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FINAL REPORT FOR SAMPLES FROM 100-N APATITE BARRIER GROUND WATER REMEDIATION PROJECT, AUGUST 2008

Sample Group No. 222S20080701

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222-S LABORATORY

FINAL REPORT FOR SAMPLES FROM 100-N APATITE BARRIER GROUND WATER REMEDIATION PROJECT, AUGUST 2008

1.0 INTRODUCTION

Four water samples from the Ground Water Remediation Project 100-N Apatite Barrier were received at the 222-S Laboratory on August 6, 2008 and assigned to group 222S20080701. The samples were analyzed in accordance with ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory* and *Statement of Work for ATL/222-S Laboratory Services for the 100-NR-2 Apatite PRB Treatability Test Sequestration of Sr-90 Sample Analysis* (SOW). All known deviations from the requirements in these documents are sited in this narrative.

Attachment 1	Data Summary Report
Attachment 2	Receipt Paperwork

2.0 SAMPLE RECEIPT AND HANDLING

The samples were collected and delivered to the laboratory on August 6, 2008. The sample custodian was unable to measure the temperature of the samples, since a temperature blank was not included with the sample shipment. The samples were refrigerated after receipt.

3.0 ANALYTICAL RESULTS

The Data Summary Report, included as Attachment 1, presents the analytical results for the analytes requested on the chain of custody. In this attachment, the column labeled "A#" indicates the aliquot class or the method used for sample preparation before analysis. Since the only analysis required was ion chromatography (IC), a direct analysis without any preparation, this column is blank.

3.1 HOLDING TIME REPORT

The SOW requested that the laboratory strive to meet the holding times specified in SW-846, Method 9056 or at a minimum not exceed double the holding time. Nitrate, nitrite, and phosphate have a holding time of 48 hours. Chloride, fluoride, and sulfate have a holding time of 28 days. Since all the requested anions are analyzed at the same time in a given sample, only the holding time information for nitrate, nitrite and phosphate are presented in Table 1.

Table 1. Holding Times

Lab. Sample ID	Analyte	Sampling Date	Analysis Date	Elapsed Time	SW-846 Holding Time
S08M000107	Nitrate/ Nitrite	8/06/08, 08:45	8/08/08, 00:33	39:48	48 hours
S08M000108	Nitrate/ Nitrite	8/06/08, 09:45	8/08/08, 01:15	39:30	48 hours
S08M000109	Nitrate/ Nitrite	8/06/08, 10:05	8/08/08, 01:29	39:29	48 hours
S08M000110	Nitrate/ Nitrite	8/06/08, 08:55	8/08/08, 01:43	40:48	48 hours
S08M000107	Phosphate	8/06/08, 08:45	8/08/08, 01:57	41:12	48 hours
S08M000108	Phosphate	8/06/08, 09:45	8/08/08, 03:07	41:22	48 hours
S08M000109	Phosphate	8/06/08, 10:05	8/08/08, 03:21	41:16	48 hour
S08M000110	Phosphate	8/06/08, 08:55	8/08/08, 01:43	40:48	48 hours

3.2 ION CHROMATOGRAPHY

The IC analysis was performed on direct aliquots. The laboratory control sample and matrix spike recoveries met the criteria listed in ATL-MP-1011. The relative percent difference between sample and duplicate results were less than 20%. The low level standard for chloride was below the required 75% recovery at 67.2%. This was due to low level interference, which made the peak difficult to integrate. Since the instrument response for chloride in the samples was well above that of the LLS, it is the laboratory's opinion that the analytical results were not affected. A low level of chloride was detected in method blank. This was due to the same interferent that affected the LLS recovery. Since this result was less than 5% of the sample results, the data is not affected. The chloride interference issue is being address by the laboratory.

4.0 ANALYTICAL PROCEDURES

Table 2 presents the 222-S Laboratory analytical procedure used to generate the reported results.

Table 2. Analytical Procedures.

Analysis	Reference Method	Analysis Procedure
IC	SW846-9056	LA-533-107 Rev. H-0

5.0 REFERENCES

Statement of Work for ATL/222-S Laboratory Services for the 100-NR-2 Apatite PRB Treatability, August, 2008, Fluor Hanford, Inc., Richland, Washington.

