL	08-APR-98	06-MAY-98					
L9801054-017	RS228	SOIL	08-APR-98	06-MAY-98					
L9801054-018	RS229	SOIL	08-APR-98	06-MAY-98					
L9801054-019	RS230	SOIL	08-APR-98	06-MAY-98					
L9801054-020	RS735	SOIL	08-APR-98	06-MAY-98					

005

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By:_____

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
19-MAY-98 10:09

Service Req. No. L9801054
Client No. 154375
Client Name Ogden Environmental

Project No. 313150002
Project Name Rocketdyne

Bottles: 20 - Canisters/Decore

Bill To: Ogden Environmental
Attn: Accounts Payable
5510 Morehouse Dr.
San Diego, CA 92121

Report To: Ogden Environmental
Anne Freed
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No.
Logged In By JWICKER
ISR Num
COC Received Y
Samples Submitted 08-APR-98

Site ID
Project Chemist Leo Raab

Note: This Service Request has been invoiced - # 503793

Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	TITLE 22 METALS SE/GFAA
L9801054-001	RS747	SOIL	08-APR-98	06-MAY-98	
L9801054-002	RS748	SOIL	08-APR-98	06-MAY-98	
L9801054-003	RS749	SOIL	08-APR-98	06-MAY-98	III
L9801054-004	RS232	SOIL	08-APR-98	06-MAY-98	
L9801054-005	RS233	SOIL	08-APR-98	06-MAY-98	
L9801054-006	RS234	SOIL	08-APR-98	06-MAY-98	
L9801054-007	RS235	SOIL	08-APR-98	06-MAY-98	
L9801054-008	RS236	SOIL	08-APR-98	06-MAY-98	
L9801054-009	RS220	SOIL	08-APR-98	06-MAY-98	
L9801054-010	RS221	SOIL	08-APR-98	06-MAY-98	
L9801054-011	RS222	SOIL	08-APR-98	06-MAY-98	
L9801054-012	RS223	SOIL	08-APR-98	06-MAY-98	
L9801054-013	RS224	SOIL	08-APR-98	06-MAY-98	
L9801054-014	RS225	SOIL	08-APR-98	06-MAY-98	
L9801054-015	RS226	SOIL	08-APR-98	06-MAY-98	
L9801054-016	RS227	SOIL	08-APR-98	06-MAY-98	
L9801054-017	RS228	SOIL	08-APR-98	06-MAY-98	
L9801054-018	RS229	SOIL	08-APR-98	06-MAY-98	
L9801054-019	RS230	SOIL	08-APR-98	06-MAY-98	
L9801054-020	RS735	SOIL	08-APR-98	06-MAY-98	

Comments:

L9801054 SB/GFAA: Use SPLP extract.
L9801054 SIM-PP: 8270
L9801054 TCLP: SPLP
L9801054 TITLE 22 METALS:

006

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By:_____

L9801054

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 747
Date 4 / 8 / 98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment: BLUE CAP = TOP OF SLEEVE
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:			
QC Level:	Level4	TAT:	28 - Day

Preservatives	HCL, pH<2 4°C	H_2SO_4, pH<2 4°C	4°C	4°C	4°C	4°C	H_2SO_4, pH<2 4°C	4°C	HNO3, pH<2 4°C	HNO3, pH<2 4°C	4°C	4°C	4°C	4°C	MEthod 1312 SPLP/Full Means				

Sample Data						Field Data		Matrix				8260M VOC	8015OG HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010 METALSRT	6010 METALSA(AL,B)	7196 CrVI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*		Extra Volume MS/MSD	HOLD	Total # of Bottles
Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge																		
RS747	ABBS15DØ1	7	4/8/98	1750	-1	HA	AILAOC	X					X																1
RS748	SNBS15SØ1	0.5	↓	1815	-2	↓	6.8	X					X																↓
RS749	BLBSØ1SØ1	0.5		1830	-3		7.1	X													X				X				
RS750	EVQWØ2EØ1	-	↓	1830		G	5.2		X												X								

ICR 4/9/98 PER DIXIE H. 1230

Samplers Signature	KMJ	Date 4/8/98	Time 1800
Relinquished By:	KMJ	Date 4/8/98	Time 2110
Received By:		Date 4/8/98	Time 2110
Relinquished By:		Date	Time
Received By (LAB):		Date	Time

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, Ogden contacted: Y or N	
Date contacted: __/__/__	
Temperature °C 7°	

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L9801054

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 232
Date 4/8/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:
QC Level: Level4 TAT: 28 - Day

	Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge
10	RS232	LXBS10S02	10	4/8/98	1530	-4		4.5	X			
10	RS233	LXBS10S03	14	↓	1545	-5		4.5	X			
18	RS234	CDBS21S01	0.5		1715	-6		AI AOC	X			
18	RS235	CDBS21S02	3.0		1720	-7		↓	X			
10b	RS236	CDBS20S02	5.0	↓	1735	-8			X			

Sample ID	8260M VOC (HCL, pH<2 4°C)	8015OG HYDROCARBON (H2SO4, pH<2 4°C)	8270SIM PAH (4°C)	8270R SVOC (4°C)	8290 DIOXIN (4°C)	8081C PCBs (4°C)	3500 FORMALDEHYDE (H2SO4, pH<2 4°C)	8330 ORDINANCE (4°C)	~~6010/7000~~ METALSRT 1LMOR.1PT (HNO3, pH<2 4°C)	6010 METALSA(AL,B) (HNO3, pH<2 4°C)	7196 CrVI (4°C)	340.2 FLUORIDE* (4°C)	300 ANIONS* (4°C)	9045/9040 pH* (4°C)	COMMENT		Extra Volume MS/MSD	HOLD	Total # of Bottles
RS232									X						*				
RS233									X						*			⊗ ON HOLD PER DIXIE -LCR 4/9/98 @1230	
RS234		X																	
RS235		X																	
RS236		X																	

T.B. 4/8/98

	Date	Time
Samplers Signature: Thomas J. Barton	4/8/98	1800
Relinquished By: Thomas J. Barton	4/8/98	2035
Received By: KMT	4/8/98	2035
Relinquished By: KMT	4/8/98	2110
Received By (LAB): Janet Nickerson	4/8/98	2110

1 Original, 2 Lab Copy, 3 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 N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 1°

* Copper only

REV: 1

008

L9801054

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS220
Date 4/8/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ JB Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* FLUORIDE, ANIONS, AND PH WILL USE ONE AQUEOUS CONTAINER

Cooler No:
QC Level: Level4 TAT: 28 - Day

Preservatives: HCL, pH<2 4°C (VOC); H2SO4, pH<2 4°C (HYDROCARBON); 4°C (PAH); 4°C (SVOC); 4°C (DIOXIN); 4°C (PCBs); H2SO4, pH<2 4°C (FORMALDEHYDE); 4°C (ORDINANCE); HNO3, pH<2 4°C (METALSRT); HNO3, pH<2 4°C (METALSA); 4°C (CrVI); 4°C (FLUORIDE); 4°C (ANIONS); 4°C (pH)

ULS	Sample ID	Description (for Ogden use only)	Depth (ft.)	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	~~8260M~~ 8021a VOC	8015OG HYDROCARBON	8270SIM PAH	8270R SVOC	8290 DIOXIN	8081C PCBs	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	~~6010~~ 11M03.IR METALSA~~(AL,B)~~	7196 CrVI	340.2 FLUORIDE *	300 ANIONS*	9045/9040 pH*	COMMENT		Extra Volume MS/MSD	HOLD	Total # of Bottles
68	RS220	CLBS55SØ1	1.5	4/5/98	0935	-9	B	4.7	X				X																		
68	RS221	CLBS55SØ2	10.5	↓	1015	-10	↓	↓	↓				X																		
68	RS222	CLBS55SØ3	16		1035	-11							X																		
69	RS223	CLBS56SØ1	2		1100	-12							X																		
69	RS224	CLBS56SØ2	10.5		1130	-13							X																		
69	RS225	CLBS56SØ3	14.5		1145	-14							X																		
69	RS226	CLBS56SØ4	18		1155	-15							X																		
5	RS227	CLBS27SØ3	Ø.5		1215	-16							X																		
70	RS228	CLBS57SØ1	Ø.5		1230	-17								X																	
59	RS229	CLBS50SØ2	5.5		1240	-18								X																	
9	RS230	LXBSØ9SØ4	13.5		1430	-19		4.5														X					*				
10	RS231	LXBS1ØSØ1	5.Ø	↓	1520		↓	↓	↓													X					*			⊗	

Samplers Signature	Date	Time
[signature]	4/8/98	1800
Relinquished By: [signature]	4/8/98	2035
Received By: KMJ	4/8/98	2035
Relinquished By: KMJ	4/8/98	2110
Received By (LAB): [signature]	4/8/98	2110

1 Original, 2 Lab Copy, 3 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 N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: __/__/__
Temperature °C 7°

* Copper only

ON HOLD PER DIXIE 4/9/98@1230 -LER

REV: 1

600

L98D1054

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 735
Date 4 / 8 /98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment: DECANT SLUDGE SAMPLES PRIOR TO TESTING; BLUE CAP = TOP OF SLEEVE

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary 28-day full package

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	SLUDGE	~~8260M~~ VOC ~~8010/8020~~ 8021	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	COMMENT	SWMU	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	H_2SO_4,pH<2 4°C	4°C	HNO3, pH<2 4°C	4°C	4°C	4°C	4°C	4°C	4°C						
RS 735	ILBS49SØ1	0.5	4/8/98	1000	46b	-20	X				X		X													4.3	HA			1
RS 736	ILBS 49 DØ1	0.5		1030	46b						X															4.3				
RS 737	BSBS 30 SØ1			1050	30													X							*	AI AOC				
RS 738	BSBS 31 SØ1			1100	31													X							*	AI AOC				
RS 739	EVBS 32 SØ1			1145	30						X							~~X~~								5.2				
RS 740	EVBS11SØ1			1230	22													X							†					
RS 741	EVBS 30 SØ1			1400	32						X	X						X				X			☆					
RS 742	EVBS 30 DØ1			1405	32						X	X						X												
RS 743	EVBS 31 SØ1			1415	31													X							†				X	
RS 744	APBSØ3SØ1			1600	8					X								X							→	5.6			(X)	
RS 745	ABBS18SØ1			1630	56a					X		X														AI AOC				
RS 746	ABBS15SØ3	7		1745	62		X					X																		

	Date	Time
Samplers Signature: KMJ	4/8/98	1015
Relinquished By: KMJ	4/8/98	2110
Received By: [signature]	4/8/98	2110
Relinquished By:		
Received By (LAB):		

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 7°

* TEST FOR Pb & Hg ONLY
† TEST FOR Hg ONLY
☆ FAX RESULTS TO DIXIE ASAP
→ TEST FOR Ba & Ag ONLY

NOT ON HOLD PER DIXIE 4/9/98@1230 [initials]

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

010

Columbia Analytical Services inc.

Tuesday, March 17, 1998

Anne Freed
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9800238

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 1/28-30/98.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296, expiration August 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

Stuart Sigman
Quality Assurance Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

001

CAS CSR #L9800238

Table of Contents

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9800238
Project:	Rocketdyne SSFL 313150002	**Date Received:**	1/28-30/98
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Sample Delivery Group Assignment" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses. Any tests marked under the grey-shaded parameters to the far right of this form were sub-contracted to the following laboratories:

Formaldehyde	Columbia Analytical Services, Kelso, WA.

Subcontracted test results, case narratives and data packages are included as an appendix to this report.

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

MS/MSD analysis for 8080PCB was performed on sample RS652 from SDG L9800196.
MS/MSD analysis for 8015TPH was performed on sample RS181 from SDG L9800225.

No difficulties were experienced during analysis of this batch.

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 3/17/98

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

SAMPLE DELIVERY GROUP ASSIGNMENT

CLIENT: OGDEN
PROJECT MANAGER: DIXIE HAMBRICK
PROJECT NAME: ROCKETDYNE SSFL
PROJECT NUMBER: 313150002

SDG NUMBER: L9800238
LABORATORY: COLUMBIA ANALYTICAL SRV.
SDG CLOSING DATE: 1/29/98
SUMMARY / FINAL DUE: 2/12/98 / 2/26/98

#	SAMPLE NAME	SAMPLE DATE	RECEIVED DATE	MATRIX	MS/MSD or MS/DUP	MOISTURE	8260 VOC	8015OG TEPH	8270 SIM	8270 R	METALS (CAM-17)	METALS (CAM-17 + AL + B)	7196 HEXAVALENT CHROMIUM	340.2 FLUORIDE	300.0M ANIONS (CL NO3 NO2)	9040 / 9045 PH	8080 PCB	Hg CVAA 7471			ASTM D19 FORMALDEHYDE	PERCHLORATE	TRIBUTYLTIN	8290 DIOXIN/FURAN	HYDRAZINES	8330 EXPLOSIVES
1	RS182	1/28/98	1/28/98	SOLID		X		X																		
2	RS183	1/28/98	1/28/98	SOLID		X		X																		
3	RS683	1/29/98	1/29/98	SOLID		X						X				X										
4	RS684	1/29/98	1/29/98	SOLID		X							X													
5	RS685	1/29/98	1/29/98	SOLID		X							X													
6	RS686	1/29/98	1/29/98	SOLID		X							X													
7	RS687	1/29/98	1/29/98	SOLID		X		X																		
8	RS688	1/29/98	1/29/98	SOLID		X							X													
9	RS689	1/29/98	1/29/98	SOLID		X							X													
10	RS690	1/29/98	1/29/98	SOLID		X							X													
11	RS691	1/29/98	1/29/98	SOLID		X							X													
12	RS692	1/29/98	1/29/98	SOLID		X							X													
13	RS693	1/29/98	1/29/98	SOLID		X							X													
14	RS694	1/29/98	1/29/98	SOLID		X							X													
15	RS186	1/29/98	1/29/98	SOLID		X		X									X									
* 16	RS695	1/29/98	1/29/98	SOLID		C																				
17	RS696	1/29/98	1/29/98	SOLID		X							X													
18	RS698	1/30/98	1/30/98	SOLID		X		X	X													X				
19	RS699	1/30/98	1/30/98	SOLID		X		X	X													X				
20	RS700	1/30/98	1/30/98	SOLID		X		X																		

* RS695 MOVED TO SDG L9800338

L9800238

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS176
Date 1/28/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary
28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4, pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ		Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS176	BABS45S01	5.5	1/28/98	1155	53		X				X														B			
RS177	BABS45S02	10		1205	↓						X																	
RS178	BABS39S01	5		1445	55						X																	
RS179	BABS39S02	10		1455							X																	
RS180	BABS39S03	15		1515							X																	
RS181	BABS39S04	20		1540							X																	
RS182	BABS~~30~~39S05	25		1610		1					X																	
RS183	BABS~~30~~39S06	30		1630		2					X																	
RS184	BAQW03E01	—	↓	1700	↓		~~X~~		X		X														—			2

T.B. 1/28/98

Samplers Signature: Thomas J. Brust	1/28/98	1000
Relinquished By: Thomas J. Brust	1/28/98	1842
Received By: Janet Dickson	1/28/98	1842
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number:
Do COC match samples (Y) or N
Broken container: Y or (N)
Received within holding time (Y) or N
COC seal intact: Y or N N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 7°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9800238

Chain of Custody

Control Number: COC RS 6083
Date 1/29/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:	Laboratory Disposal
Shipment Method:	
Comment:	

Cooler No:		
QC Level:	Level4	TAT: 14-day hardcopy summary 28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

SWMU

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	SLUDGE	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
AIV AOC	RS 6083	SRBSØ6SØ1	0.5	1/29/98	1120	7	3	X										X				X			HA			1
↓	RS 6084	SRBSØ3SØ1	0.5		1145	1	4	↓											X						↓			
5.13	RS 6085	SBVSSØ3SØ2	0		1230	40	5												X						G			
4.16	RS 6086	RIBSØ1SØ1	2		1345	2	6			X									X						G			
4.15	RS 6087	BABS18SØ1	0.5		1400	33a	7	X				X													HA			
4.7	RS 6088	CLBS19SØ1	0.5		1500	46	8	X																				
5.23	RS 6089	DABSØ4SØ1	0.5		1525	4	9												X									
6.8	RS 6090	SNBSØ9SØ1	0.5		1540	10	10												X									
6.9	RS 6091	ELBSØ2SØ1	0.5		1550	2	11												X									
A. III AOC	RS 6092	STBSØ1SØ1	0.5		1600	1	12												X									
7.1	RS 6093	BLBSØ5SØ1	0.5		1620	4	13	↓											X									
4.5	RS 6094	LXBSØ1SØ1	0.5	↓	1640	1	14				X								X						↓			↓

Samplers Signature	KMJ	Date 1/29/98 Time 1130
Relinquished By:	KMJ	Date 1/29/98 Time 1845
Received By:		Date 1/29/98 Time 1845
Relinquished By:		Date 1/29/98 Time 1934
Received By (LAB):		Date 1/29/98 Time 1930

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 17

FOR ALL SAMPLES, TAKE FROM MIDDLE OF SLEEVE.

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9800238

Chain of Custody

Control Number: COC RS185

Date 1/29/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:

QC Level: Level4

TAT: 14-day hardcopy summary
28-day full package

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

SWMU 5.13 "

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS185	BVBS185$01	0.5	1/29/98	0935	38		X				X											X		HA		*	
RS186	BVBS255$03	1	↓	1240	37	15.	X				X											X		HA			

T.B. 1/29/98

	Date	Time
Samplers Signature: Thomas J. Burton	1/29/98	0930
Relinquished By: Thomas J. Burton	1/29/98	1825
Received By:	1/29/98	1825
Relinquished By:	1/29/98	1930
Received By (LAB):	1/29/98	1930

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do 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, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 17

* Hold both analytes

Sample from middle of sleeves

800

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9800238

Chain of Custody

Control Number: COC RS 695
Date 1 / 29 / 98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:	
QC Level: Level4	TAT: 14-day hardcopy summary 28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

SWMU 5.2 7.4

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	1312 SPLP	COMMENT	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS695	EVBS17SØ1	2	1/29/98	1700	179	16	X																	X	*	HA			1
RS696	OCBSØ7SØ1	1	↓	1730	4	17	X											X								↓			↓
RS697	BAQWØ4EØ1	-	↓	1800	-	—		X			X															-			2

KJ 1/29/98

Samplers Signature	KMJ	Date 1/29/98 Time 1645
Relinquished By:	KMJ	Date 1/29/98 Time 1845
Received By:		Date 1/29/98 Time 1845
Relinquished By:		Date 1/29/98 Time 1930
Received By (LAB):		Date 1/29/98 Time 1930

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do COC match samples: Y or N
Broken container: Y or N
Received within holding time: Y or N
COC seal intact: Y or NA
Any other problems: Y or N
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 17

* Sb ONLY.
FOR ALL SAMPLES, TAKE FROM MIDDLE OF SLEEVE.

REV: 1

L9800238

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 698
Date 1/30/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary, 28-day full package

Preservatives: 8260M VOC: HCL, pH<2 4°C; 8015OG TPH: HCL, pH<2 4°C; 8270SIM SVOC: 4°C; 8270R SVOC: 4°C; 8290 DIOXIN: 4°C; ASTM D19 FORMALDEHYDE: H2SO4,pH<2 4°C; 8330 ORDINANCE: 4°C; 1LM02.IRT METALSRT: HNO3, pH<2 4°C; 7196 HEX CHROME: 4°C; 340.2 FLUORIDE: 4°C; 300 ANIONS: 4°C; 9045/9040 pH: 4°C; 8081 PCBs: 4°C; IC HYDRAZ: 4°C

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS 698	ECBS20S01	0.5'	1/30/98	1445	18	18	X				X	X			X									HA		[illegible]	1
RS 699	ECBS20S02	5'	↓	1545	↓	19	↓				X	X			X									↓			↓
RS 700	ABBS20S01	3'	↓	1615	68	20	↓				X													↓			↓
RS 701	ABBS21S01	2.5'	↓	1630	69		↓				X													↓			↓

WMU 0.1,16.3 ↓ II ↓

KJ 1/30/98

	Signature	Date	Time
Samplers Signature	KMJ	1/30/98	1500
Relinquished By:	KMJ	1/30/98	1705
Received By:	Thomas J. Bt	1/30/98	1705
Relinquished By:	Thomas J. Bt	1/30/98	1913
Received By (LAB):	[illegible]	1/31/98	1913

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: __/__/__
Temperature °C 6°C

REV: 1

008

Columbia Analytical Services inc.

