



## **ATTACHMENT #9**

# **Gamma Spectroscopy Results for 1-2 Meter Grid Samples**

# **GRID 36**



**Solutient**  
Technologies, LLC

Project Name:	NAR LINDA	Model:	N/A	NORTH ↑
Work Order #	201421	Serial #		
Surveyor Name:	mt eyes by	Probe:		
Date:	7-25-14	Serial #		
Survey Type:	1-2-meter	Calibration Date	N/A	
GRID # 36	⊕ = Sample Location			

  

<div style="display: flex; justify-content: space-between;"> <span>1</span> <span>1 Minute Integrated Count</span> </div> <div style="text-align: center; margin-top: 20px;"> <u>NA</u> </div> <div style="position: relative; height: 150px; margin-top: 20px;"> <span style="position: absolute; left: 10%; top: 10%;">y 0.8</span> <span style="position: absolute; left: 25%; top: 30%;">⊕</span> </div> <div style="text-align: center; margin-top: 20px;"> x 3.6 </div>	<div style="display: flex; justify-content: space-between;"> <span>2</span> <span>1 Minute Integrated Count</span> </div> <div style="text-align: center; margin-top: 20px;"> <u>NA</u> </div> <div style="position: relative; height: 150px; margin-top: 20px;"> <span style="position: absolute; left: 10%; top: 10%;">y 3.0</span> <span style="position: absolute; left: 25%; top: 30%;">⊕</span> </div> <div style="text-align: center; margin-top: 20px;"> x 4.5 </div>
<div style="text-align: center;">1 Minute Integrated Count</div> <div style="text-align: center; margin-top: 20px;"> <u>NA</u> </div> <div style="position: relative; height: 150px; margin-top: 20px;"> <span style="position: absolute; left: 25%; top: 30%;">⊕</span> </div>	<div style="text-align: center;">1 Minute Integrated Count</div> <div style="text-align: center; margin-top: 20px;"> <u>NA</u> </div> <div style="position: relative; height: 150px; margin-top: 20px;"> <span style="position: absolute; left: 25%; top: 30%;">⊕</span> </div>

- \* All readings are presented in C.P.M
- \* Each grid represents an 10 Meter x 10 Meter area.
- \* Each Sub grid represents an 5 Meter x 5 Meter area.

Instrument BKG:

N/A

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
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ename: C:\My Documents\AAR\AAR\Grid Samples\AAR72414 GRID 36-1.CNF

Report Generated On : 10/8/2014 11:27:15 AM

Sample Location : AAR072414-36-1  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 36-1  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/25/2014 1:05:00 PM  
Acquisition Started : 7/25/2014 1:06:02 PM

Live Time : 900.0 seconds  
Real Time : 900.6 seconds

Dead Time : 0.07 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
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Detector Name: RE1A

Sample Title: AAR072414-36-1

Peak Analysis Performed on: 10/8/2014 11:27:16 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7992-	8025	8008.66	1462.93	0.38	8.70E+001	18.28	0.00E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

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 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
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Sample Title: AAR072414-36-1

Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide	Id	Energy	Yield	Activity	Activity
Name	Confidence	(keV)	(%)	(pCi/Gram)	Uncertainty

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide	Nuclide	Wt mean	Wt mean
Name	Id	Activity	Activity
	Confidence	(pCi/Gram)	Uncertainty

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 11:27:16 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak	Energy	Peak Size in	Peak CPS
No.	(keV)	Counts per Second	% Uncertainty
1	1462.93	9.6667E-002	21.01

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

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 \*\*\*\*\* N U C L I D E M D A ' R E P O R T \*\*\*\*\*  
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Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR072414-36-1  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.4960E+001	2.80E+000	3.9622E+000
		727.17	11.80	2.7999E+000		-3.3331E+000
		785.42	2.00	1.5787E+001		7.3533E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.9524E+000	5.96E-001	-1.2977E+000
		77.11	17.50	1.0511E+000		-9.5288E-001
		87.20	6.30	3.0210E+000		2.0906E+002
		89.80	1.75	1.0704E+001		-1.2211E+000
		115.19	0.60	3.3465E+001		1.4435E+001
		238.63	44.60	5.9622E-001		-2.3108E-001
		300.09	3.41	7.8719E+000		3.3282E+000
	BI-214	609.31	46.30	9.0705E-001	9.07E-001	9.3989E-001
		768.36	5.04	8.1706E+000		5.8580E+000
		806.17	1.23	2.8963E+001		-7.2052E+000
		934.06	3.21	1.1846E+001		-6.8682E+000
		1120.29	15.10	3.8425E+000		5.5676E+000
		1155.19	1.69	2.5148E+001		2.4209E+001
		1238.11	5.94	9.9390E+000		-2.3972E+000
		1280.96	1.47	3.6002E+001		-5.8916E+000
		1377.67	4.11	1.1034E+001		7.9578E-001
		1385.31	0.78	6.1141E+001		5.3437E+001
		1401.50	1.39	3.4752E+001		3.0373E+001
		1407.98	2.48	1.8730E+001		1.5481E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.9610E+000	7.94E-001	-1.9681E+000
		77.11	10.70	1.7191E+000		-1.5584E+000
		87.20	3.70	5.1438E+000		3.5596E-002
		89.80	1.03	1.8187E+001		-2.0746E+000
		241.98	7.49	3.7213E+000		4.2317E+000
		295.21	19.20	1.4428E+000		-8.0153E-001
		351.92	37.20	7.9399E-001		3.8925E-001
		785.91	1.10	2.8719E+001		7.7586E-001
	AC-228	338.32	11.40	2.2992E+000	1.57E+000	-6.9314E-001
		911.07	27.70	1.5737E+000		-7.1918E-001
		969.11	16.60	2.8401E+000		2.4619E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
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Filename: REL1A

Report Generated On : 7/28/2014 7:47:38 AM

Sample Location : AAR07241-36-2  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 36-2  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : MONAZITE SAND  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/28/2014 6:41:00 AM  
Acquisition Started : 7/28/2014 7:32:37 AM

Live Time : 900.0 seconds  
Real Time : 900.8 seconds

Dead Time : 0.08 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :



\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
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Detector Name: RE1A  
Sample Title: AAR07241-36-2  
Peak Analysis Performed on: 7/28/2014 7:47:38 AM  
Peak Analysis From Channel: 40  
Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7986	8019	8002.49	1461.80	1.36	6.88E+001	20.71	8.20E+000

M = First peak in a multiplet region  
m = Other peak in a multiplet region  
F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR07241-36-2  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
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\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance : 3.000 keV  
 Nuclide confidence index threshold = 0.30  
 Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
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? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 7/28/2014 7:47:38 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1461.80	7.6443E-002	30.11

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
\*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Geometry: 8 Oz. Can  
Sample Title: AAR07241-36-2  
Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.2212E+001	2.87E+000	5.9540E+000
		727.17	11.80	2.8681E+000		-1.3996E+000
		785.42	2.00	1.5287E+001		-6.7080E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.9670E+000	6.25E-001	8.8363E-001
		77.11	17.50	1.0673E+000		8.0586E-001
		87.20	6.30	2.8673E+000		3.1609E-004
		89.80	1.75	1.0547E+001		-6.1055E+000
		115.19	0.60	2.8395E+001		-1.0467E+000
		238.63	44.60	6.2453E-001		8.9070E-002
		300.09	3.41	8.0523E+000		-6.6008E-001
	BI-214	609.31	46.30	7.9278E-001	7.93E-001	5.3036E-001
		768.36	5.04	6.6070E+000		2.3447E+000
		806.17	1.23	2.7061E+001		-3.8908E+001
		934.06	3.21	1.3150E+001		1.6147E+001
		1120.29	15.10	3.0920E+000		-3.4642E+000
		1155.19	1.69	2.6884E+001		-5.7860E+001
		1238.11	5.94	1.0542E+001		4.0711E+000
		1280.96	1.47	3.6508E+001		-2.7870E+001
		1377.67	4.11	1.2465E+001		2.2176E+000
		1385.31	0.78	6.8406E+001		6.8705E+001
		1401.50	1.39	3.3247E+001		2.7480E+001
		1407.98	2.48	1.8730E+001		1.7904E+000
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.9831E+000	7.58E-001	1.3401E+000
		77.11	10.70	1.7455E+000		1.3180E+000
		87.20	3.70	4.8822E+000		5.3821E-004
		89.80	1.03	1.7920E+001		-1.0373E+001
		241.98	7.49	3.8518E+000		3.2620E+000
		295.21	19.20	1.4195E+000		1.1284E+000
		351.92	37.20	7.5755E-001		-6.6607E-001
		785.91	1.10	2.7809E+001		-2.1006E+001
	AC-228	89.95	2.10	8.9842E+000	1.71E+000	-3.7375E+000
		93.35	3.50	5.6097E+000		7.3993E-001
		129.08	2.80	6.3565E+000		-4.6562E+000
		209.28	4.40	5.0594E+000		3.4719E+000
		270.23	3.60	5.7407E+000		-6.1813E+000

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
AC-228	327.64	3.20	7.1778E+000	1.71E+000	3.6303E+000
	338.32	11.40	2.1005E+000		-3.0053E+000
	409.51	2.13	1.2172E+001		2.0578E+000
	463.00	4.40	5.7706E+000		3.8180E+000
	583.20	0.14	2.0571E+002		-2.3527E+001
	794.70	4.60	7.4520E+000		6.3543E-001
	911.07	27.70	1.7148E+000		2.4846E+000
	964.60	5.20	9.3802E+000		5.3901E+000
	969.11	16.60	2.8963E+000		3.9788E+000
>	1587.90	3.71	0.0000E+000		0.0000E+000

+ = Nuclide identified during the nuclide identification

\* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

# **GRID 37**

Solutient  
Technologies, LLC

Project Name:	AARL 101A	Model:	N/A	NORTH ↑
Work Order #	201421	Serial #		
Surveyor Name:	mat crosby	Probe:		
Date:	7-23-14	Serial #		
Survey Type:	1-2 meter	Calibration Due	N/A	
GRID # 37	⊕ = Sample Location	Comments:		
1 Minute Integrated Count		1 Minute Integrated Count		
<p>N/A</p> <p>43.8</p> <p>⊕</p> <p>X 3.3</p>		<p>N/A</p> <p>4.9</p> <p>⊕</p> <p>X 2.0</p>		
1 Minute Integrated Count		1 Minute Integrated Count		
<p>N/A</p> <p>4.1</p> <p>⊕</p> <p>X 3.4</p>		<p>N/A</p> <p>4.7</p> <p>⊕</p> <p>X 0.0</p>		

- \* All readings are presented in C.P.M
- \* Each grid represents an 10 Meter x 10 Meter area.
- \* Each Sub grid represents an 5 Meter x 5 Meter area.

Instrument BKG:

N/A

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR-37-1.CNF

Report Generated On : 10/8/2014 9:57:04 AM

Sample Location : AAR-37-1  
Sample Identification : AAR-37-1  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL WASTE  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/23/2014 3:13:00 PM  
Acquisition Started : 7/23/2014 3:13:48 PM

Live Time : 900.0 seconds  
Real Time : 900.5 seconds

Dead Time : 0.06 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :



\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR-37-1

Peak Analysis Performed on: 10/8/2014 9:57:05 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7986-	8019	8002.62	1461.82	0.76	9.60E+001	19.20	0.00E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-37-1  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide	Id	Energy	Yield	Activity	Activity
Name	Confidence	(keV)	(%)	(pCi/Gram)	Uncertainty

\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance : 3.000 keV  
 Nuclide confidence index threshold = 0.30  
 Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
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Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
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? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:57:05 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1461.82	1.0667E-001	20.00

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
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Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR-37-1  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.3889E+001	2.34E+000	3.0405E+000
		727.17	11.80	2.3450E+000		-1.4131E+000
		785.42	2.00	1.6270E+001		1.5638E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.9670E+000	6.62E-001	1.0124E+000
		77.11	17.50	1.0429E+000		-1.2231E-001
		87.20	6.30	2.9779E+000		-4.7546E-001
		89.80	1.75	1.0307E+001		-6.2944E+000
		115.19	0.60	3.0344E+001		-7.4987E+000
		238.63	44.60	6.6202E-001		6.1121E-001
		300.09	3.41	6.6258E+000		4.1495E+000
	BI-214	609.31	46.30	8.6542E-001	8.65E-001	2.7897E-001
		768.36	5.04	6.6070E+000		7.5291E+000
		806.17	1.23	2.9687E+001		-3.2805E+001
		934.06	3.21	9.2932E+000		-5.8539E+000
		1120.29	15.10	3.1342E+000		1.6391E+000
		1155.19	1.69	2.5148E+001		-9.9257E+000
		1238.11	5.94	8.8338E+000		-1.5936E+000
		1280.96	1.47	3.2211E+001		7.4420E+000
		1377.67	4.11	1.0774E+001		8.6399E+000
		1385.31	0.78	5.9834E+001		5.0892E+001
		1401.50	1.39	3.3247E+001		-5.3286E-001
		1407.98	2.48	1.8730E+001		-3.8424E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.9831E+000	6.52E-001	1.5354E+000
		77.11	10.70	1.7057E+000		-2.0003E-001
		87.20	3.70	5.0706E+000		-8.0958E-001
		89.80	1.03	1.7511E+001		-1.0694E+001
		241.98	7.49	3.8996E+000		2.7316E+000
		295.21	19.20	1.2338E+000		9.2147E-001
		351.92	37.20	6.5152E-001		1.7819E-001
		785.91	1.10	2.9598E+001		2.8448E+000
	AC-228	338.32	11.40	2.2992E+000	1.45E+000	-1.0158E+000
		911.07	27.70	1.4536E+000		2.4770E-001
		969.11	16.60	2.7826E+000		-3.0754E-001

