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Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: December 13, 1999
In Reply Refer To: ESH-18/WQ&H:99-0439
Mail Stop: K497
Telephone: (505) 665-1859

Ms. Marcy Leavitt, Chief
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: ANALYTICAL RESULTS FROM SAMPLING GROUND WATER PRODUCED DURING THE DRILLING OF MONITORING WELL R-15 AT 646 AND 1,100 FOOT DEPTHS

Dear Ms. Leavitt:

Enclosed are copies of the validated analytical reports for screening samples collected from Monitoring Well R-15 at the 646 and 1,100 foot depths. These results are being submitted to the New Mexico Environment Department (NMED GWQB) for the following two purposes: First, for your agency's general information; and second, as an addendum to the Laboratory's June 25, 1999, Notice of Intent (NOI) to discharge purge and development water produced during the drilling of Monitoring Well R-15. Additional information on the Laboratory's NOI is presented at the end of this letter.

Monitoring Well R-15, located in Mortandad Canyon, was drilled using a casing-advance drilling method. Drilling mud was used as a casing lubricant. This lubricant method was selected to improve drilling speed and cost effectiveness; however, drilling mud was introduced into the produced ground water. As a result, the quality of the produced water is not representative of the ground water in the aquifer. Discussion of the enclosed analytical reports is presented below.

Attachment I: Non-Filtered Samples: 646 Feet
On July 22, 1999, samples CAMO-99-0103 (non-filtered sample) and CAMO-99-0105 (non-filtered sample) were collected from R-15 at 646 feet (basalt perched zone). The results from inorganic analyses are presented in Table 1.0. These samples contained residual drilling mud, which biased the major ion and trace element chemistries. Validation of the data confirmed that the results are acceptable as reported.

Analysis of sample CAMO-99-0103 (non-filtered sample) for High-Explosive Compounds (HECs) detected 4-amino-2,6-dinitrotoluene (0.77 µg/L) in the sample at concentrations greater than the laboratory's reporting limit. However, analysis of sample CAMO-99-0105 (non-filtered sample) for High-Explosive Compounds (HECs) did not confirm the presence of any target analytes. Validation

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of the data confirmed that the results are acceptable as reported. However, a focused validation of these samples cautioned that the large number of non-target peaks in the semi-volatile analysis indicates an increased possibility for both interferences and false positive results in the HE analysis (see Attachment VI-Focused Validation Report for Samples CAMO-99-0103 and CAMO-99-0105).

Analysis of samples CAMO-99-0103 (non-filtered sample) and CAMO-99-0105 (non-filtered sample) for volatile and semi-volatile organic compounds did not confirm the presence of any target analytes at concentrations greater than the laboratory's reporting limit with the exception of acetone at 44 µg/L and 40 µg/L, respectively. Several Tentatively Identified Compounds in samples CAMO-99-0103 (non-filtered sample) and CAMO-99-0105 (non-filtered sample) are noted in the analytical report. These mainly include hydrocarbons and organic acids that are probably associated with drilling activities. Validation of the data confirmed that the results are acceptable as reported (see Attachment VI).

Analysis of samples CAMO-99-0103 (non-filtered sample) and CAMO-99-0105 (non-filtered sample) for radiological analyses confirmed the presence of the following analytes at activities greater than three times the individual measurement uncertainty (3 sigma): U-234, U-235, U-238, Pu-238, Am-241, and tritium (See Table 2.0). Drilling mud was present in the samples. Naturally occurring uranium may be present in the drilling mud, which may have slightly contributed to the isotopic uranium concentrations (activities) reported for both samples. Gross alpha, beta, and gamma results are presented in Table 2.0. Validation of the data confirmed that the results are acceptable as reported.

Attachment II: Filtered Samples: 646 Feet

On July 22, 1999, samples CAMO-99-0102 (filtered sample) and CAMO-99-0104 (filtered sample) were collected from R-15 at 646 feet. The results from inorganic analyses are presented in Table 1.0. Analysis of samples CAMO-99-0102 (filtered sample) and CAMO-99-0104 (filtered sample) for nitrate/nitrite, chloride, fluoride, and sulfate did not confirm their presence at concentrations greater than NM WQCC Regulation 3103 ground water standards. The concentration of total dissolved solids (TDS) in sample CAMO-99-0102 was 260 mg/L. The concentration total uranium in samples CAMO-99-0102 and CAMO-99-0104 were 1.10 µg/L and 1.29 µg/L, respectively. Validation of the data confirmed that the results are acceptable as reported.

Analysis of samples CAMO-99-0102 (filtered sample) and CAMO-99-0104 (filtered sample) for radiological analyses confirmed the presence of the following analytes at activities greater than three times the individual measurement uncertainty (3 sigma): U-234 and U-238 (See Table 2.0). Drilling mud was present in the samples. Naturally occurring uranium may be present in the drilling mud, which may have slightly contributed to the isotopic uranium concentrations (activities) reported for both samples. Gross alpha, beta, and gamma results are presented in Table 2.0. Validation of the data confirmed that the results are acceptable as reported.

Attachment III: Non-Filtered Sample: 1,100 Feet

On August 27, 1999, sample CAMO-99-0107 (non-filtered sample) was collected from R-15 at 1,100 feet. The results from inorganic analyses are presented in Table 1.0. This sample contained residual drilling mud, which biased the major ion and trace element chemistries. Validation of the data confirmed that the results are acceptable as reported.

Analysis of sample CAMO-99-0107 (non-filtered sample) for low-level tritium analysis produced a result of 1.21 pCi/L (+/- 0.35 pCi/L). All method required quality control parameters were met for this analysis. Analysis of sample CAMO-99-0107 (non-filtered sample) for radiological analyses confirmed the presence of the following analytes at activities greater than three times the individual measurement uncertainty (3 sigma): U-234, U-235, and U-238 (See Table 2.0). Drilling mud was present in the sample. Naturally occurring uranium may be present in the drilling mud, which may have contributed to the isotopic uranium concentrations (activities) reported for the sample. Gross alpha, beta, and gamma results are presented in Table 2.0. Validation of the data confirmed that the results are acceptable as reported.

Attachment IV: Filtered Sample; 1,100 Feet

On August 27, 1999, sample CAMO-99-0106 (filtered sample) was collected from R-15 at 1,100 feet. Analysis of CAMO-99-0106 (filtered sample) for metals did not confirm the presence of any target analytes at concentrations greater than the NM WQCC Regulation 3103 ground water standards (See Table 1.0). Validation of the data confirmed that the results are acceptable as reported.

Analysis of sample CAMO-99-0106 (filtered sample) for nitrate/nitrite, chloride, fluoride, and sulfate did not confirm their presence at concentrations greater than the NM WQCC Regulation 3103 ground water standards (See Table 1.0). The concentration of total dissolved solids (TDS) in sample CAMO-99-0106 (filtered sample) was 190 mg/L. Validation of the data confirmed that the results are acceptable as reported.

Analysis of sample CAMO-99-0106 (filtered sample) for radiological analyses confirmed the presence of the following analytes at activities greater than three times the individual measurement uncertainty (3 sigma): U-234, U-238, and Am-241 (See Table 2.0). It should be noted that Am-241 was not detected in sample CAMO-99-0107 (non-filtered sample, 1,100 ft.). Drilling mud was present in the sample. Naturally occurring uranium may be present in the drilling mud, which may have contributed to the isotopic uranium concentrations (activities) reported for the sample. Gross alpha, beta, and gamma results are presented in Table 2.0. Validation of the data confirmed that the results are acceptable as reported.

Land Application NOI

On June 25, 1999, the Laboratory submitted a Notice of Intent (NOI) to Discharge (WQ&H:99-0245) to the NMED GWQB for the land application of purge and development water produced during the drilling of Monitoring Well R-15. On July 22, 1999, your agency replied to the Laboratory's request by requiring an addendum to the NOI should concentrations in the purge and development water exceed NM WQCC Regulation 3103 ground water standards. This letter and the enclosed attachments are intended to serve as the required addendum.

Currently, approximately 10,000 gallons of ground water produced during the drilling of Monitoring Well R-15 are in temporary storage at the Mortandad Canyon well site. Approximately half of this water (5,000 gallons) was produced at the 646 foot water bearing zone and the other half (5,000 gallons) from the 1,100 foot zone. The enclosed non-filtered analytical results from samples collected at the 664 and 1,100 foot depths are representative of the quality of the water in storage, respectively.

In December 1999 and January 2000, Monitoring Well R-15 will be developed. It is currently estimated that approximately 25,000 gallons of ground water will be produced during well development. All ground water produced during well development will be temporarily stored on-site.

Under the current NOI (June 25, 1999), the Laboratory selected a land application area in the Mortandad Canyon floodplain, north and east of the drilling site. After further review, the Laboratory has determined that it would be more advantageous if the produced ground water could be beneficially reused. As a result, the Laboratory proposes to use all purge and development water to enhance revegetation of the R-15 drilling site. Revegetation activities are currently scheduled for spring 2000. An addendum to the June 25, 1999, NOI has been enclosed in Attachment V to document these proposed changes.

Please contact me at 667-1859, or Bob Beers at 667-7969, if you need any additional information regarding this data.

Sincerely,

Steven Rae
Group Leader
Water Quality and Hydrology Group

DEC 1999
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SR:RB/rm

Enclosures: a/s

Cy: D. Saracino, Pueblo of San Ildefonso, New Mexico, w/enc.
J. Pecos, Pueblo of Cochiti, New Mexico, w/enc.
G. Suazo, CRO-1, w/enc., MS A117
J. Keiling, NMED/HRMB, Santa Fe, New Mexico, w/enc.
J. Young, NMED/HRMB, Santa Fe, New Mexico, w/enc.
J. Davis, NMED/SWQB, Santa Fe, New Mexico, w/enc.
B. Hoditschek, NMED/SWQB, Santa Fe, New Mexico, w/enc.
S. Yanicek, NMED/DOE/OB, w/enc., MS J993
J. Vozella, DOE/LAAO, w/enc., MS A316
B. Enz, DOE/LAAO, w/enc., MS A316
T. Gunderson, DIR, w/enc., A100
M. Baker, EM-DO, w/enc., MS J591
J. Canepa, EM/ER, w/enc., MS M992
T. George, EM/ER, w/enc., MS M992
A. Pratt, EES-13, w/enc., MS M992
D. Broxton, EES-1, w/enc., MS D462
P. Longmire, EES-1, w/enc., MS D469
D. McInroy, EM/ER, w/enc., MS M992

Cy (continued):
R. Bohn, EM/ER, w/enc., MS M992
D. Erickson, ESH-DO, w/enc., MS K491
C. Nylander, ESH-18, w/enc., MS K497
S. Veenis, ESH-18, w/enc., MS K497
M. Saladen, ESH-18, w/enc., MS K497
B. Beers, ESH-18, w/enc., MS K497
H. Decker, ESH-18, w/enc., MS K497
D. Woitte, LC-GEN, w/enc., MS A187
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

Table 1.0

12/13/99

Inorganic Analytical Results[1]
Monitoring Well R-15 Screening Samples
646 and 1,100 Foot Depths
Units: ug/L, unless noted.

Source Depth (ft)	Sample Type	Sample ID No.	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg
646	NF	99-0103	192,200	9.0	46.1	5,120	44.2	67.3	6.0	607,000	832	719	1420	750,000	262	597,000
646	NF	99-0105	173,000	7.4	28.9	2,930	26.4	45.8	4.5	335,000	689	401	937	649,000	231	314,000
1,100	NF	99-0107	43,600	3.4	24.0	2,820	12.3	42.1	0.59	266,000	21.8	107	26	21,300	67.1	58,200
1,100	F	99-0106	11.2	4.0	2.7	39.6	0.47	46.0	0.20	13,900	0.50	4.0	1.4	22.3	1.3	4,240
WQCC 3101 Standards (ug/L)[2]			*5,000*		*100*	*1,000*		*750*	*10*		*50*	*50*	*1,000*	*1,000*	*50*	

Source Depth (ft)	Sample Type	Sample ID No.	Mn	Hg	Mo	Ni	K	Se	Ag	Na	Sr	Tl	V	Zn	Total U
646	NF	99-0103	33,500	0.36	37.2	2,080	30,800	12.6	0.7	126,000	3,250	22.0	129	3,800	30.9
646	NF	99-0105	17,900	0.44	65.5	1,170	21,400	12.4	0.7	104,000	2,220	22.2	142	2,390	34.9
1,100	NF	99-0107	7,270	0.02	5.5	64.2	21,200	3.7	0.7	35,900	1,140	4.5	344	142	NA
646	F	99-0102	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.10
646	F	99-0104	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.29
1,100	F	99-0106	193	0.02	20.1	5.4	3,300	2.9	1.2	23,000	57.9	5.2	1.6	5.7	2.44
WQCC 3101 Standards (ug/L)[2]			*200*	*20*	*1,000*	*200*		*50*	*50*					*10,000*	*5,000*

Source Depth (ft)	Sample Type	Sample ID No.	NH3 (mg/L)	CaCO3[3] (mg/L)	CN (mg/L)	NO3 (mg/L)	Total P (mg/L)	Br (mg/L)	Cl (mg/L)	F (mg/L)	SO4 (mg/L)	TDS (mg/L)
646	NF	99-0103	0.53	140	0.035	0.5	0.098	0.2	13	1.5	45	NA
646	NF	99-0105	0.53	140	0.03	0.5	0.077	0.2	13	1.4	47	NA
646	F	99-0102	0.54	120	NA	0.93	0.05	0.2	13	1.5	45	260
646	F	99-0104	0.53	120	NA	0.05	0.05	0.2	13	1.3	45	NA
1,100	F	99-0106	0.53	NA	NA	0.052	0.05	0.2	3.7	0.3	15	190
WQCC 3101 Standards (ug/L)[2]					*0.2*	*10*			*250*	*1.6*	*600*	*1,000*

Notes:

NF means non-filtered sample.

F means that the sample was filtered.

NA means that no analysis was conducted for this analyte.

[1]Results not representative of ground water in the aquifer due to introduction of drilling mud.

[2]NM WQCC 3103 Standards apply to the dissolved portion of the contaminants.

[3]Bicarbonate as CaCO3.

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Table 2.0

12/13/99

Radiological Analytical Results[1]
Monitoring Well R-15 Screening Samples
646 and 1,100 Foot Depths
Units: pCi/L

Source Depth (ft)	Sample Type	Sample ID No.	U-234	U-235	U-238	Gross Alpha	Gross Beta	Gross Gamma
646	F	99-0102	0.488 (+/-0.056)	0.027 (+/-0.014)	0.304 (+/-0.042)	1.53 (+/-0.41)	3.35 (+/-0.39)	280 (+/-22.5)
646	F	99-0104	0.495 (+/-0.056)	0.045 (+/-0.016)	0.301 (+/-0.041)	0.7 (+/-0.65)	2.7 (+/-0.55)	317 (+/-23)
646	F	99-0104 dupe	NA	NA	NA	1.12 (+/-0.39)	3.58 (+/-0.41)	275 (+/-22.5)
646	NF	99-0103	11.85 (+/-0.74)	0.577 (+/-0.065)	8.6 (+/-0.54)	183 (+/-13)	140 (+/-9)	260 (+/-10)
646	NF	99-0103-dupe	NA	NA	NA	NA	NA	299 (+/-11)
646	NF	99-0105	20.0 (+/-1.6)	0.97 (+/-0.25)	16.6 (+/-1.4)	125 (+/-9)	98 (+/-7)	279 (+/-10.5)
646	NF	99-0105 dupe	NA	NA	NA	110 (+/-8)	93 (+/-7)	NA
1,100	F	99-0106	1.44 (+/-0.12)	0.043 (+/-0.016)	0.683 (+/-0.069)	2.5 (+/-0.55)	2.5 (+/-0.7)	223 (+/-9)
1,100	F	99-0106 dupe	NA	NA	NA	1.7 (+/-0.6)	1.4 (+/-0.7)	216 (+/-9)
1,100	NF	99-0107	18.7 (+/-1.1)	0.698 (+/-0.070)	13.25 (+/-0.81)	66.2 (+/-3.9)	50.5 (+/-2.8)	253 (+/-10)
Water Quality Standards								
DOE Drinking Water System DCG						*1.2*	*40*	
EPA Primary Drinking Water Standard						*15*		
EPA Screening Level							*50*	

Source Depth (ft)	Sample Type	Sample ID No.	Sr-90	Pu-238	Pu-239	Am-241	Tritium	Np-237
646	F	99-0102	-0.13 (+/-0.23)	-0.0029 (+/-0.0077)	0.0123 (+/-0.0083)	0.0046 (+/-0.0074)	NA	0.00 (+/-0.005)
646	F	99-0104	0.12 (+/-0.25)	0.0121 (+/-0.0081)	0.0093 (+/-0.0075)	0.025 (+/-0.011)	NA	0.00 (+/-0.005)
646	NF	99-0103	0.3 (+/-0.55)	0.021 (+/-0.015)	-0.0071 (+/-0.0096)	0.123 (+/-0.026)	4,020 (+/-280)	0.03 (+/-0.025)
646	NF	99-0105	0.31 (+/-0.33)	0.057 (+/-0.019)	0.0090 (+/-0.0091)	0.207 (+/-0.039)	4,320 (+/-300)	-0.01 (+/-0.02)
646	NF	99-0105 dupe	-0.17 (+/-0.32)	NA	NA	NA	NA	0.06 (+/-0.03)
1,100	F	99-0106	-0.17 (+/-0.17)	0.0167 (+/-0.0082)	0.0083 (+/-0.0067)	0.044 (+/-0.014)	NA	0.01 (+/-0.015)
1,100	F	99-0106 dupe	-0.14 (+/-0.18)	NA	NA	NA	NA	NA
1,100	NF	99-0107	-0.04 (+-0.2)	0.0111 (+/-0.0075)	-0.0017 (+/-0.0069)	0.0072 (+/-0.0072)	1.21 (+/-0.35)	NA
Water Quality Standards								
DOE Drinking Water DCG			*40*	*1.6*	*1.2*	*1.2*	*80,000*	
EPA Primary Drinking Water Standard			*8*				*20,000*	

Notes:

[1] Results not representative of ground water in the aquifer due to the introduction of drilling mud.

