



2609 North River Road, Port Allen, Louisiana 70767

(800) 401-4277 -- FAX (225) 381-2996

American Radiation Services, Inc.

Laboratory Analysis Report

ARS1-08-01562

Prepared for:

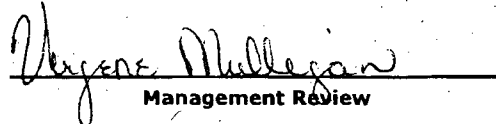
Nuclear Regulatory Commission (NRC)

James Noggle
USNRC Region 1
475 Allendale Road
King of Prussia, PA 19406
James.Noggle@nrc.gov

Phone: 610.337.5063

Fax:


Project Manager Review


Management Review

Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

Contact Person: Questions regarding this analytical report should be addressed to:

Project Manager

ProjectManagers@amrad.com

Phone: 225.381.2991
Fax: 225.381.2996

LELAP Cert# 30658

NELAP Cert# E87558



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September 16, 2008

Nuclear Regulatory Commission
James Noggle
475 Allendale Road
King of Prussia, PA 19406

Client Sample: LAF-002-(009)
ARS SGD: ARS1-08-01562-001

Dear Mr. Noggle,

On August 12, 2008, American Radiation Services (ARS) received 1 Ground Water Sample to be analyzed for Gamma Spectroscopy, Tritium, Strontium-90, and Nickel-63.


The sample was processed and counted using the appropriate counting equipment and QA/QC for this type of analysis. Results of the analysis and QA/QC are attached in the data package.

The sample and QA/QC's were counted with a count time sufficient to meet a statistical sound detection limits.

Counting equipment Quality Assurance was with in acceptance criteria when the above referenced samples were processed.

If you have any questions please do not hesitate to call at 225-381-2991.

Sincerely,


Laboratory Director
American Radiation Services



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COVER PAGE

Statement of Work for Analytical Laboratories

PROJECT SAMPLE IDENTIFICATION CROSS-REFERENCE TO ARS SAMPLE LABORATORY IDs

CLIENT SAMPLE	American Radiation Services SAMPLE ID NUMBER(S)
LAF-002-(009)	ARS1-08-01562-001

SAMPLE RECEIPT

The samples were received in good condition. The samples were screened for radioactive contamination as per procedure ARS-062 "Sample Receiving".

ANALYTICAL METHODS

The Gamma Spectroscopy determinations were performed using American Radiation Services procedure ARS-007/EPA 901.1, "Gamma Emitting Radionuclides in Water." The tritium analyses were performed using American Radiation Services procedure ARS-054, "Tritium In Water". The Strontium-90 analyses were performed using American Radiation Services procedure ARS-032, "Total Strontium by Eichrom Resin Separation." The Nickel-63 analyses were performed using American Radiation Services procedure ARS-022.

ANALYTICAL RESULTS

The result data that are flagged with "U" indicates that the activity is below the MDC.

For Nickel-63 analyses, the LCSD fell outside the acceptance criteria biased low; however, the LCS did meet the acceptance criteria and the RER/DER met acceptance criteria. The data is being reported per technical review.

For Strontium analyses, the LCSD fell outside the acceptance criteria biased low; however, this was due to loss of sample during the analysis due to equipment malfunction. RER and DER didn't meet acceptance criteria due to low bias of LCSD; however the LCS is well within the acceptance criteria. The data is being reported per technical review.



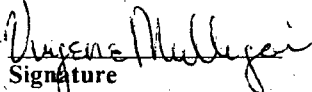
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American Radiation Services Project Manager/Laboratory Manager's Comments:

"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."

"I certify that this electronic image, and all hardcopies produced from this image, accurately represents the data and is in compliance with the client specific requirements, both technically and for completeness, other than the conditions detailed above or in the sample data package narrative. Release, by submission through email, the data contained in this electronic image and the computer-readable EDD (as applicable), has been authorized by the laboratory Manager/Technical Director or the Manager's designee."