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR-37-2.CNF

Report Generated On : 10/8/2014 9:57:40 AM

Sample Location : AAR-37-2  
Sample Identification : AAR-37-2  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL WASTE  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/23/2014 2:54:00 PM  
Acquisition Started : 7/23/2014 2:55:30 PM

Live Time : 900.0 seconds  
Real Time : 900.6 seconds

Dead Time : 0.06 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

```
*****
***** P E A K   A N A L Y S I S   R E P O R T *****
*****
```

Detector Name: RE1A

Sample Title: AAR-37-2

Peak Analysis Performed on: 10/8/2014 9:57:40 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7987-	8020	8003.02	1461.90	1.51	1.10E+002	20.56	0.00E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-37-2  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance : 3.000 keV  
 Nuclide confidence index threshold = 0.30  
 Errors quoted at 1.960 sigma



\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide	Nuclide	Wt mean	Wt mean
Nuclide	Id	Activity	Activity
Name	Confidence	(pCi/Gram)	Uncertainty

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:57:40 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak	Energy	Peak Size in	Peak CPS
No.	(keV)	Counts per Second	% Uncertainty
1	1461.90	1.2222E-001	18.69

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR-37-2  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.1126E+001	3.30E+000	-3.5579E+000
		727.17	11.80	3.3029E+000		-2.3809E-001
		785.42	2.00	1.7414E+001		4.4071E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.8775E+000	6.46E-001	1.5149E-001
		77.11	17.50	1.0753E+000		3.2177E-001
		87.20	6.30	3.0423E+000		1.4619E+000
		89.80	1.75	1.1087E+001		-9.8493E-001
		115.19	0.60	2.9387E+001		-2.0278E-001
		238.63	44.60	6.4624E-001		1.0627E+000
		300.09	3.41	6.9468E+000		3.5386E-001
	BI-214	609.31	46.30	7.6286E-001	7.63E-001	5.7315E-001
		768.36	5.04	6.9506E+000		5.0932E+000
		806.17	1.23	2.4998E+001		-2.7883E+001
		934.06	3.21	1.2018E+001		1.3249E+001
		1120.29	15.10	3.1342E+000		1.9558E+000
		1155.19	1.69	2.8108E+001		1.1136E+001
		1238.11	5.94	8.8338E+000		4.8265E+000
		1280.96	1.47	3.9855E+001		-4.5117E+000
		1377.67	4.11	1.1774E+001		1.5218E+000
		1385.31	0.78	5.9834E+001		7.3158E+000
		1401.50	1.39	3.0831E+001		-3.3627E+001
		1407.98	2.48	1.6887E+001		1.2222E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.8475E+000	6.99E-001	2.2975E-001
		77.11	10.70	1.7586E+000		5.2626E-001
		87.20	3.70	5.1801E+000		2.4891E+000
		89.80	1.03	1.8837E+001		-1.6734E+000
		241.98	7.49	3.7544E+000		1.4488E+000
		295.21	19.20	1.2873E+000		8.7991E-001
		351.92	37.20	6.9908E-001		1.8822E-001
		785.91	1.10	3.1678E+001		2.0826E+001
	AC-228	338.32	11.40	1.9932E+000	1.40E+000	3.9157E-001
		911.07	27.70	1.3987E+000		9.1382E-001
		969.11	16.60	2.6635E+000		-7.8435E-001

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

**GRID 74**

**Solution**  
Technologies, LLC

Project Name:	AAR LIVENIA	Model:	N/A	NORTH  N
Work Order #	201421	Serial #		
Surveyor Name:	mat ccsdy	Probe:		
Date:	7-25-14	Serial #		
Survey Type:	1-2 Refec	Calibration Due	N/A	
GRID #	74	* ⊕ = Sample Location Comments:		
1 Minute Integrated Count 1 N/A		2 Minute Integrated Count 2 N/A		
Y 1.1 ⊕ X 3.5		Y 2.7 ⊕ X 0.4		
3 Minute Integrated Count 3 N/A		4 Minute Integrated Count 4 N/A		
Y 0.3 ⊕ X 1.2		Y 1.7 ⊕ X 3.5		

- \* All readings are presented in C.P.M
- \* Each grid represents an 10 Meter x 10 Meter area.
- \* Each Sub grid represents an 5 Meter x 5 Meter area.

Instrument BKG:

N/A

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR072414 GRID 74-1.CNF

Report Generated On : 10/8/2014 11:24:52 AM

Sample Location : AAR07242014 74-1  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE 74-1  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/25/2014 10:51:00 AM  
Acquisition Started : 7/25/2014 11:18:24 AM

Live Time : 900.0 seconds  
Real Time : 900.6 seconds

Dead Time : 0.07 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

```
*****
***** P E A K   A N A L Y S I S   R E P O R T *****
*****
```

Detector Name: RE1A

Sample Title: AAR07242014 74-1

Peak Analysis Performed on: 10/8/2014 11:24:53 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7988-	8021	8004.86	1462.23	0.23	8.18E+001	19.96	4.19E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR07242014 74-1  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma



\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide	Nuclide	Wt mean	Wt mean
Name	Id	Activity	Activity
	Confidence	(pCi/Gram)	Uncertainty

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 11:24:53 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak	Energy	Peak Size in	Peak CPS
No.	(keV)	Counts per Second	% Uncertainty
1	1462.23	9.0904E-002	24.40

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR07242014 74-1  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.5165E+001	2.73E+000	8.3303E+000
		727.17	11.80	2.7299E+000		-1.6144E+000
		785.42	2.00	1.8062E+001		1.3866E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.1995E+000	6.05E-001	1.9773E-001
		77.11	17.50	1.1810E+000		8.7841E-001
		87.20	6.30	3.0210E+000		1.9298E+000
		89.80	1.75	1.0626E+001		-1.6819E+000
		115.19	0.60	2.8896E+001		-2.0036E+001
		238.63	44.60	6.0486E-001		-2.6537E-001
		300.09	3.41	7.3022E+000		3.4739E-001
	BI-214	609.31	46.30	8.1587E-001	8.16E-001	-6.4005E-001
		768.36	5.04	6.6070E+000		-7.6561E+000
		806.17	1.23	3.0391E+001		-2.2049E+000
		934.06	3.21	1.0558E+001		-3.1224E+000
		1120.29	15.10	3.4518E+000		2.5480E+000
		1155.19	1.69	3.0758E+001		3.7766E+001
		1238.11	5.94	8.0907E+000		8.2902E+000
		1280.96	1.47	3.4965E+001		9.3129E+000
		1377.67	4.11	1.0774E+001		8.6399E+000
		1385.31	0.78	5.5701E+001		-7.8584E+001
		1401.50	1.39	3.0831E+001		-1.2429E+001
		1407.98	2.48	1.9159E+001		-4.5262E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	3.3358E+000	7.62E-001	2.9988E-001
		77.11	10.70	1.9315E+000		1.4366E+000
		87.20	3.70	5.1438E+000		3.2859E+000
		89.80	1.03	1.8054E+001		-2.8577E+000
		241.98	7.49	3.6879E+000		3.0211E+000
		295.21	19.20	1.3046E+000		4.3600E-001
		351.92	37.20	7.6221E-001		4.1582E-001
		785.91	1.10	3.2858E+001		1.1121E+001
	AC-228	338.32	11.40	2.3461E+000	1.45E+000	6.0650E-001
		911.07	27.70	1.4536E+000		-1.1017E+000
		969.11	16.60	2.5703E+000		-8.5915E-001

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR72414 GRID74-2.CNF

Report Generated On : 10/8/2014 11:26:26 AM

Sample Location : AAR07242014 74-2  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE 74-2  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/25/2014 11:50:00 AM  
Acquisition Started : 7/25/2014 11:50:38 AM

Live Time : 900.0 seconds  
Real Time : 900.8 seconds

Dead Time : 0.09 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR07242014 74-2

Peak Analysis Performed on: 10/8/2014 11:26:27 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	1299-	1317	1307.44	238.81	1.17	3.01E+002	44.30	5.95E+001
2	1844-	1862	1852.49	338.37	0.35	7.68E+001	21.95	1.43E+001
3	3183-	3205	3194.93	583.60	1.16	1.11E+002	25.34	1.45E+001
4	4980-	5005	4992.98	912.05	0.93	7.65E+001	20.00	6.50E+000
5	5295-	5322	5308.95	969.77	1.15	5.30E+001	21.11	1.40E+001
6	7990-	8023	8006.73	1462.58	0.93	7.82E+001	23.70	1.28E+001

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR07242014 74-2  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Cop of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
AC-228	0.989	338.32*	11.40	4.29668E+000	1.27845E+000
		911.07*	27.70	3.58990E+000	9.48605E-001
		969.11*	16.60	4.39606E+000	1.75805E+000

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
AC-228	0.989	3.928623E+000	6.989971E-001

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 11:26:27 AM

Peak Locate From Channel: 40

Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	238.81	3.3394E-001	14.74
3	583.60	1.2278E-001	22.93
6	1462.58	8.6847E-002	30.32

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR07242014 74-2  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.9540E+001	3.63E+000	9.1186E+000
		727.17	11.80	3.6315E+000		-4.0769E+000
		785.42	2.00	2.2033E+001		-4.5727E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	3.0550E+000	1.26E+000	-2.9511E+000
		77.11	17.50	1.7384E+000		2.5257E-001
		87.20	6.30	4.3224E+000		-6.9849E-001
		89.80	1.75	1.5272E+001		-2.3041E+001
		115.19	0.60	4.2367E+001		1.3445E+001
		238.63	44.60	1.2566E+000		3.9480E+000
		300.09	3.41	9.9526E+000		4.6686E+000
	BI-214	609.31	46.30	9.2215E-001	9.22E-001	7.5006E-001
		768.36	5.04	9.2809E+000		5.8137E+000
		806.17	1.23	3.3676E+001		-2.7821E+001
		934.06	3.21	1.1130E+001		1.1179E+001
		1120.29	15.10	3.7056E+000		5.1474E+000
		1155.19	1.69	2.8503E+001		1.3983E+001
		1238.11	5.94	8.8338E+000		4.0711E+000
		1280.96	1.47	3.7007E+001		2.0456E+001
		1377.67	4.11	1.3326E+001		-1.3465E+001
		1385.31	0.78	6.8406E+001		2.2784E+001
		1401.50	1.39	3.2464E+001		7.4325E-001
		1407.98	2.48	1.7369E+001		-4.9524E+000
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	4.6331E+000	8.66E-001	-4.4756E+000
		77.11	10.70	2.8431E+000		4.1309E-001
		87.20	3.70	7.3598E+000		-1.1893E+000
		89.80	1.03	2.5947E+001		-3.9148E+001
		241.98	7.49	7.5606E+000		2.4423E+001
		295.21	19.20	1.7545E+000		1.8439E+000
		351.92	37.20	8.6607E-001		8.3260E-001
		785.91	1.10	4.2780E+001		4.7466E+001
+	AC-228	338.32*	11.40	1.4357E+000	9.38E-001	4.2967E+000
		911.07*	27.70	9.3846E-001		3.5899E+000
		969.11*	16.60	2.3904E+000		4.3961E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated



@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\AAR072414 GRID 74-3.CNF

Report Generated On : 5/6/2015 12:35:52 PM

Sample Location : AAR072414-74-3  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 74-3  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/25/2014 12:28:00 AM  
Acquisition Started : 7/25/2014 12:28:36 PM

Live Time : 900.0 seconds  
Real Time : 900.6 seconds

Dead Time : 0.06 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR072414-74-3

Peak Analysis Performed on: 5/6/2015 12:35:52 PM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7992-	8025	8008.23	1462.85	1.29	9.96E+001	21.79	4.40E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E    I D E N T I F I C A T I O N    R E P O R T    \*\*\*\*\*  
 \*\*\*\*\*

Sample Title:            AAR072414-74-3  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....  
 .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance :    3.000 keV  
 Nuclide confidence index threshold =    0.30  
 Errors quoted at    1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 5/6/2015 12:35:52 PM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1462.85	1.1067E-001	21.88

