



Terry Tamminen  
Agency Secretary  
Cal/EPA



## Department of Toxic Substances Control

Hazardous Materials Laboratory  
700 Heinz Avenue, Suite 100  
Berkeley, California 94710



Arnold Schwarzenegger  
Governor

### MEMORANDUM

**TO:** Gerard Abrams  
Department of Toxic Substances Control  
8800 Cal Center Drive  
Sacramento, CA 95826

**FROM:** Fred Seto, Ph.D. FS  
Hazardous Materials Laboratory  
Department of Toxic Substances Control  
700 Heinz Avenue, Suite 100  
Berkeley, CA 94704

**DATE:** September 28, 2004

**SUBJECT:** Review of Data Packages, Boeing Rocketdyne-Santa Susana  
Field Laboratory RFI  
Calscience Environmental Laboratories, Inc. (Calscience): EPA Method  
6010 (Metals), EPA Method 7470 (Mercury in water), EPA Method 7471  
(Mercury in soil)  
Centrum Analytical Services, Inc. (Centrum): EPA Method 6010  
(Selenium)

As requested, we have reviewed the data packages for metals. The data packages contain seven samples. Two soil and one water samples were analyzed by Calscience for mercury and metals. Four soil samples were analyzed by Centrum for selenium. The samples are described below. The analytical results and the associated reporting limits are given in Table 1, Table 2 and Table 3.

<u>SDG No</u> <u>Laboratory</u>	<u>Sample No</u>	<u>Date Collected</u>	<u>Matrix</u>	<u>EPA</u> <u>Method</u>
0018 Calscience	RX049	05/08/00	Water	7470, 6010
	RX057	05/08/00	Soil	7471, 6010
	RX058	05/08/00	Soil	7471, 6010
0018 Centrum	RX048	05/08/00	Soil	6010
	RX059	05/08/00	Soil	6010

RX060  
RX061

05/08/00  
05/08/00

Soil  
Soil

6010  
6010

We have evaluated, where applicable, the holding times, initial calibrations, calibration verifications, method blanks, laboratory control sample/laboratory control sample duplicate (LCS/LCSD), matrix spike/matrix spike duplicate (MS/MSD), interference check standard (ICS), analyte identification and quantitation. The data review results are summarized in Table 4. We have the following comments:

For the water sample and soil samples analyzed by Calscience, no "raw data" for samples and quality control (QC) samples were provided. Some QC summary sheets indicated that the QC results met the QC limits. However, the reported analytical results and QC results can not be verified without the associated raw data.

For the soil samples analyzed by Centrum using EPA method 6010, only the selenium test results were reported even though EPA method 6010 normally can determine as many as nineteen metals. Centrum provided raw data for LCS and MS/MSD supporting these QC samples met the QC limits. However, no raw data for initial calibration, calibration verification, method blanks, and ICS were provided.

Thus, we do not have sufficient raw data to verify that the relevant QC test results met their established limits. Consequently, the reported test results can be satisfactory if the claimed QC results can be substantiated by their associated raw data.

If you have any questions, please contact me or James Cheng at (510) 540-3003.

CC: Cindy Dingman  
Lorna Garcia  
James Cheng  
Thomas Li, Ph.D.

**Table 1: Analytical Results and Reporting Limits for Metals in Water Sample ( Analyzed by Calscience)**

Analyte	Sample No RX049 (mg/L)	Reporting Limit (mg/L)
Aluminum (Al)	0.05500	0.05000
Antimony (Sb)	ND	0.01500
Arsenic (As)	ND	0.01500
Barium (Ba)	ND	0.01000
Beryllium (Be)	ND	0.00100
Boron (B)	ND	0.02000
Cadmium (Cd)	ND	0.00500
Chromium Cr)	ND	0.00500
Cobalt (Co)	ND	0.00500
Copper (Cu)	0.00608	0.00500
Lead (Pb)	ND	0.01000
Mercury (Hg)	ND	0.00050
Molybdenum (Mo)	ND	0.00500
Nickel (Ni)	ND	0.00500
Selenium (Se)	ND	0.01500
Silver (Ag)	ND	0.00500
Thallium (TL)	ND	0.01500
Vanadium (V)	ND	0.00500
Zinc (Zn)	0.02750	0.01000