Tuesday, March 17, 1998

Anne Freed
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9800238

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 1/28-30/98.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296, expiration August 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

Stuart Sigman
Quality Assurance Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

001

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9800238
Project:	Rocketdyne SSFL 313150002	**Date Received:**	1/28-30/98
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Sample Delivery Group Assignment" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses. Any tests marked under the grey-shaded parameters to the far right of this form were sub-contracted to the following laboratories:

Formaldehyde	Columbia Analytical Services, Kelso, WA.

Subcontracted test results, case narratives and data packages are included as an appendix to this report.

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

MS/MSD analysis for 8080PCB was performed on sample RS652 from SDG L9800196.
MS/MSD analysis for 8015TPH was performed on sample RS181 from SDG L9800225.

No difficulties were experienced during analysis of this batch.

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 3/17/98

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

SAMPLE DELIVERY GROUP ASSIGNMENT

CLIENT: **OGDEN**
PROJECT MANAGER: **DIXIE HAMBRICK**
PROJECT NAME: **ROCKETDYNE SSFL**
PROJECT NUMBER: **313150002**

SDG NUMBER: **L9800238**
LABORATORY: COLUMBIA ANALYTICAL SRV.
SDG CLOSING DATE: 1/29/98
SUMMARY / FINAL DUE: 2/12/98 / 2/26/98

#	SAMPLE NAME	SAMPLE DATE	RECEIVED DATE	MATRIX	MS/MSD or MS/DUP	MOISTURE	8260 VOC	8015OG TEPH	8270 SIM	8270 R	METALS (CAM-17)	METALS (CAM-17 + AL + B)	7196 HEXAVALENT CHROMIUM	340.2 FLUORIDE	300.0M ANIONS (CL NO3 NO2)	9040 / 9045 PH	8080 PCB	Hg CVAA 7471			ASTM D19 FORMALDEHYDE	PERCHLORATE	TRIBUTYLTIN	8290 DIOXIN/FURAN	HYDRAZINES	8330 EXPLOSIVES
1	**RS182**	1/28/98	1/28/98	SOLID		X		X																		
2	**RS183**	1/28/98	1/28/98	SOLID		X		X																		
3	**RS683**	1/29/98	1/29/98	SOLID		X						X				X										
4	**RS684**	1/29/98	1/29/98	SOLID		X							X													
5	**RS685**	1/29/98	1/29/98	SOLID		X							X													
6	**RS686**	1/29/98	1/29/98	SOLID		X							X													
7	**RS687**	1/29/98	1/29/98	SOLID		X		X																		
8	**RS688**	1/29/98	1/29/98	SOLID		X							X													
9	**RS689**	1/29/98	1/29/98	SOLID		X							X													
10	**RS690**	1/29/98	1/29/98	SOLID		X							X													
11	**RS691**	1/29/98	1/29/98	SOLID		X							X													
12	**RS692**	1/29/98	1/29/98	SOLID		X							X													
13	**RS693**	1/29/98	1/29/98	SOLID		X							X													
14	**RS694**	1/29/98	1/29/98	SOLID		X							X													
15	**RS186**	1/29/98	1/29/98	SOLID		X		X									X									
* 16	**RS695**	1/29/98	1/29/98	SOLID		C																				
17	**RS696**	1/29/98	1/29/98	SOLID		X							X													
18	**RS698**	1/30/98	1/30/98	SOLID		X		X	X													X				
19	**RS699**	1/30/98	1/30/98	SOLID		X		X	X													X				
20	**RS700**	1/30/98	1/30/98	SOLID		X		X																		

* RS695 MOVED TO SDG L9800338

L9800238

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS176
Date 1/28/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary
28-day full package

Preservatives: HCL, pH<2, 4 C | HCL, pH<2, 4 C | 4 C | 4 C | 4 C | H_2SO_4, pH<2, 4 C | 4 C | HNO_3, pH<2, 4 C | 4 C | 4 C | 4 C | 4 C | 4 C | 4 C

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ			Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS176	BABS45 S01	5.5	1/28/98	1155	53		X				X															B			
RS177	BABS45 S02	10		1205	↓						X																		
RS178	BABS39 S01	5		1445	55						X																		
RS179	BABS39 S02	10		1455							X																		
RS180	BABS39 S03	15		1515							X																		
RS181	BABS39 S04	20		1540							X																		
RS182	BABS~~30~~39 S05	25		1610		1					X																		
RS183	BABS~~30~~39 S06	30		1630		2					X																		
RS184	BAQW03 E01	—	↓	1700	↓		~~X~~				X															—			2

T.B. 1/28/98

Samplers Signature: Thomas J. Burt	Date: 1/28/98	Time: 1000
Relinquished By: Thomas J. Burt	Date: 1/28/98	Time: 1842
Received By: Jeffrey Dickey	Date: 1/28/98	Time: 1842
Relinquished By:	Date:	Time:
Received By (LAB):	Date:	Time:

For Lab Use

Lab Number:
Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature C 7.0

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9800238

Chain of Custody

Control Number: COC RS 683
Date 1/29/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:	
QC Level: Level4	TAT: 14-day hardcopy summary 28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4, pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

SWMU	Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	SLUDGE
AIV AOC	RS 6083	SRBSØ6SØ1	0.5	1/29/98	1120	7	3	X			
↓	RS 6084	SRBSØ3SØ1	0.5		1145	1	4	↓			
5.13	RS 6085	BVSSØ3SØ2	0		1230	40	5				
4.16	RS 6086	R1BSØ1SØ1	2		1345	2	6				X
4.15	RS 6087	BABS18SØ1	0.5		1400	33a	7	X			
4.7	RS 6088	CLBS19SØ1	0.5		1500	46	8	X			
5.23	RS 6089	DABSØ4SØ1	0.5		1525	4	9				
6.8	RS 6090	SNBSØ9SØ1	0.5		1540	10	10				
6.9	RS 6091	ELBSØ2SØ1	0.5		1550	2	11				
A.III AOC	RS 6092	STBSØ1SØ1	0.5		1600	1	12				
7.1	RS 6093	BLBSØ5SØ1	0.5		1620	4	13	↓			
4.6	RS 6094	LXBSØ1SØ1	1'		1640	1	14				X

	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ			Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
								X	X			X					HA			1
									X								↓			
									X								G			
		X							X								G			
																	HA			
									X											
									X											
									X											
									X											
									X											
									X											
									X								↓			

Samplers Signature	KMJ	Date 1/29/98	Time 1130
Relinquished By:	KMJ	Date 1/29/98	Time 1845
Received By:		Date 1/29/98	Time 1845
Relinquished By:		Date 1/29/98	Time 1934
Received By (LAB):		Date 1/29/98	Time 1950

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 1

FOR ALL SAMPLES, TAKE FROM MIDDLE OF SLEEVE.

500

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9800238

Chain of Custody

Control Number: COC RS185

Date 1/29/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:

QC Level: Level4

TAT: 14-day hardcopy summary
28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

SWMU 5.13 "

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS185	BVBS185Φ1	0.5	1/29/98	0935	38		X				X											X		HA		*	
RS186	BVBS255Φ3	1	↓	1240	37	15.	X				X											X		HA			

T. B 1/29/98

Samplers Signature	Thomas J. Bunton	Date 1/29/98	Time 0930
Relinquished By:	Thomas J. Bunton	Date 1/29/98	Time 1825
Received By:		Date 1/29/98	Time 1825
Relinquished By:		Date 1/29/98	Time 1930
Received By (LAB):		Date 1/29/98	Time 1930

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do 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, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 17

* Hold both analytes

Sample from middle of sleeves

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9800238

Chain of Custody

Control Number: COC RS 695
Date 1/29/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary
28-day full package

SWMU 5.2 7.4

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	1312 SPLP	COMMENT Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS695	EVBS17SØ1	2	1/29/98	1700	179	16	X																	X	*			1
RS696	OCBSØ7SØ1	1	↓	1730	4	17	X											X							HA			↓
RS697	BAQWØ4EØ1	-	↓	1800	-	—		X			X														-			2

KMJ

1/29/98

	Date	Time
Samplers Signature: KMJ	1/29/98	1645
Relinquished By: KMJ	1/29/98	1845
Received By:	1/29/98	1845
Relinquished By:	1/29/98	1934
Received By (LAB):	1/30/98	1930

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do COC match samples: Y or N
Broken container: Y or N
Received within holding time: Y or N
COC seal intact: Y or N/A
Any other problems: Y or N
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 17

* Sb ONLY.
FOR ALL SAMPLES, TAKE FROM MIDDLE OF SLEEVE.

REV: 1

L9800238

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 698
Date 1/30/98 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary
28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4, pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS 698	ECBS2ØSØ1	Ø.5'	1/30/98	1445	18	18	X				X	X			X									HA			1
RS 699	ECBS2ØSØ2	5'		1545	↓	19	X				X	X			X									↓			↓
RS 700	ABBS2ØSØ1	3'		1615	686	20	X				X																
RS 701	ABBS21SØ1	2.5'	↓	1630	69		↓				X																

KJ 1/30/98

Samplers Signature	KMJ	Date 1/30/98	Time 1500
Relinquished By:	KMJ	Date 1/30/98	Time 1705
Received By:	Thomas J. Sato	Date 1/30/98	Time 1705
Relinquished By:	Thomas J. Sato	Date 1/30/98	Time 1913
Received By (LAB):		Date 1/31/98	Time 1913

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:
Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N N/A
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 6°C

REV: 1

Columbia Analytical Services, Inc.

Tuesday, March 10, 1998

Anne Freed
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: **Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9704359**

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 12/18-19/97.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296, expiration August 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

Stuart Sigman
Quality Assurance Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

001

CAS CSR #L9704359

Table of Contents

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9704359
Project:	Rocketdyne SSFL 313150002	**Date Received:**	12/18-19/97
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Sample Delivery Group Assignment" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses. Any tests marked under the grey-shaded parameters to the far right of this form were sub-contracted to the following laboratories:

Perchlorate	Columbia Analytical Services, San Jose, CA.

Subcontracted test results, case narratives and data packages are included as an appendix to this report.

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

MS/MSD analysis for 8270SIM was performed on sample RS595 from SDG L9704318.

The following difficulties were experienced during analysis of this batch:
Surrogates for 8270SIM for RS603DLDL were not reportable due to sample matrix requiring dilution.

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 3/10/98

SAMPLE DELIVERY GROUP ASSIGNMENT

CLIENT: **OGDEN**
PROJECT MANAGER: **DIXIE HAMBRICK**
PROJECT NAME: **ROCKETDYNE SSFL**
PROJECT NUMBER: **313150002**

SDG NUMBER: **L9704359**
LABORATORY: COLUMBIA ANALYTICAL SRV.
SDG CLOSING DATE: 12/19/97
SUMMARY / FINAL DUE: 1/2/98 / 1/16/98

#	SAMPLE NAME	SAMPLE DATE	RECEIVED DATE	MATRIX	MS/MSD or MS/DUP	MOISTURE	8260 VOC	8015OG TEPH	8270 SIM	8270 R	METALS (CAM-17)	METALS (CAM-17 + AL + B)	7196 HEXAVALENT CHROMIUM	340.2 FLUORIDE	300.0M ANIONS (CL NO3 NO2)	9040 / 9045 PH	8080 PCB	Arsenic & Lead	Lead	8021VOC	ASTM D19 FORMALDEHYDE	PERCHLORATE	TRIBUTYLTIN	8290 DIOXIN/FURAN	HYDRAZINES	8330 EXPLOSIVES
1	RS602	12/18/97	12/18/97	SOLID		X		X																		
2	RS603	12/18/97	12/18/97	SOLID		X		X	X																	
3	RS605	12/18/97	12/18/97	SOLID		X					X															
4	RS606	12/18/97	12/18/97	SOLID		X		X																		
5	RS607	12/18/97	12/18/97	SOLID		X		X			X					X										
6	RS608	12/18/97	12/18/97	SOLID		X		X																		
7	RS609	12/18/97	12/18/97	SOLID		X		X			X															
8	RS611	12/19/97	12/19/97	SOLID		X			X										X							
9	RS612	12/19/97	12/19/97	SOLID		X													X							
10	RS613	12/19/97	12/19/97	SOLID		X			X																	
11	RS614	12/19/97	12/19/97	SOLID		X							X									X				
12	RS615	12/19/97	12/19/97	SOLID		X												X								
13	RS084	12/19/97	12/19/97	SOLID		X							X													
14	RS085	12/19/97	12/19/97	SOLID		X							X									X				
15	RS086	12/19/97	12/19/97	SOLID		X					X		X			X						X				
16	RS087	12/19/97	12/19/97	SOLID		X					X		X			X						X				
17	RS079	12/19/97	12/19/97	SOLID		X														X						
18	RS080	12/19/97	12/19/97	SOLID		X														X						
19	RS081	12/19/97	12/19/97	SOLID		X														X						
20	RS083	12/19/97	12/19/97	SOLID		X							X									X				

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9704359

Chain of Custody

Control Number: COC RS601
Date 12/18/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary; 28-day full package

Sample Data

SWMU	Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	SLUDGE
7.1	RS601	BLBS10S01	0.5	12/18/97	940	11	—	X			
↓	RS602	BLBS11S01	↓	↓	950	12	1	↓			
6.5	RS603	SLSS07S01	0	↓	1020	44	2	↓			
↓	RS604	SLSS06S01	0	↓	1020	43	—	↓			
6.4	RS605	CFBS06S02	4.5	↓	1050	14	3	↓			
5.18	~~CA~~ RS606	CASS02S01	0	↓	1125	10a	4				X
4.7	RS607	CLBS35S01	0.5	↓	1150	20	5	X			
↓	RS608	CLBS36S01	0.5	↓	1200	21	6	X			
4.12	RS609	LFBS24S01	0.5	↓	1225	40	7	X			
4.7	RS610	CLQW07E01	-	↓	1345	-	—		X		

KJ 12/18/97

Analyses

Sample ID	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ		COMMENT	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						
RS601		X															HA			1
RS602		X															↓			↓
RS603		X	X													*	G			↓
RS604			X														G		X	↓
RS605								X									HA			↓
RS606		X															G			↓
RS607		X						X				X					HA			↓
RS608		X															↓			↓
RS609		X						X									↓			↓
RS610		X															-			2

	Date	Time
Samplers Signature: KMJ	12/18/97	1000
Relinquished By: [signature]	12/18/97	1849
Received By: [signature]	12/18/97	1809
Relinquished By:		
Received By (LAB):		

For Lab Use

Lab Number:

*FAX RESULTS TO DIXIE ASAP

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 11°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L9704359

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 611

Date 12/19/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:		
QC Level:	Level4	TAT: 14-day hardcopy summary 28-day full package

Preservatives	HCL, pH<2 4°C	HCL, pH<2 4°C	4°C	4°C	4°C	H_2SO_4,pH<2 4°C	4°C	HNO_3, pH<2 4°C	4°C	4°C	4°C	4°C	4°C	4°C						

Sample Data							Matrix				8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Perchlorates	Comment	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	Sludge																				
RS611	BARS39S#1	0.5	12/19/97	1015	116	8	X						X					X							*	HA			1
RS612	BARS#6S#3	10		1145	11	9	X						X					X							*				1
RS613	CLBS28S#2	5		1500	63	10	X						X																1
RS614	BSSW2-S#2	3.5		1600	2	11				X									X					X					1
RS615	AFBS12S#1	1.5		1620	17	12	X											X							☆				1

TB 12/19/97

Samplers Signature	Date 12/19/97	Time 1015
Relinquished By:	Date 12/19/97	Time 1915
Received By:	Date 12/19/97	Time 1915
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 6°

* run for lead only
☆ run As, Pb only

900

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9704359

Chain of Custody

Control Number: COC RS084

Date 12/19/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:		
QC Level:	Level4	TAT: 14-day hardcopy summary 28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | Perchlorates

SWMU
AIAOC

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.1RT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Perchlorates	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS084	BSBS081D04	7.0	12/19/97	1515	3	13	X											1							B			1
RS085	BSBS085D06	13.5		1525	3	14	X											1						1				1
RS086	BSBS085D07	20.0		1540	3	15	X				*	*					1	1			1			1		2	X	1
RS087	BSBS085D08	24.5	↓	1600	3	16	X				*	*					1	1			1			1	↓	2	X	1

25
12/19/97

	Date	Time
Samplers Signature	12/19/97	1734
Relinquished By:	12/19/97	1857
Received By:	12/19/97	1857
Relinquished By:		
Received By (LAB):		

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 6°

NOTE: RUN RS086, RS087 FOR INDICATED PARAMETERS

* HOLD FOR INDICATED PARAMETER

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L9704359

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS472

Date 12/19/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:	
QC Level: Level4	TAT: 14-day hardcopy summary 28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | Reach Lab Notes

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS472	CTB54654Q1	6.0	12/19/97	0850	4		X				1											1		B			1
RS473	CTB5466DQ1	6.0		0850	4		X				1											1					1
RS474	CNB52354Q1	0.5		0922	22		X				1																1
RS475	CNB52454Q1	0.5		0927	6		X				1																1
RS476	CNB52554Q1	1.5		0944	1		X				1																1
RS477	CNB5525DQ1	1.5		0944	1		X				1																1
RS478	CLB5435Q1	0.5		1125	34		X				1																1
RS479	CLB5435Q2	4.5		1135	34	17	X				1																1
RS480	CLB5425Q1	13.0		1240	45	18	X				1																1
RS481	EVB5215Q1	1.5		1410	11	19	X				1																1
RS482	EVB5215Q2	4.0		1425	11		X				1																1
RS483	BSB54854Q5	1.0		1510	3	20	X																		X		1

SW/MW
A1AOC
A1AOC
4.14
4.7
5.2
5.2
A1AOC

	Date	Time
Samplers Signature	12/19/97	1730
Relinquished By:	12/19/97	1852
Received By:	12/19/97	1852
Relinquished By:		
Received By (LAB):		

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: __/__/__
Temperature °C 6

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

Columbia Analytical Services inc.

Tuesday, March 10, 1998

Anne Freed
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: **Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9704359**

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 12/18-19/97.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296, expiration August 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

Stuart Sigman
Quality Assurance Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

6925 Canoga Avenue ▪ Canoga Park, CA 91303 ▪ (818) 587-5550 ▪ Fax (818) 587-5555

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9704359
Project:	Rocketdyne SSFL 313150002	**Date Received:**	12/18-19/97
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Sample Delivery Group Assignment" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses. Any tests marked under the grey-shaded parameters to the far right of this form were sub-contracted to the following laboratories:

Perchlorate	Columbia Analytical Services, San Jose, CA.

Subcontracted test results, case narratives and data packages are included as an appendix to this report.

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

MS/MSD analysis for 8270SIM was performed on sample RS595 from SDG L9704318.

The following difficulties were experienced during analysis of this batch:
Surrogates for 8270SIM for RS603DLDL were not reportable due to sample matrix requiring dilution.

