

**GRID 315**

**Solutient**  
Technologies, LLC

Project Name:	AAR Livonia	Model:	N/A	NORTH A/T
Work Order #	2019 21	Serial #		
Surveyor Name:	mt Crosby	Prober		
Date:	7-28-14	Serial #		
Survey Type:	1-2 meter	Calibration Due	N/A	
GRID # 315	⊕ = Sample Location	Comments:		
<p>1 Minute Integrated Count</p> <p><u>N/A</u></p> <p>Y 0.5 ⊕</p> <p>X 2.2</p>		<p>2 Minute Integrated Count</p> <p><u>N/A</u></p> <p>Y 3.2 ⊕</p> <p>X 5.0</p>		
<p>3 Minute Integrated Count</p> <p><u>N/A</u></p> <p>Y 4.8 ⊕</p> <p>X 1.7</p>		<p>4 Minute Integrated Count</p> <p><u>N/A</u></p> <p>Y 4.8 ⊕</p> <p>X 2.6</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



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 \*\*\*\*\* 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: C:\My Documents\AAR\AAR\Grid Samples\AAR315-1.CNF

Report Generated On : 10/7/2014 8:51:56 AM

Sample Location : AAR072514-315-1  
 Sample Identification : CLEARANCE  
 Sample Description 1 : 8 Oz. Can  
 Sample Description 2 : GRID 315-1  
 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 12:37:00 AM  
 Acquisition Started : 7/28/2014 12:37:44 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 :

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*****
***** 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: AAR072514-315-1

Peak Analysis Performed on: 10/7/2014 8:51:57 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	1299-	1314	1306.23	238.59	0.63	6.96E+001	23.55	2.44E+001
2	7985-	8018	8001.75	1461.67	1.16	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

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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: AAR072514-315-1  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

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

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

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 \*\*\*\*\* 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: 10/7/2014 8:51:57 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	238.59	7.7376E-002	33.82
2	1461.67	1.0556E-001	20.11

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 \*\*\*\*\*  
 \*\*\*\*\*

Detector Name: RE1A  
 Sample Geometry: 8 Oz. Can  
 Sample Title: AAR072514-315-1  
 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	1.2212E+001	3.27E+000	4.4171E+000
	727.17	11.80	3.2740E+000		9.5376E-001
	785.42	2.00	1.7633E+001		-2.0364E+000
	1620.56	2.75	0.0000E+000		0.0000E+000
> PB-212	74.81	9.60	1.9670E+000	7.36E-001	-6.9654E-001
	77.11	17.50	1.0429E+000		3.8037E-001
	87.20	6.30	2.6556E+000		-1.3127E+000
	89.80	1.75	9.9760E+000		-5.8772E+000
BI-214	115.19	0.60	3.3676E+001	7.63E-001	1.0815E+001
	238.63	44.60	7.3566E-001		1.1281E+000
	300.09	3.41	7.4973E+000		7.1513E+000
	609.31	46.30	7.6287E-001		-8.3627E-002
	768.36	5.04	5.7509E+000		-6.8493E+000
	806.17	1.23	2.8594E+001		1.6883E+001
	934.06	3.21	1.1494E+001		-7.6952E+000
	1120.29	15.10	3.2972E+000		1.8224E+000
	1155.19	1.69	2.4693E+001		-1.0894E+001
	1238.11	5.94	8.8338E+000		1.1669E+000
	1280.96	1.47	3.2211E+001		3.1009E+001
	1377.67	4.11	1.2240E+001		3.5300E+000
	1385.31	0.78	6.4887E+001		6.1071E+001
	1401.50	1.39	3.4009E+001		2.8927E+001
	1407.98	2.48	1.8289E+001		1.4666E+001
> PB-214	1509.19	2.19	0.0000E+000	8.12E-001	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
AC-228	1847.44	2.12	0.0000E+000	1.61E+000	0.0000E+000
	2118.54	1.21	0.0000E+000		0.0000E+000
	74.81	6.33	2.9831E+000		-1.0564E+000
	77.11	10.70	1.7057E+000		6.2210E-001
	87.20	3.70	4.5217E+000		-2.2351E+000
	89.80	1.03	1.6950E+001		-9.9856E+000
	241.98	7.49	4.5400E+000		6.9766E+000
	295.21	19.20	1.2697E+000		-4.4356E-001
	351.92	37.20	8.1156E-001		1.4499E-001
	785.91	1.10	3.2470E+001		-3.0810E+001
AC-228	338.32	11.40	2.5808E+000	1.61E+000	1.3657E+000
	911.07	27.70	1.6062E+000		1.0359E+000
	969.11	16.60	2.6938E+000		-5.6962E-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

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\*\*\*\*\* 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: C:\My Documents\AAR\AAR\Grid Samples\AAR 315-2.CNF

Report Generated On : 10/7/2014 8:55:23 AM

Sample Location : AAR072514-315-2  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 315-2  
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 1:01:00 PM  
Acquisition Started : 7/28/2014 1:01:31 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 :

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\*\*\*\*\* 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: AAR072514-315-2

Peak Analysis Performed on: 10/7/2014 8:55:23 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-	1313	1306.42	238.62	1.03	9.22E+001	23.72	1.88E+001
2	7987-	8020	8003.65	1462.01	1.40	8.20E+001	17.75	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: AAR072514-315-2  
 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	Nuclide	Wt mean	Wt mean
Name	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: 10/7/2014 8:55:23 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	238.62	1.0244E-001	25.73
2	1462.01	9.1111E-002	21.64

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 \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Geometry: 8 Oz. Can  
Sample Title: AAR072514-315-2  
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	2.73E+000	4.3944E+000
		727.17	11.80	2.7299E+000		1.9994E+000
		785.42	2.00	1.7633E+001		-8.4914E-001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.1339E+000	8.11E-001	7.7417E-001
		77.11	17.50	1.0673E+000		-4.6380E-001
		87.20	6.30	3.0634E+000		7.4583E+001
		89.80	1.75	1.0547E+001		-3.6019E+000
		115.19	0.60	3.0108E+001		-8.6379E+000
		238.63	44.60	8.1073E-001		1.4800E+000
		300.09	3.41	7.9174E+000		3.8093E+000
	BI-214	609.31	46.30	8.1587E-001	8.16E-001	8.6857E-001
		768.36	5.04	7.0336E+000		2.4912E+000
		806.17	1.23	3.2406E+001		1.4855E+000
		934.06	3.21	1.1314E+001		-7.3527E+000
		1120.29	15.10	3.2573E+000		2.0932E+000
		1155.19	1.69	3.0395E+001		-3.1472E+001
		1238.11	5.94	9.5138E+000		1.1103E+000
		1280.96	1.47	3.1628E+001		4.2120E+000
		1377.67	4.11	1.0507E+001		8.1599E+000
		1385.31	0.78	6.6083E+001		1.1222E+001
		1401.50	1.39	4.1981E+001		1.4734E+001
		1407.98	2.48	2.1535E+001		-1.4047E+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	7.19E-001	1.1741E+000
		77.11	10.70	1.7455E+000		-7.5856E-001
		87.20	3.70	5.2160E+000		1.2699E+000
		89.80	1.03	1.7920E+001		-6.1197E+000
		241.98	7.49	4.8397E+000		8.3047E+000
		295.21	19.20	1.3468E+000		-2.1748E-001
		351.92	37.20	7.1914E-001		2.8516E-001
		785.91	1.10	3.0865E+001		-3.4990E+001
	AC-228	338.32	11.40	2.4221E+000	1.67E+000	2.7989E-001
		911.07	27.70	1.6692E+000		1.5986E-001
		969.11	16.60	2.4731E+000		-3.0475E-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 \*\*\*\*\*  
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Filename: C:\My Documents\AAR\AAR\Grid Samples\AAR315-3.CNF

Report Generated On : 10/7/2014 8:52:39 AM

Sample Location : AAR072514-315-3  
 Sample Identification : CLEARANCE  
 Sample Description 1 : 8 Oz. Can  
 Sample Description 2 : GRID 315-3  
 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 1:17:00 PM  
 Acquisition Started : 7/28/2014 1:17:44 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 :

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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: AAR072514-315-3

Peak Analysis Performed on: 10/7/2014 8:52:39 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	8002.65	1461.83	0.55	1.02E+002	19.80	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: AAR072514-315-3  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

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

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
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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	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: 10/7/2014 8:52:39 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	1461.83	1.1333E-001	19.41

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: AAR072514-315-3  
 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	1.2467E+001	2.90E+000	3.5579E+000
		727.17	11.80	2.9015E+000		2.4233E+000
		785.42	2.00	1.7849E+001		2.1609E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.0101E+000	6.49E-001	-2.0678E-002
		77.11	17.50	1.1370E+000		4.1734E-001
		87.20	6.30	2.8673E+000		-1.0069E+000
		89.80	1.75	9.8916E+000		-7.0572E+000
		115.19	0.60	2.8896E+001		1.8506E+001
		238.63	44.60	6.4889E-001		8.0062E-001
		300.09	3.41	6.5707E+000		3.4424E+000
	BI-214	609.31	46.30	6.7143E-001	6.71E-001	-6.9460E-001
		768.36	5.04	6.2426E+000		4.9825E-001
		806.17	1.23	2.7061E+001		-1.2540E+001
		934.06	3.21	1.2353E+001		-5.0718E+000
		1120.29	15.10	3.5630E+000		3.0359E+000
		1155.19	1.69	3.1820E+001		2.1292E+001
		1238.11	5.94	9.2932E+000		1.1251E+001
		1280.96	1.47	2.9802E+001		4.6808E+000
		1377.67	4.11	1.2009E+001		1.1040E+001
		1385.31	0.78	5.7117E+001		4.5803E+001
		1401.50	1.39	2.8177E+001		-4.4502E+000
		1407.98	2.48	1.8289E+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	3.0485E+000	7.34E-001	-3.1359E-002
		77.11	10.70	1.8595E+000		6.8256E-001
		87.20	3.70	4.8822E+000		-1.7144E+000
		89.80	1.03	1.6806E+001		-1.1990E+001
		241.98	7.49	3.7708E+000		4.1896E+000
		295.21	19.20	1.1872E+000		-1.1925E+000
		351.92	37.20	7.3379E-001		6.3567E-001
		785.91	1.10	3.2077E+001		-1.9872E+001
	AC-228	338.32	11.40	1.7142E+000	1.49E+000	2.7989E-002
		911.07	27.70	1.4890E+000		4.1020E-001
		969.11	16.60	2.3367E+000		-1.9894E+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\AAR315-4.CNF

Report Generated On : 10/7/2014 8:53:09 AM

Sample Location : AAR072514-315-4  
Sample Identification : CLEARANCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 315-4  
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 1:33:00 PM  
Acquisition Started : 7/28/2014 1:33:53 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: AAR072514-315-4

Peak Analysis Performed on: 10/7/2014 8:53:09 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-	1315	1306.58	238.65	0.83	9.77E+001	25.57	2.23E+001
2	3182-	3203	3192.35	583.13	0.44	4.65E+001	17.48	8.52E+000
3	7987-	8020	8003.12	1461.92	0.28	8.90E+001	22.34	8.00E+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: AAR072514-315-4  
 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 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 8:53:09 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	1.0850E-001	26.18
2	583.13	5.1646E-002	37.61
3	1461.92	9.8889E-002	25.10

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: AAR072514-315-4  
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	3.39E+000	-3.1435E+000
		727.17	11.80	3.3883E+000		2.5960E+000
		785.42	2.00	1.8272E+001		1.7095E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.0935E+000	8.29E-001	-1.3261E+000
		77.11	17.50	1.1882E+000		5.0552E-001
		87.20	6.30	2.8673E+000		-3.9861E+000
		89.80	1.75	1.1952E+001		-4.0710E-001
		115.19	0.60	3.3252E+001		2.2878E+000
		238.63	44.60	8.2941E-001		1.3106E+000
		300.09	3.41	7.9626E+000		4.7590E+000
	BI-214	609.31	46.30	7.9278E-001	7.93E-001	5.4107E-001
		768.36	5.04	7.2765E+000		3.1714E+000
		806.17	1.23	2.7453E+001		-2.4118E+001
		934.06	3.21	1.2018E+001		1.3249E+001
		1120.29	15.10	3.5992E+000		8.9405E-001
		1155.19	1.69	2.8108E+001		3.0988E+001
		1238.11	5.94	8.3465E+000		-5.8327E+000
		1280.96	1.47	2.9802E+001		-9.7455E-001
		1377.67	4.11	9.9484E+000		7.1999E+000
		1385.31	0.78	5.2740E+001		-8.6093E+000
		1401.50	1.39	3.3247E+001		2.7480E+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	3.1750E+000	8.33E-001	-2.0112E+000
		77.11	10.70	1.9433E+000		8.2679E-001
		87.20	3.70	4.8822E+000		-6.7871E+000
		89.80	1.03	2.0306E+001		-6.9167E-001
		241.98	7.49	4.9148E+000		8.3849E+000
		295.21	19.20	1.4351E+000		-1.1085E+000
		351.92	37.20	8.3297E-001		3.2715E-001
		785.91	1.10	3.2470E+001		-4.8362E+001
	AC-228	338.32	11.40	2.3461E+000	1.74E+000	-2.5511E+000
		911.07	27.70	1.7445E+000		6.3949E-001
		969.11	16.60	2.7826E+000		2.2729E+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 368**

**Solutient**  
Technologies, LLC

Project Name :	AAR Lupa n.a	Model:	N/A	<b>NORTH</b> ↑
Work Order #	201421	Serial #		
Surveyor Name:	<del>Not</del>	Probe:	5	
Date:		Serial #		
Survey Type:		Calibration Due	N/A	
GRID #	368	⊕ = Sample Location Comments:		

  

<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; border-bottom: 1px solid black; margin: 10px 0;">N/A</div> <div style="text-align: center; margin-top: 40px;">⊕</div> <div style="position: absolute; left: 10%; top: 30%; font-size: 1.5em;">x-3.1</div> <div style="position: absolute; left: 10%; top: 45%; font-size: 1.5em;">x-1.3</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; border-bottom: 1px solid black; margin: 10px 0;">N/A</div> <div style="text-align: center; margin-top: 40px;">⊕</div> <div style="position: absolute; left: 10%; top: 30%; font-size: 1.5em;">x-0.9</div> <div style="position: absolute; left: 10%; top: 45%; font-size: 1.5em;">x-2.4</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; border-bottom: 1px solid black; margin: 10px 0;">N/A</div> <div style="text-align: center; margin-top: 40px;">⊕</div> <div style="position: absolute; left: 10%; top: 30%; font-size: 1.5em;">x-1.9</div> <div style="position: absolute; left: 10%; top: 45%; font-size: 1.5em;">x-1.6</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; border-bottom: 1px solid black; margin: 10px 0;">N/A</div> <div style="text-align: center; margin-top: 40px;">⊕</div> <div style="position: absolute; left: 10%; top: 30%; font-size: 1.5em;">x-0.4</div> <div style="position: absolute; left: 10%; top: 45%; font-size: 1.5em;">x-0.1</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 \*\*\*\*\*  
\*\*\*\*\*

lename: RE1A

Report Generated On : 7/28/2014 8:11:45 AM

Sample Location : AAR07241-368-1  
Sample Identification : CLEARENCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 368-1  
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 7:56:00 AM  
Acquisition Started : 7/28/2014 7:56:44 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: AAR07241-368-1

Peak Analysis Performed on: 7/28/2014 8:11:46 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	1306.43	238.62	0.42	9.60E+001	25.48	2.40E+001
2	7986-	8019	8002.37	1461.78	0.81	1.01E+002	23.62	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: AAR07241-368-1  
 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 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 8:11:46 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	238.62	1.0667E-001	26.55
2	1461.78	1.1167E-001	23.50

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: AAR07241-368-1  
 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	1.4753E+001	3.63E+000	1.1515E-001
		727.17	11.80	3.6315E+000		3.0847E+000
		785.42	2.00	1.8686E+001		-3.1090E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.3966E+000	8.25E-001	-1.0132E-001
		77.11	17.50	1.3356E+000		3.0329E-001
		87.20	6.30	3.3056E+000		4.0158E-001
		89.80	1.75	1.2021E+001		4.7242E-001
		115.19	0.60	3.1945E+001		-1.9900E+000
		238.63	44.60	8.2530E-001		1.2081E+000
		300.09	3.41	8.0523E+000		4.1765E+000
	BI-214	609.31	46.30	8.8128E-001	8.81E-001	5.9004E-001
		768.36	5.04	8.1001E+000		8.8118E+000
		806.17	1.23	2.8963E+001		8.0394E+000
		934.06	3.21	1.1846E+001		-6.9249E+000
		1120.29	15.10	3.3755E+000		4.2019E+000
		1155.19	1.69	2.9276E+001		1.9340E+001
		1238.11	5.94	1.0830E+001		1.0641E+001
		1280.96	1.47	3.7498E+001		-2.1706E+000
		1377.67	4.11	9.9484E+000		7.1999E+000
		1385.31	0.78	5.2740E+001		3.8169E+001
		1401.50	1.39	2.9093E+001		2.0249E+001
		1407.98	2.48	1.6390E+001		-3.8266E+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	3.6347E+000	8.12E-001	-1.5366E-001
		77.11	10.70	2.1844E+000		4.9604E-001
		87.20	3.70	5.6285E+000		6.8377E-001
		89.80	1.03	2.0423E+001		8.0266E-001
		241.98	7.49	4.8144E+000		7.8230E+000
		295.21	19.20	1.4884E+000		6.3927E-001
		351.92	37.20	8.1156E-001		1.4385E-001
		785.91	1.10	3.3619E+001		-4.4911E+001
	AC-228	89.95	2.10	9.9010E+000	1.86E+000	-3.1205E+000
		93.35	3.50	6.0699E+000		1.9073E+000
		129.08	2.80	8.0182E+000		3.1679E+000
		209.28	4.40	5.8109E+000		5.6370E+000
		270.23	3.60	6.7833E+000		1.8881E+000

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
AC-228	327.64	3.20	8.1698E+000	1.86E+000	-4.5133E-001
	338.32	11.40	2.4956E+000		-1.4857E+000
	409.51	2.13	1.2793E+001		9.8898E+000
	463.00	4.40	7.0370E+000		2.4395E+000
	583.20	0.14	2.5375E+002		1.7712E+002
	794.70	4.60	7.6485E+000		-4.2148E+000
	911.07	27.70	1.8581E+000		1.1720E-001
	964.60	5.20	1.0442E+001		3.1645E+000
	969.11	16.60	3.3812E+000		2.9012E-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 \*\*\*\*\*  
 \*\*\*\*\*

ename: C:\My Documents\AAR\AAR\Grid Samples\AAR-368-02.CNF

Report Generated On : 10/8/2014 10:41:50 AM

Sample Location : AAR-368-02  
 Sample Identification : AAR-368-02  
 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 : 7/16/2014 1:36:00 PM  
 Acquisition Started : 7/16/2014 1:36:59 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-368-02

Peak Analysis Performed on: 10/8/2014 10:41:51 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	8004.02	1462.08	0.87	8.11E+001	21.58	7.90E+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-368-02  
 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 10:41:51 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	1462.08	9.0112E-002	26.60

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-368-02  
 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	1.1409E+001	2.69E+000	-7.0522E+000
		727.17	11.80	2.6941E+000		6.0685E-001
		785.42	2.00	1.6966E+001		3.2698E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.8622E+000	6.19E-001	4.5550E-001
		77.11	17.50	9.6593E-001		9.8475E-002
		87.20	6.30	2.3410E+000		-7.5564E-001
		89.80	1.75	8.5151E+000		-1.4850E+001
		115.19	0.60	3.0108E+001		-2.6299E+001
		238.63	44.60	6.1898E-001		6.7006E-001
		300.09	3.41	7.3515E+000		1.9562E+000
	BI-214	609.31	46.30	7.7498E-001	7.75E-001	2.1252E-001
		768.36	5.04	7.1156E+000		5.3769E+000
		806.17	1.23	2.7061E+001		2.4255E+000
		934.06	3.21	1.2186E+001		-1.2832E+001
		1120.29	15.10	2.7281E+000		1.0043E+000
		1155.19	1.69	2.8892E+001		1.7502E+001
		1238.11	5.94	9.7289E+000		7.5782E+000
		1280.96	1.47	2.7151E+001		-2.4497E+001
		1377.67	4.11	1.1034E+001		-5.8105E-001
		1385.31	0.78	6.2418E+001		5.5982E+001
		1401.50	1.39	2.5194E+001		-4.9247E+001
		1407.98	2.48	1.5337E+001		-5.0924E+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	2.8242E+000	6.52E-001	6.9081E-001
		77.11	10.70	1.5798E+000		1.6106E-001
		87.20	3.70	3.9860E+000		-1.2866E+000
		89.80	1.03	1.4467E+001		-2.5230E+001
		241.98	7.49	3.7213E+000		2.1392E+000
		295.21	19.20	1.2246E+000		7.2823E-001
		351.92	37.20	6.5152E-001		-1.9578E-002
		785.91	1.10	3.1274E+001		2.0867E+001
	AC-228	338.32	11.40	2.0831E+000	1.51E+000	1.4735E+000
		911.07	27.70	1.5064E+000		-1.7727E-001
		969.11	16.60	2.9240E+000		2.7688E+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: REL1A

Report Generated On : 7/28/2014 8:32:31 AM

Sample Location : AAR07241-368-3  
 Sample Identification : CLEARANCE  
 Sample Description 1 : 8 Oz. Can  
 Sample Description 2 : GRID 368-3  
 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 8:17:00 AM  
 Acquisition Started : 7/28/2014 8:17:30 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 \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A

Sample Title: AAR07241-368-3

Peak Analysis Performed on: 7/28/2014 8:32:31 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	1297-	1316	1306.61	238.66	0.90	1.43E+002	31.95	3.50E+001
2	7986-	8019	8002.69	1461.84	0.58	8.50E+001	18.07	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: AAR07241-368-3  
 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: 7/28/2014 8:32:31 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	238.66	1.5889E-001	22.34
2	1461.84	9.4444E-002	21.26

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: AAR07241-368-3  
 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	1.1683E+001	3.36E+000	-8.3329E+000
	727.17	11.80	3.3601E+000		3.8073E+000
	785.42	2.00	2.0434E+001		2.1902E+001
>	1620.56	2.75	0.0000E+000		0.0000E+000
PB-212	74.81	9.60	2.3848E+000	9.33E-001	-2.0635E+000
	77.11	17.50	1.4503E+000		1.3532E+000
	87.20	6.30	3.5303E+000		-2.6728E+000
	89.80	1.75	1.3628E+001		-2.1191E+001
	115.19	0.60	3.5115E+001		-2.1143E+001
	238.63	44.60	9.3343E-001		1.4731E+000
	300.09	3.41	7.6401E+000		-1.2221E+000
BI-214	609.31	46.30	9.4675E-001	9.47E-001	1.3401E+000
	768.36	5.04	8.5801E+000		-2.2504E+000
	806.17	1.23	3.4293E+001		6.2660E+000
	934.06	3.21	1.2838E+001		1.6953E+000
	1120.29	15.10	3.7403E+000		-2.1199E+000
	1155.19	1.69	2.9276E+001		2.0647E+001
	1238.11	5.94	1.0345E+001		8.4290E+000
	1280.96	1.47	3.3343E+001		3.3489E+001
	1377.67	4.11	1.3932E+001		6.6074E+000
	1385.31	0.78	7.3860E+001		3.2941E+001
	1401.50	1.39	3.9523E+001		-4.6554E+001
	1407.98	2.48	2.2969E+001		2.4444E+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	3.6168E+000	8.74E-001	-3.1296E+000
	77.11	10.70	2.3720E+000		2.2132E+000
	87.20	3.70	6.0110E+000		-4.5510E+000
	89.80	1.03	2.3155E+001		-3.6005E+001
	241.98	7.49	5.5101E+000		1.3720E+001
	295.21	19.20	1.4884E+000		9.4773E-001
	351.92	37.20	8.7413E-001		1.1818E+000
	785.91	1.10	3.6491E+001		-3.3842E+001
AC-228	89.95	2.10	1.1406E+001	1.89E+000	-1.5870E+001
	93.35	3.50	7.2126E+000		4.4081E+000
	129.08	2.80	8.7248E+000		9.4216E+000
	209.28	4.40	5.8388E+000		3.4731E+000
	270.23	3.60	7.6391E+000		2.8357E+000

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
AC-228	327.64	3.20	8.2242E+000	1.89E+000	3.3256E+000
	338.32	11.40	2.6767E+000		1.7876E+000
	409.51	2.13	1.3946E+001		-3.7963E-001
	463.00	4.40	6.7833E+000		-2.1317E+000
	583.20	0.14	3.0457E+002		3.2326E+002
	794.70	4.60	9.0559E+000		-5.2895E+000
	911.07	27.70	1.8854E+000		3.0472E+000
	964.60	5.20	1.0595E+001		7.3602E+000
	969.11	16.60	3.2855E+000		2.5903E+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

\*\*\*\*\*  
\*\*\*\*\* 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-368-04.CNF

Report Generated On : 10/8/2014 10:42:44 AM

Sample Location : AAR-368-04  
Sample Identification : AAR-368-04  
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 : 7/16/2014 1:58:00 PM  
Acquisition Started : 7/16/2014 1:58:40 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-368-04

Peak Analysis Performed on: 10/8/2014 10:42:44 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	8003.09	1461.91	0.94	7.50E+001	16.97	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-368-04  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\COPY of Stdlib.nlb

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

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

\* = 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 Id	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty
Name	Confidence		

? = 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 10:42:44 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	1461.91	8.3333E-002	22.63

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-368-04  
 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	1.4328E+001	2.73E+000	9.1911E+000
		727.17	11.80	2.7299E+000		1.8363E+000
		785.42	2.00	1.8272E+001		1.4145E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	1.8775E+000	5.96E-001	4.5469E-001
		77.11	17.50	9.3874E-001		-3.1399E-001
		87.20	6.30	2.8898E+000		1.4152E+000
		89.80	1.75	1.0859E+001		1.0805E+000
		115.19	0.60	3.0344E+001		-6.7090E+000
		238.63	44.60	5.9622E-001		4.0140E-001
		300.09	3.41	6.4022E+000		-7.0545E-001
	BI-214	609.31	46.30	7.6895E-001	7.69E-001	1.6942E-001
		768.36	5.04	7.3555E+000		9.5221E+000
		806.17	1.23	2.4118E+001		-4.4926E+000
		934.06	3.21	1.0558E+001		3.7392E+000
		1120.29	15.10	3.3366E+000		4.0969E+000
		1155.19	1.69	2.6884E+001		2.8083E+001
		1238.11	5.94	9.2932E+000		6.0014E+000
		1280.96	1.47	3.1033E+001		-1.7055E+001
		1377.67	4.11	1.0774E+001		8.6399E+000
		1385.31	0.78	5.9834E+001		5.0892E+001
		1401.50	1.39	2.9093E+001		-9.3237E+001
		1407.98	2.48	1.6887E+001		-4.0332E+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	2.8475E+000	7.43E-001	6.8958E-001
		77.11	10.70	1.5353E+000		-5.1354E-001
		87.20	3.70	4.9205E+000		2.4097E+000
		89.80	1.03	1.8450E+001		1.8358E+000
		241.98	7.49	3.5858E+000		2.8364E+000
		295.21	19.20	1.1286E+000		-4.2680E-001
		351.92	37.20	7.4339E-001		6.5657E-001
		785.91	1.10	3.2470E+001		-1.9138E+001
	AC-228	338.32	11.40	2.2351E+000	1.47E+000	7.3909E-002
		911.07	27.70	1.4715E+000		3.1829E-001
		969.11	16.60	2.8115E+000		3.7301E+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 369**

**Solutient**  
Technologies, LLC

Project Name:		Model:		<b>NORTH</b> 
Work Order #		Serial #		
Surveyor Name:		Probe:		
Date:		Serial #		
Survey Type:		Calibration Due		
<b>GRID #</b> 369		⊕ = Sample Location		
<b>Comments:</b>				

  

<div style="text-align: center;"> <b>1 Minute Integrated Count</b>  <div style="border-bottom: 1px solid black; display: inline-block; width: 150px; margin: 5px 0;">N/A</div> </div> <div style="text-align: center; margin-top: 40px;">       ⊕     </div> <div style="position: absolute; left: 10px; top: 30%; transform: rotate(-90deg);">       X 3.8     </div> <div style="position: absolute; left: 10%; top: 45%;">       X 4.5     </div>	<div style="text-align: center;"> <b>1 Minute Integrated Count</b>  <div style="border-bottom: 1px solid black; display: inline-block; width: 150px; margin: 5px 0;">N/A</div> </div> <div style="text-align: center; margin-top: 40px;">       ⊕     </div> <div style="position: absolute; left: 10%; top: 30%;">       X 1.5     </div> <div style="position: absolute; left: 45%; top: 45%;">       X 2.0     </div>
<div style="text-align: center;"> <b>1 Minute Integrated Count</b>  <div style="border-bottom: 1px solid black; display: inline-block; width: 150px; margin: 5px 0;">N/A</div> </div> <div style="text-align: center; margin-top: 40px;">       ⊕     </div> <div style="position: absolute; left: 10%; top: 30%;">       X 1.5     </div> <div style="position: absolute; left: 10%; top: 65%;">       X 1.4     </div>	<div style="text-align: center;"> <b>1 Minute Integrated Count</b>  <div style="border-bottom: 1px solid black; display: inline-block; width: 150px; margin: 5px 0;">N/A</div> </div> <div style="text-align: center; margin-top: 40px;">       ⊕     </div> <div style="position: absolute; left: 40%; top: 30%;">       X 2.1     </div> <div style="position: absolute; left: 50%; top: 65%;">       X 4.5     </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\AAR-369-1.CNF

Report Generated On : 10/8/2014 10:04:06 AM

Sample Location : AAR-369-1  
 Sample Identification : AAR-369-1  
 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 2:02:00 PM  
 Acquisition Started : 7/23/2014 2:03:14 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-369-1

Peak Analysis Performed on: 10/8/2014 10:04:06 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	1299-	1314	1306.45	238.63	1.06	6.58E+001	24.09	2.82E+001
2	7986-	8019	8002.40	1461.78	0.97	1.15E+002	22.76	3.96E+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-369-1  
 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 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 10:04:06 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	238.63	7.3126E-002	36.60
2	1461.78	1.2782E-001	19.78

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-369-1  
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	1.5366E+001	3.09E+000	2.5740E+000
		727.17	11.80	3.0938E+000		-1.0659E+000
		785.42	2.00	1.6966E+001		3.2698E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.0523E+000	7.67E-001	-2.6539E+000
		77.11	17.50	1.1370E+000		-2.1005E-001
		87.20	6.30	3.2862E+000		1.5131E+000
		89.80	1.75	1.2427E+001		-2.6199E+001
		115.19	0.60	3.4094E+001		1.5910E+001
		238.63	44.60	7.6750E-001		1.1518E+000
		300.09	3.41	8.8562E+000		8.8381E+000
	BI-214	609.31	46.30	8.6007E-001	8.60E-001	1.0297E+000
		768.36	5.04	7.6628E+000		1.4253E+000
		806.17	1.23	2.9687E+001		-2.0783E+001
		934.06	3.21	1.3304E+001		4.8700E+000
		1120.29	15.10	3.8088E+000		1.7121E-001
		1155.19	1.69	2.8892E+001		-2.0101E+001
		1238.11	5.94	1.0735E+001		1.0583E+001
		1280.96	1.47	3.6508E+001		-4.6513E+000
		1377.67	4.11	9.9484E+000		7.1999E+000
		1385.31	0.78	5.7117E+001		6.1495E+000
		1401.50	1.39	3.3247E+001		2.7480E+001
		1407.98	2.48	1.8289E+001		-4.6850E+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	3.1125E+000	8.12E-001	-4.0249E+000
		77.11	10.70	1.8595E+000		-3.4354E-001
		87.20	3.70	5.5954E+000		2.5764E+000
		89.80	1.03	2.1113E+001		-4.4514E-001
		241.98	7.49	4.5265E+000		6.1973E+000
		295.21	19.20	1.4658E+000		5.2343E-001
		351.92	37.20	8.1156E-001		9.3093E-001
		785.91	1.10	3.1274E+001		3.6207E+001
	AC-228	338.32	11.40	2.3461E+000	1.74E+000	1.0656E+000
		911.07	27.70	1.7445E+000		2.5784E+000
		969.11	16.60	3.0584E+000		6.0057E-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-369-2.CNF

Report Generated On : 5/6/2015 1:24:54 PM

Sample Location : AAR-369-2  
Sample Identification : AAR-369-2  
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 2:37:00 PM  
Acquisition Started : 7/23/2014 2:37:49 PM

Live Time : 900.0 seconds  
Real Time : 900.7 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-369-2

Peak Analysis Performed on: 5/6/2015 1:24:55 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	1300-	1313	1306.48	238.63	0.83	5.81E+001	20.87	1.99E+001
2	7987-	8020	8003.08	1461.91	1.06	1.26E+002	22.00	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: AAR-369-2  
 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: 5/6/2015 1:24:55 PM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

Peak	Energy	Peak Size in	Peak CPS
No.	(keV)	Counts per Second	% Uncertainty
1	238.63	6.4509E-002	35.94
2	1461.91	1.4000E-001	17.46

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-369-2  
 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	3.30E+000	2.0210E+000
		727.17	11.80	3.3029E+000		4.7857E+000
		785.42	2.00	2.0060E+001		4.6131E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.1735E+000	7.70E-001	9.5450E-004
		77.11	17.50	1.2164E+000		7.6645E-001
		87.20	6.30	3.3442E+000		-9.0952E-003
		89.80	1.75	1.1310E+001		-2.4537E+000
		115.19	0.60	2.9870E+001		2.1371E+001
		238.63	44.60	7.6972E-001		5.5252E-001
		300.09	3.41	7.4004E+000		-1.8099E+000
	BI-214	609.31	46.30	8.5468E-001	8.55E-001	-4.9612E-001
		768.36	5.04	7.7376E+000		1.3725E+000
		806.17	1.23	3.1750E+001		-1.2768E+001
		934.06	3.21	1.1671E+001		-5.1753E-001
		1120.29	15.10	3.4518E+000		2.7181E+000
		1155.19	1.69	3.1116E+001		2.1915E+001
		1238.11	5.94	1.0245E+001		8.4508E+000
		1280.96	1.47	3.2211E+001		1.1870E+001
		1377.67	4.11	1.1034E+001		1.3895E-001
		1385.31	0.78	5.8493E+001		-4.8984E+001
		1401.50	1.39	3.2464E+001		-5.9078E+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	3.2964E+000	8.46E-001	1.4476E-003
		77.11	10.70	1.9894E+000		1.2535E+000
		87.20	3.70	5.6941E+000		-1.5486E-002
		89.80	1.03	1.9215E+001		-4.1690E+000
		241.98	7.49	4.3891E+000		5.7906E+000
		295.21	19.20	1.3468E+000		2.6069E-001
		351.92	37.20	8.4554E-001		7.4684E-001
		785.91	1.10	3.5797E+001		-3.9051E+001
	AC-228	338.32	11.40	2.5100E+000	1.65E+000	1.6094E+000
		911.07	27.70	1.6537E+000		1.5643E-001
		969.11	16.60	3.0845E+000		4.5590E+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\Truck samples\AAR-369-3.CNF

Report Generated On : 10/8/2014 10:53:01 AM

Sample Location : AAR-369-3  
Sample Identification : AAR-369-3  
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 1:45:00 PM  
Acquisition Started : 7/23/2014 1:46:07 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-369-3

Peak Analysis Performed on: 10/8/2014 10:53:01 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-	1316	1306.41	238.62	0.49	7.30E+001	29.02	4.30E+001
2	7986-	8019	8002.71	1461.84	0.30	1.02E+002	21.74	4.11E+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-369-3  
 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 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 10:53:01 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	238.62	8.1106E-002	39.76
2	1461.84	1.1321E-001	21.34

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-369-3  
 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	1.2212E+001	2.77E+000	-5.8087E+000
		727.17	11.80	2.7651E+000		-1.6705E+000
		785.42	2.00	1.9089E+001		-6.3457E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.1866E+000	8.13E-001	1.6119E+000
		77.11	17.50	1.1738E+000		5.0330E-002
		87.20	6.30	3.0844E+000		-2.4515E+000
		89.80	1.75	1.1456E+001		-1.0041E+001
		115.19	0.60	3.4094E+001		-2.1003E+000
		238.63	44.60	8.1283E-001		1.5879E+000
		300.09	3.41	8.6109E+000		4.0239E+000
	BI-214	609.31	46.30	9.1715E-001	9.17E-001	9.4705E-001
		768.36	5.04	8.2404E+000		6.0344E+000
		806.17	1.23	2.4118E+001		-2.7625E+001
		934.06	3.21	1.1671E+001		-1.7389E+000
		1120.29	15.10	3.8425E+000		1.9697E+000
		1155.19	1.69	3.1116E+001		-2.7308E+001
		1238.11	5.94	9.7289E+000		1.7024E+000
		1280.96	1.47	3.7982E+001		2.4307E+001
		1377.67	4.11	1.2903E+001		3.9200E+000
		1385.31	0.78	7.2805E+001		7.8883E+001
		1401.50	1.39	3.7561E+001		3.6158E+001
		1407.98	2.48	2.1535E+001		-1.0796E+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	3.3161E+000	8.20E-001	2.4446E+000
		77.11	10.70	1.9197E+000		8.2315E-002
		87.20	3.70	5.2517E+000		-4.1742E+000
		89.80	1.03	1.9463E+001		-1.7059E+001
		241.98	7.49	4.8018E+000		7.2277E+000
		295.21	19.20	1.4809E+000		-1.4690E+000
		351.92	37.20	8.2020E-001		-3.1029E-002
		785.91	1.10	3.4361E+001		-3.0192E+001
	AC-228	338.32	11.40	2.4221E+000	1.68E+000	-2.7374E+000
		911.07	27.70	1.6846E+000		9.7276E-001
		969.11	16.60	2.7533E+000		3.5643E+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-369-4.CNF

Report Generated On : 10/8/2014 10:05:23 AM

Sample Location : AAR-369-4  
Sample Identification : AAR-369-4  
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 2:20:00 PM  
Acquisition Started : 7/23/2014 2:20:39 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-369-4

Peak Analysis Performed on: 10/8/2014 10:05:23 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-	1314	1306.17	238.58	1.03	6.08E+001	23.72	2.82E+001
2	7986-	8019	8002.47	1461.80	0.68	9.70E+001	19.30	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-369-4  
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 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 10:05:23 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	238.58	6.7503E-002	39.04
2	1461.80	1.0778E-001	19.90

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-369-4  
 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	1.1683E+001	3.09E+000	-4.5811E+000
	727.17	11.80	3.0938E+000		4.1537E+000
	785.42	2.00	1.7633E+001		1.1369E+001
>	1620.56	2.75	0.0000E+000		0.0000E+000
PB-212	74.81	9.60	1.9670E+000	7.33E-001	2.3041E-002
	77.11	17.50	1.1295E+000		2.3350E-001
	87.20	6.30	3.3056E+000		1.6408E+000
	89.80	1.75	1.2225E+001		-8.0899E-001
	115.19	0.60	3.1041E+001		7.9838E+000
	238.63	44.60	7.3333E-001		5.9491E-001
	300.09	3.41	8.0967E+000		4.7891E+000
BI-214	609.31	46.30	8.3274E-001	8.33E-001	3.7131E-001
	768.36	5.04	7.3555E+000		5.3301E-001
	806.17	1.23	2.8963E+001		-3.2565E+001
	934.06	3.21	1.2517E+001		7.8280E+000
	1120.29	15.10	3.2168E+000		1.3715E-001
	1155.19	1.69	2.7298E+001		2.9051E+001
	1238.11	5.94	9.7289E+000		-9.0304E+000
	1280.96	1.47	3.7007E+001		2.0019E+001
	1377.67	4.11	1.1774E+001		2.0400E+000
	1385.31	0.78	5.5701E+001		-7.2597E+000
	1401.50	1.39	3.5478E+001		3.1819E+001
	1407.98	2.48	1.9986E+001		1.4722E+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	8.33E-001	3.4944E-002
	77.11	10.70	1.8472E+000		3.8189E-001
	87.20	3.70	5.6285E+000		2.7938E+000
	89.80	1.03	2.0771E+001		-1.3745E+000
	241.98	7.49	4.2758E+000		3.7949E+000
	295.21	19.20	1.4195E+000		-1.4058E+000
	351.92	37.20	8.3297E-001		6.7139E-001
	785.91	1.10	3.2077E+001		3.8276E+001
AC-228	338.32	11.40	2.3615E+000	1.54E+000	2.0432E+000
	911.07	27.70	1.5404E+000		-8.6728E-001
	969.11	16.60	2.5060E+000		2.9012E+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 370**

**Solutient**  
Technologies, LLC

Project Name: <u>HAIR LIDAR A</u>		Model: <u>N/A</u>		<b>NORTH</b>
Work Order #: <u>201421</u>		Serial #: <u></u>		
Surveyor Name: <u>MAH C. S. D. J.</u>		Probe: <u>5</u>		
Date: <u>7-21-14</u>		Serial #: <u></u>		
Survey Type: <u>1-2 meter</u>		Calibration Due: <u>N/A</u>		
GRID # <u>370</u>		⊕ = Sample Location Comments:		

  

<div style="text-align: center;"> <b>01</b>            1 Minute Integrated Count  <u>N/A</u>              ⊕              X - 2.7              X - 1.6         </div>	<div style="text-align: center;"> <b>02</b>            1 Minute Integrated Count  <u>N/A</u>              ⊕              X - 0.7              X - 2.7         </div>
<div style="text-align: center;"> <b>03</b>            1 Minute Integrated Count  <u>N/A</u>              ⊕              X - 4.7              X - 2.2         </div>	<div style="text-align: center;"> <b>04</b>            1 Minute Integrated Count  <u>N/A</u>              ⊕              X - 4.7              X - 2.6         </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 \*\*\*\*\*  
\*\*\*\*\*

R

Filename: REL1A

Report Generated On : 7/23/2014 12:22:48 PM

Sample Location : AAR-370-01  
Sample Identification : AAR-370-01  
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 : 7/23/2014 12:05:00 PM  
Acquisition Started : 7/23/2014 12:07:47 PM

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 \*\*\*\*\*  
\*\*\*\*\*

Detector Name: RE1A  
Sample Title: AAR-370-01  
Peak Analysis Performed on: 7/23/2014 12:22:49 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	1296-	1317	1306.78	238.69	0.81	3.14E+002	52.40	1.05E+002
2	3181-	3203	3192.19	583.10	1.32	9.81E+001	26.78	2.29E+001
3	4977-	5002	4989.93	911.49	0.89	6.68E+001	17.55	3.16E+000
4	5294-	5321	5307.01	969.42	0.27	4.32E+001	20.95	1.48E+001
5	7986-	8019	8002.44	1461.79	1.37	9.28E+001	22.84	8.24E+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-370-01  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Coppy 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: 7/23/2014 12:22:49 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	238.69	3.4906E-001	16.68
2	583.10	1.0904E-001	27.29
3	911.49	7.4266E-002	26.25
4	969.42	4.8017E-002	48.47
5	1461.79	1.0306E-001	24.62

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-370-01  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Cop 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	1.9072E+001	3.88E+000	-5.9267E+000
		727.17	11.80	3.8828E+000		-7.3622E-001
		785.42	2.00	2.2203E+001		-2.0297E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	3.1449E+000	1.35E+000	-2.3721E+000
		77.11	17.50	1.8850E+000		2.3728E+000
		87.20	6.30	4.7264E+000		-5.1553E-003
		89.80	1.75	1.6845E+001		-9.4256E+000
		115.19	0.60	4.3183E+001		-1.0787E+001
		238.63	44.60	1.3455E+000		5.1490E+000
		300.09	3.41	1.0573E+001		6.4050E+000
	BI-214	609.31	46.30	9.5640E-001	9.56E-001	-1.1097E-001
		768.36	5.04	8.5133E+000		3.5910E+000
		806.17	1.23	2.7453E+001		-5.5189E+001
		934.06	3.21	1.2517E+001		-4.5868E+000
		1120.29	15.10	3.7747E+000		-1.0505E-001
		1155.19	1.69	3.1470E+001		5.5681E+000
		1238.11	5.94	9.8346E+000		-1.0051E+001
		1280.96	1.47	2.7841E+001		-2.8424E+000
		1377.67	4.11	1.2009E+001		1.1040E+001
		1385.31	0.78	5.9834E+001		-1.9403E+000
		1401.50	1.39	3.8227E+001		-5.6977E+001
		1407.98	2.48	2.1160E+001		2.0370E+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	4.7695E+000	9.51E-001	-3.5976E+000
		77.11	10.70	3.0830E+000		3.8807E+000
		87.20	3.70	8.0476E+000		-8.7780E-003
		89.80	1.03	2.8620E+001		-1.6014E+001
		241.98	7.49	8.1197E+000		5.0953E-001
		295.21	19.20	1.8698E+000		2.3426E+000
		351.92	37.20	9.5084E-001		7.6201E-001
		785.91	1.10	4.0698E+001		5.6896E+000
	AC-228	89.95	2.10	1.3793E+001	2.40E+000	-1.7898E+001
		93.35	3.50	8.0905E+000		2.0460E+000
		129.08	2.80	1.0428E+001		1.6297E+000
		209.28	4.40	7.6147E+000		8.3215E+000
		270.23	3.60	8.5411E+000		3.1486E+000

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/Gram)	Nuclide MDA (pCi/Gram)	Activity (pCi/Gram)
AC-228	327.64	3.20	1.0322E+001	2.40E+000	8.8299E+000
	338.32	11.40	3.3836E+000		5.1403E+000
	409.51	2.13	1.4921E+001		1.0986E+001
	463.00	4.40	7.5169E+000		-3.1740E+000
	583.20	0.14	4.0569E+002		5.5180E+002
	794.70	4.60	9.0559E+000		-8.0934E-001
	911.07	27.70	2.4041E+000		3.6918E+000
	964.60	5.20	1.3273E+001		1.3115E+001
	969.11	16.60	4.3059E+000		5.2791E+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

\*\*\*\*\*  
\*\*\*\*\* 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-370-02.CNF

Report Generated On : 10/8/2014 9:44:45 AM

Sample Location : AAR-370-02  
Sample Identification : AAR 370-02  
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 5:05:00 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-370-02

Peak Analysis Performed on: 10/8/2014 9:44:46 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	8007.38	1462.69	0.80	1.29E+002	22.26	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-370-02  
 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	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 9:44:46 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	1462.69	1.4333E-001	17.26

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-370-02  
 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	1.2961E+001	2.83E+000	-1.0779E+001
	727.17	11.80	2.8342E+000		-2.1683E-001
	785.42	2.00	1.7849E+001		5.5444E+000
>	1620.56	2.75	0.0000E+000		0.0000E+000
PB-212	74.81	9.60	2.2505E+000	7.87E-001	-4.0735E-001
	77.11	17.50	1.3037E+000		6.3823E-001
	87.20	6.30	3.2071E+000		9.9717E-001
	89.80	1.75	1.1671E+001		-2.6861E+000
	115.19	0.60	3.4914E+001		8.8685E+000
	238.63	44.60	7.8726E-001		1.2471E+000
	300.09	3.41	8.2719E+000		1.8967E+000
BI-214	609.31	46.30	8.3828E-001	8.38E-001	4.3461E-001
	768.36	5.04	7.1966E+000		-5.0500E+000
	806.17	1.23	3.2406E+001		-1.0692E+001
	934.06	3.21	1.2186E+001		-3.1711E+001
	1120.29	15.10	3.9418E+000		-5.4400E-002
	1155.19	1.69	3.1116E+001		-2.9535E+001
	1238.11	5.94	9.5138E+000		6.4545E+000
	1280.96	1.47	3.1628E+001		2.9768E+001
	1377.67	4.11	1.1774E+001		3.2400E+000
	1385.31	0.78	5.9834E+001		7.3158E-001
	1401.50	1.39	3.6881E+001		3.4712E+001
	1407.98	2.48	1.8730E+001		-1.6189E+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	3.4131E+000	8.46E-001	-6.1778E-001
	77.11	10.70	2.1322E+000		1.0438E+000
	87.20	3.70	5.4607E+000		1.6979E+000
	89.80	1.03	1.9829E+001		-4.5638E+000
	241.98	7.49	4.6597E+000		6.2134E+000
	295.21	19.20	1.4958E+000		-7.7818E-002
	351.92	37.20	8.4554E-001		1.0404E+000
	785.91	1.10	3.1678E+001		-3.5043E+001
AC-228	338.32	11.40	2.3768E+000	1.67E+000	5.4061E-002
	911.07	27.70	1.6692E+000		3.5043E-001
	969.11	16.60	3.1361E+000		3.4411E+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-370-03.2.CNF

Report Generated On : 10/8/2014 9:45:36 AM

Sample Location : AAR-370-03  
Sample Identification : AAR-370-03  
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 : 7/29/2014 3:03:00 PM  
Acquisition Started : 7/29/2014 3:04:06 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-370-03

Peak Analysis Performed on: 10/8/2014 9:45:36 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	1297-	1315	1306.61	238.66	0.90	2.91E+002	39.39	3.33E+001
2	1919-	1937	1926.90	351.97	0.36	5.87E+001	19.92	1.33E+001
3	2787-	2806	2796.24	510.77	1.07	7.76E+001	21.56	1.24E+001
4	3183-	3204	3193.27	583.29	0.76	8.40E+001	22.49	1.30E+001
5	3325-	3346	3335.92	609.35	0.35	4.85E+001	16.30	5.50E+000
6	4976-	5001	4988.96	911.32	0.25	5.60E+001	20.71	1.30E+001
7	7987-	8020	8003.92	1462.06	1.61	1.31E+002	22.43	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-370-03  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

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

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/Gram)	Activity Uncertainty
BI-214	0.447	609.31*	46.30	9.70123E-001	3.31620E-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	0.447	9.701226E-001	3.316200E-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 9:45:36 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	238.66	3.2302E-001	13.55
2	351.97	6.5170E-002	33.96
3	510.77	8.6194E-002	27.79
4	583.29	9.3385E-002	26.76
6	911.32	6.2271E-002	36.95
7	1462.06	1.4556E-001	17.12

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-370-03  
 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	1.7062E+001	3.42E+000	1.1378E+000
		727.17	11.80	3.4163E+000		-4.6954E+000
		785.42	2.00	2.1862E+001		-2.2120E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.8761E+000	1.22E+000	-2.6085E+000
		77.11	17.50	1.6398E+000		1.0214E+000
		87.20	6.30	4.2188E+000		-1.8735E+000
		89.80	1.75	1.5642E+001		-1.1248E+001
		115.19	0.60	3.8920E+001		-1.5440E+001
		238.63	44.60	1.2241E+000		4.0160E+000
		300.09	3.41	1.0024E+001		9.4909E+000
+	BI-214	609.31*	46.30	3.5313E-001	3.53E-001	9.7012E-001
		768.36	5.04	8.9697E+000		8.4702E+000
		806.17	1.23	3.2406E+001		-1.1897E+002
		934.06	3.21	1.4043E+001		5.3087E+000
		1120.29	15.10	3.9418E+000		7.1611E-001
		1155.19	1.69	3.4797E+001		-2.0416E+001
		1238.11	5.94	1.0542E+001		-1.3620E-001
		1280.96	1.47	3.9396E+001		-6.4037E+001
		1377.67	4.11	1.4128E+001		7.0436E+000
		1385.31	0.78	6.7256E+001		6.6160E+001
		1401.50	1.39	3.4009E+001		2.0610E+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	4.3618E+000	1.00E+000	-3.9560E+000
		77.11	10.70	2.6819E+000		1.6704E+000
		87.20	3.70	7.1834E+000		-3.1900E+000
		89.80	1.03	2.6576E+001		-1.9110E+001
		241.98	7.49	7.2104E+000		2.6600E+001
		295.21	19.20	1.8639E+000		2.4111E+000
		351.92	37.20	1.0043E+000		3.9813E-001
		785.91	1.10	4.0082E+001		-9.5516E+000
	AC-228	338.32	11.40	3.2551E+000	2.34E+000	4.4725E+000
		911.07	27.70	2.3406E+000		1.9924E+000
		969.11	16.60	3.7590E+000		4.3685E+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-370-04.CNF

Report Generated On : 10/8/2014 9:46:56 AM

Sample Location : AAR-370-04  
Sample Identification : AAR 370-04  
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 5:22:00 PM  
Acquisition Started : 7/22/2014 5:23:30 PM

Live Time : 900.0 seconds  
Real Time : 900.7 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-370-04

Peak Analysis Performed on: 10/8/2014 9:46:56 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-	1314	1306.95	238.72	0.82	9.31E+001	28.93	3.99E+001
2	4979-	5004	4991.73	911.82	0.47	3.54E+001	17.08	9.58E+000
3	7991-	8024	8007.06	1462.64	1.59	1.07E+002	23.79	7.94E+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-370-04  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\Copy of Stdlib.nlb

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

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

\* = 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 9:46:56 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	238.72	1.0344E-001	31.07
2	911.82	3.9352E-002	48.23
3	1462.64	1.1895E-001	22.22

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: AAR-370-04  
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	1.2961E+001	2.90E+000	-1.0674E+001
		727.17	11.80	2.9015E+000		1.9865E-001
		785.42	2.00	1.6966E+001		3.2698E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.3848E+000	8.71E-001	2.9149E-001
		77.11	17.50	1.2972E+000		5.2287E-001
		87.20	6.30	3.4756E+000		-1.4464E+000
		89.80	1.75	1.2754E+001		-1.0996E+001
		115.19	0.60	3.3038E+001		-1.5100E+001
		238.63	44.60	8.7140E-001		1.4986E+000
		300.09	3.41	8.7344E+000		7.2296E+000
	BI-214	609.31	46.30	8.3274E-001	8.33E-001	9.0507E-001
		768.36	5.04	7.1966E+000		6.1356E+000
		806.17	1.23	3.0391E+001		-1.5842E+000
		934.06	3.21	1.3304E+001		-1.0335E+001
		1120.29	15.10	3.2573E+000		3.8868E+000
		1155.19	1.69	3.1116E+001		3.8734E+001
		1238.11	5.94	1.0144E+001		8.4672E+000
		1280.96	1.47	3.6002E+001		-5.6242E+001
		1377.67	4.11	1.2009E+001		2.6348E+000
		1385.31	0.78	6.3666E+001		-3.8805E+001
		1401.50	1.39	3.4752E+001		5.1827E+000
		1407.98	2.48	1.9159E+001		-3.0555E-002
>		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	3.6168E+000	7.58E-001	4.4207E-001
		77.11	10.70	2.1215E+000		8.5516E-001
		87.20	3.70	5.9178E+000		-2.4628E+000
		89.80	1.03	2.1670E+001		-1.8682E+001
		241.98	7.49	5.2271E+000		9.8965E+000
		295.21	19.20	1.4658E+000		-4.3074E-001
		351.92	37.20	7.5755E-001		5.1569E-001
		785.91	1.10	3.1274E+001		8.0393E+000
	AC-228	338.32	11.40	2.5668E+000	2.08E+000	1.3479E+000
		911.07	27.70	2.0778E+000		2.2828E+000
		969.11	16.60	2.9240E+000		2.7134E+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 375**

**Solutient**  
Technologies, LLC

Project Name:	AAR LITONIA	Model:	N/A	NORTH ↑
Work Order #	201421	Serial #		
Surveyor Name:	mat crosby	Probes		
Date:	7-28-14	Serial #		
Survey Type:	1-2 meter	Calibration Due	N/A	
GRID #	376	⊕ = Sample Location Comments:		

  

<div style="text-align: center;">1 Minute Integrated Count</div> <div style="text-align: center; font-size: 2em; margin-top: 20px;">NA</div> <div style="text-align: center; margin-top: 100px;">⊕</div> <div style="position: absolute; left: 10px; top: 300px;">y 3.1</div> <div style="position: absolute; left: 10px; top: 450px;">x 1.6</div>	<div style="text-align: center;">1 Minute Integrated Count</div> <div style="text-align: center; font-size: 2em; margin-top: 20px;">NA</div> <div style="text-align: center; margin-top: 100px;">⊕</div>
<div style="text-align: center;">1 Minute Integrated Count</div> <div style="text-align: center; font-size: 2em; margin-top: 20px;">NA</div> <div style="text-align: center; margin-top: 100px;">⊕</div> <div style="position: absolute; left: 10px; top: 300px;">y 4.2</div> <div style="position: absolute; left: 10px; top: 450px;">x 1.5</div>	<div style="text-align: center;">1 Minute Integrated Count</div> <div style="text-align: center; font-size: 2em; margin-top: 20px;">NA</div> <div style="text-align: center; margin-top: 100px;">⊕</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\AAR375-1.CNF

Report Generated On : 10/7/2014 8:59:21 AM

Sample Location : AAR07241-375-1  
Sample Identification : CLEARENCE  
Sample Description 1 : 8 Oz. Can  
Sample Description 2 : GRID 375-1  
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 8:52:00 AM  
Acquisition Started : 7/28/2014 8:53:05 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: AAR07241-375-1

Peak Analysis Performed on: 10/7/2014 8:59:21 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	8003.05	1461.90	0.85	1.29E+002	22.26	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: AAR07241-375-1

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 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 8:59:21 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	1461.90	1.4333E-001	17.26

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: AAR07241-375-1  
 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	1.2961E+001	3.24E+000	-1.7630E+000
		727.17	11.80	3.2447E+000		-3.6163E-001
		785.42	2.00	1.6738E+001		-2.9428E+001
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.1995E+000	7.33E-001	1.3546E+000
		77.11	17.50	1.0988E+000		-3.4866E-001
		87.20	6.30	3.0634E+000		-7.2938E-002
		89.80	1.75	1.0143E+001		-1.6117E+001
		115.19	0.60	3.3465E+001		3.7396E+001
		238.63	44.60	7.3333E-001		1.4033E+000
		300.09	3.41	8.0967E+000		7.7190E+000
	BI-214	609.31	46.30	8.6007E-001	8.60E-001	2.5442E-001
		768.36	5.04	7.1966E+000		5.5267E+000
		806.17	1.23	3.0391E+001		-1.8916E+000
		934.06	3.21	1.0752E+001		-9.7172E+000
		1120.29	15.10	3.4139E+000		7.0908E-001
		1155.19	1.69	2.5148E+001		-1.7721E+001
		1238.11	5.94	9.0667E+000		5.5268E+000
		1280.96	1.47	3.2783E+001		8.0384E+000
		1377.67	4.11	1.0507E+001		8.1599E+000
		1385.31	0.78	5.2740E+001		3.8169E+001
		1401.50	1.39	2.8177E+001		-1.9748E+000
		1407.98	2.48	1.4778E+001		-6.6665E+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	3.3358E+000	7.39E-001	2.0544E+000
		77.11	10.70	1.7972E+000		-5.7024E-001
		87.20	3.70	5.2160E+000		-1.2419E-001
		89.80	1.03	1.7233E+001		-2.7383E+001
		241.98	7.49	4.2034E+000		4.0956E+000
		295.21	19.20	1.4273E+000		1.2994E-001
		351.92	37.20	7.3861E-001		6.3906E-001
		785.91	1.10	3.1678E+001		8.0172E+000
	AC-228	338.32	11.40	2.1689E+000	1.68E+000	-1.0099E-001
		911.07	27.70	1.6846E+000		1.7465E+000
		969.11	16.60	2.6635E+000		2.0277E+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 375-3.CNF

Report Generated On : 10/7/2014 8:55:58 AM

Sample Location : AAR07241-375-3  
 Sample Identification : CLEARENCE  
 Sample Description 1 : 8 Oz. Can  
 Sample Description 2 : GRID 375-3  
 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 8:34:00 AM  
 Acquisition Started : 7/28/2014 8:35:48 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: AAR07241-375-3

Peak Analysis Performed on: 10/7/2014 8:55:59 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-	1315	1307.24	238.77	0.24	5.25E+001	22.55	2.55E+001
2	7986-	8019	8002.21	1461.75	0.85	1.08E+002	26.41	1.33E+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: AAR07241-375-3  
 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	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 8:55:59 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	238.77	5.8333E-002	42.95
2	1461.75	1.1966E-001	24.52

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: AAR07241-375-3  
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	1.2961E+001	3.06E+000	-5.2415E+000
		727.17	11.80	3.0627E+000		2.7270E+000
		785.42	2.00	1.8272E+001		4.8904E+000
>		1620.56	2.75	0.0000E+000		0.0000E+000
	PB-212	74.81	9.60	2.1472E+000	7.00E-001	-1.1519E+000
		77.11	17.50	1.2233E+000		7.8010E-001
		87.20	6.30	3.0634E+000		-4.7053E-001
		89.80	1.75	1.0859E+001		-1.2388E+001
		115.19	0.60	3.3038E+001		1.9897E+001
		238.63	44.60	6.9986E-001		6.2476E-001
		300.09	3.41	8.2284E+000		7.6404E+000
	BI-214	609.31	46.30	8.4378E-001	8.44E-001	1.1963E+000
		768.36	5.04	6.8665E+000		2.0484E+000
		806.17	1.23	2.9687E+001		-1.4063E+001
		934.06	3.21	1.0359E+001		4.5183E+000
		1120.29	15.10	3.3755E+000		-1.4044E+000
		1155.19	1.69	2.7706E+001		3.0019E+001
		1238.11	5.94	1.0345E+001		-1.2361E+001
		1280.96	1.47	3.7982E+001		-2.0156E+000
		1377.67	4.11	1.0232E+001		-2.3925E+000
		1385.31	0.78	5.1185E+001		-6.4524E+001
		1401.50	1.39	3.2464E+001		-1.0044E+000
		1407.98	2.48	1.7836E+001		-2.1209E+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	3.2565E+000	8.16E-001	-1.7469E+000
		77.11	10.70	2.0008E+000		1.2759E+000
		87.20	3.70	5.2160E+000		-8.0117E-001
		89.80	1.03	1.8450E+001		-2.1047E+001
		241.98	7.49	4.1297E+000		4.7397E+000
		295.21	19.20	1.5252E+000		1.3253E+000
		351.92	37.20	8.1589E-001		9.3670E-001
		785.91	1.10	3.3240E+001		2.7620E+001
	AC-228	338.32	11.40	2.2351E+000	1.73E+000	1.5954E+000
		911.07	27.70	1.7297E+000		4.2670E-001
		969.11	16.60	3.3337E+000		5.3879E+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



## **ATTACHMENT #10**

### **Site Photos**











