ND = Not Detected

**Table 2: Analytical Results and Reporting Limits for Metals in Soil Samples (Analyzed by Calscience)**

Analyte	Sample No		Reporting Limits (mg/kg)
	RX057 (mg/kg)	RX058 (mg/kg)	
Al	13900	14100	25
Sb	ND	ND	0.750
As	3.32	4.20	0.75
Ba	64.2	43.6	0.5
Be	0.718	0.693	0.250
B	ND	ND	1.00
Cd	ND	ND	0.500
Cr	16.5	17.2	0.2
Co	6.90	6.15	0.25
Cu	7.26	7.39	0.50
Pb	9.35	8.46	0.50
Hg	ND	ND	0.0835
Mo	ND	ND	0.250
Ni	10.40	9.55	0.25
Se	1.60	2.03	0.75
Ag	ND	ND	0.250
Tl	ND	ND	0.750
V	31.7	36.5	0.2
Zn	39.2	34.3	1.0

ND = Not Detected

**Table 3: Analytical Results and Reporting Limits for Metals in Soil Samples (Analyzed by Centrum)**

Analyte	Sample No				Reporting Limits (mg/kg)
	RX048 (mg/kg)	RX059 (mg/kg)	RX060 (mg/kg)	RX061 (mg/kg)	
Al	NDR	NDR	NDR	NDR	NDR
Sb	NDR	NDR	NDR	NDR	NDR
As	NDR	NDR	NDR	NDR	NDR
Ba	NDR	NDR	NDR	NDR	NDR
Be	NDR	NDR	NDR	NDR	NDR
B	NDR	NDR	NDR	NDR	NDR
Cd	NDR	NDR	NDR	NDR	NDR
Cr	NDR	NDR	NDR	NDR	NDR
Co	NDR	NDR	NDR	NDR	NDR
Cu	NDR	NDR	NDR	NDR	NDR
Pb	NDR	NDR	NDR	NDR	NDR
Hg	NDR	NDR	NDR	NDR	NDR
Mo	NDR	NDR	NDR	NDR	NDR
Ni	NDR	NDR	NDR	NDR	NDR
Se	ND	ND	ND	ND	2.5
Ag	NDR	NDR	NDR	NDR	NDR
Tl	NDR	NDR	NDR	NDR	NDR
V	NDR	NDR	NDR	NDR	NDR
Zn	NDR	NDR	NDR	NDR	NDR

ND = Not Detected

NDR = No Data Reported

**Table 4: Metals Data Review Summary**

QA/QC Criteria	ACCEPTABILITY			
	EPA Method 6010 (4 samples, analyzed by Centrum)	EPA Method 6010 (3 samples, analyzed by Calscience)	EPA Method 7470 (1 sample, analyzed by Calscience)	EPA Method 7471 (2 samples, analyzed by Calscience)
Holding times 6 months (except Hg) 28 days (Hg)	Yes	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data
Initial Calibration	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data
Calibration Verification R=90%-110% (except Hg) R=80%-120% (Hg)	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data
Method Blanks	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data
LCS/LCSD R=75%-125% RPD=<20%	Yes , for LCS	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data
MS/MSD R=60%-130% RPD=<20%	Yes	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data
Interference Check Standard R=80% -120%	can not be verified due to missing raw data	can not be verified due to missing raw data	NA	NA
Identification	Yes	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data
Quantification	Yes	can not be verified due to missing raw data	can not be verified due to missing raw data	can not be verified due to missing raw data

R = Recovery

RPD = Relative Percent Difference

NA = Not Applicable