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 3/10/98

SAMPLE DELIVERY GROUP ASSIGNMENT

CLIENT: **OGDEN**
PROJECT MANAGER: **DIXIE HAMBRICK**
PROJECT NAME: **ROCKETDYNE SSFL**
PROJECT NUMBER: **313150002**

SDG NUMBER: **L9704359**
LABORATORY: COLUMBIA ANALYTICAL SRV.
SDG CLOSING DATE: 12/19/97
SUMMARY / FINAL DUE: 1/2/98 / 1/16/98

#	SAMPLE NAME	SAMPLE DATE	RECEIVED DATE	MATRIX	MS/MSD or MS/DUP	MOISTURE	8260 VOC	8015OG TEPH	8270 SIM	8270 R	METALS (CAM-17)	METALS (CAM-17 + AL + B)	7196 HEXAVALENT CHROMIUM	340.2 FLUORIDE	300.0M ANIONS (CL NO3 NO2)	9040 / 9045 PH	8080 PCB	Arsenic & Lead	Lead	8021VOC	ASTM D19 FORMALDEHYDE	PERCHLORATE	TRIBUTYLTIN	8290 DIOXIN/FURAN	HYDRAZINES	8330 EXPLOSIVES
1	RS602	12/18/97	12/18/97	SOLID		X		X																		
2	RS603	12/18/97	12/18/97	SOLID		X		X	X																	
3	RS605	12/18/97	12/18/97	SOLID		X					X															
4	RS606	12/18/97	12/18/97	SOLID		X		X																		
5	RS607	12/18/97	12/18/97	SOLID		X		X			X					X										
6	RS608	12/18/97	12/18/97	SOLID		X		X																		
7	RS609	12/18/97	12/18/97	SOLID		X		X			X															
8	RS611	12/19/97	12/19/97	SOLID		X			X										X							
9	RS612	12/19/97	12/19/97	SOLID		X													X							
10	RS613	12/19/97	12/19/97	SOLID		X			X																	
11	RS614	12/19/97	12/19/97	SOLID		X							X									X				
12	RS615	12/19/97	12/19/97	SOLID		X												X								
13	RS084	12/19/97	12/19/97	SOLID		X							X													
14	RS085	12/19/97	12/19/97	SOLID		X							X									X				
15	RS086	12/19/97	12/19/97	SOLID		X					X		X			X						X				
16	RS087	12/19/97	12/19/97	SOLID		X					X		X			X						X				
17	RS079	12/19/97	12/19/97	SOLID		X														X						
18	RS080	12/19/97	12/19/97	SOLID		X														X						
19	RS081	12/19/97	12/19/97	SOLID		X														X						
20	RS083	12/19/97	12/19/97	SOLID		X							X									X				

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9704359

Chain of Custody

Control Number: COC RS60Ø1

Date 12/18/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:

QC Level: Level4

TAT: 14-day hardcopy summary
28-day full package

Sample Data							Matrix				Preservatives																					
Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	SLUDGE	HCL, pH<2 4°C	HCL, pH<2 4°C	4°C	4°C	4°C	H_2SO_4,pH<2 4°C	4°C	HNO_3, pH<2 4°C	4°C	4°C	4°C	4°C	4°C	4°C								
											8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ		COMMENT	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles	
SWMU 7.1	RS60Ø1	BLBS1Ø5Ø1	0.5	12/18/97	940	11	X					X															HA			1	
↓	RS60Ø2	BLBS1Ø5Ø1	↓		950	12						X															↓			1	
6.5	RS60Ø3	SLSSØ75Ø1	Ø		1020	44						X	X													*	G			1	
↓	RS60Ø4	SLSSØ65Ø1	Ø		1020	43							X														G		X		
6.4	RS60Ø5	CFBSØ65Ø2	4.5		1050	14												X									HA				
5.18	~~EA~~RS60Ø6	CASSØ25Ø1	Ø		1125	10a				X		X															G				
4.7	RS60Ø7	CLBS355Ø1	0.5		1150	20	X					X						X				X					HA				
↓	RS60Ø8	CLBS365Ø1	0.5		1200	21	X					X															↓				
4.12	RS60Ø9	LFBS245Ø1	Ø.5		1225	4D	X					X						X									-			2	
4.7	RS60Ø	CLQW07E01	-	↓	1345	-		X				X																				
									KMJ																							
											12/18/97																					

Samplers Signature	KMJ	Date 12/18/97	Time 1000
Relinquished By:		Date 12/18/97	Time 1849
Received By:		Date 12/18/97	Time 1809
Relinquished By:		Date	Time
Received By (LAB):		Date	Time

For Lab Use

Lab Number:

*FAX RESULTS TO DIXIE ASAP

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 11°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L9704359

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 611

Date 12/19/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:	
QC Level: Level4	TAT: 14-day hardcopy summary 28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	Sludge	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Perchlorate	Comment	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS611	BABS39S41	0.5	12/19/97	1015	116	8	X						X					X								*	HA			1
RS612	BABS46S03	10		1145	11	9	X											X								*				1
RS613	CLBS28S42	5		1500	63	10	X						X																	1
RS614	BSSUR2-S42	3.5		1600	2	11				X									X					X						1
RS615	AFBS12-S41	1.5		1620	17	12	X											X								☆				1

TB 12/19/97

	Date	Time
Samplers Signature:	12/19/97	1015
Relinquished By:	12/19/97	1915
Received By:	12/19/97	1915
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 6°

* run for lead only
☆ run As, Pb only

900

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L9704359

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS#84
Date 12/19/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:	
QC Level: Level4	TAT: 14-day hardcopy summary 28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | Perchlorates

SWMU
A1AOC

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Perchlorates	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS084	BSBS085D04	7.0	12/19/97	1515	3	13	X											1							B			1
RS085	BSBS085S06	13.5		1525	3	14	X											1						1				1
RS086	BSBS085S07	20.0		1540	3	15	X				*	*					1	1			1			1				1
RS087	BSBS085S08	24.5	↓	1600	3	16	X				*	*					1	1			1			1	↓	A	X	1
																											X	1

25
12/19/97

	Date	Time
Samplers Signature	12/19/97	1730
Relinquished By:	12/19/97	1857
Received By:	12/19/97	1857
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: __/__/__
Temperature °C 6°

NOTE: RUN RS086, RS087 FOR INDICATED PARAMETERS

* HOLD FOR INDICATED PARAMETER

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L970435 9

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS072
Date 12/19/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary; 28-day full package

SWMU	Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	~~8260M~~ 8021 VOC (HCL, pH<2 4°C)	8015OG TPH (HCL, pH<2 4°C)	8270SIM SVOC (4°C)	8270R SVOC (4°C)	8290 DIOXIN (4°C)	ASTM D19 FORMALDEHYDE (H2SO4, pH<2 4°C)	8330 ORDINANCE (4°C)	1LM02.IRT METALSRT (HNO3, pH<2 4°C)	7196 HEX CHROME (4°C)	340.2 FLUORIDE (4°C)	300 ANIONS (4°C)	9045/9040 pH (4°C)	8081 PCBs (4°C)	IC HYDRAZ (4°C)	Perchlorates	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
A1AOC	RS072	CTBS065Ø1	6.0	12/19/97	0850	4		X				/											/			B			1
A1AOC 4.14	RS073	CTBS06DØ1	6.0		0850	4		X				/											/						1
	RS074	CNBS235Ø1	0.5		0922	22		X				/																	1
	RS075	CNBS245Ø1	0.5		0927	6		X				/																	1
	RS076	CNBS255Ø1	1.5		Ø94Ø	1		X			/	/																	1
4.7	RS077	CNBS25DØ1	1.5		Ø94Ø	1		X			/	/																	1
	RS078	CLBS435Ø1	0.5		1125	34		X			/																		1
	RS079	CLBS435Ø2	4.5		1135	34	17	X			/																		1
5.2	RS080	CLBS425Ø1	13.0		124Ø	45	18	X			/																		1
5.2	RS081	EVBS215Ø1	1.5		141Ø	11	19	X			/																		1
	RS082	EVBS215Ø2	4.0		1425	11		X			/																	X	1
A1AOC	RS083	BSBS085Ø5	1.0		151Ø	3	20	X											/						/				1

Samplers Signature	Date	Time
[signature]	12/19/97	173Ø
Relinquished By: [signature]	12/19/97	1852
Received By: [signature]	12/19/97	1852
Relinquished By:		
Received By (LAB):		

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:
Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: __/__/__
Temperature °C 6

008

REV: 1

Columbia Analytical Services INC.

Tuesday, March 10, 1998

Anne Freed
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: **Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9704338**

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 12/17-18/97.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296, expiration August 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

Stuart Sigman
Quality Assurance Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

001

CAS CSR #L9704338

Table of Contents

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition. 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9704338
Project:	Rocketdyne SSFL 313150002	**Date Received:**	12/17-18/97
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Sample Delivery Group Assignment" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses.

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

MS/MSD analysis for 8270SIM was performed on sample RS595 from SDG L9704318.
MS/MSD analysis for 8015TPH was performed on sample RS607 from SDG L9704359.
pH Duplicate was performed on sample RS584 from SDG L9704318.

The following difficulties were experienced during analysis of this batch:
Confirmation analysis for 8021VOC did not confirm Trichloroethene (TCE). This is most probably due to low levels. The highest TCE result on sample RS051 (60 UG/KG) did confirm (6 UG/KG).

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 3/10/98

SAMPLE DELIVERY GROUP ASSIGNMENT

CLIENT: **OGDEN**
PROJECT MANAGER: **DIXIE HAMBRICK**
PROJECT NAME: **ROCKETDYNE SSFL**
PROJECT NUMBER: **313150002**

SDG NUMBER: **L9704338**
LABORATORY: COLUMBIA ANALYTICAL SRV.
SDG CLOSING DATE: 12/18/97
SUMMARY / FINAL DUE: 1/1/98 ./ 1/15/98

#	SAMPLE NAME	SAMPLE DATE	RECEIVED DATE	MATRIX	MS/MSD or MS/DUP	MOISTURE	8260 VOC	8015OG TEPH	8270 SIM	8270 R	METALS (CAM-17)	METALS (CAM-17 + AL + B)	7196 HEXAVALENT CHROMIUM	340.2 FLUORIDE	300.0M ANIONS (CL NO3 NO2)	9040 / 9045 PH	8080 PCB	Hg CVAA 7471	8021VOC		ASTM D19 FORMALDEHYDE	PERCHLORATE	TRIBUTYLTIN	8290 DIOXIN/FURAN	HYDRAZINES	8330 EXPLOSIVES
1	RS057	12/17/97	12/17/97	SOLID		X													X							
2	RS059	12/17/97	12/17/97	SOLID		X													X							
3	RS047	12/17/97	12/17/97	SOLID		X													X							
4	RS051	12/17/97	12/17/97	SOLID		X													X							
5	RS054	12/17/97	12/17/97	SOLID		X													X							
6	RS055	12/17/97	12/17/97	SOLID		X													X							
7	RS596	12/17/97	12/17/97	SOLID		X			X																	
8	RS597	12/17/97	12/17/97	SOLID		X					X					X										
9	RS598	12/17/97	12/17/97	SOLID		X					X															
10	RS599	12/17/97	12/17/97	SOLID		X					X															
11	RS060	12/18/97	12/18/97	SOLID		X		X																		
12	RS061	12/18/97	12/18/97	SOLID		X		X																		
13	RS064	12/18/97	12/18/97	SOLID		X		X																		
14	RS065	12/18/97	12/18/97	SOLID		X		X																		
15	RS066	12/18/97	12/18/97	SOLID		X		X																		
16	RS067	12/18/97	12/18/97	SOLID		X		X																		
17	RS068	12/18/97	12/18/97	SOLID		X		X																		
18	RS069	12/18/97	12/18/97	SOLID		X		X																		
19	RS070	12/18/97	12/18/97	SOLID		X		X																		
20	RS601	12/18/97	12/18/97	SOLID		X		X																		

L9704338

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC R5057
Date 12/17/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:	
QC Level:	Level4
TAT:	14-day hardcopy summary 28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

SWMU 4.7

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260 8021 BTEX VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
R5057	CLB541504	20.0	12/17/97	1535	32	1	X			1																	1
R5058	CLB541505	25.0		1550	32		X			1																X	1
R5059	CLB541506	31.5		1615	32	2	X			1																	1

12/17/97

	Date	Time
Samplers Signature:	12/17/97	1830
Relinquished By:	12/17/97	2035
Received By:	12/17/97	2035
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (N/A)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 4°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

005

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9704338

Chain of Custody

Control Number: COC RS045

Date 12/17/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:

QC Level: Level4

TAT: 14-day hardcopy summary
28-day full package

SWMU 4.7

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	Preservatives: HCL, pH<2 4°C	HCL, pH<2 4°C	4°C	4°C	4°C	H_2SO_4,pH<2 4°C	4°C	HNO_3, pH<2 4°C	4°C	4°C	4°C	4°C	4°C	4°C	4°C	4°C	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
										~~8260B~~ 8021 VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ					
RS045	CLBS395Φ1	5.0	12/17/97	0845	11		X			1																X	1
RS046	CLBS395Φ2	10.0		0855	11					1																X	1
RS047	CLBS395Φ3	17.0		0910	11	•3				1																	1
RS048	CLBS395Φ4	19.0		0910	11					1																X	1
RS049	CLBS4Φ5Φ1	5.5		1145	12					1																X	1
RS050	CLBS4Φ5Φ2	10.0		1115	12					1																X	1
RS051	CLBS4Φ5Φ3	17.0		1130	12	•4				1																	1
RS052	CLBS4Φ5Φ4	20.5		1145	12					1																X	1
RS053	CLBS4Φ5Φ5	25.0		1200	12					1																X	1
RS054	CLBS4Φ5Φ6	30.0		1215	12	•5				1																	1
RS055	CLBS415Φ1	1.5		1505	32	•6				1																	1
RS056	CLBS415Φ2	10.0	↓	1515	32		↓			1																X	1

Samplers Signature	Date 12/17/97	Time 1834
Relinquished By:	Date 12/17/97	Time 2035
Received By:	Date 12/17/97	Time 2035
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 4°

900

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9704338

Chain of Custody

Control Number: **COC** RS ~~585~~ 596 KJ

Date 12/17/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary, 28-day full package

Preservatives: HCL, pH<2 4°C (8260M VOC); HCL, pH<2 4°C (8015OG TPH); 4°C (8270SIM SVOC); 4°C (8270R SVOC); 4°C (8290 DIOXIN); H2SO4, pH<2 4°C (ASTM D19 FORMALDEHYDE); 4°C (8330 ORDINANCE); HNO3, pH<2 4°C (1LM02.IRT METALSRT); 4°C (7196 HEX CHROME); 4°C (340.2 FLUORIDE); 4°C (300 ANIONS); 4°C (9045/9040 pH); 4°C (8081 PCBs); 4°C (IC HYDRAZ)

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ			Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS 596	CLBS45S01	0.5	12/17/97	1600	43	7	X					X					X									HA			1
RS 597	CLBS49S01	0.5	↓	1605	44	8	X										X				X					↓			1
RS 598	CLBS49D01	0.5	↓	1630	45	9	X										X									↓			1
RS599	CLBS19S02	4.5	↓	1650	46	10	X										X									↓	X		1
RS600	CLQW000E01	-	↓	1740	-	—		X						X												-			2

SWMU 4.7

KJ 12/17/97

	Date	Time
Samplers Signature: KMJ	12/17/97	1615
Relinquished By: [signature]	12/17/97	2035
Received By: [signature]	12/17/97	2035
Relinquished By:		
Received By (LAB):		

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: __/__/__
Temperature °C 4°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L 9704338

Chain of Custody

Control Number: COC R5Φ6Φ
Date 12/18/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary
28-day full package

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

SWMU 4.15

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
R5Φ6Φ	BABS365Φ1	1.5	12/18/97	0945	44	11	X				/													B			1
R5Φ61	BABS365Φ2	5.0		0950		12	X				/																1
R5Φ62	BABS365Φ3	10.0		0955			X				/															X	1
R5Φ63	BABS365Φ4	12.0		0955	↓		X				/															X	1
R5Φ64	BABS375Φ1	5.0		1045	4a	13	X				/																1
R5Φ65	BABS375Φ2	10.0		1055		14	X				/																1
R5Φ66	BABS37DΦ2	10.0		1055	↓	15	X				/																1
R5Φ67	BABS38[illegible]1	5.0		1130	52	16	X				/																1
R5Φ68	BABS385Φ2	10.0		1140		17	X				/																1
R5Φ69	BABS38DΦ2	10.0		1140		18	X				/																1
R5Φ7Φ	BABS385Φ3	14.5		1150	↓	19	X				/																1
R5Φ71	BABS38																										

DB 12/18/97

	Date	Time
Samplers Signature	12/18/97	1405
Relinquished By:	12/18/97	1809
Received By:	12/18/97	1809
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 11°

008

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L9704338

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 60P1
Date 12/18/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary
28-day full package

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

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	SLUDGE	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	COMMENT	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
7.1	RS60P1	BLBS10S01	0.5	12/18/97	940	11	20	X				X														HA			1
↓	RS60P2	BLBS11S01	↓		950	12						X	X													↓			
10.5	RS60P3	SLSS07S01	0		1020	44						X	X												*	G			
↓	RS60P4	SLSS06S01	0		1020	43							X													G		X	
10.4	RS60P5	CFBS06S02	1.5		1050	14		↓										X								HA			
5.18	~~EA~~ RS60P6	CASS02S01	0		1125	10a				X		X	X													G			
11.7	RS60P7	CLBS35S01	0.5		1150	20	X					X	X					X				X				HA			
↓	RS60P8	CLBS36S01	0.5		1200	21	X					X	X													↓			
11.12	RS60P9	LFBS24S01	0.5		1225	40	X					X	X					X								-			2
11.7	RS60P0	CLQW07E01	-	↓	1345	-			X	KJ		X																	
												12/18/97																	

Samplers Signature	KMJ	Date	Time
		12/18/97	1000
Relinquished By:		Date	Time
		12/18/97	1849
Received By:		Date	Time
		12/18/97	1809
Relinquished By:		Date	Time
Received By (LAB):		Date	Time

For Lab Use

Lab Number:

*FAX RESULTS TO DIXIE ASAP

Do COC match samples? (Y) or N
Broken container: Y or (N)
Received within holding time (Y) or N
COC seal intact: Y or N (N/A)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 10°

600

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

Columbia Analytical Services inc.

MAR 16 1998

Tuesday, March 10, 1998

Anne Freed
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: **Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9704338**

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 12/17-18/97.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296, expiration August 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

Eydie Schwartz for
Stuart Sigman
Quality Assurance Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

6925 Canoga Avenue ▪ Canoga Park, CA 91303 ▪ (818) 587-5550 ▪ Fax (818) 587-5555

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9704338
Project:	Rocketdyne SSFL 313150002	**Date Received:**	12/17-18/97
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Sample Delivery Group Assignment" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses.

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

MS/MSD analysis for 8270SIM was performed on sample RS595 from SDG L9704318.
MS/MSD analysis for 8015TPH was performed on sample RS607 from SDG L9704359.
pH Duplicate was performed on sample RS584 from SDG L9704318.

The following difficulties were experienced during analysis of this batch:
Confirmation analysis for 8021VOC did not confirm Trichloroethene (TCE). This is most probably due to low levels. The highest TCE result on sample RS051 (60 UG/KG) did confirm (6 UG/KG).