ATL-MP-1011, 2008, *ATL Quality Assurance Project Plan for 222-S Laboratory*, Revision 8, Advanced Technologies and Laboratories International, Inc., Richland, Washington.

Attachment 1

DATA SUMMARY REPORT

Data Summary of All Results

Sample Group: 20080701

Customer Group or SDG Number: 222S20080701

Customer Sample ID: B1WP17

Sample Portion: Liquid

Sample# R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err %	Qual Flags
S08M000107		Fluoride	ug/mL	100	<6.16E-03	<0.622	<0.622	n/a	n/a	76.4	0.622	n/a	
S08M000107		Chloride	ug/mL	95.1	0.0512	283	272	278	3.90	75.8	0.313	n/a	
S08M000107		Nitrite	ug/mL	99.6	<0.0400	<2.04	<2.04	n/a	n/a	107	2.04	n/a	U
S08M000107		Nitrate	ug/mL	104	<0.0162	<0.826	<0.826	n/a	n/a	99.6	0.826	n/a	U
S08M000107		Phosphate	ug/mL	98.3	<0.0381	664	653	659	1.67	93.5	1.94	n/a	
S08M000107		Sulfate	ug/mL	98.0	<0.0219	<1.12	<1.12	n/a	n/a	92.4	1.12	n/a	U

222S20080701

E - Estimated

U - < Det Limit

Data Summary of All Results

Sample Group: 20080701

Customer Group or SDG Number: 222S20080701

Customer Sample ID: B1WP18

Sample Portion: Liquid

Sample# R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err %	Qual Flags
S08M000108		Fluoride	ug/mL	100	<6.16E-03	<0.314	n/a	n/a	n/a	n/a	0.314	n/a	U
S08M000108		Chloride	ug/mL	95.1	0.0512	123	n/a	n/a	n/a	n/a	0.158	n/a	
S08M000108		Nitrite	ug/mL	99.6	<0.0400	<2.04	n/a	n/a	n/a	n/a	2.04	n/a	U
S08M000108		Nitrate	ug/mL	104	<0.0162	<0.826	n/a	n/a	n/a	n/a	0.826	n/a	U
S08M000108		Phosphate	ug/mL	98.3	<0.0381	720	n/a	n/a	n/a	n/a	1.94	n/a	
S08M000108		Sulfate	ug/mL	98.0	<0.0219	1.38	n/a	n/a	n/a	n/a	1.12	n/a	E

222S20080701

E - Estimated

U - < Det Limit

Data Summary of All Results

Sample Group: 20080701

Customer Group or SDG Number: 222S20080701

Customer Sample ID: B1WP20

Sample Portion: Liquid

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err %	Qual Flags
S08M000109			Fluoride	ug/mL	100	<6.16E-03	<0.314	n/a	n/a	n/a	n/a	0.314	n/a	U
S08M000109			Chloride	ug/mL	95.1	0.0512	249	n/a	n/a	n/a	n/a	0.313	n/a	
S08M000109			Nitrite	ug/mL	99.6	<0.0400	<2.04	n/a	n/a	n/a	n/a	2.04	n/a	U
S08M000109			Nitrate	ug/mL	104	<0.0162	<0.826	n/a	n/a	n/a	n/a	0.826	n/a	U
S08M000109			Phosphate	ug/mL	98.3	<0.0381	980	n/a	n/a	n/a	n/a	1.94	n/a	
S08M000109			Sulfate	ug/mL	98.0	<0.0219	<1.12	n/a	n/a	n/a	n/a	1.12	n/a	U

222S20080701

E - Estimated

U - < Det Limit

Data Summary of All Results

Sample Group: 20080701

Customer Group or SDG Number: 222S20080701

Customer Sample ID: B1WP21

Sample Portion: Liquid

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err %	Qual Flags
S08M000110			Fluoride	ug/mL	100	<6.16E-03	<0.314	n/a	n/a	n/a	n/a	0.314	n/a	U
S08M000110			Chloride	ug/mL	95.1	0.0512	210	n/a	n/a	n/a	n/a	0.313	n/a	
S08M000110			Nitrite	ug/mL	99.6	<0.0400	<2.04	n/a	n/a	n/a	n/a	2.04	n/a	U
S08M000110			Nitrate	ug/mL	104	<0.0162	<0.826	n/a	n/a	n/a	n/a	0.826	n/a	U
S08M000110			Phosphate	ug/mL	98.3	<0.0381	1.33E+03	n/a	n/a	n/a	n/a	3.85	n/a	
S08M000110			Sulfate	ug/mL	98.0	<0.0219	<1.12	n/a	n/a	n/a	n/a	1.12	n/a	U