Signature

Laboratory Director, American Radiation Services
Title

9-16-08
Date



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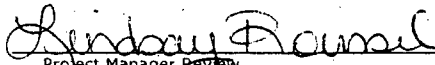
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ARS Sample Delivery Group: ARS1-08-01562
Client Sample ID: LAF-002-(009)04-10/1048
Sample Collection Date: 04/10/08 10:48
Sample Matrix: Aqueous

Request or PO Number: N/A
ARS Sample ID: ARS1-08-01562-001
Date Received: 8/12/2008
Report Date: 08/22/08 08:27

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
MN-54	-0.945	1.622	2.230	1.115	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
FE-59	-1.358	1.338	4.470	2.235	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
CO-58	-0.531	2.534	2.250	1.125	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
CO-60	-1.406	2.454	2.790	1.395	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
ZN-65	-1.583	1.580	5.280	2.640	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
ZR-95	0.829	1.001	3.370	1.685	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
NB-95	-0.093	0.526	1.800	0.900	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
CS-134	-20.159	706.380	25.100	12.550	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
CS-137	-0.084	0.698	2.370	1.185	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
BA-140	-4.426	27.062	7.990	3.995	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
LA-140	-1.536	3.584	3.170	1.585	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
SR-90	0.248	0.083	0.253	0.121	pCi/L	ARS-032/Eichrom SRW-01	8/21/08 14:48	BJS	108.00%
H-3	-8.789	96.061	163.989	80.754	pCi/L	ARS-054/EPA 906.0	9/8/08 4:31	BJS	N/A
NI-63	-0.583	4.788	8.185	4.027	pCi/L	ARS-022	9/7/08 13:49	BJS	N/A

NOTES: Preliminary Report / Shipment# 08-152 / NRC-03-08-072


Project Manager Review

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NELAP Certificate # E87558



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QC Results Report

Sample Delivery Group: ARS1-08-01562
Date Received: 08/12/08

Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1σ)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B08-02213	LCS	Sr-90	15.91	1.2	0.295	20.80		pCi/L	ARS-032/EPA 905.0	8/21/08 14:48	BJS	77	75%-125%

Blank Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1σ)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician
ARS1-B08-02213	MBL	Sr-90	-0.099	0.083	0.253	NA	U	pCi/L	ARS-032/EPA 905.0	8/21/08 14:48	BJS

RER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1σ)	Result 2	CSU 2 (1σ)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	RER	RER Acceptance Range
ARS1-B08-02213	LCS	Sr-90	15.91	1.2	13.13	1.0		pCi/L	ARS-032/EPA 905.0	8/21/08 14:48	BJS	1.24	< 1

DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1σ)	Result 2	CSU 2 (1σ)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	DER	DER Acceptance Range
ARS1-B08-02213	LCS	Sr-90	15.91	1.2	13.1	1.0		pCi/L	ARS-032/EPA 905.0	8/21/08 14:48	BJS	3.49	< 3

Lindsay Rounel
Project Manager Review

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QC Results Report

Sample Delivery Group: ARS1-08-01562

Date Received: 08/12/08

Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B08-02204	LCS	CO-60	24779.00	495.75	200.80	25315.22		pCi/g	EPA 901.1	08/18/08	JLA	98	75%-125%
ARS1-B08-02204	LCS	CS-137	15083.00	359.87	137.80	15285.98		pCi/g	EPA 901.1	08/18/08	JLA	99	75%-125%
ARS1-B08-02204	LCS	AM-241	34007.00	1235.00	277.10	34794.33		pCi/g	EPA 901.1	08/18/08	JLA	98	75%-125%

Blank Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date	Analysis Technician
ARS1-B08-02204	MBL	CO-60	-0.001	0.005	0.005	NA	U	pCi/g	EPA 901.1	08/18/08	JLA
ARS1-B08-02204	MBL	CS-137	0.001	0.001	0.004	NA	U	pCi/g	EPA 901.1	08/18/08	JLA
ARS1-B08-02204	MBL	AM-241	-0.001	0.014	0.006	NA	U	pCi/g	EPA 901.1	08/18/08	JLA

RER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1 s)	Result 2	CSU 2 (1 s)	Qual	Analysis Units	Analysis Test Method	Analysis Date	Analysis Technician	RER	RER Acceptance Range
ARS1-B08-02204	LCSD	CO-60	24779.00	495.75	25129.00	492.32		pCi/g	EPA 901.1	08/18/08	JLA	0.35	< 1
ARS1-B08-02204	LCSD	CS-137	15083.00	359.87	15425.00	341.69		pCi/g	EPA 901.1	08/18/08	JLA	0.49	< 1
ARS1-B08-02204	LCSD	AM-241	34007.00	1235.00	34050.00	1247.60		pCi/g	EPA 901.1	08/18/08	JLA	0.02	< 1

DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1 s)	Result 2	CSU 2 (1 s)	Qual	Analysis Units	Analysis Test Method	Analysis Date	Analysis Technician	DER	DER Acceptance Range
ARS1-B08-02204	LCSD	CO-60	24779.00	495.75	25129.00	492.32		pCi/g	EPA 901.1	08/18/08	JLA	1.00	< 3
ARS1-B08-02204	LCSD	CS-137	15083.00	359.87	15425.00	341.69		pCi/g	EPA 901.1	08/18/08	JLA	1.38	< 3
ARS1-B08-02204	LCSD	AM-241	34007.00	1235.00	34050.00	1247.60		pCi/g	EPA 901.1	08/18/08	JLA	0.05	< 3

Lindsay Roumel
Quality Assurance Review

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QC Results Report

Sample Delivery Group: ARS1-08-01562

Date Received: 8/12/2008

Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
N/A	LCS	Ni-63	223.41	51.9	8.5485	204.46		pCi/L	ARS-022	9/5/08 19:45	BJS	109	75%-125%

Blank Evaluation

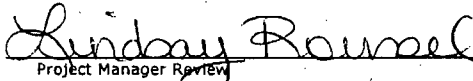
Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician
N/A	MBL	Ni-63	2.094	4.66	7.8386	NA	U	pCi/L	ARS-022	9/6/08 4:18	BJS

RER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1 s)	Result 2	CSU 2 (1s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	RER	RER Acceptance Range
N/A	LCSD	Ni-63	223.41	51.9	143.428	33.597		pCi/L	ARS-022	9/6/08 0:03	BJS	0.94	< 1

DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1 s)	Result 2	CSU 2 (1s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	DER	DER Acceptance Range
N/A	LCSD	Ni-63	223.41	51.9	143.428	33.597		pCi/L	ARS-022	9/6/08 0:03	BJS	2.59	< 3


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QC Results Report

Sample Delivery Group: ARS1-08-01562

Date Received: 8/12/2008

Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B08-02293	LCS	H3	1136.06	161.4	158.48416	1270.45		pCi/L	ARS-054/EPA 906.0	9/4/08 18:01	BJS	89	75%-125%

Blank Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician
ARS1-B08-02293	MBL	H3	67.923	94.439817	158.41962	NA	U	pCi/L	ARS-054/EPA 906.0	9/5/08 2:16	BJS

RER Duplicate Evaluation

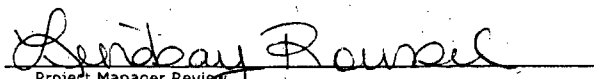
Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1 s)	Result 2	CSU 2 (1s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	RER	RER Acceptance Range
ARS1-B08-02293	LCSD	H3	1136.06	161.4	1143.2572	161.9636		pCi/L	ARS-054/EPA 906.0	9/4/08 22:09	BJS	0.02	< 1

DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1 s)	Result 2	CSU 2 (1s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	DER	DER Acceptance Range
ARS1-B08-02293	LCSD	H3	1136.06	161.4	1143.2572	161.9636		pCi/L	ARS-054/EPA 906.0	9/4/08 22:09	BJS	0.06	< 3

Matrix Spike

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	Unspiked Activity	Spike Con.	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B08-02293	MS	H3	13755.623	1429.035	1862.953	13970.11		pCi/L	ARS-054/EPA 906.0	9/5/08 6:24	BJS	85	60%-140%


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Notes:

Comments:

- 1.0) Soil and Sludge analysis are reported on a wet basis or an as received basis unless otherwise indicated.
- 2.0) The data in this report are within the limits of uncertainty specified in the reference method unless specified.
- 3.0) Modified analysis procedures are procedures that are modified to meet the certain specifications. An example may be the use of a water method to analyze a solid matrix due to the lack of an officially recognized procedure for the analysis of the solid matrix.
- 4.0) Derived Air Concentrations and Effluent Release Concentrations are obtained from 10 CFR 20 Appendix B.
- 5.0) Total activity is actually total gamma activity and is determined utilizing the prominent gamma emitters from the naturally occurring radioactive decay chains and other prominent radioactive nuclides. Total activity may be lower than the actual total activity due to the extent of secular equilibrium achieved in the various decay chains at the time of analysis. The total activity is not representative of nuclides that emit solely alpha or beta particles.
- 6.0) Ra-228 is determined via secular equilibrium with its daughter, Actinium 228. (Gamma Spectroscopy only).
- 7.0) U-238 is determined via secular equilibrium with its daughter, Thorium 234. (Gamma Spectroscopy only).
- 8.0) All gamma spectroscopy was performed utilizing high purity germanium detectors (HPGe).
- 9.0) ARS makes every attempt to match sample density to calibrated density; however, in some cases, it is not practical or possible to do so and data results may be affected.

Method References:

- 1.0) EPA 600/4-80-032, Prescribed Procedures for the Measurements of Radioactivity in Drinking Water, August 1980.
- 2.0) Standard Methods for Examination of Water and Waste Water, 18th, 1992.
- 3.0) EPA SW-846, Test Methods for Evaluating Solid Waste, Third Edition, (9/86). (Updated through 1995).
- 4.0) EPA 600/4/79-020, Methods for Chemical Analysis of Water and Waste, March 1983.
- 5.0) HASL 300

Definitions:

- | | | |
|-------|-----------------|--|
| 1.0) | BDL | Analyte not detected because the value was below the detection limit. |
| 2.0) | ND | Not detected above the detection limit. |
| 3.0) | Detection Limit | The minimum amount of the analyte that ARS can detect utilizing the specific analysis. |
| 4.0) | B | Method Blank |
| 5.0) | D | Method Duplicate |
| 6.0) | MS | Matrix Spike |
| 7.0) | S | Spike |
| 8.0) | RS | Reference Spike |
| 9.0) | *SC | Subcontracted out to another qualified laboratory |
| 10.0) | NR | Not Referenced |
| 11.0) | N/A | Not Applicable |
| 12.0) | * | Reported as a calculated value |
| 13.0) | ** | False Positive due to interference from <u>Bi-214</u> |

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SHIPMENT # 08-152

NRC FORM 303 (4-2004) U.S. NUCLEAR REGULATORY COMMISSION REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY				LABORATORY USE ONLY			
LABORATORY: _____				CONTROL NUMBER _____			
SAMPLE LOCATION (LICENSEE) INDIAN POINT ENERGY CENTER				LICENSEE NUMBER _____		DOCKET NO. _____	
SAMPLE SUBMITTED				DATE SAMPLES SUBMITTED _____		PRIORITY <input type="checkbox"/> ROUTINE <input type="checkbox"/> URGENT	
# TOTAL	TYPE	VOLUME	WEIGHT	SAMPLE COLLECTION INTERVAL		MONTH DAY YEAR TIME	
1	GROUND WATER	2000 ML	~ 2 Kg				
INSPECTOR RESPONSIBLE Jim Noggle (USNRC)				TELEPHONE NUMBER (610) 337-5063			
ANALYSIS TO BE PERFORMED		LIST DESIRED LLD (Optional)	OTHER TYPE OF ANALYSIS (Specify)			LIST DESIRED LLD (Optional)	
<input type="checkbox"/> GROSS ALPHA (GA)			<input checked="" type="checkbox"/> STRONTIUM-90 (Sr90)				
<input type="checkbox"/> GROSS BETA (GB)			<input checked="" type="checkbox"/> NICKEL-63 (Ni63)				
<input checked="" type="checkbox"/> GAMMA SPEC (GS)			<input type="checkbox"/>				
<input checked="" type="checkbox"/> TRITIUM (H3)			<input type="checkbox"/>				
<input type="checkbox"/> CARBON-14 (C14)			<input type="checkbox"/>				
<input type="checkbox"/> IODINE-125 (I125)			<input type="checkbox"/>				
RELEQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY			
<i>Paul Gordon</i>	<i>Jim Noggle</i>	4/10/08	10 52 am	<i>Sample receipt</i>			
<i>J. Nuff</i>	<i>Donahue</i>	04/10/08	1052	<i>Sample storage; awaiting shipping</i>			
<i>Donahue</i>	SECURE STORAGE	4/20/08	1205	<i>Sample Storage</i>			
STORAGE	<i>W. Selt</i>	8-7-2008	1100	<i>PREP FOR SHIPMENT</i>			
<i>W. Selt</i>	FED/EX	8-7-2008	1600	<i>SHIPMENT</i>			
	<i>[Signature]</i>	8-12-08	09:56				
FEE RECOVERABLE <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES TAC NUMBER _____							
REMARKS: Inspection Report: 1007005							
NOTE: SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS REASON ARE NOTED IN REMARKS ABOVE.							

NRC FORM 303
(4-2004)

U.S. NUCLEAR REGULATORY COMMISSION

LABORATORY USE ONLY
CONTROL NUMBER

SAMPLE RECORD - Continued

LABORATORY: _____

SAMPLE NUMBER	SAMPLE NAME AND DESCRIPTION	COLLECTION DATE/TIME	REMARKS, PRESERVATIVE ANALYSIS REQUESTED, ETC.
LAF-002-(009)	Ground Water Split Sample of LAF-002-(009)	04-10-08 1048	Sample is unfiltered & unpreserved. Analyze for Gamma Spec, H3, Sr90, Ni63