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Geometry: 8 Oz. Can  
Sample Title: AAR072414-74-3  
Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.1951E+001	3.00E+000	-1.2707E+000
		727.17	11.80	2.9993E+000		2.5005E+000
		785.42	2.00	1.5787E+001		1.6491E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.8153E+000	6.11E-001	-1.5426E-001
		77.11	17.50	9.5696E-001		-3.2457E-001
		87.20	6.30	2.7519E+000		-5.4936E-001
		89.80	1.75	1.0626E+001		-1.4170E+000
		115.19	0.60	2.9629E+001		3.4521E+000
		238.63	44.60	6.1055E-001		5.4502E-001
		300.09	3.41	6.3450E+000		-3.0295E-001
	BI-214	609.31	46.30	7.5054E-001	7.51E-001	3.7833E-001
		768.36	5.04	6.5180E+000		7.3077E+000
		806.17	1.23	2.7453E+001		9.9014E-001
		934.06	3.21	1.1130E+001		-2.1161E+000
		1120.29	15.10	3.5630E+000		-5.5967E-001
		1155.19	1.69	2.9654E+001		-1.7558E+001
		1238.11	5.94	7.4078E+000		1.5930E+000
		1280.96	1.47	2.9165E+001		4.3722E+000
		1377.67	4.11	1.1533E+001		-1.5428E-001
		1385.31	0.78	5.5701E+001		4.3259E+001
		1401.50	1.39	3.6187E+001		-2.3503E+001
		1407.98	2.48	2.0386E+001		1.8740E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.7530E+000	7.53E-001	-2.3395E-001
		77.11	10.70	1.5651E+000		-5.3084E-001
		87.20	3.70	4.6856E+000		-9.3539E-001
		89.80	1.03	1.8054E+001		-2.4076E+000
		241.98	7.49	3.5336E+000		2.7193E+000
		295.21	19.20	1.1967E+000		3.4148E-001
		351.92	37.20	7.5286E-001		4.9759E-001
		785.91	1.10	2.8268E+001		-1.5166E+001
	AC-228	338.32	11.40	2.1179E+000	1.51E+000	1.8758E-001
		911.07	27.70	1.5064E+000		4.5708E-001
		969.11	16.60	2.7237E+000		-1.7476E+000

+ = Nuclide identified during the nuclide identification  
\* = Energy line found in the spectrum  
> = MDA value not calculated

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR072414 GRID 74-4.CNF

Report Generated On : 10/8/2014 11:25:38 AM

Sample Location : AAR072414-74-4  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 74-4  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/25/2014 12:48:00 AM  
Acquisition Started : 7/25/2014 12:49:03 PM

Live Time : 900.0 seconds  
Real Time : 900.6 seconds

Dead Time : 0.07 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :



\*\*\*\*\*  
\*\*\*\*\* P E A K     A N A L Y S I S     R E P O R T     \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Title: AAR072414-74-4  
Peak Analysis Performed on: 10/8/2014 11:25:38 AM  
Peak Analysis From Channel: 40  
Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7991-	8024	8007.94	1462.80	0.34	9.10E+001	18.70	0.00E+000

M = First peak in a multiplet region  
m = Other peak in a multiplet region  
F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR072414-74-4  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide	Nuclide	Wt mean	Wt mean
Nuclide	Id	Activity	Activity
Name	Confidence	(pCi/Gram)	Uncertainty

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 11:25:38 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak	Energy	Peak Size in	Peak CPS
No.	(keV)	Counts per Second	% Uncertainty
1	1462.80	1.0111E-001	20.55

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR072414-74-4  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.2717E+001	2.80E+000	1.3314E+000
		727.17	11.80	2.7999E+000		-1.4600E+000
		785.42	2.00	1.6506E+001		-6.2463E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.8153E+000	5.84E-001	3.2959E-001
		77.11	17.50	9.2013E-001		-5.2900E-002
		87.20	6.30	2.6060E+000		-1.3440E+000
		89.80	1.75	1.0143E+001		-8.1673E+000
		115.19	0.60	2.7885E+001		1.4480E+001
		238.63	44.60	5.8449E-001		2.5040E-001
		300.09	3.41	7.2026E+000		3.6751E+000
	BI-214	609.31	46.30	8.0442E-001	8.04E-001	1.0464E+000
		768.36	5.04	7.6628E+000		4.2628E+000
		806.17	1.23	2.7839E+001		1.8902E+001
		934.06	3.21	1.0156E+001		1.2138E+000
		1120.29	15.10	3.1758E+000		-1.5457E-001
		1155.19	1.69	2.7298E+001		-2.0231E+001
		1238.11	5.94	9.4042E+000		6.4207E+000
		1280.96	1.47	3.4434E+001		1.8156E+001
		1377.67	4.11	1.0232E+001		-6.2099E+000
		1385.31	0.78	5.7117E+001		4.5803E+001
		1401.50	1.39	3.0832E+001		2.3141E+001
		1407.98	2.48	1.5874E+001		-3.3281E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.7530E+000	7.09E-001	4.9986E-001
		77.11	10.70	1.5049E+000		-8.6519E-002
		87.20	3.70	4.4373E+000		-2.2885E+000
		89.80	1.03	1.7233E+001		-1.3876E+001
		241.98	7.49	3.5858E+000		5.2314E+000
		295.21	19.20	1.3046E+000		4.5694E-001
		351.92	37.20	7.0918E-001		-5.2791E-002
		785.91	1.10	3.0027E+001		-2.3777E+001
	AC-228	338.32	11.40	2.2674E+000	1.70E+000	1.7073E+000
		911.07	27.70	1.6998E+000		1.0151E+000
		969.11	16.60	2.7533E+000		-3.6482E-001

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

**GRID 75**

**Solutient**  
Technologies, LLC

Project Name:	AAIC LIVONIA	Model:	N/A	NORTH ↑
Work Order #	201421	Serial #		
Surveyor Name:	MAT COASBY	Probe:		
Date:	7-23-14	Serial #		
Survey Type:	1-2 Meter	Calibration Due	N/A	
GRID # 75	⊕ = Sample Location	Comments:		
1 Minute Integrated Count		1 Minute Integrated Count		
N/A		N/A		
4 3.2	⊕	4 3.0	⊕	
X 2.4		X 3.0		
1 Minute Integrated Count		1 Minute Integrated Count		
N/A		N/A		
4 1.1	⊕	4 2.4	⊕	
X 2.8		X 3.6		

\* All readings are presented in C.P.M

\* Each grid represents an 10 Meter x 10 Meter area.

\* Each Sub grid represents an 5 Meter x 5 Meter area.

Instrument BKG:

N/A

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR-75-01.CNF

Report Generated On : 10/8/2014 9:52:32 AM

Sample Location : AAR-75-01  
Sample Identification : AAR-75-01  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/29/2014 2:01:00 AM  
Acquisition Started : 7/29/2014 2:02:23 PM

Live Time : 900.0 seconds  
Real Time : 900.8 seconds

Dead Time : 0.09 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :



\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR-75-01

Peak Analysis Performed on: 10/8/2014 9:52:32 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	1295-	1316	1306.65	238.67	0.87	3.14E+002	50.64	9.37E+001
2	1844-	1862	1852.83	338.44	0.41	7.92E+001	23.94	2.09E+001
3	3182-	3204	3192.71	583.19	1.14	9.99E+001	27.88	2.61E+001
4	4977-	5002	4989.40	911.40	0.70	7.20E+001	16.63	0.00E+000
5	5294-	5321	5307.86	969.57	0.28	5.77E+001	16.64	3.29E+000
6	7986-	8019	8002.82	1461.86	0.30	9.78E+001	21.45	4.20E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-75-01  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
AC-228	0.998	338.32*	11.40	4.43145E+000	1.38909E+000
		911.07*	27.70	3.37648E+000	7.90636E-001
		969.11*	16.60	4.78605E+000	1.39028E+000

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
AC-228	0.998	3.860669E+000	6.160009E-001

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:52:32 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	238.67	3.4921E-001	16.11
3	583.19	1.1099E-001	27.91
6	1461.86	1.0867E-001	21.94

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR-75-01  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.7062E+001	3.83E+000	-7.9243E+000
		727.17	11.80	3.8339E+000		2.3564E-001
		785.42	2.00	2.5055E+001		1.5132E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	3.3337E+000	1.33E+000	-2.0187E+000
		77.11	17.50	2.0042E+000		2.4008E+000
		87.20	6.30	4.5913E+000		5.2791E-001
		89.80	1.75	1.6205E+001		4.6915E-001
		115.19	0.60	4.3984E+001		1.9638E+000
		238.63	44.60	1.3342E+000		3.8315E+000
		300.09	3.41	9.9526E+000		4.9418E+000
	BI-214	609.31	46.30	9.5640E-001	9.56E-001	-1.0001E-001
		768.36	5.04	8.7772E+000		-1.1156E+001
		806.17	1.23	3.1416E+001		-1.3306E+002
		934.06	3.21	1.3151E+001		9.9366E+000
		1120.29	15.10	3.4518E+000		-8.1694E+000
		1155.19	1.69	2.9654E+001		3.4861E+001
		1238.11	5.94	8.8338E+000		1.0067E+001
		1280.96	1.47	3.2783E+001		3.2249E+001
		1377.67	4.11	1.2240E+001		-1.0110E+001
		1385.31	0.78	6.1141E+001		-7.1795E+000
		1401.50	1.39	2.9977E+001		2.1695E+001
		1407.98	2.48	1.5337E+001		-5.5508E+000
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	5.0559E+000	9.32E-001	-3.0615E+000
		77.11	10.70	3.2779E+000		3.9266E+000
		87.20	3.70	7.8176E+000		8.9887E-001
		89.80	1.03	2.7532E+001		7.9711E-001
		241.98	7.49	8.0305E+000		3.1132E+000
		295.21	19.20	1.7794E+000		7.2371E-001
		351.92	37.20	9.3229E-001		1.7646E+000
		785.91	1.10	4.5580E+001		3.5791E+001
+	AC-228	338.32*	11.40	1.6931E+000	1.27E-001	4.4315E+000
		911.07*	27.70	1.2690E-001		3.3765E+000
		969.11*	16.60	1.2573E+000		4.7860E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR-75-2.CNF

Report Generated On : 10/8/2014 9:53:05 AM

Sample Location : AAR-75-2  
Sample Identification : AAR-75-2  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL WASTE  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/23/2014 3:29:00 PM  
Acquisition Started : 7/23/2014 3:30:29 PM

Live Time : 900.0 seconds  
Real Time : 900.6 seconds

Dead Time : 0.07 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K     A N A L Y S I S     R E P O R T     \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR-75-2

Peak Analysis Performed on: 10/8/2014 9:53:05 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7986-	8019	8002.92	1461.88	0.43	8.16E+001	22.01	8.39E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-75-2  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma



\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:53:05 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1461.88	9.0679E-002	26.96

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR-75-2  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.2467E+001	2.47E+000	2.0793E+000
		727.17	11.80	2.4675E+000		-6.0805E+000
		785.42	2.00	1.7633E+001		-3.2621E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.9228E+000	6.33E-001	6.8236E-001
		77.11	17.50	1.1066E+000		-9.9909E-002
		87.20	6.30	2.6800E+000		-3.2571E+000
		89.80	1.75	9.8916E+000		-1.0383E+001
		115.19	0.60	2.9387E+001		8.8244E+000
		238.63	44.60	6.3276E-001		1.0013E+000
		300.09	3.41	7.0503E+000		4.7048E+000
	BI-214	609.31	46.30	7.8690E-001	7.87E-001	1.2401E+000
		768.36	5.04	6.6070E+000		1.3840E+000
		806.17	1.23	2.8963E+001		-3.3845E+001
		934.06	3.21	9.9481E+000		-9.8627E+000
		1120.29	15.10	3.0491E+000		1.7300E+000
		1155.19	1.69	2.4228E+001		-1.1862E+001
		1238.11	5.94	9.4042E+000		5.8153E+000
		1280.96	1.47	3.1033E+001		4.0446E+000
		1377.67	4.11	9.9484E+000		7.1999E+000
		1385.31	0.78	4.9574E+001		-6.6552E+000
		1401.50	1.39	2.5194E+001		1.4463E+001
		1407.98	2.48	1.3578E+001		-7.1747E+000
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.9161E+000	6.52E-001	1.0349E+000
		77.11	10.70	1.8098E+000		-1.6340E-001
		87.20	3.70	4.5633E+000		-5.5459E+000
		89.80	1.03	1.6806E+001		-1.7642E+001
		241.98	7.49	3.8518E+000		2.3062E+000
		295.21	19.20	1.1680E+000		-3.1683E-001
		351.92	37.20	6.5152E-001		4.7949E-001
		785.91	1.10	3.3992E+001		1.4409E+000
	AC-228	338.32	11.40	2.3920E+000	1.49E+000	1.6621E+000
		911.07	27.70	1.4890E+000		1.1819E+000
		969.11	16.60	2.7237E+000		-3.8781E-001

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR-75-3.CNF

Report Generated On : 10/8/2014 9:53:43 AM

Sample Location : AAR-75-3  
Sample Identification : AAR-75-3  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL WASTE  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/23/2014 4:03:00 PM  
Acquisition Started : 7/23/2014 4:04:05 PM

Live Time : 900.0 seconds  
Real Time : 900.6 seconds

Dead Time : 0.06 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR-75-3

Peak Analysis Performed on: 10/8/2014 9:53:43 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7986-	8019	8002.71	1461.84	0.61	8.49E+001	20.21	4.14E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-75-3  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance : 3.000 keV  
 Nuclide confidence index threshold = 0.30  
 Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:53:43 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1461.84	9.4288E-002	23.82