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 3/10/98

SAMPLE DELIVERY GROUP ASSIGNMENT

CLIENT: **OGDEN**
PROJECT MANAGER: **DIXIE HAMBRICK**
PROJECT NAME: **ROCKETDYNE SSFL**
PROJECT NUMBER: **313150002**

SDG NUMBER: **L9704338**
LABORATORY: COLUMBIA ANALYTICAL SRV.
SDG CLOSING DATE: 12/18/97
SUMMARY / FINAL DUE: 1/1/98 / 1/15/98

#	SAMPLE NAME	SAMPLE DATE	RECEIVED DATE	MATRIX	MS/MSD or MS/DUP	MOISTURE	8260 VOC	8015OG TEPH	8270 SIM	8270 R	METALS (CAM-17)	METALS (CAM-17 + AL + B)	7196 HEXAVALENT CHROMIUM	340.2 FLUORIDE	300.0M ANIONS (CL NO3 NO2)	9040 / 9045 PH	8080 PCB	Hg CVAA 7471	8021VOC		ASTM D19 FORMALDEHYDE	PERCHLORATE	TRIBUTYLTIN	8290 DIOXIN/FURAN	HYDRAZINES	8330 EXPLOSIVES
1	RS057	12/17/97	12/17/97	SOLID		X													X							
2	RS059	12/17/97	12/17/97	SOLID		X													X							
3	RS047	12/17/97	12/17/97	SOLID		X													X							
4	RS051	12/17/97	12/17/97	SOLID		X													X							
5	RS054	12/17/97	12/17/97	SOLID		X													X							
6	RS055	12/17/97	12/17/97	SOLID		X													X							
7	RS596	12/17/97	12/17/97	SOLID		X			X																	
8	RS597	12/17/97	12/17/97	SOLID		X					X					X										
9	RS598	12/17/97	12/17/97	SOLID		X					X															
10	RS599	12/17/97	12/17/97	SOLID		X					X															
11	RS060	12/18/97	12/18/97	SOLID		X		X																		
12	RS061	12/18/97	12/18/97	SOLID		X		X																		
13	RS064	12/18/97	12/18/97	SOLID		X		X																		
14	RS065	12/18/97	12/18/97	SOLID		X		X																		
15	RS066	12/18/97	12/18/97	SOLID		X		X																		
16	RS067	12/18/97	12/18/97	SOLID		X		X																		
17	RS068	12/18/97	12/18/97	SOLID		X		X																		
18	RS069	12/18/97	12/18/97	SOLID		X		X																		
19	RS070	12/18/97	12/18/97	SOLID		X		X																		
20	RS601	12/18/97	12/18/97	SOLID		X		X																		

L9704338

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC R5057
Date 12/17/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:	
QC Level: Level4	TAT: 14-day hardcopy summary 28-day full package

SWMU 4.7

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product
R5057	CLB5415054	20.0	12/17/97	1535	32	1	X		
R5058	CLB5415055	25.0		1550	32		X		
R5059	CLB5415056	31.5		1615	32	2	X		

Preservatives	HCL, pH<2 4°C	HCL, pH<2 4°C	4°C	4°C	4°C	H_2SO_4,pH<2 4°C	4°C	HNO_3, pH<2 4°C	4°C	4°C	4°C	4°C	4°C	4°C	4°C						
~~8260~~ 8021 VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ			Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
1																			1
1																		X	1
1																			1

12/17/97

	Date	Time
Samplers Signature	12/17/97	1830
Relinquished By:	12/17/97	2035
Received By:	12/17/97	2035
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 4°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

005

L9704338

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: **COC** R5Φ45

Date 12/17/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:

QC Level: Level4

TAT: 14-day hardcopy summary
28-day full package

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

SWMU 4.7

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	~~8260M~~ 8021 VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.1RT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ			Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
R5Φ45	CLBS395Φ1	5.Φ	12/17/97	Φ845	11	—	X			/																		X	1
R5Φ46	CLBS395Φ2	10.Φ		Φ855	11	—	↓			/																		X	1
R5Φ47	CLBS395Φ3	17.Φ		Φ910	11	.3				/																			1
R5Φ48	CLBS395Φ4	19.Φ		Φ910	11	—				/																		X	1
R5Φ49	CLBS4Φ5Φ1	5.5		1105	12	—				/																		X	1
R5Φ50	CLBS4Φ5Φ2	10.Φ		1115	12	—				/																		X	1
R5Φ51	CLBS4Φ5Φ3	17.Φ		1130	12	.4				/																			1
R5Φ52	CLBS4Φ5Φ4	20.5		1145	12	—				/																		X	1
R5Φ53	CLBS4Φ5Φ5	25.Φ		1200	12	—				/																		X	1
R5Φ54	CLBS4Φ5Φ6	30.Φ		1215	12	.5				/																			1
R5Φ55	CLBS415Φ1	1.5		1505	32	.6				/																			1
R5Φ56	CLBS415Φ2	10.Φ	↓	1515	32	—	↓			/																		X	1

	Date	Time
Samplers Signature [signature]	12/17/97	183Φ
Relinquished By: [signature]	12/17/97	2035
Received By: [signature]	12/17/97	2035
Relinquished By:		
Received By (LAB):		

For Lab Use

Lab Number:

Do COC match samples (Y) or N
Broken container: Y or (N)
Received within holding time (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: __/__/__
Temperature °C 4°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9704338

Chain of Custody

Control Number: COC RS 596 ~~585~~ KT

Date 12/17/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:		
QC Level: Level4	TAT: 14-day hardcopy summary 28-day full package	

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS 596	CLBS48S01	0.5	12/17/97	1600	607	7	X					X					X				X			HA			1
RS 597	CLBS49S01	0.5		1605	4606	8	X										X										1
RS 598	CLBS49D01	0.5		1630	4606	9	X										X								X		1
RS 599	CLBS19S02	4.5		1650	46	10	X										X										1
RS 600	CLQW01E01	-		1740	-			X						X										-			2

Matrix: Soil | Water | Product

Samplers Signature: KMT	Date: 12/17/97	Time: 1615
Relinquished By:	Date: 12/17/97	Time: 2035
Received By:	Date: 12/17/97	Time: 2035
Relinquished By:	Date:	Time:
Received By (LAB):	Date:	Time:

For Lab Use

Lab Number:

Do COC match samples (Y) or N

Broken container: Y or (N)

Received within holding time (Y) or N

COC seal intact: Y or N (NA)

Any other problems: Y or (N)

If any YES, Ogden contacted: Y or N

Date contacted: __/__/__

Temperature °C 4.0

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

007

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L 9704338

Chain of Custody

Control Number: COC RS060

Date 12/18/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:		
QC Level: Level4	TAT: 14-day hardcopy summary 28-day full package	

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

SWMU 4.15

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ		Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS060	BABS365Q1	1.5	12/18/97	0945	44	11	X				1														B			1
RS061	BABS365Q2	5.0		0950		12	X				1																	1
RS062	BABS365Q3	10.5		0955			X				1																X	1
RS063	BABS365Q4	12.0		0955	↓		X				1																X	1
RS064	BABS375Q1	5.0		1045	44a	13	X				1																	1
RS065	BABS375Q2	10.0		1055		14	X				1																	1
RS066	BABS37DQ2	10.0		1055	↓	15	X				1																	1
RS067	BABS385Q1	5.0		1130	52	16	X				1																	1
RS068	BABS385Q2	10.0		1140		17	X				1																	1
RS069	BABS38DQ2	10.0		1140		18	X				1																	1
RS070	BABS385Q3	14.5		1150	↓	19	X				1																	1
RS071	BABS38																								↓			

DB 12/18

Sampler's Signature	Date 12/18/97	Time 1405
Relinquished By:	Date 12/18/97	Time 1809
Received By: Kristle Burgess	Date 12/18/97	Time 1809
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

800

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 11°

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

L9704338

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RS 60Φ1
Date 12/18/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method:
Comment:

Cooler No:
QC Level: Level4
TAT: 14-day hardcopy summary
28-day full package

Preservatives	HCL, pH<2 4°C	HCL, pH<2 4°C	4°C	4°C	4°C	H_2SO_4,pH<2 4°C	4°C	HNO_3, pH<2 4°C	4°C	4°C	4°C	4°C	4°C	4°C	4°C						

Sample Data							Matrix																								
Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	ULS Number	Lab ID	Soil	Water	Product	SLUDGE	8260M VOC	8015OG TPH	8270SIM SVOC	8270R SVOC	8290 DIOXIN	ASTM D19 FORMALDEHYDE	8330 ORDINANCE	1LM02.IRT METALSRT	7196 HEX CHROME	340.2 FLUORIDE	300 ANIONS	9045/9040 pH	8081 PCBs	IC HYDRAZ		COMMENT	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RS60Φ1	BLBS10S0Φ1	0.5	12/18/97	940	11	20	X					X														HA			1
RS60Φ2	BLBS11S0Φ1	↓	↓	950	12		↓					X														↓			
RS60Φ3	SLSS0Φ75Φ1	Φ		1020	44							X	X												*	G			
RS60Φ4	SLSS0Φ65Φ1	Φ		1020	43								X													G		X	
RS60Φ5	CFBS0Φ65Φ2	1.5		1050	14													X								HA			
RS60Φ6	CASS0Φ25Φ1	Φ		1125	10					X		X														G			
RS60Φ7	CLBS355Φ1	0.5		1150	20		X					X						X				X				HA			
RS60Φ8	CLBS360Φ1	0.5		1200	21		X					X														↓			
RS60Φ9	LFBS245Φ1	Φ.5		1225	40		X					X						X								-			2
RS60Φ	CLQW07EΦ1	-		1345	-			X		KJ		X																	
											12/18/97																			

Samplers Signature	KMJ	Date 12/18/97	Time 1000
Relinquished By:		Date 12/18/97	Time 1849
Received By:		Date 12/18/97	Time 1809
Relinquished By:		Date	Time
Received By (LAB):		Date	Time

For Lab Use

Lab Number:

*FAX RESULTS TO DIXIE ASAP

Do COC match samples? Y or N
Broken container: Y or (N)
Received within holding time (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 10°

600

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

Columbia Analytical Services inc.

Thursday, February 19, 1998

Anne Freed
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9703698

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 10/27 -31/97.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296, expiration August 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

Stuart Sigman
Quality Assurance Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

0001

CAS CSR #L9703698

Table of Contents

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

2000
0002

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9703698
Project:	Rocketdyne SSFL 313150002	**Date Received:**	10/27-31/97
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Sample Delivery Group Assignment" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses. Any tests marked under the grey-shaded parameters to the far right of this form were sub-contracted to the following laboratories:

Formaldehyde	Columbia Analytical Services, Kelso, WA.

Subcontracted test results, case narratives and data packages are included as an appendix to this report.

The following changes were requested via fax from Lisa Arrasmith on 10/30/97:
Add Aluminum and Boron to RF702.

Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

Cooler temperatures were recorded on COCs except for Control Nos. RF150, RF736 & RF160.

MS/MSD for Fluoride was performed on RF750 from SDG L9703713.

MS/MSD for Anions was performed on RF176 from SDG L9703713.

MS/MSD analysis for 8270R was performed on sample RF795DL from SDG L9703763.

No difficulties were experienced during analysis of this batch.

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 2/19/98

SAMPLE DELIVERY GROUP ASSIGNMENT

CLIENT: **OGDEN**
PROJECT MANAGER: **DIXIE HAMBRICK**
PROJECT NAME: **ROCKETDYNE SSFL**
PROJECT NUMBER: **313150002**

SDG NUMBER: **L9703698**
LABORATORY: COLUMBIA ANALYTICAL SRV.
SDG CLOSING DATE: 10/31/97
SUMMARY / FINAL DUE: 11/14/97 / 11/28/97

#	SAMPLE NAME	SAMPLE DATE	RECEIVED DATE	MATRIX	MS/MSD or MS/DUP	MOISTURE	8260 VOC	8015OG TEPH	8270 SIM	8270 R	METALS (CAM-17)	METALS (CAM-17 + AL + B)	7196 HEXAVALENT CHROMIUM	340.2 FLUORIDE	300.0M ANIONS (CL NO3 NO2)	9040 / 9045 PH	8080 PCB	Hg CVAA 7471	ICP AL & B		ASTM D19 FORMALDEHYDE	PERCHLORATE	TRIBUTYLTIN	8290 DIOXIN/FURAN	HYDRAZINES	8330 EXPLOSIVES
1	RF733	10/29/97	10/29/97	SOLID		X					X					X										
2	RF734	10/29/97	10/29/97	SOLID		X					X					X										
3	RF735	10/29/97	10/29/97	SOLID		X					X					X										
4	RF143	10/29/97	10/29/97	SOLID		X					X					X										
5	RF144	10/29/97	10/29/97	SOLID		X					X					X										
6	RF145	10/29/97	10/29/97	SOLID		X					X					X										
7	RF146	10/29/97	10/29/97	SOLID		X					X					X										
8	RF147	10/29/97	10/29/97	SOLID		X					X					X										
9	RF148	10/29/97	10/29/97	SOLID		X					X					X										
10	RF150	10/30/97	10/30/97	SOLID		X					X					X										
11	RF151	10/30/97	10/30/97	SOLID		X					X					X										
12	RF157	10/30/97	10/30/97	SOLID		X			X		X					X										
13	RF736	10/30/97	10/30/97	SOLID		X					X					X										
14	RF738	10/30/97	10/30/97	SOLID		X			X		X			X	X	X										
15	RF739	10/30/97	10/30/97	SOLID		X				X	X					X										
16	RF740	10/30/97	10/30/97	SOLID		X				X	X					X										
17	RF741	10/30/97	10/30/97	SOLID		X					X					X										
18	RF744	10/30/97	10/30/97	SOLID		X			X												X					
19	RF702	10/27/97	10/27/97	SOLID		X			X			X				X										
20	RF160	10/31/97	10/31/97	SOLID		X			X		X					X										

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9703698

Chain of Custody

Control Number: **COC** RF 726

Date 10 / 21 / 97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Duffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal

Shipment Method: Federal Express

Comment:

* CHLORIDE & NITRATE WILL USE ONE CONTAINER

Cooler No:	
QC Level: Level4	TAT: 35 - Day

Preservatives: 8260M VOC – HCL, pH<2, 4°C; 8015OG Hydrocarbon – HCL, pH<2, 4°C; 8270SIM PAH – 4°C; 8290 Dioxin – 4°C; 3500 Formaldehyde – H2SO4, pH<2, 4°C; 6330 Ordinance – 4°C; 6010/7000 MetalsRT – HNO3, pH<2, 4°C; 7196 CrVI – 4°C; 340.2 Fluoride – 4°C; 300 Nitrate/Nitrite* – 4°C; 300 Chloride* – 4°C; 9045/9040 pH – 4°C

Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Soil	Water	Product	Sludge	8260M VOC	8015OG Hydrocarbon	8270SIM PAH	8290 Dioxin	3500 Formaldehyde	6330 Ordinance	6010/7000 MetalsRT	7196 CrVI	340.2 Fluoride	300 Nitrate/Nitrite*	300 Chloride*	9045/9040 pH	PCBs	SWMU	Sampling Method	Extra Volume MS/MSD	HOLD	Total # of Bottles
RF 726	AFSS01SO1 DUP	0	10/21/97	0810		X						1		1													1
RF728	OCBS10SO1	0.5	↓	1135					X			1											4.9	G			1
RF729	OCBS11SO1	0.5	↓	1215		X										1		1	1	1	1		7.4	HA			1
~~RF 731~~	BLBS04SO1	0.5	↓	1415		X															~~1~~ [illegible]	1	7.4	HA			1
~~RF 732~~	BLBS05SO1	0.5	↓	1430		X										1					1		7.1	↓			1
RF 733	BLBS06SO1	0.5	↓	1500	1	X										1					1		↓	↓			1
RF 734	BLBS07SO1	0.5	↓	1600 ~~[illegible]~~	2	X										1					1		↓	↓			1
RF 735	BLBS08SO1	0.5	↓	~~[illegible]~~ 1600	3	X										1					1		↓	↓			1

K. Jamison 10/21/97

ULS # 14, 7, 18, 3, 4, 6, 5, 7

	Date	Time
Samplers Signature: K. Jamison	10/21/97	0820
Relinquished By: K. Jamison	10/21/97	1715
Received By: [illegible signature]	10/27/97	1445
Relinquished By: [illegible signature]	10/27/97	1835
Received By (LAB): [illegible signature]	10/28/97	1835

For Lab Use

Lab Number:

Do COC match samples? (Y) or N

Broken container: Y or (N)

Received within holding time (Y) or N

COC seal intact: Y or N (NA)

Any other problems: Y or (N)

If any YES, Ogden contacted: Y or N

Date contacted: __ / __ / __

Temperature °C 1.4

1 Original, 2 Lab Copy, 3 Field Copy

0005

REV. 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9703698

Chain of Custody

Control Number: COC RF140

Date 10/29/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Mark Deffley
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* CHLORIDE & NITRATE WILL USE ONE CONTAINER

Cooler No: R11

QC Level: Level4 TAT: 35 - Day

Preservatives: HCL, pH<2 4°C | HCL, pH<2 4°C | 4°C | 4°C | H_2SO_4,pH<2 4°C | 4°C | HNO_3, pH<2 4°C | 4°C | 4°C | 4°C | 4°C | 4°C

Sample Data

Sample ID	Description (for Ogden use only)	DEPTH	Date Collected	Time Collected	Lab ID
RF143	BLBS01S01	0.5	10/29/97	1410	4
RF144	BLBS01S02	5.0		1430	5
RF145	BLBS02S01	0.5		150	
RF145	BLBS01S03	9.5	10/29/97	1440	6
RF146	BLBS02S01	0.5		1505	7
RF147	BLBS02S02	5.0		1515	8
RF148	BLBS02S03	9.5		1530	9
RF149	BLQW01E01	—		1710	

Matrix

Soil	Water	Product	METHOD
X			B
X			B
X			B
X			B
X			B
X			B
	X		G

8260M VOC	8015OG HYDROCARBON	8270SIM PAH	8290 DIOXIN	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	7196 CrVI	340.2 FLUORIDE	300 NITRATE/NITRITE*	300 CHLORIDE *	9045/9040 pH	SW846	Extra Volume MS/MSD	HOLD	Total # of Bottles
						/					/	7.1			1
						/					/				1
						/					/				1
						/					/				1
						/					/				1
						/					/				1
						/					/				1
		DUP	10/29/97												

ULS
1
1
1
2
2
2
1

Samplers Signature	Date 10/29/97	Time 1715
Relinquished By:	Date 10/29/97	Time 1739
Received By:	Date 10/29/97	Time 1752
Relinquished By:	Date 10/29/97	Time 1825
Received By (LAB):	Date 10/29/97	Time 1835

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (N/A)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 14

REV: 1

L9703678

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RF150
Date 10 / 30 / 97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ pending
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* CHLORIDE & NITRATE WILL USE ONE CONTAINER

Cooler No:
QC Level: Level4 TAT: 35 - Day

Preservatives: 8260M VOC — HCL, pH<2 4°C; 8015OG HYDROCARBON — HCL, pH<2 4°C; 8270SIM PAH — 4°C; 8290 DIOXIN — 4°C; 3500 FORMALDEHYDE — H2SO4,pH<2 4°C; 8330 ORDINANCE — 4°C; 6010/7000 METALSRT — HNO3, pH<2 4°C; 7196 CrVI — 4°C; 340.2 FLUORIDE — 4°C; 300 NITRATE/NITRITE — 4°C; 300 CHLORIDE * — 4°C; 9045/9040 pH — 4°C

Margin	Sample ID	Description (for Ogden use only)		Date Collected	Time Collected	Lab ID	Soil	Water	Product	Method	8260M VOC	8015OG HYDROCARBON	8270SIM PAH	8290 DIOXIN	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	7196 CrVI	340.2 FLUORIDE	300 NITRATE/NITRITE	300 CHLORIDE *	9045/9040 pH	Extra Volume MS/MSD	HOLD	Total # of Bottles
ULS 2	RF150	BLBSØ2SØ4	16.0	10-30-97	930	10	X			B							X					X			
8	RF151	BLBSØ3SØ1	1.0	"	1040	11	X			B							X					X			
1	RF157	B4BSØ4SØ1	1.5	"	1550	12	X			B			X				X					X			
ANS	~~RF159~~	~~B4BSØ4SØ2~~		~~"~~			~~X~~			~~B~~			~~X~~				~~X~~					~~X~~			
—	RF158	B4GWØ1EØ1	—	"	1725			X														X			

ANS 10-30-97

	Date	Time
Samplers Signature: A. S[signature]	10-30-97	930
Relinquished By: [signature]	10/30/97	1904
Received By: [signature]	10/30/97	1904
Relinquished By:		
Received By (LAB):		

For Lab Use
Lab Number:
Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C Cool

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

0007

L9703698

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: **COC** RF 736

Date 10 / 30 / 97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Beffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:	Laboratory Disposal
Shipment Method:	Federal Express
Comment:	

* CHLORIDE & NITRATE WILL USE ONE CONTAINER

Cooler No:			
QC Level:	Level4	TAT:	35 - Day

Preservatives: HCL, pH<2 4°C (8260M VOC); HCL, pH<2 4°C (8015OG Hydrocarbon); 4°C (8270SIM PAH); 4°C (8290 Dioxin); H2SO4, pH<2 4°C (3500 Formaldehyde); 4°C (8330 Ordinance); HNO3, pH<2 4°C (6010/7000 Metalsrt); 4°C (7196 CrVI); 4°C (340.2 Fluoride); 4°C (300 Nitrate/Nitrite*); 4°C (300 Chloride*); 4°C (9045/9040 pH)

Sample Data

UIS #	Sample ID	Description (for Ogden use only)	DEPTH	Date Collected	Time Collected	Lab ID	Soil	Water	Product	8260M VOC	8015OG HYDROCARBON	8270SIM PAH	8290 DIOXIN	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	7196 CrVI	340.2 FLUORIDE	300 NITRATE/NITRITE*	300 CHLORIDE*	9045/9040 pH	FULL SVOC SUITE			SWMU	SAMPLING METHOD	Extra Volume MS/MSD	HOLD	Total # of Bottles
9	RF 736	BLBSØ9SØ1	Ø.5	10/30/97	0815	13	X									1					1				7.1	HA			1
17	RF 738	OCBS14SØ1	Ø.5		1000	14	X					1				1		1	1	1	1				7.4	HA			1
4	RF 739	LXBSØ4SØ1	Ø.5		1130	15	X									1					1	1			4.5	HA			1
5	RF 740	LXBSØ5SØ1	5.Ø		1215	16	X									1					1	1			4.5	HA			1
4	RF 741	DASSØ1SØ1	Ø		1515	17	X									1					1				5.23	~~6~~ G	~~[scribble]~~ VKJ		1
2a	RF 744	DASSØ2SØ1	Ø	✓	1645	18	X					1		1											5.23	G			1

K Jamieson 10/30/97

Samplers Signature	Date	Time
K Jamieson	10/30/97	0820
Relinquished By: K Jamieson	10/30/97	1904
Received By: [signature]	10/30/97	1904
Relinquished By:		
Received By (LAB):		

For Lab Use

Lab Number:

Do COC match samples: (Y) or N

Broken container: Y or (N)

Received within holding time: (Y) or N

COC seal intact: Y or N (NA)

Any other problems: Y or (N)

If any YES, Ogden contacted: Y or N

Date contacted: ___/___/___

Temperature °C cool

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

0008

L9703698-19
~~L9703644~~

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RF 702
Date 10/27/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* CHLORIDE & NITRATE WILL USE ONE CONTAINER

Cooler No: R11
QC Level: Level4 TAT: 35 - Day

Preservatives 98-99

Sample ID	Description (for Ogden use only)	DEPTH	Date Collected	Time Collected	Lab ID	Soil	Water	Product	Sludge	8260M VOC	8015OG HYDROCARBON	8270SIM PAH	8290 DIOXIN	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	7196 CrVI	340.2 FLUORIDE	300 NITRATE/NITRITE	300 CHLORIDE *	9045/9040 pH	SAMPLING METHOD	Extra Volume MS/MSD	HOLD	Total # of Bottles
RF 702	SNBS@5S@2	0.5	10/27/97	0830					X			1				1					1	G		*	1
RF 703	SNBS@1S@2	0.5		0850					X			1				1					1	G		*	1
RF 704	SNBS@6S@2	0.5		1030					X			1				1					1	G		*	1
RF 705	R1BS@1S@1	0.5	2.0	1155	8				X			1			1	1					1	G			1
RF 706	R1BS@2S@1	0.5		1220	9				X			1			1	1					1	G			1
RF 707	R1BS@4S@1	0.5		1435	10	X						1			1	1					1	G			1
RF 708	R1BS@3S@1	1.0		1430	11				X			1			1	1					1	G			1
RF 710	LESS@7S@1	0		1610	12	X										1		1	1	1	1	G			1

K Jamieson 10/27/97

HA 5

Samplers Signature: K Jamieson	Date: 10/27/97	Time: 1730
Relinquished By: K Jamieson	Date: 10/27/97	Time: 1730
~~Received By:~~	Date: 10/27/97	Time: 1730
Relinquished By:	Date: 10/27/97	Time: 1830
Received By (LAB):	Date: 10/27/97	Time: 1830

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do COC match samples (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 3

* HOLD ALL TESTS UNTIL OGDEN AUTHORIZES THEM.