222S20080701

E - Estimated

U - < Det Limit

Attachment 3

RECEIPT PAPERWORK

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F06-027-288	PAGE 1 OF 1
COLLECTOR J Mulder	**COMPANY CONTACT** TRENT, SJ	**TELEPHONE NO.** 373-5869	**PROJECT COORDINATOR** TRENT, SJ	**PRICE CODE** 7K **DATA TURNAROUND**
SAMPLING LOCATION 199-N-140	**PROJECT DESIGNATION** 100-N Apatite Barrier Performance Monitoring		**SAF NO.** F06-027	**AIR QUALITY** ☐ **15 Days / 45 Days**
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF-N-585-11	**ACTUAL SAMPLE DEPTH**	**COA** 122561ES20	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE
Tie to Split Sample: B1WNX7

PRESERVATION	Cool~4C
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	250mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B1WP17	WATER	8/6/8	0845
S08TM000107			

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CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
J Mulder	8/6/8 1340		8-6-08 1340

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS
(1)IC Anions - 9056 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}

GRP# 20080701

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

222S20080701

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F06-027-289	PAGE 1 OF 1
COLLECTOR J. Newton	COMPANY CONTACT TRENT, SJ	TELEPHONE NO. 373-5869	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 7K AIR QUALITY ☐	DATA TURNAROUND 15 Days / 45 Days
SAMPLING LOCATION 199-N-141	PROJECT DESIGNATION 100-N Apatite Barrier Performance Monitoring		SAF NO. F06-027		
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-585-11	ACTUAL SAMPLE DEPTH	COA 122561ES20	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE
Tie to Split Sample: B1WNX9

PRESERVATION	Cool~4C
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	250mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B1WP18	WATER	8/6/8	0945
SOEMUCO 108			

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
J. Newton [signature]	8/6/8 1340	[signature]	8-6-08 1340

SPECIAL INSTRUCTIONS
(1)IC Anions - 9056 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}

GRP# 20080701

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

222S20080701

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F06-027-291	PAGE 1 OF 1
COLLECTOR J. Mueller	**COMPANY CONTACT** TRENT, SJ	**TELEPHONE NO.** 373-5869	**PROJECT COORDINATOR** TRENT, SJ	**PRICE CODE** 7K **DATA TURNAROUND**
SAMPLING LOCATION 199-N-162	**PROJECT DESIGNATION** 100-N Apatite Barrier Performance Monitoring		**SAF NO.** F06-027	**AIR QUALITY** ☐ **15 Days / 45 Days**
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF-N-585-11	**ACTUAL SAMPLE DEPTH**	**COA** 122561ES20	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE
Tie to Split Sample: B1WNY3

PRESERVATION	Cool~4C
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	250mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B1WP20	WATER	8/6/8	1005
S08M00 109			

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
J. Mueller	8/6/8 1340	R. Hilbert	8-6-08 1340

SPECIAL INSTRUCTIONS
(1)IC Anions - 9056 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}

GRP# 20080701

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

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222S20080701

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F06-027-292	PAGE 1 OF 1
COLLECTOR Mueller J	**COMPANY CONTACT** TRENT, SJ	**TELEPHONE NO.** 373-5869	**PROJECT COORDINATOR** TRENT, SJ	**PRICE CODE** 7K **DATA TURNAROUND**
SAMPLING LOCATION 199-N-145	**PROJECT DESIGNATION** 100-N Apatite Barrier Performance Monitoring		**SAF NO.** F06-027	**AIR QUALITY** ☐ **15 Days / 45 Days**
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF-N-585-11	**ACTUAL SAMPLE DEPTH**	**COA** 122561ES20	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE
Tie to Split Sample: B1WNY5

PRESERVATION	Cool~4C
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	250mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B1WP21	WATER	8/6/8	0855
SOSMCOO 110			

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
J. Mueller Duke	8/6/8 1340	RT Bloom	8-6-08 1340

SPECIAL INSTRUCTIONS
(1)IC Anions - 9056 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}

GRP # 2080701

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

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222S20080701