



2609 North River Road, Port Allen, Louisiana 70767  
(800) 401-4277 -- FAX (225) 381-2996

**American Radiation Services, Inc.**

**Laboratory Analysis Report**

**ARS1-09-00989**

*Prepared for:*

**Nuclear Regulatory Commission (NRC)**

**Gene Bonano  
USNRC Region 3  
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Lisle, IL 60532  
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Project Manager Review

  
Management Review

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**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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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-01  
**Sample Collection Date:** 03/10/09 09:05  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-001  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:54

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	87.371	95.939	160.110	78.884	U	pCi/L	ARS-054/EPA 906.0	3/29/09 7:40	BS	N/A

**NOTES: Braidwood Station BD-09-1**

  
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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-02  
**Sample Collection Date:** 03/10/09 10:55  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-002  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:54

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	85.870	95.847	160.021	78.840	U	pCi/L	ARS-054/EPA 906.0	3/29/09 11:47	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-03  
**Sample Collection Date:** 03/10/09 10:25  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-003  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:54

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	79.305	96.005	160.587	79.119	U	pCi/L	ARS-054/EPA 906.0	3/29/09 15:54	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-04  
**Sample Collection Date:** 03/10/09 13:15  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-004  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:54

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	22.402	94.365	160.030	78.844	U	pCi/L	ARS-054/EPA 906.0	3/29/09 20:01	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-05  
**Sample Collection Date:** 03/10/09 09:45  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-005  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:54

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	706.506	128.501	160.835	79.240		pCi/L	ARS-054/EPA 906.0	3/30/09 0:08	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-06  
**Sample Collection Date:** 03/10/09 15:20  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-006  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:54

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	109.020	97.138	161.128	79.385	U	pCi/L	ARS-054/EPA 906.0	3/30/09 4:15	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-07  
**Sample Collection Date:** 03/10/09 11:25  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-007  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	23.667	94.469	160.165	78.910	U	pCi/L	ARS-054/EPA 906.0	3/30/09 8:22	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-08  
**Sample Collection Date:** 03/10/09 15:54  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-008  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	149.032	98.981	162.170	79.898	U	pCi/L	ARS-054/EPA 906.0	3/30/09 12:29	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-09  
**Sample Collection Date:** 03/10/09 14:15  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-009  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	78.714	96.278	161.081	79.362	U	pCi/L	ARS-054/EPA 906.0	3/30/09 16:37	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-10  
**Sample Collection Date:** 03/10/09 14:50  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-010  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	2454.513	283.524	160.984	79.314		pCi/L	ARS-054/EPA 906.0	3/30/09 20:44	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-11  
**Sample Collection Date:** 03/10/09 14:53  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-011  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	253.866	102.222	160.935	79.290		pCi/L	ARS-054/EPA 906.0	3/31/09 0:51	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-12  
**Sample Collection Date:** 03/10/09 13:15  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-012  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	-65.714	93.854	161.460	79.548	U	pCi/L	ARS-054/EPA 906.0	3/31/09 4:58	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-13  
**Sample Collection Date:** 03/10/09 13:46  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-013  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	26.467	94.887	160.780	79.213	U	pCi/L	ARS-054/EPA 906.0	3/31/09 9:05	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-14  
**Sample Collection Date:** 03/10/09 14:21  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-014  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	10.181	94.282	160.294	78.974	U	pCi/L	ARS-054/EPA 906.0	3/31/09 13:12	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-15  
**Sample Collection Date:** 03/10/09 15:25  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-015  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	34.267	95.298	161.202	79.421	U	pCi/L	ARS-054/EPA 906.0	3/31/09 17:21	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-16  
**Sample Collection Date:** 03/10/09 13:45  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-016  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	-21.705	93.260	159.478	78.572	U	pCi/L	ARS-054/EPA 906.0	3/31/09 21:28	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-17  
**Sample Collection Date:** 03/10/09 11:08  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-017  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	-41.108	93.871	160.991	79.317	U	pCi/L	ARS-054/EPA 906.0	4/1/09 1:35	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-18  
**Sample Collection Date:** 03/10/09 11:38  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-018  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	1696.308	210.904	158.727	78.202		pCi/L	ARS-054/EPA 906.0	4/1/09 5:43	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-19  
**Sample Collection Date:** 03/10/09 09:40  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-019  
**Date Received:** 3/16/2009  
**Report Date:** 04/06/09 10:55

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	88.090	96.505	161.046	79.344	U	pCi/L	ARS-054/EPA 906.0	4/1/09 9:50	BS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-20  
**Sample Collection Date:** 03/10/09 10:08  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-020  
**Date Received:** 3/16/2009  
**Report Date:** 04/13/09 15:19

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	109.728	97.206	161.190	79.390	U	pCi/L	ARS-054/EPA 906.0	4/9/09 2:20	BJS	N/A

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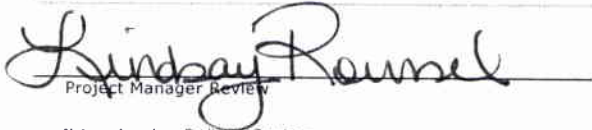
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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-21  
**Sample Collection Date:** 03/11/09 10:40  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-021  
**Date Received:** 3/16/2009  
**Report Date:** 04/13/09 15:19

