

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Aerojet PGOU
Collection Date: June 19, 2006
LDC Report Date: September 21, 2006
Matrix: Soil
Parameters: Total Petroleum Hydrocarbons
Validation Level: EPA Level III & IV equivalent
Laboratory: Test America - Irvine
Sample Delivery Group (SDG): S606389

Sample Identification

C41-SS07-0
C41-SS08-0 **
C41-SS16-0

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers three soil samples listed on the cover sheet including QC samples, dilutions, and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report, if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in the SDG	All target compounds	Cooler temperature was reported at 10.8°C upon receipt by the laboratory.	Cooler temperature must be $4 \pm 2^\circ\text{C}$	None	A

Although the samples were received outside of the $4 \pm 2^\circ\text{C}$ criteria, the bottles were received in good condition the same day of sampling and no qualification of the data is warranted.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than 20.0%.

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No diesel range organic contaminants were found in the method blanks.

No samples were identified as field blanks. Therefore, this parameter was not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within the QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory analyzed and reported another client's MS/MSD samples, which were prepared in the same analytical batch as the project's samples. Although the MS/MSD results were within QC criteria, matrix-specific effects cannot be assessed from a direct correlation of a spike on another client's sample to the project samples. Therefore, samples were not qualified where another client's MS/MSD is used.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed.

Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which an EPA Level IV review was performed.

Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report, if data has been qualified.

IX. Field Duplicates

No samples were identified as field duplicates. Therefore, this parameter was not reviewed.

Aerojet PGOU

Total Petroleum Hydrocarbons - Data Qualification Summary - SDG S606389

No Sample Data Qualified in this SDG

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Total Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG S606389

No Sample Data Qualified in this SDG

ERM-West - Sacramento
2525 Natomas Park Dr., Ste. 350
Sacramento CA, 95833

Project: Aerojet PGOU
Project Number: 20648.03
Project Manager: Bruce Lewis

S606389
Reported:
07/13/06 11:50

EXTRACTABLE FUEL HYDROCARBONS (CADHS/8015 Modified)
TestAmerica - Irvine, CA

Analyte	Result	MDL	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
			Limit	Units						
C41-SS07-0 (S606389-02) Soil Sampled: 06/19/06 10:10 Received: 06/19/06 16:57										
EFH (C10 - C30)	ND		5.0	mg/kg	1	6F26062	06/26/06	06/27/06	EPA 8015 MOD.	
Surrogate: n-Octacosane		80 %	40-125			"	"	"	"	
C41-SS08-0 (S606389-03) Soil Sampled: 06/19/06 10:20 Received: 06/19/06 16:57										
EFH (C10 - C30)	7.6		5.0	mg/kg	1	6F26062	06/26/06	06/27/06	EPA 8015 MOD.	
Surrogate: n-Octacosane		87 %	40-125			"	"	"	"	
C41-SS16-0 (S606389-04) Soil Sampled: 06/19/06 10:30 Received: 06/19/06 16:57										
EFH (C10 - C30)	ND		5.0	mg/kg	1	6F26062	06/26/06	06/27/06	EPA 8015 MOD.	
Surrogate: n-Octacosane		79 %	40-125			"	"	"	"	

0)
9/14/06

LDC #: 0609-1A0
 SDG #: S606389
 Laboratory: Del Mar - Irvine

VALIDATION COMPLETENESS WORKSHEET
 ✓ EPA Level III/IV

Date: 9/13/06
 Page: 1 of 1
 Reviewer: CG
 2nd Reviewer: NE

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 6/19/2006
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	non-site sample
IVc.	Laboratory control samples	A	
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	C41-SS07-0	11		21		31	
2	C41-SS08-0 **	12		22		32	
3	C41-SS16-0	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

VALIDATION FINDINGS CHECKLIST

Method: TPH as Extractables (EPA SW 846 8015B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	X			
Cooler temperature criteria was met.	X			Samples rec'd good condition same day as sampling
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	X			6pt
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	X			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		X		
Did the initial calibration meet the curve fit acceptance criteria?			X	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? %D or x %R	X			
Was a continuing calibration analyzed daily?	X			
Were all percent differences (%D) < 15%.0 or percent recoveries 85-115%?	X			
V. Blanks				
Was a method blank associated with every sample in this SDG?	X			
Was a method blank analyzed for each matrix and concentration?	X			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		X		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	X			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			X	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			X	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	X			non-site samples
Was a MS/MSD analyzed every 20 samples of each matrix?	X			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	X			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	X			
Was an LCS analyzed per extraction batch?	X			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	X			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			X	
Were the performance evaluation (PE) samples within the acceptance limits?			X	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	X			

LDC #: 0609-1AB
 SDG #: SLX0398

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: G
 2nd Reviewer: LE

Validation Area	Yes	No	NA	Findings/Comments
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	X			
XII. System performance				
System performance was found to be acceptable.	X			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	X			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.		X		
Target compounds were detected in the field duplicates.			X	
XV. Field blanks				
Field blanks were identified in this SDG.		X		
Target compounds were detected in the field blanks.			X	

METHOD: GC Total Petroleum Hydrocarbons (EPA SW 846 Method 8015)

The calibration factors (CF) and relative standard deviation (%RSD) were calculated for TPH (C10-C28) using the following calculation:

CF = Area/Concentration
 %RSD = $100 * (S/X)$

Where:

S = Standard deviation of calibration factors

X = Mean of calibration factors

Calibration Date	Compound	Standard	Standard Concentration (ppb)	Response (A/H)	Recalculated		Reported	
					Calibration Factor (CF)	%RSD	Calibration Factor (CF)	%RSD
6/12/2006	TPH (C10-C28)	Point 1	100	357546.49	3575.46			
		Point 2	250	1097954.92	4391.82			
		Point 3	750	3486367.24	4648.49			
		Point 4	2000	10280999.57	5140.50			
		Point 5	3000	15801310.36	5267.10			
		Point 6	4000	19663814.72	4915.95			
		Mean calibration factor			4656.555	13.28	4656.555	13.28

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. Although circled values did not agree within 10.0%, they were still within QC limits.

METHOD: GC Total Petroleum Hydrocarbons (EPA SW 846 Method 8015)

The percent recoveries (%R) were calculated for TPH using the following calculation:

$$\text{Percent recovery (\% R)} = 100 * C/N$$

Where:

N = Nominal Amount

C = Calculated Amount

Standard ID	File ID	Compound	N (ppb)	C (ppb)	Recalculated		Reported	
					% R		% R	
CCV2 2K/200	6020323	TPH	2000	1900.0801	95		95	
CCV1 750/150	6040281	TPH	750	737.4566	98		98	
CCV2 2K/200	6050490	TPH	2000	1903.659	95		96	
CCV1 750/150	6040281	TPH	750	649.0680	87		87	

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

METHOD: Total Petroleum Hydrocarbons by GC (EPA method 8015B)

The percent recoveries (%R) of the laboratory control sample were calculated for perchlorate below using the following calculation:

$$\% \text{Recovery} = 100 * (\text{SSC} - \text{SC}) / \text{SA}$$

Where: SSC = Spiked concentration SC = Sample concentration
 SA = Spike added

$$\text{RPD} = | \text{LFB} - \text{LFBd} | * 2 / (\text{LFB} + \text{LFBd})$$

LFB = Laboratory Fortified Blank
 LFBd = Laboratory Fortified Blank duplicate recovery

LFB sample: 6F26062-BS1

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		LFB		LFBd			
	LFB	LFBd		LFB	LFBd	Percent Recovery Reported	Recalc.	Percent Recovery Reported	Recalc.		
Extractable Fuel Hydrocarbons	33.3	NA	0	25.4	NA	76	76	NA	NA	NA	NA

LDC #: G609-1A8
SDG #: S606389

VALIDATION FINDINGS WORKSHEET
Surrogate Compounds
Results Verification

Page: 1 of 1
Reviewer: CT
2nd Reviewer: NE

METHOD: GC Total Petroleum Hydrocarbons (EPA SW 846 Method 8015)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

%Recovery: $SURRF/SURRS * 100$

Where: SURRF = Surrogate Found
SURRS = Surrogate Spiked

Sample ID: C41-SS08-0

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
n-Octacosane	200.00	173.07	87	87	1