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR-75-3  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.3889E+001	3.12E+000	3.5987E+000
		727.17	11.80	3.1246E+000		-2.1431E+000
		785.42	2.00	1.7192E+001		-5.3982E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.7340E+000	5.93E-001	-4.0166E-001
		77.11	17.50	9.2948E-001		4.5469E-001
		87.20	6.30	2.5808E+000		-2.3970E+000
		89.80	1.75	1.0225E+001		2.2441E+000
		115.19	0.60	2.8647E+001		1.0942E+001
		238.63	44.60	5.9331E-001		-1.4819E-001
		300.09	3.41	6.9988E+000		1.2486E+000
	BI-214	609.31	46.30	7.2521E-001	7.25E-001	3.8080E-002
		768.36	5.04	6.6947E+000		4.3656E+000
		806.17	1.23	2.8219E+001		1.9194E+000
		934.06	3.21	1.1846E+001		-1.0351E-001
		1120.29	15.10	3.0491E+000		1.0981E+000
		1155.19	1.69	2.8892E+001		3.2924E+001
		1238.11	5.94	9.5138E+000		1.1843E+001
		1280.96	1.47	3.6508E+001		-2.9712E+001
		1377.67	4.11	1.1533E+001		1.2171E+000
		1385.31	0.78	5.9834E+001		9.3197E+000
		1401.50	1.39	2.8177E+001		-9.4568E+000
		1407.98	2.48	1.5337E+001		9.7775E+000
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.6298E+000	6.84E-001	-6.0916E-001
		77.11	10.70	1.5202E+000		7.4366E-001
		87.20	3.70	4.3944E+000		-4.0813E+000
		89.80	1.03	1.7373E+001		3.8128E+000
		241.98	7.49	3.6542E+000		2.6967E+000
		295.21	19.20	1.2246E+000		6.9610E-001
		351.92	37.20	6.8362E-001		4.6526E-001
		785.91	1.10	3.1678E+001		8.0172E+000
	AC-228	338.32	11.40	2.2674E+000	1.42E+000	1.6984E+000
		911.07	27.70	1.4173E+000		8.8335E-001
		969.11	16.60	2.5060E+000		1.3949E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated



@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR-75-4.CNF

Report Generated On : 10/8/2014 9:54:23 AM

Sample Location : AAR-75-4  
Sample Identification : AAR-75-4  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL WASTE  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/23/2014 3:46:00 PM  
Acquisition Started : 7/23/2014 3:47:43 PM

Live Time : 900.0 seconds  
Real Time : 900.7 seconds

Dead Time : 0.08 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR-75-4

Peak Analysis Performed on: 10/8/2014 9:54:24 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7985-	8018	8001.71	1461.66	1.00	7.77E+001	21.59	8.29E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-75-4  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance : 3.000 keV  
 Nuclide confidence index threshold = 0.30  
 Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide	Nuclide	Wt mean	Wt mean
Nuclide	Id	Activity	Activity
Name	Confidence	(pCi/Gram)	Uncertainty

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:54:24 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak	Energy	Peak Size in	Peak CPS
No.	(keV)	Counts per Second	% Uncertainty
1	1461.66	8.6344E-002	27.78

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR-75-4  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
BI-212	39.86	1.10	1.1951E+001	2.87E+000	-1.0610E+000
	727.17	11.80	2.8681E+000		1.0610E+000
	785.42	2.00	1.4768E+001		-2.5459E+001
>	1620.56	2.75	0.0000E+000		0.0000E+000
PB-212	74.81	9.60	1.9524E+000	6.46E-001	1.2607E-002
	77.11	17.50	1.0095E+000		-2.2011E-001
	87.20	6.30	2.5808E+000		4.1536E-001
	89.80	1.75	9.8063E+000		-8.1350E+000
	115.19	0.60	3.2167E+001		-5.4130E-001
	238.63	44.60	6.4624E-001		7.1256E-001
	300.09	3.41	6.6258E+000		3.4172E+000
BI-214	609.31	46.30	8.0442E-001	8.04E-001	8.0506E-001
	768.36	5.04	6.5180E+000		7.3077E+000
	806.17	1.23	2.9687E+001		2.3023E+001
	934.06	3.21	1.2186E+001		8.2554E+000
	1120.29	15.10	3.1342E+000		-1.5448E-003
	1155.19	1.69	2.8503E+001		-1.8414E+001
	1238.11	5.94	8.9511E+000		4.4581E+000
	1280.96	1.47	2.4164E+001		1.6124E+001
	1377.67	4.11	9.3512E+000		-3.5446E+000
	1385.31	0.78	5.1185E+001		-2.1993E+001
	1401.50	1.39	2.9093E+001		-6.3277E+000
	1407.98	2.48	1.6887E+001		1.2222E+001
>	1509.19	2.19	0.0000E+000		0.0000E+000
>	1661.28	1.15	0.0000E+000		0.0000E+000
>	1729.60	3.05	0.0000E+000		0.0000E+000
>	1764.49	15.80	0.0000E+000		0.0000E+000
>	1847.44	2.12	0.0000E+000		0.0000E+000
>	2118.54	1.21	0.0000E+000		0.0000E+000
PB-214	74.81	6.33	2.9610E+000	7.39E-001	1.9119E-002
	77.11	10.70	1.6510E+000		-3.5999E-001
	87.20	3.70	4.3944E+000		7.0724E-001
	89.80	1.03	1.6661E+001		-1.3822E+001
	241.98	7.49	3.9154E+000		2.2154E+000
	295.21	19.20	1.2608E+000		3.0644E-001
	351.92	37.20	7.3861E-001		7.8678E-001
	785.91	1.10	2.7809E+001		1.3831E+001
AC-228	338.32	11.40	2.1350E+000	1.24E+000	2.1778E+000
	911.07	27.70	1.2391E+000		4.6610E-001
	969.11	16.60	2.7533E+000		2.2501E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

**GRID 76**



**Solutient**  
Technologies, LLC

Project Name:	NAVR License	Model:	N/A	<b>NORTH</b> 
Work Order #	201421	Serial #		
Surveyor Name:	Mat Crosby	Probe:		
Date:	7-21-14	Serial #		
Survey Type:	1-2 meter	Calibration Due	N/A	
GRID # 76		⊕ = Sample Location Comments:		

  

<div style="display: flex; justify-content: space-between;"> <span>01</span> <span>1 Minute Integrated Count</span> </div> <div style="text-align: center; margin-top: 20px;"> <u>N/A</u> </div> <div style="text-align: center; margin-top: 40px;">⊕</div> <div style="margin-top: 20px;"> X 0.2  X 1.5 </div>	<div style="display: flex; justify-content: space-between;"> <span>02</span> <span>1 Minute Integrated Count</span> </div> <div style="text-align: center; margin-top: 20px;"> <u>N/A</u> </div> <div style="text-align: center; margin-top: 40px;">⊕</div> <div style="margin-top: 20px;"> X 3.4  X 1.9 </div>
<div style="display: flex; justify-content: space-between;"> <span>03</span> <span>1 Minute Integrated Count</span> </div> <div style="text-align: center; margin-top: 20px;"> <u>N/A</u> </div> <div style="text-align: center; margin-top: 40px;">⊕</div> <div style="margin-top: 20px;"> X 3.7  X 2.9 </div>	<div style="display: flex; justify-content: space-between;"> <span>04</span> <span>1 Minute Integrated Count</span> </div> <div style="text-align: center; margin-top: 20px;"> <u>N/A</u> </div> <div style="text-align: center; margin-top: 40px;">⊕</div> <div style="margin-top: 20px;"> X 2.4  X 3.0 </div>

\* All readings are presented in C.P.M

\* Each grid represents an 10 Meter x 10 Meter area.

\* Each Sub grid represents an 5 Meter x 5 Meter area.

Instrument BKG:

N/A

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR-76-01.CNF

Report Generated On : 10/8/2014 9:49:47 AM

Sample Location : AAR-76-01  
Sample Identification : AAR 76-01  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : Soil  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/22/2014 3:33:00 PM  
Acquisition Started : 7/22/2014 3:51:36 PM

Live Time : 900.0 seconds  
Real Time : 900.5 seconds

Dead Time : 0.06 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Title: AAR-76-01  
Peak Analysis Performed on: 10/8/2014 9:49:47 AM  
Peak Analysis From Channel: 40  
Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7990-	8023	8006.90	1462.61	0.75	8.30E+001	17.86	0.00E+000

M = First peak in a multiplet region  
m = Other peak in a multiplet region  
F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-76-01  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance : 3.000 keV  
 Nuclide confidence index threshold = 0.30  
 Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:49:47 AM

Peak Locate From Channel: 40

Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1462.61	9.2222E-002	21.51

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
\*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Geometry: 8 Oz. Can  
Sample Title: AAR-76-01  
Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.3434E+001	2.87E+000	2.1894E+000
		727.17	11.80	2.8681E+000		3.5216E+000
		785.42	2.00	1.8272E+001		6.6817E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.9524E+000	6.92E-001	1.3027E-001
		77.11	17.50	1.1444E+000		-3.9468E-002
		87.20	6.30	2.9121E+000		-2.9955E-002
		89.80	1.75	1.1456E+001		-3.4489E+000
		115.19	0.60	2.8395E+001		6.7773E+000
		238.63	44.60	6.9247E-001		3.1825E-001
		300.09	3.41	7.6870E+000		8.0950E-001
	BI-214	609.31	46.30	8.6542E-001	8.65E-001	1.0492E+000
		768.36	5.04	6.5180E+000		7.3077E+000
		806.17	1.23	2.5845E+001		3.7495E+000
		934.06	3.21	1.2517E+001		1.4491E+001
		1120.29	15.10	3.4893E+000		-1.0511E+000
		1155.19	1.69	2.6462E+001		1.0228E+001
		1238.11	5.94	9.4042E+000		8.1421E-001
		1280.96	1.47	3.1033E+001		7.5769E+000
		1377.67	4.11	9.6551E+000		6.7199E+000
		1385.31	0.78	4.7899E+001		-8.4291E+000
		1401.50	1.39	2.5194E+001		1.4463E+001
		1407.98	2.48	1.4778E+001		-5.9628E+000
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.9610E+000	8.37E-001	1.9757E-001
		77.11	10.70	1.8717E+000		-6.4550E-002
		87.20	3.70	4.9584E+000		-5.1005E-002
		89.80	1.03	1.9463E+001		-5.8598E+000
		241.98	7.49	4.1593E+000		3.3948E+000
		295.21	19.20	1.3877E+000		-2.9206E-002
		351.92	37.20	8.3719E-001		5.4439E-001
		785.91	1.10	3.3619E+001		4.2413E+001
	AC-228	338.32	11.40	2.2188E+000	1.57E+000	-2.3042E+000
		911.07	27.70	1.5737E+000		2.0627E+000
		969.11	16.60	2.6017E+000		5.1807E-001

+ = Nuclide identified during the nuclide identification  
\* = Energy line found in the spectrum  
> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

lename: C:\My Documents\AAR\AAR\Grid Samples\AAR-76-02.CNF

Report Generated On : 10/8/2014 9:50:21 AM

Sample Location : AAR-76-02  
Sample Identification : AAR 76-02  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : Soil  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/22/2014 4:29:00 PM  
Acquisition Started : 7/22/2014 4:47:57 PM

Live Time : 900.0 seconds  
Real Time : 900.6 seconds

Dead Time : 0.07 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :



\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Title: AAR-76-02  
Peak Analysis Performed on: 10/8/2014 9:50:22 AM  
Peak Analysis From Channel: 40  
Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	1300-	1315	1307.81	238.88	0.83	1.55E+002	34.66	5.21E+001
2	1920-	1937	1927.99	352.17	0.63	5.29E+001	19.76	1.51E+001
3	3184-	3205	3194.44	583.51	0.61	6.25E+001	19.16	8.52E+000
4	3327-	3348	3337.72	609.68	1.41	3.33E+001	16.29	8.68E+000
5	7992-	8025	8008.22	1462.85	2.10	1.63E+002	26.55	4.04E+000

M = First peak in a multiplet region  
m = Other peak in a multiplet region  
F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-76-02  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
BI-214	0.446	609.31*	46.30	6.66784E-001	3.28586E-001
		768.36	5.04		
		806.17	1.23		
		934.06	3.21		
		1120.29	15.10		
		1155.19	1.69		
		1238.11	5.94		
		1280.96	1.47		
		1377.67	4.11		
		1385.31	0.78		
		1401.50	1.39		
		1407.98	2.48		
		1509.19	2.19		
		1661.28	1.15		
		1729.60	3.05		
		1764.49	15.80		
		1847.44	2.12		
		2118.54	1.21		

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
BI-214	0.446	6.667839E-001	3.285859E-001

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:50:22 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	238.88	1.7213E-001	22.38
2	352.17	5.8791E-002	37.35
3	583.51	6.9421E-002	30.66
5	1462.85	1.8106E-001	16.29