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	105.121	97.536	161.986	79.782	U	pCi/L	ARS-054/EPA 906.0	4/9/09 6:27	BJS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-22  
**Sample Collection Date:** 03/11/09 10:25  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-022  
**Date Received:** 3/16/2009  
**Report Date:** 04/13/09 15:19

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	77.728	96.863	162.126	79.851	U	pCi/L	ARS-054/EPA 906.0	4/9/09 10:34	BJS	N/A

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**ARS Sample Delivery Group:** ARS1-09-00989  
**Client Sample ID:** BD-09-1-23  
**Sample Collection Date:** 03/11/09 09:45  
**Sample Matrix:** Aqueous

**Request or PO Number:** N/A  
**ARS Sample ID:** ARS1-09-00989-023  
**Date Received:** 3/16/2009  
**Report Date:** 04/13/09 15:19

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	161.712	98.931	161.299	79.443		pCi/L	ARS-054/EPA 906.0	4/9/09 14:41	BJS	N/A

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## QC Results Report

Sample Delivery Group: ARS1-09-00989

Date Received: 3/16/2009

### 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-B09-01153	LCS	H3	1134.207	161.440	159.766	1249.329		pCi/L	ARS-054/EPA 906.0	3/28/09 15:11	BS	91	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-B09-01153	MBL	H3	23.164	94.948	160.998	NA	U	pCi/L	ARS-054/EPA 906.0	3/28/09 23:25	BS

### 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-B09-01153	LCSD	H3	1134.207	161.440	1054.222	154.786		pCi/L	ARS-054/EPA 906.0	3/28/09 19:18	BS	0.25	< 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-B09-01153	LCSD	H3	1134.207	161.440	1054.222	154.786		pCi/L	ARS-054/EPA 906.0	3/28/09 19:18	BS	0.72	< 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 (%)	MS Acceptance Range
ARS1-B09-01153	MS	H3	11148.591	1162.237	87.371	15602.52		pCi/L	ARS-054/EPA 906.0	3/29/09 3:32	BS	71	60%-140%

  
Project Manager 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 ARS International.

LELAP Certificate# 01949

NELAP Certificate # E87558



2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

## QC Results Report

Sample Delivery Group: ARS1-09-00989

Date Received: 3/16/2009

### 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-B09-01230	LCS	H3	1173.730	164.971	159.655	1247.214		pCi/L	ARS-054/EPA 906.0	4/8/09 9:51	BS	94	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-B09-01230	MBL	H3	93.886	96.922	161.481	NA	U	pCi/L	ARS-054/EPA 906.0	4/8/09 18:05	BS

### 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/Time	Analysis Technician	RER	RER Acceptance Range
ARS1-B09-01230	LCSD	H3	1173.730	164.971	1056.691	155.152		pCi/L	ARS-054/EPA 906.0	4/8/09 13:58	BS	0.37	< 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/Time	Analysis Technician	DER	DER Acceptance Range
ARS1-B09-01230	LCSD	H3	1173.730	164.971	1056.691	155.152		pCi/L	ARS-054/EPA 906.0	4/8/09 13:58	BS	1.03	< 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 (%)	MS Acceptance Range
ARS1-B09-01230	MS	H3	11248.039	1172.936	109.728	12971.59		pCi/L	ARS-054/EPA 906.0	4/8/09 22:12	BS	86	60%-140%

  
Project Manager Review

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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) Data in this report are within the limits of uncertainty specified in the reference method unless otherwise 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. Modified analyses are indicated by the subsequent addition of "m" to the procedure number (i.e. 900.0M).
- 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, 18<sup>th</sup>, 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**
- 6.0) **ARS-040**; An LCSD is not reported with this process. The criteria for the LCS/LCSD analysis for reproducibility have not been established for Low Level Tritium analysis. A prepared standard for Low Level Tritium has not been developed. As a result, the standard we use is based on the dilution of a verified conventional tritium standard. The volume required for Low Level Tritium analysis, in addition to the lack of an available Low Level Tritium standard, introduce variability into the LCS/LCSD analysis that does not represent the actual sample analysis. The preferred measure for reproducibility is to run a duplicate analysis of a sample.

### Definitions:

- |       |                 |   |
|-------|-----------------|---|
| 1.0)  | <b>ND</b>       | Not detected above the detection limit (non-detect).  |
| 2.0)  | <b>MDC</b>      | (Minimum Detectable Concentration) minimum concentration of the analyte that ARS can detect utilizing the specific analysis |
| 3.0)  | <b>MBL</b>      | Method Blank  |
| 4.0)  | <b>DO</b>       | Duplicate Original  |
| 5.0)  | <b>DUP</b>      | Method Duplicate  |
| 6.0)  | <b>MS/MSD</b>   | Matrix Spike/Matrix Spike Duplicate   |
| 7.0)  | <b>S</b>        | Spike   |
| 8.0)  | <b>RS</b>       | Reference Spike   |
| 9.0)  | <b>*SC</b>      | Subcontracted out to another qualified laboratory   |
| 10.0) | <b>NR</b>       | Not Referenced  |
| 11.0) | <b>N/A</b>      | Not Applicable  |
| 12.0) | <b>*</b>        | Reported as a calculated value  |
| 13.0) | <b>**</b>       | False Positive due to interference from <u>Bi-214</u>   |
| 14.0) | <b>U</b>        | Activity is below the MDC   |
| 15.0) | <b>LCS/LCSD</b> | Laboratory Control Standard/Laboratory Control Standard Duplicate   |

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NRC FORM 303  
(1-2007)

U.S. NUCLEAR REGULATORY COMMISSION

LABORATORY USE ONLY

**REQUEST FOR ANALYSIS AND  
CHAIN OF CUSTODY**

LABORATORY --  ORISE  OTHER ARS  
(Specify)

CONTROL NUMBER

**BD-09-1**

SAMPLE LOCATION (LICENSEE)

**Braidwood Station**

INSPECTION NO.

LICENSE NO.

DOCKET NO.

SAMPLE SUBMITTED

**050-00456**

# TOTAL

TYPE

VOLUME

WEIGHT

DATE SAMPLES SUBMITTED

PRIORITY

14

H2O

250 ml/ea

n/a

03/13/2009

ROUTINE  
 URGENT

9

H2O

125 ml/ea

n/a

SAMPLE COLLECTION INTERVAL

START

MONTH	DAY	YEAR	TIME
3	10	2009	8:00am

STOP

3	11	2009	10:40 <del>12:00pm</del>
---	----	------	-----------------------------

INSPECTOR RESPONSIBLE

**Gene Bonano**

TELEPHONE NUMBER

630-829-9826

ANALYSIS TO BE PERFORMED

LIST DESIRED  
LLD (Optional)

OTHER TYPE OF ANALYSIS (Specify)

LIST DESIRED  
LLD (Optional)

GROSS ALPHA (GA)

GROSS BETA (GB)

GAMMA SPEC (GS)

TRITIUM (H3)

200 pCi/L

CARBON-14 (C14)

IODINE-125 (I125)

RELINQUISHED BY

RECEIVED BY

DATE

TIME

REASON FOR CHANGE OF CUSTODY

**Gene Bonano**

**FEDEX**

03/13/2009

5:00pm

Samples sent to lab

FEE RECOVERABLE

YES

NO

TAC NUMBER

050-00456/2009002 (If Assigned)

REMARKS

Do not process/analyze samples until directed/authorized by Elaine Keegan (Tel.: 301-415-8517), NRR, HQ NRC...

Hold samples until notified by NRC...

NOTE: SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS REASONS ARE NOTED IN REMARKS ABOVE.



SAMPLE RECORD -- Continued

LABORATORY USE ONLY

LABORATORY --  ORISE  OTHER ARS  
(Specify)

CONTROL NUMBER

BD-09-1

SAMPLE NUMBER	SAMPLE NAME AND DESCRIPTION	COLLECTION DATE/TIME	REMARKS, PRESERVATIVE ANALYSIS REQUESTED, ETC.
BD-09-1-01	MW-110	3-10-09 9:05 AM	250 ml
BD-09-1-02	MW-111DR	3-10-09 10:55 AM	250 ml
BD-09-1-03	MW-131D	3-10-09 10:25 AM	Bad pad, loose cement, 250 ml
BD-09-1-04	MW-132D	3-10-09 1:15 PM	250 ml
BD-09-1-05	F-5D	3-10-09 9:45 AM	250 ml
BD-09-1-06	MW-105	3-10-09 3:20 PM	125 ml
BD-09-1-07	MW-112D	3-10-09 11:25 AM	No CASING, flip top, 250 ml
BD-09-1-08	MW-113DR	3-10-09 3:54 PM	125 ml
BD-09-1-09	MW-133D	3-10-09 2:15 PM	250 ml
BD-09-1-10	MW-134D	3-10-09 2:50 PM	250 ml
BD-09-1-11	MW-135D	3-10-09 2:53 PM	125 ml
BD-09-1-12	MW-136D	3-10-09 1:15 PM	250 ml
BD-09-1-13	MW-137D	3-10-09 1:46 PM	125 ml
BD-09-1-14	MW-138D	3-10-09 2:21 PM	250 ml
BD-09-1-15	MW-139D	3-10-09 3:25 PM	250 ml
BD-09-1-16	MW-140D	3-10-09 1:45 PM	250 ml
BD-09-1-17	VB-4-5D	3-10-09 11:08 AM	125 ml
BD-09-1-18	VB-4-6D	3-10-09 11:38 AM	125 ml
BD-09-1-19	MW-145D	3-10-09 9:40 AM	250 ml
BD-09-1-20	MW-157D	3-10-09 10:08 AM	250 ml
BD-09-1-21	DS-2, F Ditch	3-11-09 10:40 AM	125 ml
BD-09-1-22	MW-109D	3-11-09 10:25 AM	125 ml
BD-09-1-23	MW-130D	3-11-09 9:45 AM	125 ml