3°/Intact

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9703698

Chain of Custody

Control Number: COC RF160
Date 10/31/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Doffloy~~ purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* CHLORIDE & NITRATE WILL USE ONE CONTAINER

Cooler No:			
QC Level:	Level4	TAT:	35 - Day

Sample ID	Description (for Ogden use only)	DEPTH	Date Collected	Time Collected	Lab ID
RF160	BUBS@65@1	4.5	10-31-97	850	-20
RF161	BUBS@75@1	0.5	"	925	
RF166	SPBS@85@1	1.0	10/31/97	1415	
RF167	SPBS@95@1	@.5		1430	
RF168	SPBS@95@2	5.0	↓	1440	
RF169	SPBS10S@1	@.5	↓	1515	
RF172	PEBS@35@1	0.5	"	1650	
RF173	PEBS@9.5@1	2.5	"	1650	

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

Matrix	Soil	Water	Product	Method
RF160	X			B
RF161	X			B
RF166	X			B
RF167	X			B
RF168	X			B
RF169	X			B
RF172	X			S
RF173	X			S

Sample ID	8260M VOC	8015OG HYDROCARBON	8270SIM PAH	8290 DIOXIN	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	7196 CrVI	340.2 FLUORIDE	300 NITRATE/NITRITE*	300 CHLORIDE *	9045/9040 pH	SVMS	Extra Volume MS/MSD	HOLD	Total # of Bottles
RF160			X				X					X	5.5			
RF161							X					X	5.5			
RF166			X		X								AOC			
RF167			X		X								AOC			
RF168			X		X								AOC			
RF169			X		X								AOC			
RF172			X				X									
RF173																
		A														
		10-31-97														

Samplers Signature	Date 10/31/97	Time 1710
Relinquished By:	Date 10/31/97	Time 1710
Received By:	Date 10/31/97	Time 1110
Relinquished By:	Date 10/31/97	Time 1850
Received By (LAB):	Date 10/31/97	Time 1750

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C

REV: 1

OGDEN ENVIRONMENTAL AND ENERGY SERVICE

5510 Morehouse Drive
San Diego, CA 92121-1709
(619) 458-9044
fax: (619) 458-0943

FACSIMILE

To: Mr. Leo Raab/Columbia Analytical Services
Fax No.: (818) 587-5555

From: Lisa L. Arrasmith *sign:* Lisa L Arrasmith

Date: 10/30/97 There is 1 Page to transmit including this cover page

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

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	Date Collected	Method (s) Originally Requested[a]	Method (s) Now Requested[a]	
RF702	RF702	10/27/97	S, M & pH	S, M+ & pH	L9703698-19
RF702	RF703	10/27/97	S, M+ & pH	HOLD	–
RF702	RF704	10/27/97	S, M+ & pH	HOLD	–
RF713	RF721	10/28/97	Fl, A & pH	S, F, Al & B	L9703679-9
RF713	RF722	10/28/97	Fl, A & pH	S & F	-10

[a] S= 8270 SIM, semi-volatile organics
M= Metals
M+= Metals + Aluminum (Al) & Boron (B)
Fl= 340.2, Fluoride
F= 3500, Formaldehyde
A= Anions

The reason for these changes is:

Incorrectly marked on COC form _____
Lack of sample volume _____
Ogden office personnel require this change X
Other: Containers mislabeled ___ _____

Thank you.

0011

Columbia Analytical Services inc.

Thursday, February 19, 1998

Anne Freed
Ogden
5510 Morehouse Drive
San Diego, CA 92121

Re: Rocketdyne SSFL / Project No. 313150002 / CAS SDG No. L9703679

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on 10/28 - 29/97.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 1296, expiration August 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Leo Raab
Project Chemist

Stuart Sigman
Quality Assurance Chemist

xc:
Elizabeth Wessling
Ogden
550 S. Wadsworth Blvd., Suite 500
Lakewood, CO 80226

6925 Canoga Avenue ▪ Canoga Park, CA 91303 ▪ (818) 587-5550 ▪ Fax (818) 587-5555

CAS CSR #L9703679

Table of Contents

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Ogden	**Service Request No.:**	L9703679
Project:	Rocketdyne SSFL 313150002	**Date Received:**	10/28-29/97
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix Spike (MS), Duplicate Matrix Spike (DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

Refer to the "Sample Delivery Group Assignment" form for a listing of Ogden (EPA) Sample ID's versus Columbia Analytical Services' SDG/Service Request numbers, sample dates, received dates, matrix and requested analyses. Any tests marked under the grey-shaded parameters to the far right of this form were sub-contracted to the following laboratories:

Formaldehyde	Columbia Analytical Services, Kelso, WA.
Dioxins/Furans/EPA 8290	Triangle Lab, Durham, NC.

Subcontracted test results, case narratives and data packages are included as an appendix to this report.

The following changes were requested via fax from Lisa Arrasmith on 10/30/97:
Add on 8270 SIM, Formaldehyde, Aluminum and Boron to RF 721. Add on 8270 SIM and Formaldehyde to RF722. Fluoride, Anions and pH were cancelled on RF721 & RF722.

MS/MSD analysis for 8080-PCB was performed on sample RF678 from SDG L9703578.
Laboratory Control Samples are liquids. For solid SDGs, data is calculated and reported in solid units.

The following difficulties were experienced during analysis of this batch:
Surrogates for 8270SIM for RF723DL, RF728DL, RF723DLDL & RF726DLDL were not reportable due to sample matrix requiring dilution. Surrogate for 8270SIM for RF126DL was slightly above range for one of three surrogates.

Data Qualifier Flags are: U = Not Detected, E = Estimated Value above calibration range, J = Estimated Value between MDL and PQL.

Approved by: _____ Date: 2/19/98

SAMPLE DELIVERY GROUP ASSIGNMENT

CLIENT: **OGDEN**
PROJECT MANAGER: **DIXIE HAMBRICK**
PROJECT NAME: **ROCKETDYNE SSFL**
PROJECT NUMBER: **313150002**

SDG NUMBER: **L9703679**
LABORATORY: COLUMBIA ANALYTICAL SRV.
SDG CLOSING DATE: 10/30/97 * See Note
SUMMARY / FINAL DUE: 11/13/97 / 11/26/97

#	SAMPLE NAME	SAMPLE DATE	RECEIVED DATE	MATRIX	MS/MSD or MS/DUP	MOISTURE	8260 VOC	8015OG TEPH	8270 SIM	8270 R	METALS (CAM-17)	METALS (CAM-17 + AL + B)	7196 HEXAVALENT CHROMIUM	340.2 FLUORIDE	300.0M ANIONS (CL NO3 NO2)	9040 / 9045 PH	8080 PCB	ICP AL & B			ASTM D19 FORMALDEHYDE	PERCHLORATE	TRIBUTYLTIN	8290 DIOXIN/FURAN	HYDRAZINES	8330 EXPLOSIVES
1	RF713	10/28/97	10/28/97	SOLID		X					X					X										
2	RF714	10/28/97	10/28/97	SOLID		X					X					X										
3	RF715	10/28/97	10/28/97	SOLID		X					X			X	X	X								X		
4	RF716	10/28/97	10/28/97	SOLID		X							X				X									
5	RF717	10/28/97	10/28/97	SOLID		X					X		X			X										
6	RF718	10/28/97	10/28/97	SOLID		X					X		X			X										
7	RF719	10/28/97	10/28/97	SOLID		X					X		X			X										
8	RF720	10/28/97	10/28/97	SOLID		X					X		X			X										
9	RF721	10/28/97	10/28/97	SOLID		X			X					C	C	C		X			X					
10	RF722	10/28/97	10/28/97	SOLID		X			X					C	C	C					X					
11	RF723	10/28/97	10/28/97	SOLID		X			X									X			X					
12	RF124	10/28/97	10/28/97	SOLID		X			X																	
13	RF126	10/28/97	10/28/97	SOLID		X			X																	
14	RF127	10/28/97	10/28/97	SOLID		X			X																	
15	RF128	10/28/97	10/28/97	SOLID		X			X																	
16	RF726	10/29/97	10/29/97	SOLID		X			X												X					
17	RF728	10/29/97	10/29/97	SOLID		X			X		X			X	X	X										
18	RF729	10/29/97	10/29/97	SOLID		X											X									
19	RF731	10/29/97	10/29/97	SOLID		X					X					X										
20	RF732	10/29/97	10/29/97	SOLID		X					X					X										

cancelled & added to RF721 & RF722 10/30

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9703679

Chain of Custody

Control Number: **COC** RF 713

Date 10 / 28 / 97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* CHLORIDE & NITRATE WILL USE ONE CONTAINER

Cooler No:
QC Level: Level4 TAT: 35 - Day

Preservatives: HCL, pH<2 4°C (8260M VOC); HCL, pH<2 4°C (8015OG HYDROCARBON); 4°C (8270SIM PAH); 4°C (8290 DIOXIN); H2SO4,pH<2 4°C (3500 FORMALDEHYDE); 4°C (8330 ORDINANCE); HNO3, pH<2 4°C (6010/7000 METALSRT); 4°C (7196 CrVI); 4°C (340.2 FLUORIDE); 4°C (300 NITRATE/NITRITE); 4°C (300 CHLORIDE *); 4°C (9045/9040 pH)

ULS #	Sample ID	Description (for Ogden use only)	DEPTH	Date Collected	Time Collected	Lab ID	Soil	Water	Product	SLUDGE	8260M VOC	8015OG HYDROCARBON	8270SIM PAH	8290 DIOXIN	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	7196 CrVI	340.2 FLUORIDE	300 NITRATE/NITRITE	300 CHLORIDE *	9045/9040 pH	Al, B	SWMU	PCBs		SAMPLING METHOD	Extra Volume MS/MSD	HOLD	Total # of Bottles
5	RF 713	NCSS01S01	Ø	10/28/97	0840	1	X										1					1		7.8			G			1
4	RF 714	NCSS02S01	Ø		0840	2	X										1					1		7.8			G		~~1~~	1
9	RF 715	LFSS01S03	Ø		0955	3				X				1			1		1	1	1	1		4.12			G		~~X~~	1
46	RF 716	IL500~~2S02~~ 3S01	Ø		~~1130~~ 1400	4	~~X~~			X							~~1~~	1				~~1~~		4.3	1		G			1
4	RF 717	APSS01S01	Ø		1500	5	X										1	1				1		5.6			G			1
3	RF 718	APSS02S01	Ø		1505	6	X										1	1				1		5.6			G			1
1	RF 719	APSS03S01	Ø		1505	7	X										1	1				1		5.6			G			1
2	RF 720	APSS04S01	Ø		1505	8	X										1	1				1		5.6			G			1
29	RF 721	CLSS01S01	Ø		~~1605~~ 1610	9	X								~~1~~				1	1	1	1		4.7			G			1
30	RF 722	CLSS02S01	Ø		1615	10	X								~~1~~				1	1	1	1		4.7			G			1
48a	RF 723	CLSS03S01	Ø	↓	1610	11	X						1		1								1	4.7			G			1

	Date	Time
Samplers Signature: KM. Jamieson	10/28/97	0850
Relinquished By: KM. Jamieson	10/28/97	1820
Received By: [signature]	10/28/97	1820
Relinquished By: [signature]	10/28/97	1855
Received By (LAB): [signature]	10/28/97	1855

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 3

~~*HOLD DIOXIN TEST UNTIL OGDEN AUTHORIZES ONE.~~ KJ

3°/Intact

REV: 1

005

L9703679

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RF124
Date 10/28/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To:	Mark Deffley
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal
Shipment Method: Federal Express
Comment:
* CHLORIDE & NITRATE WILL USE ONE CONTAINER

Cooler No:
QC Level: Level4 TAT: 35 - Day

Sample ID	Description (for Ogden use only)	Date Collected	Time Collected	Lab ID	Soil	Water	Product	8260M VOC (HCL, pH<2 4°C)	8015OG HYDROCARBON (HCL, pH<2 4°C)	8270SIM PAH (4°C)	8290 DIOXIN (4°C)	3500 FORMALDEHYDE (H2SO4,pH<2 4°C)	8330 ORDINANCE (4°C)	6010/7000 METALSRT (HNO3, pH<2 4°C)	7196 CrVI (4°C)	340.2 FLUORIDE (4°C)	300 NITRATE/NITRITE* (4°C)	300 CHLORIDE * (4°C)	9045/9040 pH (4°C)	[illegible]	Extra Volume MS/MSD	HOLD	Total # of Bottles
RF124	BABS05S01 1.0	10-28-97	1025	12	X					X										B			
RF126	BABS05S02 5.5	"	1040	13	X					X										B			
RF127	BABS05D02 5.5	"	1040	14	X					X										B			
RF128	BABS05S03 10.0	"	1050	15	X					X										B			

ABS 10-28-97

	Date	Time
Samplers Signature: A. S[illegible]	10-28-97	1445
Relinquished By: A. S[illegible]	10-28-97	1445
Received By: [signature]	10/28/97	1445
Relinquished By: [signature]	10/28/97	1855
Received By (LAB): [signature]	10/28/97	1855

For Lab Use

Lab Number:
Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 3

3° [illegible]

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

L9703679

Chain of Custody

Control Number: COC RF 726

Date 10 / 29 / 97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150002
Deliver results to the address above or as stated in contract	

Bill To: KJ ~~Mark Deffley~~ PURCHASING	
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions: Laboratory Disposal	
Shipment Method: Federal Express	
Comment:	
* CHLORIDE & NITRATE WILL USE ONE CONTAINER	

Cooler No:	
QC Level: Level4	TAT: 35 - Day

Preservatives: HCL, pH<2 4°C; HCL, pH<2 4°C; 4°C; 4°C; H_2SO_4,pH<2 4°C; 4°C; HNO_3, pH<2 4°C; 4°C; 4°C; 4°C; 4°C; 4°C

Sample Data						Matrix				8260M VOC	8015OG HYDROCARBON	8270SIM PAH	8290 DIOXIN	3500 FORMALDEHYDE	8330 ORDINANCE	6010/7000 METALSRT	7196 CrVI	340.2 FLUORIDE	300 NITRATE/NITRITE	300 CHLORIDE *	9045/9040 pH		PCBs			SWMU SAMPLING METHOD	Extra Volume MS/MSD	HOLD	Total # of Bottles
Sample ID	Description (for Ogden use only)	DEPTH	Date Collected	Time Collected	Lab ID	Soil	Water	Product	SLUDGE																				
RF 726	AFSSØ1SØ1	Ø	10/29/97	0810	16	X						1		1												4.9	G			1
RF728	OCBSIØSØ1	Ø.5	|	1135	17				X			1				1		1	1	1	1		1			7.4	HA			1
RF729	OCBS11SØ1	Ø.5	|	1215	18	X															1					7.4	HA			1
RF 731	BLBSØ4SØ1	Ø.5	|	1415	19	X										1										7.1	|			1
RF 732	BLBSØ5SØ1	Ø.5	|	1430	20	X										1										|	|			1
RF 733	BLBSØ6SØ1	Ø.5	|	1500		X										1										|	|			1
RF 734	BLBSØ7SØ1	Ø.5	|	1600 ~~1500~~		X										1										|	|			1
RF 735	BLBSØ8SØ1	Ø.5	↓	1600		X										1										↓	↓			1

K Jamison 10/29/97

Samplers Signature: K Jamison	Date: 10/29/97	Time: 0820
Relinquished By: K Jamison	Date: 10/29/97	Time: 1745
Received By:	Date: 10/29/97	Time: 1945
Relinquished By:	Date: 10/29/97	Time: 1845
Received By (LAB):	Date: 10/29/97	Time: 1835

1 Original, 2 Lab Copy, 3 Field Copy

For Lab Use

Lab Number:

Do COC match samples: (Y) or N
Broken container: Y or (N)
Received within holding time: (Y) or N
COC seal intact: Y or N (NA)
Any other problems: Y or (N)
If any YES, Ogden contacted: Y or N
Date contacted: ___/___/___
Temperature °C 14

REV: 1

OGDEN ENVIRONMENTAL AND ENERGY SERVICE

5510 Morehouse Drive
San Diego, CA 92121-1709
(619) 458-9044
fax: (619) 458-0943

FACSIMILE

To: Mr. Leo Raab/Columbia Analytical Services
Fax No.: (818) 587-5555

From: Lisa L. Arrasmith *sign:* Lisa L Arrasmith

Date: 10/30/97 There is 1 Page to transmit including this cover page

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

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	Date Collected	Method (s) Originally Requested[a]	Method (s) Now Requested[a]	
RF702	RF702	10/27/97	S, M & pH	S, M+ & pH	L9703698-19
RF702	RF703	10/27/97	S, M+ & pH	HOLD	—
RF702	RF704	10/27/97	S, M+ & pH	HOLD	—
RF713	RF721	10/28/97	Fl, A & pH	S, F, Al & B	L9703679-9
RF713	RF722	10/28/97	Fl, A & pH	S & F	-10

[a] S= 8270 SIM, semi-volatile organics
M= Metals
M+= Metals + Aluminum (Al) & Boron (B)
Fl= 340.2, Fluoride
F= 3500, Formaldehyde
A= Anions

The reason for these changes is:

Incorrectly marked on COC form	
Lack of sample volume	
Ogden office personnel require this change	X
Other: Containers mislabeled	

Thank you.

TRIANGLE LABS

CASE NARRATIVE

Analysis of Samples for the Presence of

Polychlorinated Dibenzo-*p*-Dioxins and Dibenzofurans by

High-Resolution Chromatography / High-Resolution Mass Spectrometry

Method 8290 Rev. 0 (9/94)

Date:	November 13, 1997
Client ID:	Columbia Analytical Services
P.O. Number:	
TLI Project Number:	43820

Rev. 05/08/97

Triangle Laboratories, Inc.
801 Capitola Drive
Durham, NC 27713-4411
919-544-5729
P.O. Box 13485
Research Triangle Park, NC 27709-3485
Fax # 919-544-5491

Overview

The sample and any associated QC samples were extracted and analyzed according to procedures described in EPA Method 8290 Rev. 0 (9/94). Any particular difficulties encountered during the sample handling by Triangle Laboratories will be discussed in the QC Remarks section below. Results reported relate only to the items tested.

Quality Control Samples

A laboratory method blank, identified as the TLI Blank, was prepared along with the sample.

Laboratory control spike (LCS) and laboratory control spike duplicate (LCSD) samples were extracted and analyzed along with the samples. A report summarizing the analyte recoveries and relative percent differences for these samples is included in the data package.

Quality Control Remarks

This release of this particular set of Columbia Analytical Services analytical data by Triangle Laboratories was authorized by the Quality Control Chemist who has reviewed each sample data package individually following a series of inspections/reviews. When applicable, general deviations from acceptable QC requirements are identified below and comments are made on the effect of these deviations upon the validity and reliability of the results. Specific QC issues associated with this particular project are:

Sample receipt: One sludge sample was received from Columbia Analytical Services at 4 °C in good condition on October 30, 1997 and was stored in a refrigerator at 4 °C. Additional sample was received from Columbia Analytical Services at 4 °C in good condition on November 5, 1997 and was stored in a refrigerator at 4 °C.

Sample Preparation Laboratory: None

Mass Spectrometry: None

Data Review: The additional sample was composited with the original sample. Then, another percent moisture determination was performed prior to extraction.

Other Comments: No analytes were detected in the method blank.

Average continuing calibration (Concal) response factors are used instead of average initial calibration (Ical) response factors for all analyte and labeled standard calculations in sample(s) with a beginning and ending calibration listed on the quantitation report. Average response factors are used when the ending Concal meets Method 8290 ending Concal requirements but not beginning Concal requirements. The average response factor is an average of the factors from the beginning and ending Concals.

Sample Calculations:

Analyte Concentration

The concentration or amount of any analyte is calculated using the following expression.

$$C_{(\sigma)} = \frac{A_\sigma * Q_\beta}{A_\beta * RRF_{(\sigma)} * W}$$

Where:

$C_{(\sigma)}$ is the concentration or amount of a given analyte,

A_σ is the integrated current for the characteristic ions of the analyte,

A_β is the integrated current of the characteristic ions of the corresponding internal standard,

Q_β represents the amount of internal standard added to the sample before extraction,

$RRF_{(\sigma)}$ is the mean analyte relative response factor from the initial calibration (ICal) and,

W is the sample weight or volume

Detection Limits

The detection limit reported for a target analyte that is not detected or presents an analyte response that is less than 2.5 times the background level is calculated by using the following expression. The area of the analyte is replaced by the noise level measured in a region of the chromatogram clear of genuine GC signals multiplied by an empirically determined factor. The detection limits represent the maximum possible concentration of a target analyte that could be present without being detected.

$$DL_{(\sigma)} = \frac{2 * 2.5 * (F * H) * Q_{\beta}}{A_{\beta} * RRF_{(\sigma)} * W}$$

Where:

$DL_{(\sigma)}$ is the estimated detection limit for a target analyte,

2.5 is the minimum response required for a GC signal,

F is an empirical number that approximates the area to height ratio for a GC signal. This number is 3.7 for both the DB-5 GC column and the DB-225 GC column,

H is the height of the noise

A_{β} is the integrated current of the characteristic ions of the corresponding internal standard,

Q_{β} represents the amount of internal standard added to the sample before extraction,

$RRF_{(\sigma)}$ is the mean analyte relative response factor from the initial calibration (ICal) and,

W is the sample weight or volume

Data Flags

In order to assist with data interpretation, data qualifier flags are used on the final reports. Please note that all data qualifier flags are subjective and are applied as consistently as possible. Each flag has been reviewed by two independent Chemists and the impact of the data qualifier flag on the quality of the data discussed above. The most commonly used flags are:

A **'B'** flag is used to indicate that an analyte has been detected in the laboratory method blank as well as in an associated field sample. The 'B' flag will be used only when the concentration of analyte found in the sample is less than 20 times that found in the associated blank. This flag denotes possible contribution of background laboratory contamination to the concentration or amount of that analyte detected in the field sample. Under Triangle Laboratories guidelines, a laboratory blank is acceptable if the tetra- through hepta-CDD/CDF levels are all below the target detection limits (TDLS) or if the contamination levels are less than 5% of the levels detected in the associated field samples.

If these conditions are satisfied or if the blank is unable to be reextracted, the interpretation of the contamination levels relative to the samples should be as follows: 1) analyte quantitations should be considered valid if the level of blank contamination is less than five percent of the level detected in the field sample, 2) analyte quantitations should be considered estimated if the analyte level in the sample is five to twenty times the level of the analyte in the blank, or 3) analytes whose level in a sample is the same as or less than five times the level detected in the associated blank should be considered present likely due to laboratory contamination and not native to the sample.

An **'E'** flag is used to indicate that an PCDF peak has eluted at the same time as the associated diphenyl ether (DPE) and that the DPE peak intensity is ten percent or more of the PCDF peak intensity. Total PCDF values are flagged 'E' if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks are quantitated with EMPC values, regardless of the isotopic abundance ratio. These EMPC values are most likely overestimated due to the DPE contribution to the peak area.

An **'I'** flag is used to indicate labeled standards have been interfered with on the GC column by coeluting, interferent peaks. The interference may have caused the standard's area to be overestimated. All quantitations relative to this standard, therefore, may be underestimated.

A **'PR'** flag is used to indicate that a GC peak is poorly resolved. This resolution problem may be seen as two closely eluting peaks without a reasonable valley between the peak tops, overly broad peaks, or peaks whose shapes vary greatly from a normal distribution. The concentrations or amounts reported for such peaks are most likely overestimated.

A **'Q'** flag is used to indicate the presence of QC ion instabilities caused by quantitative interferences. Affected analytes may be overestimated or underestimated as a result of this interference. A peak is flagged 'Q' only if it is affected by a QC ion deviation greater than 20% full scale as determined relative to the labeled standard against which it is quantitated. Total PCDF/PCDF quantitations will be flagged 'Q' if the interferences affect ten percent or more of the total PCDD/PCDF peak areas.

An **'RO'** flag is used to indicate that a labeled standard has an ion abundance ratio that is outside of the acceptable QC limits, most likely due to a coeluting interference. This may have caused the percent recovery of the standard to be overestimated. All quantitations versus this standard, therefore, may be underestimated.

A 'U' flag is used to indicate that a specific (2,3,7,8-substituted) isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration/amount cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

A 'V' flag is used to indicate that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

By our interpretation, the analytical data in this project are valid based on the guidelines of EPA Method 8290 Rev. 0 (9/94). Any specific QC concerns or problems have been discussed in the QC Remarks section of this case narrative with emphasis on their effect on the data. Should Columbia Analytical Services have any questions or comments regarding this data package, please feel free to contact our Project Scientist, Amy Boehm, at 919/544-5729 ext. 268.

For Triangle Laboratories, Inc.,

Report Preparation

Craig Myrick

Craig Myrick
Report Preparation Chemist

Quality Control

William D. Hill

William D. Hill
Report Preparation Chemist

The total number of pages in the data package is : 139 444
10/2/98

REVISED PAGE: 6
10/2/98

TRIANGLE LABS

CASE NARRATIVE

Analysis of Samples for the Presence of

Polychlorinated Dibenzo-*p*-Dioxins and Dibenzofurans by

High-Resolution Chromatography / High-Resolution Mass Spectrometry

Method 8290 Rev. 0 (9/94)

Date:	November 13, 1997
Client ID:	Columbia Analytical Services
P.O. Number:	
TLI Project Number:	43820

Rev. 05/08/97

Triangle Laboratories, Inc.
801 Capitola Drive
Durham, NC 27713-4411
919-544-5729
P.O. Box 13485
Research Triangle Park, NC 27709-3485
Fax # 919-544-5491

Overview

The sample and any associated QC samples were extracted and analyzed according to procedures described in EPA Method 8290 Rev. 0 (9/94). Any particular difficulties encountered during the sample handling by Triangle Laboratories will be discussed in the QC Remarks section below. Results reported relate only to the items tested.

Quality Control Samples

A laboratory method blank, identified as the TLI Blank, was prepared along with the sample.

Laboratory control spike (LCS) and laboratory control spike duplicate (LCSD) samples were extracted and analyzed along with the samples. A report summarizing the analyte recoveries and relative percent differences for these samples is included in the data package.

Quality Control Remarks

This release of this particular set of Columbia Analytical Services analytical data by Triangle Laboratories was authorized by the Quality Control Chemist who has reviewed each sample data package individually following a series of inspections/reviews. When applicable, general deviations from acceptable QC requirements are identified below and comments are made on the effect of these deviations upon the validity and reliability of the results. Specific QC issues associated with this particular project are:

Sample receipt: One sludge sample was received from Columbia Analytical Services at 4 °C in good condition on October 30, 1997 and was stored in a refrigerator at 4 °C. Additional sample was received from Columbia Analytical Services at 4 °C in good condition on November 5, 1997 and was stored in a refrigerator at 4 °C.

Sample Preparation Laboratory: None

Mass Spectrometry: None

Data Review: The additional sample was composited with the original sample. Then, another percent moisture determination was performed prior to extraction.

Other Comments: No analytes were detected in the method blank.

Average continuing calibration (Concal) response factors are used instead of average initial calibration (Ical) response factors for all analyte and labeled standard calculations in sample(s) with a beginning and ending calibration listed on the quantitation report. Average response factors are used when the ending Concal meets Method 8290 ending Concal requirements but not beginning Concal requirements. The average response factor is an average of the factors from the beginning and ending Concals.

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Analyte Concentration

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$$C_{(\sigma)} = \frac{A_\sigma * Q_\beta}{A_\beta * RRF_{(\sigma)} * W}$$

Where:

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Where:

$DL_{(\sigma)}$ is the estimated detection limit for a target analyte,

2.5 is the minimum response required for a GC signal,

F is an empirical number that approximates the area to height ratio for a GC signal. This number is 3.7 for both the DB-5 GC column and the DB-225 GC column,

H is the height of the noise

A_{β} is the integrated current of the characteristic ions of the corresponding internal standard,

Q_{β} represents the amount of internal standard added to the sample before extraction,

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For Triangle Laboratories, Inc.,

Report Preparation

Craig Myrick

Craig Myrick
Report Preparation Chemist

Quality Control

William D. Hill
Report Preparation Chemist

The total number of pages in the data package is : 139 444
10/2/98

REVISED PAGE: 6
10/2/98

Columbia Analytical Services, Inc.

COPY

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

6925 Canoga Avenue • Canoga Park, CA 91303 • (818) 587-5550 • Fax (818) 587-5555

DATE _____ PAGE 1 OF 1

PROJECT NAME Rocketdyne # ~~10~~ 31315 0002

PROJECT MANAGER LEO RAAB

COMPANY/ADDRESS COLUMBIA ANALYTICAL

PHONE (818) 587 5550

SAMPLERS SIGNATURE _____

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	TPH Gas/BTEX 8015/8020/602	TPH/8015 Modified Diesel ☐ FC ☐ Gasoline ☐	BTEX 602/8020	Total Petroleum Hydrocarbons EPA 418.1	Halogenated Volatiles 601/8010	Volatile Organics GC/MS 624/8240/8260	Base Neutral Acid Organic GC/MS 625/8270	CAM Metals 6010/7000	X	D	10	X	1	2	5	SDG REMARKS
RF715	10/28	0955		SL4066	1									X								L9703679

RELINQUISHED BY:

Signature: Charlotte Bragas

Printed Name: A. BRAGAS IN

Firm: CAS

Date/Time: 10/29/97 1500

RECEIVED BY:

Signature: Bill Hunt

Printed Name: Bill Hunt

Firm: TLI

Date/Time: 10/30/97

TURNAROUND REQUIREMENTS

____ 24 hr ____ 48 hr. ____ 5 day

____ Standard

____ Other (Specify)

____ Provide Verbal Preliminary Results 11/7

Requested Report Date ~~11/7~~ as

REPORT REQUIREMENTS

____ I. Routine Report

____ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)

X III. Data Validation Report (includes All Raw Data)

____ RWQCB

INVOICE INFORMATION:

P.O.# _____

Bill To _____

SAMPLE RECEIPT:

Shipping VIA: _____

Shipping #: _____

Condition: _____

Lab No: _____

RELINQUISHED BY:

Signature

Printed Name

Firm

Date/Time

RECEIVED BY:

Signature

Printed Name

Firm

Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

PLEASE REFERENCE SDG & N REPORT

Columbia Analytical Services INC.

Qt 11bb197

COPY

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

6925 Canoga Avenue • Canoga Park, CA 91303 • (818) 587-5550 • Fax (818) 587-5555

DATE ______ PAGE 1 OF 1

PROJECT NAME Rocketdyne # 31315002

PROJECT MANAGER LEO RAAB

COMPANY/ADDRESS COLUMBIA ANALYTICAL

PHONE ______

SAMPLERS SIGNATURE ______

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	TPH Gas/BTEX 8015/8020/602	TPH/8015 Modified Diesel ⌐ FC ⌐ Gasoline ⌐	BTEX 602/8020	Total Petroleum Hydrocarbons EPA 418.1	Halogenated Volatiles 601/8010	Volatile Organics GC/MS 624/8240/8260	Base Neutral Acid Organic GC/MS 625/8270	CAM Metals 6010/7000	DIOXINS *	~~REMARKS~~ SOG
RF 715	10/28/97	0955		SOLIDS	1										L9703679-3

RELINQUISHED BY:
Signature: [signature]
Printed Name: A. BRAGASIN
Firm: CAS
Date/Time: 11/4/97 1500

RECEIVED BY:
Signature: [signature]
Printed Name: Bill Hurst
Firm: TLI
Date/Time: 11/5/97 10:30

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr. ___ 5 day
___ Standard
___ Other (Specify)
___ Provide Verbal Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)
X III. Data Validation Report (includes All Raw Data)
___ RWQCB

INVOICE INFORMATION:
P.O.# ______
Bill To ______

SAMPLE RECEIPT:
Shipping VIA: ______
Shipping #: ______
Condition: ______
Lab No: ______

RELINQUISHED BY:
Signature ______
Printed Name ______
Firm ______
Date/Time ______

RECEIVED BY:
Signature ______
Printed Name ______
Firm ______
Date/Time ______

SPECIAL INSTRUCTIONS/COMMENTS:

ADDITIONAL SAMPLES AS REQUIRED/REQUESTE[D] By Amy Boehm.
ORIGINAL JOB SUBMITTED 10/29 to be Received 10/30

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

Columbia Analytical Services, Inc. 6925 Canoga Avenue • Canoga Park, CA 91303 • (818) 587-5550 • Fax (818) 587-5555

DATE _____ PAGE 1 OF 1

PROJECT NAME Rocketdyne # 313150002

PROJECT MANAGER LEO RAAB

COMPANY/ADDRESS COLUMBIA ANALYTICAL

PHONE _____

SAMPLERS SIGNATURE _____

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	ANALYSIS REQUESTED: TPH Gas/BTEX 8015/8020/602	TPH/8015 Modified Diesel ☐ FC ☐ Gasoline ☐	BTEX 602/8020	Total Petroleum Hydrocarbons EPA 418.1	Halogenated Volatiles 601/8010	Volatile Organics GC/MS 624/824C/8260	Base Neutral Acid Organic GC/MS 625/8270	CAM Metals 6010/7000	X 8290 DIOXINS	SDG ~~REMARKS~~
RF 757	11/3	0930		SOIL	1									X	L9703734

RELINQUISHED BY:

Signature: Christie Bragasin

Printed Name: A. BRAGASIN

Firm: CAS

Date/Time: 11/4/97 1500

RECEIVED BY:

Signature: Bill Hughes

Printed Name: Bill Hughes

Firm: TKE

Date/Time: 11/05/97/1000

TURNAROUND REQUIREMENTS

____ 24 hr ____ 48 hr. ____ 5 day

____ Standard

____ Other (Specify)

____ Provide Verbal Preliminary Results

Requested Report Date 11/11

REPORT REQUIREMENTS

____ I. Routine Report

____ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)

X III. Data Validation Report (includes All Raw Data)

____ RWQCB

INVOICE INFORMATION:

P.O.# _____

Bill To _____

SAMPLE RECEIPT:

Shipping VIA: _____

Shipping #: _____

Condition: _____

Lab No: _____

RELINQUISHED BY:

Signature _____

Printed Name _____

Firm _____

Date/Time _____

RECEIVED BY:

Signature _____

Printed Name _____

Firm _____

Date/Time _____

SPECIAL INSTRUCTIONS/COMMENTS:

* Reporting Dry Weight

Please reference SDG #

TRIANGLE LABS

CASE NARRATIVE

Analysis of Samples for the Presence of

Polychlorinated Dibenzo-*p*-Dioxins by

High-Resolution Chromatography / High-Resolution Mass Spectrometry

Method 8290 Rev. 0 (9/94)

Date:	December 23, 1997
Client ID:	Columbia Analytical Services
P.O. Number:	
TLI Project Number:	44280D

Rev. 11/19/97

Triangle Laboratories, Inc.
801 Capitola Drive
Durham, NC 27713-4411
919-544-5729
P.O. Box 13485
Research Triangle Park, NC 27709-3485
Fax # 919-544-5491

Overview

The sample and associated QC samples were extracted and analyzed according to procedures described in EPA Method 8290 Rev. 0 (9/94). Any particular difficulties encountered during the sample handling by Triangle Laboratories will be discussed in the QC Remarks section below. This report contains results from only the 8290 dioxin/furan analysis of the soil sample RF715.

Quality Control Samples

A laboratory method blank, identified as the TLI Blank, was prepared along with the sample.

A laboratory control spike (LCS) and laboratory control spike duplicate (LCSD) were prepared along with the samples in this project. A report summarizing the results from these QC samples is included in the data package.

Quality Control Remarks

This release of this particular set of Columbia Analytical Services analytical data by Triangle Laboratories was authorized by the Quality Control Chemist who has reviewed each sample data package following a series of inspections/reviews. When applicable, general deviations from acceptable QC requirements are identified below and comments are made on the effect of these deviations upon the validity and reliability of the results. Specific QC issues associated with this particular project are:

Sample receipt: Seven soil samples were received from Columbia Analytical Services at 4 °C in good condition on December 11, 1997 and stored in a refrigerator at 4 °C. Only results for sample RF715 are included in this data package.

Sample Preparation Laboratory: A new aliquot of sample RF715 was submitted for re-extraction using a one gram sample aliquot because 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8,-HpCDF, OCDF, and OCDD analytes in sample were above the calibration range in the initial aliquot. Only 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8,9-HpCDF, OCDF, OCDD, total HpCDF, and total HpCDD are reported for sample RF715.

Mass Spectrometry: None

Data Review: The re-extracted sample results of sample RF715 do not match the results of the original analysis with RPDs of 154% for 1,2,3,4,6,7,8-HpCDD, 157% for 1,2,3,4,6,7,8-HpCDF, 151% for OCDF, and 169% for OCDD. This is probably due to the heterogeneous nature of soil samples.

Other Comments: No 2,3,7,8-substituted target analytes were detected in the TLI Blank above the target detection limit (TDL).

The analytical data presented in this report are consistent with the guidelines of EPA Method 8290 Rev. 0 (9/94). Any exceptions have been discussed in the QC Remarks section of this case narrative with emphasis on their effect on the data. Should Columbia Analytical Services have any questions or comments regarding this data package, please feel free to contact our Project Scientist, Amy Boehm, at 919/544-5729 ext. 268.

For Triangle Laboratories, Inc.,

Report Preparation

William D. Hill
Report Preparation Chemist

Quality Control

Amy E. Boehm
Report Preparation Chemist

The total number of pages in the data package is : 428 .