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR-76-02  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.7062E+001	3.53E+000	1.0916E+000
		727.17	11.80	3.5257E+000		4.5593E-001
		785.42	2.00	2.0434E+001		-9.2156E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.5450E+000	1.04E+000	-3.2769E+000
		77.11	17.50	1.5345E+000		1.4146E+000
		87.20	6.30	4.0504E+000		-5.5922E-001
		89.80	1.75	1.5002E+001		3.1511E+000
		115.19	0.60	3.5515E+001		1.4908E+001
		238.63	44.60	1.0397E+000		2.4257E+000
		300.09	3.41	9.8451E+000		1.2430E+001
+	BI-214	609.31*	46.30	4.4769E-001	4.48E-001	6.6678E-001
		768.36	5.04	8.1001E+000		-2.8349E+000
		806.17	1.23	3.1750E+001		-7.2322E+001
		934.06	3.21	1.2838E+001		9.0218E+000
		1120.29	15.10	3.5630E+000		-3.5664E+000
		1155.19	1.69	3.0758E+001		2.2074E+001
		1238.11	5.94	1.1202E+001		6.4020E+000
		1280.96	1.47	4.1199E+001		2.9545E+001
		1377.67	4.11	1.2240E+001		-1.7175E+001
		1385.31	0.78	6.3666E+001		7.1637E+000
		1401.50	1.39	3.4009E+001		2.8927E+001
		1407.98	2.48	1.7836E+001		1.3851E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	3.8597E+000	9.25E-001	-4.9698E+000
		77.11	10.70	2.5097E+000		2.3136E+000
		87.20	3.70	6.8966E+000		-9.5218E-001
		89.80	1.03	2.5489E+001		5.3537E+000
		241.98	7.49	6.2517E+000		1.5635E+001
		295.21	19.20	1.7355E+000		1.5500E+000
		351.92	37.20	9.2476E-001		7.8788E-001
		785.91	1.10	3.6834E+001		-4.5796E+001
	AC-228	338.32	11.40	3.1439E+000	2.02E+000	2.3231E+000
		911.07	27.70	2.0158E+000		3.5160E+000
		969.11	16.60	3.0845E+000		1.9238E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

lename: C:\My Documents\AAR\AAR\Grid Samples\AAR-76-03.CNF

Report Generated On : 10/8/2014 9:51:06 AM

Sample Location : AAR-76-03  
Sample Identification : AAR 76-03  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : Soil  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/22/2014 4:29:00 PM  
Acquisition Started : 7/22/2014 4:30:40 PM

Live Time : 900.0 seconds  
Real Time : 900.6 seconds

Dead Time : 0.07 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR-76-03

Peak Analysis Performed on: 10/8/2014 9:51:07 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7992-	8025	8008.07	1462.82	0.34	1.08E+002	20.37	0.00E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-76-03  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance : 3.000 keV  
 Nuclide confidence index threshold = 0.30  
 Errors quoted at 1.960 sigma



\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:51:07 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1462.82	1.2000E-001	18.86

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR-76-03  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
BI-212	39.86	1.10	1.1951E+001	2.69E+000	-7.1665E+000
	727.17	11.80	2.6941E+000		1.8577E+000
	785.42	2.00	1.2122E+001		8.4410E-001
>	1620.56	2.75	0.0000E+000		0.0000E+000
PB-212	74.81	9.60	1.7993E+000	6.82E-001	-8.9280E-001
	77.11	17.50	1.0264E+000		9.6519E-001
	87.20	6.30	2.9562E+000		5.1231E-001
	89.80	1.75	1.0626E+001		-6.7554E+000
	115.19	0.60	3.2606E+001		1.7957E+001
	238.63	44.60	6.8248E-001		5.3359E-001
	300.09	3.41	7.5928E+000		-1.3979E+000
BI-214	609.31	46.30	8.2716E-001	8.27E-001	6.4592E-001
	768.36	5.04	6.5180E+000		1.1626E+000
	806.17	1.23	2.9327E+001		-5.1764E+000
	934.06	3.21	1.3605E+001		5.4612E+000
	1120.29	15.10	3.5264E+000		2.8029E+000
	1155.19	1.69	3.1470E+001		5.5681E+000
	1238.11	5.94	9.0667E+000		4.9943E+000
	1280.96	1.47	3.1628E+001		-1.5298E+001
	1377.67	4.11	9.9484E+000		-1.6880E+000
	1385.31	0.78	5.2740E+001		-5.5558E+000
	1401.50	1.39	3.4752E+001		-2.6395E+001
	1407.98	2.48	1.9986E+001		1.7925E+001
>	1509.19	2.19	0.0000E+000		0.0000E+000
>	1661.28	1.15	0.0000E+000		0.0000E+000
>	1729.60	3.05	0.0000E+000		0.0000E+000
>	1764.49	15.80	0.0000E+000		0.0000E+000
>	1847.44	2.12	0.0000E+000		0.0000E+000
>	2118.54	1.21	0.0000E+000		0.0000E+000
PB-214	74.81	6.33	2.7289E+000	7.71E-001	-1.3540E+000
	77.11	10.70	1.6786E+000		1.5786E+000
	87.20	3.70	5.0335E+000		8.7232E-001
	89.80	1.03	1.8054E+001		-1.1478E+001
	241.98	7.49	4.0240E+000		4.7199E+000
	295.21	19.20	1.3796E+000		4.1808E-001
	351.92	37.20	7.7143E-001		6.2709E-001
	785.91	1.10	2.2052E+001		1.5679E+000
AC-228	338.32	11.40	2.2351E+000	1.57E+000	1.1097E+000
	911.07	27.70	1.5737E+000		-7.7352E-001
	969.11	16.60	2.7826E+000		6.6972E-001

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR-76-04.CNF

Report Generated On : 10/8/2014 9:51:47 AM

Sample Location : AAR-76-04  
Sample Identification : AAR 76-04  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID CLEARANCE  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : Soil  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/22/2014 4:08:00 PM  
Acquisition Started : 7/22/2014 4:09:09 PM

Live Time : 900.0 seconds  
Real Time : 900.5 seconds

Dead Time : 0.06 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Title: AAR-76-04  
Peak Analysis Performed on: 10/8/2014 9:51:47 AM  
Peak Analysis From Channel: 40  
Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7991-	8024	8007.79	1462.77	0.27	9.96E+001	23.55	8.45E+000

M = First peak in a multiplet region  
m = Other peak in a multiplet region  
F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-76-04  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide	Id	Energy	Yield	Activity	Activity
Name	Confidence	(keV)	(%)	(pCi/Gram)	Uncertainty

\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance : 3.000 keV  
 Nuclide confidence index threshold = 0.30  
 Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:51:47 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1462.77	1.1061E-001	23.66

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
\*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Geometry: 8 Oz. Can  
Sample Title: AAR-76-04  
Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	9.9019E+000	2.93E+000	-1.0654E+001
		727.17	11.80	2.9345E+000		-2.2200E+000
		785.42	2.00	1.5787E+001		2.0589E-001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.9524E+000	6.75E-001	-1.0197E+000
		77.11	17.50	1.0988E+000		1.5075E-001
		87.20	6.30	2.9121E+000		-2.1996E+000
		89.80	1.75	1.0626E+001		-8.7224E+000
		115.19	0.60	3.0811E+001		1.7387E+001
		238.63	44.60	6.7488E-001		1.0156E+000
		300.09	3.41	7.2526E+000		2.1624E+000
	BI-214	609.31	46.30	7.6286E-001	7.63E-001	3.8701E-001
		768.36	5.04	7.5873E+000		4.3783E+000
		806.17	1.23	2.9687E+001		-1.7099E+001
		934.06	3.21	1.3304E+001		-3.4726E+000
		1120.29	15.10	3.1342E+000		-2.6262E-002
		1155.19	1.69	3.1116E+001		-1.1536E+001
		1238.11	5.94	1.0042E+001		-2.2107E+000
		1280.96	1.47	2.7151E+001		2.1086E+001
		1377.67	4.11	8.3612E+000		-3.0480E+000
		1385.31	0.78	4.9574E+001		-1.6442E+001
		1401.50	1.39	3.4752E+001		3.0373E+001
		1407.98	2.48	1.9159E+001		3.0860E+000
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.9610E+000	8.03E-001	-1.5465E+000
		77.11	10.70	1.7972E+000		2.4655E-001
		87.20	3.70	4.9584E+000		-3.7452E+000
		89.80	1.03	1.8054E+001		-1.4820E+001
		241.98	7.49	3.9623E+000		3.4841E+000
		295.21	19.20	1.3301E+000		5.0950E-001
		351.92	37.20	8.0283E-001		7.3372E-001
		785.91	1.10	2.9162E+001		1.8103E+000
	AC-228	338.32	11.40	2.3461E+000	1.47E+000	2.9808E+000
		911.07	27.70	1.4715E+000		1.0915E+000
		969.11	16.60	2.3716E+000		-1.1926E+000

+ = Nuclide identified during the nuclide identification  
\* = Energy line found in the spectrum  
> = MDA value not calculated



@ = Half-life too short to be able to perform the decay correction

**GRID 94**

**Solutient**  
Technologies, LLC

Project Name :	AAR Livonia	Model:		NORTH ↑
Work Order #	201421	Serial #		
Surveyor Name:	DeL REUSS	Probe:	N/A	
Date:	6-4-14	Serial #		
Survey Type:	Soil 1-2 meter	Calibration Due		
GRID # 94		⊕ = Sample Location		
Comments:				

  

<p align="center">1 Minute Integrated Count</p> <p>01 ⊕</p> <p align="center"><u>N/A</u></p> <p align="center">⊕</p> <p>X-4.8</p> <p>X-1.7</p>	<p align="center">1 Minute Integrated Count</p> <p>02</p> <p align="center"><u>N/A</u></p> <p align="center">⊕</p> <p>X-4.8</p> <p>X-2.6</p>
<p align="center">1 Minute Integrated Count</p> <p>03</p> <p align="center"><u>N/A</u></p> <p align="center">⊕</p> <p>X-4.9</p> <p>X-4.4</p>	<p align="center">1 Minute Integrated Count</p> <p>04</p> <p align="center"><u>N/A</u></p> <p align="center">⊕</p> <p>X-2.4</p> <p>X-3.3</p>

- \* All readings are presented in C.P.M
- \* Each grid represents an 10 Meter x 10 Meter area.
- \* Each Sub grid represents an 5 Meter x 5 Meter area.

Instrument BKG:

N/A

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR-94-01.CNF

Report Generated On : 10/7/2014 8:59:52 AM

Sample Location : AAR  
Sample Identification : AAR-94-01  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : Grid 94 clear  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : clear area  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 6/4/2014 2:55:00 PM  
Acquisition Started : 6/4/2014 2:56:25 PM

Live Time : 600.0 seconds  
Real Time : 600.3 seconds

Dead Time : 0.05 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR

Peak Analysis Performed on: 10/7/2014 8:59:52 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	8009-	8042	8025.14	1465.94	0.24	6.20E+001	15.43	0.00E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide	Nuclide	Wt mean	Wt mean
Name	Id	Activity	Activity
	Confidence	(pCi/Gram)	Uncertainty

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/7/2014 8:59:52 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak	Energy	Peak Size in	Peak CPS
No.	(keV)	Counts per Second	% Uncertainty
1	1465.94	1.0333E-001	24.89

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.6252E+001	4.09E+000	-7.8622E-001
		727.17	11.80	4.0948E+000		-1.0874E+000
		785.42	2.00	2.1751E+001		2.0472E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.3919E+000	6.92E-001	-1.3641E+000
		77.11	17.50	1.3076E+000		-1.1190E-002
		87.20	6.30	3.3379E+000		-6.3258E-001
		89.80	1.75	1.3639E+001		-6.0432E+000
		115.19	0.60	4.0249E+001		2.8181E+001
		238.63	44.60	6.9151E-001		3.8140E-001
		300.09	3.41	9.3432E+000		6.0324E+000
	BI-214	609.31	46.30	9.9656E-001	9.97E-001	2.0932E-001
		768.36	5.04	9.7770E+000		1.7439E+000
		806.17	1.23	3.3359E+001		-2.6317E+001
		934.06	3.21	1.4922E+001		1.3042E+001
		1120.29	15.10	4.5084E+000		4.8847E+000
		1155.19	1.69	3.0964E+001		2.3241E+001
		1238.11	5.94	9.2048E+000		-2.8127E-001
		1280.96	1.47	4.1761E+001		3.3489E+001
		1377.67	4.11	1.3059E+001		-6.0545E+000
		1385.31	0.78	6.9230E+001		4.1986E+001
		1401.50	1.39	3.4421E+001		1.7356E+001
		1407.98	2.48	1.7236E+001		-2.0675E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	3.6276E+000	8.91E-001	-2.0688E+000
		77.11	10.70	2.1385E+000		-1.8302E-002
		87.20	3.70	5.6834E+000		-1.0771E+000
		89.80	1.03	2.3174E+001		-1.0267E+001
		241.98	7.49	4.1388E+000		5.7955E-001
		295.21	19.20	1.5998E+000		3.9027E-001
		351.92	37.20	8.9077E-001		7.2689E-001
		785.91	1.10	3.9568E+001		3.7241E+001
	AC-228	338.32	11.40	2.9339E+000	1.79E+000	4.0304E+000
		911.07	27.70	1.7931E+000		1.6877E+000
		969.11	16.60	3.3976E+000		3.4814E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated



@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR-94-02.CNF

Report Generated On : 10/7/2014 9:00:57 AM

Sample Location : AAR  
Sample Identification : AAR-94-02  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : Grid 94 clear  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : clear area  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 6/4/2014 2:55:00 PM  
Acquisition Started : 6/4/2014 3:18:54 PM

Live Time : 600.0 seconds  
Real Time : 600.3 seconds

Dead Time : 0.04 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR

Peak Analysis Performed on: 10/7/2014 9:00:57 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	8006-	8039	8022.95	1465.54	0.97	5.70E+001	14.80	0.00E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR

Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide	Nuclide	Wt mean	Wt mean
Name	Id	Activity	Activity
	Confidence	(pCi/Gram)	Uncertainty

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/7/2014 9:00:57 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak	Energy	Peak Size in	Peak CPS
No.	(keV)	Counts per Second	% Uncertainty
1	1465.54	9.5000E-002	25.96

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.7927E+001	3.99E+000	7.9003E+000
		727.17	11.80	3.9867E+000		1.0754E+000
		785.42	2.00	2.1342E+001		-1.7978E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.7229E+000	9.12E-001	-3.2761E-001
		77.11	17.50	1.6366E+000		1.1190E+000
		87.20	6.30	4.0200E+000		-1.9101E+000
		89.80	1.75	1.3214E+001		-9.0432E+000
		115.19	0.60	4.4805E+001		-1.4076E+001
		238.63	44.60	9.1157E-001		1.1894E+000
		300.09	3.41	8.9836E+000		1.0492E+000
	BI-214	609.31	46.30	9.8585E-001	9.86E-001	1.3358E-001
		768.36	5.04	9.3639E+000		-3.4739E+000
		806.17	1.23	3.8138E+001		3.8305E+001
		934.06	3.21	1.5836E+001		6.0939E+000
		1120.29	15.10	3.7861E+000		-2.0878E+000
		1155.19	1.69	3.7040E+001		3.4861E+001
		1238.11	5.94	1.0443E+001		-7.2169E+000
		1280.96	1.47	4.3748E+001		1.6745E+000
		1377.67	4.11	1.8360E+001		1.7280E+001
		1385.31	0.78	8.9751E+001		7.6339E+001
		1401.50	1.39	4.0838E+001		-5.9119E+001
		1407.98	2.48	2.3006E+001		1.4666E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	4.1295E+000	8.63E-001	-4.9684E-001
		77.11	10.70	2.6766E+000		1.8302E+000
		87.20	3.70	6.8449E+000		-3.2523E+000
		89.80	1.03	2.2451E+001		-1.5365E+001
		241.98	7.49	5.4303E+000		6.5403E+000
		295.21	19.20	1.5674E+000		1.2973E-001
		351.92	37.20	8.6297E-001		3.9003E-001
		785.91	1.10	3.9568E+001		-2.7591E+001
	AC-228	338.32	11.40	3.2785E+000	2.41E+000	-5.1619E-002
		911.07	27.70	2.4093E+000		1.0678E+000
		969.11	16.60	2.9236E+000		-1.8806E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR-94-03.CNF

Report Generated On : 10/7/2014 9:01:20 AM

Sample Location : AAR grid sample  
Sample Identification : AAR-94-03  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : Grid 94 clear -03  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : clear area  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 6/4/2014 3:56:00 PM  
Acquisition Started : 6/4/2014 3:56:12 PM

Live Time : 600.0 seconds  
Real Time : 600.3 seconds

Dead Time : 0.05 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :



No peak analysis results available for reporting purposes

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR grid sample  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide	Nuclide	Wt mean	Wt mean
Name	Id	Activity	Activity
	Confidence	(pCi/Gram)	Uncertainty

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

No peak search results available for nuclide analysis.

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR grid sample  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.5802E+001	3.70E+000	1.5756E+000
		727.17	11.80	3.7012E+000		4.4745E-001
		785.42	2.00	1.8183E+001		1.6527E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.3082E+000	7.08E-001	2.3891E-001
		77.11	17.50	1.0376E+000		3.3911E-003
		87.20	6.30	3.2929E+000		1.2586E+000
		89.80	1.75	1.0629E+001		-6.4380E+000
		115.19	0.60	3.4577E+001		-3.5856E+001
		238.63	44.60	7.0847E-001		-3.6607E-001
		300.09	3.41	8.5108E+000		6.2905E+000
	BI-214	609.31	46.30	9.0703E-001	9.07E-001	3.0752E-001
		768.36	5.04	8.6263E+000		5.2283E+000
		806.17	1.23	3.4800E+001		-5.0816E+001
		934.06	3.21	1.2872E+001		-8.9430E+000
		1120.29	15.10	3.7861E+000		3.3090E+000
		1155.19	1.69	3.4901E+001		-2.0699E+001
		1238.11	5.94	9.7216E+000		-5.8780E+000
		1280.96	1.47	2.9519E+001		-2.6222E+001
		1377.67	4.11	1.4923E+001		1.0800E+001
		1385.31	0.78	7.1849E+001		4.5803E+001
		1401.50	1.39	4.2266E+001		2.8203E+001
		1407.98	2.48	2.1290E+001		1.2222E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	3.5006E+000	7.40E-001	3.6233E-001
		77.11	10.70	1.6971E+000		5.5461E-003
		87.20	3.70	5.6069E+000		2.1430E+000
		89.80	1.03	1.8058E+001		-1.0938E+001
		241.98	7.49	4.4990E+000		5.6918E+000
		295.21	19.20	1.4478E+000		1.3954E+000
		351.92	37.20	7.4035E-001		-3.7884E-001
		785.91	1.10	3.3967E+001		-1.6978E+001
	AC-228	338.32	11.40	2.5385E+000	1.65E+000	7.0053E-001
		911.07	27.70	1.6535E+000		-1.9180E+000
		969.11	16.60	2.7217E+000		-2.1101E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR-94-04.CNF

Report Generated On : 10/7/2014 9:01:41 AM

Sample Location : AAR  
Sample Identification : AAR-94-04  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : Grid 94 clear  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : clear area  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 6/4/2014 2:17:00 PM  
Acquisition Started : 6/4/2014 2:18:56 PM

Live Time : 600.0 seconds  
Real Time : 600.3 seconds

Dead Time : 0.05 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR

Peak Analysis Performed on: 10/7/2014 9:01:41 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	8008-	8041	8024.98	1465.91	0.74	5.88E+001	17.63	4.20E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma



\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/7/2014 9:01:41 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1465.91	9.8003E-002	29.99

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.6689E+001	3.45E+000	6.5028E-001
		727.17	11.80	3.4538E+000		-4.4020E-001
		785.42	2.00	2.2930E+001		4.5808E-001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.4726E+000	7.46E-001	-2.9689E-001
		77.11	17.50	1.2772E+000		-5.9379E-001
		87.20	6.30	3.6357E+000		-9.3797E-001
		89.80	1.75	1.3499E+001		7.5240E+000
		115.19	0.60	4.2212E+001		2.5188E+001
		238.63	44.60	7.4644E-001		8.1622E-001
		300.09	3.41	7.9025E+000		-4.4793E+000
	BI-214	609.31	46.30	8.3292E-001	8.33E-001	9.6731E-002
		768.36	5.04	8.4702E+000		2.6573E+000
		806.17	1.23	3.4088E+001		-1.0995E+001
		934.06	3.21	1.6971E+001		-2.0184E+000
		1120.29	15.10	3.5369E+000		-5.2152E+000
		1155.19	1.69	3.5630E+001		3.1956E+001
		1238.11	5.94	1.1112E+001		-1.3502E+001
		1280.96	1.47	3.9661E+001		2.9768E+001
		1377.67	4.11	1.5348E+001		-2.3625E+000
		1385.31	0.78	7.9110E+001		-8.9825E+001
		1401.50	1.39	4.9870E+001		-6.6798E+000
		1407.98	2.48	2.5331E+001		-3.4629E+000
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	3.7499E+000	7.84E-001	-4.5026E-001
		77.11	10.70	2.0889E+000		-9.7115E-001
		87.20	3.70	6.1905E+000		-1.5971E+000
		89.80	1.03	2.2935E+001		1.2783E+001
		241.98	7.49	4.3717E+000		3.4109E+000
		295.21	19.20	1.3359E+000		-7.0036E-002
		351.92	37.20	7.8357E-001		-9.4623E-002
		785.91	1.10	4.1013E+001		-2.8229E+001
	AC-228	338.32	11.40	2.8187E+000	1.79E+000	7.7670E-001
		911.07	27.70	1.7931E+000		-4.3950E-001
		969.11	16.60	3.1706E+000		-9.3252E-001

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

# GRID 98

**Solutient**  
Technologies, LLC

Project Name:	AGR Llanita	Model:	N/A	NORTH  ↑
Work Order #	201421	Serial #		
Surveyor Name:	ngt Crosby	Probes		
Date:	7-28-14	Serial #		
Survey Type:	1-2 meter	Calibration Due	N/A	
GRID # 98		⊕ = Sample Location		
<div style="text-align: center;">1 Minute Integrated Count</div> <div style="text-align: center; font-size: 2em;">1</div> <div style="text-align: center; font-size: 1.5em;">N/A</div> <div style="text-align: center; font-size: 1.5em;">Y 1.7</div> <div style="text-align: center; font-size: 1.5em;">X 4.6</div>		<div style="text-align: center;">1 Minute Integrated Count</div> <div style="text-align: center; font-size: 2em;">2</div> <div style="text-align: center; font-size: 1.5em;">N/A</div> <div style="text-align: center; font-size: 1.5em;">Y 2.0</div> <div style="text-align: center; font-size: 1.5em;">X 1.9</div>		
<div style="text-align: center;">1 Minute Integrated Count</div> <div style="text-align: center; font-size: 2em;">3</div> <div style="text-align: center; font-size: 1.5em;">N/A</div> <div style="text-align: center; font-size: 1.5em;">Y 3.2</div> <div style="text-align: center; font-size: 1.5em;">X 3.0</div>		<div style="text-align: center;">1 Minute Integrated Count</div> <div style="text-align: center; font-size: 2em;">4</div> <div style="text-align: center; font-size: 1.5em;">N/A</div> <div style="text-align: center; font-size: 1.5em;">Y 2.8</div> <div style="text-align: center; font-size: 1.5em;">X 4.8</div>		

- \* All readings are presented in C.P.M
- \* Each grid represents an 10 Meter x 10 Meter area.
- \* Each Sub grid represents an 5 Meter x 5 Meter area.

Instrument BKG:

N/A

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR98-1.CNF

Report Generated On : 10/8/2014 9:40:46 AM

Sample Location : AAR072514-98-1  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 98-1  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/28/2014 11:18:00 AM  
Acquisition Started : 7/28/2014 11:19:32 AM

Live Time : 900.0 seconds  
Real Time : 900.7 seconds

Dead Time : 0.08 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR072514-98-1

Peak Analysis Performed on: 10/8/2014 9:40:47 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7986-	8019	8002.04	1461.72	0.34	9.50E+001	19.10	0.00E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR072514-98-1  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma



\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: RE1A

Report Generated On : 7/28/2014 11:51:47 AM

Sample Location : AAR072514-98-2  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 98-2  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/28/2014 11:36:00 AM  
Acquisition Started : 7/28/2014 11:36:46 AM

Live Time : 900.0 seconds  
Real Time : 900.8 seconds

Dead Time : 0.09 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K   A N A L Y S I S   R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR072514-98-2

Peak Analysis Performed on: 7/28/2014 11:51:47 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7986	8019	8002.81	1461.86	0.85	9.45E+001	23.12	8.50E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR072514-98-2  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance : 3.000 keV  
 Nuclide confidence index threshold = 0.30  
 Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 7/28/2014 11:51:47 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1461.86	1.0500E-001	24.47