NA means that no analysis was conducted for this analyte.

Detection defined as value > 3X uncertainty (3 sigma) and > detection limit.

NF means non filtered sample.

F means sample was filtered.

Reported uncertainties are the Estimated Total Propagated Uncertainty (1 sigma).

7/27/99

ATTACHMENT I

MONITORING WELL R-15

646 FEET

NON-FILTERED SAMPLE RESULTS:
CAMO-99-0103
CAMO-99-0105

R-15 NF 64 FL

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CAMO-99-0103

Lab Name: PARAGON_ANALYTICS_____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 5875R_

Matrix (soil/water): WATER Lab Sample ID: 9907207-1

Level (low/med): LOW__ Date Received: 07/27/99

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	192000	_		P_
7440-36-0	Antimony_	9.0	B		P_
7440-38-2	Arsenic__	46.1	_		P_
7440-39-3	Barium___	5120	_		P_
7440-41-7	Beryllium	44.2	_		P_
7440-42-8	Boron____	67.3	B		P_
7440-43-9	Cadmium__	6.0	B		P_
7440-70-2	Calcium__	607000	_		P_
7440-47-3	Chromium_	832	_		P_
7440-48-4	Cobalt___	719	_		P_
7440-50-8	Copper___	1420	_		P_
7439-89-6	Iron_____	750000	_		P_
7439-92-1	Lead_____	262	_		P_
7439-95-4	Magnesium	597000	_		P_
7439-96-5	Manganese	33500	_		P_
7439-97-6	Mercury__	0.36	_		AV
7439-98-7	Molybdenu	37.2	_		P_
7440-02-0	Nickel___	2080	_		P_
7440-09-7	Potassium	30800	_	E	P_
7782-49-2	Selenium_	12.6	B		P_
7440-22-4	Silver___	0.70	U		P_
7440-23-5	Sodium___	126000	_		P_
7440-24-6	Strontium	3250	_		P_
7440-28-0	Thallium_	22.0	B		P_
7440-62-2_	Vanadium_	129	_		P_
7440-66-6_	Zinc_____	3800	_		P_

P1

Color Before: LT_BROWN_ Clarity Before: CLEAR_ Texture: N/A___

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

C ments:

R-15 NF 48 fL

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CAMO-99-0105

Lab Name: PARAGON_ANALYTICS_____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 5875R_

Matrix (soil/water): WATER Lab Sample ID: 9907207-2

Level (low/med): LOW__ Date Received: 07/27/99

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	173000	_		P_
7440-36-0	Antimony_	7.4	B		P_
7440-38-2	Arsenic__	28.9	_		P_
7440-39-3	Barium___	2930	_		P_
7440-41-7	Beryllium	26.4	_		P_
7440-42-8	Boron____	45.8	B		P_
7440-43-9	Cadmium__	4.5	B		P_
7440-70-2	Calcium__	335000	_		P_
7440-47-3	Chromium_	689	_		P_
7440-48-4	Cobalt___	401	_		P_
7440-50-8	Copper___	937	_		P_
7439-89-6	Iron____	649000	_		P_
7439-92-1	Lead____	231	_		P_
7439-95-4	Magnesium	314000	_		P_
7439-96-5	Manganese	17900	_		P_
7439-97-6	Mercury__	0.44	_		AV
7439-98-7	Molybdenu	65.5	_		P_
7440-02-0	Nickel___	1170	_		P_
7440-09-7	Potassium	21400	_	E	P_
7782-49-2	Selenium_	12.4	B		P_
7440-22-4	Silver___	0.70	U		P_
7440-23-5	Sodium___	104000	_		P_
7440-24-6	Strontium	2220	_		P_
7440-28-0	Thallium_	22.0	B		P_
7440-62-2_	Vanadium_	142	_		P_
7440-66-6_	Zinc____	2390	_		P_

PL

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

nments:

FORM I - IN

R-15 646 FE , F

AMMONIA

Method EPA350.3

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 5875R
Work Order Number: 9907207
Reporting Basis: As Received

Final Volume: 10 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0103	9907207-1	7/22/99	8/11/99	8/11/99	N/A	1	0.53	0.53	U	10 ML
CAMO-99-0105	9907207-2	7/22/99	8/11/99	8/11/99	N/A	1	0.53	0.53	U	10 ML

PL

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *NH9907207-1*

R-15 646 FL NF

BICARBONATE AS CACO3

Method EPA310.1M

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 5875R
Work Order Number: 9907207
Reporting Basis: As Received

Final Volume: 20 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0103	9907207-1	7/22/99	7/30/99	7/30/99	N/A	1	140	25		20 ML
CAMO-99-0105	9907207-2	7/22/99	7/30/99	7/30/99	N/A	1	140	25		20 ML

Comments:

PL

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *AK9907207-1*

R-15 646A F

CYANIDE, TOTAL

Method SW9010

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 5875R
Work Order Number: 9907207
Reporting Basis: As Received

Final Volume: 50 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0103	9907207-1	7/22/99	8/3/99	8/4/99	N/A	1	0.035	0.01		50 ML
CAMO-99-0105	9907207-2	7/22/99	8/3/99	8/4/99	N/A	1	0.03	0.01		50 ML

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

PL

Data Package ID: *CN9907207-1*

R-15 646FL, F

NITRATE/NITRITE

Method EPA353.3

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 5875R
Work Order Number: 9907207
Reporting Basis: As Received

Final Volume: 3 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0103	9907207-1	7/22/99	8/10/99	8/10/99	N/A	10	0.5	0.5	U	3 ML
CAMO-99-0105	9907207-2	7/22/99	8/10/99	8/10/99	N/A	10	0.5	0.5	U	3 ML

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

PL

Data Package ID: *NN9907207-1*

R-15 646ft N

TOTAL PHOSPHORUS

Method EPA365.2

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 5875R
Work Order Number: 9907207
Reporting Basis: As Received

Final Volume: 50 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0103	9907207-1	7/22/99	8/12/99	8/13/99	N/A	1	0.098	0.05	N	50 ML
CAMO-99-0105	9907207-2	7/22/99	8/12/99	8/13/99	N/A	1	0.077	0.05	N	50 ML

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

PL

Data Package ID: *PO9907207-1*

R-15 646ft NF

Ion Chromatography

Method EPA300.0

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907207
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5875R

Field ID: CAMO-99-0103
Lab ID: 9907207-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 04-Aug-99
Date Analyzed: 04-Aug-99

Prep Batch: IC990804-1
QCBatchID: IC990804-1-2
Run ID: IC990804-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: MG/L
File Name: 99080463

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
24959-67-9	BROMIDE	1	0.2	0.2	U	
16887-00-6	CHLORIDE	10	13	2		
16984-48-8	FLUORIDE	1	1.5	0.1		
14808-79-8	SULFATE	1	45	1		

PL

Data Package ID: *IC9907207-1*

R-15 846ft F

Ion Chromatography

Method EPA300.0

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907207
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5875R

Field ID: CAMO-99-0105
Lab ID: 9907207-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 04-Aug-99
Date Analyzed: 04-Aug-99

Prep Batch: IC990804-1
QCBatchID: IC990804-1-2
Run ID: IC990804-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: MG/L
File Name: 99080464

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
24959-67-9	BROMIDE	1	0.2	0.2	U	
16887-00-6	CHLORIDE	10	13	2		
16984-48-8	FLUORIDE	1	1.4	0.1		
14808-79-8	SULFATE	1	47	1		

PL

Data Package ID: *IC9907207-1*

R-15 646ft N

TOTAL URANIUM ANALYSIS RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Paragon Analytics, Inc. Date Collected: 07/22/99

Client Name: Los Alamos National Lab. Date Analyzed : 08/16/99

Client Project ID: 5875R

Lab Sample ID Series: 99-07-207 Sample Matrix : Water

Client Sample ID	Lab Sample ID	Total Uranium (ug/L)	Reporting Limit	Flag
CAMO-99-0103	07-207-01	30.9 ± 4.2	10.00	
CAMO-99-0105	07-207-02	34.9 ± 4.7	10.00	
Blank	07-207-B1	BDL	0.10	U
Duplicate	07-207-D1	30.6 ± 4.2	10.00	

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ).
See PAI SOP 743FC for details of TPU determinations.

FLAGS = J - 'Estimated Value' - result between Method Detection Limit and Reporting Limit.
U - 'Not Detected' - result less than Method Detection Limit.

BDL = Below Detection Limit; see method for DL determination.

Remarks:

Sample 99-07-207-D1 is a duplicate of 99-07-207-01.

BP

R-15 648ft 'F

HPLC Explosives

Method SW8330

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907205
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5876R

FIELD ID	CAMO-99-0103
LAB ID	9907205-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 29-Jul-99
Date Analyzed: 06-Aug-99

Prep Batch: EX990729-4
QCBatchID: EX990729-4-1
Run ID: HP990806-41
Cleanup: NONE
Basis: As Received

Sample Aliquot: 350 ML
Final Volume: 1.5 ML
Result Units: UG/L
File Name: 08060008

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
2691-41-0	HMX	2	1	1	U	
121-82-4	RDX	2	0.84	0.84	U	
99-35-4	1,3,5-TRINITROBENZENE	2	0.26	0.26	U	
99-65-0	1,3-DINITROBENZENE	2	0.25	0.25	U	
479-45-8	TETRYL	2	1	1	U	
98-95-3	NITROBENZENE	2	1	1	U	
118-96-7	2,4,6-TRINITROTOLUENE	2	0.25	0.25	U	
1946-51-0	4-AMINO-2,6-DNT	2	0.77	0.25		
35572-78-2	2-AMINO-4,6-DNT	2	0.25	0.25	U	
606-20-2	2,6-DINITROTOLUENE	2	0.25	0.25	U	
121-14-2	2,4-DINITROTOLUENE	2	0.25	0.25	U	
88-72-2	2-NITROTOLUENE	2	1	1	U	
99-99-0	4-NITROTOLUENE	2	1	1	U	
99-08-1	3-NITROTOLUENE	2	1	1	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
100-25-4	1,4-DINITROBENZENE	1.65		2.14	77	34 - 106

Data Package ID: *HP9907205-1*

11

R-15 6464 NF

HPLC Explosives

Method SW8330

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907205
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5876R

Client ID	CAMO-99-0105
Lab ID	9907205-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 29-Jul-99
Date Analyzed: 06-Aug-99

Prep Batch: EX990729-4
QCBatchID: EX990729-4-1
Run ID: HP990806-41
Cleanup: NONE
Basis: As Received

Sample Aliquot: 350 ML
Final Volume: 1.5 ML
Result Units: UG/L
File Name: 08060009

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
2691-41-0	HMX	2	1	1	U	
121-82-4	RDX	2	0.84	0.84	U	
99-35-4	1,3,5-TRINITROBENZENE	2	0.26	0.26	U	
99-65-0	1,3-DINITROBENZENE	2	0.25	0.25	U	
479-45-8	TETRYL	2	1	1	U	
98-95-3	NITROBENZENE	2	1	1	U	
118-96-7	2,4,6-TRINITROTOLUENE	2	0.25	0.25	U	
1946-51-0	4-AMINO-2,6-DNT	2	0.25	0.25	U	
35572-78-2	2-AMINO-4,6-DNT	2	0.25	0.25	U	
606-20-2	2,6-DINITROTOLUENE	2	0.25	0.25	U	
121-14-2	2,4-DINITROTOLUENE	2	0.25	0.25	U	
88-72-2	2-NITROTOLUENE	2	1	1	U	
99-99-0	4-NITROTOLUENE	2	1	1	U	
99-08-1	3-NITROTOLUENE	2	1	1	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
100-25-4	1,4-DINITROBENZENE	1.6		2.14	75	34 - 106

Data Package ID: *HP9907205-1*

R-15 646FL

GC/MS Volatiles

Method SW8260
Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID: CAMO-99-103
Lab ID: 9907211-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 28-Jul-99
Date Analyzed: 28-Jul-99

Prep Batch: VL990728-1
QCBatchID: VL990728-1-1
Run ID: VL990728-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: UG/L
File Name: A7522

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	1	10	10	U	
74-87-3	CHLOROMETHANE	1	10	10	U	
75-01-4	VINYL CHLORIDE	1	10	10	U	
74-83-9	BROMOMETHANE	1	10	10	U	
75-00-3	CHLOROETHANE	1	10	10	U	
75-69-4	TRICHLOROFLUOROMETHANE	1	5	5	U	
75-35-4	1,1-DICHLOROETHENE	1	5	5	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	1	5	5	U	
67-64-1	ACETONE	1	44	20		
74-88-4	IODOMETHANE	1	5	5	U	
75-15-0	CARBON DISULFIDE	1	5	5	U	
75-09-2	METHYLENE CHLORIDE	1	2.6	5	J,B	
156-60-5	TRANS-1,2-DICHLOROETHENE	1	5	5	U	
75-34-3	1,1-DICHLOROETHANE	1	5	5	U	
156-59-2	CIS-1,2-DICHLOROETHENE	1	5	5	U	
78-93-3	2-BUTANONE	1	13	20	J	
74-97-5	BROMOCHLOROMETHANE	1	5	5	U	
67-66-3	CHLOROFORM	1	5	5	U	
71-55-6	1,1,1-TRICHLOROETHANE	1	5	5	U	
594-20-7	2,2-DICHLOROPROPANE	1	5	5	U	
56-23-5	CARBON TETRACHLORIDE	1	5	5	U	
563-58-6	1,1-DICHLOROPROPENE	1	5	5	U	
107-06-2	1,2-DICHLOROETHANE	1	5	5	U	
71-43-2	BENZENE	1	5	5	U	
79-01-6	TRICHLOROETHENE	1	5	5	U	
78-87-5	1,2-DICHLOROPROPANE	1	5	5	U	
74-95-3	DIBROMOMETHANE	1	5	5	U	
75-27-4	BROMODICHLOROMETHANE	1	5	5	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	1	5	5	U	
108-10-1	4-METHYL-2-PENTANONE	1	20	20	U	

PL

Data Package ID: *VL9907211-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID: CAMO-99-103
Lab ID: 9907211-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 28-Jul-99
Date Analyzed: 28-Jul-99

Prep Batch: VL990728-1
QCBatchID: VL990728-1-1
Run ID: VL990728-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: UG/L
File Name: A7522

108-88-3	TOLUENE	1	5	5	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	1	5	5	U	
79-00-5	1,1,2-TRICHLOROETHANE	1	5	5	U	
591-78-6	2-HEXANONE	1	20	20	U	
127-18-4	TETRACHLOROETHENE	1	5	5	U	
142-28-9	1,3-DICHLOROPROPANE	1	5	5	U	
124-48-1	DIBROMOCHLOROMETHANE	1	5	5	U	
106-93-4	1,2-DIBROMOETHANE	1	5	5	U	
108-90-7	CHLOROBENZENE	1	5	5	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	1	5	5	U	
100-41-4	ETHYLBENZENE	1	5	5	U	
136777-61-2	M+P-XYLENE	1	5	5	U	
95-47-6	O-XYLENE	1	5	5	U	
100-42-5	STYRENE	1	5	5	U	
75-25-2	BROMOFORM	1	5	5	U	
98-82-8	ISOPROPYLBENZENE	1	5	5	U	
96-18-4	1,2,3-TRICHLOROPROPANE	1	5	5	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	1	5	5	U	
108-86-1	BROMOBENZENE	1	5	5	U	
103-65-1	N-PROPYLBENZENE	1	5	5	U	
95-49-8	2-CHLOROTOLUENE	1	5	5	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	1	5	5	U	
106-43-4	4-CHLOROTOLUENE	1	5	5	U	
98-06-6	TERT-BUTYLBENZENE	1	5	5	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	1	5	5	U	
135-98-8	SEC-BUTYLBENZENE	1	5	5	U	
541-73-1	1,3-DICHLOROBENZENE	1	5	5	U	
99-87-6	P-ISOPROPYLTOLUENE	1	5	5	U	
106-46-7	1,4-DICHLOROBENZENE	1	5	5	U	
104-51-8	N-BUTYLBENZENE	1	5	5	U	
95-50-1	1,2-DICHLOROBENZENE	1	5	5	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	1	10	10	U	

Data Package ID: *VL9907211-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID: CAMO-99-103
Lab ID: 9907211-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 28-Jul-99
Date Analyzed: 28-Jul-99

Prep Batch: VL990728-1
QCBatchID: VL990728-1-1
Run ID: VL990728-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: UG/L
File Name: A7522

120-82-1	1,2,4-TRICHLOROBENZENE	1	5	5	U	
87-68-3	HEXACHLOROBUTADIENE	1	5	5	U	
91-20-3	NAPHTHALENE	1	5	5	U	
87-61-6	1,2,3-TRICHLOROBENZENE	1	5	5	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	53.2		50	106	86 - 115
1868-53-7	DIBROMOFLUOROMETHANE	48.7		50	97	86 - 118
2037-26-5	TOLUENE-D8	51.2		50	102	88 - 110

Data Package ID: *VL9907211-1*

PL

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID: CAMO-99-105
Lab ID: 9907211-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 28-Jul-99
Date Analyzed: 28-Jul-99

Prep Batch: VL990728-1
QCBatchID: VL990728-1-1
Run ID: VL990728-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: UG/L
File Name: A7523

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	1	10	10	U	
74-87-3	CHLOROMETHANE	1	10	10	U	
75-01-4	VINYL CHLORIDE	1	10	10	U	
74-83-9	BROMOMETHANE	1	10	10	U	
75-00-3	CHLOROETHANE	1	10	10	U	
75-69-4	TRICHLOROFLUOROMETHANE	1	5	5	U	
75-35-4	1,1-DICHLOROETHENE	1	5	5	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	1	5	5	U	
67-64-1	ACETONE	1	40	20		
74-88-4	IODOMETHANE	1	5	5	U	
75-15-0	CARBON DISULFIDE	1	5	5	U	
75-09-2	METHYLENE CHLORIDE	1	2.3	5	J,B	
156-60-5	TRANS-1,2-DICHLOROETHENE	1	5	5	U	
75-34-3	1,1-DICHLOROETHANE	1	5	5	U	
156-59-2	CIS-1,2-DICHLOROETHENE	1	5	5	U	
78-93-3	2-BUTANONE	1	13	20	J	
74-97-5	BROMOCHLOROMETHANE	1	5	5	U	
67-66-3	CHLOROFORM	1	5	5	U	
71-55-6	1,1,1-TRICHLOROETHANE	1	5	5	U	
594-20-7	2,2-DICHLOROPROPANE	1	5	5	U	
56-23-5	CARBON TETRACHLORIDE	1	5	5	U	
563-58-6	1,1-DICHLOROPROPENE	1	5	5	U	
107-06-2	1,2-DICHLOROETHANE	1	5	5	U	
71-43-2	BENZENE	1	5	5	U	
79-01-6	TRICHLOROETHENE	1	5	5	U	
78-87-5	1,2-DICHLOROPROPANE	1	5	5	U	
74-95-3	DIBROMOMETHANE	1	5	5	U	
75-27-4	BROMODICHLOROMETHANE	1	5	5	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	1	5	5	U	
108-10-1	4-METHYL-2-PENTANONE	1	20	20	U	

Data Package ID: *VL9907211-1*

PL

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID: CAMO-99-105	**Sample Matrix:** WATER	**Prep Batch:** VL990728-1	**Sample Aliquot:** 5 ML
Lab ID: 9907211-2	**% Moisture:** N/A	**QCBatchID:** VL990728-1-1	**Final Volume:** 5 ML
	Date Collected: 22-Jul-99	**Run ID:** VL990728-1A	**Result Units:** UG/L
	Date Extracted: 28-Jul-99	**Cleanup:** NONE	
	Date Analyzed: 28-Jul-99	**Basis:** As Received	**File Name:** A7523

108-88-3	TOLUENE	1	5	5	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	1	5	5	U	
79-00-5	1,1,2-TRICHLOROETHANE	1	5	5	U	
591-78-6	2-HEXANONE	1	7.3	20	J	
127-18-4	TETRACHLOROETHENE	1	5	5	U	
142-28-9	1,3-DICHLOROPROPANE	1	5	5	U	
124-48-1	DIBROMOCHLOROMETHANE	1	5	5	U	
106-93-4	1,2-DIBROMOETHANE	1	5	5	U	
108-90-7	CHLOROBENZENE	1	5	5	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	1	5	5	U	
100-41-4	ETHYLBENZENE	1	5	5	U	
136777-61-2	M+P-XYLENE	1	5	5	U	
95-47-6	O-XYLENE	1	5	5	U	
100-42-5	STYRENE	1	5	5	U	
75-25-2	BROMOFORM	1	5	5	U	
98-82-8	ISOPROPYLBENZENE	1	5	5	U	
96-18-4	1,2,3-TRICHLOROPROPANE	1	5	5	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	1	5	5	U	
108-86-1	BROMOBENZENE	1	5	5	U	
103-65-1	N-PROPYLBENZENE	1	5	5	U	
95-49-8	2-CHLOROTOLUENE	1	5	5	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	1	5	5	U	
106-43-4	4-CHLOROTOLUENE	1	5	5	U	
98-06-6	TERT-BUTYLBENZENE	1	5	5	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	1	5	5	U	
135-98-8	SEC-BUTYLBENZENE	1	5	5	U	
541-73-1	1,3-DICHLOROBENZENE	1	5	5	U	
99-87-6	P-ISOPROPYLTOLUENE	1	5	5	U	
106-46-7	1,4-DICHLOROBENZENE	1	5	5	U	
104-51-8	N-BUTYLBENZENE	1	5	5	U	
95-50-1	1,2-DICHLOROBENZENE	1	5	5	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	1	10	10	U	

Data Package ID: *VL9907211-1*

PL

GC/MS Volatiles

Method SW8260
Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID: CAMO-99-105	**Sample Matrix:** WATER	**Prep Batch:** VL990728-1	**Sample Aliquot:** 5 ML
Lab ID: 9907211-2	**% Moisture:** N/A	**QCBatchID:** VL990728-1-1	**Final Volume:** 5 ML
	Date Collected: 22-Jul-99	**Run ID:** VL990728-1A	**Result Units:** UG/L
	Date Extracted: 28-Jul-99	**Cleanup:** NONE	
	Date Analyzed: 28-Jul-99	**Basis:** As Received	**File Name:** A7523

120-82-1	1,2,4-TRICHLOROBENZENE	1	5	5	U	
87-68-3	HEXACHLOROBUTADIENE	1	5	5	U	
91-20-3	NAPHTHALENE	1	5	5	U	
87-61-6	1,2,3-TRICHLOROBENZENE	1	5	5	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	47.6		50	95	86 - 115
1868-53-7	DIBROMOFLUOROMETHANE	49.1		50	98	86 - 118
2037-26-5	TOLUENE-D8	51.8		50	104	88 - 110

Data Package ID: *VL9907211-1*

PL

GC/MS Volatiles

Method SW8260

Tentatively Identified Compounds

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID: CAMO-99-103
Lab ID: 9907211-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 7/22/99
Date Extracted: 28-Jul-99
Date Analyzed: 28-Jul-99

Prep Batch: VL990728-1
QCBatchID: VL990728-1-1
Run ID: VL990728-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML

Retention Time	Target Analyte	Dilution Factor	Result	Units	Qualifier
5.64	OXYGENATED HYDROCARBON1	1	35	UG/L	J
7.68	ALIPHATIC HYDROCARBON1	1	6.4	UG/L	J
8.63	OXYGENATED HYDROCARBON2	1	7.8	UG/L	J
9.64	SILOXANE1	1	13	UG/L	J

Data Package ID: *VL9907211-1*

GC/MS Volatiles

Method SW8260

Tentatively Identified Compounds

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID: CAMO-99-105
Lab ID: 9907211-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 7/22/99
Date Extracted: 28-Jul-99
Date Analyzed: 28-Jul-99

Prep Batch: VL990728-1
QCBatchID: VL990728-1-1
Run ID: VL990728-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML

Retention Time	Target Analyte	Dilution Factor	Result	Units	Qualifier
5.64	OXYGENATED HYDROCARBON1	1	8.5	UG/L	J
7.43	ALIPHATIC HYDROCARBON1	1	7.1	UG/L	J
8.63	OXYGENATED HYDROCARBON2	1	10	UG/L	J
9.63	UNKNOWN HYROCARBON1	1	6.5	UG/L	J

Data Package ID: *VL9907211-1*

R-15-646 ft

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID:	CAMO-99-103
Lab ID:	9907211-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 28-Jul-99
Date Analyzed: 03-Aug-99

Prep Batch: EX990728-9
QCBatchID: EX990728-9-2
Run ID: SV990802-3
Cleanup: NONE
Basis: As Received

Sample Aliquot: 970 ML
Final Volume: 1 ML
Result Units: UG/L
File Name: R4936

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
110-86-1	PYRIDINE	1	10	10	U	
62-75-9	N-NITROSODIMETHYLAMINE	1	10	10	U	
62-53-3	ANILINE	1	21	21	U	
108-95-2	PHENOL	1	10	10	U	
111-44-4	BIS(2-CHLOROETHYL)ETHER	1	10	10	U	
95-57-8	2-CHLOROPHENOL	1	10	10	U	
541-73-1	1,3-DICHLOROBENZENE	1	10	10	U	
106-46-7	1,4-DICHLOROBENZENE	1	10	10	U	
95-50-1	1,2-DICHLOROBENZENE	1	10	10	U	
100-51-6	BENZYL ALCOHOL	1	21	21	U	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	1	10	10	U	
95-48-7	2-METHYLPHENOL	1	10	10	U	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	1	10	10	U	
106-44-5	4-METHYLPHENOL	1	10	10	U	
67-72-1	HEXACHLOROETHANE	1	10	10	U	
98-95-3	NITROBENZENE	1	10	10	U	
78-59-1	ISOPHORONE	1	10	10	U	
88-75-5	2-NITROPHENOL	1	10	10	U	
105-67-9	2,4-DIMETHYLPHENOL	1	10	10	U	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	1	10	10	U	
120-83-2	2,4-DICHLOROPHENOL	1	10	10	U	
65-85-0	BENZOIC ACID	1	52	52	U	
120-82-1	1,2,4-TRICHLOROBENZENE	1	10	10	U	
91-20-3	NAPHTHALENE	1	10	10	U	
106-47-8	4-CHLOROANILINE	1	21	21	U	
87-68-3	HEXACHLOROBUTADIENE	1	10	10	U	
59-50-7	4-CHLORO-3-METHYLPHENOL	1	21	21	U	
91-57-6	2-METHYLNAPHTHALENE	1	10	10	U	
77-47-4	HEXACHLOROCYCLOPENTADIENE	1	10	10	U	
88-06-2	2,4,6-TRICHLOROPHENOL	1	10	10	U	

Data Package ID: *SV9907211-1*

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GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID:	CAMO-99-103
Lab ID:	9907211-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 28-Jul-99
Date Analyzed: 03-Aug-99

Prep Batch: EX990728-9
QCBatchID: EX990728-9-2
Run ID: SV990802-3
Cleanup: NONE
Basis: As Received

Sample Aliquot: 970 ML
Final Volume: 1 ML
Result Units: UG/L
File Name: R4936

95-95-4	2,4,5-TRICHLOROPHENOL	1	52	52	U	
91-58-7	2-CHLORONAPHTHALENE	1	10	10	U	
88-74-4	2-NITROANILINE	1	52	52	U	
131-11-3	DIMETHYL PHTHALATE	1	10	10	U	
606-20-2	2,6-DINITROTOLUENE	1	10	10	U	
208-96-8	ACENAPHTHYLENE	1	10	10	U	
99-09-2	3-NITROANILINE	1	52	52	U	
83-32-9	ACENAPHTHENE	1	10	10	U	
51-28-5	2,4-DINITROPHENOL	1	52	52	U	
100-02-7	4-NITROPHENOL	1	52	52	U	
132-64-9	DIBENZOFURAN	1	10	10	U	
121-14-2	2,4-DINITROTOLUENE	1	10	10	U	
84-66-2	DIETHYL PHTHALATE	1	10	10	U	
86-73-7	FLUORENE	1	10	10	U	
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	1	10	10	U	
100-01-6	4-NITROANILINE	1	21	21	U	
103-33-3	AZOBENZENE	1	21	21	U	
534-52-1	4,6-DINITRO-2-METHYLPHENOL	1	52	52	U	
86-30-6	N-NITROSODIPHENYLAMINE	1	10	10	U	
101-55-3	4-BROMOPHENYL PHENYL ETHER	1	10	10	U	
118-74-1	HEXACHLOROBENZENE	1	10	10	U	
87-86-5	PENTACHLOROPHENOL	1	52	52	U	
85-01-8	PHENANTHRENE	1	10	10	U	
120-12-7	ANTHRACENE	1	10	10	U	
86-74-8	CARBAZOLE	1	10	10	U	
84-74-2	DI-N-BUTYL PHTHALATE	1	10	10	U	
206-44-0	FLUORANTHENE	1	10	10	U	
92-87-5	BENZIDINE	1	10	10	U	
129-00-0	PYRENE	1	10	10	U	
85-68-7	BUTYL BENZYL PHTHALATE	1	10	10	U	
56-55-3	BENZO(A)ANTHRACENE	1	10	10	U	
91-94-1	3,3'-DICHLOROBENZIDINE	1	21	21	U	

Data Package ID: *SV9907211-1*

PL

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID:	CAMO-99-103
Lab ID:	9907211-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 28-Jul-99
Date Analyzed: 03-Aug-99

Prep Batch: EX990728-9
QCBatchID: EX990728-9-2
Run ID: SV990802-3
Cleanup: NONE
Basis: As Received

Sample Aliquot: 970 ML
Final Volume: 1 ML
Result Units: UG/L
File Name: R4936

218-01-9	CHRYSENE	1	10	10	U	
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1	14	10	B	
117-84-0	DI-N-OCTYL PHTHALATE	1	10	10	U	
205-99-2	BENZO(B)FLUORANTHENE	1	10	10	U	
207-08-9	BENZO(K)FLUORANTHENE	1	10	10	U	
50-32-8	BENZO(A)PYRENE	1	10	10	U	
193-39-5	INDENO(1,2,3-CD)PYRENE	1	10	10	U	
53-70-3	DIBENZO(A,H)ANTHRACENE	1	10	10	U	
191-24-2	BENZO(G,H,I)PERYLENE	1	10	10	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	68.5		77.3	89	0 - 123
321-60-8	2-FLUOROBIPHENYL	31.4		51.5	61	43 - 116
367-12-4	2-FLUOROPHENOL	60.9		77.3	79	21 - 100
4165-60-0	NITROBENZENE-D5	40.7		51.5	79	35 - 114
4165-62-2	PHENOL-D5	63.1		77.3	82	10 - 94
1718-51-0	TERPHENYL-D14	11	*	51.5	21	33 - 141

PL

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Fld.ID:	CAMO-99-105
Lab ID:	9907211-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 28-Jul-99
Date Analyzed: 03-Aug-99

Prep Batch: EX990728-9
QCBatchID: EX990728-9-2
Run ID: SV990802-3
Cleanup: NONE
Basis: As Received

Sample Aliquot: 970 ML
Final Volume: 1 ML
Result Units: UG/L
File Name: R4937

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
110-86-1	PYRIDINE	1	10	10	U	
62-75-9	N-NITROSODIMETHYLAMINE	1	10	10	U	
62-53-3	ANILINE	1	21	21	U	
108-95-2	PHENOL	1	10	10	U	
111-44-4	BIS(2-CHLOROETHYL)ETHER	1	10	10	U	
95-57-8	2-CHLOROPHENOL	1	10	10	U	
541-73-1	1,3-DICHLOROBENZENE	1	10	10	U	
106-46-7	1,4-DICHLOROBENZENE	1	10	10	U	
95-50-1	1,2-DICHLOROBENZENE	1	10	10	U	
100-51-6	BENZYL ALCOHOL	1	21	21	U	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	1	10	10	U	
95-48-7	2-METHYLPHENOL	1	10	10	U	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	1	10	10	U	
106-44-5	4-METHYLPHENOL	1	10	10	U	
67-72-1	HEXACHLOROETHANE	1	10	10	U	
98-95-3	NITROBENZENE	1	10	10	U	
78-59-1	ISOPHORONE	1	10	10	U	
88-75-5	2-NITROPHENOL	1	10	10	U	
105-67-9	2,4-DIMETHYLPHENOL	1	10	10	U	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	1	10	10	U	
120-83-2	2,4-DICHLOROPHENOL	1	10	10	U	
65-85-0	BENZOIC ACID	1	52	52	U	
120-82-1	1,2,4-TRICHLOROBENZENE	1	10	10	U	
91-20-3	NAPHTHALENE	1	10	10	U	
106-47-8	4-CHLOROANILINE	1	21	21	U	
87-68-3	HEXACHLOROBUTADIENE	1	10	10	U	
59-50-7	4-CHLORO-3-METHYLPHENOL	1	21	21	U	
91-57-6	2-METHYLNAPHTHALENE	1	10	10	U	
77-47-4	HEXACHLOROCYCLOPENTADIENE	1	10	10	U	
88-06-2	2,4,6-TRICHLOROPHENOL	1	10	10	U	

Data Package ID: *SV9907211-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID: CAMO-99-105	**Sample Matrix:** WATER	**Prep Batch:** EX990728-9	**Sample Aliquot:** 970 ML
Lab ID: 9907211-2	**% Moisture:** N/A	**QCBatchID:** EX990728-9-2	**Final Volume:** 1 ML
	Date Collected: 22-Jul-99	**Run ID:** SV990802-3	**Result Units:** UG/L
	Date Extracted: 28-Jul-99	**Cleanup:** NONE	
	Date Analyzed: 03-Aug-99	**Basis:** As Received	**File Name:** R4937

95-95-4	2,4,5-TRICHLOROPHENOL	1	52	52	U	
91-58-7	2-CHLORONAPHTHALENE	1	10	10	U	
88-74-4	2-NITROANILINE	1	52	52	U	
131-11-3	DIMETHYL PHTHALATE	1	10	10	U	
606-20-2	2,6-DINITROTOLUENE	1	10	10	U	
208-96-8	ACENAPHTHYLENE	1	10	10	U	
99-09-2	3-NITROANILINE	1	52	52	U	
83-32-9	ACENAPHTHENE	1	10	10	U	
51-28-5	2,4-DINITROPHENOL	1	52	52	U	
100-02-7	4-NITROPHENOL	1	52	52	U	
132-64-9	DIBENZOFURAN	1	10	10	U	
121-14-2	2,4-DINITROTOLUENE	1	10	10	U	
84-66-2	DIETHYL PHTHALATE	1	10	10	U	
86-73-7	FLUORENE	1	10	10	U	
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	1	10	10	U	
100-01-6	4-NITROANILINE	1	21	21	U	
103-33-3	AZOBENZENE	1	21	21	U	
534-52-1	4,6-DINITRO-2-METHYLPHENOL	1	52	52	U	
86-30-6	N-NITROSODIPHENYLAMINE	1	10	10	U	
101-55-3	4-BROMOPHENYL PHENYL ETHER	1	10	10	U	
118-74-1	HEXACHLOROBENZENE	1	10	10	U	
87-86-5	PENTACHLOROPHENOL	1	52	52	U	
85-01-8	PHENANTHRENE	1	10	10	U	
120-12-7	ANTHRACENE	1	10	10	U	
86-74-8	CARBAZOLE	1	10	10	U	
84-74-2	DI-N-BUTYL PHTHALATE	1	1.3	10	J	
206-44-0	FLUORANTHENE	1	10	10	U	
92-87-5	BENZIDINE	1	10	10	U	
129-00-0	PYRENE	1	10	10	U	
85-68-7	BUTYL BENZYL PHTHALATE	1	10	10	U	
56-55-3	BENZO(A)ANTHRACENE	1	10	10	U	
91-94-1	3,3'-DICHLOROBENZIDINE	1	21	21	U	

Data Package ID: *SV9907211-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID:	CAMO-99-105
Lab ID:	9907211-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 28-Jul-99
Date Analyzed: 03-Aug-99

Prep Batch: EX990728-9
QCBatchID: EX990728-9-2
Run ID: SV990802-3
Cleanup: NONE
Basis: As Received

Sample Aliquot: 970 ML
Final Volume: 1 ML
Result Units: UG/L
File Name: R4937

218-01-9	CHRYSENE	1	10	10	U	
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1	20	10	B	
117-84-0	DI-N-OCTYL PHTHALATE	1	10	10	U	
205-99-2	BENZO(B)FLUORANTHENE	1	10	10	U	
207-08-9	BENZO(K)FLUORANTHENE	1	10	10	U	
50-32-8	BENZO(A)PYRENE	1	10	10	U	
193-39-5	INDENO(1,2,3-CD)PYRENE	1	10	10	U	
53-70-3	DIBENZO(A,H)ANTHRACENE	1	10	10	U	
191-24-2	BENZO(G,H,I)PERYLENE	1	10	10	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	66		77.3	85	0 - 123
321-60-8	2-FLUOROBIPHENYL	32.8		51.5	64	43 - 116
367-12-4	2-FLUOROPHENOL	57.9		77.3	75	21 - 100
4165-60-0	NITROBENZENE-D5	41.1		51.5	80	35 - 114
4165-62-2	PHENOL-D5	61		77.3	79	10 - 94
1718-51-0	TERPHENYL-D14	17.5		51.5	34	33 - 141

Data Package ID: *SV9907211-1*

PL

GC/MS Semi-volatiles

Method SW8270

Tentatively Identified Compounds

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID	CAMO-99-103
Lab ID	9907211-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 7/22/99
Date Extracted: 28-Jul-99
Date Analyzed: 03-Aug-99

Prep Batch: EX990728-9
QCBatchID: EX990728-9-2
Run ID: SV990802-3
Cleanup: NONE
Basis: As Received

Sample Aliquot: 970 ML
Final Volume: 1 ML

Retention Time	Target Analyte	Dilution Factor	Result	Units	Qualifier
8.62	2-ETHYL-1-HEXANOL	1	9.7	UG/L	J
9.12	OXYGENATED HYDROCARBON1	1	14	UG/L	J
9.41	OXYGENATED HYDROCARBON2	1	12	UG/L	J
11.28	1,2-OCTANEDIOL	1	17	UG/L	J
11.49	2-(1,1-DIMETHYLETHYL)-PHENOL1	1	47	UG/L	J
11.61	OXYGENATED HYDROCARBON3	1	9.4	UG/L	J
11.64	OXYGENATED HYDROCARBON4	1	13	UG/L	J
11.67	SATURATED HYDROCARBON1	1	17	UG/L	J
11.73	OXYGENATED HYDROCARBON5	1	9.8	UG/L	J
11.76	OXYGENATED HYDROCARBON6	1	12	UG/L	J
11.92	PROPYL ESTER BUTANOIC ACID	1	20	UG/L	J
12.17	UNKNOWN1	1	20	UG/L	J
12.54	PROPANOIC ACID, 2-METHYL BUTYL ES	1	11	UG/L	J
12.98	OXYGENATED HYDROCARBON7	1	22	UG/L	J
13.10	OXYGENATED HYDROCARBON8	1	9.8	UG/L	J
13.31	OXYGENATED HYDROCARBON9	1	14	UG/L	J
14.21	TETRADECANOIC ACID	1	20	UG/L	J
15.80	OLEIC ACID	1	42	UG/L	J
15.90	OCTADECANOIC ACID	1	200	UG/L	J
22.16	UNKNOWN2	1	9.8	UG/L	J

Data Package ID: *SV9907211-1*

PL

GC/MS Semi-volatiles

Method SW8270

Tentatively Identified Compounds

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907211
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5874R

Field ID:	CAMO-99-105
Lab ID:	9907211-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 7/22/99
Date Extracted: 28-Jul-99
Date Analyzed: 03-Aug-99

Prep Batch: EX990728-9
QCBatchID: EX990728-9-2
Run ID: SV990802-3
Cleanup: NONE
Basis: As Received

Sample Aliquot: 970 ML
Final Volume: 1 ML

Retention Time	Target Analyte	Dilution Factor	Result	Units	Qualifier
5.22	OXYGENATED HYDROCARBON1	1	10	UG/L	J
9.12	OXYGENATED HYDROCARBON2	1	11	UG/L	J
9.40	OXYGENATED HYDROCARBON3	1	10	UG/L	J
10.60	UNKNOWN1	1	8.8	UG/L	J
11.27	1,2-OCTANEDIOL	1	7.4	UG/L	J
11.42	OXYGENATED HYDROCARBON4	1	9.3	UG/L	J
11.50	2-(1,1-DIMETHYLETHYL)-PHENOL1	1	42	UG/L	J
11.61	OXYGENATED HYDROCARBON5	1	9.2	UG/L	J
11.64	OXYGENATED HYDROCARBON6	1	18	UG/L	J
11.68	SATURATED HYDROCARBON1	1	17	UG/L	J
11.73	OXYGENATED HYDROCARBON7	1	8.9	UG/L	J
11.75	OXYGENATED HYDROCARBON8	1	8.5	UG/L	J
11.91	OXYGENATED HYDROCARBON9	1	14	UG/L	J
12.54	PROPANOIC ACID, 2-METHYL BUTYL ES	1	8.8	UG/L	J
12.96	OXYGENATED HYDROCARBON10	1	9.7	UG/L	J
13.31	OXYGENATED HYDROCARBON11	1	9.8	UG/L	J
13.40	OXYGENATED HYDROCARBON12	1	8.4	UG/L	J
14.21	TETRADECANOIC ACID	1	21	UG/L	J
15.80	OLEIC ACID	1	43	UG/L	J
15.93	OCTADECANOIC ACID	1	460	UG/L	J

PL

Data Package ID: *SV9907211-1*

R-15 646 ft

Sample Results Summary

NON-FILTERED

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 5880R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9907206

Reported on: Tuesday, August 24, 1999 12:24:47

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9907206-1	CAMO-99-0103	U-ISO	U-234	NF 11.85 +/- 0.74	0.074	pCi/l	Water	AS02724	8/12/99	
9907206-1	CAMO-99-0103	U-ISO	U-235	NF 0.577 +/- 0.065	0.034	pCi/l	Water	AS02724	8/12/99	
9907206-1	CAMO-99-0103	U-ISO	U-238	NF 8.60 +/- 0.54	0.054	pCi/l	Water	AS02724	8/12/99	
9907206-2	CAMO-99-0105	U-ISO	U-234	NF 20.0 +/- 1.6	0.71	pCi/l	Water	AS02737	8/18/99	
9907206-2	CAMO-99-0105	U-ISO	U-235	NF 0.97 +/- 0.25	0.47	pCi/l	Water	AS02737	8/18/99	
9907206-2	CAMO-99-0105	U-ISO	U-238	NF 16.6 +/- 1.4	0.63	pCi/l	Water	AS02737	8/18/99	

Comments:

0001130

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

R-15 6464

ALPHA/BETA ANALYSIS RESULTS SUMMARY

Method 900.0/9310 (Modified)

Lab Name: Paragon Analytics, Inc.

Date Collected: 07/22/99

Client Name: Los Alamos National Lab

Date Analyzed : 08/19/99

Client Project ID: 5880R

Sample Matrix : Water

Lab Sample ID Series: 99-07-206

Count Duration: 1000 Min.

Analyzed By : CJM

Non Filtered

Client Sample ID	Lab Sample ID	Gross Alpha (pCi/liter)	Gross Beta (pCi/liter)
CAMO-99-0103	07-206-01	183 ± 26	140 ± 18
CAMO-99-0105	07-206-02	125 ± 18	98 ± 14
CAMO-99-0105	07-206-D1	110 ± 16	93 ± 14

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See PAI SOP 743R1 for TPU determinations.

Reported Activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

These samples were prepared using PAI SOP 702R12 and analyzed using PAI SOP 724R5.

Remarks:

Sample 99-07-206-D1 is a duplicate of sample 99-07-206-02.

P2

R-15 646 ft NF

Gross Gamma Results Summary

Lab Name: Paragon Analytics, Inc. Date Analyzed: 8/4/99

Client Name: Los Alamos National Laboratory SMO Sample Matrix: Water

Lab Sample Series: 99-07-206 Units: pCi/L

Non Filtered

Client Sample ID	Lab Sample ID	Collection Date	Activity	Uncertainty	MDC
CAMO-99-0103	99-07-206-01	7/22/99	260	20	18
CAMO-99-0103	99-07-206-D1	7/22/99	299	22	19
CAMO-99-0105	99-07-206-02	7/22/99	279	21	19

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate.

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2 sigma).
See PAI SOP 743FC for details of the TPU determination.

99-07-206-D1 is a duplicate of sample 99-07-206-01.

Prepared by gH 8/10/99

P1

R-15 NF 64 ft

Sr-90 ANALYSIS RESULTS SUMMARY

Method ASTM D5811-95

Lab Name: Paragon Analytics, Inc.

Date Collected: 07/22/99

Client Name: Los Alamos National Lab

Date Analyzed : 08/23/99

Client Project ID: 5880R

Sample Matrix : Water

Lab Sample ID Series: 99-07-206

Count Duration: 60 Min.

Analyzed by: CJM

Client Sample ID	Lab Sample ID	Sr-90 (pCi/l)
CAMO-99-0103	99-07-206-01	0.3 ± 1.1
CAMO-99-0105	99-07-206-02	0.31 ± 0.66
CAMO-99-0105	99-07-206-D1	-0.17 ± 0.63

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ. See PAI SOP 743R1 for details of TPU determinations.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

These samples were prepared using PAI SOP707R3 and analyzed using PAI SOP724R5.

Remarks:

Sample 99-07-206-D1 is a duplicate of 99-07-206-02.

PL

15 646ft

Sample Results Summary NON FILTERED

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 5880R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9907206

Reported on: Tuesday, August 24, 1999 10:34:00

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9907206-1	CAMO-99-0103	PU-ISO	Pu-238	0.021 +/- 0.015	0.062	pCi/l	Water	AS02724	8/12/99	U
9907206-1	CAMO-99-0103	PU-ISO	Pu-239	-0.0071 +/- 0.0096	0.049	pCi/l	Water	AS02724	8/12/99	U
9907206-2	CAMO-99-0105	PU-ISO	Pu-238	0.057 +/- 0.019	0.041	pCi/l	Water	AS02724	8/12/99	LT
9907206-2	CAMO-99-0105	PU-ISO	Pu-239	0.0090 +/- 0.0091	0.035	pCi/l	Water	AS02724	8/12/99	U

Comments: 14

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

1-15 646 fb

Sample Results Summary

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 5880R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9907206

Reported on: Tuesday, August 24, 1999 10:34:00

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9907206-1	CAMO-99-0103	AM-241	Am-241	0.123 +/- 0.026	0.041	pCi/l	Water	AS02724	8/16/99	
9907206-2	CAMO-99-0105	AM-241	Am-241	0.207 +/- 0.039	0.058	pCi/l	Water	AS02724	8/16/99	

Non Filtered

Comments:

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

R-1 646ft

Sample Results Summary

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 5880R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9907206

Reported on: Wednesday, August 11, 1999 09:54:14

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9907206-1	CAMO-99-0103	TRITIUM	H-3	4020 +/- 280	260	pCi/l	Water	LS00054	8/5/99	
9907206-2	CAMO-99-0105	TRITIUM	H-3	4320 +/- 300	260	pCi/l	Water	LS00054	8/5/99	

NON-FILTERED

Comments:

000003

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

R-15 NF 64 ft

NEPTUNIUM-237 ANALYSIS RESULTS SUMMARY

Lab Name: Paragon Analytics, Inc.

Date Collected: 07/22/99

Client Name: Los Alamos National Lab

Date Analyzed : 08/19/99

Client Project ID: 5880R

Sample Matrix : Water

Lab Sample ID Series: 99-07-206

Count Duration: 1000 Min.

Analyzed by: RG

Client Sample ID	Lab Sample ID	(pCi/l)	MDA
CAMO-99-0103	07-206-01	0.03 ± 0.05	0.09
CAMO-99-0105	07-206-02	-0.01 ± 0.04	0.08
Duplicate-01	07-206-D1	0.06 ± 0.06	0.09

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ)
See PAI SOP 743FC for details of TPU determinations.

These samples were prepared using PAI SOP707FC and analyzed using PAI SOP724FC.

Remarks:

Sample 99-07-206-D1 is a duplicate of 99-07-206-01.

P1

R-15 646 ft JF

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5880R
Client Sample ID: CAMO-99-0103

Lab Sample ID: 99-07-206-01 Date Collected: 07/22/99 12:00
Sample Matrix: WATER Date Analyzed: 08/04/99 16:58
Count Duration: 800 Min. Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	6.8 ± 8.7	129.0	U
Na-22	2.1 ± 2.4	113.4	U
K-40	-101 ± 85	N/A	U
Mn-54	-0.9 ± 2.0	N/A	U
Co-57	0.4 ± 1.3	279.0	U
Co-60	0.7 ± 2.1	305.2	U
Zn-65	5.2 ± 4.8	91.9	TI
Se-75	1.6 ± 2.4	152.1	U
Sr-85	-7.5 ± 3.1	N/A	U
Y-88	1.2 ± 2.7	232.7	U
Ru-106	-10 ± 20	N/A	U
Cd-109	24 ± 40	169.9	U
Sn-113	-0.8 ± 2.5	N/A	U
Cs-134	0.1 ± 2.2	1522.0	U
Cs-137	-0.4 ± 2.2	N/A	U
Ce-139	-1.3 ± 1.4	N/A	U
Ba-140	3 ± 13	385.6	U
La-140	-380 ± 800	N/A	U
Ce-144	1.6 ± 9.6	619.3	U
Eu-152	3.0 ± 5.5	180.9	U
Hg-203	0.8 ± 2.1	280.3	U
Tl-208	2.1 ± 7.4	355.3	U
Bi-211	-43 ± 34	N/A	U
Pb-211	53 ± 53	99.0	TI
Bi-212	0 ± 100	N/A	U
Pb-212	8 ± 11	140.2	U
Bi-214	8 ± 15	181.1	U
Pb-214	1 ± 12	1237.5	U
Rn-219	-6 ± 22	N/A	U
Ra-223	-45 ± 39	N/A	U
Ra-224	-128 ± 40	N/A	U
Ra-226	-40 ± 110	N/A	U

Data stored in file 10006643.SPC

Continued on next page...

PL

R-15 646 ft F

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5880R
Client Sample ID: CAMO-99-0103

Lab Sample ID: 99-07-206-01
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 07/22/99 12:00
Date Analyzed: 08/04/99 16:58
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	-1 ± 10	N/A	U
Ac-228	13 ± 21	165.5	U
Pa-231	20 ± 63	311.4	U
Pa-233	-2.8 ± 3.7	N/A	U
Pa-234m	-600 ± 1200	N/A	U
Th-234	-270 ± 160	N/A	U
U-235	-2.6 ± 6.5	N/A	U
Np-237	-10 ± 12	N/A	U
Am-241	6 ± 11	172.6	U

Data stored in file 10006643.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.

PL

R-15 6464 NF

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5880R
Client Sample ID: CAMO-99-0105

Lab Sample ID: 99-07-206-02 Date Collected: 07/22/99 12:00
Sample Matrix: WATER Date Analyzed: 08/04/99 16:59
Count Duration: 800 Min. Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	-26.7 ± 9.7	N/A	U
Na-22	-1.9 ± 2.5	N/A	U
K-40	-30 ± 81	N/A	U
Mn-54	-1.2 ± 2.2	N/A	U
Co-57	0.5 ± 1.1	235.9	U
Co-60	-0.8 ± 2.3	N/A	U
Zn-65	-1.8 ± 5.2	N/A	U
Se-75	-0.6 ± 2.2	N/A	U
Sr-85	-7.1 ± 3.3	N/A	U
Y-88	3.2 ± 2.6	82.5	TI
Ru-106	-4 ± 19	N/A	U
Cd-109	8 ± 37	474.7	U
Sn-113	-1.9 ± 2.2	N/A	U
Cs-134	-0.1 ± 2.1	N/A	U
Cs-137	1.3 ± 2.1	161.9	U
Ce-139	-0.3 ± 1.4	N/A	U
Ba-140	11 ± 14	132.7	U
La-140	-150 ± 760	N/A	U
Ce-144	8.1 ± 8.7	108.1	U
Eu-152	-0.6 ± 5.0	N/A	U
Hg-203	1.7 ± 2.1	120.4	U
Tl-208	5.9 ± 7.1	121.1	U
Bi-211	-46 ± 16	N/A	U
Pb-211	-8 ± 45	N/A	U
Bi-212	-48 ± 96	N/A	U
Pb-212	16.2 ± 9.1	56.0	
Bi-214	8 ± 14	170.2	U
Pb-214	-1 ± 13	N/A	U
Rn-219	-18 ± 20	N/A	U
Ra-223	-41 ± 35	N/A	U
Ra-224	-145 ± 43	N/A	U
Ra-226	166 ± 67	40.1	SI

Data stored in file 10006644.SPC

Continued on next page...

P1

R-15 648ft NF

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5880R
Client Sample ID: CAMO-99-0105

Lab Sample ID: 99-07-206-02
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 07/22/99 12:00
Date Analyzed: 08/04/99 16:59
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	-6 ± 11	N/A	U
Ac-228	0 ± 23	8876.1	U
Pa-231	29 ± 60	206.0	U
Pa-233	2.3 ± 3.3	143.2	U
Pa-234m	80 ± 360	454.9	U
Th-234	-100 ± 160	N/A	U
U-235	9.5 ± 2.9	30.4	TI
Np-237	-11 ± 11	N/A	U
Am-241	-3.7 ± 9.5	N/A	U

Data stored in file 10006644.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.
SI = Identification is tentative due to spectral interference. See narrative for further discussion.

P1

R-15 646 fl N

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5880R
Client Sample ID: Duplicate

Lab Sample ID: 99-07-206-D1
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 07/22/99 12:00
Date Analyzed: 08/05/99 16:18
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	-25.5 ± 9.7	N/A	U
Na-22	-1.9 ± 2.2	N/A	U
K-40	39 ± 85	215.9	U
Mn-54	1.1 ± 2.3	209.8	U
Co-57	-0.4 ± 1.1	N/A	U
Co-60	0.7 ± 2.4	370.6	U
Zn-65	2.3 ± 4.9	215.5	U
Se-75	1.7 ± 2.3	133.2	U
Sr-85	-8.7 ± 3.5	N/A	U
Y-88	2.4 ± 2.6	111.0	U
Ru-106	-13 ± 19	N/A	U
Cd-109	-19 ± 36	N/A	U
Sn-113	3.2 ± 2.4	77.0	TI
Cs-134	-2.2 ± 2.1	N/A	U
Cs-137	0.0 ± 2.1	4698.3	U
Ce-139	-1.4 ± 1.4	N/A	U
Ba-140	5 ± 14	317.6	U
La-140	-500 ± 1100	N/A	U
Ce-144	-7.7 ± 8.5	N/A	U
Eu-152	1.2 ± 5.0	429.1	U
Hg-203	2.9 ± 2.1	72.7	SI
Tl-208	3.4 ± 6.9	201.6	U
Bi-211	-33 ± 15	N/A	U
Pb-211	-25 ± 46	N/A	U
Bi-212	3 ± 95	3355.6	U
Pb-212	11.5 ± 8.9	76.8	
Bi-214	10 ± 14	137.5	U
Pb-214	-5 ± 13	N/A	U
Rn-219	-22 ± 21	N/A	U
Ra-223	-23 ± 33	N/A	U
Ra-224	-143 ± 43	N/A	U
Ra-226	145 ± 65	45.1	SI

Data stored in file 10006668.SPC

Continued on next page...

PL

R-15 NF 6 ft

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5880R
Client Sample ID: Duplicate

Lab Sample ID: 99-07-206-D1
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 07/22/99 12:00
Date Analyzed: 08/05/99 16:18
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	-1 ± 10	N/A	U
Ac-228	9 ± 23	268.2	U
Pa-231	28 ± 57	205.8	U
Pa-233	1.6 ± 3.4	211.2	U
Pa-234m	130 ± 370	276.2	U
Th-234	-100 ± 160	N/A	U
U-235	8.3 ± 2.7	33.1	TI
Np-237	-3 ± 11	N/A	U
Am-241	-3.5 ± 9.9	N/A	U

Data stored in file 10006668.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.
SI = Identification is tentative due to spectral interference. See narrative for further discussion.

Remarks: Sample 99-07-206-D1 is a duplicate of 99-07-206-01.

P1

Aug 1999

ATTACHMENT II

MONITORING WELL R-15

646 FEET

FILTERED SAMPLE RESULTS:
CAMO-99-0102
CAMO-99-0104

R-15 16ft F

AMMONIA

Method EPA350.3

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 5892R
Work Order Number: 9907231
Reporting Basis: As Received

Final Volume: 10 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0102	9907231-1	7/22/99	8/11/99	8/11/99	N/A	1	0.54	0.54	U	10 ML
CAMO-99-0104	9907231-2	7/22/99	8/11/99	8/11/99	N/A	1	0.53	0.53	U	10 ML

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

PL

Data Package ID: *NH9907231-1*

R-15 64 F

BICARBONATE AS CACO3

Method EPA310.1M

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 5892R
Work Order Number: 9907231
Reporting Basis: As Received

Final Volume: 50 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0102	9907231-1	7/22/99	8/12/99	8/12/99	N/A	1	120	10		50 ML
CAMO-99-0104	9907231-2	7/22/99	8/12/99	8/12/99	N/A	1	120	10		50 ML

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

PL

Data Package ID: *AK9907231-1*

R-1: 646 Pt F

NITRATE/NITRITE

Method EPA353.3

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 5892R
Work Order Number: 9907231
Reporting Basis: As Received

Final Volume: 3 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0102	9907231-1	7/22/99	8/10/99	8/10/99	N/A	1	0.93	0.05		3 ML
CAMO-99-0104	9907231-2	7/22/99	8/10/99	8/10/99	N/A	1	0.05	0.05	U	3 ML

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

PL

Data Package ID: *NN9907231-1*

R-15 646 Ft F

TOTAL DISSOLVED SOLIDS

Method EPA160.1

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 5892R
Work Order Number: 9907231
Reporting Basis: As Received

Final Volume: 100 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0102	9907231-1	7/22/99	8/10/99	8/11/99	N/A	1	260	20		100 ML

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

PL

Data Package ID: *TD9907231-1*

R-15 0.6 Ft F

TOTAL PHOSPHORUS

Method EPA365.2

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 5892R
Work Order Number: 9907231
Reporting Basis: As Received

Final Volume: 50 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0102	9907231-1	7/22/99	8/12/99	8/13/99	N/A	1	0.05	0.05	N	50 ML
CAMO-99-0104	9907231-2	7/22/99	8/12/99	8/13/99	N/A	1	0.05	0.05	N	50 ML

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

PL

Data Package ID: *PO9907231-1*

R-15 646 F

Ion Chromatography

Method EPA300.0

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907231
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5892R

Field ID: CAMO-99-0102
Lab ID: 9907231-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 19-Aug-99
Date Analyzed: 19-Aug-99

Prep Batch: IC990819-1
QCBatchID: IC990819-1-1
Run ID: IC990819-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: MG/L
File Name: 99081916

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
24959-67-9	BROMIDE	1	0.2	0.2	U	
16887-00-6	CHLORIDE	5	13	1		
16984-48-8	FLUORIDE	1	1.5	0.1		
14808-79-8	SULFATE	1	45	1		

P1

Data Package ID: *IC9907231-1*

R-15641 # F

Ion Chromatography

Method EPA300.0

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9907231
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 5892R

Field ID: CAMO-99-0104
Lab ID: 9907231-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 22-Jul-99
Date Extracted: 19-Aug-99
Date Analyzed: 19-Aug-99

Prep Batch: IC990819-1
QCBatchID: IC990819-1-1
Run ID: IC990819-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: MG/L
File Name: 99081917

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
24959-67-9	BROMIDE	1	0.2	0.2	U	
16887-00-6	CHLORIDE	5	13	1		
16984-48-8	FLUORIDE	1	1.3	0.1		
14808-79-8	SULFATE	1	45	1		

PL

Data Package ID: *IC9907231-1*

R-15 646ft zone
Filtered

TOTAL URANIUM ANALYSIS RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Paragon Analytics, Inc. Date Collected: 07/22/99

Client Name: Los Alamos National Lab. Date Analyzed : 08/16/99

Client Project ID: 5892R

Lab Sample ID Series: 99-07-231 Sample Matrix : Water

Client Sample ID	Lab Sample ID	Total Uranium (ug/L)	Reporting Limit	Flag
CAMO-99-0102	07-231-01	1.10 ± 0.15	0.10	
CAMO-99-0104	07-231-02	1.29 ± 0.17	0.10	
Blank	07-231-B1	BDL	0.10	U
Duplicate	07-231-D1	1.15 ± 0.16	0.10	

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ).
See PAI SOP 743FC for details of TPU determinations.

FLAGS = J - 'Estimated Value' - result between Method Detection Limit and Reporting Limit.
U - 'Not Detected' - result less than Method Detection Limit.

BDL = Below Detection Limit; see method for DL determination.

Remarks:

Sample 99-07-231-D1 is a duplicate of 99-07-231-01.

PL
BP

R-15 646 ft Filtered

Sample Results Summary

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 5895R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9907232

Reported on: Tuesday, August 24, 1999 10:35:46

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9907232-1	CAMO-99-0102	U-ISO	U-234	0.488 +/- 0.056	0.041	pCi/l	Water	AS02724	8/12/99	
9907232-1	CAMO-99-0102	U-ISO	U-235	0.027 +/- 0.014	0.051	pCi/l	Water	AS02724	8/12/99	U
9907232-1	CAMO-99-0102	U-ISO	U-238	0.304 +/- 0.042	0.036	pCi/l	Water	AS02724	8/12/99	
9907232-2	CAMO-99-0104	U-ISO	U-234	0.495 +/- 0.056	0.052	pCi/l	Water	AS02724	8/12/99	
9907232-2	CAMO-99-0104	U-ISO	U-235	0.045 +/- 0.016	0.043	pCi/l	Water	AS02724	8/12/99	LT
9907232-2	CAMO-99-0104	U-ISO	U-238	0.301 +/- 0.041	0.035	pCi/l	Water	AS02724	8/12/99	

Comments:

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

R-15 646 Fr

ALPHA/BETA ANALYSIS RESULTS SUMMARY

Method 900.0/9310 (Modified)

Lab Name: Paragon Analytics, Inc.

Date Collected: 07/22/99

Client Name: Los Alamos National Lab

Date Analyzed : 08/22/99

Client Project ID: 5895R

Sample Matrix : Water

Lab Sample ID Series: 99-07-232

Count Duration: 1000 Min.

Analyzed By : KI

F. Hood

Client Sample ID	Lab Sample ID	Gross Alpha (pCi/liter)	Gross Beta (pCi/liter)
CAMO-99-0102	07-232-01	1.53 ± 0.81	3.35 ± 0.78
CAMO-99-0104	07-232-02	0.7 ± 1.3	2.7 ± 1.1
CAMO-99-0104	07-232-D1	1.12 ± 0.77	3.58 ± 0.81

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ) See PAI SOP 743R1 for TPU determinations.

Reported Activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

These samples were prepared using PAI SOP 702R12 and analyzed using PAI SOP 724R5.

Remarks:

Sample 99-07-232-D1 is a duplicate of sample 99-07-232-02.

PL

R-15 646 ft

Gross Gamma Results Summary

Lab Name: Paragon Analytics, Inc. Date Analyzed: 8/10/99

Client Name: Los Alamos National Laboratory SMO Sample Matrix: Water

Lab Sample Series: 99-07-232 Units: pCi/L

Filtered

Client Sample ID	Lab Sample ID	Collection Date	Activity	Uncertainty	MDC
CAMO-99-0102	99-07-232-01	7/22/99	280	45	66
CAMO-99-0104	99-07-232-02	7/22/99	317	46	66
CAMO-99-0104	99-07-232-D1	7/22/99	275	45	66

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate.

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2 sigma).
See PAI SOP 743FC for details of the TPU determination.

99-07-232-D1 is a duplicate of sample 99-07-232-02.

Prepared by JH 8/12/99

PL

R-15 646FL

Sr-90 ANALYSIS RESULTS SUMMARY FILTERED

Method ASTM D5811-95

Lab Name: Paragon Analytics, Inc.

Date Collected: 07/22/99

Client Name: Los Alamos National Labor

Date Analyzed : 08/12/99

Client Project ID: 5895R

Sample Matrix : Water

Lab Sample ID Series: 99-07-232

Count Duration: 45 Min.

Analyzed by: CJM

Client Sample ID	Lab Sample ID	Sr-90 (pCi/l)
CAMO-99-0102	99-07-232-01	-0.13 ± 0.46
CAMO-99-0104	99-07-232-02	0.12 ± 0.49

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ) See PAI SOP 743R1 for details of TPU determinations.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

These samples were prepared using PAI SOP707R3 and analyzed using PAI SOP724R5.

PL

R-15 46fl

Sample Results Summary

Filtered

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 5895R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9907232

Reported on: Tuesday, August 24, 1999 10:35:46

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9907232-1	CAMO-99-0102	PU-ISO	Pu-238	-0.0029 +/- 0.0077	0.043	pCi/l	Water	AS02724	8/12/99	U
9907232-1	CAMO-99-0102	PU-ISO	Pu-239	0.0123 +/- 0.0083	0.029	pCi/l	Water	AS02724	8/12/99	U
9907232-2	CAMO-99-0104	PU-ISO	Pu-238	0.0121 +/- 0.0081	0.029	pCi/l	Water	AS02724	8/12/99	U
9907232-2	CAMO-99-0104	PU-ISO	Pu-239	0.0093 +/- 0.0075	0.015	pCi/l	Water	AS02724	8/12/99	U

Comments:

000293

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

R- 646 FL

Sample Results Summary

Filtered

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 5895R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9907232

Reported on: Tuesday, August 24, 1999 10:35:46

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9907232-1	CAMO-99-0102	AM-241	Am-241	0.0046 +/- 0.0074	0.015	pCi/l	Water	AS02724	8/16/99	U
9907232-2	CAMO-99-0104	AM-241	Am-241	0.025 +/- 0.011	0.027	pCi/l	Water	AS02724	8/16/99	U

Comments:

000362

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

R-15 F 646 2

NEPTUNIUM-237 ANALYSIS RESULTS SUMMARY

Lab Name: Paragon Analytics, Inc.

Date Collected: 07/22/99

Client Name: Los Alamos National Lab

Date Analyzed : 08/19/99

Client Project ID: 5895R

Sample Matrix : Water

Lab Sample ID Series: 99-07-232

Count Duration: 1000 Min.

Analyzed by: RG

Client Sample ID	Lab Sample ID	(pCi/l)	MDA
CAMO-99-0102	07-232-01	0.00 ± 0.01	0.02
CAMO-99-0104	07-232-02	0.00 ± 0.01	0.02
Duplicate-02	07-232-D1	0.01 ± 0.01	0.02

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ)
See PAI SOP 743FC for details of TPU determinations.

These samples were prepared using PAI SOP707FC and analyzed using PAI SOP724FC.

Remarks:

Sample 99-07-232-D1 is a duplicate of 99-07-232-02.

R-15 646 ft

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5895R
Client Sample ID: CAMO-99-0102

Lab Sample ID: 99-07-232-01
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 07/22/99 12:00
Date Analyzed: 08/06/99 15:52
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	-17.7 ± 5.1	N/A	U
Na-22	0.3 ± 1.0	354.7	U
K-40	-36 ± 46	N/A	U
Mn-54	1.0 ± 1.1	108.7	U
Co-57	0.50 ± 0.85	168.7	U
Co-60	0.4 ± 1.1	300.1	U
Zn-65	1.5 ± 2.2	154.9	U
Se-75	0.2 ± 1.4	738.8	U
Sr-85	-5.8 ± 2.0	N/A	U
Y-88	1.9 ± 1.4	71.7	TI
Ru-106	-7 ± 11	N/A	U
Cd-109	-11 ± 29	N/A	U
Sn-113	0.1 ± 1.3	1121.7	U
Cs-134	-0.5 ± 1.3	N/A	U
Cs-137	-0.7 ± 1.1	N/A	U
Ce-139	-0.29 ± 0.87	N/A	U
Ba-140	4.2 ± 7.6	183.5	U
La-140	10 ± 670	4554.1	U
Ce-144	5.9 ± 6.6	110.5	U
Eu-152	-2.5 ± 3.1	N/A	U
Hg-203	0.2 ± 1.3	685.3	U
Tl-208	-1.4 ± 3.3	N/A	U
Bi-211	1 ± 12	837.9	U
Pb-211	15 ± 27	186.6	U
Bi-212	-18 ± 40	N/A	U
Pb-212	1.7 ± 5.1	293.6	U
Bi-214	1.1 ± 8.7	810.6	U
Pb-214	0.5 ± 6.7	1382.1	U
Rn-219	5 ± 12	265.9	U
Ra-223	-28 ± 21	N/A	U
Ra-224	-69 ± 23	N/A	U
Ra-226	-40 ± 61	N/A	U

Data stored in file 10006690.SPC

Continued on next page...

R-15 641ft F

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5895R
Client Sample ID: CAMO-99-0102

Lab Sample ID: 99-07-232-01
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 07/22/99 12:00
Date Analyzed: 08/06/99 15:52
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	-16.1 ± 6.6	N/A	U
Ac-228	1 ± 12	1542.3	U
Pa-231	22 ± 35	157.6	U
Pa-233	0.8 ± 2.0	249.4	U
Pa-234m	10 ± 500	6223.5	U
Th-234	-50 ± 110	N/A	U
U-235	-1.7 ± 3.7	N/A	U
Np-237	-0.6 ± 8.6	N/A	U
Am-241	2.0 ± 7.2	353.5	U

Data stored in file 10006690.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.

AL

R-15 646ft F

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5895R
Client Sample ID: CAMO-99-0104

Lab Sample ID: 99-07-232-02
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 07/22/99 12:00
Date Analyzed: 08/06/99 15:53
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	5.6 ± 8.7	155.5	U
Na-22	0.9 ± 2.4	253.3	U
K-40	-100 ± 86	N/A	U
Mn-54	-0.9 ± 2.1	N/A	U
Co-57	0.1 ± 1.2	1558.5	U
Co-60	1.6 ± 2.2	136.1	U
Zn-65	6.8 ± 4.9	71.9	TI
Se-75	0.1 ± 2.5	2372.6	U
Sr-85	-6.9 ± 3.0	N/A	U
Y-88	1.0 ± 2.9	273.5	U
Ru-106	-14 ± 21	N/A	U
Cd-109	-16 ± 39	N/A	U
Sn-113	-1.7 ± 2.5	N/A	U
Cs-134	2.7 ± 2.4	87.1	TI
Cs-137	0.1 ± 2.2	3693.8	U
Ce-139	-0.5 ± 1.4	N/A	U
Ba-140	3 ± 14	437.8	U
La-140	1100 ± 1700	152.9	U
Ce-144	-0.8 ± 9.3	N/A	U
Eu-152	-2.3 ± 5.3	N/A	U
Hg-203	0.0 ± 2.2	N/A	U
Tl-208	0.4 ± 7.3	1668.6	U
Bi-211	-53 ± 34	N/A	U
Pb-211	-13 ± 50	N/A	U
Bi-212	72 ± 98	136.6	U
Pb-212	-5.2 ± 9.6	N/A	U
Bi-214	-2 ± 15	N/A	U
Pb-214	-10 ± 12	N/A	U
Rn-219	-15 ± 23	N/A	U
Ra-223	-10 ± 39	N/A	U
Ra-224	-54 ± 32	N/A	U
Ra-226	0 ± 110	N/A	U

Data stored in file 10006691.SPC

Continued on next page...

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R-15 646 Ft

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5895R
Client Sample ID: CAMO-99-0104

Lab Sample ID: 99-07-232-02
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 07/22/99 12:00
Date Analyzed: 08/06/99 15:53
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	7 ± 10	141.9	U
Ac-228	3 ± 21	680.3	U
Pa-231	72 ± 64	89.6	SI
Pa-233	0.0 ± 3.7	N/A	U
Pa-234m	-500 ± 1200	N/A	U
Th-234	-210 ± 150	N/A	U
U-235	-1.3 ± 6.5	N/A	U
Np-237	-8 ± 12	N/A	U
Am-241	7 ± 11	143.3	U

Data stored in file 10006691.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.
SI = Identification is tentative due to spectral interference. See narrative for further discussion.

PL

R-15 646 F

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5895R
Client Sample ID: Duplicate

Lab Sample ID: 99-07-232-D1 Date Collected: 07/22/99 12:00
Sample Matrix: WATER Date Analyzed: 08/09/99 16:07
Count Duration: 800 Min. Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	2.7 ± 4.3	157.1	U
Na-22	0.7 ± 1.1	151.9	U
K-40	42 ± 49	115.7	U
Mn-54	-0.3 ± 1.1	N/A	U
Co-57	0.27 ± 0.86	315.8	U
Co-60	1.2 ± 1.1	89.3	TI
Zn-65	0.5 ± 2.3	432.9	U
Se-75	0.0 ± 1.7	N/A	U
Sr-85	-6.1 ± 2.1	N/A	U
Y-88	1.1 ± 1.4	125.6	U
Ru-106	1 ± 12	880.5	U
Cd-109	-3 ± 29	N/A	U
Sn-113	-1.2 ± 1.4	N/A	U
Cs-134	-0.3 ± 1.3	N/A	U
Cs-137	-0.1 ± 1.1	N/A	U
Ce-139	0.17 ± 0.90	514.9	U
Ba-140	3.7 ± 9.1	245.7	U
La-140	-400 ± 1300	N/A	U
Ce-144	2.4 ± 6.6	271.6	U
Eu-152	1.1 ± 3.0	268.3	U
Hg-203	0.0 ± 1.4	N/A	U
Tl-208	0.0 ± 3.5	34244	U
Bi-211	-14.5 ± 9.0	N/A	U
Pb-211	-7 ± 27	N/A	U
Bi-212	10 ± 39	401.8	U
Pb-212	4.1 ± 5.4	132.1	U
Bi-214	-1.8 ± 8.6	N/A	U
Pb-214	-3.8 ± 7.0	N/A	U
Rn-219	-4 ± 13	N/A	U
Ra-223	-21 ± 22	N/A	U
Ra-224	-79 ± 24	N/A	U
Ra-226	33 ± 71	213.6	U

Data stored in file 10006710.SPC

Continued on next page...

PL

R-15 646 A C

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 5895R
Client Sample ID: Duplicate

Lab Sample ID: 99-07-232-D1
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 07/22/99 12:00
Date Analyzed: 08/09/99 16:07
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	-15.4 ± 6.7	N/A	U
Ac-228	-7 ± 11	N/A	U
Pa-231	13 ± 35	277.6	U
Pa-233	0.8 ± 2.1	265.4	U
Pa-234m	300 ± 250	83.9	
Th-234	-30 ± 110	N/A	U
U-235	1.9 ± 3.9	203.4	U
Np-237	-2.4 ± 8.7	N/A	U
Am-241	0.3 ± 7.2	2597.6	U

Data stored in file 10006710.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.

Remarks: Sample 99-07-232-D1 is a duplicate of 99-07-232-02.

PL

oct 99

ATTACHMENT III

MONITORING WELL R-15

1,100 FEET

NON-FILTERED SAMPLE RESULTS:
CAMO-99-0107

R-15

1,100 ft.
Nonfiltered

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CAMO-99-0107

Lab Name: PARAGON_ANALYTICS_____ Contract: _____
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 6032R_
Matrix (soil/water): WATER Lab Sample ID: 9909037-1
Level (low/med): LOW__ Date Received: 09/08/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	43600			P
7440-36-0	Antimony_	3.4	U		P
7440-38-2	Arsenic__	24.0			P
7440-39-3	Barium___	2820			P
7440-41-7	Beryllium	12.3			P
7440-42-8	Boron____	42.1	B		P
7440-43-9	Cadmium__	0.59	B		P
7440-70-2	Calcium__	266000			P
7440-47-3	Chromium_	21.8			P
7440-48-4	Cobalt___	107			P
7440-50-8	Copper___	26.0			P
7439-89-6	Iron_____	21300			P
7439-92-1	Lead_____	67.1			P
7439-95-4	Magnesium	58200			P
7439-96-5	Manganese	7270			P
7439-97-6	Mercury__	0.02	U		AV
7439-98-7	Molybdenu	5.5	B		P
7440-02-0	Nickel___	64.2			P
7440-09-7	Potassium	21200			P
7782-49-2	Selenium_	3.7	B		P
7440-22-4	Silver___	0.70	U		P
7440-23-5	Sodium___	35900			P
7440-24-6	Strontium	1140			P
7440-28-0	Thallium_	4.5	U		P
7440-62-2_	Vanadium_	344			P
7440-66-6_	Zinc_____	142			P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

Sample Results Summary

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 6034R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9909039

Reported on: Tuesday, October 05, 1999 08:13:03

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9909039-1	CAMO-99-0107	U-ISO	U-234	18.7 +/- 1.1	0.041	pCi/l	Water	AS02796	9/22/99	
9909039-1	CAMO-99-0107	U-ISO	U-235	0.698 +/- 0.070	0.030	pCi/l	Water	AS02796	9/22/99	
9909039-1	CAMO-99-0107	U-ISO	U-238	13.25 +/- 0.81	0.045	pCi/l	Water	AS02796	9/22/99	

R-15

1,100 ft
Nonfiltered

10/27/99

Comments:

000082

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

R-15

1,100 ft
Non Filtered

ALPHA/BETA ANALYSIS RESULTS SUMMARY

Method 900.0/9310 (Modified)

Lab Name: Paragon Analytics, Inc.

Date Collected: 08/27/99

Client Name: Los Alamos National Lab

Date Analyzed : 09/24/99

Client Project ID: 6034R

Sample Matrix : Water

Lab Sample ID Series: 99-09-039

Count Duration: 1000 Min.

Analyzed By : KI

Client Sample ID	Lab Sample ID	Gross Alpha (pCi/liter)	Gross Beta (pCi/liter)
CAMO-99-0107	09-039-01	66.2 ± 7.8	50.5 ± 5.6

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See PAI SOP743R1 for TPU determinations.

Reported Activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

These samples were prepared using PAI SOP702R12 and analyzed using PAI SOP724R5.

PL 10/27/99

R-15

1,100 ft
Nonfiltered

Gross Gamma Results Summary

Lab Name: Paragon Analytics, Inc.

Date Analyzed: 8/22/99

Client Name: Los Alamos National Laboratory SMO

Sample Matrix: Water

Lab Sample Series: 99-09-039

Units: pCi/L

Client Sample ID	Lab Sample ID	Collection Date	Activity	Uncertainty	MDC
Shared Q.C.	99-09-049-01	8/22/99	223	18	19
Shared Q.C.	99-09-049-D1	8/27/99	216	18	18
CAMO-99-0107	99-09-039-01	8/22/99	253	20	18

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate.

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2 sigma).
See PAI SOP 743FC for details of the TPU determination.

99-09-049-D1 is a duplicate of sample 99-09-049-01.

PL 10/27/99

Prepared by 10/6/99

R-15

1,100 ft
Non Filtered

Sr-90 ANALYSIS RESULTS SUMMARY

Method ASTM D5811-95

Lab Name: Paragon Analytics, Inc.

Date Collected: 08/27/99

Client Name: Los Alamos National Lab

Date Analyzed : 10/10/99

Client Project ID: 6034R

Sample Matrix : Water

Lab Sample ID Series: 99-09-039

Count Duration: 45 Min.

Analyzed by: CJM

Client Sample ID	Lab Sample ID	Sr-90 (pCi/l)
CAMO-99-0107	99-09-039-01	-0.04 ± 0.40

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See PAI SOP 743R1 for details of TPU determinations.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

These samples were prepared using PAI SOP707R3 and analyzed using PAI SOP724R5.

PL
10/27/99

Sample Results Summary

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 6034R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9909039

Reported on: Tuesday, October 05, 1999 08:13:03

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9909039-1	CAMO-99-0107	PU-ISO	Pu-238	0.0111 +/- 0.0075	0.026	pCi/l	Water	AS02796	9/22/99	U
9909039-1	CAMO-99-0107	PU-ISO	Pu-239	-0.0017 +/- 0.0069	0.026	pCi/l	Water	AS02796	9/22/99	U

R-15

10/27/99

1,100 FZ
Non filtered

Comments:

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

Sample Results Summary

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 6034R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9909039

Reported on: Tuesday, October 05, 1999 08:13:03

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9909039-1	CAMO-99-0107	AM-241	Am-241	0.0072 +/- 0.0072	0.028	pCi/l	Water	AS02796	9/24/99	U

R-15

PL 10/27/99

1,100 ft
Non-filtered

Comments:

Abbreviations:
TPU - Total Propegated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

R-15

1,100ft
Nonfiltered

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 6034R
Client Sample ID: CAMO-99-0107

Lab Sample ID: 99-09-039-01
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 08/27/99 12:00
Date Analyzed: 09/22/99 16:06
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	-24.4 ± 9.2	N/A	U
Na-22	-1.0 ± 2.3	N/A	U
K-40	-3 ± 86	N/A	U
Mn-54	-0.1 ± 2.2	N/A	U
Co-57	-0.1 ± 1.3	N/A	U
Co-60	1.5 ± 2.2	150.4	U
Zn-65	-0.3 ± 4.6	N/A	U
Se-75	-0.4 ± 2.6	N/A	U
Sr-85	-9.9 ± 3.6	N/A	U
Y-88	3.7 ± 2.9	77.5	TI
Ru-106	10 ± 20	206.1	U
Cd-109	26 ± 41	157.3	U
Sn-113	3.1 ± 2.7	85.4	TI
Cs-134	-1.0 ± 2.2	N/A	U
Cs-137	0.8 ± 2.1	272.7	U
Ce-139	0.2 ± 1.4	901.0	U
Ba-140	35 ± 27	76.4	TI
La-140	-1600 ± 3000	N/A	U
Ce-144	-6.7 ± 9.7	N/A	U
Eu-152	-1.5 ± 5.3	N/A	U
Hg-203	0.3 ± 2.6	900.8	U
Tl-208	-2.4 ± 6.6	N/A	U
Bi-211	1 ± 16	1099.1	U
Pb-211	29 ± 51	178.4	U
Bi-212	-30 ± 100	N/A	U
Pb-212	-3.7 ± 7.9	N/A	U
Bi-214	4 ± 15	342.3	U
Pb-214	-3 ± 13	N/A	U
Rn-219	16 ± 24	142.9	U
Ra-223	-3 ± 37	N/A	U
Ra-224	-93 ± 35	N/A	U
Ra-226	-20 ± 110	N/A	U

Data stored in file 10007175.SPC

PL 10/27/99

Continued on next page...

R-15

1,100 ft
Non-filtered

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 6034R
Client Sample ID: CAMO-99-0107

Lab Sample ID: 99-09-039-01
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 08/27/99 12:00
Date Analyzed: 09/22/99 16:06
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	1.5 ± 9.7	625.0	U
Ac-228	-10 ± 24	N/A	U
Pa-231	0 ± 62	N/A	U
Pa-233	-2.1 ± 3.7	N/A	U
Pa-234m	230 ± 360	157.8	U
Th-234	-220 ± 160	N/A	U
U-235	-1.2 ± 6.5	N/A	U
Np-237	-13 ± 12	N/A	U
Am-241	2 ± 10	543.5	U

Data stored in file 10007175.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.

PL 10/27/99

R-15

1,100ft Nonfiltered

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 6047R
Client Sample ID: CAMO-99-0106

Lab Sample ID: 99-09-049-01 Date Collected: 08/27/99 12:00
Sample Matrix: WATER Date Analyzed: 09/22/99 16:07
Count Duration: 800 Min. Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	-26.4 ± 9.6	N/A	U
Na-22	-0.5 ± 2.1	N/A	U
K-40	7 ± 79	1127.7	U
Mn-54	-0.4 ± 2.2	N/A	U
Co-57	-0.6 ± 1.1	N/A	U
Co-60	0.8 ± 2.3	282.2	U
Zn-65	4.3 ± 5.6	129.6	U
Se-75	-0.9 ± 2.3	N/A	U
Sr-85	-8.1 ± 3.8	N/A	U
Y-88	-5.5 ± 8.7	N/A	U
Ru-106	4 ± 19	545.5	U
Cd-109	-24 ± 35	N/A	U
Sn-113	1.5 ± 2.5	167.0	U
Cs-134	-0.6 ± 2.0	N/A	U
Cs-137	-1.1 ± 2.0	N/A	U
Ce-139	-1.3 ± 1.5	N/A	U
Ba-140	29 ± 28	97.6	TI
La-140	-2800 ± 3400	N/A	U
Ce-144	0.8 ± 8.7	1045.0	U
Eu-152	5.8 ± 5.1	87.9	TI
Hg-203	-0.7 ± 2.4	N/A	U
Tl-208	-3.2 ± 6.6	N/A	U
Bi-211	-2 ± 11	N/A	U
Pb-211	37 ± 46	124.3	U
Bi-212	50 ± 100	225.9	U
Pb-212	5.9 ± 8.3	141.9	U
Bi-214	2 ± 14	637.6	U
Pb-214	-7 ± 13	N/A	U
Rn-219	10 ± 20	193.6	U
Ra-223	19 ± 34	184.4	U
Ra-224	-96 ± 36	N/A	U
Ra-226	30 ± 110	384.8	U

Data stored in file 10007176.SPC

Continued on next page...

PL 10/27/99

R-15

1,100 ft
Nonfiltered

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 6047R
Client Sample ID: CAMO-99-0106

Lab Sample ID: 99-09-049-01
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 08/27/99 12:00
Date Analyzed: 09/22/99 16:07
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	-7.7 ± 9.9	N/A	U
Ac-228	-3 ± 21	N/A	U
Pa-231	38 ± 57	148.0	U
Pa-233	-2.6 ± 3.2	N/A	U
Pa-234m	-40 ± 350	N/A	U
Th-234	-130 ± 160	N/A	U
U-235	-0.6 ± 6.7	N/A	U
Np-237	3 ± 10	365.6	U
Am-241	6.7 ± 9.7	143.7	U

Data stored in file 10007176.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.

PL 10/27/99

R-15

1,100 ft
Nonfiltered

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 6047R
Client Sample ID: Duplicate

Lab Sample ID: 99-09-049-D1
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 08/27/99 12:00
Date Analyzed: 09/27/99 17:35
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	4.0 ± 8.9	221.1	U
Na-22	1.5 ± 2.4	161.1	U
K-40	-13 ± 78	N/A	U
Mn-54	1.6 ± 2.1	134.3	U
Co-57	0.0 ± 1.2	8465.4	U
Co-60	1.4 ± 2.3	163.0	U
Zn-65	0.1 ± 4.5	7988.7	U
Se-75	1.9 ± 2.7	143.2	U
Sr-85	-9.1 ± 3.7	N/A	U
Y-88	3.4 ± 2.9	87.6	TI
Ru-106	-1 ± 21	N/A	U
Cd-109	34 ± 41	121.3	U
Sn-113	1.6 ± 2.8	180.5	U
Cs-134	0.0 ± 2.5	N/A	U
Cs-137	1.6 ± 2.3	139.0	U
Ce-139	1.0 ± 1.5	144.2	U
Ba-140	-3 ± 34	N/A	U
La-140	-2100 ± 3400	N/A	U
Ce-144	2.7 ± 9.8	362.5	U
Eu-152	1.8 ± 5.5	299.9	U
Hg-203	3.1 ± 2.9	94.1	SI
Tl-208	-3.4 ± 6.7	N/A	U
Bi-211	1 ± 13	934.1	U
Pb-211	-4 ± 48	N/A	U
Bi-212	-40 ± 110	N/A	U
Pb-212	-4.0 ± 8.1	N/A	U
Bi-214	-2 ± 15	N/A	U
Pb-214	-7 ± 12	N/A	U
Rn-219	-1 ± 21	N/A	U
Ra-223	-8 ± 38	N/A	U
Ra-224	-69 ± 32	N/A	U
Ra-226	0 ± 110	N/A	U

Data stored in file 10007222.SPC

Continued on next page...

PL 10/27/99

R-15

1,100 ft
Nonfiltered

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 6047R
Client Sample ID: Duplicate

Lab Sample ID: 99-09-049-D1
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 08/27/99 12:00
Date Analyzed: 09/27/99 17:35
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	-1.7 ± 9.7	N/A	U
Ac-228	17.2 ± 9.0	52.2	TI
Pa-231	-20 ± 62	N/A	U
Pa-233	3.5 ± 3.8	107.6	U
Pa-234m	150 ± 370	250.2	U
Th-234	-190 ± 150	N/A	U
U-235	-0.6 ± 6.9	N/A	U
Np-237	7 ± 12	179.6	U
Am-241	-1 ± 11	N/A	U

Data stored in file 10007222.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.
SI = Identification is tentative due to spectral interference. See narrative for further discussion.

Remarks: Sample 99-09-049-D1 is a duplicate of 99-09-049-01.

PL 10/27/99

R-15

UNIVERSITY OF Miami

THE ROSENSTIEL SCHOOL

September 22, 1999

1,100 ft

TRITIUM LABORATORY

Data Release #99-110
Job # 1252

Purchase Order No. 09184 6039

LOS ALAMOS NATIONAL LABORATORY
TRITIUM SAMPLES

D COPY

Dr. James D. Happell
Associate Research Professor

Distribution:
S. Hagelberg
University of California, LANL
SMO, TA-3, BLDG. 271, MS H865
Los Alamos, New Mexico 87545

Pat

Report Sent To: _____

Approved By: 10/01/99

Date Sent: _____

Rosenstiel School of Marine and Atmospheric Science
Tritium Laboratory
4600 Rickenbacker Causeway
Miami, Florida 33149-1098
Phone: (305) 361-4100
Fax: (305) 361-4112
email: tritium@rsmas.miami.edu

Revised 12 September 1995

GENERAL COMMENTS ON TRITIUM RESULTS

Tritium Scale (New)

Tritium concentrations are expressed in TU, where 1 TU indicates a T/H ratio of 10^{-18}. The values refer to the new tritium scale of U.S. National Institute of Science and Technology (formerly NBS), and based on their tritium water standard #4926 as measured on 1961/09/03 and again 1978/09/03, and age-corrected with the new half-life of 12.43 years, i.e., $\lambda = 5.576\%$ year^{-1}. In this scale, 1 TU is 7.088 dpm/kg H_2O, or 3.193 pCi/kg H_2O, or 0.1181 Bq/kg H_2O (Bq = disint/sec). TU values are calculated for date of sample collection, REFDATE in the table, as provided by the submitter. If no such date is available, date of sample arrival at our laboratory is used. The stated errors, eTU, are one standard deviation (1 sigma) including all conceivable contributions. In the table, QUANT is quantity of sample received, and ELYS is the amount of water taken for electrolytic enrichment. DIR means direct run (no enrichment).

Through 31 December 1993, we reported tritium values in the "old" scale using the half-life 12.26 years, i.e., $\lambda = 5.65\%$ year^{-1}. In that old scale, 1 TU(old) is 7.186 dpm/kg H_2O, 3.237 pCi/kg H_2O. To convert from the new scale back to the old at any given point in time, multiply the listed TU(new)-values by F, where

$$F = 0.9645 - (\text{year}-1990) \times 0.0008$$

i.e. for 1994 the factor is 0.9613. The formula is correct within 0.02% between 1962 and 1999. To convert data from the old scale to the new, divide by F.

Very low tritium values

In some cases, negative TU values are listed. Such numbers can occur because the net tritium count rate is, in principle the difference between the count rate of the sample and that of a tritium-free sample (background count or blank sample). Given a set of "unknown" samples with no tritium, the distribution of net results should become symmetrical around 0 TU. The negative values are reported as such for the benefit of allowing the user unbiased statistical treatment of sets of the data. For other applications, 0 TU should be used.

Reliability of results

Refer to Services Rendered (Tritium), Section II.8, in the "Tritium Laboratory Price Schedule; Procedures and Standards; Advice on Sampling". Tritium efficiencies and background values are different in the nine counters and values are corrected for cosmic intensity, gas pressure and other parameters. For tritium, the efficiency is typically 1.00 cpm per 100 TU (direct counting). At 50× enrichment, the efficiency is equivalent to 1.00 cpm per 2 TU. The background is about 0.3 cpm, known to about ± 0.02 cpm. Our reported results include not only the Poisson statistics, but also other experimental uncertainties such as enrichment error, etc.

References

Mann, W.B., M.P. Unterweger, and B.M. Coursey, Comments on the NBS tritiated-water standards and their use, *Int. J. Appl. Radiat. Isot.*, 33, 383-386, 1982.

Taylor, C.B., and W. Roether, A uniform scale for reporting low-level tritium measurements in water, *Int. J. Appl. Radiat. Isot.*, *33*, 377-382, 1982.

Client: LOS ALAMOS NATIONAL LAB - HAGELBERG Purchase Order: 09184
Recvd : 99/09/09 Contact: J.Valdez 505/665-9968
Job# : 1252 Env. Sci & Waste Tech. (f) 665-9972
Final : 99/09/22 CC: P. Longmire, -9118(F) CST-7, Los Alamos, NM 87545

Cust	LABEL INFO	JOB.SX	REFDATE	QUANT	ELYS	TU	eTU
LANL-REQ#6039R	CAMO-99-0107	21 1252.01	990827	500	184	0.38 r	0.11

r: Laboratory RERUN in progress

pCi/l 1.21 ± 0.35

Sept 99

ATTACHMENT IV

MONITORING WELL R-15

1,100 FEET

FILTERED SAMPLE RESULTS:
CAMO-99-0106

R-15

1,100 ft.
Filtered

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CAMO-99-0106

Lab Name: PARAGON_ANALYTICS_____ Contract: _____
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 6042R_
Matrix (soil/water): WATER Lab Sample ID: 9909052-1
Level (low/med): LOW__ Date Received: 09/09/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	11.2	B		P
7440-36-0	Antimony_	4.0	B		P
7440-38-2	Arsenic__	2.7	U		P
7440-39-3	Barium___	39.6	B		P
7440-41-7	Beryllium	0.47	B		P
7440-42-8	Boron____	46.0	B		P
7440-43-9	Cadmium__	0.20	U		P
7440-70-2	Calcium__	13900			P
7440-47-3	Chromium_	0.50	U		P
7440-48-4	Cobalt___	4.0	B		P
7440-50-8	Copper___	1.4	B		P
7439-89-6	Iron_____	22.3	B		P
7439-92-1	Lead_____	1.3	U		P
7439-95-4	Magnesium	4240	B		P
7439-96-5	Manganese	193			P
7439-97-6	Mercury__	0.02	U		AV
7439-98-7	Molybdenu	20.1			P
7440-02-0	Nickel___	5.4	B		P
7440-09-7	Potassium	3300	B		P
7782-49-2	Selenium_	2.9	U		P
7440-22-4	Silver___	1.2	B		P
7440-23-5	Sodium___	23000			P
7440-24-6	Strontium	59.7			P
7440-28-0	Thallium_	5.2	B		P
7440-62-2_	Vanadium_	1.6	B		P
7440-66-6_	Zinc_____	5.7	B		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

R-15 F ~~646~~ 1,100

TOTAL URANIUM ANALYSIS RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Paragon Analytics, Inc. Date Collected: 08/27/99

Client Name: Los Alamos National Lab. Date Analyzed : 10/06/99

Client Project ID: 6042R

Lab Sample ID Series: 99-09-052 Sample Matrix : Water

Client Sample ID	Lab Sample ID	Total Uranium (ug/L)	Reporting Limit	Flag
CAMO-99-0106	09-052-01	2.44 ± 0.33	0.10	
Duplicate	09-052-D1	2.43 ± 0.33	0.10	

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ).
See PAI SOP 743FC for details of TPU determinations.

FLAGS = J - 'Estimated Value' - result between Method Detection Limit and Reporting Limit.
U - 'Not Detected' - result less than Method Detection Limit.

Remarks:

Sample 99-09-052-D1 is a duplicate of 99-09-052-01.

BP

12

R-15 F ~~646~~ FL 1,100

AMMONIA

Method EPA350.3

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 6042R
Work Order Number: 9909052
Reporting Basis: As Received

Final Volume: 10 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0106	9909052-1	8/27/99	9/24/99	9/24/99	N/A	1	0.53	0.53	U	10 ML

PL

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *NH9909052-1*

R-15 F ~~648~~ E
1,100

NITRATE/NITRITE

Method EPA353.3

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 6042R
Work Order Number: 9909052
Reporting Basis: As Received

Final Volume: 3 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0106	9909052-1	8/27/99	9/22/99	9/22/99	N/A	1	0.052	0.05		3 ML

PL

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *NN9909052-1*

R-15 F 646ft
1,100

TOTAL PHOSPHORUS

Method EPA365.2

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 6042R
Work Order Number: 9909052
Reporting Basis: As Received

Final Volume: 50 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0106	9909052-1	8/27/99	9/20/99	9/21/99	N/A	1	0.05	0.05	UN	50 ML

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *PO9909052-1*

R-15 : Hend

TOTAL DISSOLVED SOLIDS

Method EPA160.1

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Los Alamos National Laboratory SMO
Client Project ID: 6046R
Work Order Number: 9909050
Reporting Basis: As Received

Final Volume: 100 ML
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Detection Limit	Flag	Sample Aliquot
CAMO-99-0106	9909050-1	8/27/99	9/9/99	9/10/99	N/A	1	190	20		100 ML

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *TD9909050-1*

R- 5 ~~nonfiltered~~ RSB
Filtered

Ion Chromatography

Method EPA300.0
Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 9909053
Client Name: Los Alamos National Laboratory SMO
ClientProject ID: 6041R

Field ID	CAMO-99-0106
Lab ID	9909053-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 27-Aug-99
Date Extracted: 11-Sep-99
Date Analyzed: 11-Sep-99

Prep Batch: IC990911-1
QCBatchID: IC990911-1-1
Run ID: IC990911-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: MG/L
File Name: 99091112

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
24959-67-9	BROMIDE	1	0.2	0.2	U	
16887-00-6	CHLORIDE	1	3.7	0.2		
16984-48-8	FLUORIDE	1	0.3	0.1		
14808-79-8	SULFATE	1	15	1		

Data Package ID: *IC9909053-1*

Sample Results Summary

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 6047R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9909049

Reported on: Tuesday, October 05, 1999 08:15:31

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9909049-1	CAMO-99-0106	U-ISO	U-234	1.44 +/- 0.12	0.035	pCi/l	Water	AS02796	9/22/99	
9909049-1	CAMO-99-0106	U-ISO	U-235	0.043 +/- 0.016	0.047	pCi/l	Water	AS02796	9/22/99	U
9909049-1	CAMO-99-0106	U-ISO	U-238	0.683 +/- 0.069	0.047	pCi/l	Water	AS02796	9/22/99	

P-15

1100 FZ
Filtered

DA 10/27/99

Comments:

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

R-15

1,100 ft
Filtered

ALPHA/BETA ANALYSIS RESULTS SUMMARY

Method 900.0/9310 (Modified)

Lab Name: Paragon Analytics, Inc.

Date Collected: 08/27/99

Client Name: Los Alamos National Lab

Date Analyzed : 09/28/99

Client Project ID: 6047R

Sample Matrix : Water

Lab Sample ID Series: 99-09-049

Count Duration: 240 Min.

Analyzed By : KI

Client Sample ID	Lab Sample ID	Gross Alpha (pCi/liter)	Gross Beta (pCi/liter)
CAMO-99-0106	09-049-01	2.5 ± 1.1	2.5 ± 1.4
CAMO-99-0106	09-049-D1	1.7 ± 1.2	1.4 ± 1.4

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See PAI SOP743R1 for TPU determinations.

Reported Activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

These samples were prepared using PAI SOP702R12 and analyzed using PAI SOP724R5.

Remarks:

Sample 99-09-049-D1 is a duplicate of sample 99-09-049-01.

PS 10/27/99

R-15

1,100 ft
Filtered

Gross Gamma Results Summary

Lab Name:	Paragon Analytics, Inc.	Date Analyzed:	9/22/99
Client Name:	Los Alamos National Laboratory SMO	Sample Matrix:	Water
Lab Sample Series:	99-09-049	Units:	pCi/L

Client Sample ID	Lab Sample ID	Collection Date	Activity	Uncertainty	MDC
CAMO-99-0106	99-09-049-01	9/22/99	223	18	19
CAMO-99-0106	99-09-049-D1	9/27/99	216	18	18

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate.

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2 sigma).
See PAI SOP 743FC for details of the TPU determination.

99-09-049-D1 is a duplicate of sample 99-09-049-01.

PL 10/27/99

Prepared by JM 10/5/99

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R-15

1,100ft
Filtered

Sr-90 ANALYSIS RESULTS SUMMARY

Method ASTM D5811-95

Lab Name: Paragon Analytics, Inc.

Date Collected: 08/27/99

Client Name: Los Alamos National Lab

Date Analyzed : 10/10/99

Client Project ID: 6047R

Sample Matrix : Water

Lab Sample ID Series: 99-09-049

Count Duration: 45 Min.

Analyzed by: CJM

Client Sample ID	Lab Sample ID	Sr-90 (pCi/l)
CAMO-99-0106	99-09-049-01	-0.17 ± 0.34
CAMO-99-0106	99-09-049-D1	-0.14 ± 0.35

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See PAI SOP 743R1 for details of TPU determinations.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

These samples were prepared using PAI SOP707R3 and analyzed using PAI SOP724R5.

Remarks:

Sample 99-09-049-D1 is a duplicate of 99-09-049-01.

PL 10/27/99

Sample Results Summary

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 6047R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9909049

Reported on: Tuesday, October 05, 1999 08:15:31

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9909049-1	CAMO-99-0106	PU-ISO	Pu-238	0.0167 +/- 0.0082	0.013	pCi/l	Water	AS02796	9/22/99	LT
9909049-1	CAMO-99-0106	PU-ISO	Pu-239	0.0083 +/- 0.0067	0.013	pCi/l	Water	AS02796	9/22/99	U

R-15

1,100 ft
F. Hand

10/27/99

Comments:

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

Sample Results Summary

Client Name: Los Alamos National Laboratory SMO
Client Project Name:
Client Project Number: 6047R

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 9909049

Reported on: Tuesday, October 05, 1999 08:15:31

Lab Sample ID	Client Sample ID	Test	Nuclide	Result +/- 1 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
9909049-1	CAMO-99-0106	AM-241	Am-241	0.044 +/- 0.014	0.026	pCi/l	Water	AS02796	9/24/99	LT

R-15

10/27/99

Comments:

Abbreviations:
TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Qualifiers/Flags:
U - Result is less than the sample specific minimum detectable activity.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y2 - Chemical Yield outside default limits.

R-15

1,100 ft
Filtered

NEPTUNIUM-237 ANALYSIS RESULTS SUMMARY

Lab Name: Paragon Analytics, Inc.

Date Collected: 08/27/99

Client Name: Los Alamos National Lab

Date Analyzed : 09/24/99

Client Project ID: 6047R

Sample Matrix : Water

Lab Sample ID Series: 99-09-049

Count Duration: 600 Min.

Analyzed by: KG

Client Sample ID	Lab Sample ID	(pCi/l)	MDA
CAMO-99-0106	09-049-01	0.01 ± 0.03	0.05

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See PAI SOP 743FC for details of TPU determinations.

These samples were prepared using PAI SOP707FC and analyzed using PAI SOP724FC.

PL 10/27/99

R-15

1,100 ft
Filtered

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 6047R
Client Sample ID: CAMO-99-0106

Lab Sample ID: 99-09-049-01 Date Collected: 08/27/99 12:00
Sample Matrix: WATER Date Analyzed: 09/22/99 16:07
Count Duration: 800 Min. Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	-26.4 ± 9.6	N/A	U
Na-22	-0.5 ± 2.1	N/A	U
K-40	7 ± 79	1127.7	U
Mn-54	-0.4 ± 2.2	N/A	U
Co-57	-0.6 ± 1.1	N/A	U
Co-60	0.8 ± 2.3	282.2	U
Zn-65	4.3 ± 5.6	129.6	U
Se-75	-0.9 ± 2.3	N/A	U
Sr-85	-8.1 ± 3.8	N/A	U
Y-88	-5.5 ± 8.7	N/A	U
Ru-106	4 ± 19	545.5	U
Cd-109	-24 ± 35	N/A	U
Sn-113	1.5 ± 2.5	167.0	U
Cs-134	-0.6 ± 2.0	N/A	U
Cs-137	-1.1 ± 2.0	N/A	U
Ce-139	-1.3 ± 1.5	N/A	U
Ba-140	29 ± 28	97.6	TI
La-140	-2800 ± 3400	N/A	U
Ce-144	0.8 ± 8.7	1045.0	U
Eu-152	5.8 ± 5.1	87.9	TI
Hg-203	-0.7 ± 2.4	N/A	U
Tl-208	-3.2 ± 6.6	N/A	U
Bi-211	-2 ± 11	N/A	U
Pb-211	37 ± 46	124.3	U
Bi-212	50 ± 100	225.9	U
Pb-212	5.9 ± 8.3	141.9	U
Bi-214	2 ± 14	637.6	U
Pb-214	-7 ± 13	N/A	U
Rn-219	10 ± 20	193.6	U
Ra-223	19 ± 34	184.4	U
Ra-224	-96 ± 36	N/A	U
Ra-226	30 ± 110	384.8	U

Data stored in file 10007176.SPC

PL 10/27/99

Continued on next page...

R-15

1,100 ft
Filtered

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 6047R
Client Sample ID: CAMO-99-0106

Lab Sample ID: 99-09-049-01
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 08/27/99 12:00
Date Analyzed: 09/22/99 16:07
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	-7.7 ± 9.9	N/A	U
Ac-228	-3 ± 21	N/A	U
Pa-231	38 ± 57	148.0	U
Pa-233	-2.6 ± 3.2	N/A	U
Pa-234m	-40 ± 350	N/A	U
Th-234	-130 ± 160	N/A	U
U-235	-0.6 ± 6.7	N/A	U
Np-237	3 ± 10	365.6	U
Am-241	6.7 ± 9.7	143.7	U

Data stored in file 10007176.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.

PL 10/27/99

R-15

1,100 ft
Filtered

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 6047R
Client Sample ID: Duplicate

Lab Sample ID: 99-09-049-D1
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 08/27/99 12:00
Date Analyzed: 09/27/99 17:35
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Ann-Rad	4.0 ± 8.9	221.1	U
Na-22	1.5 ± 2.4	161.1	U
K-40	-13 ± 78	N/A	U
Mn-54	1.6 ± 2.1	134.3	U
Co-57	0.0 ± 1.2	8465.4	U
Co-60	1.4 ± 2.3	163.0	U
Zn-65	0.1 ± 4.5	7988.7	U
Se-75	1.9 ± 2.7	143.2	U
Sr-85	-9.1 ± 3.7	N/A	U
Y-88	3.4 ± 2.9	87.6	TI
Ru-106	-1 ± 21	N/A	U
Cd-109	34 ± 41	121.3	U
Sn-113	1.6 ± 2.8	180.5	U
Cs-134	0.0 ± 2.5	N/A	U
Cs-137	1.6 ± 2.3	139.0	U
Ce-139	1.0 ± 1.5	144.2	U
Ba-140	-3 ± 34	N/A	U
La-140	-2100 ± 3400	N/A	U
Ce-144	2.7 ± 9.8	362.5	U
Eu-152	1.8 ± 5.5	299.9	U
Hg-203	3.1 ± 2.9	94.1	SI
Tl-208	-3.4 ± 6.7	N/A	U
Bi-211	1 ± 13	934.1	U
Pb-211	-4 ± 48	N/A	U
Bi-212	-40 ± 110	N/A	U
Pb-212	-4.0 ± 8.1	N/A	U
Bi-214	-2 ± 15	N/A	U
Pb-214	-7 ± 12	N/A	U
Rn-219	-1 ± 21	N/A	U
Ra-223	-8 ± 38	N/A	U
Ra-224	-69 ± 32	N/A	U
Ra-226	0 ± 110	N/A	U

Data stored in file 10007222.SPC

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PL 10/27/99

R-15

1,100 fL
Filtered

Paragon Analytics, Inc.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Client Name: Los Alamos National Laboratory SMO
Client Project Id: 6047R
Client Sample ID: Duplicate

Lab Sample ID: 99-09-049-D1
Sample Matrix: WATER
Count Duration: 800 Min.

Date Collected: 08/27/99 12:00
Date Analyzed: 09/27/99 17:35
Aliquot: 1.000

Nuclide	Activity (pCi/Liter)	% Uncertainty	Flag
Th-227	-1.7 ± 9.7	N/A	U
Ac-228	17.2 ± 9.0	52.2	TI
Pa-231	-20 ± 62	N/A	U
Pa-233	3.5 ± 3.8	107.6	U
Pa-234m	150 ± 370	250.2	U
Th-234	-190 ± 150	N/A	U
U-235	-0.6 ± 6.9	N/A	U
Np-237	7 ± 12	179.6	U
Am-241	-1 ± 11	N/A	U

Data stored in file 10007222.SPC

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See PAI SOP 743 for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an *a priori* detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Flags:
U = Result is less than the sample specific minimum detectable activity.
TI = Nuclide identification is tentative. See narrative for discussion.
SI = Identification is tentative due to spectral interference. See narrative for further discussion.

Remarks: Sample 99-09-049-D1 is a duplicate of 99-09-049-01.

PL 10/27/99

ATTACHMENT V

ADDENDUM

TO THE

LAND APPLICATION NOI

FOR

WATER FROM MONITORING WELL R-15

ADDENDUM TO THE LAND APPLICATION NOI FOR WATER FROM MONITORING WELL R-15

1. **Name and address of facility making the discharge.**
   Los Alamos National Laboratory
   P.O. Box 1663
   Los Alamos, New Mexico 87545

2. **Location of the discharge.**
   The R-15 monitoring well is located at Technical Area (TA)-5 in Mortandad Canyon. This is generally a flat area with a less than 10% slope at the discharge location. The new proposed land application area is to be at the drilling site. The water will be land applied onto the drilling location after completion of the monitoring well. The land application is expected to begin in the spring and continue through the summer of 2000 in order to enhance re-vegetation and reclamation of the drilling site.

3. **The means of discharge. (To lagoon, flowing stream, watercourse, arroyo, septic tank, other).**
   The sprinkled discharge will be applied to the surface of the drilling site by means of a sprinkler system. The method of land application is described in the original NOI submitted on June 25, 1999, document number ESH-18/WQ&H:99-0245. All requirements specified in the June 25, 1999 NOI concerning erosion and run-off controls for this discharge to take place will be adhered to.

4. **The estimated concentration of contaminants (if any) in the discharge.**
   The enclosed analytical data of water samples collected from the 646 and 1100 foot depth of monitoring well R-15 are representative of containerized water to be land applied.

5. **The type of operation from which the discharge is derived**
   The R-15 Monitoring Well is part of the on-going study undertaken by Los Alamos National Laboratory in order to better understand the geologic and hydrologic characteristics of the regional aquifer, intermediate perched zones, and unsaturated zones at the Laboratory. The approximately 35,000 gallons of water to be discharged will be collected from the drilling, purging and sampling operations at this monitoring well.

6. **The estimated flow to be discharged per day.**
   The discharge of water will be on an as needed basis during the spring and summer of 2000 in order to promote and enhance re-vegetation efforts at the R-15 monitoring well drilling site.

7. **The estimated depth to groundwater (if available)**
   The regional aquifer is located at the 1100 foot depth.

Signed: _____ Date: Dec. 13, 1999
Group Leader, ESH-18

ATTACHMENT VI

MONITORING WELL R-15

646 FEET

FOCUSED VALIDATION REPORT
CAMO-99-0103
CAMO-99-0105

X-Sender: 113274@er.lanl.gov
X-Mailer: QUALCOMM Windows Eudora Pro Version 4.0.1
Date: Fri, 03 Dec 1999 15:04:12 -0700
To: csmith@lanl.gov, nylander@lanl.gov, broxton@lanl.gov, mcinroy@lanl.gov, kmullen@lanl.gov, canepa_julie@lanl.gov, plongmire@lanl.gov, pratt_allyn_r@lanl.gov, royb@lanl.gov, u109949@lanl.gov, stevenrae@lanl.gov, torig@lanl.gov, bartvan@lanl.gov, bbeers@lanl.gov, plongmire@lanl.gov
From: "Bart J. Vanden Plas" <bartvan@lanl.gov>
Subject: Focused Validation of samples CAMO-99-103 and CAMO-99-105
Cc: wbh@lanl.gov

Focused validation report for samples CAMO-99-103 and CAMO-99-105

Samples CAMO-99-103 and CAMO-99-105 were collected from well R-15. Sample CAMO-99-015 is a field duplicate of sample CAMO-99-103. The results reported for the volatile organic compound analysis (VOA) (following EPA SW-846 Method 8260B) indicated that acetone was possibly present in the samples. The high explosive (HE) analysis (following EPA SW-846 Method 8330) indicated that 4-amino-2,6-dinitrotoluene was possibly present in sample CAMO-99-103 and not in the field duplicate sample CAMO-99-105. Since acetone is a possible laboratory contaminant and because of the difference between the sample and field duplicate in the high explosives analyses, the data were submitted for a focused validation of the organic analyses conducted. This focused validation also included the semivolatile organic compound analysis (SVOA) (following EPA SW-846 Method 8270C) in order to provide a complete picture of the possible organic compounds present in the samples.

The review of the VOA indicated that the samples were analyzed very late in the analytical run sequence. The method blank was analyzed well before samples CAMO-99-103 and CAMO-99-105 were analyzed. Even though the method blank was clean, there were over one dozen samples analyzed between the method blank and samples CAMO-99-103 and CAMO-99-105. This indicates that there were many opportunities for the system to become contaminated. In addition, the method blank and all the samples were contaminated with methylene chloride, another common laboratory contaminant. Typically, acetone and methylene chloride are found together since they are used in the laboratory to extract the target compounds in the SVOA method. However, following the EPA National Functional Guidelines for Organic Data Review, there is no direct evidence to indicate that the detection of acetone in these samples is related to laboratory contamination. Therefore, the results must be reported as detections.

The review of the detection of the 4-amino-2,6-dinitrotoluene in the HE analysis of sample CAMO-99-103 was more complicated. A review of the data indicated that the detection was confirmed by second-column analysis and that the detection of 4-amino-2,6-dinitrotoluene in the field duplicate sample was not confirmed because the second column result was just below the quantitation limit on the second column. Another important piece of evidence is that there were a number of peaks on both columns for both samples and most of the HE compounds were possibly detected but the confirmations were not acceptable. In fact, the confirmation of 4-amino-2,6-dinitrotoluene was not of acceptable quality because the percent difference (%D) between the quantitation on the two columns was 175%. A %D value that is that high indicates that there is either a large interference

(positive or negative) on one of the columns or that the peaks really are from two different compounds and the target compound is not really present in the sample. In order to investigate which of these possibilities were most likely, the SVOA data were reviewed.

The SVOA data indicated that there were a large number of non-target compounds in the sample, some of which were tentatively identified by the laboratory. The only target compounds detected were phthalates, which are common sample contaminants that can be introduced in the field or laboratory. The tentatively identified compounds (TICs) appeared to be mainly oxygenated hydrocarbon compounds, with some identified as ketones, aldehydes, and carboxylic acids. There was no direct evidence of amino or nitro compounds in the SVOA; however, the levels seen in the HE analysis were an order of magnitude lower than the TICs that were detected in the SVOA. The oxygenated compounds that were detected could indicate the presence of a surfactant or other compound introduced into the well during construction, possibly by the drilling mud or the lubricant used. The large number of non-target peaks seen in the SVOA indicates an increased possibility for both interferences and false positive results in the HE analysis, so neither possibility can be ruled out.

In conclusion, the evidence provided can't rule out the detections of acetone and 4-amino-2,6-dinitrotoluene; however, it does not appear likely that either of these compounds are really present in the groundwater at R-15. Further investigation is needed to clarify the results for these analytes in samples CAMO-99-103 and CAMO-99-105. The first step will be to sample the drilling mud and the lubricant used in drilling R-15 to determine if the same organic compounds are detected in these materials. In addition, it will be necessary to resample the well once it is developed to determine if the compounds are present in the groundwater.

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Bart J. Vanden Plas CIH
(505) 667-0675
bartvan@lanl.gov