Columbia Analytical Services[inc]

COPY

12-1-97

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FOR

6925 Canoga Avenue • Canoga Park, CA 91303 • (818) 587-5550 • Fax (818) 587-5555

DATE ______ PAGE 1 OF 1

PROJECT NAME Rocketdyne #

PROJECT MANAGER LEO RAAB

COMPANY/ADDRESS COLUMBIA ANALYTICAL

PHONE

SAMPLERS SIGNATURE

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	TPH Gas/BTEX 8015/8020/602	TPH/8015 Modified Diesel ¬ FC ¬ Gasoline ¬	BTEX 602/8020	Total Petroleum Hydrocarbons EPA 418.1	Halogenated Volatiles 601/8010	Volatile Organics GC/MS 624/8240/8260	Base Neutral Acid Organic GC/MS 625/8270	CAM Metals 6010/7000	DIOXIN *								SDG# ~~REMARKS~~
RF631				Soil	1									X								L9703503
RF661	10/17			↓	1									X								L9703547
RF663	10/20			↓	1									X								L9703578
RF677	10/22			↓	1									X								L9703578
RF 715	10/28			↓	1									X								L9703679
RF683	10/23			↓	1									X								9703607
RF686	10/23			↓	1									X								9703607

RELINQUISHED BY:

Signature: [signature]

Printed Name: A. BRAOASIN

Firm: CAS

Date/Time: 12/1/97 1500

RECEIVED BY:

Signature

Printed Name

Firm

Date/Time

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr. ___ 5 day

___ Standard

___ Other (Specify)

___ Provide Verbal Preliminary Results

Requested Report Date ______

REPORT REQUIREMENTS

___ I. Routine Report

___ II. Report (includes DUP,MS, MSD, as required, may be charged as samples)

___ III. Data Validation Report (includes All Raw Data)

___ RWQCB

INVOICE INFORMATION:

P.O.# ______

Bill To ______

SAMPLE RECEIPT:

Shipping VIA: ______

Shipping #: ______

Condition: ______

Lab No: -

RELINQUISHED BY:

Signature

Printed Name

Firm

Date/Time

RECEIVED BY:

Signature: [signature]

Printed Name: Bill Hurst

Firm: TLF[illegible]

Date/Time: 12-1-97 1180

SPECIAL INSTRUCTIONS/COMMENTS:

* FOR DILUTION RERUNS

PLEASE REFERENCE SDG #S ON REPORT

Rec'd 1/9/98

Columbia Analytical Services, Inc.

January 6, 1998

Anne Freed
OGDEN
5510 Morehouse Drive
San Diego, CA 92121

Re: Rocketdyne / Project #313150001

Dear Anne:

Enclosed are the results of the samples submitted to our laboratory on October 27-31, 1997. For your reference, these analyses have been assigned our service request number L9703643.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services Mobile Laboratory is certified for environmental analyses by the California Department of Health Services (certificate number: 1993, expiration May 1998).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Thomas X. Robinson
Project Chemist

TR/iz

6925 Canoga Avenue ▪ Canoga Park, CA 91303 ▪ (818) 587-5550 ▪ Fax (818) 587-5555

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	InterPhase Environmental	**Service Request No.:**	L9703643
Project:	Rocketdyne/313150001	**Date Received:**	10/27-31/97
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for samples designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

The following difficulties were experienced during analysis of this batch:

Several samples required dilutions to bring the concentration of a particular analyte within its calibration range. Upon reanalysis the result did not always yield the expected concentration, in some cases a lower result was determined. The most probable cause of this phenomenon is sample homogeneity; concentrations vary throughout various subsamples of the sample container, additionally the volatility of the target analytes causes concentrations to decrease after subsampling of the initial analysis.

Sample results that have elevated PQL's with no target compounds detected were diluted due to matrix interferences from hydrocarbons, these samples are appropriately footnoted.

Sample RD708 required second column confirmation for volatile organic compounds but was inadvertently missed, the original result is reported.

Approved by: _____ Date: 2/23/98

R-003

COLUMBIA ANALYTICAL SERVICES, INC.

Nonconformity and Corrective Action Report

SAMPLES/SYSTEM/JOB/CLIENT AFFECTED

L9703643 - 019 Ogden Sample AD708

NONCONFORMITY

Analysis/Event: Second column confirmation was not performed.

Instrument/System: GC 11 Date: 2/23/98

Detailed Description:

Originator: Tom Robinson Date: 2/23/98

Supervisor Verification: Thomas K. Robinson Date: 2/23/98

CORRECTIVE ACTION AND OUTCOME

Detailed Description: (Re-establishment of conformity must be demonstrated and documented. Describe the steps that were taken, or are planned to be taken, to correct the problem. Describe the outcome.)

The analyst is responsible for determining which sample needs confirmation; in the future second party review will assist in determining confirmation.

Person Responsible: Bo Kim Date: 2/23/98

Supervisor Verification: Thomas K Robinson Date: 2/23/98

NOTIFICATION - CUSTOMER/CLIENT - INTERNAL/EXTERNAL

Project Chemist Notified? No (Yes) Date: 2/23/98

Customer Notification Necessary? (Attach telephone record) No (Yes) Date: 2/23/98

Notifier: Tom Robinson Date: 2/23/98

ACCEPTANCE OF CORRECTIVE ACTION

QA Coordinator: Date: 2/23/98

Original: Client File Photocopies: Supervisor and QA Coordinator CORACTEP.DOC 10/29/96

003A

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	InterPhase Environmental	**Service Request No.:**	L9703643
Project:	Rocketdyne/313150001	**Date Received:**	10/27-31/97
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed in accordance with our laboratory's quality assurance program. This report contains analytical results for samples designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS) and Laboratory Control Sample (LCS).

All EPA recommended holding times have been met for analyses in this sample delivery group.

The following difficulties were experienced during analysis of this batch:

Several samples required dilutions to bring the concentration of a particular analyte within its calibration range. Upon reanalysis the result did not always yield the expected concentration, in some cases a lower result was determined. The most probable cause of this phenomenon is sample homogeneity; concentrations vary throughout various subsamples of the sample container, additionally the volatility of the target analytes causes concentrations to decrease after subsampling of the initial analysis.

Sample results that have elevated PQL's with no target compounds detected were diluted due to matrix interferences from hydrocarbons, these samples are appropriately footnoted.

Approved by: Thomas D. Robin Date: 12/29/97

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
03-NOV-97 17:01

Service Req. No. L9703643
Client No. 095000
Client Name InterPhase Environmental

Project No. 313150001
Project Name Rocketdyne

Bottles: 92 - Canisters/Decore
2 - VOA Vial Set (2)
1 - VOA Vial Set (4)

Bill To: InterPhase Environmental
Attn: Accounts Payable
6200 Peachtree Street
Los Angeles, CA 90040

Report To: Ogden Environmental
Anne Freed
5510 Morehouse Dr.
San Diego, CA 92121

P.O. No.
Logged In By ABRAGASI
ISR Num
COC Received Y
Samples Submitted 31-OCT-97

Site ID
Project Chemist Tom Robinson

Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	8021 HOLD	TPH-FC-CA
L9703643-001	RD702	SLUDGE	27-OCT-97	14-NOV-97	III	III
L9703643-002	RD703	SLUDGE	27-OCT-97	14-NOV-97	III	III
L9703643-003	RD704	SLUDGE	27-OCT-97	14-NOV-97	III	III
L9703643-004	RD109	SOIL	27-OCT-97	14-NOV-97		III
L9703643-005	RD110	SOIL	27-OCT-97	14-NOV-97		III
L9703643-006	RD111	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-007	RD112	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-008	RD113	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-009	RD114	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-010	RD115	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-011	RD116	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-012	RD117	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-013	RD118	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-014	RD119	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-015	RD120	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-016	RD705	SLUDGE	27-OCT-97	14-NOV-97	III	III
L9703643-017	RD706	SLUDGE	27-OCT-97	14-NOV-97	III	III
L9703643-018	RD707	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-019	RD708	SLUDGE	27-OCT-97	14-NOV-97	III	III
L9703643-020	RD709	SOIL	27-OCT-97	14-NOV-97	III	III
L9703643-021	RD710	SOIL	27-OCT-97	14-NOV-97		III
L9703643-022	RD121	SOIL	28-OCT-97	14-NOV-97		III
L9703643-023	RD122	SOIL	28-OCT-97	14-NOV-97		III
L9703643-024	RD123	SOIL	28-OCT-97	14-NOV-97		III
L9703643-025	RD124	SOIL	28-OCT-97	14-NOV-97	III	III
L9703643-026	RD125	SOIL	28-OCT-97	14-NOV-97	III	III
L9703643-027	RD126	SOIL	28-OCT-97	14-NOV-97	III	III
L9703643-028	RD128	SOIL	28-OCT-97	14-NOV-97	III	III
L9703643-029	RD129	SOIL	28-OCT-97	14-NOV-97		III
L9703643-030	RD130	SOIL	28-OCT-97	14-NOV-97		III
L9703643-031	RD131	SOIL	28-OCT-97	14-NOV-97		III
L9703643-032	RD132	SOIL	28-OCT-97	14-NOV-97	III	III
L9703643-033	RD133	SOIL	28-OCT-97	14-NOV-97	III	III
L9703643-034	RD134	SOIL	28-OCT-97	14-NOV-97	III	III
L9703643-035	RD135	SOIL	28-OCT-97	14-NOV-97	III	III
L9703643-036	RD139	SOIL	28-OCT-97	14-NOV-97	III	III

TESTS/DAY

21+18=39

14+17=31

METALS VOA
IC WET
SEMI VOA

004

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By: DXA 11/10

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
03-NOV-97 17:01

Service Req. No. L9703643
Client No. 095000
Client Name InterPhase Environmental

Bill To: InterPhase Environmental
Attn: Accounts Payable
6200 Peachtree Street
Los Angeles, CA 90040

P.O. No.
Logged In By ABRAGASI
ISR Num
COC Received Y
Samples Submitted 31-OCT-97

Project No. 313150001
Project Name Rocketdyne

Report To: Ogden Environmental
Anne Freed
5510 Morehouse Dr.
San Diego, CA 92121

Site ID
Project Chemist Tom Robinson

Bottles: 92 - Canisters/Decore
2 - VOA Vial Set (2)
1 - VOA Vial Set (4)

Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	8021 HOLD	TPH-FC-CA
L9703643-037	RD136	SOIL	28-OCT-97	14-NOV-97	III	
L9703643-038	RD137	SOIL	28-OCT-97	14-NOV-97	III	
L9703643-039	RD138	H2O	28-OCT-97	14-NOV-97	III	III
L9703643-040	RD723	SOIL	28-OCT-97	14-NOV-97	III	III
L9703643-041	RD721	SOIL	28-OCT-97	14-NOV-97		III
L9703643-042	RD722	SOIL	28-OCT-97	14-NOV-97		III
L9703643-043	RD724	H2O	28-OCT-97	14-NOV-97	III	
L9703643-044	RD725	H2O	28-OCT-97	14-NOV-97		III
L9703643-045	RD140	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-046	RD141	SOIL	29-OCT-97	14-NOV-97		III
L9703643-047	RD142	SOIL	29-OCT-97	14-NOV-97		III
L9703643-048	RD143	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-049	RD144	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-050	RD145	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-051	RD146	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-052	RD147	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-053	RD148	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-054	RD726	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-055	RD727	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-056	RD728	SLUDGE	29-OCT-97	14-NOV-97		III
L9703643-057	RD730	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-058	RD731	SOIL	29-OCT-97	14-NOV-97		III
L9703643-059	RD732	SOIL	29-OCT-97	14-NOV-97		III
L9703643-060	RD733	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-061	RD734	SOIL	29-OCT-97	14-NOV-97		III
L9703643-062	RD735	SOIL	29-OCT-97	14-NOV-97	III	III
L9703643-063	RD736	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-064	RD737	SLUDGE	30-OCT-97	14-NOV-97		III
L9703643-065	RD738	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-066	RD739	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-067	RD740	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-068	RD150	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-069	RD151	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-070	RD152	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-071	RD153	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-072	RD741	SOIL	30-OCT-97	14-NOV-97	III	III

30

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By: JRN

005

Columbia Analytical Services -- Canoga Park
INTERNAL LOGIN SUMMARY REPORT (il01)
03-NOV-97 17:01

Service Req. No. L9703643
Client No. 095000
Client Name InterPhase Environmental

Bill To: InterPhase Environmental
Attn: Accounts Payable
6200 Peachtree Street
Los Angeles, CA 90040

P.O. No.
Logged In By ABRAGASI
ISR Num
COC Received Y
Samples Submitted 31-OCT-97

Project No. 313150001
Project Name Rocketdyne

Report To: Ogden Environmental
Anne Freed
5510 Morehouse Dr.
San Diego, CA 92121

Site ID
Project Chemist Tom Robinson

Bottles: 92 - Canisters/Decore
2 - VOA Vial Set (2)
1 - VOA Vial Set (4)

Storage:

CAS Samp No.	Client Sample No.	Matrix	Collected	DueDate	8021 HOLD	TPH-FC-CA
L9703643-073	RD742	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-074	RD743	SOIL	30-OCT-97	14-NOV-97		III
L9703643-075	RD744	SOIL	30-OCT-97	14-NOV-97		III
L9703643-076	RD154	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-077	RD155	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-078	RD156	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-079	RD157	SOIL	30-OCT-97	14-NOV-97	III	III
L9703643-080	RD159	SOIL	31-OCT-97	14-NOV-97	III	III
L9703643-081	RD160	SOIL	31-OCT-97	14-NOV-97	III	III
L9703643-082	RD162	SOIL	31-OCT-97	14-NOV-97	III	
L9703643-083	RD163	SOIL	31-OCT-97	14-NOV-97	III	
L9703643-084	RD164	SOIL	31-OCT-97	14-NOV-97	III	
L9703643-085	RD165	SOIL	31-OCT-97	14-NOV-97	III	
L9703643-086	RD745	SOIL	31-OCT-97	14-NOV-97		III
L9703643-087	RD747	SOIL	31-OCT-97	14-NOV-97		III
L9703643-088	RD750	SOIL	31-OCT-97	14-NOV-97	III	III
L9703643-089	RD751	SOIL	31-OCT-97	14-NOV-97	III	III
L9703643-090	RD754	SOIL	31-OCT-97	14-NOV-97	III	III
L9703643-091	RD166	SOIL	31-OCT-97	14-NOV-97	III	III
L9703643-092	RD167	SOIL	31-OCT-97	14-NOV-97	III	III
L9703643-093	RD168	SOIL	31-OCT-97	14-NOV-97	III	III
L9703643-094	RD169	SOIL	31-OCT-97	14-NOV-97		III
L9703643-095	RD170	SOIL	31-OCT-97	14-NOV-97		III
L9703643-096	RD171	SOIL	31-OCT-97	14-NOV-97	III	

31

25

Comments:

Samples Found To Be Hazardous: NONE__ ALL__ *SOME__

Reviewed By: DXN

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD 702
Date 10 / 27 / 97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS #	Sample Data: EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID (L9703643)	Field Data: Sampling Method	SWMU	Matrix: Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
2	RD702	SNBSØ5SØ2	0.5'	10/27/97	0830	-001	G	6.8				X	1	1			1	Relinquished By: K Jamieson	10/27/97 1100
																		Received By:	10/27/97 1100
1	RD703	SNBSØ1SØ2	0.5'	↓	0850	-002	G	6.8				X	1	1			1	Relinquished By: K Jamieson	10/27/97 1100
																		Received By:	10/27/97 1100
3	RD 704	SNBSØ6SØ2	0.5'	↓	1030	-003	G	6.8				X	1	1			1	Relinquished By: K Jamieson	10/27/97 1100
																		Received By:	10/27/97 1100
																		Relinquished By:	
					K Jamieson 10/27/97													Received By:	
																		Relinquished By:	
																		Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
K Jamieson	10/27/97	910

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

007

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: **COC** RD109

Date 10/27/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:	
Shipment Method:	
Comment:	

ULS #	EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID (L9J03643)	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
6	RD 109	EBS09S01	0.5'	10-27-97	810	-004	G		X					X				Relinquished By: A. Ser Received By: [signature]	10-27-97 1415 10/29/97 1415
10	RD 110	CAB15 S01	0.5	"	9.10	-005	B		X					X				Relinquished By: A. Ser Received By: [signature]	" "
1	RD 111	LX BS01 S01	1.0	"	1050	-006	B		X				X	X				Relinquished By: A. Ser Received By: [signature]	" "
1	RD 112	LX BS01 S02	5.0	"	1055	-009	B		X				X	X				Relinquished By: A. Ser Received By: [signature]	" "
1	RD 113	LX BS01 S03	9.5	"	1105	-008	B		X				X	X				Relinquished By: A. Ser Received By: [signature]	" "

QC Level: EPA Level III Equivalent, See Contract Requirements

Cooler No:

TAT: 14 - day

Sampler's Signature	Date	Time
A. Ser	10-27-97	1415

For Lab Use

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 or NA
Temperature °C ________

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD114

Date 10/27/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

DLS #

Sample Data						Field Data		Matrix											
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID 9710243	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
3 RD114	LXBS025D1	0.5	10/27/97	1210	-009	B		X				X	X				Relinquished By:	10-27-97 1415
																	Received By:	10/27/97 1415
3 RD115	LXBS025D2	5.0		1220	-010	B		X				X	X				Relinquished By:	"
																	Received By:	"
3 RD116	LXBS025D3	9.5		1235	-011	B		X				X	X				Relinquished By:	"
																	Received By:	"
~~RD117B~~			RD 10-27-97			B		X				X	X				Relinquished By:	"
																	Received By:	
						B		X				X	X				Relinquished By:	
																	Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
	10.27.97	1415

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

009

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD118

Date 10 / 27 / 97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ DB purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

DLS #	EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID (L9705643)	Field Data: Sampling Method	Field Data: SWMU	Matrix: Soil	Matrix: Water	Matrix: Product	Matrix: Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers
2	RD117	LxBSφ3Sφ1	1.0	10 27 97	1425	-012	B		X				X	X			
2	RD118	LxBSφ3Sφ2 DB	5.0	4	1435	-013	B		X				X	X			
13	RD119	~~BBT~~ BVBSφ8Sφ1	6.0	4	1630	-014	B		X				X	X			
22	RD120	BVBSφ9Sφ1	0.5	11	1650	-015	B		X				X	X			
					MD 10-27-97												

Sample Transfer	Date/ Time
Relinquished By: A. Sam	10-27-97 1730
Received By:	10/27/97 1730
Relinquished By: A. Sam	4
Received By:	4
Relinquished By: A. Sam	4
Received By:	4
Relinquished By: A. Sam	4
Received By:	11
Relinquished By:	
Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
A. Sam	10-27-97	1730

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

010

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD705

Date 10/27/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

VLS

Sample Data						Field Data		Matrix												
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	L9703143 Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
1-2 RD 705	R1BS01S01	2.0	10/21/97	1155	-016	G	4.16				X	1	1			1	Relinquished By: K Jamieson	10/27/97 1730
																	Received By:	10/27/97 1730
3 RD 706	R1BS02S01	0.5'		1220	-017	G					X	1	1			1	Relinquished By: K Jamieson	10/27/97 1730
																	Received By:	10/27/97 1730
4 RD 707	R1BS04S01	0.5'		1435	-018	HA		X				1	1			1	Relinquished By: K Jamieson	10/27/97 1730
																	Received By:	10/27/97 1730
1 RD 708	R1BS03S01	1.0'		1430	-019	G					X	1	1			1	Relinquished By: K Jamieson	10/27/97 1730
																	Received By:	10/27/97 1730
28 RD 709	~~R1~~ LFBS04S01	0.5'		1530	-020	HA	4.12	X				1	1			1	Relinquished By: K Jamieson	10/27/97 1730
																	Received By:	10/27/97 1730

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No: R11	TAT: 14 - day

Sampler's Signature	Date	Time
K Jamieson	10/27/97	1730

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

0111

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD 710

Date 10/27/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	KJ ~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS #

Sample Data						Field Data		Matrix											
	EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
						L9703643													
25	RD 710 ~~6010~~	LFSS07S01	0'	10/27/97	1610	-021	G	4.12	X					1			1	Relinquished By: K Jamieson	10/27/97 1730
																		Received By:	10/27/97 1730
																		Relinquished By:	
																		Received By:	
																		Relinquished By:	
																		Received By:	
																		Relinquished By:	
																		Received By:	
																		Relinquished By:	
																		Received By:	

K Jamieson 10/27/97

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No: R11	TAT: 14 - day

Sampler's Signature	Date	Time
K Jamieson	10/27/97	1650

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

012

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD121

Date 10/28/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ RB Rundle
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

Sample Data						Field Data		Matrix											
	EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	L9710343 Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
VLS																			
19	RD 121	BVBS10S01	0.5	10-28-97	840	-022	B	SWMU 5.13	X					X				Relinquished By: A. San	10-28-97 1430
																		Received By:	10/28/97 1430
~~RB~~ 8	RD 122	~~BVBS10D01~~ RB BVBS11S01	1.0	"	855	-023	B	"	X					X				Relinquished By: A. San	10-28-97 "
																		Received By:	"
8	RD 123	BVBS12S02	3.5	"	"	-024	B	"	X					X				Relinquished By: A. San	10-28-97 "
																		Received By:	"
22	RD 124	BABS05S01	1.0	"	1025	-025	B	RB #	X				X	X				Relinquished By: A. San	10-28-97 "
																		Received By:	"
22	RD 125	BABS05D01	1.0	"	1025	-026	B	~~RB~~ #	X				X	X				Relinquished By: A. San	10-28-97 "
																		Received By:	"

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
A. San	10-28-97	1430

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

013

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD126

Date 10/28/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ pending
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

Sample Data						Field Data		Matrix												
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	L9703643 Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
RD 126	BABS05SD2	5.5	10.28 97	1040	-027	B	4.15	X				X	X				Relinquished By: A. Sam	10/28/97 1435
RD128	BABS05SD3	10.0	〃	1050	-028	B	〃	X				X	X				Received By: [illegible]	10/28/97 1430
RD129	BABS05DD3	10.0	〃	1050	-029	B	〃	X				X	X				Relinquished By: A. Sam	〃
RD130	BABS11SD1	1.5	〃	1105	-030	B	〃	X					X				Received By: [illegible]	〃
RD131	BABS11SD2	5.0	〃	1110	-031	B	〃	X					X				Relinquished By: A. Sam	〃
																	Received By: [illegible]	〃

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
A. Sam	10-28-97	1435

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

014

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD132

Date 10/28/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Dettley~~ purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

	Sample Data						Field Data		Matrix											
	EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	L9703643 Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
25	RD 132	BABS12S#1	~~0.0~~ 0.5	10-28-97	1145	-032	B	4.15	X					X				Relinquished By: A Sam	10.28.97 1430
																		Received By:	10/28/97 1430
25	RD 133	BABS12S#2	11.0	11	1200	-033	B	11	X				X	X				Relinquished By: A. Sam	11
																		Received By:	11
25	RD 134	BABS12S#3	16.0	11	1220	-034	B	X	X				X	X				Relinquished By: A Sam	11
																		Received By:	11
25	RD 135	BABS12S#4	20.0	11	1230	-035	B		X				X	X				Relinquished By: A. Sam	11
																		Received By:	11
					AAS 10-26-97													Relinquished By:	
																		Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature A Sam	Date 10-28-97	Time 1430

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

015

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD135

Date 10/28/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ Pendleton
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

Sample Data						Field Data		Matrix											
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	197105643 Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
RD ~~135~~ 139	SLBSΦ2SΦ1 ~~DS~~ 10/29/97	0.5 ~~DS~~	10-28-97	1525	-036	B		X				X					Relinquished By: A. San	10-28-97 1730
																	Received By:	10/28/97 1950
RD 134	SLBSΦ2SΦ2	~~6.0~~ 8.0	4	1535	-037	B		X				X					Relinquished By: A. San	4
																	Received By:	10/28/97 1950
RD 137	CFBSΦ1SΦ1	7.0	4	1620	-038	B		X				X					Relinquished By: A. San	4
																	Received By:	10/28/97 1950
R139	BAQWΦ1EΦ1	-	4	1710	-039	G			X			X	X			4	Relinquished By: A. San	4
																	Received By:	10/28/97 1950
																	Relinquished By:	
																	Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
A. San	10-28-97	1730

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

019

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD 716
Date 10/28/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	KJ ~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS #	EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/Time
~~46a~~	~~RD 716~~	~~1LSU02S02~~ 3S01	~~0'~~	~~10/28/97~~	~~1430~~ 1400	L9103642	~~G~~	~~4.3~~	~~X~~			~~X~~		1			1	~~Relinquished By:~~ KJ	
																		Received By:	
48a	RD 723	CLSS03S01	0'	↓	1610	-040	G	4.7	X				1	1			1	Relinquished By: KJamieson	10/28/97 1820
																		Received By: [signature]	10/28/97 1820
~~29~~	~~RD 721~~	~~CLSS01S01~~	~~0'~~		~~1610~~	~~-041~~	~~G~~	~~4.7~~	~~X~~					~~1~~			~~1~~	Relinquished By: KJamieson	10/28/97 1820
																		~~Received By: [signature]~~	~~10/28/97 1820~~
~~30~~	~~RD 722~~	~~CLSS02S01~~	~~0'~~		~~1605~~	~~-042~~	~~G~~	~~4.7~~	~~X~~					1			1	Relinquished By: KJamieson	10/28/97 1820
																		Received By: [signature]	10/28/97 1820
					KJamieson 10/28/97													Relinquished By:	
																		Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements

Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
KJamieson	10/28/97	1140

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

For Lab Use

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 or NA
Temperature °C ________

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD 724

Date 10/28/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS #

Sample Data						Field Data		Matrix											
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID (L9703643)	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
RD 724	CLQWØIEØ1	N/A	10/28/97	1720 KJ	-043		4.7		X			1				2	Relinquished By: KJamieson	10/28/97 1820
																	Received By:	10/28/97 1820
RD 725	CLQWØIEØ2	N/A	↓	↓	-044		↓		X				1			2	Relinquished By: KJamieson	10/28/97 1820
																	Received By:	10/28/97 1820
~~RD 720~~		N/A	↓	↓	KJ		↓		~~X~~								Relinquished By:	
					KJamieson 10/28/97												Received By:	
																	Relinquished By:	
																	Received By:	
																	Relinquished By:	
																	Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
KJamieson	10/28/97	1720

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

018

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD140
Date 10/29/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	Mark Deffley
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

	Sample Data					Field Data		Matrix											
	EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID L9710364-3	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
ULS																			
5Φ	RD14Φ	1LBSΦ2 SΦΦ6 DΦ5	31.5'	10/29/97	ΦΦ92Φ	-045	B	4.3/4.4	X				X	X			1	Relinquished By:	10/29/97 1738
																		Received By:	10/29/97 1738
6	RD141	DABSΦ3SΦ1	1.Φ'		1125	-046	B	5.23	X					X			1	Relinquished By:	10/29/97 1738
																		Received By:	10/29/97 1738
6	RD14Z	DABSΦ3SΦ2	6.Φ'		113Φ	-047	B	5.23	X					X			1	Relinquished By:	10/29/97 1738
																		Received By:	10/29/97 1738
1	RD143	BLBSΦ1SΦ1	Φ.5'		141Φ	-048	B	7.1	X				X	X			1	Relinquished By:	10/29/97 1738
																		Received By:	10/29/97 1738
1	RD144	BLBSΦ1SΦ2	5.Φ		143Φ	-049	B	7.1	X				X	X			1	Relinquished By:	10/29/97 1738
																		Received By:	10/29/97 1738

QC Level: EPA Level III Equivalent, See Contract Requirements
Cooler No: / TAT: 14 - day

Sampler's Signature	Date	Time
	10/29/97	173Φ

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

019

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD145
Date 10/29/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	Mark Deffley
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

VLS

Sample Data						Field Data		Matrix											
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	L9703643 Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
1 RD145	BLBS01S03	9.5	10/29/97	1440	-050	B	7.1	X				X	X			1	Relinquished By:	10/29/97 1738
																	Received By:	10/29/97 1738
2 RD146	BLBS025Q1	9.5		1505	-051	B	7.1	X				X	X			1	Relinquished By:	10/29/97 1738
																	Received By:	10/29/97 1738
2 RD147	BLBS025Q2	5.0		1515	-052	B	7.1	X				X	X			1	Relinquished By:	10/29/97 1738
																	Received By:	10/29/97 1738
2 RD148	BLBS025Q3	9.5		1530	-053	B	7.1	X				X	X			1	Relinquished By:	10/29/97 1738
																	Received By:	10/29/97 1738
							D&B										Relinquished By:	
							10/29/97										Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
	10/29/97	1730

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

020

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD 726
Date 10/29/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	KJ ~~Mark Delley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS #	EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID 9710364-3	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
14	RD 726	AF KJ SSØ1SØ1	Ø'	10-29-97	0810	-054	G	4.9	X				1	1			1	Relinquished By: K Jamieson	10/29/97 1745
																		Received By:	10/29/97 1745
12	RD 727	OCBSØ9SØ1	Ø.5'		1040	-055	HA	7.4	X				1	1			1	Relinquished By: K Jamieson	10/29/97 1745
																		Received By:	10/29/97 1945
7	RD 728	OCBS1ØSØ1	Ø.5'		1135	-056	HA	7.4				X		1			1	Relinquished By: K Jamieson	10/29/97 1745
																		Received By:	10/29/97 1945
15	RD 730	OCBS12SØ1	Ø.5'		1230	-051	HA	7.4	X				Ø	1			1	Relinquished By: K Jamieson	10/29/97 1745
																		Received By:	10/29/97 1945
						K Jamieson 10/29/97												Relinquished By:	
																		Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
K Jamieson	10-29-97	0820

For Lab Use	
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 or NA	
Temperature °C _____	

021

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD731
Date 10/29/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To: KJ ~~Mark Bentley~~ PURCHASING	
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS

Sample Data						Field Data		Matrix											
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID 9710364	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
3 RD 731	BLBSØ4SØ1	Ø.5'	10/29/97	1415	-058	HA	7.1	X					X			1	Relinquished By: K Jamieson	10/29/97 1745
																	Received By:	10/29/97 1745
4 RD 732	BLBSØ5SØ1	Ø.5'		1430	-059	HA	7.1	X					X			1	Relinquished By: K Jamieson	10/29/97 1745
																	Received By:	10/29/97 1745
6 RD 733	BLBSØ6SØ1	Ø.5'		1500	-060	HA	7.1	X				X	X			1	Relinquished By: K Jamieson	10/29/97 1745
																	Received By:	10/29/97 1745
5 RD 734	BLBSØ7SØ1	Ø.5'		1600 ~~1530~~ TB	-061	HA	7.1	X				X	X			1	Relinquished By: K Jamieson	10/29/97 1745
																	Received By:	10/29/97 1745
7 RD 735	BLBSØ8SØ1	Ø.5'		1600	-062	HA	7.1	X				X	X			1	Relinquished By: K Jamieson	10/29/97 1745
																	Received By:	10/29/97 1745

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
Tom Bolo	10/29/97	1645

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

022

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD 7360
Date 10 / 30 / 97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS #	Sample Data: EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID (L9703643)	Field Data: Sampling Method	SWMU	Matrix: Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
9	RD 736	BLBSØ9SØ1	Ø.5'	10/30/97	0815	-063	HA	7.1	X				1	1			1	Relinquished By: K Jamieson	10/30/97 1220
																		Received By:	10/30/97 1220
10	RD 737	OCBS13SØ1	Ø.5'		0930	-064	HA	7.4				X		1			1	Relinquished By: K Jamieson	10/30/97 1220
																		Received By:	10/30/97 1220
17	RD 738	OCBS14SØ1	Ø.5'		1000	-065	HA	7.4	X				1	1			1	Relinquished By: K Jamieson	10/30/97 1220
																		Received By:	10/30/97 1220
4	RD 739	LXBSØ4SØ1	Ø.5'		1130	-066	HA	4.5	X				1	1			1	Relinquished By: K Jamieson	10/30/97 1220
																		Received By:	10/30/97 1220
5	RD 740	LXBSØ5SØ1	5.Ø		1215	-067	HA	4.5	X				1	1			1	Relinquished By: K Jamieson	10/30/97 1220
																		Received By:	10/30/97 1220

QC Level: EPA Level III Equivalent, See Contract Requirements
Cooler No: / TAT: 14 - day

Sampler's Signature	Date	Time
K Jamieson	10/30/97	1145

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

023

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD150

Date 10 / 30 / 97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ Purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

	Sample Data						Field Data		Matrix											
	EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID L9710364[illegible]	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
2	RD 150	BL-BS@2S@4	16.0	10-30-97	930	T068	B	7.1	X				X	X				Relinquished By: A. Sam	10-30-97 1330
																		Received By:	10/30/97 1330
3	RD 151	BL-BS@3S@1	1.0	4	1040	-069	B	7.1	X				X	X				Relinquished By: A. Sam	10-30-97 4
																		Received By:	10/30/97 1330
3	RD152	BLBS@1S@1	5.0	4	1220	-070	B	5.5	X				X	X				Relinquished By: A Sam	4
																		Received By:	10/30/97 1330
3	RD153	BLBS@1S@2	9.5	4	1225	-071	B	5.5	X				X	X				Relinquished By: A. Sam	4
																		Received By:	10/30/97 1330
~~3~~	RD154	BLBS@1S@3		4			B		X				X	X				Relinquished By:	
																		Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
A. Sam	10-30-97	1330

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

024

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD 741
Date 10/30/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS #

Sample Data						Field Data		Matrix											
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
4 RD 741	DABS04S01	0.5'	10/30/97	1515	-012	HA	5.23	X				1	1			1	Relinquished By: KJamieson	10/30/97 1730
																	Received By:	10/30/97 1730
3 RD 742	DABS05S01	0.5'		1545	-013	HA	5.23	X				1	1			1	Relinquished By: KJamieson	10/30/97 1730
																	Received By:	10/30/97 1730
2 RD 743	DABS06S01	0.5'		1605	-014	HA	5.23	X					1			1	Relinquished By: KJamieson	10/30/97 1730
																	Received By:	10/30/97 1730
2a RD KJ 744	DASS02S01	0'	↓	1605	-015	G	5.23	X					1			1	Relinquished By: KJamieson	10/30/97 1730
																	Received By:	10/30/97 1730
				KJamieson			10/30/97										Relinquished By:	
																	Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
KJamieson	10/30/97	1530

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

025

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD 154.

Date 10/30/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

	Sample Data						Field Data		Matrix											
	EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
4	RD 154	BURBSΦ2SΦ1	0.5	10-30-97	1355	~~1355~~ -0176	B	5.5	X				X	X				Relinquished By: A. Sam	10-30-97 1730
																		Received By:	10/30/97 1730
2	RD 155	BURBSΦ~~5~~5SΦ1	~~6.5~~ 5.5	〃	~~1430~~ 1635	-0177	B	〃	1				1	1				Relinquished By: A. Sam	〃
																		Received By:	〃
2	RD 156	BURBSΦ~~3~~5Φ2	9.5	〃	1500	-0178	B	〃	1				1	1		X		Relinquished By: A. Sam	〃
																		Received By:	〃
1	RD 157	BURBSΦ4SΦ1	1.5	〃	1550	-0179	B	〃	1				1	1				Relinquished By: A. Sam	〃
																		Received By:	〃
~~2~~ DNB	~~RD~~ 158	~~BURBSΦ4SΦ2~~		〃			B	〃	1				1	1				Relinquished By:	
																		Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature: A. Sam	Date 10-30-97	Time

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

026

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD159
Date 10/31/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ RB purchasing
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS

Sample Data						Field Data		Matrix										
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID 10/31/97	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
2 RD 159	B4BS055Ø2	10.0	10-31 97	820	-080	B	5.5/ AOC	X				X	X				Relinquished By: A. Sam	10/31/97 1340
																	Received By:	10/31/97 1340
1 RD 160	B4BSØ65Ø1	4.5	4	850	-081	B	5.5/ AOC	X				X	X				Relinquished By: A. Sam	10/31/97 1340
																	Received By:	10/31/97 1340
~~RD 161~~	~~B4BSØ75Ø1B~~		4		RB 10/31/97	B		X				X	X				Relinquished By: A. Sam	~~10/31/97~~ 1340
																	Received By:	
27 RD 162	CLBSØ65Ø1	1.Ø	10/31/ 97	1052	-082	B	4.7	X				X					Relinquished By:	10/31/97 1340
																	Received By:	10/31/97 1340
27 RD 163	CLBSØ65Ø2	5.Ø	↓	1100	-083	B	4.7	X				X			X		Relinquished By:	10/31/97 1340
																	Received By:	10/31/97 1340

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
	10/31/97	

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

027

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD164
Date 10/31/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	Mark Deffley
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS

Sample Data						Field Data		Matrix											
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID L91036[43]	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
27 RD164	CLBSQ65Q4	10'	10/31/97	1115	-084	B	4.7	X				X					Relinquished By:	10/31/97 1340
																	Received By:	10/31/97 1340
27 RD165	CLBSQ65Q3 (*)	7.0'	↓	1115	-085	B	4.7	X				X					Relinquished By:	10/31/97 1340
																	Received By:	10/31/97 1340
				D.B 10/31/97													Relinquished By:	
																	Received By:	
																	Relinquished By:	
																	Received By:	
																	Relinquished By:	
																	Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
	10/31/97	1200

For Lab Use	
Does COC match samples: Y or N	(*) ANALYZE Sample From Black Soil @ Top of Sleeve
Broken container: Y or N	
Received within holding time: Y or N	
COC seal intact: Y or N or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

028

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD 745

Date 10/31/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	KJ ~~Mark Deffley~~ PURCHASING
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS #	Sample Data: EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID (L9707643)	Field Data: Sampling Method	SWMU	Matrix: Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
20	RD 745	DABSØ7SØ1	Ø.5'	10/31/97	0815	-086	HA	5.23	X					1			1	Relinquished By: KJ	10/31/97 1625
																		Received By:	10/31/97 1625
19	RD 747	DABSØ9SØ1	Ø.5'	"	0855	-087	HA	5.23	X					1			1	Relinquished By: KJ	10/31/97 1625
																		Received By:	10/31/97 1625
14	RD 750	SPBSØ3SØ1	Ø.5'	"	1035	-088	HA	A.II	X				1	1			1	Relinquished By: KJ	10/31/97 1625
																		Received By:	10/31/97 1625
17	RD 751	SPBSØ4SØ1	Ø.5'	"	1115	-089	HA	A.II	X				1	1			1	Relinquished By: KJ	10/31/97 1625
																		Received By:	10/31/97 1625
18	RD 754	SPBSØ7SØ1	Ø.5'	"	1410	-090	HA	A.II	X				1	1			1	Relinquished By: KJ	10/31/97 1625
																		Received By:	10/31/97 1625

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No: CP 9728	TAT: 14 - day

Sampler's Signature	Date	Time
K Jamieson	10/31/97	0830

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

020

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: COC RD166
Date 10/31/97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	Mark Deffley
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:
Shipment Method:
Comment:

ULS

Sample Data						Field Data		Matrix											
EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID 9710364	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
2	RD166 SPBSΦBSΦ1	1.Φ	10/31/97	1415	-091	X B	AREA II ADC	X				X	X				Relinquished By:	10/31/97 1715
																	Received By:	10/31/97 1715
1	RD167 SPBSΦ9SΦ1	Φ.5		1430	-092	B		X				X	X				Relinquished By:	10/31/97 1715
																	Received By:	10/31/97 1715
1	RD168 SPBSΦ9SΦ2	5.Φ		1440	-093	B		X				X	X				Relinquished By:	10/31/97 1715
																	Received By:	10/31/97 1715
2Φ	RD169 SPBS1ΦSΦ1	Φ.5		1515	-094	B		X					X				Relinquished By:	10/31/97 1715
																	Received By:	10/31/97 1715
																	Relinquished By:	
					10/31/97												Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements	
Cooler No:	TAT: 14 - day

Sampler's Signature	Date	Time
	10/31/97	1625

For Lab Use	
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 or NA	
Temperature °C _____	

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1

030

OGDEN

5510 MOREHOUSE DRIVE
SAN DIEGO, CA 92121
(619) 458-9044

Chain of Custody

Control Number: **COC** RD170
Date 10 / 31 / 97 Page 1 of 1

Project Manager:	Dixie Hambrick
Project Name:	Rocketdyne
Project Number:	313150001
Deliver results to the address above or as stated in contract	

Bill To:	~~Mark Deffley~~ pinclesiz
Company:	Ogden Environmental
Address:	5510 Morehouse Drive, San Diego, CA 92121

Sample Disposal Instructions:	
Shipment Method:	
Comment:	

EPA Sample ID	Description (for Ogden use only)	Depth	Date Collected	Time Collected	Lab ID 9710364	Sampling Method	SWMU	Soil	Water	Product	Sludge	EPA 8010/8020 VOCs	EPA 8015M		HOLD	Total # Containers	Sample Transfer	Date/ Time
RD170	PEBS015Ø1	~~[illegible]~~ 0.5'	10-31-97	1650	-095	G		X					X				Relinquished By: A. S[illegible]	10-31-97 1915
																	Received By: [signature]	10/31/97 1915
RD171	PEBSØ25Ø1	0.5'	〃	〃	-096	G.		X				X					Relinquished By: A. S[illegible]	
																	Received By: [signature]	
					AAS 10-31-97												Relinquished By:	
																	Received By:	
																	Relinquished By:	
																	Received By:	
																	Relinquished By:	
																	Received By:	

QC Level: EPA Level III Equivalent, See Contract Requirements

Cooler No:

TAT: 14 - day

Sampler's Signature	Date	Time
[signature]	10/31/97	1625

Graphics\HazMat\Rocketdyne\Rocketdyne COC2.FH5

For Lab Use

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 or NA
Temperature °C ______

1 Original, 2 Lab Copy, 3 Field Copy

REV: 1