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
\*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Geometry: 8 Oz. Can  
Sample Title: AAR072514-98-2  
Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
BI-212	39.86	1.10	1.2961E+001	2.51E+000	-1.1436E+000
	727.17	11.80	2.5068E+000		-2.3734E+000
	785.42	2.00	1.8686E+001		-3.2586E+001
>	1620.56	2.75	0.0000E+000		0.0000E+000
PB-212	74.81	9.60	1.8928E+000	6.82E-001	-8.4707E-002
	77.11	17.50	1.0988E+000		5.3095E-001
	87.20	6.30	2.9562E+000		-7.0854E-001
	89.80	1.75	1.1011E+001		-9.0292E+000
	115.19	0.60	3.0578E+001		1.3718E+001
	238.63	44.60	6.8248E-001		1.1490E+000
	300.09	3.41	8.0967E+000		1.1324E+001
BI-214	609.31	46.30	7.5673E-001	7.57E-001	-7.2111E-001
	768.36	5.04	6.4277E+000		-5.7091E+000
	806.17	1.23	3.1416E+001		-1.3307E+000
	934.06	3.21	1.2018E+001		3.1052E-001
	1120.29	15.10	3.4518E+000		-1.4969E+000
	1155.19	1.69	3.1820E+001		6.5364E+000
	1238.11	5.94	9.2932E+000		1.1251E+001
	1280.96	1.47	3.2211E+001		-1.4574E+001
	1377.67	4.11	1.0507E+001		8.1599E+000
	1385.31	0.78	5.8493E+001		-1.0580E+001
	1401.50	1.39	3.1660E+001		2.4588E+001
	1407.98	2.48	1.8289E+001		-1.7880E+000
>	1509.19	2.19	0.0000E+000		0.0000E+000
>	1661.28	1.15	0.0000E+000		0.0000E+000
>	1729.60	3.05	0.0000E+000		0.0000E+000
>	1764.49	15.80	0.0000E+000		0.0000E+000
>	1847.44	2.12	0.0000E+000		0.0000E+000
>	2118.54	1.21	0.0000E+000		0.0000E+000
PB-214	74.81	6.33	2.8706E+000	7.04E-001	-1.2847E-001
	77.11	10.70	1.7972E+000		8.6838E-001
	87.20	3.70	5.0335E+000		-1.2064E+000
	89.80	1.03	1.8709E+001		-1.5341E+001
	241.98	7.49	4.0087E+000		4.1017E+000
	295.21	19.20	1.4428E+000		1.4663E+000
	351.92	37.20	7.0415E-001		6.5320E-001
	785.91	1.10	3.5797E+001		3.4682E+001
AC-228	89.95	2.10	9.2382E+000	1.61E+000	-4.1942E+000
	93.35	3.50	5.1457E+000		7.5658E-001
	129.08	2.80	6.8615E+000		1.2423E+000
	209.28	4.40	4.9611E+000		3.0339E+000
	270.23	3.60	6.5619E+000		-3.6122E-001

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
AC-228	327.64	3.20	6.9870E+000	1.61E+000	-5.9477E+000
	338.32	11.40	2.1857E+000		9.2410E-001
	409.51	2.13	1.1171E+001		-8.2094E+000
	463.00	4.40	6.5190E+000		7.8589E+000
	583.20	0.14	2.2153E+002		2.2270E+002
	794.70	4.60	8.2963E+000		-4.3854E-001
	911.07	27.70	1.6062E+000		2.1565E+000
	964.60	5.20	8.5615E+000		2.4369E+000
	969.11	16.60	2.6017E+000		5.1807E-001
>	1587.90	3.71	0.0000E+000		0.0000E+000

+ = Nuclide identified during the nuclide identification

\* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR98-3.CNF

Report Generated On : 10/8/2014 9:41:31 AM

Sample Location : AAR072514-98-3  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 98-3  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/28/2014 11:59:00 AM  
Acquisition Started : 7/28/2014 12:00:18 PM

Live Time : 900.0 seconds  
Real Time : 900.7 seconds

Dead Time : 0.08 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR072514-98-3

Peak Analysis Performed on: 10/8/2014 9:41:31 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7986-	8019	8002.23	1461.75	1.53	9.40E+001	19.00	0.00E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma



\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR072514-98-3

Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide	Id	Energy	Yield	Activity	Activity
Name	Confidence	(keV)	(%)	(pCi/Gram)	Uncertainty

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide	Nuclide	Wt mean	Wt mean
Name	Id	Activity	Activity
	Confidence	(pCi/Gram)	Uncertainty

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:41:31 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak	Energy	Peak Size in	Peak CPS
No.	(keV)	Counts per Second	% Uncertainty
1	1461.75	1.0444E-001	20.22

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR072514-98-3  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
BI-212	39.86	1.10	1.3434E+001	3.16E+000	3.8022E+000
	727.17	11.80	3.1551E+000		-2.8999E+000
	785.42	2.00	1.6270E+001		-2.2622E+001
>	1620.56	2.75	0.0000E+000		0.0000E+000
PB-212	74.81	9.60	2.1339E+000	6.92E-001	-2.1422E-001
	77.11	17.50	1.1810E+000		4.2877E-001
	87.20	6.30	3.1258E+000		-1.3154E+000
	89.80	1.75	1.1671E+001		-5.3235E+000
	115.19	0.60	3.3252E+001		-5.0261E+000
	238.63	44.60	6.9247E-001		8.4789E-001
	300.09	3.41	8.0523E+000		1.0305E+001
BI-214	609.31	46.30	7.4429E-001	7.44E-001	-1.3219E-001
	768.36	5.04	7.2765E+000		-5.7958E+000
	806.17	1.23	3.3364E+001		7.0936E+000
	934.06	3.21	1.2838E+001		9.4750E+000
	1120.29	15.10	3.4139E+000		5.9058E-001
	1155.19	1.69	3.0758E+001		2.2161E+001
	1238.11	5.94	9.9390E+000		2.2105E+000
	1280.96	1.47	3.3343E+001		-1.2093E+001
	1377.67	4.11	9.3512E+000		-1.4141E+001
	1385.31	0.78	5.7117E+001		4.5803E+001
	1401.50	1.39	2.9977E+001		-3.8328E+000
	1407.98	2.48	1.6390E+001		1.1407E+001
>	1509.19	2.19	0.0000E+000		0.0000E+000
>	1661.28	1.15	0.0000E+000		0.0000E+000
>	1729.60	3.05	0.0000E+000		0.0000E+000
>	1764.49	15.80	0.0000E+000		0.0000E+000
>	1847.44	2.12	0.0000E+000		0.0000E+000
>	2118.54	1.21	0.0000E+000		0.0000E+000
PB-214	74.81	6.33	3.2363E+000	7.71E-001	-3.2488E-001
	77.11	10.70	1.9315E+000		7.0125E-001
	87.20	3.70	5.3224E+000		-2.2398E+000
	89.80	1.03	1.9829E+001		-9.0447E+000
	241.98	7.49	4.0393E+000		4.4903E+000
	295.21	19.20	1.3551E+000		1.3852E+000
	351.92	37.20	7.7143E-001		6.0969E-001
	785.91	1.10	3.0449E+001		-2.4310E+001
AC-228	338.32	11.40	2.3920E+000	1.57E+000	1.6752E+000
	911.07	27.70	1.5737E+000		1.3350E+000
	969.11	16.60	2.4060E+000		2.6525E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR 98-4.CNF

Report Generated On : 10/8/2014 9:40:03 AM

Sample Location : AAR072514-98-4  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 98-4  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : SOIL  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/28/2014 12:20:00 AM  
Acquisition Started : 7/28/2014 12:21:02 PM

Live Time : 900.0 seconds  
Real Time : 900.7 seconds

Dead Time : 0.08 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR072514-98-4

Peak Analysis Performed on: 10/8/2014 9:40:04 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7986-	8019	8002.28	1461.76	1.02	8.58E+001	22.19	8.16E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR072514-98-4  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide	Nuclide	Wt mean	Wt mean
Name	Id	Activity	Activity
	Confidence	(pCi/Gram)	Uncertainty

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:40:04 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak	Energy	Peak Size in	Peak CPS
No.	(keV)	Counts per Second	% Uncertainty
1	1461.76	9.5378E-002	25.85

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma



\*\*\*\*\*  
\*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Geometry: 8 Oz. Can  
Sample Title: AAR072514-98-4  
Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.2467E+001	2.73E+000	-3.0785E+000
		727.17	11.80	2.7299E+000		-1.7608E+000
		785.42	2.00	1.6738E+001		-6.2294E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.7832E+000	6.44E-001	-3.3425E-001
		77.11	17.50	9.8360E-001		3.1980E-001
		87.20	6.30	2.7754E+000		-2.4521E+000
		89.80	1.75	1.0225E+001		-2.4382E+000
		115.19	0.60	2.7885E+001		-5.8776E+000
		238.63	44.60	6.4356E-001		7.8894E-001
		300.09	3.41	7.9174E+000		1.2959E+001
	BI-214	609.31	46.30	6.4270E-001	6.43E-001	3.2377E-002
		768.36	5.04	7.3556E+000		-1.3506E+000
		806.17	1.23	2.7839E+001		3.1212E+001
		934.06	3.21	1.1846E+001		-6.0067E+000
		1120.29	15.10	3.1342E+000		-1.6205E+000
		1155.19	1.69	3.0395E+001		1.8666E+001
		1238.11	5.94	8.9511E+000		-4.8705E+000
		1280.96	1.47	3.2783E+001		-3.1641E+001
		1377.67	4.11	1.1034E+001		9.1199E+000
		1385.31	0.78	5.5701E+001		3.3679E+000
		1401.50	1.39	3.5478E+001		7.2810E+000
		1407.98	2.48	1.9578E+001		-1.4870E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.7045E+000	6.73E-001	-5.0692E-001
		77.11	10.70	1.6087E+000		5.2304E-001
		87.20	3.70	4.7256E+000		-4.1752E+000
		89.80	1.03	1.7373E+001		-4.1426E+000
		241.98	7.49	3.7544E+000		4.0289E+000
		295.21	19.20	1.2246E+000		1.1105E+000
		351.92	37.20	6.7310E-001		-2.7450E-002
		785.91	1.10	3.0865E+001		5.9482E+000
	AC-228	338.32	11.40	1.9180E+000	1.59E+000	-1.4141E+000
		911.07	27.70	1.5901E+000		5.9538E-001
		969.11	16.60	2.6635E+000		6.8385E-001

+ = Nuclide identified during the nuclide identification  
\* = Energy line found in the spectrum  
> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

**GRID 99**

**Solutient**  
Technologies, LLC

Project Name :	AAR LIDON.A	Model:	N/A	NORTH 
Work Order #	2014 21	Serial #		
Surveyor Name:	mt crosby	Probe:		
Date:	7-15-14	Serial #		
Survey Type:	1-2 Actn	Calibration Due	N/A	
GRID # 99	⊕ = Sample Location		Comments:	

  

<p>1 Minute Integrated Count</p> <p align="center">1 <span style="float: right;">✓</span></p> <p align="center"><u>N/A</u></p> <p align="center">⊕</p> <p>X-3.8</p> <p>X-0.4</p>	<p>1 Minute Integrated Count</p> <p align="center">2 <span style="float: right;">✓</span></p> <p align="center"><u>N/A</u></p> <p align="center">⊕</p> <p>X-1.0</p> <p>X-2.0</p>
<p>1 Minute Integrated Count</p> <p align="center">3 <span style="float: right;">✓</span></p> <p align="center"><u>N/A</u></p> <p align="center">⊕</p> <p>X-1.2</p> <p>X-3.5</p>	<p>1 Minute Integrated Count</p> <p align="center">4 <span style="float: right;">✓</span></p> <p align="center"><u>N/A</u></p> <p align="center">⊕</p> <p>X-3.7</p> <p>X-3.4</p>

- \* All readings are presented in C.P.M
- \* Each grid represents an 10 Meter x 10 Meter area.
- \* Each Sub grid represents an 5 Meter x 5 Meter area.

Instrument BKG:

N/A

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR-99-01.CNF

Report Generated On : 10/8/2014 9:36:41 AM

Sample Location : AAR-99-01  
Sample Identification : AAR-99-01  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : Grid Clearance  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : Soil Waste  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/16/2014 10:03:00 AM  
Acquisition Started : 7/16/2014 10:03:41 AM

Live Time : 900.0 seconds  
Real Time : 900.5 seconds

Dead Time : 0.06 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Title: AAR-99-01  
Peak Analysis Performed on: 10/8/2014 9:36:41 AM  
Peak Analysis From Channel: 40  
Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7986-	8019	8002.15	1461.74	0.31	8.40E+001	17.96	0.00E+000

M = First peak in a multiplet region  
m = Other peak in a multiplet region  
F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-99-01  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Cop of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.  
 @ = Energy line not used for Weighted Mean Activity  
 Energy Tolerance : 3.000 keV  
 Nuclide confidence index threshold = 0.30  
 Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:36:41 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1461.74	9.3333E-002	21.39

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma



\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR-99-01  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
BI-212	39.86	1.10	1.1683E+001	2.80E+000	-9.8309E-001
	727.17	11.80	2.7999E+000		-5.0823E-001
	785.42	2.00	1.7633E+001		-1.1089E+001
>	1620.56	2.75	0.0000E+000		0.0000E+000
PB-212	74.81	9.60	1.7173E+000	5.76E-001	-8.9486E-002
	77.11	17.50	9.5696E-001		3.3218E-001
	87.20	6.30	2.7986E+000		-8.0776E-001
	89.80	1.75	9.4569E+000		-7.1043E+000
	115.19	0.60	2.4875E+001		-4.3676E+000
	238.63	44.60	5.7553E-001		2.1998E-001
	300.09	3.41	6.5151E+000		4.1561E+000
BI-214	609.31	46.30	6.7840E-001	6.78E-001	3.8958E-001
	768.36	5.04	6.9506E+000		-1.1189E+000
	806.17	1.23	2.7453E+001		1.7978E+001
	934.06	3.21	1.0943E+001		-2.1736E+000
	1120.29	15.10	3.2972E+000		-1.2889E+000
	1155.19	1.69	2.7706E+001		-3.8250E+001
	1238.11	5.94	8.7148E+000		4.2393E+000
	1280.96	1.47	3.1628E+001		2.9768E+001
	1377.67	4.11	1.1774E+001		-4.4181E+000
	1385.31	0.78	6.4887E+001		-3.6261E+001
	1401.50	1.39	3.4009E+001		-1.2005E+001
	1407.98	2.48	1.4778E+001		-3.2536E+001
>	1509.19	2.19	0.0000E+000		0.0000E+000
>	1661.28	1.15	0.0000E+000		0.0000E+000
>	1729.60	3.05	0.0000E+000		0.0000E+000
>	1764.49	15.80	0.0000E+000		0.0000E+000
>	1847.44	2.12	0.0000E+000		0.0000E+000
>	2118.54	1.21	0.0000E+000		0.0000E+000
PB-214	74.81	6.33	2.6044E+000	7.71E-001	-1.3571E-001
	77.11	10.70	1.5651E+000		5.4329E-001
	87.20	3.70	4.7653E+000		-1.3754E+000
	89.80	1.03	1.6068E+001		-1.2070E+001
	241.98	7.49	3.4805E+000		-1.4904E+000
	295.21	19.20	1.1485E+000		-1.7552E-001
	351.92	37.20	7.7143E-001		4.5079E-001
	785.91	1.10	3.1678E+001		-5.1752E+001
AC-228	338.32	11.40	2.1521E+000	1.28E+000	-1.6272E-001
	911.07	27.70	1.2811E+000		6.2158E-001
	969.11	16.60	2.4398E+000		3.5919E-001

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR-99-02.CNF

Report Generated On : 10/8/2014 9:37:24 AM

Sample Location : AAR-99-02  
Sample Identification : AAR-99-02  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : Grid Clearance  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : Soil Waste  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/16/2014 8:49:00 AM  
Acquisition Started : 7/16/2014 8:50:23 AM

Live Time : 900.0 seconds  
Real Time : 900.5 seconds

Dead Time : 0.05 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR-99-02

Peak Analysis Performed on: 10/8/2014 9:37:25 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	7986-	8019	8002.88	1461.87	0.36	7.68E+001	19.46	4.17E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
\*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Sample Title: AAR-99-02  
Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

## ..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
-----------------	------------------	-----------------	--------------	------------------------	-------------------------

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:37:24 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	1461.87	8.5370E-002	25.33

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR-99-02  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
BI-212	39.86	1.10	1.2212E+001	2.87E+000	-5.6635E+000
	727.17	11.80	2.8681E+000		1.1854E+000
	785.42	2.00	1.5787E+001		-1.5638E+001
>	1620.56	2.75	0.0000E+000		0.0000E+000
PB-212	74.81	9.60	2.0101E+000	6.67E-001	-1.5903E-001
	77.11	17.50	1.0592E+000		6.1706E-002
	87.20	6.30	2.5808E+000		-1.3302E+000
	89.80	1.75	9.1854E+000		2.2875E+000
	115.19	0.60	2.8395E+001		-4.5521E+000
	238.63	44.60	6.6720E-001		9.9216E-001
	300.09	3.41	7.5452E+000		5.7190E+000
BI-214	609.31	46.30	7.8096E-001	7.81E-001	9.7212E-001
	768.36	5.04	6.9506E+000		-4.7086E+000
	806.17	1.23	2.9687E+001		8.2883E+000
	934.06	3.21	1.1671E+001		1.0282E+000
	1120.29	15.10	3.2972E+000		3.9918E+000
	1155.19	1.69	2.9654E+001		1.9401E+001
	1238.11	5.94	9.4042E+000		6.7661E+000
	1280.96	1.47	3.2783E+001		-1.3334E+001
	1377.67	4.11	1.1774E+001		-2.0449E+001
	1385.31	0.78	6.3666E+001		-3.8805E+001
	1401.50	1.39	3.6881E+001		3.4712E+001
	1407.98	2.48	1.9577E+001		1.7111E+001
>	1509.19	2.19	0.0000E+000		0.0000E+000
>	1661.28	1.15	0.0000E+000		0.0000E+000
>	1729.60	3.05	0.0000E+000		0.0000E+000
>	1764.49	15.80	0.0000E+000		0.0000E+000
>	1847.44	2.12	0.0000E+000		0.0000E+000
>	2118.54	1.21	0.0000E+000		0.0000E+000
PB-214	74.81	6.33	3.0485E+000	6.99E-001	-2.4118E-001
	77.11	10.70	1.7324E+000		1.0092E-001
	87.20	3.70	4.3944E+000		-2.2649E+000
	89.80	1.03	1.5606E+001		3.8865E+000
	241.98	7.49	3.9778E+000		4.7795E+000
	295.21	19.20	1.3046E+000		6.5871E-001
	351.92	37.20	6.9908E-001		-4.3333E-001
	785.91	1.10	2.9162E+001		-1.4146E+001
AC-228	338.32	11.40	2.3615E+000	1.51E+000	8.5523E-003
	911.07	27.70	1.5064E+000		-7.6766E-001
	969.11	16.60	2.7237E+000		-1.9094E+000

+ = Nuclide identified during the nuclide identification  
 \* = Energy line found in the spectrum  
 > = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction



\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR-99-03.CNF

Report Generated On : 10/8/2014 9:38:05 AM

Sample Location : AAR-99-03  
Sample Identification : AAR-99-03  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : Grid Clearance  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : Soil Waste  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/16/2014 10:52:00 AM  
Acquisition Started : 7/16/2014 10:53:15 AM

Live Time : 900.0 seconds  
Real Time : 900.5 seconds

Dead Time : 0.06 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

\*\*\*\*\*  
\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR-99-03

Peak Analysis Performed on: 10/8/2014 9:38:06 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	1301-	1314	1307.93	238.90	0.87	4.74E+001	19.85	1.96E+001
2	7987-	8020	8003.49	1461.98	0.64	1.09E+002	20.46	0.00E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-99-03  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
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\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution  
 X = nuclide rejected by the interference analysis  
 @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:38:06 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	238.90	5.2682E-002	41.86
2	1461.98	1.2111E-001	18.77

M = First peak in a multiplet region  
 m = Other peak in a multiplet region  
 F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
\*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Geometry: 8 Oz. Can  
Sample Title: AAR-99-03  
Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.2961E+001	2.90E+000	-1.1436E+000
		727.17	11.80	2.9015E+000		-2.4380E-001
		785.42	2.00	1.6506E+001		-2.1929E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.7832E+000	6.52E-001	-3.2695E-001
		77.11	17.50	1.0347E+000		-4.5908E-001
		87.20	6.30	3.3250E+000		-2.2996E-001
		89.80	1.75	1.1236E+001		-6.8608E+000
		115.19	0.60	2.7885E+001		-1.1747E+001
		238.63	44.60	6.5154E-001		5.6206E-001
		300.09	3.41	7.4973E+000		1.4126E+000
	BI-214	609.31	46.30	7.7498E-001	7.75E-001	1.2001E+000
		768.36	5.04	6.5180E+000		-1.5736E+000
		806.17	1.23	3.0391E+001		1.0640E+001
		934.06	3.21	1.3605E+001		1.7389E+001
		1120.29	15.10	3.5264E+000		1.1388E+000
		1155.19	1.69	3.0027E+001		3.5829E+001
		1238.11	5.94	8.5940E+000		3.5807E+000
		1280.96	1.47	3.5488E+001		-1.1723E+001
		1377.67	4.11	9.3512E+000		-2.6677E+000
		1385.31	0.78	5.4244E+001		-1.6262E+001
		1401.50	1.39	3.6187E+001		4.9207E+000
		1407.98	2.48	2.0386E+001		-1.4967E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	2.7045E+000	7.43E-001	-4.9585E-001
		77.11	10.70	1.6922E+000		-7.5082E-001
		87.20	3.70	5.6614E+000		-3.9156E-001
		89.80	1.03	1.9090E+001		-1.1657E+001
		241.98	7.49	3.9778E+000		3.1410E+000
		295.21	19.20	1.3633E+000		5.5430E-001
		351.92	37.20	7.4339E-001		5.0289E-001
		785.91	1.10	3.0865E+001		5.9482E+000
	AC-228	338.32	11.40	2.3150E+000	1.45E+000	-6.6200E-001
		911.07	27.70	1.4536E+000		1.7346E+000
		969.11	16.60	2.6635E+000		-1.8909E+000

+ = Nuclide identified during the nuclide identification  
\* = Energy line found in the spectrum  
> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

\*\*\*\*\*  
\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
\*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR-99-04.CNF

Report Generated On : 10/8/2014 9:38:48 AM

Sample Location : AAR-99-04  
Sample Identification : AAR-99-04  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : Grid Clearance  
Sample Description 3 :  
Sample Description 4 :  
Sample Type : Soil Waste  
Sample Geometry : 8 Oz. Can

Peak Locate Threshold : 5.00  
Peak Locate Range (in channels) : 40 - 8192  
Peak Area Range (in channels) : 40 - 8192  
Identification Energy Tolerance : 3.000 keV

Sample Size : 2.003E+002 Grams

Sample Taken On : 7/16/2014 10:29:00 AM  
Acquisition Started : 7/16/2014 10:30:36 AM

Live Time : 900.0 seconds  
Real Time : 900.5 seconds

Dead Time : 0.06 %

Energy Calibration Used Done On : 6/4/2008  
Efficiency Calibration Used Done On : 5/23/2008  
Efficiency ID :

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*****
*****      P E A K      A N A L Y S I S      R E P O R T      *****
*****
```

Detector Name: RE1A

Sample Title: AAR-99-04

Peak Analysis Performed on: 10/8/2014 9:38:48 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	1298-	1313	1306.55	238.65	0.81	7.08E+001	26.11	3.52E+001
2	7986-	8019	8002.59	1461.82	1.49	9.48E+001	21.15	4.16E+000

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma



\*\*\*\*\*  
 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Sample Title: AAR-99-04  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

..... IDENTIFIED NUCLIDES .....

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
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\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 3.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 1.960 sigma

\*\*\*\*\*  
 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
 \*\*\*\*\*

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
-----------------	-----------------------------	-----------------------------------	------------------------------------

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 10/8/2014 9:38:48 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	238.65	7.8658E-002	36.88
2	1461.82	1.0538E-001	22.30

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

\*\*\*\*\*  
\*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Geometry: 8 Oz. Can  
Sample Title: AAR-99-04  
Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
	BI-212	39.86	1.10	1.3434E+001	3.12E+000	-8.8409E+000
		727.17	11.80	3.1246E+000		3.0043E+000
		785.42	2.00	1.7633E+001		3.4042E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.1735E+000	8.07E-001	-4.1499E-001
		77.11	17.50	1.2507E+000		7.3597E-001
		87.20	6.30	3.1258E+000		-1.1933E+000
		89.80	1.75	1.1600E+001		-1.2491E+001
		115.19	0.60	3.2387E+001		-2.1341E+001
		238.63	44.60	8.0651E-001		1.0265E+000
		300.09	3.41	7.2526E+000		1.7281E+000
	BI-214	609.31	46.30	8.2153E-001	8.22E-001	9.0521E-002
		768.36	5.04	6.9506E+000		-3.9277E+000
		806.17	1.23	2.7839E+001		4.0197E+000
		934.06	3.21	1.3455E+001		4.0367E+000
		1120.29	15.10	3.6351E+000		3.2023E+000
		1155.19	1.69	2.0643E+001		1.5494E+001
		1238.11	5.94	9.1807E+000		6.5197E+000
		1280.96	1.47	3.7498E+001		1.7551E+001
		1377.67	4.11	1.2465E+001		4.1712E+000
		1385.31	0.78	6.8406E+001		1.4961E+001
		1401.50	1.39	3.2464E+001		2.6034E+001
		1407.98	2.48	1.7836E+001		1.3851E+001
>		1509.19	2.19	0.0000E+000		0.0000E+000
>		1661.28	1.15	0.0000E+000		0.0000E+000
>		1729.60	3.05	0.0000E+000		0.0000E+000
>		1764.49	15.80	0.0000E+000		0.0000E+000
>		1847.44	2.12	0.0000E+000		0.0000E+000
>		2118.54	1.21	0.0000E+000		0.0000E+000
	PB-214	74.81	6.33	3.2964E+000	8.90E-001	-6.2936E-001
		77.11	10.70	2.0456E+000		1.2037E+000
		87.20	3.70	5.3224E+000		-2.0319E+000
		89.80	1.03	1.9708E+001		-2.1222E+001
		241.98	7.49	4.8144E+000		5.3602E+000
		295.21	19.20	1.3216E+000		5.1509E-001
		351.92	37.20	8.9003E-001		7.8616E-001
		785.91	1.10	3.2077E+001		-4.9277E+000
	AC-228	338.32	11.40	2.3306E+000	1.73E+000	-5.9177E-001
		911.07	27.70	1.7297E+000		-1.8405E-001
		969.11	16.60	2.6017E+000		1.9567E+000

+ = Nuclide identified during the nuclide identification  
\* = Energy line found in the spectrum  
> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction