

SAF-RC-189
100N Field Remediation –
Soil Full Protocol
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21

KW 6/2/14
INITIAL/DATE

COMMENTS:

SDG XP0093

SAF RC-189

Rad only

Chem only

Rad & Chem

Complete

Partial

Sample Location: 100-N-104 Verification

WASHINGTON CLOSURE HANFORD

SAF: RC-189, SDG: XP0093

**STANDARD LEVEL IV
REPORT OF ANALYSIS**

WORK ORDER #14-05081-OR

May 29, 2014

**EBERLINE ANALYTICAL/OAK RIDGE LABORATORY
OAK RIDGE, TN**

TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE
I	Chain of Custody	0004
II	Sample Acknowledgement	0008
III	Case Narrative	0011
IV	Analytical Results Summary	0014
V	Analytical Standard	0017
VI	Quality Control Sample Results Summary	0022
VII	Laboratory Technician's Notes	0027
VIII	Analytical Data (Total Strontium)	0035
IX	Analytical Data (Gamma Spectroscopy)	0052
	Last Page Number	0229

SECTION I
CHAIN OF CUSTODY



Internal Chain of Custody

Work Order #	14-05081
Lab Deadline	5/26/2014
Analysis	Gamma - Level 4
Sample Matrix	Soil/Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
<p>Report Am241, Cs137, Co60, Eu152/154/155, K40, Pa234m, Pb212/214, Ra226, Th234, Tl208, U235 and positives</p> <p>Report on DRY WEIGHT basis.</p>	04	37	E1.3

	Location (circle one)						Initials	Date
	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Received by	<u>Sample Storage</u>	<u>Rough Prep</u>	Prep	Separations	Count Room	1300	King	5-20-14
Relinquished by	Sample Storage	<u>Rough Prep</u>	Prep	Separations	Count Room	0810	King	5-21-14
Received by	Sample Storage	Rough Prep	Prep	Separations	<u>Count Room</u>	0810	King	5-21-14
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	<u>Count Room</u>		C	5/21/14
Received by	<u>Sample Storage</u>	Rough Prep	Prep	Separations	Count Room			
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room			
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room			

SECTION II
SAMPLE ACKNOWLEDGEMENT



Eberline Services – Oak Ridge Laboratory

SAMPLE RECEIPT CHECKLIST
MP-001-2

WORK ORDER # 14-05081

SAMPLE MATRIX/MATRICES:

(CIRCLE ONE OR BOTH)

AQUEOUS NON-AQUEOUS

(CIRCLE EITHER YES, NO, OR N/A)

WERE SAMPLES:

Received in good condition?	<input checked="" type="radio"/> Y	<input type="radio"/> N	
If aqueous, properly preserved	<input type="radio"/> Y	<input type="radio"/> N	<input checked="" type="radio"/> N/A

WERE CHAIN OF CUSTODY SEALS:

Present on outside of package?	<input checked="" type="radio"/> Y	<input type="radio"/> N
Unbroken on outside of package?	<input checked="" type="radio"/> Y	<input type="radio"/> N
Present on samples?	<input checked="" type="radio"/> Y	<input type="radio"/> N
Unbroken on samples?	<input checked="" type="radio"/> Y	<input type="radio"/> N
Was chain of custody present upon sample receipt?	<input checked="" type="radio"/> Y	<input type="radio"/> N

IF THE RESPONSE TO ANY OF THE ABOVE IS NO, A DISCREPANT SAMPLE RECEIPT REPORT (DSR) HAS BEEN ISSUED.

REMARKS: _____

SIGNATURE: Kirsten Coulston DATE: 5/20/14

SECTION III
CASE NARRATIVE



EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD
OAK RIDGE, TENNESSEE 37830
PHONE (865) 481-0683
FAX (865) 483-4621

EBS-OR-37321

May 29, 2014

Joan Kessner
Washington Closure Hanford
2620 Fermi Avenue
Richland, WA 99354

CASE NARRATIVE
SAF: RC-189, SDG: XP0093
Work Order # 14-05081-OR

SAMPLE RECEIPT

This work order contains one soil sample received 05/20/2014. Sample was analyzed for Total Strontium and by Gamma Spectroscopy.

CLIENT ID

LAB ID

J1TLD8

14-05081-04

ANALYTICAL METHODS

Total Strontium was analyzed using EIChroM Method SRW01 Modified. Gamma Spectroscopy was performed using Method LANL ER-130 Modified.

Laboratory qualifier is as follows:

U - Result is less than or equal to MDA.

ANALYTICAL RESULTS

Combined Standard Uncertainty is reported at 2-sigma value.

SPECIAL CIRCUMSTANCES

All results are reported on a "dry weight" basis.

TOTAL STRONTIUM

Sample was prepared by acid digestion as appropriate for the matrix. Chemical separations were conducted using EIChroM stabilized chemical resins. Strontium fractions of the sample were eluted onto steel planchets. Chemical recovery was determined by use of a stable Strontium carrier and subsequent mass measurements. Sample was counted by gas flow proportional counting and corrected for Yttrium-90 ingrowth.

ANALYTICAL RESULTS CONTINUED

TOTAL STRONTIUM CONTINUED

Sample demonstrated acceptable results for all Total Strontium analyses. Chemical recovery was acceptable for all samples. The Total Strontium method blank demonstrated acceptable results. Results for the Total Strontium duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Total Strontium laboratory control sample demonstrated an acceptable percent recovery.

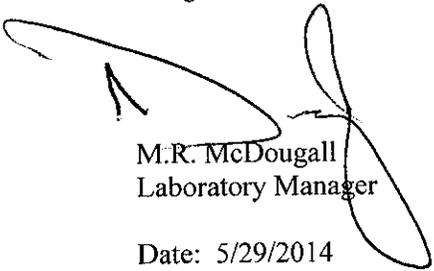
GAMMA SPECTROSCOPY

Sample for Gamma Spectroscopy analysis was prepared by transferring a known mass/aliquot of the prepared and homogenized sample to a standard geometry container. Sample was counted on a High Purity Germanium (HPGe) gamma ray detector.

Sample demonstrated acceptable results for all gamma-emitting radionuclides as reported. The method blank demonstrated acceptable results for all radionuclides as reported. Results for the Potassium-40, Thorium-234 and Lead-214 replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Cobalt-60 and Cesium-137 laboratory control sample demonstrated an acceptable percent recovery.

CERTIFICATION OF ACCURACY

I certify that this data report is in compliance with the terms and conditions of the Purchase Order, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the cognizant project manager or his/her designee to be accurate as verified by the following signature.



M.R. McDougall
Laboratory Manager

Date: 5/29/2014

Eberline Analytical wants and encourages your feedback regarding our performance providing radioanalytical services. Please visit <http://www.eberlineservices.com/client.htm> to provide us with feedback on our services.

SECTION IV
ANALYTICAL RESULTS SUMMARY

SAF: RC-189
SDG: XP0093
Work Order: 14-05081
Date Received: 05/20/2014
Matrix: Soil

Joan Kessner
Washington Closure Hanford
2620 Fermi Avenue
Richland, WA 99354

Sample Number	Lab Sample ID	QC Type	Date Analyzed	Method Name	CAS Number	Isotope	Result	2-Sigma Counting Error	Total Propagated Uncertainty	MDA	Lab Qualifier	Analysis Units
NA	14-05081-01	LCS	5/21/2014	GAMMA_GS	10198-40-0	Cobalt-60	134.822	8.84	11.23	0.70	U	pCi/g
		LCS	5/21/2014	GAMMA_GS	10045-97-3	Cesium-137	87.038	7.76	8.95	0.80	U	pCi/g
		LCS	5/23/2014	SRTOT_SEP_PRECIP_GPC	SR-RAD	Total beta radiostrontium	45.104	1.21	15.74	0.60	U	pCi/g
NA	14-05081-02	BLK	5/21/2014	GAMMA_GS	14596-10-2	Americium-241	0.012	0.03	0.03	0.04	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	10198-40-0	Cobalt-60	-9.000	0.02	0.02	0.03	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	10045-97-3	Cesium-137	0.014	0.02	0.02	0.03	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	14683-23-9	Europium-152	0.063	0.08	0.08	0.08	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	15585-10-1	Europium-154	-0.011	0.05	0.05	0.04	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	14391-16-3	Europium-155	0.012	0.06	0.06	0.06	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	13966-00-2	Potassium-40	0.228	0.16	0.16	0.21	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	15100-28-4	Protactinium-234m	-0.692	1.82	1.82	2.70	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	15092-94-1	Lead-212	7.000	0.04	0.04	0.05	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	15067-28-4	Lead-214	0.057	0.04	0.04	0.07	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	13982-63-3	Radium-226	0.037	0.04	0.04	0.08	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	15065-10-8	Thorium-234	0.160	0.26	0.26	0.43	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	14913-50-9	Thallium-208	0.031	0.06	0.06	0.10	U	pCi/g
		BLK	5/21/2014	GAMMA_GS	15117-96-1	Uranium-235	0.020	0.14	0.14	0.18	U	pCi/g
		BLK	5/23/2014	SRTOT_SEP_PRECIP_GPC	SR-RAD	Total beta radiostrontium	-0.360	0.31	0.33	0.69	U	pCi/g
J1TLD8	14-05081-03	DUP	5/21/2014	GAMMA_GS	14596-10-2	Americium-241	-0.105	0.08	0.08	0.09	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	10198-40-0	Cobalt-60	-0.026	0.04	0.04	0.06	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	10045-97-3	Cesium-137	0.054	0.05	0.05	0.07	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	14683-23-9	Europium-152	-0.141	0.21	0.21	0.14	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	15585-10-1	Europium-154	-0.102	0.10	0.10	0.07	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	14391-16-3	Europium-155	0.034	0.11	0.11	0.13	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	13966-00-2	Potassium-40	10.715	1.32	1.43	0.77	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	15100-28-4	Protactinium-234m	-0.255	3.62	3.62	5.48	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	15092-94-1	Lead-212	0.548	0.08	0.08	0.14	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	15067-28-4	Lead-214	0.658	0.09	0.10	0.16	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	13982-63-3	Radium-226	0.624	0.10	0.11	0.14	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	15065-10-8	Thorium-234	1.083	0.75	0.75	1.05	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	14913-50-9	Thallium-208	0.531	0.13	0.13	0.23	U	pCi/g
		DUP	5/21/2014	GAMMA_GS	15117-96-1	Uranium-235	-0.089	0.25	0.25	0.31	U	pCi/g
		DUP	5/23/2014	SRTOT_SEP_PRECIP_GPC	SR-RAD	Total beta radiostrontium	-0.241	0.36	0.37	0.80	U	pCi/g



EBERLINE
SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

SAF: RC-189
 SDG: XP0093
 Work Order: 14-05081
 Date Received: 05/20/2014
 Matrix: Soil

Joan Kessner
 Washington Closure Hanford
 2620 Fermi Avenue
 Richland, WA 99354

Sample Number	Lab Sample ID	QC Type	Date Analyzed	Method Name	CAS Number	Isotope	Result	2-Sigma Counting Error	Propagated Uncertainty	MDA	Lab Qualifier	Analysis Units
J1TLD8	14-05081-04		5/21/2014	GAMMA_GS	14596-10-2	Americium-241	0.011	0.03	0.03	0.09	U	pCi/g
			5/21/2014	GAMMA_GS	10198-40-0	Cobalt-60	0.012	0.03	0.03	0.05	U	pCi/g
			5/21/2014	GAMMA_GS	10045-97-3	Cesium-137	0.061	0.03	0.03	0.05	U	pCi/g
			5/21/2014	GAMMA_GS	14683-23-9	Europium-152	0.097	0.21	0.21	0.14	U	pCi/g
			5/21/2014	GAMMA_GS	15585-10-1	Europium-154	0.066	0.08	0.08	0.07	U	pCi/g
			5/21/2014	GAMMA_GS	14391-16-3	Europium-155	0.124	0.09	0.09	0.14	U	pCi/g
			5/21/2014	GAMMA_GS	13986-00-2	Potassium-40	11.595	1.40	1.52	0.47	U	pCi/g
			5/21/2014	GAMMA_GS	15100-28-4	Protactinium-234m	2.634	3.02	3.03	5.89	U	pCi/g
			5/21/2014	GAMMA_GS	15092-94-1	Lead-212	0.592	0.08	0.09	0.17	U	pCi/g
			5/21/2014	GAMMA_GS	15067-28-4	Lead-214	0.572	0.09	0.09	0.14	U	pCi/g
			5/21/2014	GAMMA_GS	13982-63-3	Radium-226	0.596	0.10	0.11	0.16	U	pCi/g
			5/21/2014	GAMMA_GS	15065-10-8	Thorium-230	1.104	0.84	0.84	1.38	U	pCi/g
			5/21/2014	GAMMA_GS	14913-50-9	Thallium-208	0.509	0.13	0.14	0.24	U	pCi/g
			5/21/2014	GAMMA_GS	15117-96-1	Uranium-235	0.171	0.23	0.23	0.31	U	pCi/g
			5/23/2014	SRTOT_SEP_PRECIP_GPC	SR-RAD	Total beta radiostrontium	0.216	0.31	0.32	0.64	U	pCi/g



EBERLINE ANALYTICAL CORPORATION
 601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

SECTION V
ANALYTICAL STANDARD

SR-42
13 u/m



National Institute of Standards & Technology Certificate

Standard Reference Material 4234A Strontium-90 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive strontium-90 chloride, non-radioactive strontium chloride, non-radioactive yttrium chloride, and hydrochloric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of beta-particle counting instruments and for the monitoring of radiochemical procedures.

Radiological Hazard

The SRM ampoule contains strontium-90 with a total activity of approximately 13 MBq. Strontium-90 decays by beta-particle emission to yttrium-90, which also decays by beta-particle emission. None of the beta particles escape from the SRM ampoule. The beta particles emitted from strontium-90 and yttrium-90 produce bremsstrahlung photons with energies up to 2 MeV. Most of these photons escape from the SRM ampoule and can represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. Appropriate shielding and/or distance should be used to minimize personnel exposure. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard

The SRM ampoule contains hydrochloric acid (HCl) with a concentration of 1 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least March 2005.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group and D.B. Golas, Nuclear Energy Institute Research Associate.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899
May 1995 (Text only revised November 1997)

Thomas E. Gills, Chief
Standard Reference Materials Program



QUALITY CONTROL PROGRAM
QCP-009

Rev.8; 11/10/03
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE SOLUTIONS
PRIMARY DILUTION RECERTIFICATION
QCP 009-1

SOLUTION REFERENCE # NIST 4234A CURRENT DATE 7/22/13
SOLUTION # Sr-13

Principal Radionuclide ⁹⁰Strontium Half Life, Years 2.870E+01 Half Life, Days 1.048E+04

Radionuclide ⁹⁰Strontium Reference Date 3/13/1995 0:00
Certified Activity 6.7405E+01 μCi
Certified Concentration 6.7405E+01 $\mu\text{Ci per gram}$

Ampoule /Solution Gross	9.2400	Weight, Grams
Empty Ampoule	4.1769	Weight, Grams
Solution Net	5.0631	Weight, Grams
Total Activity in Ampoule	341.2803	μCi

Chemical Composition of Standard Solution
⁹⁰SrCl₂ in 1M HCl

Dilution Instructions: Dilution Solvent Used 1M HCl
Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 341.2803 μCi Which Equals 7.576E+08 dpm at the date listed above

And after dilution the activity of this solution is 7.576E+05 dpm/ml
This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: July 2, 2014

Recertified By Date: 7/22/13
Verified & QC Approved By Date: 7/23/13



QUALITY CONTROL PROGRAM
QCP-009

Rev 8; 11/10/03
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION RECERTIFICATION

Solution Reference # QCP-009-1-A NIST 4234A Date 07/22/13
Solution # Sr-13a

Principal Radionuclide ⁹⁰Sr Half Life, Years 2.878E+01 Half Life, Days 1.051E+04

Radionuclide of Interest ⁹⁰Sr Reference Date 3/13/1995 0.00
Parent Solution Conc. 7.58E+05 dpm/ml

Chemical Composition of Standard Solution

⁹⁰SrCl₂ in 1M HCl

Dilution Instructions: Dilution Solvent Used 1M HCl

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 3.5558 ml Final Activity Concentration: 2.6939E+03 dpm/ml
Total Activity: 2.6939E+06 dpm
Final Volume: 1000.00 ml

NOTES:

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: July 2, 2014

Recertified By [Signature]

Date: 7/22/13

Verified & QC Approved By [Signature]

Date: 7/23/13

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

GAS-1302

94268

Sand in 16 Ounce PP Taral Jar Filled to Top

Customer: Eberline Analytical Corporation
P.O. No.: 1304009, Item 7 **Product Code:** 8401-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.017994

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* $\mu\text{ps}/\text{gram}$	This Source μps	Uncertainty*, %			Calibration Method*
					u_A	u_B	U	
Am-241	59.5	1.580E+05	—	2.094E+03	0.1	1.7	3.5	4 π LS
Cd-109	88.0	4.626E+02	1.641E+05	2.952E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	1.595E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	2.236E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	4.727E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	3.124E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	2.015E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	7.553E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	3.732E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	3.732E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	7.996E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



SECTION VI
QUALITY CONTROL SAMPLE RESULTS SUMMARY

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
14-05081	SrTOT	1	pCi	g	Washington Closure Hanford

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	CSU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	CSU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
TOTAL SR	1.16	82.88%	34.90%	100.00%	0.56%	5.44E+01	3.05E-01	4.51E+01	1.57E+01	Sr-13a	1.69E+03	5.60E-01	7.14E-02

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS CSU	Sample Result	Sample CSU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

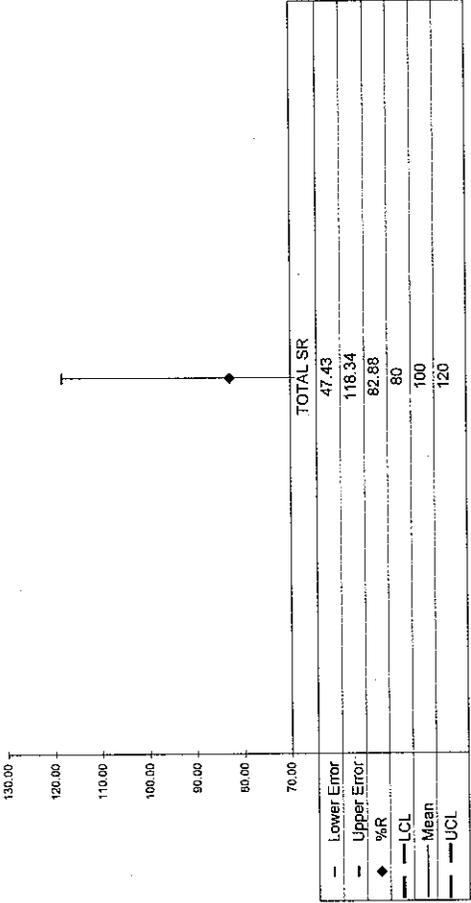
Analyte	Normalized Difference	RPD	Original Result	Original CSU	Replicate Result	Replicate CSU	LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
TOTAL SR	1.83	3642.96	2.16E-01	3.20E-01	-2.41E-01	3.70E-01	0.83	OK	OK			NA	OK

QC Summary

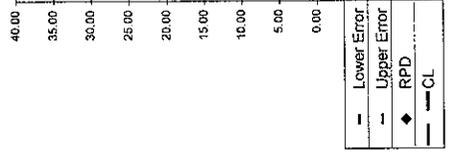
QC Summary													
Analyte	Normalized Difference	RPD	Original Result	Original CSU	Replicate Result	Replicate CSU	LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
TOTAL SR	1.83	3642.96	2.16E-01	3.20E-01	-2.41E-01	3.70E-01	0.83	OK	OK			NA	OK

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
14-05081	SrTOT	1	pCi	g	Washington Closure Hanford

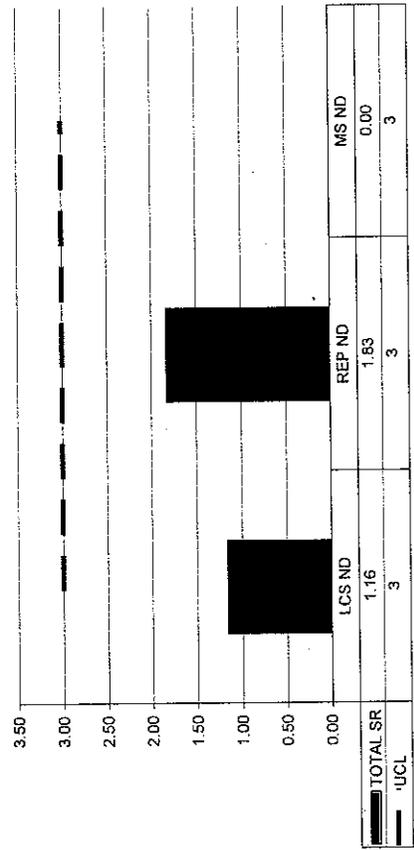
LCS % Recovery



Replicate Sample RPD



Normalized Difference



No Matrix Spike

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
14-05081	Gamma	1	pCi	g	Washington Closure Hanford

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	CSU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	CSU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
CO-60	0.73	103.37%	8.33%	100.00%	4.00%	1.30E+02	5.22E+00	1.35E+02	1.12E+01	GAS-1202	1.30E+02	5.22E+00	7.36E+02
CS-137	0.87	104.92%	10.29%	100.00%	4.00%	8.30E+01	3.32E+00	8.70E+01	8.95E+00	GAS-1202	8.30E+01	3.32E+00	7.36E+02

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS CSU	Sample Result	Sample CSU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

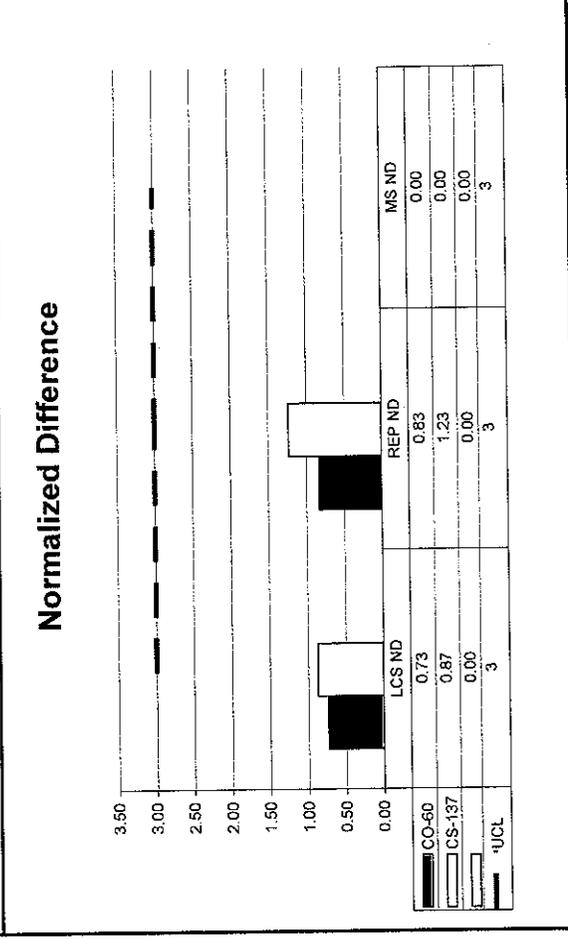
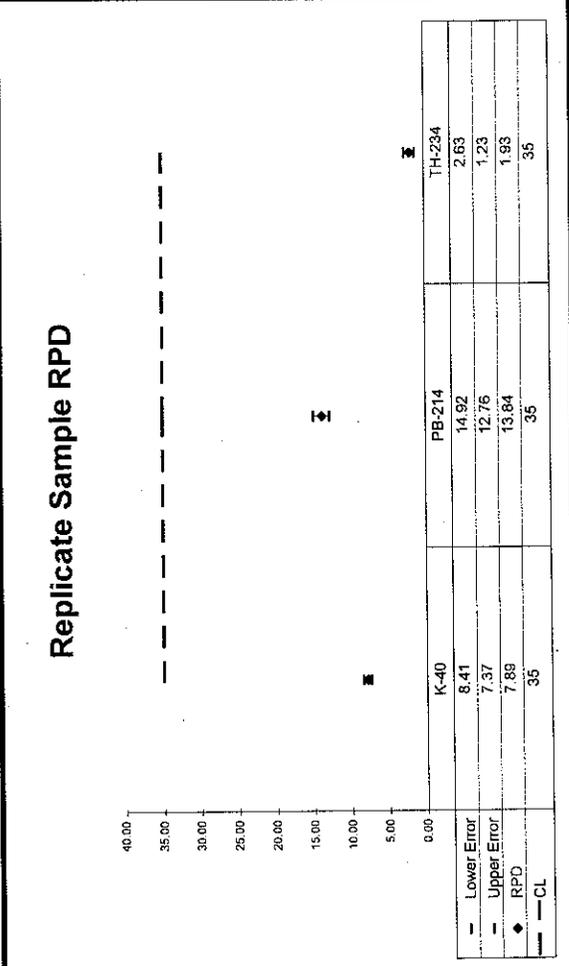
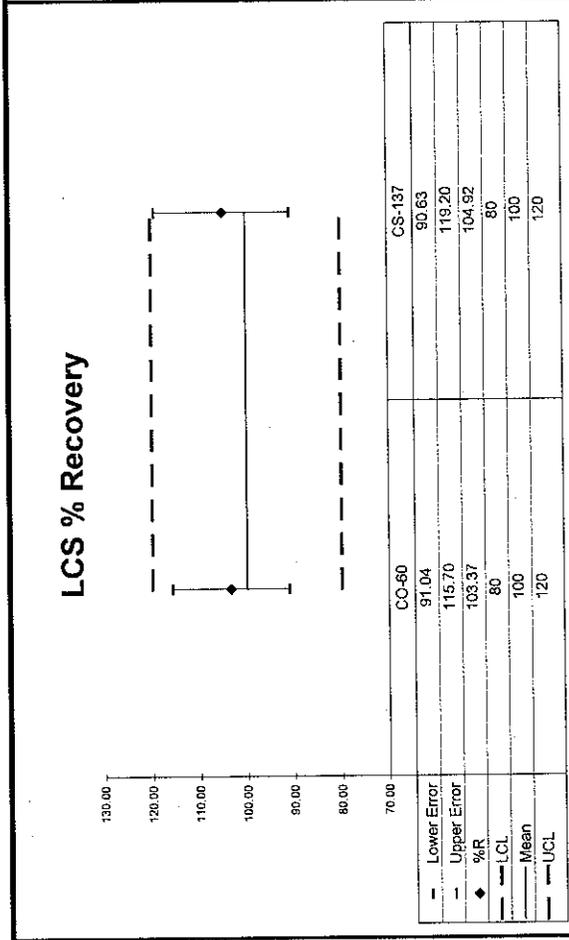
Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original CSU	Replicate Result	Replicate CSU	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
K-40	0.83	7.89	1.16E+01	1.52E+00	1.07E+01	1.43E+00	OK	OK	<CS-137	K-40>	NA	NA
PB-214	1.23	13.84	5.72E-01	9.18E-02	6.58E-01	1.00E-01	OK	OK	<CO-60	PB-214>	NA	OK
TH-234	0.04	1.93	1.10E+00	8.40E-01	1.08E+00	7.53E-01				TH-234>	NA	OK

QC Summary

Analyte	Normalized Difference	RPD	Original Result	Original CSU	Replicate Result	Replicate CSU	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
K-40	0.83	7.89	1.16E+01	1.52E+00	1.07E+01	1.43E+00	OK	OK	<CS-137	K-40>	NA	NA
PB-214	1.23	13.84	5.72E-01	9.18E-02	6.58E-01	1.00E-01	OK	OK	<CO-60	PB-214>	NA	OK
TH-234	0.04	1.93	1.10E+00	8.40E-01	1.08E+00	7.53E-01				TH-234>	NA	OK

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
14-05081	Gamma	1	pCi	9	Washington Closure Hanford



No Matrix Spike

SECTION VII
LABORATORY TECHNICIAN'S NOTES

TOT SR NOTES

 EBERLINE <small>SERVICES</small> Work Order Analysis Notes	Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 www.eberlineservices.com		Internal Work Order	14-05081
			Analysis Code	SrTOT
			Run Number	1

#	Date	Dept	User	Notes
1	05/23/14 05:45	PREP	MHIGHTOWER	Samples were aliquoted. Spike, carrier, and HNO ₃ were added and samples were dried. HNO ₃ and H ₂ O ₂ were added and samples were dried, then transferred to c-tubes using 8M HNO ₃ . Samples were centrifuged and run over columns conditioned with 8M HNO ₃ . Columns were then rinsed with 8N HNO ₃ . Waste was discarded. T ₀ was recorded. Columns were eluted with .05M HNO ₃ . Solution was collected in clean c-tubes, dried on tared planchets, weighed, covered with foil, and submitted to count room

Mu 23 MAY 14



Reagents Used in an Analysis

Internal Work Order

14-05081

Analysis Code

Run

SrTOT

1

Reagent ID	Reagent Name	Reagent Concentration	Analyst ID	Date Recorded
014831D01	Nitric Acid	0.05N	MHIGHTOWER	5/23/2014
014831D03	Nitric Acid	8N	MHIGHTOWER	5/23/2014
014831P	Nitric Acid	Reagent Grade	MHIGHTOWER	5/23/2014

Date	Sample #	Client	Transaction	CT#	Assays	Spec
5/17/14	WEEKLY BKGD	LAB	1230	12142	2B	AC
5/17	ETZAC	LAB	0707	70	L1B	S
5/17	BKGD AC	LAB	0707	60	L1B	S
5/17	1405079PB(1-7)	UCON	0707	2L	Pb210	C
5/17	1405079PB(1-7)	Grace	0707	2L	Pb210	C
5/17	1405079PB(24)	USA	0919	2L	L1B	C
5/17	1405079PB(24)	UCON	0919	2L	Pb210	C
5/17	ETZAC	LAB	0713	70	L1B	C
5/17	BKGD AC	LAB	0746	60	L1B	C
5/17	1405074PB(24)	USA	0707	2L	Pb210	C
5/17	1405074PB(11)	USA	0707	70	Pb210	C
5/17	1405080PB(24)	UCON	0707	2L	Pb210	C
5/17	1405044NP(4-7)	UCON	0824	10	NP277	C
5/17	1405075RA(2-7)	Accutest	0944	2L	RA8	C
5/17	1405075RA(11)	Accutest	0944	70	RA8	C
5/17	1405050RA(1-6)	Grace Prod.	1717	2L	RA8	C
5/17	1405072RA(24)	UCON	1717	2L	RA8	C
5/17	ETZAC	LAB	0511	70	L1B	C
5/17	BKGD AC	LAB	0544	60	L1B	C
5/17	1405080NP(1-4)	UCON	0707	10	NP277	C
5/17	140507134(1-4) (10/11/13)	UCON	0876	2L	SR9014	C
5/17	1405015AD(1-4)	Unitech	1046	2L	L1B	C
5/17	1405035AB(1-7)	Accutest	1344	2L	2B	W
5/17	ETZAC	LAB	0707	70	L1B	C
5/17	BKGD AC	LAB	0738	60	L1B	C
5/17	1405094AD(1-7) (1-7-10)	Freezer	0707	2L	L1B	C
5/17	1405094		0707			
5/17	1405018AD(1-14)	Accutest	0813	2L	L1B	C
5/17	140507934(2-4)	UCON	0819	2L	SR9014	C
5/17	14050815RL(1-4)	Washington	1018	2L	SR707	C
5/17	14050825RL(1-4)	Washington	1018	2L	SR707	C

GAMMA NOTES

DATE	Sample #	Client	LoadTime	CT	Time Analysis	Techn
5/18	1405046-01	Accutest	0619	1hr	Ba	C
5/19	1405046-06	Accutest	0629	1hr	Ba	C
5/19	1405046-11	Accutest	0616	1hr	Ba	C
5/19	1404118-03	Freezor	0946	2L	V	C
5/19	1404118-04	Freezor	1048	2L	V	C
5/19/14	1404118-09	Freezor	1149	1hr	V	KB
5/19	1404118-11	Freezor	1251	2L	V	C
5/19/14	1404118-17	Freezor	1353	1hr	V	KB
5/20	GAS 1201	LAB	0511	1hr	V	C
5/20	Dairy B	LAB	0529	1hr	V	C
5/20	1405068-05	UCON	0701	2L	V	C
5/20	1405068-07	UCON	0924	2L	V	C
5/20	1405073-02	USA	0907	1hr	Ba	C
5/20/14	1405058-02	TEC	1124	15 mins	Ba	KB
5/20/14	1405059-03	TEC	1142	15 mins	Ba	KB
5/20/14	1405059-04	TEC	1158	15 mins	Ba	KB
5/20/14	1405060-02	TEC	1217	15 mins	Ba	KB
5/20/14	1405066-02	Accutest	1233	15 mins	Ba	KB
5/20/14	1405066-06	Accutest	1244	15 mins	Ba	KB
5/20	1405066-08	Accutest	1705	1hr	Ba	C
5/20	1405071-03	Accutest	1720	1hr	Ba	C
5/20	1405071-04	Accutest	1737	1hr	Ba	C
5/20/14	1405071-10	Accutest	1353	15 mins	Ba	KB
5/20/14	1405071-14	Accutest	1409	15 mins	Ba	KB
5/20/14	1405071-10	Accutest	1425	15 mins	Ba	KB
5/20/14	1405084-03	TGE	1455	1hr	V	KB
5/20/14	1405084-04	TGE	1558	1hr	V	KB
5/20/14	1405068-12	UCON	1703	2hrs	V	KB
5/20	GAS 1201	LAB	0522	1hr	V	C
5/20	Dairy B	LAB	0524	1hr	V	C
5/20	Dairy B	LAB	0612	1hr	V	C
5/20	1405081-02	Washington	0829	2L	V	C
5/20	1405081-01	Washington	0928	2L	V	C

DATE	SAMPLE #	Client	Last Time	Time	Analysis	Tech
5/20/14	1405071-06	Accutest	1337	15mins	Ba	KB
5/20/14	1405071-09	Accutest	1353	15mins	Ba	KB
5/20/14	1405071-13	Accutest	1409	15mins	Ba	KB
5/20/14	1405071-07	Accutest	1425	15mins	Ba	KB
5/20/14	1405068-10	UCOR	1454	2hrs	✓	KB
5/20/14	1405068-11	UCOR	1703	2hrs	✓	KB
JUL	GA 710	LAB	0822	1hr	✓	✓
JUL	Duip	LAB	0824	1hr	✓	✓
JUL	1407081-05	Washington	0822	7L	✓	✓
JUL	1407081-04	Washington	0827	7L	✓	✓

SECTION VIII
ANALYTICAL DATA (TOTAL STRONTIUM)

Internal Work Order		Run	Analysis Code		Date		Technician		Technician Initials		Witness Initials																																																																		
14-05081		1	SrTOT		5/21/2014 10:31		MHIGHTOWER		<i>My</i>																																																																				
LCS & Matrix Spikes																																																																													
Isotope	Sol #	Activity dpm/g	Solution Date	Approx Addition	LCS Volume Used (g)	MS Volume Used (g)	LCS Volume Used (g)	MSD Volume Used (g)	LCS Known pCi	MS Added pCi	MSD Known pCi	MSD Added pCi	Error Estimate																																																																
TOTAL SR	Sr-13a	1691.991	5/21/2014	0.070	0.0714		54.42	0.305	0.00	0.00	0.00	0.00	0.000																																																																
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="13">Tracers</th> </tr> <tr> <th>fraction</th> <th>Isotope</th> <th>Sol #</th> <th>Activity dpm/g</th> <th>Solution Date</th> <th>Volume Used (g)</th> <th>Approx Addition</th> <th colspan="6">Balance Printer Tapes</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="6">Tracer</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="6">LCS</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="6">Matrix Spike</td> </tr> </thead></table>													Tracers													fraction	Isotope	Sol #	Activity dpm/g	Solution Date	Volume Used (g)	Approx Addition	Balance Printer Tapes													Tracer													LCS													Matrix Spike					
Tracers																																																																													
fraction	Isotope	Sol #	Activity dpm/g	Solution Date	Volume Used (g)	Approx Addition	Balance Printer Tapes																																																																						
							Tracer																																																																						
							LCS																																																																						
							Matrix Spike																																																																						

Handwritten initials and a circled number '12'.

Sheet1

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
B1	1405081-01	5	5839	120	1400	5/23/14 12:20
B2	1405081-02	9	162	120	1400	5/23/14 12:20
B3	1405081-03	8	156	120	1400	5/23/14 12:20
B4	1405081-04	8	155	120	1400	5/23/14 12:20

GPC Detector Report
(ALL Backgrounds)

5720

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PRW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/18/2007	5/23/2014	8.33E-02	P	-2.01E+01	2.54E-01	2.06E+01
LB4110A - A2	Alpha	11/18/2007	5/23/2014	6.67E-02	P	-1.70E+01	2.29E-01	1.75E+01
LB4110A - A3	Alpha	11/18/2007	5/23/2014	5.00E-02	P	-1.66E+01	1.99E-01	1.70E+01
LB4110A - A4	Alpha	11/18/2007	5/23/2014	1.17E-01	P	-1.76E+01	2.14E-01	1.80E+01
LB4110A - B1	Alpha	11/18/2007	5/23/2014	0.00E+00	P	-9.37E-02	7.30E-02	2.40E-01
LB4110A - B2	Alpha	11/18/2007	5/23/2014	1.67E-02	P	-7.42E-02	7.24E-02	2.19E-01
LB4110A - B3	Alpha	11/18/2007	5/23/2014	3.33E-02	P	-6.16E-02	5.38E-02	1.69E-01
LB4110A - B4	Alpha	11/18/2007	5/23/2014	3.33E-02	P	-1.32E-01	7.77E-02	2.88E-01
LB4110A - C1	Alpha	11/18/2007	5/23/2014	1.00E-01	P	-1.41E-01	8.71E-02	3.15E-01
LB4110A - C2	Alpha	11/18/2007	5/23/2014	1.00E-01	P	-1.70E-01	8.18E-02	3.34E-01
LB4110A - C3	Alpha	11/18/2007	5/23/2014	6.67E-02	P	-1.65E-01	9.63E-02	3.57E-01
LB4110A - C4	Alpha	11/18/2007	5/23/2014	3.33E-02	P	-6.38E-02	6.85E-02	2.01E-01
LB4110A - D1	Alpha	11/18/2007	5/23/2014	8.33E-02	P	-5.46E-02	8.19E-02	2.18E-01
LB4110A - D2	Alpha	11/18/2007	5/23/2014	3.33E-02	P	-7.15E-02	6.12E-02	1.94E-01
LB4110A - D3	Alpha	11/18/2007	5/23/2014	1.67E-02	P	-4.95E-02	6.95E-02	1.88E-01
LB4110A - D4	Alpha	11/18/2007	5/23/2014	1.17E-01	P	-6.72E-02	7.10E-02	2.09E-01
LB4110R - A1	Alpha	11/24/2006	5/23/2014	1.00E-01	P	-9.44E-02	9.90E-02	2.92E-01
LB4110R - A2	Alpha	11/24/2006	5/23/2014	3.33E-02	P	-8.70E-02	7.33E-02	2.34E-01
LB4110R - A3	Alpha	11/24/2006	5/23/2014	6.67E-02	P	-7.24E-02	8.04E-02	2.33E-01
LB4110R - A4	Alpha	11/24/2006	5/23/2014	5.00E-02	P	-5.22E-02	6.92E-02	1.91E-01
LB4110R - B1	Alpha	11/24/2006	5/23/2014	5.00E-02	P	-9.14E-02	6.16E-02	2.15E-01
LB4110R - B2	Alpha	11/24/2006	5/23/2014	6.67E-02	P	-6.92E-02	6.09E-02	1.91E-01
LB4110R - B3	Alpha	11/24/2006	5/23/2014	1.33E-01	P	-6.52E-02	7.20E-02	2.09E-01
LB4110R - B4	Alpha	11/24/2006	5/23/2014	6.67E-02	P	-6.23E-02	6.85E-02	1.99E-01
LB4110R - C1	Alpha	11/24/2006	5/23/2014	8.33E-02	P	-7.61E-02	7.32E-02	2.22E-01
LB4110R - C2	Alpha	11/24/2006	5/23/2014	5.00E-02	P	-7.63E-02	6.87E-02	2.14E-01
LB4110R - C3	Alpha	11/24/2006	5/23/2014	6.67E-02	P	-8.43E-02	8.40E-02	2.52E-01
LB4110R - C4	Alpha	11/24/2006	5/23/2014	1.00E-01	P	-6.03E-02	7.91E-02	2.19E-01
LB4110R - D1	Alpha	11/24/2006	12/12/2013	0.00E+00	P	-1.06E-01	6.71E-02	2.40E-01
LB4110R - D2	Alpha	11/24/2006	12/12/2013	0.00E+00	P	-8.22E-02	6.66E-02	2.15E-01
LB4110R - D3	Alpha	11/24/2006	12/12/2013	0.00E+00	P	-8.70E-02	6.63E-02	2.20E-01
LB4110R - D4	Alpha	11/24/2006	12/12/2013	0.00E+00	P	-8.03E-02	7.09E-02	2.22E-01
LB5100 - 1	Alpha	7/10/2006	10/26/2007	5.00E-02	P	-1.56E-02	9.58E-02	2.07E-01

GPC Detector Report
(ALL Backgrounds)

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PFW	LCL	Mean	UCL
LB4110A - A1	Beta	11/18/2007	5/23/2014	3.05E+00	P	-2.71E+02	7.52E+00	2.86E+02
LB4110A - A2	Beta	11/18/2007	5/23/2014	3.58E+00	P	-2.83E+01	2.70E+00	3.37E+01
LB4110A - A3	Beta	11/18/2007	5/23/2014	1.98E+00	P	-4.71E+01	2.53E+00	5.21E+01
LB4110A - A4	Beta	11/18/2007	5/23/2014	7.43E+00	P	-3.00E+01	3.71E+00	3.74E+01
LB4110A - B1	Beta	11/18/2007	5/23/2014	2.10E+00	P	-9.72E+00	3.16E+00	1.60E+01
LB4110A - B2	Beta	11/18/2007	5/23/2014	1.40E+00	P	-7.12E+00	1.94E+00	1.10E+01
LB4110A - B3	Beta	11/18/2007	5/23/2014	1.52E+00	P	-4.46E-01	1.40E+00	3.24E+00
LB4110A - B4	Beta	11/18/2007	5/23/2014	1.93E+00	P	-7.73E+00	1.98E+00	1.17E+01
LB4110A - C1	Beta	11/18/2007	5/23/2014	1.33E+00	P	-5.03E+00	2.05E+00	9.12E+00
LB4110A - C2	Beta	11/18/2007	5/23/2014	1.67E+00	P	2.90E-01	1.28E+00	2.27E+00
LB4110A - C3	Beta	11/18/2007	5/23/2014	2.27E+00	P	2.67E-01	1.51E+00	2.74E+00
LB4110A - C4	Beta	11/18/2007	5/23/2014	1.25E+00	P	-1.65E+00	2.02E+00	5.70E+00
LB4110A - D1	Beta	11/18/2007	5/23/2014	1.90E+00	P	-2.34E+00	2.54E+00	7.43E+00
LB4110A - D2	Beta	11/18/2007	5/23/2014	6.80E+00	W	-3.51E+00	1.66E+00	6.83E+00
LB4110A - D3	Beta	11/18/2007	5/23/2014	2.65E+00	P	1.02E+00	4.46E+00	7.90E+00
LB4110A - D4	Beta	11/18/2007	5/23/2014	1.14E+01	F	-7.41E+00	1.53E+00	1.05E+01
LB4110R - A1	Beta	11/24/2006	5/23/2014	1.30E+00	P	-5.77E+01	3.42E+00	6.46E+01
LB4110R - A2	Beta	11/24/2006	5/23/2014	1.67E+00	P	-4.58E+01	1.92E+00	4.96E+01
LB4110R - A3	Beta	11/24/2006	5/23/2014	1.32E+00	P	-4.24E+01	2.59E+00	4.76E+01
LB4110R - A4	Beta	11/24/2006	5/23/2014	2.53E+00	P	-4.22E+01	1.94E+00	4.61E+01
LB4110R - B1	Beta	11/24/2006	5/23/2014	1.37E+00	P	-4.44E+01	1.95E+00	4.83E+01
LB4110R - B2	Beta	11/24/2006	5/23/2014	1.72E+00	P	-4.44E+01	1.97E+00	4.84E+01
LB4110R - B3	Beta	11/24/2006	5/23/2014	1.50E+00	P	-4.42E+01	2.53E+00	4.93E+01
LB4110R - B4	Beta	11/24/2006	5/23/2014	1.10E+00	P	-4.45E+01	1.85E+00	4.82E+01
LB4110R - C1	Beta	11/24/2006	5/23/2014	1.48E+00	P	-4.44E+01	2.80E+00	5.00E+01
LB4110R - C2	Beta	11/24/2006	5/23/2014	1.77E+00	P	-4.43E+01	2.61E+00	4.95E+01
LB4110R - C3	Beta	11/24/2006	5/23/2014	1.33E+00	P	-4.48E+01	2.41E+00	4.96E+01
LB4110R - C4	Beta	11/24/2006	5/23/2014	1.62E+00	P	-5.05E+01	2.80E+00	5.61E+01
LB4110R - D1	Beta	11/24/2006	12/12/2013	0.00E+00	P	-4.37E+01	5.31E+00	5.43E+01
LB4110R - D2	Beta	11/24/2006	12/12/2013	0.00E+00	P	-4.67E+01	1.79E+00	5.03E+01
LB4110R - D3	Beta	11/24/2006	12/12/2013	0.00E+00	P	-5.02E+01	5.29E+00	6.08E+01
LB4110R - D4	Beta	11/24/2006	12/12/2013	0.00E+00	P	-4.65E+01	2.13E+00	5.07E+01
LB5100 - 1	Beta	7/10/2006	10/26/2007	4.52E+00	F	-3.19E-01	1.58E+00	3.48E+00

C
T
M

GPC Detector Report
(ALL Efficiencies)

Yr 2014

Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/18/2007	5/23/2014	0.2302	P	0.0023	0.2179	0.4334
LB4110A - A2	Alpha	11/18/2007	5/23/2014	0.1937	P	-0.0350	0.1771	0.3891
LB4110A - A3	Alpha	11/18/2007	5/23/2014	0.2025	P	-0.0573	0.1676	0.3925
LB4110A - A4	Alpha	11/18/2007	5/23/2014	0.2293	P	-0.0361	0.1875	0.4110
LB4110A - B1	Alpha	11/18/2007	5/23/2014	0.2178	P	0.1949	0.2238	0.2527
LB4110A - B2	Alpha	11/18/2007	5/23/2014	0.2124	P	0.1903	0.2198	0.2493
LB4110A - B3	Alpha	11/18/2007	5/23/2014	0.2330	P	0.1342	0.2325	0.3308
LB4110A - B4	Alpha	11/18/2007	5/23/2014	0.2297	P	0.2071	0.2351	0.2631
LB4110A - C1	Alpha	11/18/2007	5/23/2014	0.2197	P	0.1979	0.2204	0.2429
LB4110A - C2	Alpha	11/18/2007	5/23/2014	0.2246	P	0.1982	0.2251	0.2519
LB4110A - C3	Alpha	11/18/2007	5/23/2014	0.2468	P	0.2239	0.2491	0.2744
LB4110A - C4	Alpha	11/18/2007	5/23/2014	0.2235	P	0.1978	0.2252	0.2527
LB4110A - D1	Alpha	11/18/2007	5/23/2014	0.2175	P	0.1796	0.2313	0.2830
LB4110A - D2	Alpha	11/18/2007	5/23/2014	0.2464	P	0.2011	0.2565	0.3120
LB4110A - D3	Alpha	11/18/2007	5/23/2014	0.2520	P	0.2042	0.2618	0.3193
LB4110A - D4	Alpha	11/18/2007	5/23/2014	0.1911	P	0.1478	0.1978	0.2479
LB4110R - A1	Alpha	11/24/2006	5/23/2014	0.2312	P	0.1995	0.2380	0.2764
LB4110R - A2	Alpha	11/24/2006	5/23/2014	0.2125	P	0.1846	0.2190	0.2534
LB4110R - A3	Alpha	11/24/2006	5/23/2014	0.2169	P	0.1922	0.2234	0.2547
LB4110R - A4	Alpha	11/24/2006	5/23/2014	0.2449	P	0.2126	0.2448	0.2771
LB4110R - B1	Alpha	11/24/2006	5/23/2014	0.1926	P	0.1790	0.2240	0.2690
LB4110R - B2	Alpha	11/24/2006	5/23/2014	0.2103	P	0.1752	0.2159	0.2566
LB4110R - B3	Alpha	11/24/2006	5/23/2014	0.2411	P	0.2036	0.2438	0.2841
LB4110R - B4	Alpha	11/24/2006	5/23/2014	0.2154	P	0.1877	0.2299	0.2720
LB4110R - C1	Alpha	11/24/2006	5/23/2014	0.2054	P	0.1792	0.2143	0.2493
LB4110R - C2	Alpha	11/24/2006	5/23/2014	0.2123	P	0.1903	0.2235	0.2567
LB4110R - C3	Alpha	11/24/2006	5/23/2014	0.2298	P	0.2033	0.2385	0.2738
LB4110R - C4	Alpha	11/24/2006	5/23/2014	0.2055	P	0.1788	0.2205	0.2621
LB4110R - D1	Alpha	11/24/2006	12/12/2013	0.0000	W	-0.0274	0.1906	0.4086
LB4110R - D2	Alpha	11/24/2006	12/12/2013	0.0000	W	-0.0306	0.2168	0.4641
LB4110R - D3	Alpha	11/24/2006	12/12/2013	0.0000	W	-0.0300	0.2129	0.4559
LB4110R - D4	Alpha	11/24/2006	12/12/2013	0.0000	W	-0.0254	0.1716	0.3686
LB5100 - 1	Alpha	7/10/2006	10/26/2007	0.3368	P	0.3332	0.3455	0.3578



GPC Detector Report
(ALL Efficiencies)

Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Beta	11/18/2007	5/23/2014	0.5554	P	0.2324	0.5629	0.8933
LB4110A - A2	Beta	11/18/2007	5/23/2014	0.4991	P	0.1823	0.4678	0.7532
LB4110A - A3	Beta	11/18/2007	5/23/2014	0.5049	P	0.1147	0.4613	0.8079
LB4110A - A4	Beta	11/18/2007	5/23/2014	0.5923	P	0.1653	0.4984	0.8315
LB4110A - B1	Beta	11/18/2007	5/23/2014	0.5537	P	0.4645	0.5322	0.5999
LB4110A - B2	Beta	11/18/2007	5/23/2014	0.5391	P	0.4662	0.5272	0.5883
LB4110A - B3	Beta	11/18/2007	5/23/2014	0.6016	P	0.3297	0.5379	0.7460
LB4110A - B4	Beta	11/18/2007	5/23/2014	0.5754	P	0.4938	0.5555	0.6172
LB4110A - C1	Beta	11/18/2007	5/23/2014	0.5573	P	0.4367	0.5087	0.5807
LB4110A - C2	Beta	11/18/2007	5/23/2014	0.5894	P	0.3975	0.5123	0.6271
LB4110A - C3	Beta	11/18/2007	5/23/2014	0.6451	P	0.5242	0.5958	0.6674
LB4110A - C4	Beta	11/18/2007	5/23/2014	0.5858	P	0.4526	0.5300	0.6073
LB4110A - D1	Beta	11/18/2007	5/23/2014	0.7570	F	0.4193	0.5510	0.6827
LB4110A - D2	Beta	11/18/2007	5/23/2014	0.6926	P	0.4381	0.5841	0.7301
LB4110A - D3	Beta	11/18/2007	5/23/2014	0.6804	P	0.4761	0.6120	0.7480
LB4110A - D4	Beta	11/18/2007	5/23/2014	0.5149	P	0.3467	0.4691	0.5915
LB4110R - A1	Beta	11/24/2006	5/23/2014	0.5949	P	0.4787	0.5694	0.6600
LB4110R - A2	Beta	11/24/2006	5/23/2014	0.5414	P	0.4206	0.5102	0.5998
LB4110R - A3	Beta	11/24/2006	5/23/2014	0.5395	P	0.4543	0.5385	0.6228
LB4110R - A4	Beta	11/24/2006	5/23/2014	0.6257	P	0.5073	0.5938	0.6802
LB4110R - B1	Beta	11/24/2006	5/23/2014	0.5175	P	0.4482	0.5419	0.6356
LB4110R - B2	Beta	11/24/2006	5/23/2014	0.5178	P	0.4284	0.5198	0.6113
LB4110R - B3	Beta	11/24/2006	5/23/2014	0.6215	P	0.4972	0.5956	0.6940
LB4110R - B4	Beta	11/24/2006	5/23/2014	0.5499	P	0.4580	0.5495	0.6411
LB4110R - C1	Beta	11/24/2006	5/23/2014	0.5055	P	0.4115	0.5018	0.5921
LB4110R - C2	Beta	11/24/2006	5/23/2014	0.5663	P	0.4303	0.5349	0.6395
LB4110R - C3	Beta	11/24/2006	5/23/2014	0.6025	P	0.4789	0.5733	0.6677
LB4110R - C4	Beta	11/24/2006	5/23/2014	0.5337	P	0.4285	0.5256	0.6226
LB4110R - D1	Beta	11/24/2006	12/12/2013	0.0000	W	-0.0662	0.4558	0.9778
LB4110R - D2	Beta	11/24/2006	12/12/2013	0.0000	W	-0.0738	0.5122	1.0982
LB4110R - D3	Beta	11/24/2006	12/12/2013	0.0000	W	-0.0718	0.4974	1.0667
LB4110R - D4	Beta	11/24/2006	12/12/2013	0.0000	W	-0.0615	0.4095	0.8805
LB5100 - 1	Beta	7/10/2006	10/26/2007	0.4428	F	0.4555	0.4731	0.4906

SECTION IX
ANALYTICAL DATA (GAMMA SPECTROSCOPY)

Preliminary Data Report & Analytical Calculations
Work Order: 14-05081-Gamma-1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LSC Known	LCS %R	LCS Flag	RPD Flag	Sample Date	Sample Aliquot	Counting Date/Time	Identified
01	CO-60	LCS	LCS	pCi/g	1.35E+02	8.84E+00	6.96E-01	1.30E+02	103.37	OK		05/21/14 00:00	1.00E+00	05/21/14 09:28	YES
01	CS-137	LCS	LCS	pCi/g	8.70E+01	7.76E+00	8.03E-01	8.30E+01	104.92	OK		05/20/14 00:00	1.00E+00	05/21/14 09:28	YES
02	AM-241	MBL	BLANK	pCi/g	1.16E-02	2.68E-02	4.26E-02					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	RA-226	MBL	BLANK	pCi/g	3.70E-02	4.42E-02	7.66E-02					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	CO-60	MBL	BLANK	pCi/g	-8.82E-03	2.03E-02	2.94E-02					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	CS-137	MBL	BLANK	pCi/g	1.41E-02	1.77E-02	3.32E-02					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	EU-152	MBL	BLANK	pCi/g	6.25E-02	7.72E-02	8.23E-02					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	EU-154	MBL	BLANK	pCi/g	-1.05E-02	4.82E-02	4.28E-02					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	EU-155	MBL	BLANK	pCi/g	1.16E-02	5.85E-02	5.97E-02					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	K-40	MBL	BLANK	pCi/g	2.28E-01	1.61E-01	2.09E-01					05/20/14 00:00	1.00E+00	05/21/14 08:23	YES
02	PA-234M	MBL	BLANK	pCi/g	-6.92E-01	1.82E+00	2.70E+00					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	PB-212	MBL	BLANK	pCi/g	7.49E-03	3.79E-02	5.20E-02					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	PB-214	MBL	BLANK	pCi/g	5.70E-02	3.91E-02	6.89E-02					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	TH-234	MBL	BLANK	pCi/g	1.60E-01	2.57E-01	4.31E-01					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	TL-208	MBL	BLANK	pCi/g	3.11E-02	6.02E-02	1.02E-01					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
02	U-235	MBL	BLANK	pCi/g	1.96E-02	1.38E-01	1.79E-01					05/20/14 00:00	1.00E+00	05/21/14 08:23	NO
03	AM-241	DUP	J1TLD8 SAF: RC-189	pCi/g	-1.05E-01	8.26E-02	9.34E-02					05/16/14 10:48	7.82E+02	05/21/14 08:23	NO
03	RA-226	DUP	J1TLD8 SAF: RC-189	pCi/g	6.24E-01	1.02E-01	1.37E-01					05/16/14 10:48	7.82E+02	05/21/14 08:23	YES
03	CO-60	DUP	J1TLD8 SAF: RC-189	pCi/g	-2.54E-02	4.06E-02	5.59E-02					05/16/14 10:48	7.82E+02	05/21/14 08:23	NO
03	CS-137	DUP	J1TLD8 SAF: RC-189	pCi/g	5.37E-02	4.58E-02	7.48E-02					05/16/14 10:48	7.82E+02	05/21/14 08:23	YES
03	EU-152	DUP	J1TLD8 SAF: RC-189	pCi/g	-1.41E-01	2.08E-01	1.40E-01					05/16/14 10:48	7.82E+02	05/21/14 08:23	NO
03	EU-154	DUP	J1TLD8 SAF: RC-189	pCi/g	-1.02E-01	1.02E-01	7.39E-02					05/16/14 10:48	7.82E+02	05/21/14 08:23	NO
03	EU-155	DUP	J1TLD8 SAF: RC-189	pCi/g	3.45E-02	1.11E-01	1.27E-01					05/16/14 10:48	7.82E+02	05/21/14 08:23	NO
03	K-40	DUP	J1TLD8 SAF: RC-189	pCi/g	1.07E+01	1.32E+00	7.68E-01				NA	05/16/14 10:48	7.82E+02	05/21/14 08:23	YES
03	PA-234M	DUP	J1TLD8 SAF: RC-189	pCi/g	-2.55E-01	3.62E+00	5.48E+00					05/16/14 10:48	7.82E+02	05/21/14 08:23	NO
03	PB-212	DUP	J1TLD8 SAF: RC-189	pCi/g	5.48E-01	7.72E-02	1.40E-01					05/16/14 10:48	7.82E+02	05/21/14 08:23	YES
03	PB-214	DUP	J1TLD8 SAF: RC-189	pCi/g	6.58E-01	9.46E-02	1.58E-01				NA	05/16/14 10:48	7.82E+02	05/21/14 08:23	YES
03	TH-234	DUP	J1TLD8 SAF: RC-189	pCi/g	1.08E+00	7.51E-01	1.05E+00				NA	05/16/14 10:48	7.82E+02	05/21/14 08:23	NO
03	TL-208	DUP	J1TLD8 SAF: RC-189	pCi/g	5.31E-01	1.32E-01	2.35E-01					05/16/14 10:48	7.82E+02	05/21/14 08:23	NO
03	U-235	DUP	J1TLD8 SAF: RC-189	pCi/g	-8.86E-02	2.49E-01	3.11E-01					05/16/14 10:48	7.82E+02	05/21/14 08:23	NO
04	AM-241	DO	J1TLD8 SAF: RC-189	pCi/g	1.06E-02	3.48E-02	9.29E-02					05/16/14 10:48	7.82E+02	05/21/14 09:27	NO
04	RA-226	DO	J1TLD8 SAF: RC-189	pCi/g	5.96E-01	1.01E-01	1.64E-01					05/16/14 10:48	7.82E+02	05/21/14 09:27	YES
04	CO-60	DO	J1TLD8 SAF: RC-189	pCi/g	1.24E-02	3.50E-02	5.04E-02					05/16/14 10:48	7.82E+02	05/21/14 09:27	NO
04	CS-137	DO	J1TLD8 SAF: RC-189	pCi/g	6.06E-02	3.42E-02	5.21E-02					05/16/14 10:48	7.82E+02	05/21/14 09:27	YES
04	EU-152	DO	J1TLD8 SAF: RC-189	pCi/g	9.70E-02	2.10E-01	1.44E-01					05/16/14 10:48	7.82E+02	05/21/14 09:27	NO
04	EU-154	DO	J1TLD8 SAF: RC-189	pCi/g	6.60E-02	8.27E-02	7.33E-02					05/16/14 10:48	7.82E+02	05/21/14 09:27	NO
04	EU-155	DO	J1TLD8 SAF: RC-189	pCi/g	1.24E-01	8.64E-02	1.42E-01					05/16/14 10:48	7.82E+02	05/21/14 09:27	YES
04	K-40	DO	J1TLD8 SAF: RC-189	pCi/g	1.16E+01	1.40E+00	4.69E-01					05/16/14 10:48	7.82E+02	05/21/14 09:27	YES

Preliminary Data Report & Analytical Calculations
Work Order: 14-05081-Gamma-1

Eberline Services
Oak Ridge Laboratory

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LSC Known	LCS %R	LCS Flag	RPD Flag	Sample Date	Sample Aliquot	Counting Date/Time	Identified
04	PA-234M	DO	J1TLD8 SAF: RC-189	pCi/g	2.63E+00	3.02E+00	5.89E+00					05/16/14 10:48	7.82E+02	05/21/14 09:27	NO
04	PB-212	DO	J1TLD8 SAF: RC-189	pCi/g	5.92E-01	8.10E-02	1.67E-01					05/16/14 10:48	7.82E+02	05/21/14 09:27	YES
04	PB-214	DO	J1TLD8 SAF: RC-189	pCi/g	5.72E-01	8.70E-02	1.38E-01					05/16/14 10:48	7.82E+02	05/21/14 09:27	YES
04	TH-234	DO	J1TLD8 SAF: RC-189	pCi/g	1.10E+00	8.38E-01	1.38E+00					05/16/14 10:48	7.82E+02	05/21/14 09:27	YES
04	TL-208	DO	J1TLD8 SAF: RC-189	pCi/g	5.09E-01	1.33E-01	2.36E-01					05/16/14 10:48	7.82E+02	05/21/14 09:27	NO
04	U-235	DO	J1TLD8 SAF: RC-189	pCi/g	1.71E-01	2.29E-01	3.12E-01					05/16/14 10:48	7.82E+02	05/21/14 09:27	NO

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

90070

736g

Sand in 16 Ounce PP Taral Jar Filled to Top

CAS-1202

Customer: Eberline / Oak Ridge, TN

P.O. No.: 7393, Item 8

Reference Date: 01-Jan-2012

12:00 PM EST **Grams of Master Source:** 0.017043

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γ ps/gram	This Source γ ps	Uncertainty* , %			Calibration Method*
					u_A	u_B	U	
Am-241	59.5	1.580E+05	—	1.974E+03	0.1	1.7	3.5	4 π LS
Cd-109	88.0	4.626E+02	1.677E+05	2.858E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.795E+04	1.499E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.245E+05	2.122E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.707E+05	4.614E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.755E+05	2.991E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.128E+05	1.923E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.228E+05	7.206E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.084E+05	3.552E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.084E+05	3.552E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.476E+05	7.629E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



Analysis Report for 1405081-01
GAS-1202

C
J1214

GAMMA SPECTRUM ANALYSIS

Sample Identification : 1405081-01
Sample Description : GAS-1202
Sample Type : SOIL

Sample Size : 7.360E+02 grams
Facility : Countroom

Sample Taken On : 1/1/2012 8:19:05AM
Acquisition Started : 5/21/2014 9:28:33AM

Procedure : GAS-1302 pCi
Operator : Administrator
Detector Name : GE2
Geometry : GAS-1302
Live Time : 1800.0 seconds
Real Time : 1820.1 seconds

Dead Time : 1.11 %

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 1 - 4096
Peak Area Range (in channels) : 6 - 4096
Identification Energy Tolerance : 1.000 keV

Energy Calibration Used Done On : 5/14/2014
Efficiency Calibration Used Done On : 8/24/2013
Efficiency Calibration Description :

Sample Number : 7785

AG
5/21/14

Analysis Report for 1405081-01
GAS-1202

ENERGY CALIBRATION REPORT

Detector Name : GE2

ENERGY CALIBRATION COEFFICIENTS

Energy Calibrate Performed on : 5/14/2014 8:51:10AM
by : Administrator
Energy Calibrate Type : POLY

$$\text{Energy (keV)} = -0.186 + 1.000 \cdot \text{ch} + -1.09\text{E-}07 \cdot \text{ch}^2 + 0.00\text{E+}00 \cdot \text{ch}^3$$

SHAPE CALIBRATION COEFFICIENTS

Shape Calibrate Performed on : 5/14/2014 8:51:10AM
by : Administrator

$$\text{FWHM} = 0.636 + 4.34\text{E-}02 \cdot \text{E}^{1/2}$$

$$\text{LOW TAIL} = 2.60\text{E-}01 + 1.08\text{E-}03 \cdot \text{E}$$

ENERGY CALIBRATION RESULTS TABLE

<i>Centroid Channel</i>	<i>Centroid error</i>	<i>Energy (keV)</i>
59.84	0.16	59.54
88.36	0.12	88.03
122.24	0.51	122.06
166.04	0.34	165.85
279.47	0.25	279.20
391.50	0.07	391.69
661.27	0.03	661.65
897.53	0.06	898.02
1172.58	0.01	1173.22
1331.74	0.01	1332.49
1835.01	0.01	1836.01

SHAPE CALIBRATION RESULTS TABLE

Analysis Report for 1405081-01
GAS-1202

Energy (keV)	FWHM channels	FWHM error	TAIL channels	TAIL error
59.54	1.24	0.25	0.28	0.17
88.03	0.87	0.25	0.23	0.13
122.06	1.15	1.22	0.36	0.70
165.85	1.24	0.48	0.28	0.31
279.20	6.51	0.42	0.93	0.19
391.69	1.75	0.30	0.91	0.57
661.65	1.73	0.08	1.09	0.38
898.02	2.03	0.20	1.11	0.51
1173.22	2.09	0.03	1.48	0.19
1332.49	2.20	0.02	1.85	0.31
1836.01	2.52	0.02	2.10	0.27

EFFICIENCY CALIBRATION REPORT

Detector Name : GE2
 Geometry Description : GAS-1302
 Efficiency Calibration Performed on : 8/24/2013 11:23:24AM
 by : Administrator
 Efficiency Type Used : EMPIRICA
 Certificate File :

Efficiency Triplets

Energy	% Efficiency	Error	Computed	Error	% Difference
59.54	2.37E+00	8.65E-02			
88.03	2.58E+00	1.22E-01			
122.06	2.54E+00	1.08E-01			
165.85	2.22E+00	8.94E-02			
279.19	1.64E+00	6.41E-02			
391.69	1.26E+00	5.06E-02			
661.65	8.60E-01	3.64E-02			
898.02	6.58E-01	2.62E-02			
1173.22	5.56E-01	2.30E-02			
1332.49	5.05E-01	2.09E-02			
1836.01	3.99E-01	1.63E-02			

DUAL Efficiency Calibration Equation

Analysis Report for: 1405081-01
GAS-1202

Single Equation Terms

Offset : -2.08E+00
Slope : -9.71E+00
Quadratic : 6.01E+00
Cubic : -1.41E+00
4th Order : 1.45E-01
5th Order : -5.51E-03
6th Order : 0.00E+00
7th Order : 0.00E+00
8th Order : 0.00E+00
9th Order : 0.00E+00

EMPIRICAL Efficiency Calibration Equation

Empirical Equation Terms

Scaling : 9.48E+02
Offset : -5.06E+00
Slope : 7.72E-01
Quadratic : 9.57E-02
Cubic : -7.30E-02
4th Order : 0.00E+00
5th Order : 0.00E+00

LINEAR Efficiency Calibration Equation

Linear Equation Terms

Offset : -1.29E-04
Slope : -2.28E+00
Quadratic : 2.36E+02
Cubic : -3.01E+04
4th Order : 1.74E+06
5th Order : -3.83E+07
6th Order : 0.00E+00
7th Order : 0.00E+00
8th Order : 0.00E+00
9th Order : 0.00E+00

PEAK-TO-TOTAL CALIBRATION REPORT

Peak-to-Total Efficiency Calibration Equation

Analysis Report for 1405081-01
GAS-1202

PEAK LOCATE REPORT

Peak Locate Performed on : 5/21/2014 9:58:58AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
1	12.43	12.61	0.0000	0.00
2	22.09	22.25	0.0000	0.00
3	24.65	24.82	0.0000	0.00
4	32.18	32.34	0.0000	0.00
5	50.32	50.46	0.0000	0.00
6	59.59	59.73	0.0000	0.00
7	67.91	68.04	0.0000	0.00
8	88.05	88.16	0.0000	0.00
9	122.06	122.15	0.0000	0.00
10	136.51	136.58	0.0000	0.00
11	153.60	153.65	0.0000	0.00
12	165.92	165.97	0.0000	0.00
13	187.89	187.93	0.0000	0.00
14	239.04	239.03	0.0000	0.00
15	246.23	246.22	0.0000	0.00
16	352.72	352.62	0.0000	0.00
17	391.46	391.33	0.0000	0.00
18	430.34	430.18	0.0000	0.00
19	451.12	450.95	0.0000	0.00
20	661.71	661.38	0.0000	0.00
21	745.64	745.26	0.0000	0.00
22	821.32	820.88	0.0000	0.00
23	872.99	872.52	0.0000	0.00
24	886.00	885.53	0.0000	0.00
25	897.99	897.50	0.0000	0.00
26	1173.39	1172.73	0.0000	0.00
27	1184.16	1183.50	0.0000	0.00
28	1207.27	1206.59	0.0000	0.00
29	1332.68	1331.93	0.0000	0.00
30	1523.95	1523.10	0.0000	0.00
31	1602.79	1601.90	0.0000	0.00
32	1620.67	1619.77	0.0000	0.00
33	1749.94	1748.98	0.0000	0.00
34	1836.35	1835.35	0.0000	0.00
35	1864.28	1863.27	0.0000	0.00
36	1992.05	1990.98	0.0000	0.00
37	2161.28	2160.15	0.0000	0.00
38	2318.26	2317.07	0.0000	0.00
39	2332.72	2331.53	0.0000	0.00
40	2505.42	2504.17	0.0000	0.00
41	2614.76	2613.48	0.0000	0.00

Analysis Report for 1405081-01
GAS-1202

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1405081-01
GAS-1202

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 5/21/2014 9:58:58AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
1	12.43	11 -	17	12.61	8.17E+03	448.73	3.11E+04	1.85
M	2	19 -	29	22.25	1.10E+05	699.62	1.35E+04	1.32
m	3	19 -	29	24.82	2.95E+04	555.43	7.72E+03	1.33
	4	30 -	35	32.34	2.15E+03	245.55	1.05E+04	1.70
M	5	46 -	62	50.46	4.41E+03	300.29	1.47E+04	1.47
m	6	46 -	62	59.73	8.39E+04	625.36	1.19E+04	1.47
	7	66 -	71	68.04	7.97E+02	326.96	2.08E+04	3.41
	8	84 -	91	88.16	3.70E+04	533.81	2.26E+04	1.34
	9	118 -	124	122.15	7.66E+03	311.55	1.21E+04	1.32
	10	133 -	140	136.58	8.34E+02	278.29	1.23E+04	1.83
	11	152 -	155	153.65	1.25E+02	152.80	5.71E+03	1.44
	12	163 -	169	165.97	1.05E+03	239.91	9.66E+03	1.28
	13	186 -	190	187.93	2.01E+02	186.08	7.50E+03	4.58
	14	237 -	242	239.03	3.65E+02	200.77	7.75E+03	1.81
	15	244 -	249	246.22	2.53E+02	194.06	7.30E+03	3.82
	16	351 -	355	352.62	1.45E+02	144.76	4.54E+03	0.99
	17	388 -	395	391.33	5.08E+02	206.86	6.80E+03	2.00
	18	428 -	433	430.18	1.51E+02	163.96	5.26E+03	3.87
	19	449 -	454	450.95	1.44E+02	167.22	5.50E+03	2.49
	20	658 -	666	661.38	2.92E+04	378.03	3.94E+03	1.95
	21	743 -	749	745.26	1.04E+02	127.46	2.87E+03	2.55
	22	818 -	823	820.88	1.33E+02	119.65	2.74E+03	3.39
	23	870 -	876	872.52	1.40E+02	141.76	3.57E+03	1.71
	24	882 -	889	885.53	1.98E+02	156.83	3.96E+03	4.74
	25	895 -	901	897.50	1.45E+02	153.86	4.20E+03	1.83
	26	1167 -	1177	1172.73	2.64E+04	351.40	2.39E+03	2.15
	27	1181 -	1187	1183.50	8.12E+01	81.05	1.13E+03	3.14
	28	1203 -	1210	1206.59	8.15E+01	73.97	8.53E+02	2.05
	29	1326 -	1337	1331.93	2.39E+04	317.59	6.75E+02	2.18
	30	1521 -	1526	1523.10	2.03E+01	22.76	8.34E+01	2.66
	31	1598 -	1605	1601.90	3.44E+01	27.42	9.91E+01	1.80
	32	1617 -	1623	1619.77	1.85E+01	22.30	7.70E+01	1.24
	33	1745 -	1753	1748.98	2.00E+01	25.23	8.59E+01	3.09
	34	1831 -	1841	1835.35	1.89E+02	43.14	1.43E+02	2.42
	35	1860 -	1867	1863.27	2.12E+01	21.17	6.16E+01	2.22
	36	1985 -	1995	1990.98	2.62E+01	26.79	7.96E+01	2.16
	37	2153 -	2164	2160.15	2.52E+01	26.91	7.76E+01	4.94
	38	2311 -	2325	2317.07	2.34E+01	25.26	4.72E+01	10.02
	39	2326 -	2338	2331.53	2.45E+01	17.92	2.69E+01	3.41
	40	2496 -	2509	2504.17	3.26E+02	37.00	8.12E+00	3.00

Analysis Report for 1405081-01

GAS-1202

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
41	2614.76	2608 -	2617	2613.48	2.73E+01	12.04	5.37E+00	1.55

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 5/21/2014 9:58:58AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Net Peak Area	Net Area Uncertainty	Continuum Counts	Critical Level
	1	12.43	11 - 17	8.17E+03	448.73	3.11E+04	3.38E+02
M	2	22.09	19 - 29	1.10E+05	699.62	1.35E+04	1.91E+02
m	3	24.65	19 - 29	2.95E+04	555.43	7.72E+03	1.44E+02
	4	32.18	30 - 35	2.15E+03	245.55	1.05E+04	1.87E+02
M	5	50.32	46 - 62	4.41E+03	300.29	1.47E+04	2.00E+02
m	6	59.59	46 - 62	8.39E+04	625.36	1.19E+04	1.79E+02
	7	67.91	66 - 71	7.97E+02	326.96	2.08E+04	2.65E+02
	8	88.05	84 - 91	3.70E+04	533.81	2.26E+04	3.04E+02
	9	122.06	118 - 124	7.66E+03	311.55	1.21E+04	2.12E+02
	10	136.51	133 - 140	8.34E+02	278.29	1.23E+04	2.24E+02
	11	153.60	152 - 155	1.25E+02	152.80	5.71E+03	1.24E+02
	12	165.92	163 - 169	1.05E+03	239.91	9.66E+03	1.90E+02
	13	187.89	186 - 190	2.01E+02	186.08	7.50E+03	1.51E+02
	14	239.04	237 - 242	3.65E+02	200.77	7.75E+03	1.62E+02
	15	246.23	244 - 249	2.53E+02	194.06	7.30E+03	1.57E+02
	16	352.72	351 - 355	1.45E+02	144.76	4.54E+03	1.17E+02
	17	391.46	388 - 395	5.08E+02	206.86	6.80E+03	1.66E+02
	18	430.34	428 - 433	1.51E+02	163.96	5.26E+03	1.33E+02
	19	451.12	449 - 454	1.44E+02	167.22	5.50E+03	1.36E+02
	20	661.71	658 - 666	2.92E+04	378.03	3.94E+03	1.33E+02
	21	745.64	743 - 749	1.04E+02	127.46	2.87E+03	1.03E+02
	22	821.32	818 - 823	1.33E+02	119.65	2.74E+03	9.65E+01
	23	872.99	870 - 876	1.40E+02	141.76	3.57E+03	1.15E+02
	24	886.00	882 - 889	1.98E+02	156.83	3.96E+03	1.27E+02
	25	897.99	895 - 901	1.45E+02	153.86	4.20E+03	1.25E+02
	26	1173.39	1167 - 1177	2.64E+04	351.40	2.39E+03	1.10E+02

Analysis Report for 1405081-01

GAS-1202

Peak No.	Energy (keV)	ROI start	ROI end	Net Peak Area	Net Area Uncertainty	Continuum Counts	Critical Level
27	1184.16	1181 -	1187	8.12E+01	81.05	1.13E+03	6.50E+01
28	1207.27	1203 -	1210	8.15E+01	73.97	8.53E+02	5.90E+01
29	1332.68	1326 -	1337	2.39E+04	317.59	6.75E+02	6.05E+01
30	1523.95	1521 -	1526	2.03E+01	22.76	8.34E+01	1.72E+01
31	1602.79	1598 -	1605	3.44E+01	27.42	9.91E+01	2.04E+01
32	1620.67	1617 -	1623	1.85E+01	22.30	7.70E+01	1.69E+01
33	1749.94	1745 -	1753	2.00E+01	25.23	8.59E+01	1.94E+01
34	1836.35	1831 -	1841	1.89E+02	43.14	1.43E+02	2.73E+01
35	1864.28	1860 -	1867	2.12E+01	21.17	6.16E+01	1.57E+01
36	1992.05	1985 -	1995	2.62E+01	26.79	7.96E+01	2.04E+01
37	2161.28	2153 -	2164	2.52E+01	26.91	7.76E+01	2.05E+01
38	2318.26	2311 -	2325	2.34E+01	25.26	4.72E+01	1.92E+01
39	2332.72	2326 -	2338	2.45E+01	17.92	2.69E+01	1.23E+01
40	2505.42	2496 -	2509	3.26E+02	37.00	8.12E+00	6.64E+00
41	2614.76	2608 -	2617	2.73E+01	12.04	5.37E+00	4.91E+00

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

PEAK WITH NID REPORT

Peak Analysis Performed on : 5/21/2014 9:58:58AM

Peak Analysis From Channel : 1

Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Peak Match Tolerance : 1.000 keV

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	Tentative Nuclide
	1	11 -	17	12.61	8.17E+03	448.73	3.11E+04	.....
M	2	19 -	29	22.25	1.10E+05	699.62	1.35E+04	.....
m	3	19 -	29	24.82	2.95E+04	555.43	7.72E+03	TH-231
	4	30 -	35	32.34	2.15E+03	245.55	1.05E+04	.....
M	5	46 -	62	50.46	4.41E+03	300.29	1.47E+04	TH-227 TE-132
m	6	46 -	62	59.73	8.39E+04	625.36	1.19E+04	AM-241
	7	66 -	71	68.04	7.97E+02	326.96	2.08E+04	TI-44 TA-182 TH-230

Analysis Report for 1405081-01

GAS-1202

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	Tentative Nuclide
8	88.05	84 -	91	88.16	3.70E+04	533.81	2.26E+04	CD-109 LU-176 SN-126
9	122.06	118 -	124	122.15	7.66E+03	311.55	1.21E+04	CO-57 EU-152 SE-75
10	136.51	133 -	140	136.58	8.34E+02	278.29	1.23E+04	CO-57 SE-75
11	153.60	152 -	155	153.65	1.25E+02	152.80	5.71E+03	CS-136
12	165.92	163 -	169	165.97	1.05E+03	239.91	9.66E+03	CE-139
13	187.89	186 -	190	187.93	2.01E+02	186.08	7.50E+03	.....
14	239.04	237 -	242	239.03	3.65E+02	200.77	7.75E+03	PB-212
15	246.23	244 -	249	246.22	2.53E+02	194.06	7.30E+03	.....
16	352.72	351 -	355	352.62	1.45E+02	144.76	4.54E+03	PB-214
17	391.46	388 -	395	391.33	5.08E+02	206.86	6.80E+03	SN-113
18	430.34	428 -	433	430.18	1.51E+02	163.96	5.26E+03	.....
19	451.12	449 -	454	450.95	1.44E+02	167.22	5.50E+03	.....
20	661.71	658 -	666	661.38	2.92E+04	378.03	3.94E+03	CS-137
21	745.64	743 -	749	745.26	1.04E+02	127.46	2.87E+03	.....
22	821.32	818 -	823	820.88	1.33E+02	119.65	2.74E+03	.....
23	872.99	870 -	876	872.52	1.40E+02	141.76	3.57E+03	EU-154
24	886.00	882 -	889	885.53	1.98E+02	156.83	3.96E+03	.....
25	897.99	895 -	901	897.50	1.45E+02	153.86	4.20E+03	Y-88
26	1173.39	1167 -	1177	1172.73	2.64E+04	351.40	2.39E+03	CO-60
27	1184.16	1181 -	1187	1183.50	8.12E+01	81.05	1.13E+03	.....
28	1207.27	1203 -	1210	1206.59	8.15E+01	73.97	8.53E+02	.....
29	1332.68	1326 -	1337	1331.93	2.39E+04	317.59	6.75E+02	CO-60
30	1523.95	1521 -	1526	1523.10	2.03E+01	22.76	8.34E+01	.....
31	1602.79	1598 -	1605	1601.90	3.44E+01	27.42	9.91E+01	.....
32	1620.67	1617 -	1623	1619.77	1.85E+01	22.30	7.70E+01	BI-212
33	1749.94	1745 -	1753	1748.98	2.00E+01	25.23	8.59E+01	.....
34	1836.35	1831 -	1841	1835.35	1.89E+02	43.14	1.43E+02	Y-88
35	1864.28	1860 -	1867	1863.27	2.12E+01	21.17	6.16E+01	.....
36	1992.05	1985 -	1995	1990.98	2.62E+01	26.79	7.96E+01	.....
37	2161.28	2153 -	2164	2160.15	2.52E+01	26.91	7.76E+01	.....
38	2318.26	2311 -	2325	2317.07	2.34E+01	25.26	4.72E+01	.....
39	2332.72	2326 -	2338	2331.53	2.45E+01	17.92	2.69E+01	.....
40	2505.42	2496 -	2509	2504.17	3.26E+02	37.00	8.12E+00	.....
41	2614.76	2608 -	2617	2613.48	2.73E+01	12.04	5.37E+00	TL-208

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 2.000sigma

Analysis Report for 1405081-01
 GAS-1202

PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 5/21/2014 9:58:58AM

	Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty
	1	12.43	8.17E+03	448.73	2.86E-03	1.78E-03
M	2	22.09	1.10E+05	699.62	9.27E-03	1.78E-03
m	3	24.65	2.95E+04	555.43	1.10E-02	1.78E-03
	4	32.18	2.15E+03	245.55	1.54E-02	1.78E-03
M	5	50.32	4.41E+03	300.29	2.21E-02	1.78E-03
m	6	59.59	8.39E+04	625.36	2.39E-02	1.78E-03
	7	67.91	7.97E+02	326.96	2.49E-02	1.98E-03
	8	88.05	3.70E+04	533.81	2.57E-02	2.45E-03
	9	122.06	7.66E+03	311.55	2.47E-02	2.57E-03
	10	136.51	8.34E+02	278.29	2.39E-02	2.32E-03
	11	153.60	1.25E+02	152.80	2.29E-02	2.01E-03
	12	165.92	1.05E+03	239.91	2.22E-02	1.79E-03
	13	187.89	2.01E+02	186.08	2.09E-02	1.70E-03
	14	239.04	3.65E+02	200.77	1.83E-02	1.48E-03
	15	246.23	2.53E+02	194.06	1.79E-02	1.45E-03
	16	352.72	1.45E+02	144.76	1.40E-02	1.27E-03
	17	391.46	5.08E+02	206.86	1.29E-02	1.24E-03
	18	430.34	1.51E+02	163.96	1.20E-02	1.17E-03
	19	451.12	1.44E+02	167.22	1.16E-02	1.14E-03
	20	661.71	2.92E+04	378.03	8.48E-03	7.62E-04
	21	745.64	1.04E+02	127.46	7.70E-03	6.83E-04
	22	821.32	1.33E+02	119.65	7.13E-03	6.11E-04
	23	872.99	1.40E+02	141.76	6.79E-03	5.62E-04
	24	886.00	1.98E+02	156.83	6.72E-03	5.50E-04
	25	897.99	1.45E+02	153.86	6.65E-03	5.39E-04
	26	1173.39	2.64E+04	351.40	5.43E-03	5.26E-04
	27	1184.16	8.12E+01	81.05	5.40E-03	5.21E-04
	28	1207.27	8.15E+01	73.97	5.32E-03	5.10E-04
	29	1332.68	2.39E+04	317.59	4.97E-03	4.51E-04
	30	1523.95	2.03E+01	22.76	4.55E-03	4.21E-04
	31	1602.79	3.44E+01	27.42	4.41E-03	4.08E-04
	32	1620.67	1.85E+01	22.30	4.38E-03	4.05E-04
	33	1749.94	2.00E+01	25.23	4.19E-03	3.85E-04
	34	1836.35	1.89E+02	43.14	4.07E-03	3.71E-04
	35	1864.28	2.12E+01	21.17	4.04E-03	3.71E-04
	36	1992.05	2.62E+01	26.79	3.90E-03	3.71E-04
	37	2161.28	2.52E+01	26.91	3.75E-03	3.71E-04
	38	2318.26	2.34E+01	25.26	3.63E-03	3.71E-04
	39	2332.72	2.45E+01	17.92	3.63E-03	3.71E-04
	40	2505.42	3.26E+02	37.00	3.52E-03	3.71E-04
	41	2614.76	2.73E+01	12.04	3.47E-03	3.71E-04

Analysis Report for 1405081-01
GAS-1202

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 5/21/2014 9:58:58AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000007618.CNF

Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.	
	1	12.43	8.17E+03	448.73	1.26E+03	3.12E+01	6.90E+03	4.50E+02
M	2	22.09	1.10E+05	699.62			1.10E+05	7.00E+02
m	3	24.65	2.95E+04	555.43			2.95E+04	5.55E+02
	4	32.18	2.15E+03	245.55			2.15E+03	2.46E+02
M	5	50.32	4.41E+03	300.29			4.41E+03	3.00E+02
m	6	59.59	8.39E+04	625.36	9.09E+00	5.86E+00	8.39E+04	6.25E+02
	7	67.91	7.97E+02	326.96			7.97E+02	3.27E+02
	8	88.05	3.70E+04	533.81	4.67E+00	8.48E-01	3.70E+04	5.34E+02
	9	122.06	7.66E+03	311.55			7.66E+03	3.12E+02
	10	136.51	8.34E+02	278.29			8.34E+02	2.78E+02
	11	153.60	1.25E+02	152.80			1.25E+02	1.53E+02
	12	165.92	1.05E+03	239.91			1.05E+03	2.40E+02
	13	187.89	2.01E+02	186.08			2.01E+02	1.86E+02
	14	239.04	3.65E+02	200.77	9.26E+00	3.67E+00	3.56E+02	2.01E+02
	15	246.23	2.53E+02	194.06			2.53E+02	1.94E+02
	16	352.72	1.45E+02	144.76	1.08E+01	3.12E+00	1.34E+02	1.45E+02
	17	391.46	5.08E+02	206.86			5.08E+02	2.07E+02
	18	430.34	1.51E+02	163.96			1.51E+02	1.64E+02
	19	451.12	1.44E+02	167.22			1.44E+02	1.67E+02
	20	661.71	2.92E+04	378.03	4.24E+00	1.82E+00	2.92E+04	3.78E+02
	21	745.64	1.04E+02	127.46			1.04E+02	1.27E+02
	22	821.32	1.33E+02	119.65			1.33E+02	1.20E+02
	23	872.99	1.40E+02	141.76			1.40E+02	1.42E+02
	24	886.00	1.98E+02	156.83			1.98E+02	1.57E+02
	25	897.99	1.45E+02	153.86			1.45E+02	1.54E+02
	26	1173.39	2.64E+04	351.40	2.95E+00	1.36E+00	2.64E+04	3.51E+02
	27	1184.16	8.12E+01	81.05			8.12E+01	8.11E+01
	28	1207.27	8.15E+01	73.97			8.15E+01	7.40E+01
	29	1332.68	2.39E+04	317.59	2.97E+00	1.28E+00	2.39E+04	3.18E+02
	30	1523.95	2.03E+01	22.76			2.03E+01	2.28E+01
	31	1602.79	3.44E+01	27.42			3.44E+01	2.74E+01
	32	1620.67	1.85E+01	22.30			1.85E+01	2.23E+01
	33	1749.94	2.00E+01	25.23	0.00E+00	0.00E+00	2.00E+01	2.52E+01
	34	1836.35	1.89E+02	43.14			1.89E+02	4.31E+01
	35	1864.28	2.12E+01	21.17			2.12E+01	2.12E+01

Analysis Report for 1405081-01
 GAS-1202

Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
36	1992.05	2.62E+01	26.79			2.62E+01	2.68E+01
37	2161.28	2.52E+01	26.91			2.52E+01	2.69E+01
38	2318.26	2.34E+01	25.26			2.34E+01	2.53E+01
39	2332.72	2.45E+01	17.92			2.45E+01	1.79E+01
40	2505.42	3.26E+02	37.00			3.26E+02	3.70E+01
41	2614.76	2.73E+01	12.04	3.55E+00	8.29E-01	2.38E+01	1.21E+01

M = First peak in a multiplet region
 m = Other peak in a multiplet region
 F = Fitted singlet
 Errors quoted at 2.000sigma

AREA CORRECTION REPORT REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 5/21/2014 9:58:58AM
 Ref. Peak Energy : 0.00 Reference Date :
 Peak Ratio : 0.00 Uncertainty : 0.00
 Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000007618.CNF

Corrected Area is: Original * Peak Ratio - Background

Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Corrected Area	Corrected Uncert.
	1	8.17E+03	448.73	1.26E+03	3.12E+01	6.90E+03	4.50E+02
M	2	1.10E+05	699.62			1.10E+05	7.00E+02
m	3	2.95E+04	555.43			2.95E+04	5.55E+02
	4	2.15E+03	245.55			2.15E+03	2.46E+02
M	5	4.41E+03	300.29			4.41E+03	3.00E+02
m	6	8.39E+04	625.36	9.09E+00	5.86E+00	8.39E+04	6.25E+02
	7	7.97E+02	326.96			7.97E+02	3.27E+02
	8	3.70E+04	533.81	4.67E+00	8.48E-01	3.70E+04	5.34E+02
	9	7.66E+03	311.55			7.66E+03	3.12E+02
	10	8.34E+02	278.29			8.34E+02	2.78E+02
	11	1.25E+02	152.80			1.25E+02	1.53E+02
	12	1.05E+03	239.91			1.05E+03	2.40E+02
	13	2.01E+02	186.08			2.01E+02	1.86E+02
	14	3.65E+02	200.77	9.26E+00	3.67E+00	3.56E+02	2.01E+02
	15	2.53E+02	194.06			2.53E+02	1.94E+02
	16	1.45E+02	144.76	1.08E+01	3.12E+00	1.34E+02	1.45E+02
	17	5.08E+02	206.86			5.08E+02	2.07E+02
	18	1.51E+02	163.96			1.51E+02	1.64E+02
	19	1.44E+02	167.22			1.44E+02	1.67E+02
	20	2.92E+04	378.03	4.24E+00	1.82E+00	2.92E+04	3.78E+02
	21	1.04E+02	127.46			1.04E+02	1.27E+02
	22	1.33E+02	119.65			1.33E+02	1.20E+02

Analysis Report for 1405081-01

GAS-1202

Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Corrected Area	Corrected Uncert.
23	872.99	1.40E+02	141.76			1.40E+02	1.42E+02
24	886.00	1.98E+02	156.83			1.98E+02	1.57E+02
25	897.99	1.45E+02	153.86			1.45E+02	1.54E+02
26	1173.39	2.64E+04	351.40	2.95E+00	1.36E+00	2.64E+04	3.51E+02
27	1184.16	8.12E+01	81.05			8.12E+01	8.11E+01
28	1207.27	8.15E+01	73.97			8.15E+01	7.40E+01
29	1332.68	2.39E+04	317.59	2.97E+00	1.28E+00	2.39E+04	3.18E+02
30	1523.95	2.03E+01	22.76			2.03E+01	2.28E+01
31	1602.79	3.44E+01	27.42			3.44E+01	2.74E+01
32	1620.67	1.85E+01	22.30			1.85E+01	2.23E+01
33	1749.94	2.00E+01	25.23	0.00E+00	0.00E+00	2.00E+01	2.52E+01
34	1836.35	1.89E+02	43.14			1.89E+02	4.31E+01
35	1864.28	2.12E+01	21.17			2.12E+01	2.12E+01
36	1992.05	2.62E+01	26.79			2.62E+01	2.68E+01
37	2161.28	2.52E+01	26.91			2.52E+01	2.69E+01
38	2318.26	2.34E+01	25.26			2.34E+01	2.53E+01
39	2332.72	2.45E+01	17.92			2.45E+01	1.79E+01
40	2505.42	3.26E+02	37.00			3.26E+02	3.70E+01
41	2614.76	2.73E+01	12.04	3.55E+00	8.29E-01	2.38E+01	1.21E+01

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield(%)	Activity (pCi/grams)	Activity Uncertainty
CO-57	0.950	122.06 *	85.51	6.87E+01	7.72E+00
		136.48 *	10.60	6.23E+01	2.18E+01
CO-60	0.994	1173.22 *	100.00	1.36E+02	1.33E+01
		1332.49 *	100.00	1.34E+02	1.23E+01
Y-88	0.709	898.02 *	93.40	1.37E+02	1.46E+02
		1836.01 *	99.38	2.75E+02	6.75E+01
CD-109	0.982	88.03 *	3.72	2.90E+03	3.29E+02
SN-113	0.705	255.12	1.93		
		391.69 *	64.90	2.34E+02	9.85E+01
SN-126	0.964	87.57 *	37.00	7.94E+01	7.66E+00
CS-137	0.999	661.65 *	85.12	8.70E+01	7.92E+00
CE-139	0.818	165.85 *	80.35	9.66E+01	2.34E+01

Analysis Report for 1405081-01
 GAS-1202

Nuclide Name	Id Confidence	Energy (keV)	Yield(%)	Activity (pCi/grams)	Activity Uncertainty
PB-212	0.870	238.63 *	44.60	8.90E-01	5.08E-01
		300.09	3.41		
PB-214	0.367	295.21	19.19		
		351.92 *	37.19	5.26E-01	5.71E-01
AM-241	1.000	59.54 *	35.90	2.00E+02	1.50E+01

* = Energy line found in the spectrum.
 - = Manually added nuclide.
 ? = Manually edited nuclide.
 Energy Tolerance : 1.000 keV
 Nuclide confidence index threshold = 0.30
 Errors quoted at 2.000sigma

UNIDENTIFIED PEAKS

Peak Locate Performed on : 5/21/2014 9:58:58AM
 Peak Locate From Channel : 1
 Peak Locate To Channel : 4096

Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
	12.43	3.83394E+00	3.26		
M	22.09	6.10231E+01	0.32		
m	24.65	1.64010E+01	0.94	Tol.	TH-231
	32.18	1.19320E+00	5.72		
M	50.32	2.45120E+00	3.40	Tol.	TE-132 TH-227
	67.91	4.42652E-01	20.52	Tol.	TI-44 TA-182 TH-230 CS-136
11	153.60	6.91725E-02	61.36	Tol.	
13	187.89	1.11428E-01	46.39		
15	246.23	1.40637E-01	38.33		
18	430.34	8.38428E-02	54.32		
19	451.12	8.01798E-02	57.93	Sum	
21	745.64	5.77558E-02	61.30		
22	821.32	7.37637E-02	45.06	S-Esc	
23	872.99	7.79408E-02	50.52	Tol.	EU-154
24	886.00	1.09780E-01	39.68		
27	1184.16	4.50880E-02	49.93		
28	1207.27	4.52882E-02	45.37		
30	1523.95	1.12724E-02	56.08		
31	1602.79	1.91270E-02	39.83		
32	1620.67	1.02778E-02	60.28	Tol.	BI-212
33	1749.94	1.11287E-02	62.98		

Analysis Report for 1405081-01
GAS-1202

Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
35	1864.28	1.17895E-02	49.87		
36	1992.05	1.45497E-02	51.15		
37	2161.28	1.40061E-02	53.36		
38	2318.26	1.30083E-02	53.94		
39	2332.72	1.36257E-02	36.52		
40	2505.42	1.81078E-01	5.68	Sum	
41	2614.76	1.32031E-02	25.39	Tol.	TL-208

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield(%)	Activity (pCi/grams)	Activity Uncertainty
CO-57	0.95	122.06 *	85.51	6.87E+01	7.72E+00
		136.48 *	10.60	6.23E+01	2.18E+01
CO-60	0.99	1173.22 *	100.00	1.36E+02	1.33E+01
		1332.49 *	100.00	1.34E+02	1.23E+01
Y-88	0.70	898.02 *	93.40	1.37E+02	1.46E+02
		1836.01 *	99.38	2.75E+02	6.75E+01
CD-109	0.98	88.03 *	3.72	2.90E+03	3.29E+02
SN-113	0.70	255.12	1.93		
		391.69 *	64.90	2.34E+02	9.85E+01
SN-126	0.96	87.57 *	37.00	7.94E+01	7.66E+00
CS-137	0.99	661.65 *	85.12	8.70E+01	7.92E+00
CE-139	0.81	165.85 *	80.35	9.66E+01	2.34E+01
PB-212	0.87	238.63 *	44.60	8.90E-01	5.08E-01
		300.09	3.41		
PB-214	0.36	295.21	19.19		
		351.92 *	37.19	5.26E-01	5.71E-01
AM-241	1.00	59.54 *	35.90	2.00E+02	1.50E+01

Analysis Report for 1405081-01
GAS-1202

* = Energy line found in the spectrum.
- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/grams)	Wt mean Activity Uncertainty	Comments
CO-57	0.950	6.80E+01	7.28E+00	
CO-60	0.994	1.35E+02	9.03E+00	
Y-88	0.709	2.51E+02	6.13E+01	
? CD-109	0.982	2.90E+03	3.29E+02	
SN-113	0.705	2.34E+02	9.85E+01	
? SN-126	0.964	7.94E+01	7.66E+00	
CS-137	0.999	8.70E+01	7.92E+00	
CE-139	0.818	9.66E+01	2.34E+01	
PB-212	0.870	8.90E-01	5.08E-01	
PB-214	0.367	5.26E-01	5.71E-01	
AM-241	1.000	2.00E+02	1.50E+01	

? = 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 2.000sigma

Analysis Report for 1405081-01

GAS-1202

UNIDENTIFIED PEAKS

Peak Locate Performed on : 5/21/2014 9:58:58AM
 Peak Locate From Channel : 1
 Peak Locate To Channel : 4096

Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
	1	12.43	3.83394E+00		
M	2	22.09	6.10231E+01		
m	3	24.65	1.64010E+01	Tol.	TH-231
	4	32.18	1.19320E+00		
M	5	50.32	2.45120E+00	Tol.	TE-132 TH-227
	7	67.91	4.42652E-01	Tol.	TI-44 TA-182 TH-230
	11	153.60	6.91725E-02	Tol.	CS-136
	13	187.89	1.11428E-01		
	15	246.23	1.40637E-01		
	18	430.34	8.38428E-02		
	19	451.12	8.01798E-02	Sum	
	21	745.64	5.77558E-02		
	22	821.32	7.37637E-02	S-Esc	
	23	872.99	7.79408E-02	Tol.	EU-154
	24	886.00	1.09780E-01		
	27	1184.16	4.50880E-02		
	28	1207.27	4.52882E-02		
	30	1523.95	1.12724E-02		
	31	1602.79	1.91270E-02		
	32	1620.67	1.02778E-02	Tol.	BI-212
	33	1749.94	1.11287E-02		
	35	1864.28	1.17895E-02		
	36	1992.05	1.45497E-02		
	37	2161.28	1.40061E-02		
	38	2318.26	1.30083E-02		
	39	2332.72	1.36257E-02		
	40	2505.42	1.81078E-01	Sum	
	41	2614.76	1.32031E-02	Tol.	TL-208

Analysis Report for 1405081-01
GAS-1202

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.00sigma

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	BE-7	477.59	10.42	-1.48E+04	3.12E+05	3.12E+05
+	NA-22	1274.54	99.94	-2.44E-01	4.71E-01	4.71E-01
+	@ NA-24	1368.53	99.99	1.00E+26	1.00E+26	1.00E+26
	@	2754.09	99.86	1.00E+26		1.00E+26
+	AL-26	1808.65	99.76	5.71E-02	1.99E-01	1.99E-01
+	K-40	1460.81	10.67	1.15E+00	1.90E+00	1.90E+00
+	@ AR-41	1293.64	99.16	1.00E+26	1.00E+26	1.00E+26
+	TI-44	67.88	94.40	2.72E-01	3.19E-01	3.19E-01
		78.34	96.00	-3.76E-01		3.76E-01
+	SC-46	889.25	99.98	-4.36E+02	8.00E+02	8.29E+02
		1120.51	99.99	7.30E+02		8.00E+02
+	V-48	983.52	99.98	7.15E+15	7.37E+15	1.70E+16
		1312.10	97.50	-1.91E+15		7.37E+15
+	CR-51	320.08	9.83	1.34E+09	9.24E+09	9.24E+09
+	MN-54	834.83	99.97	2.29E+00	4.00E+00	4.00E+00
+	CO-56	846.75	99.96	-1.90E+01	7.98E+02	1.23E+03
		1037.75	14.03	3.35E+03		9.77E+03
		1238.25	67.00	1.14E+01		9.68E+02
		1771.40	15.51	-6.94E+02		2.53E+03
		2598.48	16.90	2.22E+02		7.98E+02
+	CO-57	122.06	* 85.51	6.87E+01	3.83E+00	3.83E+00
		136.48	* 10.60	6.23E+01		3.36E+01
+	CO-58	810.76	99.40	6.30E+02	2.78E+03	2.78E+03
+	FE-59	1099.22	56.50	3.47E+05	4.61E+05	8.97E+05
		1291.56	43.20	1.18E+05		4.61E+05
+	CO-60	1173.22	* 100.00	1.36E+02	6.96E-01	1.14E+00
		1332.49	* 100.00	1.34E+02		6.96E-01
+	ZN-65	1115.52	50.75	-1.88E+00	1.46E+01	1.46E+01
+	@ GA-67	93.31	35.70	1.00E+26	1.00E+26	1.00E+26
	@	208.95	2.24	1.00E+26		1.00E+26
	@	300.22	16.00	1.00E+26		1.00E+26
+	SE-75	121.11	16.70	5.92E+03	7.17E+01	3.91E+02

Analysis Report for 1405081-01

GAS-1202

Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
	SE-75	136.00	59.20	2.09E+02	7.17E+01
		264.65	59.80	4.28E+01	7.90E+01
		279.53	25.20	-1.53E+01	1.85E+02
		400.65	11.40	-1.87E+02	4.75E+02
+	RB-82	776.52	13.00	-3.41E+09	7.07E+10
+	RB-83	520.41	46.00	1.46E+02	8.68E+02
		529.64	30.30	-3.49E+02	1.32E+03
		552.65	16.40	-3.62E+02	2.39E+03
+	KR-85	513.99	0.43	1.88E+01	1.01E+02
+	SR-85	513.99	99.27	7.78E+02	4.18E+03
+	Y-88	898.02	* 93.40	1.37E+02	8.33E+01
		1836.01	* 99.38	2.75E+02	8.33E+01
+	NB-93M	16.57	9.43	3.97E+01	1.69E+01
+	NB-94	702.63	100.00	-2.18E-02	4.60E-01
		871.10	100.00	-2.72E-02	6.13E-01
+	NB-95	765.79	99.81	3.71E+06	1.54E+07
+	@ NB-95M	235.69	25.00	1.00E+26	1.00E+26
+	ZR-95	724.18	43.70	3.07E+03	1.13E+04
		756.72	55.30	6.77E+03	1.13E+04
+	@ MO-99	181.06	6.20	1.00E+26	1.00E+26
	@	739.58	12.80	1.00E+26	1.00E+26
	@	778.00	4.50	1.00E+26	1.00E+26
+	RU-103	497.08	89.00	2.45E+05	1.91E+06
+	RU-106	621.84	9.80	-2.27E+00	2.32E+01
+	AG-108M	433.93	89.90	1.00E-01	4.34E-01
		614.37	90.40	-2.36E-01	4.82E-01
		722.95	90.50	-1.62E-01	5.32E-01
+	CD-109	88.03	* 3.72	2.90E+03	4.79E+01
+	AG-110M	657.75	93.14	-1.45E+00	8.84E+00
		677.61	10.53	1.54E+01	4.72E+01
		706.67	16.46	-3.81E+00	3.14E+01
		763.93	21.98	-6.64E+00	2.56E+01
		884.67	71.63	3.85E+00	9.76E+00
		1384.27	23.94	1.33E+00	9.71E+00
+	CD-113M	263.70	0.02	5.94E+02	1.49E+03
+	SN-113	255.12	1.93	-2.34E+03	1.55E+02
		391.69	* 64.90	2.34E+02	1.55E+02
+	TE123M	159.00	84.10	-2.40E+01	4.64E+01
+	SB-124	602.71	97.87	8.33E+02	8.77E+03
		645.85	7.26	8.12E+03	1.42E+05
		722.78	11.10	-1.10E+04	9.66E+04
		1691.02	49.00	-1.90E+02	8.77E+03
+	I-125	35.49	6.49	1.44E+05	1.10E+05
+	SB-125	176.33	6.89	2.14E+00	2.33E+00
		427.89	29.33	-8.91E-01	2.33E+00
		463.38	10.35	-4.47E-01	7.23E+00
		600.56	17.80	-2.09E-01	4.43E+00
		635.90	11.32	4.84E+00	7.38E+00

Analysis Report for 1405081-01

GAS-1202

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	@ SB-126	414.70	83.30	1.00E+26	1.00E+26	1.00E+26
	@	666.33	99.60	1.00E+26		1.00E+26
	@	695.00	99.60	1.00E+26		1.00E+26
	@	720.50	53.80	1.00E+26		1.00E+26
+	SN-126	87.57	* 37.00	7.94E+01	1.31E+00	1.31E+00
+	@ SB-127	473.00	25.00	1.00E+26	1.00E+26	1.00E+26
	@	685.20	35.70	1.00E+26		1.00E+26
	@	783.80	14.70	1.00E+26		1.00E+26
+	I-129	29.78	57.00	-6.54E+00	5.94E-01	5.94E-01
		33.60	13.20	-5.57E+00		2.67E+00
		39.58	7.52	-4.39E+00		3.96E+00
+	@ I-131	284.30	6.05	1.00E+26	1.00E+26	1.00E+26
	@	364.48	81.20	1.00E+26		1.00E+26
	@	636.97	7.26	1.00E+26		1.00E+26
	@	722.89	1.80	1.00E+26		1.00E+26
+	@ TE-132	49.72	13.10	1.00E+26	1.00E+26	1.00E+26
	@	228.16	88.00	1.00E+26		1.00E+26
+	BA-133	81.00	33.00	-2.07E+00	6.40E-01	1.26E+00
		302.84	17.80	-1.13E+00		2.01E+00
		356.01	60.00	-2.43E-01		6.40E-01
+	@ I-133	529.87	86.30	1.00E+26	1.00E+26	1.00E+26
+	CS-134	563.23	8.38	-2.19E+00	1.01E+00	9.57E+00
		569.32	15.43	-2.31E-01		6.09E+00
		604.70	97.60	-5.99E-01		1.01E+00
		795.84	85.40	3.22E-01		1.37E+00
		801.93	8.73	-6.66E+00		1.33E+01
+	CS-135	268.24	16.00	-2.05E-01	1.89E+00	1.89E+00
+	@ I-135	1131.51	22.50	1.00E+26	1.00E+26	1.00E+26
	@	1260.41	28.60	1.00E+26		1.00E+26
	@	1678.03	9.54	1.00E+26		1.00E+26
+	@ CS-136	153.22	7.46	1.00E+26	1.00E+26	1.00E+26
	@	163.89	4.61	1.00E+26		1.00E+26
	@	176.55	13.56	1.00E+26		1.00E+26
	@	273.65	12.66	1.00E+26		1.00E+26
	@	340.57	48.50	1.00E+26		1.00E+26
	@	818.50	99.70	1.00E+26		1.00E+26
	@	1048.07	79.60	1.00E+26		1.00E+26
	@	1235.34	19.70	1.00E+26		1.00E+26
+	CS-137	661.65	* 85.12	8.70E+01	8.03E-01	8.03E-01
+	LA-138	788.74	34.00	-1.06E-01	2.85E-01	1.54E+00
		1435.80	66.00	8.58E-03		2.85E-01
+	CE-139	165.85	* 80.35	9.66E+01	3.51E+01	3.51E+01
+	@ BA-140	162.64	6.70	1.00E+26	1.00E+26	1.00E+26
	@	304.84	4.50	1.00E+26		1.00E+26
	@	423.70	3.20	1.00E+26		1.00E+26
	@	437.55	2.00	1.00E+26		1.00E+26
	@	537.32	25.00	1.00E+26		1.00E+26
+	@ LA-140	328.77	20.50	1.00E+26	1.00E+26	1.00E+26

Analysis Report for 1405081-01

GAS-1202

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
	@ LA-140	487.03	45.50	1.00E+26	1.00E+26	1.00E+26
	@	815.85	23.50	1.00E+26		1.00E+26
	@	1596.49	95.49	1.00E+26		1.00E+26
+	CE-141	145.44	48.40	-1.67E+07	5.92E+07	5.92E+07
+	@ CE-143	57.36	11.80	1.00E+26	1.00E+26	1.00E+26
	@	293.26	42.00	1.00E+26		1.00E+26
	@	664.55	5.20	1.00E+26		1.00E+26
+	CE-144	133.54	10.80	-6.35E+01	2.02E+01	2.02E+01
+	PM-144	476.78	42.00	-2.40E-01	2.32E+00	5.06E+00
		618.01	98.60	-3.91E-01		2.32E+00
		696.49	99.49	-1.30E+00		2.41E+00
+	PM-145	36.85	21.70	2.01E+00	8.39E-01	1.57E+00
		37.36	39.70	-4.83E-01		8.39E-01
		42.30	15.10	-3.00E+00		2.28E+00
		72.40	2.31	1.78E+01		1.71E+01
+	PM-146	453.90	39.94	1.73E-01	1.39E+00	1.39E+00
		735.90	14.01	-3.94E-01		4.61E+00
		747.13	13.10	3.35E+00		5.07E+00
+	@ ND-147	91.11	28.90	1.00E+26	1.00E+26	1.00E+26
	@	531.02	13.10	1.00E+26		1.00E+26
+	@ PM-149	285.90	3.10	1.00E+26	1.00E+26	1.00E+26
+	EU-152	121.78	20.50	3.43E+01	1.48E+00	2.32E+00
		244.69	5.40	1.23E+00		6.37E+00
		344.27	19.13	1.12E+00		1.94E+00
		778.89	9.20	-2.28E+00		6.16E+00
		964.01	10.40	2.02E+00		7.56E+00
		1085.78	7.22	4.29E+00		1.04E+01
		1112.02	9.60	6.90E+00		7.73E+00
		1407.95	14.94	4.52E-01		1.48E+00
+	GD-153	97.43	31.30	2.77E-01	9.56E+00	9.56E+00
		103.18	22.20	5.11E+00		1.37E+01
+	EU-154	123.07	40.50	1.85E+01	8.48E-01	1.26E+00
		723.30	19.70	-8.86E-01		2.91E+00
		873.19	11.50	3.04E+00		6.52E+00
		996.32	10.30	2.03E+00		7.58E+00
		1004.76	17.90	2.37E-01		4.34E+00
		1274.45	35.50	-4.39E-01		8.48E-01
+	EU-155	86.50	30.90	1.31E+02	1.70E+00	3.53E+00
		105.30	20.70	-2.42E-01		1.70E+00
+	EU-156	811.77	10.40	1.01E+17	6.83E+17	9.59E+17
		1153.47	7.20	3.10E+17		1.34E+18
		1230.71	8.90	2.56E+17		6.83E+17
+	HO-166M	184.41	72.60	-1.83E-03	3.81E-01	3.81E-01
		280.45	29.60	-5.80E-01		1.01E+00
		410.94	11.10	-6.58E-01		3.22E+00
		711.69	54.10	1.53E-02		8.54E-01
+	TM-171	66.72	0.14	3.15E+01	4.87E+02	4.87E+02
+	HF-172	81.75	4.52	-1.83E+01	5.37E+00	1.93E+01
		125.81	11.30	7.66E-01		5.37E+00

Analysis Report for 1405081-01
GAS-1202

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	@ LU-172	181.53	20.60	1.00E+26	1.00E+26	1.00E+26
	@	810.06	16.63	1.00E+26		1.00E+26
	@	912.12	15.25	1.00E+26		1.00E+26
	@	1093.66	62.50	1.00E+26		1.00E+26
+	LU-173	100.72	5.24	-7.18E+00	4.70E+00	1.58E+01
		272.11	21.20	6.28E-02		4.70E+00
+	HF-175	343.40	84.00	6.64E+02	2.16E+03	2.16E+03
+	LU-176	88.34	13.30	2.17E+02	3.29E-01	5.79E+00
		201.83	86.00	1.42E-02		3.35E-01
		306.78	94.00	1.44E-03		3.29E-01
+	TA-182	67.75	41.20	1.19E+02	1.39E+02	1.39E+02
		1121.30	34.90	1.33E+02		3.27E+02
		1189.05	16.23	-1.11E+02		5.11E+02
		1221.41	26.98	6.26E+01		2.57E+02
		1231.02	11.44	2.13E+02		5.69E+02
+	IR-192	308.46	29.68	-2.01E+02	3.01E+03	3.64E+03
		468.07	48.10	-5.53E+02		3.01E+03
+	HG-203	279.19	77.30	-1.37E+04	1.65E+05	1.65E+05
+	BI-207	569.67	97.72	-1.72E-02	4.53E-01	4.53E-01
		1063.62	74.90	2.24E-01		8.87E-01
+	TL-208	583.14	30.22	6.80E-01	4.63E-01	1.45E+00
		860.37	4.48	2.24E+00		1.32E+01
		2614.66	35.85	4.43E-01		4.63E-01
+	BI-210M	262.00	45.00	-3.89E-01	6.67E-01	6.67E-01
		300.00	23.00	3.67E-01		1.33E+00
+	PB-210	46.50	4.25	-5.31E+01	9.84E+00	9.84E+00
+	PB-211	404.84	2.90	3.49E+00	1.22E+01	1.22E+01
		831.96	2.90	1.32E+01		1.99E+01
+	BI-212	727.17	11.80	7.41E-01	4.10E+00	4.10E+00
		1620.62	2.75	3.17E-01		7.10E+00
+	PB-212	238.63	* 44.60	8.90E-01	8.19E-01	8.19E-01
		300.09	3.41	2.48E+00		8.95E+00
+	BI-214	609.31	46.30	3.79E-01	9.68E-01	9.68E-01
		1120.29	15.10	3.61E+00		3.95E+00
		1764.49	15.80	-2.94E-01		1.21E+00
		2204.22	4.98	-2.65E+00		3.29E+00
+	PB-214	295.21	19.19	6.57E-01	9.34E-01	1.59E+00
		351.92	* 37.19	5.26E-01		9.34E-01
+	RN-219	401.80	6.50	1.48E+00	5.43E+00	5.43E+00
+	RA-223	323.87	3.88	-4.98E-01	8.13E+00	8.13E+00
+	RA-224	240.98	3.95	-3.09E+00	7.79E+00	7.79E+00
+	RA-225	40.00	31.00	-5.50E+17	4.97E+17	4.97E+17
+	RA-226	186.21	3.28	-2.85E+00	8.64E+00	8.64E+00
+	TH-227	50.10	8.40	2.03E+01	2.70E+00	5.91E+00
		236.00	11.50	1.16E+00		2.70E+00
		256.20	6.30	1.81E+00		4.82E+00
+	AC-228	338.32	11.40	2.47E-01	2.44E+00	2.84E+00
		911.07	27.70	1.44E+00		2.44E+00

Analysis Report for 1405081-01

GAS-1202

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
	AC-228	969.11	16.60	2.38E-01	2.44E+00	4.01E+00
+	TH-230	48.44	16.90	5.01E+00	2.83E+00	2.83E+00
		62.85	4.60	-1.47E+00		5.49E+00
		67.67	0.37	6.76E+01		7.92E+01
+	PA-231	283.67	1.60	1.94E+00	1.33E+01	1.88E+01
		302.67	2.30	-7.50E+00		1.33E+01
+	TH-231	25.64	14.70	3.66E+02	5.78E+00	1.04E+01
		84.21	6.40	-2.55E+00		5.78E+00
+	PA-233	311.98	38.60	-6.60E+08	4.11E+09	4.11E+09
+	PA-234	131.20	20.40	2.86E-01	1.23E+00	1.23E+00
		733.99	8.80	1.31E+00		5.47E+00
		946.00	12.00	-9.27E-01		5.97E+00
+	PA-234M	1001.03	0.92	-1.76E+01	6.96E+01	6.96E+01
+	TH-234	63.29	3.80	-1.78E+00	6.64E+00	6.64E+00
+	U-235	143.76	10.50	2.33E-01	2.35E+00	2.35E+00
		163.35	4.70	7.80E-01		5.57E+00
		205.31	4.70	1.05E+00		6.14E+00
+	NP-237	86.50	12.60	2.30E+02	6.20E+00	6.20E+00
+	@ NP-239	106.10	22.70	1.00E+26	1.00E+26	1.00E+26
	@	228.18	10.70	1.00E+26		1.00E+26
	@	277.60	14.10	1.00E+26		1.00E+26
+	AM-241	59.54	* 35.90	2.00E+02	2.76E+00	2.76E+00
+	AM-243	74.67	66.00	-5.05E-01	5.38E-01	5.38E-01
+	CM-243	209.75	3.29	2.24E+00	2.29E+00	9.60E+00
		228.14	10.60	2.15E+00		3.13E+00
		277.60	14.00	1.10E+00		2.29E+00

- + = 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
 ? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Analysis Report for 1405081-01
GAS-1202

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
BE-7	477.59	10.42	3.12E+05	3.12E+05	-1.48E+04	1.54E+05
NA-22	1274.54	99.94	4.71E-01	4.71E-01	-2.44E-01	2.25E-01
@ NA-24	1368.53	99.99	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	2754.09	99.86	1.00E+26		1.00E+26	1.00E+20
AL-26	1808.65	99.76	1.99E-01	1.99E-01	5.71E-02	9.26E-02
K-40	1460.81	10.67	1.90E+00	1.90E+00	1.15E+00	8.93E-01
@ AR-41	1293.64	99.16	1.00E+26	1.00E+26	1.00E+26	1.00E+20
TI-44	67.88	94.40	3.19E-01	3.19E-01	2.72E-01	1.58E-01
	78.34	96.00	3.76E-01		-3.76E-01	1.87E-01
SC-46	889.25	99.98	8.29E+02	8.00E+02	-4.36E+02	4.09E+02
	1120.51	99.99	8.00E+02		7.30E+02	3.94E+02
V-48	983.52	99.98	1.70E+16	7.37E+15	7.15E+15	8.38E+15
	1312.10	97.50	7.37E+15		-1.91E+15	3.54E+15
CR-51	320.08	9.83	9.24E+09	9.24E+09	1.34E+09	4.57E+09
MN-54	834.83	99.97	4.00E+00	4.00E+00	2.29E+00	1.97E+00
CO-56	846.75	99.96	1.23E+03	7.98E+02	-1.90E+01	6.06E+02
	1037.75	14.03	9.77E+03		3.35E+03	4.81E+03
	1238.25	67.00	9.68E+02		1.14E+01	4.67E+02
	1771.40	15.51	2.53E+03		-6.94E+02	1.18E+03
	2598.48	16.90	7.98E+02		2.22E+02	2.99E+02
+ CO-57	122.06	* 85.51	3.83E+00	3.83E+00	6.87E+01	1.90E+00
	136.48	* 10.60	3.36E+01		6.23E+01	1.67E+01
CO-58	810.76	99.40	2.78E+03	2.78E+03	6.30E+02	1.37E+03
FE-59	1099.22	56.50	8.97E+05	4.61E+05	3.47E+05	4.42E+05
	1291.56	43.20	4.61E+05		1.18E+05	2.21E+05
+ CO-60	1173.22	* 100.00	1.14E+00	6.96E-01	1.36E+02	5.65E-01
	1332.49	* 100.00	6.96E-01		1.34E+02	3.41E-01
ZN-65	1115.52	50.75	1.46E+01	1.46E+01	-1.88E+00	7.21E+00
@ GA-67	93.31	35.70	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	208.95	2.24	1.00E+26		1.00E+26	1.00E+20
@	300.22	16.00	1.00E+26		1.00E+26	1.00E+20
SE-75	121.11	16.70	3.91E+02	7.17E+01	5.92E+03	1.95E+02
	136.00	59.20	7.17E+01		2.09E+02	3.56E+01
	264.65	59.80	7.90E+01		4.28E+01	3.91E+01
	279.53	25.20	1.85E+02		-1.53E+01	9.13E+01
	400.65	11.40	4.75E+02		-1.87E+02	2.34E+02
RB-82	776.52	13.00	7.07E+10	7.07E+10	-3.41E+09	3.48E+10
RB-83	520.41	46.00	8.68E+02	8.68E+02	1.46E+02	4.28E+02
	529.64	30.30	1.32E+03		-3.49E+02	6.48E+02
	552.65	16.40	2.39E+03		-3.62E+02	1.18E+03
KR-85	513.99	0.43	1.01E+02	1.01E+02	1.88E+01	4.97E+01
SR-85	513.99	99.27	4.18E+03	4.18E+03	7.78E+02	2.06E+03
+ Y-88	898.02	* 93.40	2.39E+02	8.33E+01	1.37E+02	1.18E+02
	1836.01	* 99.38	8.33E+01		2.75E+02	3.97E+01
NB-93M	16.57	9.43	1.69E+01	1.69E+01	3.97E+01	8.37E+00
NB-94	702.63	100.00	4.60E-01	4.60E-01	-2.18E-02	2.27E-01
	871.10	100.00	6.13E-01		-2.72E-02	3.02E-01
NB-95	765.79	99.81	1.54E+07	1.54E+07	3.71E+06	7.57E+06
@ NB-95M	235.69	25.00	1.00E+26	1.00E+26	1.00E+26	1.00E+20
ZR-95	724.18	43.70	1.37E+04	1.13E+04	3.07E+03	6.75E+03
	756.72	55.30	1.13E+04		6.77E+03	5.58E+03

Analysis Report for 1405081-01

GAS-1202

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
@ MO-99	181.06	6.20	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	739.58	12.80	1.00E+26		1.00E+26	1.00E+20
@	778.00	4.50	1.00E+26		1.00E+26	1.00E+20
RU-103	497.08	89.00	1.91E+06	1.91E+06	2.45E+05	9.42E+05
RU-106	621.84	9.80	2.32E+01	2.32E+01	-2.27E+00	1.14E+01
AG-108M	433.93	89.90	4.34E-01	4.34E-01	1.00E-01	2.15E-01
	614.37	90.40	4.82E-01		-2.36E-01	2.37E-01
	722.95	90.50	5.32E-01		-1.62E-01	2.62E-01
+ CD-109	88.03	* 3.72	4.79E+01	4.79E+01	2.90E+03	2.39E+01
AG-110M	657.75	93.14	8.84E+00	8.84E+00	-1.45E+00	4.38E+00
	677.61	10.53	4.72E+01		1.54E+01	2.33E+01
	706.67	16.46	3.14E+01		-3.81E+00	1.55E+01
	763.93	21.98	2.56E+01		-6.64E+00	1.26E+01
	884.67	71.63	9.76E+00		3.85E+00	4.82E+00
	1384.27	23.94	9.71E+00		1.33E+00	4.59E+00
CD-113M	263.70	0.02	1.49E+03	1.49E+03	5.94E+02	7.37E+02
+ SN-113	255.12	1.93	2.94E+03	1.55E+02	-2.34E+03	1.45E+03
	391.69	* 64.90	1.55E+02		2.34E+02	7.67E+01
TE123M	159.00	84.10	4.64E+01	4.64E+01	-2.40E+01	2.30E+01
SB-124	602.71	97.87	1.02E+04	8.77E+03	8.33E+02	5.02E+03
	645.85	7.26	1.42E+05		8.12E+03	6.98E+04
	722.78	11.10	9.66E+04		-1.10E+04	4.76E+04
	1691.02	49.00	8.77E+03		-1.90E+02	4.08E+03
I-125	35.49	6.49	1.10E+05	1.10E+05	1.44E+05	5.45E+04
SB-125	176.33	6.89	6.85E+00	2.33E+00	2.14E+00	3.39E+00
	427.89	29.33	2.33E+00		-8.91E-01	1.15E+00
	463.38	10.35	7.23E+00		-4.47E-01	3.57E+00
	600.56	17.80	4.43E+00		-2.09E-01	2.19E+00
	635.90	11.32	7.38E+00		4.84E+00	3.64E+00
@ SB-126	414.70	83.30	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	666.33	99.60	1.00E+26		1.00E+26	1.00E+20
@	695.00	99.60	1.00E+26		1.00E+26	1.00E+20
@	720.50	53.80	1.00E+26		1.00E+26	1.00E+20
+ SN-126	87.57	* 37.00	1.31E+00	1.31E+00	7.94E+01	6.53E-01
@ SB-127	473.00	25.00	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	685.20	35.70	1.00E+26		1.00E+26	1.00E+20
@	783.80	14.70	1.00E+26		1.00E+26	1.00E+20
I-129	29.78	57.00	5.94E-01	5.94E-01	-6.54E+00	2.93E-01
	33.60	13.20	2.67E+00		-5.57E+00	1.32E+00
	39.58	7.52	3.96E+00		-4.39E+00	1.96E+00
@ I-131	284.30	6.05	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	364.48	81.20	1.00E+26		1.00E+26	1.00E+20
@	636.97	7.26	1.00E+26		1.00E+26	1.00E+20
@	722.89	1.80	1.00E+26		1.00E+26	1.00E+20
@ TE-132	49.72	13.10	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	228.16	88.00	1.00E+26		1.00E+26	1.00E+20
BA-133	81.00	33.00	1.26E+00	6.40E-01	-2.07E+00	6.27E-01
	302.84	17.80	2.01E+00		-1.13E+00	9.95E-01
	356.01	60.00	6.40E-01		-2.43E-01	3.16E-01
@ I-133	529.87	86.30	1.00E+26	1.00E+26	1.00E+26	1.00E+20
CS-134	563.23	8.38	9.57E+00	1.01E+00	-2.19E+00	4.71E+00
	569.32	15.43	6.09E+00		-2.31E-01	3.00E+00
	604.70	97.60	1.01E+00		-5.99E-01	4.97E-01

Analysis Report for 1405081-01

GAS-1202

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
CS-134	795.84	85.40	1.37E+00	1.01E+00	3.22E-01	6.77E-01
	801.93	8.73	1.33E+01		-6.66E+00	6.56E+00
CS-135	268.24	16.00	1.89E+00	1.89E+00	-2.05E-01	9.33E-01
@ I-135	1131.51	22.50	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	1260.41	28.60	1.00E+26		1.00E+26	1.00E+20
@	1678.03	9.54	1.00E+26		1.00E+26	1.00E+20
@ CS-136	153.22	7.46	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	163.89	4.61	1.00E+26		1.00E+26	1.00E+20
@	176.55	13.56	1.00E+26		1.00E+26	1.00E+20
@	273.65	12.66	1.00E+26		1.00E+26	1.00E+20
@	340.57	48.50	1.00E+26		1.00E+26	1.00E+20
@	818.50	99.70	1.00E+26		1.00E+26	1.00E+20
@	1048.07	79.60	1.00E+26		1.00E+26	1.00E+20
@	1235.34	19.70	1.00E+26		1.00E+26	1.00E+20
+ CS-137	661.65	* 85.12	8.03E-01	8.03E-01	8.70E+01	3.98E-01
LA-138	788.74	34.00	1.54E+00	2.85E-01	-1.06E-01	7.58E-01
	1435.80	66.00	2.85E-01		8.58E-03	1.33E-01
+ CE-139	165.85	* 80.35	3.51E+01	3.51E+01	9.66E+01	1.74E+01
@ BA-140	162.64	6.70	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	304.84	4.50	1.00E+26		1.00E+26	1.00E+20
@	423.70	3.20	1.00E+26		1.00E+26	1.00E+20
@	437.55	2.00	1.00E+26		1.00E+26	1.00E+20
@	537.32	25.00	1.00E+26		1.00E+26	1.00E+20
@ LA-140	328.77	20.50	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	487.03	45.50	1.00E+26		1.00E+26	1.00E+20
@	815.85	23.50	1.00E+26		1.00E+26	1.00E+20
@	1596.49	95.49	1.00E+26		1.00E+26	1.00E+20
CE-141	145.44	48.40	5.92E+07	5.92E+07	-1.67E+07	2.93E+07
@ CE-143	57.36	11.80	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	293.26	42.00	1.00E+26		1.00E+26	1.00E+20
@	664.55	5.20	1.00E+26		1.00E+26	1.00E+20
CE-144	133.54	10.80	2.02E+01	2.02E+01	-6.35E+01	1.00E+01
PM-144	476.78	42.00	5.06E+00	2.32E+00	-2.40E-01	2.50E+00
	618.01	98.60	2.32E+00		-3.91E-01	1.14E+00
	696.49	99.49	2.41E+00		-1.30E+00	1.19E+00
PM-145	36.85	21.70	1.57E+00	8.39E-01	2.01E+00	7.76E-01
	37.36	39.70	8.39E-01		-4.83E-01	4.15E-01
	42.30	15.10	2.28E+00		-3.00E+00	1.13E+00
	72.40	2.31	1.71E+01		1.78E+01	8.51E+00
PM-146	453.90	39.94	1.39E+00	1.39E+00	1.73E-01	6.86E-01
	735.90	14.01	4.61E+00		-3.94E-01	2.27E+00
	747.13	13.10	5.07E+00		3.35E+00	2.50E+00
@ ND-147	91.11	28.90	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	531.02	13.10	1.00E+26		1.00E+26	1.00E+20
@ PM-149	285.90	3.10	1.00E+26	1.00E+26	1.00E+26	1.00E+20
EU-152	121.78	20.50	2.32E+00	1.48E+00	3.43E+01	1.15E+00
	244.69	5.40	6.37E+00		1.23E+00	3.15E+00
	344.27	19.13	1.94E+00		1.12E+00	9.58E-01
	778.89	9.20	6.16E+00		-2.28E+00	3.03E+00
	964.01	10.40	7.56E+00		2.02E+00	3.73E+00
	1085.78	7.22	1.04E+01		4.29E+00	5.11E+00
	1112.02	9.60	7.73E+00		6.90E+00	3.81E+00
	1407.95	14.94	1.48E+00		4.52E-01	6.95E-01

Analysis Report for 1405081-01

GAS-1202

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
GD-153	97.43	31.30	9.56E+00	9.56E+00	2.77E-01	4.74E+00
	103.18	22.20	1.37E+01		5.11E+00	6.81E+00
EU-154	123.07	40.50	1.26E+00	8.48E-01	1.85E+01	6.25E-01
	723.30	19.70	2.91E+00		-8.86E-01	1.44E+00
	873.19	11.50	6.52E+00		3.04E+00	3.22E+00
	996.32	10.30	7.58E+00		2.03E+00	3.74E+00
	1004.76	17.90	4.34E+00		2.37E-01	2.14E+00
	1274.45	35.50	8.48E-01		-4.39E-01	4.06E-01
EU-155	86.50	30.90	3.53E+00	1.70E+00	1.31E+02	1.76E+00
	105.30	20.70	1.70E+00		-2.42E-01	8.41E-01
EU-156	811.77	10.40	9.59E+17	6.83E+17	1.01E+17	4.73E+17
	1153.47	7.20	1.34E+18		3.10E+17	6.58E+17
	1230.71	8.90	6.83E+17		2.56E+17	3.31E+17
HO-166M	184.41	72.60	3.81E-01	3.81E-01	-1.83E-03	1.89E-01
	280.45	29.60	1.01E+00		-5.80E-01	5.01E-01
	410.94	11.10	3.22E+00		-6.58E-01	1.59E+00
	711.69	54.10	8.54E-01		1.53E-02	4.21E-01
TM-171	66.72	0.14	4.87E+02	4.87E+02	3.15E+01	2.42E+02
HF-172	81.75	4.52	1.93E+01	5.37E+00	-1.83E+01	9.58E+00
	125.81	11.30	5.37E+00		7.66E-01	2.66E+00
@ LU-172	181.53	20.60	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	810.06	16.63	1.00E+26		1.00E+26	1.00E+20
@	912.12	15.25	1.00E+26		1.00E+26	1.00E+20
@	1093.66	62.50	1.00E+26		1.00E+26	1.00E+20
LU-173	100.72	5.24	1.58E+01	4.70E+00	-7.18E+00	7.85E+00
	272.11	21.20	4.70E+00		6.28E-02	2.33E+00
HF-175	343.40	84.00	2.16E+03	2.16E+03	6.64E+02	1.07E+03
LU-176	88.34	13.30	5.79E+00	3.29E-01	2.17E+02	2.89E+00
	201.83	86.00	3.35E-01		1.42E-02	1.66E-01
	306.78	94.00	3.29E-01		1.44E-03	1.62E-01
TA-182	67.75	41.20	1.39E+02	1.39E+02	1.19E+02	6.91E+01
	1121.30	34.90	3.27E+02		1.33E+02	1.61E+02
	1189.05	16.23	5.11E+02		-1.11E+02	2.49E+02
	1221.41	26.98	2.57E+02		6.26E+01	1.25E+02
	1231.02	11.44	5.69E+02		2.13E+02	2.75E+02
IR-192	308.46	29.68	3.64E+03	3.01E+03	-2.01E+02	1.80E+03
	468.07	48.10	3.01E+03		-5.53E+02	1.49E+03
HG-203	279.19	77.30	1.65E+05	1.65E+05	-1.37E+04	8.15E+04
BI-207	569.67	97.72	4.53E-01	4.53E-01	-1.72E-02	2.24E-01
	1063.62	74.90	8.87E-01		2.24E-01	4.37E-01
TL-208	583.14	30.22	1.45E+00	4.63E-01	6.80E-01	7.13E-01
	860.37	4.48	1.32E+01		2.24E+00	6.52E+00
	2614.66	35.85	4.63E-01		4.43E-01	2.09E-01
BI-210M	262.00	45.00	6.67E-01	6.67E-01	-3.89E-01	3.30E-01
	300.00	23.00	1.33E+00		3.67E-01	6.55E-01
PB-210	46.50	4.25	9.84E+00	9.84E+00	-5.31E+01	4.89E+00
PB-211	404.84	2.90	1.22E+01	1.22E+01	3.49E+00	6.04E+00
	831.96	2.90	1.99E+01		1.32E+01	9.80E+00
BI-212	727.17	11.80	4.10E+00	4.10E+00	7.41E-01	2.02E+00
	1620.62	2.75	7.10E+00		3.17E-01	3.32E+00
+ PB-212	238.63	* 44.60	8.19E-01	8.19E-01	8.90E-01	4.06E-01
	300.09	3.41	8.95E+00		2.48E+00	4.42E+00
BI-214	609.31	46.30	9.68E-01	9.68E-01	3.79E-01	4.77E-01

Analysis Report for 1405081-01

GAS-1202

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
BI-214	1120.29	15.10	3.95E+00	9.68E-01	3.61E+00	1.94E+00
	1764.49	15.80	1.21E+00		-2.94E-01	5.64E-01
	2204.22	4.98	3.29E+00		-2.65E+00	1.50E+00
+ PB-214	295.21	19.19	1.59E+00	9.34E-01	6.57E-01	7.86E-01
	351.92 *	37.19	9.34E-01		5.26E-01	4.62E-01
RN-219	401.80	6.50	5.43E+00	5.43E+00	1.48E+00	2.68E+00
RA-223	323.87	3.88	8.13E+00	8.13E+00	-4.98E-01	4.02E+00
RA-224	240.98	3.95	7.79E+00	7.79E+00	-3.09E+00	3.86E+00
RA-225	40.00	31.00	4.97E+17	4.97E+17	-5.50E+17	2.46E+17
RA-226	186.21	3.28	8.64E+00	8.64E+00	-2.85E+00	4.28E+00
TH-227	50.10	8.40	5.91E+00	2.70E+00	2.03E+01	2.94E+00
	236.00	11.50	2.70E+00		1.16E+00	1.34E+00
	256.20	6.30	4.82E+00		1.81E+00	2.38E+00
AC-228	338.32	11.40	2.84E+00	2.44E+00	2.47E-01	1.40E+00
	911.07	27.70	2.44E+00		1.44E+00	1.20E+00
	969.11	16.60	4.01E+00		2.38E-01	1.98E+00
TH-230	48.44	16.90	2.83E+00	2.83E+00	5.01E+00	1.41E+00
	62.85	4.60	5.49E+00		-1.47E+00	2.72E+00
	67.67	0.37	7.92E+01		6.76E+01	3.93E+01
PA-231	283.67	1.60	1.88E+01	1.33E+01	1.94E+00	9.31E+00
	302.67	2.30	1.33E+01		-7.50E+00	6.58E+00
TH-231	25.64	14.70	1.04E+01	5.78E+00	3.66E+02	5.16E+00
	84.21	6.40	5.78E+00		-2.55E+00	2.87E+00
PA-233	311.98	38.60	4.11E+09	4.11E+09	-6.60E+08	2.03E+09
PA-234	131.20	20.40	1.23E+00	1.23E+00	2.86E-01	6.11E-01
	733.99	8.80	5.47E+00		1.31E+00	2.70E+00
	946.00	12.00	5.97E+00		-9.27E-01	2.95E+00
PA-234M	1001.03	0.92	6.96E+01	6.96E+01	-1.76E+01	3.43E+01
TH-234	63.29	3.80	6.64E+00	6.64E+00	-1.78E+00	3.29E+00
U-235	143.76	10.50	2.35E+00	2.35E+00	2.33E-01	1.16E+00
	163.35	4.70	5.57E+00		7.80E-01	2.76E+00
	205.31	4.70	6.14E+00		1.05E+00	3.04E+00
NP-237	86.50	12.60	6.20E+00	6.20E+00	2.30E+02	3.09E+00
@ NP-239	106.10	22.70	1.00E+26	1.00E+26	1.00E+26	1.00E+20
@	228.18	10.70	1.00E+26		1.00E+26	1.00E+20
@	277.60	14.10	1.00E+26		1.00E+26	1.00E+20
+ AM-241	59.54 *	35.90	2.76E+00	2.76E+00	2.00E+02	1.37E+00
AM-243	74.67	66.00	5.38E-01	5.38E-01	-5.05E-01	2.68E-01
CM-243	209.75	3.29	9.60E+00	2.29E+00	2.24E+00	4.75E+00
	228.14	10.60	3.13E+00		2.15E+00	1.55E+00
	277.60	14.00	2.29E+00		1.10E+00	1.13E+00

- + = 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

Analysis Report for 1405081-01
GAS-1202

No Action Level results available for reporting purposes.

DATA REVIEW COMMENTS REPORT

<i>Creation Date</i>	<i>Comment</i>	<i>User</i>
----------------------	----------------	-------------

No Data Review Comments Entered.

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: GAS-1202

Elapsed Live time: 1800
 Elapsed Real Time: 1820

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	1	569	1314
9:	1515	1667	2370	5756	6794	2375	2600	2005
17:	1812	2846	1512	2162	8490	72247	33590	4818
25:	23635	9207	1461	773	751	768	935	2177
33:	1688	991	817	1085	1150	993	1031	1120
41:	1230	1356	1579	1748	1779	2021	2346	2960
49:	3998	4750	4389	4187	4210	4381	4435	4676
57:	4933	5433	24970	55956	4965	1284	1362	1476
65:	1521	1773	1895	1893	2014	1863	1776	1824
73:	1839	1726	1876	1655	1794	1885	1794	1717
81:	1844	1793	1954	2023	2082	2030	3952	26124
89:	10200	985	905	852	896	934	882	875
97:	830	885	880	853	850	873	932	920
105:	866	873	869	919	871	829	936	904
113:	868	923	895	885	892	890	886	920
121:	1435	6122	2648	800	868	857	776	818
129:	830	816	814	806	788	782	751	1177
137:	1238	783	737	737	761	749	767	685
145:	734	726	704	740	711	774	771	670
153:	780	835	693	725	737	683	717	692
161:	703	742	706	682	902	1438	798	696
169:	660	670	701	708	723	688	724	663
177:	690	667	634	660	593	719	715	751
185:	726	810	767	814	806	753	723	766
193:	789	732	739	701	757	744	744	736
201:	773	696	723	750	726	696	721	725
209:	760	749	727	809	754	821	841	832
217:	809	820	843	800	819	798	793	771
225:	688	758	770	752	723	773	734	709
233:	703	705	730	684	648	800	810	640
241:	696	644	619	645	686	686	639	645
249:	604	581	601	609	573	650	613	582
257:	562	655	606	580	554	589	582	604
265:	615	584	588	552	565	559	549	531
273:	543	550	533	567	565	588	495	516
281:	516	523	549	510	543	507	525	503
289:	534	504	487	494	511	501	539	512
297:	484	487	483	528	490	506	487	497
305:	501	519	481	469	510	495	495	460
313:	507	456	477	449	459	461	470	484
321:	484	471	473	486	457	501	478	474
329:	460	484	482	420	463	456	519	471
337:	472	457	503	457	434	512	471	492
345:	440	455	456	442	454	430	456	574
353:	441	443	500	422	441	443	445	418
361:	468	451	424	431	461	439	445	432

369: 448 444 442 467 428 428 414 490

Sample Title: GAS-1202

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	406	413	458	436	452	481	436	427
385:	450	445	411	421	482	456	570	643
393:	488	416	434	431	454	469	428	441
401:	402	413	451	453	412	389	451	423
409:	429	436	417	418	436	424	447	434
417:	451	461	426	480	449	468	448	430
425:	464	416	408	453	461	482	473	473
433:	441	448	472	455	443	423	441	465
441:	463	453	442	446	468	469	476	411
449:	454	486	508	489	471	488	467	515
457:	464	487	461	496	469	450	477	485
465:	478	475	469	469	454	485	462	492
473:	434	501	441	438	446	398	430	420
481:	400	397	372	358	390	361	322	364
489:	360	319	345	336	351	327	345	345
497:	325	345	322	325	328	301	322	319
505:	318	324	329	304	337	365	409	375
513:	316	321	336	301	276	289	321	318
521:	286	291	318	280	306	339	296	285
529:	274	294	310	283	291	293	300	260
537:	283	282	275	290	279	263	259	277
545:	292	280	295	291	279	261	271	264
553:	281	242	243	274	250	240	273	261
561:	253	263	281	232	273	278	260	240
569:	231	240	255	258	246	260	247	243
577:	235	263	246	279	248	247	286	256
585:	238	270	246	237	276	241	232	231
593:	264	231	232	249	264	212	245	250
601:	234	262	249	272	230	265	241	265
609:	299	250	229	233	239	237	231	231
617:	219	225	220	258	240	207	264	235
625:	246	256	256	227	247	251	237	236
633:	237	275	246	243	245	251	256	219
641:	238	200	232	237	217	224	242	265
649:	243	241	256	269	232	251	262	257
657:	273	238	337	2660	14499	11323	1453	224
665:	216	195	199	199	189	192	225	189
673:	207	211	227	198	202	209	217	205
681:	207	201	217	211	217	219	203	191
689:	197	218	212	222	213	226	199	204
697:	194	220	215	222	237	195	203	211
705:	208	222	217	195	224	197	230	219
713:	171	230	183	219	194	194	202	227
721:	221	204	223	211	215	218	253	237
729:	193	231	230	212	229	205	222	219
737:	205	222	199	228	199	212	205	233
745:	250	249	201	208	195	211	205	195
753:	217	218	218	254	236	227	206	211
761:	221	236	205	216	229	220	228	251
769:	238	208	212	242	217	211	248	212
777:	219	203	199	207	212	231	231	202
785:	233	223	229	249	213	224	226	253
793:	227	211	221	238	228	219	225	214

801: 229 204 211 226 240 231 255 267

Sample Title: GAS-1202

Channel	229	204	211	226	240	231	255	267
809:	213	213	255	239	232	240	222	233
817:	251	239	267	242	271	278	205	228
825:	217	232	223	238	238	234	260	255
833:	265	255	280	240	242	232	255	247
841:	243	249	223	258	272	263	235	241
849:	241	251	248	263	246	249	249	257
857:	245	254	246	244	285	272	243	247
865:	251	281	250	261	245	231	279	317
873:	275	272	274	277	259	276	255	265
881:	244	265	252	297	287	291	265	278
889:	242	242	265	263	300	318	276	292
897:	391	393	298	296	300	305	295	264
905:	300	293	299	290	281	274	318	319
913:	323	329	274	284	315	295	346	310
921:	308	332	302	328	307	278	311	325
929:	316	315	343	302	306	340	302	328
937:	298	359	285	324	327	329	322	342
945:	351	275	356	293	333	330	303	361
953:	337	338	329	350	345	276	339	339
961:	291	299	304	303	278	264	285	266
969:	260	280	252	272	230	268	267	251
977:	264	247	266	275	249	239	244	243
985:	249	237	209	234	247	225	237	226
993:	245	241	262	254	248	217	232	237
1001:	239	233	244	245	217	236	244	232
1009:	240	212	240	262	258	242	240	262
1017:	242	266	229	231	237	218	234	213
1025:	227	246	233	240	223	236	200	210
1033:	261	244	235	228	222	211	203	229
1041:	204	198	219	215	220	228	194	199
1049:	196	225	237	202	213	201	200	258
1057:	190	208	187	223	207	188	209	219
1065:	187	233	199	215	216	216	219	207
1073:	195	208	200	228	199	204	192	205
1081:	239	216	226	210	224	237	229	226
1089:	213	199	219	216	191	216	224	215
1097:	235	219	245	238	212	233	219	213
1105:	192	207	215	217	197	219	195	214
1113:	215	226	180	163	188	163	188	189
1121:	164	167	145	136	136	147	116	121
1129:	146	137	151	142	150	144	142	138
1137:	145	124	138	117	142	119	132	132
1145:	116	126	136	118	123	137	139	135
1153:	116	131	120	123	128	125	124	121
1161:	111	113	114	133	122	131	122	124
1169:	144	246	1720	8644	11631	4241	550	106
1177:	75	104	85	89	86	116	78	117
1185:	90	82	75	76	67	80	79	85
1193:	82	92	78	71	54	67	85	60
1201:	66	61	53	58	68	87	75	50
1209:	67	50	51	55	68	52	40	60
1217:	47	47	51	61	53	54	45	56
1225:	49	43	52	48	45	43	39	48

1233: 42 37 37 30 47 47 37 35

Sample Title: GAS-1202

Channel	1	2	3	4	5	6	7	8
1241:	28	36	35	39	36	26	42	29
1249:	26	38	25	38	35	34	30	38
1257:	22	34	35	23	25	33	25	24
1265:	27	31	23	20	26	29	27	20
1273:	22	21	26	24	26	22	36	32
1281:	35	14	26	24	24	27	24	32
1289:	29	25	26	22	26	25	18	28
1297:	30	33	24	27	30	22	33	25
1305:	28	33	29	32	37	25	31	24
1313:	27	17	30	29	29	21	33	28
1321:	32	32	31	37	33	39	53	48
1329:	122	1193	6080	10415	5256	887	68	18
1337:	20	21	13	12	17	19	12	9
1345:	12	14	15	11	19	17	11	11
1353:	12	11	14	12	11	15	18	15
1361:	13	15	11	5	14	13	13	14
1369:	11	14	11	14	12	11	11	12
1377:	17	8	14	16	8	19	13	21
1385:	14	9	10	20	8	14	11	10
1393:	12	14	12	8	11	16	15	6
1401:	13	7	12	7	12	7	17	17
1409:	13	13	10	12	13	11	15	10
1417:	10	14	12	14	11	14	11	14
1425:	19	10	9	10	7	16	8	18
1433:	8	11	7	7	16	10	11	9
1441:	11	12	11	10	8	9	12	10
1449:	11	9	12	11	7	13	5	7
1457:	14	10	11	16	11	15	11	10
1465:	11	9	6	9	11	13	11	13
1473:	7	12	11	11	10	10	6	9
1481:	12	14	9	10	9	9	16	7
1489:	3	10	8	12	9	9	6	7
1497:	19	10	10	6	8	9	16	9
1505:	10	6	14	17	12	11	12	8
1513:	12	11	5	11	10	20	10	10
1521:	9	16	12	11	8	6	5	10
1529:	6	10	7	8	7	8	10	7
1537:	7	10	5	9	6	15	8	6
1545:	7	11	8	13	10	8	15	9
1553:	4	7	12	10	7	4	11	7
1561:	13	12	9	11	6	7	5	6
1569:	8	8	11	12	6	8	7	7
1577:	7	11	11	7	6	8	11	12
1585:	5	8	8	11	5	12	6	7
1593:	5	5	6	8	9	8	7	10
1601:	21	14	9	11	4	5	8	9
1609:	9	4	9	6	10	7	5	6
1617:	5	10	8	16	7	8	3	8
1625:	7	11	8	10	9	9	5	9
1633:	5	6	10	10	4	5	8	11
1641:	7	5	12	4	10	11	8	10
1649:	9	7	8	6	8	8	7	5
1657:	9	3	8	13	14	7	10	10

1665: 8 12 8 9 8 8 6 5

Sample Title: GAS-1202

Channel	1	2	3	4	5	6	7	8
1673:	12	5	5	7	13	11	4	6
1681:	8	6	8	10	10	9	12	10
1689:	8	4	6	5	3	6	6	5
1697:	6	3	4	0	6	3	6	4
1705:	8	6	2	7	5	5	7	6
1713:	5	5	7	6	8	5	3	12
1721:	8	5	9	4	7	3	9	10
1729:	6	6	4	3	5	4	5	7
1737:	3	6	8	7	8	6	8	4
1745:	5	3	10	8	11	7	7	8
1753:	4	6	9	2	2	8	3	7
1761:	6	7	8	10	8	5	5	5
1769:	11	8	3	6	6	7	7	5
1777:	6	14	7	6	7	13	4	3
1785:	7	5	6	3	7	6	6	6
1793:	3	4	3	6	7	8	5	4
1801:	5	3	1	10	3	12	8	7
1809:	4	5	13	2	13	4	8	10
1817:	3	6	4	9	7	5	8	5
1825:	6	5	5	3	5	7	9	3
1833:	15	44	79	50	31	10	7	7
1841:	6	5	6	5	7	4	7	7
1849:	8	6	4	3	3	4	10	6
1857:	7	9	3	3	4	11	10	7
1865:	8	6	3	6	2	7	2	6
1873:	5	5	12	3	8	6	6	3
1881:	4	6	6	5	6	3	7	3
1889:	4	4	10	8	7	5	5	1
1897:	6	6	4	3	9	9	2	4
1905:	2	9	5	7	8	10	5	8
1913:	3	0	4	6	7	5	9	3
1921:	4	6	6	7	6	6	1	8
1929:	5	6	5	4	10	5	8	7
1937:	9	10	4	4	8	4	7	5
1945:	4	8	6	2	8	4	11	4
1953:	9	6	5	5	2	6	5	4
1961:	3	6	6	4	6	4	8	5
1969:	4	7	7	7	2	3	10	11
1977:	1	5	4	5	8	9	4	4
1985:	6	5	7	7	3	6	5	10
1993:	11	5	1	4	7	3	6	3
2001:	5	6	9	8	5	6	7	5
2009:	1	5	4	3	5	4	4	7
2017:	3	5	5	4	8	10	2	2
2025:	8	5	4	5	4	6	7	7
2033:	11	6	2	6	10	6	4	8
2041:	2	6	2	5	4	9	4	4
2049:	5	6	9	5	2	6	6	4
2057:	5	3	6	2	5	5	2	3
2065:	7	1	6	4	4	4	6	5
2073:	2	5	5	6	4	5	7	6
2081:	8	3	3	3	4	5	4	4
2089:	4	9	2	6	2	1	5	2

2097: 2 5 5 2 6 3 4 6

Sample Title: GAS-1202

Channel	1	2	3	4	5	6	7	8
2105:	7	3	3	3	6	3	4	5
2113:	6	6	7	5	4	3	4	8
2121:	5	5	5	9	1	3	8	4
2129:	6	4	9	5	4	8	2	6
2137:	6	6	11	4	7	5	5	2
2145:	2	2	7	4	5	6	3	4
2153:	4	6	4	3	4	4	10	4
2161:	10	4	9	2	3	6	5	3
2169:	3	5	5	4	2	6	2	5
2177:	3	5	5	3	3	4	2	4
2185:	6	8	2	2	5	7	6	3
2193:	3	6	6	3	7	6	5	2
2201:	4	5	3	3	4	5	3	7
2209:	11	4	3	2	7	3	7	7
2217:	4	5	5	6	3	8	2	3
2225:	8	2	7	2	3	6	10	3
2233:	6	7	4	3	4	3	6	5
2241:	4	7	3	3	8	5	4	3
2249:	8	7	7	4	4	3	4	3
2257:	9	6	5	5	7	2	5	6
2265:	3	8	7	8	2	6	7	8
2273:	7	6	4	7	4	7	5	7
2281:	6	6	5	5	8	5	15	6
2289:	7	8	5	7	8	4	4	6
2297:	4	4	4	5	3	2	3	2
2305:	1	5	0	3	4	3	4	2
2313:	3	6	8	8	3	2	2	1
2321:	1	1	2	4	0	1	1	3
2329:	4	7	2	5	1	3	4	3
2337:	3	1	2	4	0	0	3	4
2345:	2	1	2	0	7	3	2	3
2353:	6	3	0	3	4	3	2	0
2361:	4	2	1	4	3	2	2	4
2369:	5	1	3	1	2	4	1	0
2377:	2	2	4	2	0	0	5	4
2385:	0	2	2	0	3	1	2	1
2393:	2	3	0	1	1	0	1	2
2401:	2	1	2	1	1	1	0	1
2409:	0	1	1	2	3	0	2	2
2417:	0	0	0	0	1	0	0	1
2425:	0	0	0	1	0	0	0	0
2433:	1	2	1	0	0	1	0	1
2441:	1	2	0	0	1	2	1	0
2449:	0	1	1	0	0	0	3	1
2457:	1	1	2	2	2	0	2	0
2465:	1	1	0	1	0	2	1	2
2473:	0	0	1	3	1	1	0	0
2481:	0	1	0	0	0	1	1	0
2489:	0	0	0	0	2	2	0	1
2497:	1	1	3	0	2	23	62	105
2505:	82	44	5	1	0	0	1	0
2513:	1	0	1	0	0	0	0	0
2521:	0	0	0	1	0	0	0	0

2529: 0 0 0 0 0 0 0 0 0

Sample Title: GAS-1202

Channel	1	2	3	4	5	6	7	8
2537:	0	0	0	1	0	0	0	1
2545:	1	0	0	1	0	0	0	1
2553:	1	0	0	0	0	0	0	0
2561:	0	0	0	0	0	0	0	0
2569:	0	0	0	0	0	0	0	0
2577:	0	0	1	0	0	1	0	0
2585:	0	0	2	0	0	0	0	0
2593:	1	0	0	1	0	0	0	0
2601:	1	0	0	0	0	0	1	0
2609:	0	1	1	3	13	6	5	1
2617:	0	0	1	0	0	1	0	1
2625:	0	1	0	0	0	0	1	1
2633:	0	0	0	0	1	1	0	0
2641:	0	0	0	0	0	0	0	1
2649:	0	1	0	0	0	0	0	0
2657:	0	0	2	0	0	1	0	0
2665:	0	0	0	0	0	0	0	0
2673:	1	0	0	0	0	0	0	0
2681:	0	0	1	0	1	1	0	0
2689:	0	0	0	0	0	0	1	0
2697:	0	0	1	0	0	1	0	0
2705:	0	0	1	0	0	0	0	0
2713:	0	0	0	0	0	0	0	0
2721:	0	3	0	0	0	0	0	0
2729:	0	0	2	0	1	0	0	0
2737:	0	0	0	0	0	0	1	0
2745:	0	0	0	0	0	1	0	0
2753:	0	1	0	0	0	0	0	0
2761:	0	0	0	1	0	0	0	0
2769:	0	0	0	0	0	0	0	0
2777:	0	0	0	0	0	1	0	0
2785:	0	0	0	1	0	0	0	0
2793:	0	0	0	0	0	0	0	1
2801:	1	0	0	0	0	0	1	0
2809:	0	0	0	0	0	0	0	0
2817:	0	0	0	0	0	0	0	0
2825:	0	1	0	0	0	0	0	1
2833:	0	0	0	1	0	0	0	0
2841:	0	0	0	0	1	0	0	0
2849:	0	0	0	1	0	0	0	0
2857:	0	0	0	0	0	0	0	0
2865:	0	0	0	0	0	0	0	0
2873:	0	0	1	0	0	0	0	0
2881:	0	0	0	0	0	0	0	0
2889:	0	0	0	0	0	1	0	0
2897:	0	0	0	0	0	0	0	0
2905:	0	0	0	0	0	2	0	0
2913:	0	1	0	1	0	0	0	0
2921:	0	0	0	0	0	0	0	0
2929:	0	0	0	0	0	0	0	0
2937:	0	0	0	0	1	1	0	0
2945:	0	0	0	0	0	1	0	0
2953:	0	0	1	0	0	0	0	1

2961: 0 0 0 0 0 1 0 1

Sample Title: GAS-1202

Channel	1	2	3	4	5	6	7	8	9
2969:	0	0	0	0	0	0	0	0	0
2977:	0	0	0	0	0	0	0	0	0
2985:	0	1	0	0	0	0	0	0	0
2993:	0	0	0	1	0	0	0	0	0
3001:	0	0	0	0	0	0	0	0	0
3009:	0	0	0	0	0	0	0	0	1
3017:	0	0	0	0	0	0	0	0	0
3025:	0	0	0	0	0	0	0	0	0
3033:	0	0	1	0	0	0	0	0	0
3041:	0	0	0	0	0	0	0	0	0
3049:	0	0	0	0	0	0	0	0	0
3057:	0	0	0	0	0	1	0	0	1
3065:	0	0	0	0	0	1	0	0	0
3073:	0	0	0	0	0	0	0	0	0
3081:	0	0	0	0	0	0	0	0	0
3089:	0	0	0	0	0	0	0	0	1
3097:	0	0	0	0	1	0	0	0	1
3105:	0	0	0	0	0	1	0	0	1
3113:	0	0	0	0	0	0	1	0	0
3121:	0	0	0	0	0	0	0	0	0
3129:	0	0	0	0	0	0	0	0	0
3137:	0	0	0	0	0	0	0	0	0
3145:	0	0	0	0	0	0	0	0	0
3153:	0	0	0	1	0	0	0	0	0
3161:	0	0	1	0	0	0	1	0	0
3169:	0	0	0	0	0	0	0	0	0
3177:	0	0	2	0	0	0	0	0	0
3185:	0	0	0	0	0	0	0	0	0
3193:	0	0	0	0	0	0	0	0	0
3201:	0	0	0	0	0	0	0	0	0
3209:	0	0	0	0	0	0	0	0	1
3217:	0	0	0	0	0	0	0	1	0
3225:	0	0	0	1	0	0	0	1	0
3233:	0	0	0	0	0	0	0	0	0
3241:	0	0	0	1	0	0	0	0	0
3249:	0	0	0	0	0	0	0	1	1
3257:	0	0	0	0	0	0	1	0	0
3265:	0	0	0	1	0	0	0	0	0
3273:	0	0	0	0	0	0	0	0	0
3281:	0	0	0	0	0	0	0	0	1
3289:	0	0	0	1	0	0	0	0	0
3297:	0	0	1	0	0	0	0	0	0
3305:	0	0	1	0	0	0	0	0	0
3313:	0	0	1	0	0	0	0	0	0
3321:	0	0	0	0	0	0	0	0	0
3329:	0	0	0	0	0	0	0	0	0
3337:	0	0	1	0	0	0	0	0	0
3345:	0	1	0	0	0	0	0	0	0
3353:	0	0	0	0	0	0	1	0	0
3361:	0	0	0	0	0	0	0	1	0
3369:	0	0	0	2	0	0	0	0	0
3377:	0	0	0	0	0	0	1	0	0
3385:	0	0	0	0	0	0	0	0	1

3393: 0 0 0 0 1 0 0 0

Sample Title: GAS-1202

Channel								
3401:	0	0	0	0	0	0	0	0
3409:	0	0	0	0	0	0	1	0
3417:	0	0	0	0	0	0	0	0
3425:	0	0	0	0	0	0	0	0
3433:	0	0	0	0	0	0	0	0
3441:	0	0	0	0	1	0	0	0
3449:	0	0	0	0	0	0	0	0
3457:	0	0	0	0	0	0	0	0
3465:	0	0	0	0	0	0	0	0
3473:	0	0	0	0	0	1	0	0
3481:	0	0	0	0	0	0	0	0
3489:	0	0	0	0	0	0	0	1
3497:	0	0	1	0	0	0	0	1
3505:	1	0	0	1	0	0	0	0
3513:	0	0	0	0	0	0	0	0
3521:	0	0	0	1	0	0	0	0
3529:	0	0	0	0	0	0	0	0
3537:	0	0	0	0	0	0	0	0
3545:	0	0	0	0	0	0	0	0
3553:	0	1	0	0	0	0	0	0
3561:	0	0	0	0	0	0	0	0
3569:	0	0	0	0	0	0	0	0
3577:	0	0	0	0	0	0	0	0
3585:	0	1	0	0	0	0	0	0
3593:	0	0	0	0	0	0	1	0
3601:	0	0	0	0	0	0	0	0
3609:	0	0	0	0	0	0	1	0
3617:	0	0	0	0	0	0	0	0
3625:	0	0	0	0	0	0	0	0
3633:	0	1	0	0	1	0	0	0
3641:	0	0	0	0	0	0	1	0
3649:	0	0	0	0	1	0	0	0
3657:	1	0	0	0	1	0	1	0
3665:	1	0	1	1	0	0	0	0
3673:	0	1	0	0	0	1	0	0
3681:	0	0	0	0	0	0	0	0
3689:	0	0	0	0	0	0	0	0
3697:	0	0	0	0	0	0	0	0
3705:	0	0	0	0	0	0	0	0
3713:	0	0	0	0	0	0	1	0
3721:	0	0	0	0	0	0	0	0
3729:	0	0	0	0	0	0	1	0
3737:	0	0	0	0	0	0	0	0
3745:	0	0	0	0	0	0	0	0
3753:	0	0	0	0	0	0	0	0
3761:	0	0	0	0	0	0	1	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	0	0	0	0	0
3785:	1	0	0	0	0	0	0	0
3793:	0	0	0	0	0	0	0	0
3801:	0	0	0	0	0	0	0	0
3809:	0	0	0	0	0	0	0	0
3817:	0	0	0	0	0	0	0	0

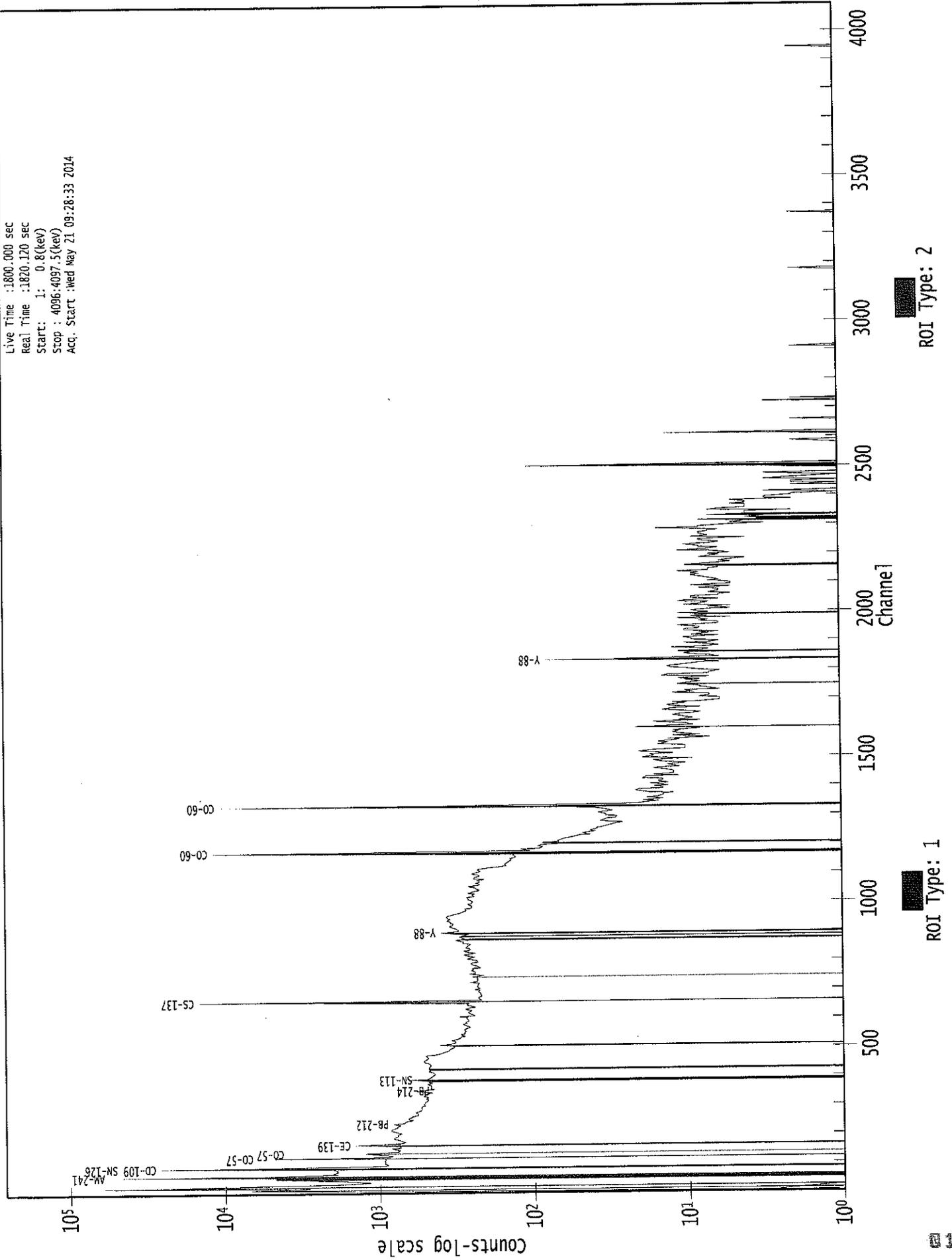
3825: 0 0 0 0 0 0 0 0 0

Sample Title: GAS-1202

Channel	1	2	3	4	5	6	7	8	9
3833:	0	0	0	0	0	0	0	0	0
3841:	0	0	0	0	0	0	0	0	0
3849:	0	0	1	0	0	0	0	0	0
3857:	0	1	0	0	0	0	0	0	0
3865:	0	0	1	0	0	0	0	0	0
3873:	0	0	0	0	0	0	0	0	0
3881:	0	0	0	0	0	0	0	0	0
3889:	0	0	0	0	0	0	0	0	0
3897:	0	0	0	0	0	0	0	0	0
3905:	0	0	0	0	0	0	0	1	0
3913:	0	0	0	0	0	0	0	0	0
3921:	0	0	0	0	0	0	0	0	0
3929:	1	0	0	0	0	0	0	0	2
3937:	0	0	1	0	0	0	0	0	0
3945:	0	0	0	0	0	0	0	0	0
3953:	0	0	0	0	0	0	0	0	0
3961:	0	0	0	0	0	0	0	0	0
3969:	0	0	0	0	0	0	0	0	0
3977:	0	0	0	0	0	1	0	0	0
3985:	0	0	0	0	0	0	0	0	0
3993:	0	0	0	0	0	0	0	0	0
4001:	0	0	0	0	0	0	0	0	0
4009:	1	0	0	0	0	0	0	0	0
4017:	0	0	0	0	0	0	0	0	0
4025:	0	0	0	0	0	0	1	0	0
4033:	0	0	1	0	0	0	0	0	0
4041:	0	0	1	0	0	0	0	1	0
4049:	0	0	0	0	0	0	1	0	0
4057:	0	0	0	0	0	0	0	0	0
4065:	0	0	0	1	1	0	0	0	0
4073:	0	0	0	0	0	0	0	0	0
4081:	0	0	0	0	0	1	0	0	0
4089:	0	1	1	0	0	0	0	0	0

0000007785.CNF

Live Time : 1800.000 sec
Real Time : 1820.120 sec
Start : 1: 0.8(keV)
Stop : 4096.4097.5(keV)
Acq. Start : wed May 21 09:28:33 2014



Analysis Report for 1405081-02
BLANK



GAMMA SPECTRUM ANALYSIS

Sample Identification : 1405081-02
Sample Description : BLANK
Sample Type : SOIL

Sample Size : 7.834E+02 grams
Facility : Countroom

Sample Taken On : 5/21/2014 8:19:35AM
Acquisition Started : 5/21/2014 8:23:14AM

Procedure : GAS-1302 pCi
Operator : Administrator
Detector Name : GE2
Geometry : GAS-1302
Live Time : 3600.0 seconds
Real Time : 3600.6 seconds

Dead Time : 0.02 %

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 1 - 4096
Peak Area Range (in channels) : 7 - 4096
Identification Energy Tolerance : 1.000 keV

Energy Calibration Used Done On : 5/14/2014
Efficiency Calibration Used Done On : 8/24/2013
Efficiency Calibration Description :

Sample Number : 7778

AG
5/21/14

Analysis Report for 1405081-02
BLANK

ENERGY CALIBRATION REPORT

Detector Name : GE2

ENERGY CALIBRATION COEFFICIENTS

Energy Calibrate Performed on : 5/14/2014 8:51:10AM
by : Administrator
Energy Calibrate Type : POLY

$$\text{Energy (keV)} = -0.186 + 1.000 \cdot \text{ch} + -1.09\text{E-}07 \cdot \text{ch}^2 + 0.00\text{E+}00 \cdot \text{ch}^3$$

SHAPE CALIBRATION COEFFICIENTS

Shape Calibrate Performed on : 5/14/2014 8:51:10AM
by : Administrator

$$\text{FWHM} = 0.636 + 4.34\text{E-}02 \cdot \text{E}^{1/2}$$

$$\text{LOW TAIL} = 2.60\text{E-}01 + 1.08\text{E-}03 \cdot \text{E}$$

ENERGY CALIBRATION RESULTS TABLE

<i>Centroid Channel</i>	<i>Centroid error</i>	<i>Energy (keV)</i>
59.84	0.16	59.54
88.36	0.12	88.03
122.24	0.51	122.06
166.04	0.34	165.85
279.47	0.25	279.20
391.50	0.07	391.69
661.27	0.03	661.65
897.53	0.06	898.02
1172.58	0.01	1173.22
1331.74	0.01	1332.49
1835.01	0.01	1836.01

SHAPE CALIBRATION RESULTS TABLE

Analysis Report for 1405081-02

BLANK

<i>Energy</i> (keV)	<i>FWHM</i> channels	<i>FWHM</i> error	<i>TAIL</i> channels	<i>TAIL</i> error
59.54	1.24	0.25	0.28	0.17
88.03	0.87	0.25	0.23	0.13
122.06	1.15	1.22	0.36	0.70
165.85	1.24	0.48	0.28	0.31
279.20	6.51	0.42	0.93	0.19
391.69	1.75	0.30	0.91	0.57
661.65	1.73	0.08	1.09	0.38
898.02	2.03	0.20	1.11	0.51
1173.22	2.09	0.03	1.48	0.19
1332.49	2.20	0.02	1.85	0.31
1836.01	2.52	0.02	2.10	0.27

EFFICIENCY CALIBRATION REPORT

Detector Name : GE2
 Geometry Description : GAS-1302
 Efficiency Calibration Performed on : 8/24/2013 11:23:24AM
 by : Administrator
 Efficiency Type Used : EMPIRICA
 Certificate File :

Efficiency Triplets

<i>Energy</i>	<i>% Efficiency</i>	<i>Error</i>	<i>Computed</i>	<i>Error</i>	<i>% Difference</i>
59.54	2.37E+00	8.65E-02			
88.03	2.58E+00	1.22E-01			
122.06	2.54E+00	1.08E-01			
165.85	2.22E+00	8.94E-02			
279.19	1.64E+00	6.41E-02			
391.69	1.26E+00	5.06E-02			
661.65	8.60E-01	3.64E-02			
898.02	6.58E-01	2.62E-02			
1173.22	5.56E-01	2.30E-02			
1332.49	5.05E-01	2.09E-02			
1836.01	3.99E-01	1.63E-02			

DUAL Efficiency Calibration Equation

Analysis Report for 1405081-02
BLANK

Single Equation Terms

Offset :	-2.08E+00
Slope :	-9.71E+00
Quadratic :	6.01E+00
Cubic :	-1.41E+00
4th Order :	1.45E-01
5th Order :	-5.51E-03
6th Order :	0.00E+00
7th Order :	0.00E+00
8th Order :	0.00E+00
9th Order :	0.00E+00

EMPIRICAL Efficiency Calibration Equation

Empirical Equation Terms

Scaling :	9.48E+02
Offset :	-5.06E+00
Slope :	7.72E-01
Quadratic :	9.57E-02
Cubic :	-7.30E-02
4th Order :	0.00E+00
5th Order :	0.00E+00

LINEAR Efficiency Calibration Equation

Linear Equation Terms

Offset :	-1.29E-04
Slope :	-2.28E+00
Quadratic :	2.36E+02
Cubic :	-3.01E+04
4th Order :	1.74E+06
5th Order :	-3.83E+07
6th Order :	0.00E+00
7th Order :	0.00E+00
8th Order :	0.00E+00
9th Order :	0.00E+00

PEAK-TO-TOTAL CALIBRATION REPORT

Peak-to-Total Efficiency Calibration Equation

Analysis Report for 1405081-02

BLANK

PEAK LOCATE REPORT

Peak Locate Performed on : 5/21/2014 9:23:24AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
1	77.48	77.60	0.0000	0.00
2	84.69	84.80	0.0000	0.00
3	210.63	210.65	0.0000	0.00
4	658.91	658.59	0.0000	0.00
5	672.30	671.96	0.0000	0.00
6	777.97	777.56	0.0000	0.00
7	790.59	790.18	0.0000	0.00
8	1085.56	1084.96	0.0000	0.00
9	1239.04	1238.35	0.0000	0.00
10	1263.11	1262.40	0.0000	0.00
11	1269.71	1269.00	0.0000	0.00
12	1419.73	1418.93	0.0000	0.00
13	1460.25	1459.43	0.0000	0.00
14	2186.34	2185.20	0.0000	0.00

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1405081-02

BLANK

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 5/21/2014 9:23:24AM

Peak Analysis From Channel : 1

Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
1	77.48	75 -	80	77.60	3.90E+01	32.03	1.74E+02	3.09
2	84.69	81 -	89	84.80	6.05E+01	44.03	2.61E+02	6.05
3	210.63	203 -	218	210.65	4.96E+01	59.43	3.23E+02	6.63
4	658.91	651 -	665	658.59	2.80E+01	19.92	3.00E+01	10.88
5	672.30	667 -	677	671.96	2.60E+01	16.40	2.20E+01	4.73
6	777.97	774 -	782	777.56	1.59E+01	12.36	1.43E+01	6.75
7	790.59	783 -	799	790.18	2.80E+01	25.49	5.21E+01	9.90
8	1085.56	1081 -	1087	1084.96	9.00E+00	8.51	6.00E+00	2.46
9	1239.04	1235 -	1241	1238.35	7.22E+00	6.95	3.56E+00	1.20
10	1263.11	1259 -	1264	1262.40	5.71E+00	6.08	2.57E+00	1.67
11	1269.71	1266 -	1271	1269.00	7.00E+00	7.62	6.00E+00	1.73
12	1419.73	1417 -	1421	1418.93	4.50E+00	5.50	3.00E+00	2.70
13	1460.25	1455 -	1462	1459.43	1.19E+01	8.49	4.29E+00	3.05
14	2186.34	2181 -	2187	2185.20	5.00E+00	4.47	0.00E+00	2.31

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 2.000sigma

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 5/21/2014 9:23:24AM

Peak Analysis From Channel : 1

Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Net Peak Area	Net Area Uncertainty	Continuum Counts	Critical Level
1	77.48	75 -	80	3.90E+01	32.03	1.74E+02	2.42E+01

Analysis Report for 1405081-02

BLANK

Peak No.	Energy (keV)	ROI start	ROI end	Net Peak Area	Net Area Uncertainty	Continuum Counts	Critical Level
2	84.69	81 -	89	6.05E+01	44.03	2.61E+02	3.39E+01
3	210.63	203 -	218	4.96E+01	59.43	3.23E+02	1.62E+01
4	658.91	651 -	665	2.80E+01	19.92	3.00E+01	1.39E+01
5	672.30	667 -	677	2.60E+01	16.40	2.20E+01	1.06E+01
6	777.97	774 -	782	1.59E+01	12.36	1.43E+01	7.77E+00
7	790.59	783 -	799	2.80E+01	25.49	5.21E+01	1.91E+01
8	1085.56	1081 -	1087	9.00E+00	8.51	6.00E+00	4.97E+00
9	1239.04	1235 -	1241	7.22E+00	6.95	3.56E+00	3.62E+00
10	1263.11	1259 -	1264	5.71E+00	6.08	2.57E+00	3.09E+00
11	1269.71	1266 -	1271	7.00E+00	7.62	6.00E+00	4.50E+00
12	1419.73	1417 -	1421	4.50E+00	5.50	3.00E+00	2.88E+00
13	1460.25	1455 -	1462	1.19E+01	8.49	4.29E+00	4.07E+00
14	2186.34	2181 -	2187	5.00E+00	4.47	0.00E+00	0.00E+00

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

PEAK WITH NID REPORT

Peak Analysis Performed on : 5/21/2014 9:23:24AM

Peak Analysis From Channel : 1

Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Peak Match Tolerance : 1.000 keV

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	Tentative Nuclide
1	77.48	75 -	80	77.60	3.90E+01	32.03	1.74E+02	TI-44
2	84.69	81 -	89	84.80	6.05E+01	44.03	2.61E+02	TH-231
3	210.63	203 -	218	210.65	4.96E+01	59.43	3.23E+02	CM-243
4	658.91	651 -	665	658.59	2.80E+01	19.92	3.00E+01	.....
5	672.30	667 -	677	671.96	2.60E+01	16.40	2.20E+01	.....
6	777.97	774 -	782	777.56	1.59E+01	12.36	1.43E+01	MO-99 EU-152
7	790.59	783 -	799	790.18	2.80E+01	25.49	5.21E+01	.....
8	1085.56	1081 -	1087	1084.96	9.00E+00	8.51	6.00E+00	EU-152
9	1239.04	1235 -	1241	1238.35	7.22E+00	6.95	3.56E+00	CO-56
10	1263.11	1259 -	1264	1262.40	5.71E+00	6.08	2.57E+00	.....
11	1269.71	1266 -	1271	1269.00	7.00E+00	7.62	6.00E+00	.....

Analysis Report for 1405081-02

BLANK

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	Tentative Nuclide
12	1419.73	1417 -	1421	1418.93	4.50E+00	5.50	3.00E+00	.....
13	1460.25	1455 -	1462	1459.43	1.19E+01	8.49	4.29E+00	K-40
14	2186.34	2181 -	2187	2185.20	5.00E+00	4.47	0.00E+00	.....

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 5/21/2014 9:23:24AM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty
1	77.48	3.90E+01	32.03	2.55E-02	2.20E-03
2	84.69	6.05E+01	44.03	2.57E-02	2.37E-03
3	210.63	4.96E+01	59.43	1.97E-02	1.60E-03
4	658.91	2.80E+01	19.92	8.51E-03	7.67E-04
5	672.30	2.60E+01	16.40	8.38E-03	7.52E-04
6	777.97	1.59E+01	12.36	7.44E-03	6.52E-04
7	790.59	2.80E+01	25.49	7.35E-03	6.40E-04
8	1085.56	9.00E+00	8.51	5.75E-03	5.30E-04
9	1239.04	7.22E+00	6.95	5.23E-03	4.95E-04
10	1263.11	5.71E+00	6.08	5.16E-03	4.84E-04
11	1269.71	7.00E+00	7.62	5.14E-03	4.81E-04
12	1419.73	4.50E+00	5.50	4.76E-03	4.37E-04
13	1460.25	1.19E+01	8.49	4.67E-03	4.31E-04
14	2186.34	5.00E+00	4.47	3.73E-03	3.71E-04

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

Analysis Report for 1405081-02

BLANK

BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 5/21/2014 9:23:24AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000007618.CNF

Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
1	77.48	3.90E+01	32.03			3.90E+01	3.20E+01
2	84.69	6.05E+01	44.03	1.37E+01	1.86E+00	4.68E+01	4.41E+01
3	210.63	4.96E+01	59.43			4.96E+01	5.94E+01
4	658.91	2.80E+01	19.92			2.80E+01	1.99E+01
5	672.30	2.60E+01	16.40			2.60E+01	1.64E+01
6	777.97	1.59E+01	12.36			1.59E+01	1.24E+01
7	790.59	2.80E+01	25.49			2.80E+01	2.55E+01
8	1085.56	9.00E+00	8.51			9.00E+00	8.51E+00
9	1239.04	7.22E+00	6.95			7.22E+00	6.95E+00
10	1263.11	5.71E+00	6.08			5.71E+00	6.08E+00
11	1269.71	7.00E+00	7.62			7.00E+00	7.62E+00
12	1419.73	4.50E+00	5.50			4.50E+00	5.50E+00
13	1460.25	1.19E+01	8.49			1.19E+01	8.49E+00
14	2186.34	5.00E+00	4.47			5.00E+00	4.47E+00

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 2.000sigma

AREA CORRECTION REPORT REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 5/21/2014 9:23:24AM

Ref. Peak Energy : 0.00

Reference Date :

Peak Ratio : 0.00

Uncertainty : 0.00

Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000007618.CNF

Corrected Area is: Original * Peak Ratio - Background

Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Corrected Area	Corrected Uncert.
1	77.48	3.90E+01	32.03			3.90E+01	3.20E+01
2	84.69	6.05E+01	44.03	1.37E+01	1.86E+00	4.68E+01	4.41E+01
3	210.63	4.96E+01	59.43			4.96E+01	5.94E+01
4	658.91	2.80E+01	19.92			2.80E+01	1.99E+01

Analysis Report for 1405081-02

BLANK

Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Corrected Area	Corrected Uncert.
5	672.30	2.60E+01	16.40			2.60E+01	1.64E+01
6	777.97	1.59E+01	12.36			1.59E+01	1.24E+01
7	790.59	2.80E+01	25.49			2.80E+01	2.55E+01
8	1085.56	9.00E+00	8.51			9.00E+00	8.51E+00
9	1239.04	7.22E+00	6.95			7.22E+00	6.95E+00
10	1263.11	5.71E+00	6.08			5.71E+00	6.08E+00
11	1269.71	7.00E+00	7.62			7.00E+00	7.62E+00
12	1419.73	4.50E+00	5.50			4.50E+00	5.50E+00
13	1460.25	1.19E+01	8.49			1.19E+01	8.49E+00
14	2186.34	5.00E+00	4.47			5.00E+00	4.47E+00

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield(%)	Activity (pCi/grams)	Activity Uncertainty
K-40	0.950	1460.81 *	10.67	2.28E-01	1.64E-01

* = Energy line found in the spectrum.
- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

UNIDENTIFIED PEAKS

Peak Locate Performed on : 5/21/2014 9:23:24AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

Analysis Report for 1405081-02
BLANK

Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
1	77.48	1.08333E-02	41.07	Tol.	TI-44
2	84.69	1.29936E-02	47.10	Tol.	TH-231
3	210.63	1.37770E-02	59.91	Tol.	CM-243
4	658.91	7.77778E-03	35.58		
5	672.30	7.22222E-03	31.54		
6	777.97	4.40821E-03	38.94	Tol.	MO-99 EU-152
7	790.59	7.76749E-03	45.57		
8	1085.56	2.50000E-03	47.30	Tol.	EU-152
9	1239.04	2.00617E-03	48.09	Tol.	CO-56
10	1263.11	1.58730E-03	53.22		
11	1269.71	1.94444E-03	54.40		
12	1419.73	1.25000E-03	61.11		
14	2186.34	1.38889E-03	44.72		

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield(%)	Activity (pCi/grams)	Activity Uncertainty
K-40	0.95	1460.81 *	10.67	2.28E-01	1.64E-01

* = Energy line found in the spectrum.
- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 1405081-02
BLANK

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/grams)	Wt mean Activity Uncertainty	Comments
K-40	0.950	2.28E-01	1.64E-01	

- ? = 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 2.000sigma

Analysis Report for 1405081-02
BLANK

UNIDENTIFIED PEAKS

Peak Locate Performed on : 5/21/2014 9:23:24AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
1	77.48	1.08333E-02	41.07	Tol.	TI-44
2	84.69	1.29936E-02	47.10	Tol.	TH-231
3	210.63	1.37770E-02	59.91	Tol.	CM-243
4	658.91	7.77778E-03	35.58		
5	672.30	7.22222E-03	31.54		
6	777.97	4.40821E-03	38.94	Tol.	MO-99 EU-152
7	790.59	7.76749E-03	45.57		
8	1085.56	2.50000E-03	47.30	Tol.	EU-152
9	1239.04	2.00617E-03	48.09	Tol.	CO-56
10	1263.11	1.58730E-03	53.22		
11	1269.71	1.94444E-03	54.40		
12	1419.73	1.25000E-03	61.11		
14	2186.34	1.38889E-03	44.72		

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	BE-7	477.59	10.42	5.13E-02	1.87E-01	1.87E-01
+	NA-22	1274.54	99.94	-3.74E-03	2.81E-02	2.81E-02
+	NA-24	1368.53	99.99	-1.06E-02	2.42E-02	2.42E-02

Analysis Report for 1405081-02

BLANK

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
	NA-24	2754.09	99.86	5.78E-03	2.42E-02	2.68E-02
+	AL-26	1808.65	99.76	-1.17E-03	2.81E-02	2.81E-02
+	K-40	1460.81	* 10.67	2.28E-01	2.09E-01	2.09E-01
+	AR-41	1293.64	99.16	1.56E-03	3.31E-02	3.31E-02
+	TI-44	67.88	94.40	-5.31E-03	1.41E-02	1.41E-02
		78.34	96.00	1.66E-02		2.02E-02
+	SC-46	889.25	99.98	-4.29E-04	2.49E-02	2.49E-02
		1120.51	99.99	1.05E-02		3.43E-02
+	V-48	983.52	99.98	4.96E-03	2.70E-02	2.70E-02
		1312.10	97.50	9.70E-03		3.41E-02
+	CR-51	320.08	9.83	-8.38E-02	2.09E-01	2.09E-01
+	MN-54	834.83	99.97	1.60E-03	3.41E-02	3.41E-02
+	CO-56	846.75	99.96	-3.93E-03	2.40E-02	2.40E-02
		1037.75	14.03	2.17E-02		2.31E-01
		1238.25	67.00	5.32E-03		4.56E-02
		1771.40	15.51	-7.43E-02		1.79E-01
		2598.48	16.90	0.00E+00		1.76E-01
+	CO-57	122.06	85.51	-9.19E-03	1.98E-02	1.98E-02
		136.48	10.60	-4.86E-02		1.66E-01
+	CO-58	810.76	99.40	-2.09E-02	2.61E-02	2.61E-02
+	FE-59	1099.22	56.50	-4.47E-03	4.20E-02	4.20E-02
		1291.56	43.20	8.47E-03		6.94E-02
+	CO-60	1173.22	100.00	-8.82E-03	2.94E-02	2.94E-02
		1332.49	100.00	5.91E-03		3.06E-02
+	ZN-65	1115.52	50.75	-3.23E-02	5.32E-02	5.32E-02
+	GA-67	93.31	35.70	8.31E-02	6.37E-02	6.37E-02
		208.95	2.24	-7.80E-01		8.92E-01
		300.22	16.00	3.45E-02		1.22E-01
+	SE-75	121.11	16.70	-6.38E-02	3.18E-02	9.97E-02
		136.00	59.20	1.61E-02		3.18E-02
		264.65	59.80	7.99E-03		3.24E-02
		279.53	25.20	4.39E-02		8.35E-02
		400.65	11.40	3.27E-02		1.66E-01
+	RB-82	776.52	13.00	-5.82E-02	2.17E-01	2.17E-01
+	RB-83	520.41	46.00	-3.85E-03	4.31E-02	4.31E-02
		529.64	30.30	1.20E-02		7.15E-02
		552.65	16.40	-8.82E-02		1.37E-01
+	KR-85	513.99	0.43	-5.46E-01	6.81E+00	6.81E+00
+	SR-85	513.99	99.27	-2.39E-03	2.98E-02	2.98E-02
+	Y-88	898.02	93.40	4.58E-03	3.10E-02	3.20E-02
		1836.01	99.38	-9.47E-03		3.10E-02
+	NB-93M	16.57	9.43	4.11E-01	1.49E+00	1.49E+00
+	NB-94	702.63	100.00	-8.92E-03	2.73E-02	2.73E-02
		871.10	100.00	-8.80E-03		3.00E-02
+	NB-95	765.79	99.81	-5.14E-03	2.64E-02	2.64E-02
+	NB-95M	235.69	25.00	-1.39E-01	7.37E-02	7.37E-02
+	ZR-95	724.18	43.70	-3.27E-02	4.44E-02	6.24E-02

Analysis Report for 1405081-02

BLANK

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
	ZR-95	756.72	55.30	-1.82E-02	4.44E-02	4.44E-02
+	MO-99	181.06	6.20	1.15E-02	2.28E-01	3.05E-01
		739.58	12.80	5.83E-02		2.28E-01
		778.00	4.50	5.00E-01		7.20E-01
+	RU-103	497.08	89.00	-8.46E-03	2.37E-02	2.37E-02
+	RU-106	621.84	9.80	8.77E-02	3.23E-01	3.23E-01
+	AG-108M	433.93	89.90	-7.05E-03	2.32E-02	2.32E-02
		614.37	90.40	-4.51E-02		2.77E-02
		722.95	90.50	1.34E-03		3.29E-02
+	CD-109	88.03	3.72	-4.81E-02	4.87E-01	4.87E-01
+	AG-110M	657.75	93.14	-1.30E-02	2.77E-02	2.77E-02
		677.61	10.53	-4.37E-02		2.20E-01
		706.67	16.46	1.13E-02		1.62E-01
		763.93	21.98	-8.66E-03		1.23E-01
		884.67	71.63	2.52E-02		4.00E-02
		1384.27	23.94	-1.93E-02		8.90E-02
+	CD-113M	263.70	0.02	1.87E+01	8.32E+01	8.32E+01
+	SN-113	255.12	1.93	-3.92E-01	2.81E-02	8.78E-01
		391.69	64.90	-2.78E-02		2.81E-02
+	TE123M	159.00	84.10	1.09E-02	2.14E-02	2.14E-02
+	SB-124	602.71	97.87	-1.48E-03	3.40E-02	3.40E-02
		645.85	7.26	2.07E-01		3.74E-01
		722.78	11.10	4.40E-02		2.74E-01
		1691.02	49.00	8.02E-03		4.25E-02
+	I-125	35.49	6.49	-7.83E-02	6.68E-01	6.68E-01
+	SB-125	176.33	6.89	-3.86E-02	6.78E-02	2.66E-01
		427.89	29.33	-2.35E-02		6.78E-02
		463.38	10.35	-2.83E-02		2.01E-01
		600.56	17.80	2.12E-02		1.82E-01
		635.90	11.32	6.57E-02		2.51E-01
+	SB-126	414.70	83.30	3.15E-03	2.15E-02	2.59E-02
		666.33	99.60	-3.47E-02		2.15E-02
		695.00	99.60	-4.04E-03		3.01E-02
		720.50	53.80	-1.58E-02		5.41E-02
+	SN-126	87.57	37.00	-4.83E-03	4.89E-02	4.89E-02
+	SB-127	473.00	25.00	-4.49E-02	6.51E-02	6.51E-02
		685.20	35.70	1.82E-02		8.33E-02
		783.80	14.70	-5.33E-02		2.03E-01
+	I-129	29.78	57.00	4.78E-03	9.64E-02	9.64E-02
		33.60	13.20	-8.17E-02		3.38E-01
		39.58	7.52	0.00E+00		5.24E-01
+	I-131	284.30	6.05	-1.76E-02	2.72E-02	3.16E-01
		364.48	81.20	1.32E-02		2.72E-02
		636.97	7.26	1.79E-01		3.93E-01
		722.89	1.80	6.75E-02		1.66E+00
+	TE-132	49.72	13.10	-4.36E-02	2.07E-02	1.06E-01
		228.16	88.00	3.33E-03		2.07E-02
+	BA-133	81.00	33.00	-5.63E-02	3.57E-02	5.51E-02
		302.84	17.80	-2.95E-02		9.27E-02

Analysis Report for 1405081-02

BLANK

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
	BA-133	356.01	60.00	-6.68E-03	3.57E-02	3.57E-02
+	I-133	529.87	86.30	-1.86E-03	2.31E-02	2.31E-02
+	CS-134	563.23	8.38	-8.06E-03	3.53E-02	2.90E-01
		569.32	15.43	5.76E-02		1.85E-01
		604.70	97.60	-7.61E-03		3.53E-02
		795.84	85.40	9.63E-03		3.77E-02
		801.93	8.73	-4.09E-02		3.47E-01
+	CS-135	268.24	16.00	-5.98E-03	1.21E-01	1.21E-01
+	I-135	1131.51	22.50	-1.33E-02	1.09E-01	1.22E-01
		1260.41	28.60	6.88E-03		1.09E-01
		1678.03	9.54	-1.24E-01		3.26E-01
+	CS-136	153.22	7.46	-8.70E-03	2.87E-02	2.25E-01
		163.89	4.61	-1.64E-01		3.93E-01
		176.55	13.56	2.69E-04		1.39E-01
		273.65	12.66	-5.39E-02		1.35E-01
		340.57	48.50	6.78E-03		4.77E-02
		818.50	99.70	3.11E-03		2.87E-02
		1048.07	79.60	7.15E-04		3.56E-02
		1235.34	19.70	1.86E-02		1.48E-01
+	CS-137	661.65	85.12	1.41E-02	3.32E-02	3.32E-02
+	LA-138	788.74	34.00	3.77E-02	4.03E-02	1.01E-01
		1435.80	66.00	-1.08E-02		4.03E-02
+	CE-139	165.85	80.35	6.55E-05	2.41E-02	2.41E-02
+	BA-140	162.64	6.70	3.63E-02	8.14E-02	2.75E-01
		304.84	4.50	-2.42E-01		3.69E-01
		423.70	3.20	-2.64E-01		5.93E-01
		437.55	2.00	7.92E-01		1.24E+00
		537.32	25.00	8.71E-03		8.14E-02
+	LA-140	328.77	20.50	9.13E-03	2.98E-02	9.09E-02
		487.03	45.50	-6.06E-03		4.56E-02
		815.85	23.50	3.48E-02		1.28E-01
		1596.49	95.49	1.14E-03		2.98E-02
+	CE-141	145.44	48.40	3.81E-03	3.73E-02	3.73E-02
+	CE-143	57.36	11.80	-4.92E-02	5.42E-02	1.12E-01
		293.26	42.00	9.03E-03		5.42E-02
		664.55	5.20	1.49E-01		5.07E-01
+	CE-144	133.54	10.80	1.25E-03	1.73E-01	1.73E-01
+	PM-144	476.78	42.00	1.27E-02	3.07E-02	4.63E-02
		618.01	98.60	5.64E-03		3.15E-02
		696.49	99.49	3.67E-03		3.07E-02
+	PM-145	36.85	21.70	3.48E-02	1.06E-01	1.96E-01
		37.36	39.70	-4.19E-03		1.06E-01
		42.30	15.10	1.31E-01		2.33E-01
		72.40	2.31	2.43E-01		8.10E-01
+	PM-146	453.90	39.94	-5.17E-03	5.42E-02	5.42E-02
		735.90	14.01	4.00E-02		1.97E-01
		747.13	13.10	-6.77E-02		2.08E-01
+	ND-147	91.11	28.90	5.25E-02	7.36E-02	7.36E-02
		531.02	13.10	-3.72E-02		1.41E-01

Analysis Report for 1405081-02

BLANK

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	PM-149	285.90	3.10	6.79E-02	5.64E-01	5.64E-01
+	EU-152	121.78	20.50	-3.83E-02	8.23E-02	8.23E-02
		244.69	5.40	-2.62E-01		3.67E-01
		344.27	19.13	1.21E-02		1.16E-01
		778.89	9.20	2.43E-01		3.50E-01
		964.01	10.40	-8.79E-03		3.04E-01
		1085.78	7.22	2.41E-01		4.64E-01
		1112.02	9.60	3.28E-02		2.65E-01
		1407.95	14.94	6.25E-02		1.89E-01
+	GD-153	97.43	31.30	-6.50E-03	5.08E-02	5.08E-02
		103.18	22.20	-1.19E-02		7.10E-02
+	EU-154	123.07	40.50	5.92E-04	4.28E-02	4.28E-02
		723.30	19.70	6.16E-03		1.51E-01
		873.19	11.50	1.35E-01		2.75E-01
		996.32	10.30	6.88E-02		3.05E-01
		1004.76	17.90	-5.49E-03		1.39E-01
		1274.45	35.50	-1.05E-02		7.91E-02
+	EU-155	86.50	30.90	-1.18E-02	5.97E-02	5.97E-02
		105.30	20.70	1.16E-02		8.12E-02
+	EU-156	811.77	10.40	-6.15E-02	2.66E-01	2.66E-01
		1153.47	7.20	-3.63E-02		3.64E-01
		1230.71	8.90	-5.13E-02		2.69E-01
+	HO-166M	184.41	72.60	3.13E-02	3.47E-02	3.47E-02
		280.45	29.60	2.16E-02		7.06E-02
		410.94	11.10	-2.02E-02		1.74E-01
		711.69	54.10	-1.10E-02		5.09E-02
+	TM-171	66.72	0.14	1.32E+00	1.01E+01	1.01E+01
+	HF-172	81.75	4.52	1.66E-02	1.68E-01	4.21E-01
		125.81	11.30	8.29E-02		1.68E-01
+	LU-172	181.53	20.60	-1.44E-01	4.48E-02	9.17E-02
		810.06	16.63	-1.25E-01		1.56E-01
		912.12	15.25	2.93E-02		2.21E-01
		1093.66	62.50	5.23E-03		4.48E-02
+	LU-173	100.72	5.24	3.06E-02	9.21E-02	3.08E-01
		272.11	21.20	1.50E-02		9.21E-02
+	HF-175	343.40	84.00	4.22E-03	2.69E-02	2.69E-02
+	LU-176	88.34	13.30	-1.34E-02	1.99E-02	1.36E-01
		201.83	86.00	-3.22E-03		2.22E-02
		306.78	94.00	2.65E-03		1.99E-02
+	TA-182	67.75	41.20	-1.22E-02	3.24E-02	3.24E-02
		1121.30	34.90	2.78E-02		9.84E-02
		1189.05	16.23	3.66E-03		1.55E-01
		1221.41	26.98	-2.36E-02		1.22E-01
		1231.02	11.44	-3.99E-02		2.09E-01
+	IR-192	308.46	29.68	-8.82E-03	4.61E-02	6.57E-02
		468.07	48.10	1.22E-02		4.61E-02
+	HG-203	279.19	77.30	1.43E-02	2.72E-02	2.72E-02
+	BI-207	569.67	97.72	9.09E-03	2.93E-02	2.93E-02
		1063.62	74.90	-3.42E-04		4.67E-02

Analysis Report for 1405081-02

BLANK

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	TL-208	583.14	30.22	3.11E-02	1.02E-01	1.02E-01
		860.37	4.48	2.80E-01		6.64E-01
		2614.66	35.85	1.35E-01		1.77E-01
+	BI-210M	262.00	45.00	-8.38E-03	4.27E-02	4.27E-02
		300.00	23.00	2.38E-02		8.42E-02
+	PB-210	46.50	4.25	9.62E-01	6.22E-01	6.22E-01
+	PB-211	404.84	2.90	-1.20E-01	5.75E-01	5.75E-01
		831.96	2.90	-2.11E-01		1.10E+00
+	BI-212	727.17	11.80	7.17E-02	2.59E-01	2.59E-01
		1620.62	2.75	6.37E-01		1.26E+00
+	PB-212	238.63	44.60	7.49E-03	5.20E-02	5.20E-02
		300.09	3.41	1.61E-01		5.68E-01
+	BI-214	609.31	46.30	3.70E-02	7.66E-02	7.66E-02
		1120.29	15.10	6.94E-02		2.27E-01
		1764.49	15.80	2.18E-02		2.05E-01
		2204.22	4.98	5.18E-02		5.57E-01
+	PB-214	295.21	19.19	-3.62E-03	6.85E-02	1.14E-01
		351.92	37.19	5.70E-02		6.85E-02
+	RN-219	401.80	6.50	8.28E-02	2.91E-01	2.91E-01
+	RA-223	323.87	3.88	4.56E-02	5.08E-01	5.08E-01
+	RA-224	240.98	3.95	2.99E-02	6.28E-01	6.28E-01
+	RA-225	40.00	31.00	0.00E+00	1.26E-01	1.26E-01
+	RA-226	186.21	3.28	1.02E+00	7.80E-01	7.80E-01
+	TH-227	50.10	8.40	-6.73E-02	1.60E-01	1.64E-01
		236.00	11.50	-3.00E-01		1.60E-01
		256.20	6.30	-1.93E-01		2.70E-01
+	AC-228	338.32	11.40	-5.00E-03	1.21E-01	1.92E-01
		911.07	27.70	1.80E-02		1.21E-01
		969.11	16.60	2.48E-02		1.80E-01
+	TH-230	48.44	16.90	-7.06E-02	8.99E-02	8.99E-02
		62.85	4.60	1.33E-01		3.56E-01
		67.67	0.37	-1.35E+00		3.61E+00
+	PA-231	283.67	1.60	-6.61E-02	7.17E-01	1.19E+00
		302.67	2.30	-2.28E-01		7.17E-01
+	TH-231	25.64	14.70	-3.96E-02	3.12E-01	4.46E-01
		84.21	6.40	9.10E-02		3.12E-01
+	PA-233	311.98	38.60	3.67E-02	5.28E-02	5.28E-02
+	PA-234	131.20	20.40	-4.09E-02	8.89E-02	8.89E-02
		733.99	8.80	2.42E-02		3.21E-01
		946.00	12.00	8.13E-03		2.18E-01
+	PA-234M	1001.03	0.92	-6.92E-01	2.70E+00	2.70E+00
+	TH-234	63.29	3.80	1.60E-01	4.31E-01	4.31E-01
+	U-235	143.76	10.50	1.96E-02	1.79E-01	1.79E-01
		163.35	4.70	5.18E-02		3.92E-01
		205.31	4.70	-7.39E-02		4.36E-01
+	NP-237	86.50	12.60	-2.90E-02	1.46E-01	1.46E-01
+	NP-239	106.10	22.70	1.41E-02	7.51E-02	7.51E-02

Analysis Report for 1405081-02

BLANK

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
	NP-239	228.18	10.70	2.74E-02	7.51E-02	1.71E-01
		277.60	14.10	-5.86E-02		1.37E-01
+	AM-241	59.54	35.90	1.16E-02	4.26E-02	4.26E-02
+	AM-243	74.67	66.00	3.44E-03	2.82E-02	2.82E-02
+	CM-243	209.75	3.29	2.57E-01	1.37E-01	6.26E-01
		228.14	10.60	2.75E-02		1.71E-01
		277.60	14.00	-5.86E-02		1.37E-01

+ = 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

? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

	Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
	BE-7	477.59	10.42	1.87E-01	1.87E-01	5.13E-02	8.22E-02
	NA-22	1274.54	99.94	2.81E-02	2.81E-02	-3.74E-03	1.15E-02
	NA-24	1368.53	99.99	2.42E-02	2.42E-02	-1.06E-02	9.38E-03
		2754.09	99.86	2.68E-02		5.78E-03	9.50E-03
	AL-26	1808.65	99.76	2.81E-02	2.81E-02	-1.17E-03	1.09E-02
+	K-40	1460.81	* 10.67	2.09E-01	2.09E-01	2.28E-01	7.83E-02
	AR-41	1293.64	99.16	3.31E-02	3.31E-02	1.56E-03	1.34E-02
	TI-44	67.88	94.40	1.41E-02	1.41E-02	-5.31E-03	6.51E-03
		78.34	96.00	2.02E-02		1.66E-02	9.55E-03
	SC-46	889.25	99.98	2.49E-02	2.49E-02	-4.29E-04	1.05E-02
		1120.51	99.99	3.43E-02		1.05E-02	1.49E-02
	V-48	983.52	99.98	2.70E-02	2.70E-02	4.96E-03	1.14E-02
		1312.10	97.50	3.41E-02		9.70E-03	1.44E-02
	CR-51	320.08	9.83	2.09E-01	2.09E-01	-8.38E-02	9.56E-02
	MN-54	834.83	99.97	3.41E-02	3.41E-02	1.60E-03	1.52E-02
	CO-56	846.75	99.96	2.40E-02	2.40E-02	-3.93E-03	1.01E-02

Analysis Report for 1405081-02

BLANK

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
CO-56	1037.75	14.03	2.31E-01	2.40E-02	2.17E-02	1.00E-01
	1238.25	67.00	4.56E-02		5.32E-03	1.91E-02
	1771.40	15.51	1.79E-01		-7.43E-02	6.92E-02
	2598.48	16.90	1.76E-01		0.00E+00	6.57E-02
CO-57	122.06	85.51	1.98E-02	1.98E-02	-9.19E-03	9.26E-03
	136.48	10.60	1.66E-01		-4.86E-02	7.81E-02
CO-58	810.76	99.40	2.61E-02	2.61E-02	-2.09E-02	1.12E-02
FE-59	1099.22	56.50	4.20E-02	4.20E-02	-4.47E-03	1.70E-02
	1291.56	43.20	6.94E-02		8.47E-03	2.88E-02
CO-60	1173.22	100.00	2.94E-02	2.94E-02	-8.82E-03	1.23E-02
	1332.49	100.00	3.06E-02		5.91E-03	1.27E-02
ZN-65	1115.52	50.75	5.32E-02	5.32E-02	-3.23E-02	2.20E-02
GA-67	93.31	35.70	6.37E-02	6.37E-02	8.31E-02	3.04E-02
	208.95	2.24	8.92E-01		-7.80E-01	4.17E-01
	300.22	16.00	1.22E-01		3.45E-02	5.56E-02
	121.11	16.70	9.97E-02	3.18E-02	-6.38E-02	4.67E-02
SE-75	136.00	59.20	3.18E-02		1.61E-02	1.50E-02
	264.65	59.80	3.24E-02		7.99E-03	1.49E-02
	279.53	25.20	8.35E-02		4.39E-02	3.86E-02
	400.65	11.40	1.66E-01		3.27E-02	7.39E-02
	776.52	13.00	2.17E-01	2.17E-01	-5.82E-02	9.49E-02
RB-83	520.41	46.00	4.31E-02	4.31E-02	-3.85E-03	1.88E-02
	529.64	30.30	7.15E-02		1.20E-02	3.16E-02
	552.65	16.40	1.37E-01		-8.82E-02	6.03E-02
KR-85	513.99	0.43	6.81E+00	6.81E+00	-5.46E-01	3.12E+00
SR-85	513.99	99.27	2.98E-02	2.98E-02	-2.39E-03	1.36E-02
Y-88	898.02	93.40	3.20E-02	3.10E-02	4.58E-03	1.39E-02
	1836.01	99.38	3.10E-02		-9.47E-03	1.23E-02
NB-93M	16.57	9.43	1.49E+00	1.49E+00	4.11E-01	7.21E-01
NB-94	702.63	100.00	2.73E-02	2.73E-02	-8.92E-03	1.20E-02
	871.10	100.00	3.00E-02		-8.80E-03	1.31E-02
NB-95	765.79	99.81	2.64E-02	2.64E-02	-5.14E-03	1.15E-02
NB-95M	235.69	25.00	7.37E-02	7.37E-02	-1.39E-01	3.40E-02
ZR-95	724.18	43.70	6.24E-02	4.44E-02	-3.27E-02	2.75E-02
	756.72	55.30	4.44E-02		-1.82E-02	1.91E-02
MO-99	181.06	6.20	3.05E-01	2.28E-01	1.15E-02	1.43E-01
	739.58	12.80	2.28E-01		5.83E-02	1.01E-01
	778.00	4.50	7.20E-01		5.00E-01	3.21E-01
RU-103	497.08	89.00	2.37E-02	2.37E-02	-8.46E-03	1.05E-02
RU-106	621.84	9.80	3.23E-01	3.23E-01	8.77E-02	1.46E-01
AG-108M	433.93	89.90	2.32E-02	2.32E-02	-7.05E-03	1.04E-02
	614.37	90.40	2.77E-02		-4.51E-02	1.22E-02
	722.95	90.50	3.29E-02		1.34E-03	1.46E-02
CD-109	88.03	3.72	4.87E-01	4.87E-01	-4.81E-02	2.30E-01
AG-110M	657.75	93.14	2.77E-02	2.77E-02	-1.30E-02	1.22E-02
	677.61	10.53	2.20E-01		-4.37E-02	9.52E-02
	706.67	16.46	1.62E-01		1.13E-02	7.14E-02
	763.93	21.98	1.23E-01		-8.66E-03	5.37E-02
	884.67	71.63	4.00E-02		2.52E-02	1.73E-02
	1384.27	23.94	8.90E-02		-1.93E-02	3.33E-02
	263.70	0.02	8.32E+01	8.32E+01	1.87E+01	3.83E+01
SN-113	255.12	1.93	8.78E-01	2.81E-02	-3.92E-01	4.01E-01
	391.69	64.90	2.81E-02		-2.78E-02	1.25E-02

Analysis Report for 1405081-02

BLANK

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
TE123M	159.00	84.10	2.14E-02	2.14E-02	1.09E-02	1.00E-02
SB-124	602.71	97.87	3.40E-02	3.40E-02	-1.48E-03	1.55E-02
	645.85	7.26	3.74E-01		2.07E-01	1.66E-01
	722.78	11.10	2.74E-01		4.40E-02	1.22E-01
	1691.02	49.00	4.25E-02		8.02E-03	1.51E-02
I-125	35.49	6.49	6.68E-01	6.68E-01	-7.83E-02	3.22E-01
SB-125	176.33	6.89	2.66E-01	6.78E-02	-3.86E-02	1.24E-01
	427.89	29.33	6.78E-02		-2.35E-02	3.02E-02
	463.38	10.35	2.01E-01		-2.83E-02	8.93E-02
	600.56	17.80	1.82E-01		2.12E-02	8.30E-02
	635.90	11.32	2.51E-01		6.57E-02	1.12E-01
SB-126	414.70	83.30	2.59E-02	2.15E-02	3.15E-03	1.17E-02
	666.33	99.60	2.15E-02		-3.47E-02	9.20E-03
	695.00	99.60	3.01E-02		-4.04E-03	1.35E-02
	720.50	53.80	5.41E-02		-1.58E-02	2.40E-02
SN-126	87.57	37.00	4.89E-02	4.89E-02	-4.83E-03	2.31E-02
SB-127	473.00	25.00	6.51E-02	6.51E-02	-4.49E-02	2.79E-02
	685.20	35.70	8.33E-02		1.82E-02	3.73E-02
	783.80	14.70	2.03E-01		-5.33E-02	8.97E-02
I-129	29.78	57.00	9.64E-02	9.64E-02	4.78E-03	4.66E-02
	33.60	13.20	3.38E-01		-8.17E-02	1.63E-01
	39.58	7.52	5.24E-01		0.00E+00	2.53E-01
I-131	284.30	6.05	3.16E-01	2.72E-02	-1.76E-02	1.45E-01
	364.48	81.20	2.72E-02		1.32E-02	1.24E-02
	636.97	7.26	3.93E-01		1.79E-01	1.76E-01
	722.89	1.80	1.66E+00		6.75E-02	7.37E-01
TE-132	49.72	13.10	1.06E-01	2.07E-02	-4.36E-02	4.87E-02
	228.16	88.00	2.07E-02		3.33E-03	9.57E-03
BA-133	81.00	33.00	5.51E-02	3.57E-02	-5.63E-02	2.60E-02
	302.84	17.80	9.27E-02		-2.95E-02	4.17E-02
	356.01	60.00	3.57E-02		-6.68E-03	1.63E-02
I-133	529.87	86.30	2.31E-02	2.31E-02	-1.86E-03	1.00E-02
CS-134	563.23	8.38	2.90E-01	3.53E-02	-8.06E-03	1.29E-01
	569.32	15.43	1.85E-01		5.76E-02	8.39E-02
	604.70	97.60	3.53E-02		-7.61E-03	1.62E-02
	795.84	85.40	3.77E-02		9.63E-03	1.67E-02
	801.93	8.73	3.47E-01		-4.09E-02	1.53E-01
CS-135	268.24	16.00	1.21E-01	1.21E-01	-5.98E-03	5.57E-02
I-135	1131.51	22.50	1.22E-01	1.09E-01	-1.33E-02	4.98E-02
	1260.41	28.60	1.09E-01		6.88E-03	4.53E-02
	1678.03	9.54	3.26E-01		-1.24E-01	1.29E-01
CS-136	153.22	7.46	2.25E-01	2.87E-02	-8.70E-03	1.05E-01
	163.89	4.61	3.93E-01		-1.64E-01	1.84E-01
	176.55	13.56	1.39E-01		2.69E-04	6.51E-02
	273.65	12.66	1.35E-01		-5.39E-02	6.14E-02
	340.57	48.50	4.77E-02		6.78E-03	2.20E-02
	818.50	99.70	2.87E-02		3.11E-03	1.25E-02
	1048.07	79.60	3.56E-02		7.15E-04	1.50E-02
	1235.34	19.70	1.48E-01		1.86E-02	6.12E-02
CS-137	661.65	85.12	3.32E-02	3.32E-02	1.41E-02	1.48E-02
LA-138	788.74	34.00	1.01E-01	4.03E-02	3.77E-02	4.54E-02
	1435.80	66.00	4.03E-02		-1.08E-02	1.60E-02
CE-139	165.85	80.35	2.41E-02	2.41E-02	6.55E-05	1.13E-02

Analysis Report for 1405081-02

BLANK

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)		
BA-140	162.64	6.70	2.75E-01	8.14E-02	3.63E-02	1.29E-01		
	304.84	4.50	3.69E-01		-2.42E-01	1.66E-01		
	423.70	3.20	5.93E-01		-2.64E-01	2.63E-01		
	437.55	2.00	1.24E+00		7.92E-01	5.65E-01		
	537.32	25.00	8.14E-02		8.71E-03	3.55E-02		
LA-140	328.77	20.50	9.09E-02	2.98E-02	9.13E-03	4.12E-02		
	487.03	45.50	4.56E-02		-6.06E-03	2.02E-02		
	815.85	23.50	1.28E-01		3.48E-02	5.62E-02		
	1596.49	95.49	2.98E-02		1.14E-03	1.18E-02		
CE-141	145.44	48.40	3.73E-02	3.73E-02	3.81E-03	1.75E-02		
CE-143	57.36	11.80	1.12E-01	5.42E-02	-4.92E-02	5.14E-02		
	293.26	42.00	5.42E-02		9.03E-03	2.52E-02		
	664.55	5.20	5.07E-01		1.49E-01	2.24E-01		
CE-144	133.54	10.80	1.73E-01	1.73E-01	1.25E-03	8.17E-02		
PM-144	476.78	42.00	4.63E-02	3.07E-02	1.27E-02	2.04E-02		
	618.01	98.60	3.15E-02		5.64E-03	1.43E-02		
	696.49	99.49	3.07E-02		3.67E-03	1.38E-02		
PM-145	36.85	21.70	1.96E-01	1.06E-01	3.48E-02	9.48E-02		
	37.36	39.70	1.06E-01		-4.19E-03	5.11E-02		
	42.30	15.10	2.33E-01		1.31E-01	1.12E-01		
	72.40	2.31	8.10E-01		2.43E-01	3.83E-01		
PM-146	453.90	39.94	5.42E-02	5.42E-02	-5.17E-03	2.43E-02		
	735.90	14.01	1.97E-01		4.00E-02	8.67E-02		
	747.13	13.10	2.08E-01		-6.77E-02	9.12E-02		
ND-147	91.11	28.90	7.36E-02	7.36E-02	5.25E-02	3.51E-02		
	531.02	13.10	1.41E-01		-3.72E-02	6.06E-02		
PM-149	285.90	3.10	5.64E-01	5.64E-01	6.79E-02	2.56E-01		
EU-152	121.78	20.50	8.23E-02	8.23E-02	-3.83E-02	3.86E-02		
	244.69	5.40	3.67E-01		-2.62E-01	1.70E-01		
	344.27	19.13	1.16E-01		1.21E-02	5.31E-02		
	778.89	9.20	3.50E-01		2.43E-01	1.56E-01		
	964.01	10.40	3.04E-01		-8.79E-03	1.32E-01		
	1085.78	7.22	4.64E-01		2.41E-01	2.01E-01		
	1112.02	9.60	2.65E-01		3.28E-02	1.09E-01		
	1407.95	14.94	1.89E-01		6.25E-02	7.63E-02		
	GD-153	97.43	31.30		5.08E-02	5.08E-02	-6.50E-03	2.38E-02
		103.18	22.20		7.10E-02		-1.19E-02	3.32E-02
EU-154	123.07	40.50	4.28E-02	4.28E-02	5.92E-04	2.01E-02		
	723.30	19.70	1.51E-01		6.16E-03	6.72E-02		
	873.19	11.50	2.75E-01		1.35E-01	1.21E-01		
	996.32	10.30	3.05E-01		6.88E-02	1.32E-01		
	1004.76	17.90	1.39E-01		-5.49E-03	5.78E-02		
	1274.45	35.50	7.91E-02		-1.05E-02	3.24E-02		
EU-155	86.50	30.90	5.97E-02	5.97E-02	-1.18E-02	2.82E-02		
	105.30	20.70	8.12E-02		1.16E-02	3.82E-02		
EU-156	811.77	10.40	2.66E-01	2.66E-01	-6.15E-02	1.15E-01		
	1153.47	7.20	3.64E-01		-3.63E-02	1.49E-01		
	1230.71	8.90	2.69E-01		-5.13E-02	1.07E-01		
HO-166M	184.41	72.60	3.47E-02	3.47E-02	3.13E-02	1.65E-02		
	280.45	29.60	7.06E-02		2.16E-02	3.27E-02		
	410.94	11.10	1.74E-01		-2.02E-02	7.74E-02		
	711.69	54.10	5.09E-02		-1.10E-02	2.25E-02		
TM-171	66.72	0.14	1.01E+01	1.01E+01	1.32E+00	4.68E+00		

Analysis Report for 1405081-02

BLANK

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
HF-172	81.75	4.52	4.21E-01	1.68E-01	1.66E-02	1.99E-01
	125.81	11.30	1.68E-01		8.29E-02	7.93E-02
LU-172	181.53	20.60	9.17E-02	4.48E-02	-1.44E-01	4.29E-02
	810.06	16.63	1.56E-01		-1.25E-01	6.72E-02
	912.12	15.25	2.21E-01		2.93E-02	9.73E-02
	1093.66	62.50	4.48E-02		5.23E-03	1.88E-02
LU-173	100.72	5.24	3.08E-01	9.21E-02	3.06E-02	1.44E-01
	272.11	21.20	9.21E-02		1.50E-02	4.24E-02
HF-175	343.40	84.00	2.69E-02	2.69E-02	4.22E-03	1.23E-02
LU-176	88.34	13.30	1.36E-01	1.99E-02	-1.34E-02	6.42E-02
	201.83	86.00	2.22E-02		-3.22E-03	1.04E-02
	306.78	94.00	1.99E-02		2.65E-03	9.07E-03
TA-182	67.75	41.20	3.24E-02	3.24E-02	-1.22E-02	1.49E-02
	1121.30	34.90	9.84E-02		2.78E-02	4.26E-02
	1189.05	16.23	1.55E-01		3.66E-03	6.25E-02
	1221.41	26.98	1.22E-01		-2.36E-02	5.19E-02
	1231.02	11.44	2.09E-01		-3.99E-02	8.30E-02
IR-192	308.46	29.68	6.57E-02	4.61E-02	-8.82E-03	3.00E-02
	468.07	48.10	4.61E-02		1.22E-02	2.06E-02
HG-203	279.19	77.30	2.72E-02	2.72E-02	1.43E-02	1.26E-02
BI-207	569.67	97.72	2.93E-02	2.93E-02	9.09E-03	1.33E-02
	1063.62	74.90	4.67E-02		-3.42E-04	2.04E-02
TL-208	583.14	30.22	1.02E-01	1.02E-01	3.11E-02	4.64E-02
	860.37	4.48	6.64E-01		2.80E-01	2.90E-01
	2614.66	35.85	1.77E-01		1.35E-01	7.82E-02
BI-210M	262.00	45.00	4.27E-02	4.27E-02	-8.38E-03	1.97E-02
	300.00	23.00	8.42E-02		2.38E-02	3.85E-02
PB-210	46.50	4.25	6.22E-01	6.22E-01	9.62E-01	2.97E-01
PB-211	404.84	2.90	5.75E-01	5.75E-01	-1.20E-01	2.52E-01
	831.96	2.90	1.10E+00		-2.11E-01	4.87E-01
BI-212	727.17	11.80	2.59E-01	2.59E-01	7.17E-02	1.15E-01
	1620.62	2.75	1.26E+00		6.37E-01	5.24E-01
PB-212	238.63	44.60	5.20E-02	5.20E-02	7.49E-03	2.44E-02
	300.09	3.41	5.68E-01		1.61E-01	2.60E-01
BI-214	609.31	46.30	7.66E-02	7.66E-02	3.70E-02	3.52E-02
	1120.29	15.10	2.27E-01		6.94E-02	9.83E-02
	1764.49	15.80	2.05E-01		2.18E-02	8.30E-02
	2204.22	4.98	5.57E-01		5.18E-02	2.09E-01
PB-214	295.21	19.19	1.14E-01	6.85E-02	-3.62E-03	5.27E-02
	351.92	37.19	6.85E-02		5.70E-02	3.17E-02
RN-219	401.80	6.50	2.91E-01	2.91E-01	8.28E-02	1.30E-01
RA-223	323.87	3.88	5.08E-01	5.08E-01	4.56E-02	2.32E-01
RA-224	240.98	3.95	6.28E-01	6.28E-01	2.99E-02	2.96E-01
RA-225	40.00	31.00	1.26E-01	1.26E-01	0.00E+00	6.09E-02
RA-226	186.21	3.28	7.80E-01	7.80E-01	1.02E+00	3.71E-01
TH-227	50.10	8.40	1.64E-01	1.60E-01	-6.73E-02	7.52E-02
	236.00	11.50	1.60E-01		-3.00E-01	7.37E-02
	256.20	6.30	2.70E-01		-1.93E-01	1.23E-01
AC-228	338.32	11.40	1.92E-01	1.21E-01	-5.00E-03	8.79E-02
	911.07	27.70	1.21E-01		1.80E-02	5.34E-02
	969.11	16.60	1.80E-01		2.48E-02	7.73E-02
TH-230	48.44	16.90	8.99E-02	8.99E-02	-7.06E-02	4.14E-02
	62.85	4.60	3.56E-01		1.33E-01	1.67E-01

Analysis Report for 1405081-02

BLANK

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
TH-230	67.67	0.37	3.61E+00	8.99E-02	-1.35E+00	1.66E+00
PA-231	283.67	1.60	1.19E+00	7.17E-01	-6.61E-02	5.46E-01
	302.67	2.30	7.17E-01		-2.28E-01	3.22E-01
TH-231	25.64	14.70	4.46E-01	3.12E-01	-3.96E-02	2.15E-01
	84.21	6.40	3.12E-01		9.10E-02	1.48E-01
PA-233	311.98	38.60	5.28E-02	5.28E-02	3.67E-02	2.42E-02
PA-234	131.20	20.40	8.89E-02	8.89E-02	-4.09E-02	4.18E-02
	733.99	8.80	3.21E-01		2.42E-02	1.42E-01
	946.00	12.00	2.18E-01		8.13E-03	9.21E-02
PA-234M	1001.03	0.92	2.70E+00	2.70E+00	-6.92E-01	1.12E+00
TH-234	63.29	3.80	4.31E-01	4.31E-01	1.60E-01	2.01E-01
U-235	143.76	10.50	1.79E-01	1.79E-01	1.96E-02	8.42E-02
	163.35	4.70	3.92E-01		5.18E-02	1.84E-01
	205.31	4.70	4.36E-01		-7.39E-02	2.04E-01
NP-237	86.50	12.60	1.46E-01	1.46E-01	-2.90E-02	6.92E-02
NP-239	106.10	22.70	7.51E-02	7.51E-02	1.41E-02	3.53E-02
	228.18	10.70	1.71E-01		2.74E-02	7.89E-02
	277.60	14.10	1.37E-01		-5.86E-02	6.29E-02
AM-241	59.54	35.90	4.26E-02	4.26E-02	1.16E-02	1.98E-02
AM-243	74.67	66.00	2.82E-02	2.82E-02	3.44E-03	1.33E-02
CM-243	209.75	3.29	6.26E-01	1.37E-01	2.57E-01	2.93E-01
	228.14	10.60	1.71E-01		2.75E-02	7.91E-02
	277.60	14.00	1.37E-01		-5.86E-02	6.30E-02

- + = 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

No Action Level results available for reporting purposes.

DATA REVIEW COMMENTS REPORT

Creation Date	Comment	User
---------------	---------	------

Analysis Report for 1405081-02
BLANK

No Data Review Comments Entered.

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: BLANK

Elapsed Live time: 3600
 Elapsed Real Time: 3601

Channel	1	9	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137	145	153	161	169	177	185	193	201	209	217	225	233	241	249	257	265	273	281	289	297	305	313	321	329	337	345	353	361	
	0	1067	111	87	83	82	13	17	21	26	12	12	11	15	13	9	15	16	18	14	13	13	19	35	9	11	15	12	10	11	13	12	6	8	9	15	5	6	5	6	6	6	6	5	7	8	4
	0	1295	75	91	72	80	13	11	20	13	26	17	16	16	19	17	20	14	7	14	9	21	12	57	13	14	18	5	4	8	8	8	5	8	8	7	6	6	6	4	8	4	8	8	7		
	0	738	94	93	85	62	13	19	19	16	21	20	17	24	22	14	21	18	18	16	21	13	15	14	7	13	4	10	9	11	12	6	8	8	8	10	6	6	2	9	7	8	4	5			
	0	365	85	92	83	48	16	25	14	21	31	29	15	14	20	22	12	16	16	12	18	12	17	11	13	12	18	8	17	12	9	7	8	12	6	9	9	11	6	8	13	8	7				
	0	1636	70	102	85	33	14	14	14	24	21	58	14	16	17	19	18	13	13	12	14	15	17	10	9	10	10	10	14	3	10	9	7	8	8	9	7	13	6	7	13	7	11				
	69	615	85	85	95	69	19	18	20	27	20	30	16	21	18	23	24	15	10	10	10	11	7	20	10	26	8	10	6	15	10	7	13	15	8	8	9	8	9	7	5	10	8				
	69	82	93	82	53	16	19	26	21	26	18	13	20	20	20	22	18	13	16	21	14	14	15	20	13	14	10	8	6	32	4	8	17	11	6	4	6	11	9	7	8	9	5				
	475	95	94	92	91	20	12	19	17	22	14	13	23	20	15	16	20	8	19	19	13	15	10	15	18	15	15	6	13	17	16	9	9	5	3	13	4	12	10	8	6	9	19	8			

369: 7 2 5 5 9 4 5 3

Sample Title: BLANK

Channel	1	2	3	4	5	6	7	8
377:	8	8	7	4	6	4	7	8
385:	5	7	4	9	8	5	3	8
393:	2	4	10	6	3	6	3	7
401:	4	4	5	3	3	2	4	4
409:	5	5	4	2	7	2	10	5
417:	5	9	4	10	5	1	7	4
425:	7	2	5	6	6	4	8	6
433:	3	3	8	5	8	6	9	3
441:	4	5	3	4	3	5	3	5
449:	4	5	4	7	6	4	4	4
457:	6	6	3	4	4	4	8	4
465:	2	6	6	3	5	5	3	5
473:	1	0	3	5	5	1	4	1
481:	6	2	3	3	6	3	5	2
489:	4	4	7	6	2	4	6	3
497:	4	6	1	10	4	5	1	5
505:	6	4	2	8	12	21	29	16
513:	14	5	1	4	5	3	4	2
521:	5	2	3	3	8	5	5	3
529:	5	2	4	1	1	4	3	0
537:	3	5	5	3	3	0	3	4
545:	3	1	5	6	5	4	4	4
553:	5	2	4	11	4	2	3	4
561:	3	3	4	6	6	8	3	4
569:	6	3	3	4	2	1	3	6
577:	3	4	4	7	3	7	7	5
585:	4	2	2	5	3	5	1	8
593:	1	1	2	3	7	4	6	3
601:	5	5	7	8	5	5	7	7
609:	11	12	1	1	3	2	3	4
617:	6	3	5	6	5	6	4	4
625:	3	1	5	6	4	4	5	3
633:	2	5	5	3	1	5	4	2
641:	1	2	1	6	4	3	2	3
649:	3	1	1	1	5	3	5	2
657:	3	1	2	3	4	6	4	3
665:	0	2	0	2	1	7	6	5
673:	6	5	2	2	1	1	1	2
681:	2	5	3	6	1	4	2	3
689:	2	4	2	1	4	3	3	1
697:	4	8	2	8	1	1	2	2
705:	3	2	3	4	2	5	2	0
713:	3	3	5	3	4	2	4	6
721:	1	1	3	3	5	3	2	4
729:	3	3	3	2	2	3	1	5
737:	3	3	1	1	2	5	3	1
745:	3	3	2	4	2	2	5	1
753:	3	1	1	2	3	1	2	3
761:	3	2	2	2	2	3	2	2
769:	3	2	5	1	1	0	5	4
777:	4	1	2	2	5	0	2	2
785:	3	5	4	7	2	2	3	1
793:	4	1	5	4	3	4	2	2

801: 3 4 2 3 3 4 3 1

Sample Title: BLANK

Channel	1	2	3	4	5	6	7	8
809:	1	1	3	4	0	5	4	0
817:	2	3	1	2	4	2	1	1
825:	4	2	3	4	2	2	3	3
833:	2	4	4	6	1	3	5	3
841:	1	2	2	2	2	2	0	1
849:	1	3	1	1	2	1	3	0
857:	2	1	4	0	1	5	3	1
865:	0	3	5	0	2	1	2	5
873:	0	6	1	3	2	0	0	1
881:	4	1	1	3	2	1	2	0
889:	0	3	4	0	0	1	3	2
897:	1	3	3	2	1	3	2	2
905:	2	4	1	1	3	2	5	5
913:	0	3	1	3	3	2	1	3
921:	0	3	2	1	1	1	0	0
929:	2	3	0	2	4	1	3	1
937:	3	0	3	1	1	4	1	1
945:	1	0	1	2	3	0	0	1
953:	2	3	2	4	1	3	2	1
961:	3	1	4	1	3	2	1	3
969:	1	1	1	4	0	2	1	0
977:	1	0	0	1	0	2	2	1
985:	2	2	1	3	1	2	1	2
993:	3	4	3	1	0	2	1	0
1001:	1	1	1	0	3	1	1	2
1009:	2	0	1	0	3	1	1	3
1017:	2	0	3	6	1	0	3	2
1025:	1	1	0	3	0	0	3	5
1033:	1	1	1	2	3	1	0	0
1041:	2	2	2	1	1	1	0	3
1049:	4	3	1	0	3	0	1	3
1057:	1	3	1	2	2	4	2	1
1065:	3	0	2	3	1	1	0	0
1073:	1	1	1	2	0	1	1	2
1081:	0	1	0	3	2	6	0	1
1089:	1	1	0	2	0	3	2	0
1097:	0	1	1	2	1	0	0	0
1105:	0	0	2	1	0	1	4	3
1113:	2	0	0	1	2	1	1	1
1121:	2	1	1	2	1	1	2	2
1129:	1	1	0	1	2	1	0	2
1137:	0	4	1	0	1	1	1	0
1145:	0	3	1	2	5	1	4	0
1153:	4	1	0	0	0	0	1	0
1161:	1	1	0	2	2	0	1	0
1169:	4	1	1	1	2	3	1	0
1177:	1	3	0	2	2	0	1	0
1185:	0	1	3	0	1	1	0	1
1193:	1	3	2	0	0	1	2	0
1201:	3	2	1	1	3	2	1	1
1209:	4	2	2	1	2	1	2	0
1217:	1	4	2	0	2	1	0	1
1225:	3	2	0	2	1	0	0	1

1233: 1 0 0 0 1 5 1 2

Sample Title: BLANK

Channel	1	2	3	4	5	6	7	8
1241:	0	1	2	0	1	2	0	2
1249:	3	3	2	1	3	0	1	0
1257:	1	0	0	0	0	4	3	0
1265:	1	0	2	1	3	4	0	1
1273:	1	1	0	2	2	0	2	1
1281:	1	1	3	1	2	0	1	2
1289:	2	2	1	0	0	1	1	1
1297:	0	0	2	1	1	2	1	0
1305:	1	1	1	2	2	0	1	1
1313:	2	2	0	1	1	0	1	2
1321:	0	0	1	2	1	1	2	0
1329:	1	0	1	3	3	0	0	0
1337:	1	0	0	2	3	1	0	1
1345:	0	0	0	2	0	0	1	2
1353:	1	1	2	2	2	1	0	1
1361:	1	2	2	0	1	1	0	1
1369:	0	0	1	3	0	2	1	0
1377:	2	1	0	0	1	0	1	0
1385:	0	1	2	0	1	0	1	1
1393:	1	1	3	1	1	0	3	0
1401:	3	1	0	1	1	1	1	1
1409:	0	1	0	0	0	2	1	0
1417:	0	2	2	2	0	1	0	0
1425:	0	1	3	0	2	1	1	0
1433:	1	0	0	2	1	1	1	2
1441:	2	0	1	1	3	2	1	1
1449:	0	2	0	0	0	1	0	2
1457:	0	1	5	1	5	0	0	0
1465:	3	0	0	1	0	1	0	0
1473:	0	1	0	1	1	1	1	0
1481:	2	2	1	2	0	0	0	1
1489:	1	1	0	3	1	0	0	1
1497:	1	0	0	1	1	1	0	1
1505:	1	1	3	2	1	0	1	0
1513:	1	2	2	0	2	1	0	0
1521:	0	0	2	0	0	0	3	0
1529:	0	0	0	0	0	0	1	1
1537:	2	0	0	0	2	1	0	0
1545:	0	1	0	1	1	1	0	0
1553:	0	1	0	0	0	1	3	1
1561:	1	1	0	0	1	0	1	0
1569:	0	0	1	0	1	0	1	0
1577:	0	1	1	1	0	3	0	0
1585:	1	2	2	0	1	0	1	0
1593:	0	2	1	0	0	0	1	1
1601:	1	0	0	0	1	1	1	1
1609:	0	2	0	1	1	0	0	0
1617:	2	1	1	0	2	2	0	0
1625:	0	0	0	0	0	1	1	1
1633:	2	0	1	1	0	1	0	1
1641:	0	1	0	1	1	1	0	1
1649:	0	2	1	0	0	2	1	1
1657:	2	2	1	0	0	2	0	0

1665: 1 0 1 0 0 2 0 0

Sample Title: BLANK

Channel	1	2	3	4	5	6	7	8	9
1673:	1	0	1	1	0	0	0	1	1
1681:	1	2	2	1	0	1	1	0	0
1689:	0	0	0	0	0	0	0	0	0
1697:	0	1	0	1	0	1	0	0	0
1705:	0	0	0	0	0	0	2	0	1
1713:	1	0	0	0	1	0	0	0	0
1721:	0	0	1	0	1	0	1	1	1
1729:	0	2	1	1	0	1	1	1	0
1737:	0	0	2	0	0	0	0	0	0
1745:	1	1	0	0	0	2	0	0	1
1753:	0	1	0	0	1	1	0	0	0
1761:	1	0	2	2	0	0	1	0	0
1769:	0	1	0	0	0	2	1	1	0
1777:	0	0	0	0	0	0	1	1	0
1785:	0	0	1	0	0	1	1	1	1
1793:	1	2	1	0	1	2	0	0	1
1801:	0	1	0	1	1	0	1	0	0
1809:	1	0	0	0	0	1	0	0	1
1817:	0	1	2	0	1	1	1	0	0
1825:	0	0	2	0	0	2	0	0	1
1833:	0	1	2	1	0	0	0	1	0
1841:	2	0	1	0	0	0	1	2	0
1849:	0	1	0	1	0	0	1	0	0
1857:	0	0	0	0	1	0	1	0	0
1865:	0	0	0	0	0	0	0	0	0
1873:	0	0	0	0	0	2	2	1	0
1881:	0	0	1	0	1	1	0	0	0
1889:	1	2	0	1	0	0	0	0	1
1897:	0	1	0	1	0	0	0	0	0
1905:	0	1	2	0	1	0	1	0	0
1913:	1	0	0	1	0	1	0	0	0
1921:	1	1	0	1	0	0	1	0	0
1929:	1	0	0	3	0	0	0	0	0
1937:	2	1	0	0	3	1	0	0	0
1945:	0	0	1	0	0	0	0	0	0
1953:	0	0	0	3	0	0	0	0	0
1961:	1	0	0	0	0	0	0	0	1
1969:	1	0	0	0	0	0	0	0	1
1977:	1	1	1	0	1	0	0	0	0
1985:	1	0	0	1	1	0	0	0	0
1993:	0	1	1	0	0	1	0	0	0
2001:	0	0	0	0	0	0	0	0	0
2009:	0	0	0	0	2	0	1	1	2
2017:	0	0	1	0	0	1	1	1	1
2025:	1	1	1	0	1	0	1	0	0
2033:	1	0	1	0	0	1	0	0	0
2041:	0	1	0	1	0	0	0	0	0
2049:	1	0	1	0	0	0	0	0	0
2057:	2	0	0	1	0	0	0	0	0
2065:	0	0	1	1	1	0	1	1	1
2073:	1	1	0	2	0	2	0	0	0
2081:	1	1	0	0	0	0	0	0	0
2089:	0	1	1	0	0	0	0	0	1

2097: 0 1 1 0 1 1 3 0

Sample Title: BLANK

Channel	1	2	3	4	5	6	7	8
2105:	0	0	0	0	1	1	1	0
2113:	0	0	0	0	0	2	0	1
2121:	1	0	2	0	0	2	0	0
2129:	0	0	1	0	1	0	0	0
2137:	1	0	0	1	1	0	0	0
2145:	0	0	0	1	0	0	0	0
2153:	0	1	0	1	1	0	0	0
2161:	0	0	1	0	0	0	1	0
2169:	1	0	1	1	0	0	0	1
2177:	1	0	0	0	0	0	0	2
2185:	2	2	0	0	0	0	0	0
2193:	1	0	1	1	0	1	0	0
2201:	0	0	0	1	1	1	1	0
2209:	0	0	0	0	0	0	1	0
2217:	0	0	0	0	0	0	1	0
2225:	1	0	1	0	1	2	0	0
2233:	0	0	1	0	0	1	0	2
2241:	0	0	1	0	0	0	0	0
2249:	1	0	0	0	1	0	1	0
2257:	0	1	0	0	0	1	1	0
2265:	0	0	1	0	1	0	2	0
2273:	0	0	1	0	0	0	1	0
2281:	0	0	0	0	1	0	0	0
2289:	0	0	0	0	0	0	0	0
2297:	0	0	0	0	0	0	0	0
2305:	1	1	1	1	1	0	0	0
2313:	0	0	1	1	0	0	0	0
2321:	0	1	1	0	0	0	1	0
2329:	0	0	0	1	1	0	0	0
2337:	0	0	0	0	0	2	0	0
2345:	0	0	0	0	0	0	0	0
2353:	0	0	0	1	1	0	0	0
2361:	0	2	0	1	0	0	0	0
2369:	1	0	1	1	0	0	0	1
2377:	0	0	0	1	1	0	1	0
2385:	0	0	0	0	0	0	2	0
2393:	0	0	0	0	0	0	0	1
2401:	1	0	0	0	0	0	0	0
2409:	0	0	0	1	0	0	0	0
2417:	0	1	1	1	0	0	0	0
2425:	0	0	0	0	0	0	0	1
2433:	1	0	0	1	0	0	0	1
2441:	0	0	0	0	0	0	1	0
2449:	0	0	0	0	1	1	0	0
2457:	0	0	0	0	0	1	0	1
2465:	0	0	0	0	0	0	0	0
2473:	0	0	1	0	0	1	1	0
2481:	0	0	0	0	0	0	0	0
2489:	0	1	1	1	0	0	0	0
2497:	0	0	0	1	1	0	0	0
2505:	0	0	1	0	0	1	0	0
2513:	1	1	0	0	1	0	0	0
2521:	0	0	1	0	1	0	0	0

2529: 0 0 0 2 0 0 0 2

Sample Title: BLANK

Channel	1	2	3	4	5	6	7	8	9
2537:	0	0	0	0	0	1	0	0	0
2545:	0	0	0	0	0	0	0	0	0
2553:	1	0	0	0	0	0	0	0	0
2561:	0	0	0	0	0	0	0	1	1
2569:	0	0	0	1	0	0	0	0	0
2577:	1	0	0	0	0	0	0	1	0
2585:	0	0	0	0	0	0	0	1	2
2593:	0	0	0	0	0	0	0	0	0
2601:	0	0	1	0	0	0	0	0	0
2609:	0	1	1	3	3	6	3	0	0
2617:	2	0	0	1	0	0	0	0	0
2625:	0	0	0	0	0	1	0	0	0
2633:	0	0	0	0	1	3	0	0	0
2641:	1	0	0	1	0	0	0	0	0
2649:	0	0	0	0	0	0	0	0	1
2657:	0	0	0	1	0	0	0	0	0
2665:	0	0	1	0	0	0	0	2	0
2673:	0	1	1	0	0	0	2	0	0
2681:	0	0	1	1	0	0	0	0	0
2689:	0	0	0	0	1	0	1	0	2
2697:	0	0	0	2	1	0	0	1	0
2705:	0	0	0	1	0	0	0	0	0
2713:	0	0	0	0	0	0	0	0	1
2721:	0	0	0	0	0	1	0	0	0
2729:	0	0	0	0	0	0	0	0	0
2737:	1	0	1	1	0	0	0	0	0
2745:	1	0	0	0	0	0	0	0	0
2753:	2	0	0	0	0	0	0	0	0
2761:	0	0	1	0	0	0	0	0	0
2769:	0	0	0	0	0	0	0	0	1
2777:	1	0	0	0	0	0	0	0	0
2785:	0	0	0	0	1	1	1	0	0
2793:	0	0	1	0	0	0	0	2	0
2801:	1	0	1	0	0	0	0	0	2
2809:	1	0	0	0	0	0	0	0	0
2817:	0	0	0	0	0	0	0	0	0
2825:	0	0	0	0	1	0	0	0	0
2833:	0	0	0	1	0	0	0	0	0
2841:	0	1	1	0	0	0	0	0	0
2849:	0	0	0	1	0	1	0	0	0
2857:	1	0	0	1	0	0	0	0	1
2865:	0	0	0	0	0	1	0	0	1
2873:	0	0	0	0	0	1	0	0	0
2881:	0	0	0	0	0	0	0	0	0
2889:	0	0	0	1	0	0	0	0	0
2897:	0	1	1	0	0	0	0	0	0
2905:	0	0	0	0	0	0	0	0	0
2913:	1	0	0	0	0	0	0	1	0
2921:	0	0	0	0	0	0	1	0	0
2929:	0	1	0	2	0	1	0	0	0
2937:	0	0	0	0	0	0	0	0	0
2945:	0	0	0	0	0	0	0	0	1
2953:	0	0	0	0	0	0	0	0	0

2961: 0 0 0 0 0 0 0 0 1

Sample Title: BLANK

Channel	1	2	3	4	5	6	7	8	9
2969:	1	1	0	1	0	0	0	0	0
2977:	0	0	0	0	0	0	0	0	1
2985:	0	0	1	0	0	0	0	2	0
2993:	0	0	0	0	0	0	1	1	0
3001:	0	1	0	0	0	0	1	1	0
3009:	1	0	0	0	0	0	1	0	0
3017:	0	0	0	0	0	0	0	0	0
3025:	0	0	0	0	1	0	0	1	0
3033:	0	1	0	0	0	0	0	1	0
3041:	0	0	0	1	1	0	0	0	0
3049:	1	0	0	0	1	0	0	1	0
3057:	0	2	0	0	0	0	0	1	0
3065:	0	0	0	1	0	0	1	0	2
3073:	0	0	0	0	0	0	0	0	0
3081:	0	0	0	0	0	0	0	0	1
3089:	0	0	0	0	0	0	0	1	0
3097:	0	1	0	0	0	0	0	0	0
3105:	0	0	0	0	0	0	1	0	0
3113:	0	2	0	0	0	0	0	0	0
3121:	0	1	0	0	0	0	0	0	0
3129:	1	0	0	1	0	0	0	0	1
3137:	0	0	0	0	0	0	1	0	0
3145:	0	0	0	0	0	0	0	0	0
3153:	1	0	0	0	0	0	1	0	0
3161:	0	0	0	0	0	0	0	0	0
3169:	0	0	1	0	0	0	0	0	0
3177:	0	0	0	0	0	0	1	0	1
3185:	1	0	0	0	0	0	0	0	0
3193:	1	0	0	0	0	0	0	1	0
3201:	0	0	0	0	0	0	1	0	0
3209:	0	0	0	0	0	0	0	2	0
3217:	0	0	1	1	0	0	1	0	0
3225:	0	0	1	0	0	0	0	0	0
3233:	0	0	1	0	0	0	0	0	0
3241:	0	0	0	0	0	0	0	0	0
3249:	0	0	0	0	0	0	0	0	0
3257:	0	0	1	0	0	0	0	0	1
3265:	0	0	0	0	0	0	0	0	0
3273:	0	1	1	0	0	0	0	0	0
3281:	0	1	0	0	0	0	0	0	0
3289:	1	0	0	1	0	0	0	0	1
3297:	0	1	0	0	0	0	0	0	1
3305:	0	0	0	0	0	0	0	0	1
3313:	0	0	0	0	0	0	0	0	0
3321:	0	0	1	1	0	0	0	1	0
3329:	0	0	0	0	0	0	0	0	0
3337:	0	0	0	0	0	0	0	0	1
3345:	0	0	0	1	0	0	0	0	0
3353:	0	0	0	0	1	1	1	0	0
3361:	0	1	0	1	0	0	0	0	0
3369:	0	0	0	0	1	0	0	1	0
3377:	0	0	0	1	0	0	0	1	0
3385:	0	0	0	0	0	0	0	0	0

3393: 0 0 0 0 0 0 0 0 0

Sample Title: BLANK

Channel	1	2	3	4	5	6	7	8	9
3401:	0	2	0	0	0	1	2	0	0
3409:	1	0	1	0	1	2	0	0	0
3417:	0	0	0	0	0	0	0	0	0
3425:	0	0	0	0	0	0	0	0	0
3433:	0	0	0	0	0	0	0	0	0
3441:	1	0	0	1	0	0	0	0	0
3449:	0	0	0	0	0	0	1	0	0
3457:	0	1	0	0	0	1	1	0	0
3465:	0	0	0	0	1	0	0	0	0
3473:	0	0	0	0	0	0	1	0	0
3481:	0	0	0	0	1	0	0	0	0
3489:	0	0	1	0	0	0	0	0	0
3497:	0	0	0	0	0	0	0	0	0
3505:	0	0	0	0	0	0	0	0	0
3513:	0	0	0	0	0	1	0	0	0
3521:	0	0	0	0	0	0	1	0	0
3529:	0	0	0	1	1	0	0	0	0
3537:	0	0	0	0	1	0	0	0	0
3545:	0	0	0	0	0	1	0	0	0
3553:	0	0	0	0	0	0	0	0	0
3561:	0	0	0	0	0	0	0	0	0
3569:	0	0	0	0	0	0	0	0	0
3577:	0	0	0	0	0	0	0	1	0
3585:	0	1	1	0	0	0	0	0	0
3593:	0	2	0	0	0	0	1	1	0
3601:	0	1	0	0	0	0	1	0	0
3609:	0	0	1	0	0	0	0	0	0
3617:	0	0	0	0	0	0	0	1	0
3625:	1	0	1	0	0	0	0	0	0
3633:	0	0	0	0	0	1	1	0	0
3641:	1	0	0	0	0	1	0	1	0
3649:	0	0	1	0	0	0	1	1	0
3657:	0	0	1	0	0	1	2	0	1
3665:	0	0	0	0	0	0	0	0	0
3673:	0	0	0	0	0	1	0	0	1
3681:	0	0	0	1	0	1	0	0	0
3689:	0	1	0	0	0	0	0	0	0
3697:	0	0	0	0	1	1	0	0	0
3705:	0	0	0	0	0	0	0	1	0
3713:	0	0	0	0	0	0	1	1	0
3721:	0	1	0	1	0	1	0	0	0
3729:	0	0	0	0	0	0	0	0	1
3737:	0	0	0	0	0	0	0	0	0
3745:	0	0	0	0	0	2	0	0	0
3753:	0	0	0	0	0	0	0	0	1
3761:	0	0	0	0	0	0	0	0	0
3769:	0	0	0	0	0	0	0	0	0
3777:	0	0	0	1	0	1	0	0	0
3785:	1	1	0	0	0	0	0	0	0
3793:	0	0	0	0	0	0	0	0	1
3801:	0	0	0	0	0	0	0	0	0
3809:	0	0	0	0	1	0	0	0	0
3817:	0	0	0	0	0	0	0	0	0

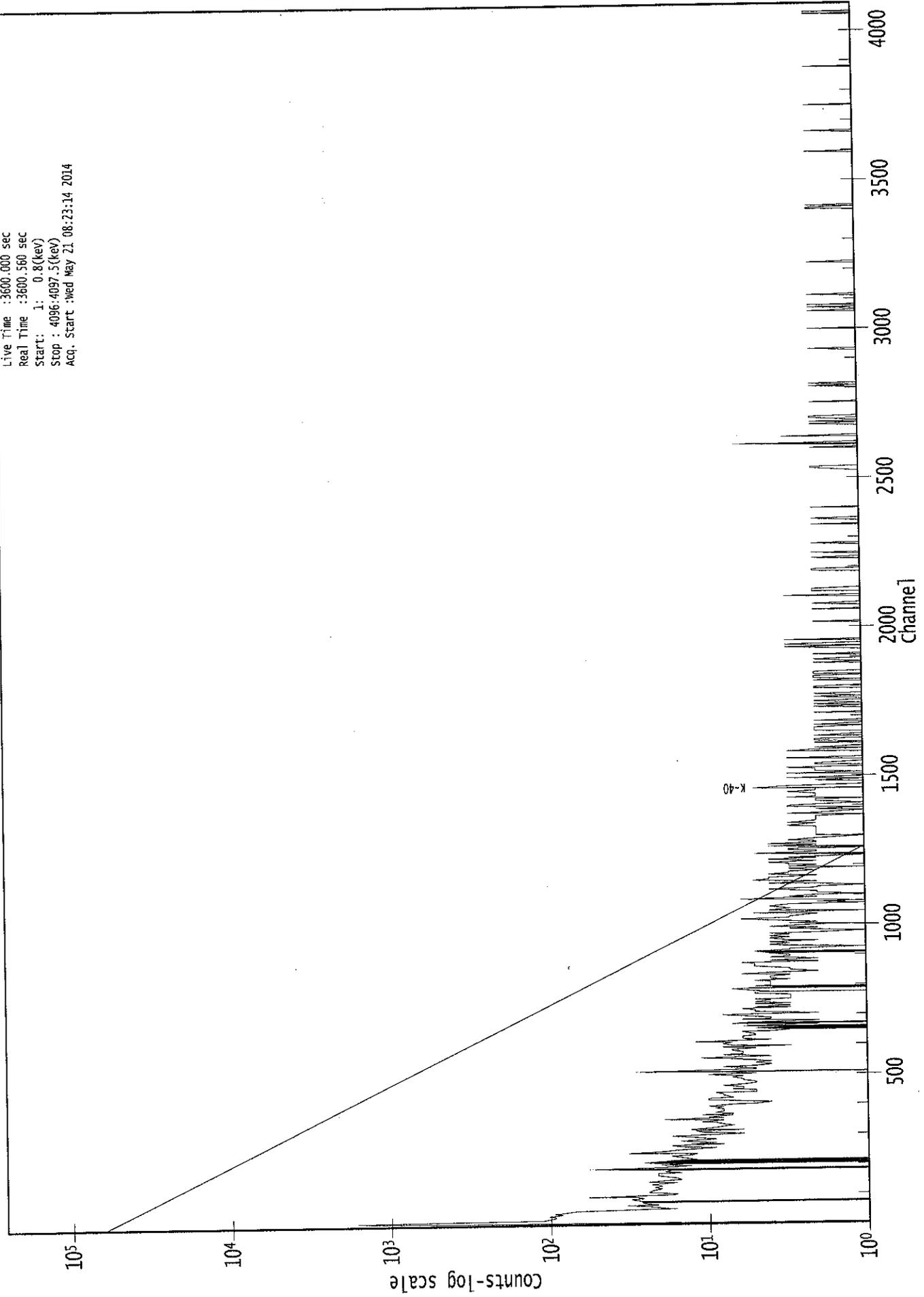
3825: 0 0 0 0 0 0 0 0 0

Sample Title: BLANK

Channel									
3833:	0	0	0	0	0	0	0	1	0
3841:	0	0	0	0	0	0	0	0	0
3849:	0	1	0	0	0	0	0	0	0
3857:	0	0	0	0	0	0	0	0	0
3865:	0	1	0	0	0	0	0	1	0
3873:	0	0	0	0	0	0	2	0	0
3881:	0	0	0	0	0	0	0	1	1
3889:	0	0	0	0	0	0	0	0	0
3897:	0	0	0	0	0	0	0	0	0
3905:	1	1	1	1	0	1	0	0	0
3913:	0	0	0	0	0	0	0	0	0
3921:	0	1	0	0	0	1	0	0	0
3929:	0	0	0	0	0	0	0	0	0
3937:	0	0	0	0	0	1	0	0	0
3945:	1	0	0	0	0	0	0	0	0
3953:	0	0	0	0	0	0	0	0	0
3961:	0	0	0	0	0	0	0	0	0
3969:	0	1	0	0	0	0	0	0	0
3977:	0	0	0	0	0	0	0	1	0
3985:	0	0	1	0	0	0	0	0	0
3993:	0	0	0	0	0	1	0	0	0
4001:	0	0	0	0	0	0	0	1	0
4009:	0	0	0	0	0	0	0	1	0
4017:	0	0	0	0	0	0	0	1	0
4025:	0	0	0	0	0	0	0	1	0
4033:	0	1	0	0	0	0	0	0	0
4041:	0	0	0	0	0	0	0	0	2
4049:	0	0	0	0	0	0	0	2	0
4057:	0	0	0	0	0	0	0	0	0
4065:	0	0	0	0	0	0	0	0	0
4073:	0	0	0	1	0	0	0	0	0
4081:	1	0	0	0	0	0	0	0	1
4089:	0	0	0	0	0	0	0	0	0

0000007778.CNF

Live Time : 3600.000 sec
Real Time : 3600.560 sec
Start : 1: 0.8(kev)
Stop : 4096.4097.5(kev)
Acq. Start : wed May 21 08:23:14 2014



ROI Type: 1

Analysis Report for 1405081-03
J1TLD8 SAF: RC-189

5/21

GAMMA SPECTRUM ANALYSIS

Sample Identification : 1405081-03
Sample Description : J1TLD8 SAF: RC-189
Sample Type : SOIL

Sample Size : 7.816E+02 grams
Facility : Countroom

Sample Taken On : 5/16/2014 8:20:03AM
Acquisition Started : 5/21/2014 8:23:00AM

Procedure : GAS-1302 pCi
Operator : Administrator
Detector Name : GE1
Geometry : GAS-1302
Live Time : 3600.0 seconds
Real Time : 3601.0 seconds

Dead Time : 0.03 %

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 1 - 4096
Peak Area Range (in channels) : 19 - 4096
Identification Energy Tolerance : 1.000 keV

Energy Calibration Used Done On : 1/9/2014
Efficiency Calibration Used Done On : 8/24/2013
Efficiency Calibration Description :

Sample Number : 7777

AG
5/21/14

Analysis Report for 1405081-03
J1TLD8 SAF: RC-189

ENERGY CALIBRATION REPORT

Detector Name : GE1

ENERGY CALIBRATION COEFFICIENTS

Energy Calibrate Performed on : 1/9/2014 1:23:31PM
by : Administrator
Energy Calibrate Type : POLY

$$\text{Energy (keV)} = -0.103 + 0.999 \cdot \text{ch} + 2.92\text{E-}08 \cdot \text{ch}^2 + 0.00\text{E+}00 \cdot \text{ch}^3$$

SHAPE CALIBRATION COEFFICIENTS

Shape Calibrate Performed on : 1/9/2014 1:23:31PM
by : Administrator

$$\text{FWHM} = 1.024 + 3.14\text{E-}02 \cdot \text{E}^{1/2}$$

$$\text{LOW TAIL} = 5.10\text{E-}01 + 7.66\text{E-}04 \cdot \text{E}$$

ENERGY CALIBRATION RESULTS TABLE

<i>Centroid Channel</i>	<i>Centroid error</i>	<i>Energy (keV)</i>
88.25	0.18	88.03
122.23	0.27	122.06
166.05	0.19	165.85
279.28	0.12	279.19
391.81	0.04	391.69
661.78	0.05	661.65
898.18	0.04	898.02
1173.39	0.04	1173.22
1332.64	0.04	1332.49
1836.16	0.03	1836.01

SHAPE CALIBRATION RESULTS TABLE

<i>Energy (keV)</i>	<i>FWHM channels</i>	<i>FWHM error</i>	<i>TAIL channels</i>	<i>TAIL error</i>
-------------------------	--------------------------	-----------------------	--------------------------	-----------------------

Analysis Report for 1405081-03
 J1TLD8 SAF: RC-189

<i>Energy</i> (keV)	<i>FWHM</i> channels	<i>FWHM</i> error	<i>TAIL</i> channels	<i>TAIL</i> error
88.03	1.28	0.45	0.51	0.51
122.06	1.41	0.68	0.62	1.02
165.85	1.41	0.31	0.51	0.43
279.19	1.72	0.37	0.96	0.99
391.69	1.67	0.10	0.91	0.31
661.65	1.83	0.11	1.03	0.37
898.02	1.93	0.09	1.14	0.42
1173.22	2.10	0.09	1.37	0.47
1332.49	2.15	0.09	1.56	0.81
1836.01	2.40	0.08	1.99	1.61

EFFICIENCY CALIBRATION REPORT

Detector Name : GE1
 Geometry Description : GAS-1302
 Efficiency Calibration Performed on : 8/24/2013 10:48:49AM
 by : Administrator
 Efficiency Type Used : EMPIRICA
 Certificate File :

Efficiency Triplets

<i>Energy</i>	<i>% Efficiency</i>	<i>Error</i>	<i>Computed</i>	<i>Error</i>	<i>% Difference</i>
59.54	2.56E+00	9.13E-02			
88.03	2.76E+00	1.31E-01			
122.06	2.76E+00	1.18E-01			
165.85	2.45E+00	9.84E-02			
279.19	1.81E+00	7.07E-02			
391.69	1.36E+00	5.43E-02			
661.65	9.59E-01	4.02E-02			
898.02	7.16E-01	2.85E-02			
1173.22	5.98E-01	2.47E-02			
1332.49	5.46E-01	2.25E-02			
1836.01	4.30E-01	1.76E-02			

DUAL Efficiency Calibration Equation

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

Single Equation Terms

Offset : 3.26E+00
 Slope : -1.39E+01
 Quadratic : 7.29E+00
 Cubic : -1.60E+00
 4th Order : 1.57E-01
 5th Order : -5.83E-03
 6th Order : 0.00E+00
 7th Order : 0.00E+00
 8th Order : 0.00E+00
 9th Order : 0.00E+00

EMPIRICAL Efficiency Calibration Equation

Empirical Equation Terms

Scaling : 9.48E+02
 Offset : -4.97E+00
 Slope : 7.88E-01
 Quadratic : 8.64E-02
 Cubic : -7.25E-02
 4th Order : 0.00E+00
 5th Order : 0.00E+00

LINEAR Efficiency Calibration Equation

Linear Equation Terms

Offset : -1.35E-04
 Slope : -2.24E+00
 Quadratic : 2.36E+02
 Cubic : -2.99E+04
 4th Order : 1.68E+06
 5th Order : -3.59E+07
 6th Order : 0.00E+00
 7th Order : 0.00E+00
 8th Order : 0.00E+00
 9th Order : 0.00E+00

PEAK-TO-TOTAL CALIBRATION REPORT

Peak-to-Total Efficiency Calibration Equation

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

PEAK LOCATE REPORT

Peak Locate Performed on : 5/21/2014 9:23:04AM
 Peak Locate From Channel : 1
 Peak Locate To Channel : 4096
 Peak Search Sensitivity : 2.50

Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
1	31.29	31.39	0.0000	0.00
2	75.16	75.27	0.0000	0.00
3	77.82	77.93	0.0000	0.00
4	93.08	93.19	0.0000	0.00
5	186.31	186.43	0.0000	0.00
6	238.94	239.06	0.0000	0.00
7	242.03	242.15	0.0000	0.00
8	278.01	278.13	0.0000	0.00
9	295.69	295.81	0.0000	0.00
10	300.55	300.67	0.0000	0.00
11	328.36	328.49	0.0000	0.00
12	338.66	338.79	0.0000	0.00
13	352.21	352.34	0.0000	0.00
14	441.08	441.21	0.0000	0.00
15	463.80	463.93	0.0000	0.00
16	470.98	471.12	0.0000	0.00
17	477.04	477.17	0.0000	0.00
18	503.10	503.23	0.0000	0.00
19	511.45	511.58	0.0000	0.00
20	583.69	583.83	0.0000	0.00
21	609.86	610.00	0.0000	0.00
22	642.00	642.15	0.0000	0.00
23	662.02	662.16	0.0000	0.00
24	727.24	727.38	0.0000	0.00
25	770.86	771.01	0.0000	0.00
26	796.04	796.19	0.0000	0.00
27	809.81	809.96	0.0000	0.00
28	861.41	861.56	0.0000	0.00
29	912.12	912.28	0.0000	0.00
30	934.63	934.78	0.0000	0.00
31	969.83	969.99	0.0000	0.00
32	977.85	978.00	0.0000	0.00
33	1120.78	1120.93	0.0000	0.00
34	1238.23	1238.39	0.0000	0.00
35	1265.19	1265.34	0.0000	0.00
36	1271.08	1271.24	0.0000	0.00
37	1280.35	1280.51	0.0000	0.00
38	1301.31	1301.47	0.0000	0.00
39	1333.55	1333.71	0.0000	0.00
40	1378.29	1378.45	0.0000	0.00
41	1394.16	1394.32	0.0000	0.00
42	1408.63	1408.79	0.0000	0.00

Analysis Report for 1405081-03
J1TLD8 SAF: RC-189

<i>Peak No.</i>	<i>Energy (keV)</i>	<i>Centroid Channel</i>	<i>Centroid Uncertainty</i>	<i>Peak Significance</i>
43	1461.70	1461.86	0.0000	0.00
44	1467.84	1468.00	0.0000	0.00
45	1477.71	1477.87	0.0000	0.00
46	1496.44	1496.60	0.0000	0.00
47	1589.08	1589.23	0.0000	0.00
48	1765.26	1765.41	0.0000	0.00
49	1923.02	1923.17	0.0000	0.00
50	2104.96	2105.11	0.0000	0.00
51	2167.66	2167.80	0.0000	0.00
52	2204.70	2204.83	0.0000	0.00
53	2265.89	2266.02	0.0000	0.00
54	2275.75	2275.88	0.0000	0.00
55	2615.78	2615.89	0.0000	0.00

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 5/21/2014 9:23:04AM

 Peak Analysis From Channel : 1
 Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
M	1	29 -	34	31.39	5.89E+01	53.37	5.14E+02	3.58
m	2	72 -	82	75.27	1.95E+02	74.35	9.20E+02	1.57
	3	72 -	82	77.93	3.10E+02	75.58	8.36E+02	1.58
	4	90 -	97	93.19	3.12E+02	92.07	1.16E+03	2.10
	5	182 -	191	186.43	1.87E+02	82.02	8.51E+02	2.16
M	6	234 -	246	239.06	5.34E+02	60.30	3.17E+02	1.66
m	7	234 -	246	242.15	1.24E+02	50.91	2.92E+02	1.66
	8	275 -	283	278.13	4.53E+01	53.28	3.97E+02	2.17
M	9	290 -	304	295.81	2.28E+02	45.78	2.90E+02	1.57
m	10	290 -	304	300.67	4.48E+01	42.33	2.99E+02	1.90
	11	325 -	332	328.49	5.15E+01	46.30	3.21E+02	1.74
	12	335 -	342	338.79	1.18E+02	48.62	3.14E+02	1.19
	13	347 -	357	352.34	4.04E+02	68.03	4.03E+02	2.03
	14	437 -	445	441.21	4.04E+01	36.47	1.79E+02	2.82
	15	461 -	467	463.93	5.86E+01	32.54	1.49E+02	1.28
M	16	468 -	483	471.12	2.69E+01	25.40	1.11E+02	1.88
m	17	468 -	483	477.17	2.21E+01	24.92	9.43E+01	1.88
	18	498 -	506	503.23	3.10E+01	35.12	1.70E+02	2.64
	19	508 -	516	511.58	1.25E+02	43.03	2.11E+02	2.53
	20	579 -	589	583.83	1.87E+02	48.18	2.11E+02	1.93
	21	605 -	614	610.00	2.92E+02	51.00	2.05E+02	1.70
	22	637 -	646	642.15	3.42E+01	33.84	1.42E+02	4.55
	23	658 -	666	662.16	4.75E+01	38.04	1.93E+02	1.52
	24	723 -	731	727.38	3.65E+01	33.77	1.53E+02	1.45
	25	767 -	774	771.01	3.99E+01	24.17	6.81E+01	4.39
	26	792 -	801	796.19	3.79E+01	25.98	7.42E+01	5.57
	27	803 -	820	809.96	5.00E+01	42.24	1.44E+02	4.28
	28	858 -	864	861.56	2.20E+01	23.45	8.40E+01	1.97
	29	908 -	917	912.28	8.40E+01	41.17	1.92E+02	1.83
	30	932 -	938	934.78	1.55E+01	19.29	5.71E+01	1.72
M	31	963 -	984	969.99	6.58E+01	23.21	4.08E+01	2.20
m	32	963 -	984	978.00	1.81E+01	16.34	1.93E+01	2.01
	33	1117 -	1125	1120.93	7.08E+01	30.02	9.64E+01	2.72
	34	1234 -	1243	1238.39	2.73E+01	31.13	1.17E+02	5.52
M	35	1262 -	1273	1265.34	1.67E+01	15.56	3.29E+01	3.14
m	36	1262 -	1273	1271.24	1.52E+01	12.66	2.09E+01	2.44
	37	1275 -	1285	1280.51	2.21E+01	25.00	7.17E+01	2.89
	38	1297 -	1304	1301.47	1.60E+01	16.00	3.20E+01	4.58
	39	1331 -	1337	1333.71	2.30E+01	15.68	2.80E+01	2.27
	40	1374 -	1382	1378.45	2.60E+01	17.26	2.60E+01	1.88

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
	41	1394.16	1383 - 1405	1394.32	6.13E+01	20.01	1.14E+01	19.67
	42	1408.63	1406 - 1411	1408.79	1.10E+01	8.60	6.00E+00	1.37
M	43	1461.70	1456 - 1470	1461.86	6.08E+02	50.93	3.19E+01	2.27
m	44	1467.84	1456 - 1470	1468.00	9.45E+00	9.81	2.00E+01	2.23
	45	1477.71	1475 - 1480	1477.87	1.17E+01	10.20	1.06E+01	3.05
	46	1496.44	1491 - 1500	1496.60	1.01E+01	13.42	1.97E+01	3.06
	47	1589.08	1587 - 1593	1589.23	1.41E+01	14.06	2.79E+01	1.26
	48	1765.26	1760 - 1771	1765.41	5.86E+01	19.49	1.88E+01	2.24
	49	1923.02	1919 - 1926	1923.17	8.50E+00	11.31	1.50E+01	3.63
	50	2104.96	2100 - 2108	2105.11	7.50E+00	9.41	9.00E+00	3.11
	51	2167.66	2163 - 2171	2167.80	1.00E+01	6.32	0.00E+00	2.99
	52	2204.70	2200 - 2208	2204.83	9.75E+00	8.26	4.50E+00	2.38
	53	2265.89	2262 - 2268	2266.02	7.36E+00	8.28	7.27E+00	2.82
	54	2275.75	2273 - 2278	2275.88	4.58E+00	5.74	2.83E+00	1.85
	55	2615.78	2612 - 2620	2615.89	7.91E+01	18.55	3.86E+00	1.86

M = First peak in a multiplet region
 m = Other peak in a multiplet region
 F = Fitted singlet
 Errors quoted at 2.00sigma

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 5/21/2014 9:23:04AM

Peak Analysis From Channel : 1
 Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Net Peak Area	Net Area Uncertainty	Continuum Counts	Critical Level
	1	31.29	29 - 34	5.89E+01	53.37	5.14E+02	4.20E+01
M	2	75.16	72 - 82	1.95E+02	74.35	9.20E+02	4.99E+01
m	3	77.82	72 - 82	3.10E+02	75.58	8.36E+02	4.75E+01
	4	93.08	90 - 97	3.12E+02	92.07	1.16E+03	6.99E+01
	5	186.31	182 - 191	1.87E+02	82.02	8.51E+02	6.36E+01
M	6	238.94	234 - 246	5.34E+02	60.30	3.17E+02	2.93E+01
m	7	242.03	234 - 246	1.24E+02	50.91	2.92E+02	2.81E+01
	8	278.01	275 - 283	4.53E+01	53.28	3.97E+02	4.24E+01
M	9	295.69	290 - 304	2.28E+02	45.78	2.90E+02	2.80E+01
m	10	300.55	290 - 304	4.48E+01	42.33	2.99E+02	2.84E+01
	11	328.36	325 - 332	5.15E+01	46.30	3.21E+02	3.62E+01
	12	338.66	335 - 342	1.18E+02	48.62	3.14E+02	3.58E+01
	13	352.21	347 - 357	4.04E+02	68.03	4.03E+02	4.51E+01

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

	Peak No.	Energy (keV)	ROI start	ROI end	Net Peak Area	Net Area Uncertainty	Continuum Counts	Critical Level
	14	441.08	437 -	445	4.04E+01	36.47	1.79E+02	2.81E+01
	15	463.80	461 -	467	5.86E+01	32.54	1.49E+02	2.36E+01
M	16	470.98	468 -	483	2.69E+01	25.40	1.11E+02	1.73E+01
m	17	477.04	468 -	483	2.21E+01	24.92	9.43E+01	1.60E+01
	18	503.10	498 -	506	3.10E+01	35.12	1.70E+02	2.74E+01
	19	511.45	508 -	516	1.25E+02	43.03	2.11E+02	3.02E+01
	20	583.69	579 -	589	1.87E+02	48.18	2.11E+02	3.26E+01
	21	609.86	605 -	614	2.92E+02	51.00	2.05E+02	3.11E+01
	22	642.00	637 -	646	3.42E+01	33.84	1.42E+02	2.61E+01
	23	662.02	658 -	666	4.75E+01	38.04	1.93E+02	2.91E+01
	24	727.24	723 -	731	3.65E+01	33.77	1.53E+02	2.59E+01
	25	770.86	767 -	774	3.99E+01	24.17	6.81E+01	1.69E+01
	26	796.04	792 -	801	3.79E+01	25.98	7.42E+01	1.88E+01
	27	809.81	803 -	820	5.00E+01	42.24	1.44E+02	3.27E+01
	28	861.41	858 -	864	2.20E+01	23.45	8.40E+01	1.77E+01
	29	912.12	908 -	917	8.40E+01	41.17	1.92E+02	3.03E+01
	30	934.63	932 -	938	1.55E+01	19.29	5.71E+01	1.45E+01
M	31	969.83	963 -	984	6.58E+01	23.21	4.08E+01	1.05E+01
m	32	977.85	963 -	984	1.81E+01	16.34	1.93E+01	7.23E+00
	33	1120.78	1117 -	1125	7.08E+01	30.02	9.64E+01	2.04E+01
	34	1238.23	1234 -	1243	2.73E+01	31.13	1.17E+02	2.41E+01
M	35	1265.19	1262 -	1273	1.67E+01	15.56	3.29E+01	9.44E+00
m	36	1271.08	1262 -	1273	1.52E+01	12.66	2.09E+01	7.52E+00
	37	1280.35	1275 -	1285	2.21E+01	25.00	7.17E+01	1.90E+01
	38	1301.31	1297 -	1304	1.60E+01	16.00	3.20E+01	1.14E+01
	39	1333.55	1331 -	1337	2.30E+01	15.68	2.80E+01	1.02E+01
	40	1378.29	1374 -	1382	2.60E+01	17.26	2.60E+01	1.14E+01
	41	1394.16	1383 -	1405	6.13E+01	20.01	1.14E+01	1.02E+01
	42	1408.63	1406 -	1411	1.10E+01	8.60	6.00E+00	4.50E+00
M	43	1461.70	1456 -	1470	6.08E+02	50.93	3.19E+01	9.28E+00
m	44	1467.84	1456 -	1470	9.45E+00	9.81	2.00E+01	7.36E+00
	45	1477.71	1475 -	1480	1.17E+01	10.20	1.06E+01	6.22E+00
	46	1496.44	1491 -	1500	1.01E+01	13.42	1.97E+01	9.71E+00
	47	1589.08	1587 -	1593	1.41E+01	14.06	2.79E+01	9.78E+00
	48	1765.26	1760 -	1771	5.86E+01	19.49	1.88E+01	9.92E+00
	49	1923.02	1919 -	1926	8.50E+00	11.31	1.50E+01	7.97E+00
	50	2104.96	2100 -	2108	7.50E+00	9.41	9.00E+00	6.29E+00
	51	2167.66	2163 -	2171	1.00E+01	6.32	0.00E+00	0.00E+00
	52	2204.70	2200 -	2208	9.75E+00	8.26	4.50E+00	4.45E+00
	53	2265.89	2262 -	2268	7.36E+00	8.28	7.27E+00	5.14E+00
	54	2275.75	2273 -	2278	4.58E+00	5.74	2.83E+00	3.15E+00
	55	2615.78	2612 -	2620	7.91E+01	18.55	3.86E+00	4.35E+00

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

PEAK WITH NID REPORT

Peak Analysis Performed on : 5/21/2014 9:23:04AM

Peak Analysis From Channel : 1

Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Peak Match Tolerance : 1.000 keV

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	Tentative Nuclide
	1	29 -	34	31.39	5.89E+01	53.37	5.14E+02	.....
M	2	72 -	82	75.27	1.95E+02	74.35	9.20E+02	AM-243
m	3	72 -	82	77.93	3.10E+02	75.58	8.36E+02	TI-44
	4	90 -	97	93.19	3.12E+02	92.07	1.16E+03	GA-67
	5	182 -	191	186.43	1.87E+02	82.02	8.51E+02	RA-226
M	6	234 -	246	239.06	5.34E+02	60.30	3.17E+02	PB-212
m	7	234 -	246	242.15	1.24E+02	50.91	2.92E+02	.....
	8	275 -	283	278.13	4.53E+01	53.28	3.97E+02	CM-243
								NP-239
M	9	290 -	304	295.81	2.28E+02	45.78	2.90E+02	PB-214
m	10	290 -	304	300.67	4.48E+01	42.33	2.99E+02	GA-67
								PB-212
								BI-210M
	11	325 -	332	328.49	5.15E+01	46.30	3.21E+02	LA-140
	12	335 -	342	338.79	1.18E+02	48.62	3.14E+02	AC-228
	13	347 -	357	352.34	4.04E+02	68.03	4.03E+02	PB-214
	14	437 -	445	441.21	4.04E+01	36.47	1.79E+02	.....
	15	461 -	467	463.93	5.86E+01	32.54	1.49E+02	SB-125
M	16	468 -	483	471.12	2.69E+01	25.40	1.11E+02	.....
m	17	468 -	483	477.17	2.21E+01	24.92	9.43E+01	PM-144
								BE-7
	18	498 -	506	503.23	3.10E+01	35.12	1.70E+02	.....
	19	508 -	516	511.58	1.25E+02	43.03	2.11E+02	.....
	20	579 -	589	583.83	1.87E+02	48.18	2.11E+02	TL-208
	21	605 -	614	610.00	2.92E+02	51.00	2.05E+02	BI-214
	22	637 -	646	642.15	3.42E+01	33.84	1.42E+02	.....
	23	658 -	666	662.16	4.75E+01	38.04	1.93E+02	CS-137
	24	723 -	731	727.38	3.65E+01	33.77	1.53E+02	BI-212
	25	767 -	774	771.01	3.99E+01	24.17	6.81E+01	.....
	26	792 -	801	796.19	3.79E+01	25.98	7.42E+01	CS-134
	27	803 -	820	809.96	5.00E+01	42.24	1.44E+02	LU-172
								CO-58
	28	858 -	864	861.56	2.20E+01	23.45	8.40E+01	.....
	29	908 -	917	912.28	8.40E+01	41.17	1.92E+02	LU-172
	30	932 -	938	934.78	1.55E+01	19.29	5.71E+01	.....
M	31	963 -	984	969.99	6.58E+01	23.21	4.08E+01	AC-228
m	32	963 -	984	978.00	1.81E+01	16.34	1.93E+01	.....
	33	1117 -	1125	1120.93	7.08E+01	30.02	9.64E+01	SC-46

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	Tentative Nuclide
								BI-214
								TA-182
								CO-56
M	34	1238.23	1234 - 1243	1238.39	2.73E+01	31.13	1.17E+02	.....
m	35	1265.19	1262 - 1273	1265.34	1.67E+01	15.56	3.29E+01	.....
m	36	1271.08	1262 - 1273	1271.24	1.52E+01	12.66	2.09E+01	.....
	37	1280.35	1275 - 1285	1280.51	2.21E+01	25.00	7.17E+01	.....
	38	1301.31	1297 - 1304	1301.47	1.60E+01	16.00	3.20E+01	.....
	39	1333.55	1331 - 1337	1333.71	2.30E+01	15.68	2.80E+01	.....
	40	1378.29	1374 - 1382	1378.45	2.60E+01	17.26	2.60E+01	.....
	41	1394.16	1383 - 1405	1394.32	6.13E+01	20.01	1.14E+01	.....
	42	1408.63	1406 - 1411	1408.79	1.10E+01	8.60	6.00E+00	EU-152
M	43	1461.70	1456 - 1470	1461.86	6.08E+02	50.93	3.19E+01	K-40
m	44	1467.84	1456 - 1470	1468.00	9.45E+00	9.81	2.00E+01	.....
	45	1477.71	1475 - 1480	1477.87	1.17E+01	10.20	1.06E+01	.....
	46	1496.44	1491 - 1500	1496.60	1.01E+01	13.42	1.97E+01	.....
	47	1589.08	1587 - 1593	1589.23	1.41E+01	14.06	2.79E+01	.....
	48	1765.26	1760 - 1771	1765.41	5.86E+01	19.49	1.88E+01	BI-214
	49	1923.02	1919 - 1926	1923.17	8.50E+00	11.31	1.50E+01	.....
	50	2104.96	2100 - 2108	2105.11	7.50E+00	9.41	9.00E+00	.....
	51	2167.66	2163 - 2171	2167.80	1.00E+01	6.32	0.00E+00	.....
	52	2204.70	2200 - 2208	2204.83	9.75E+00	8.26	4.50E+00	BI-214
	53	2265.89	2262 - 2268	2266.02	7.36E+00	8.28	7.27E+00	.....
	54	2275.75	2273 - 2278	2275.88	4.58E+00	5.74	2.83E+00	.....
	55	2615.78	2612 - 2620	2615.89	7.91E+01	18.55	3.86E+00	.....

M = First peak in a multiplet region
 m = Other peak in a multiplet region
 F = Fitted singlet
 Errors quoted at 2.000sigma

PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 5/21/2014 9:23:04AM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty
	1	5.89E+01	53.37	1.57E-02	1.84E-03
M	2	1.95E+02	74.35	2.74E-02	2.29E-03
m	3	3.10E+02	75.58	2.76E-02	2.37E-03
	4	3.12E+02	92.07	2.79E-02	2.67E-03
	5	1.87E+02	82.02	2.30E-02	1.90E-03
M	6	5.34E+02	60.30	2.01E-02	1.63E-03

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

	Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty
m	7	242.03	1.24E+02	50.91	1.99E-02	1.61E-03
	8	278.01	4.53E+01	53.28	1.82E-02	1.43E-03
M	9	295.69	2.28E+02	45.78	1.74E-02	1.44E-03
m	10	300.55	4.48E+01	42.33	1.72E-02	1.45E-03
	11	328.36	5.15E+01	46.30	1.62E-02	1.48E-03
	12	338.66	1.18E+02	48.62	1.58E-02	1.49E-03
	13	352.21	4.04E+02	68.03	1.54E-02	1.51E-03
	14	441.08	4.04E+01	36.47	1.29E-02	1.45E-03
	15	463.80	5.86E+01	32.54	1.24E-02	1.41E-03
M	16	470.98	2.69E+01	25.40	1.23E-02	1.39E-03
m	17	477.04	2.21E+01	24.92	1.21E-02	1.38E-03
	18	503.10	3.10E+01	35.12	1.16E-02	1.33E-03
	19	511.45	1.25E+02	43.03	1.15E-02	1.31E-03
	20	583.69	1.87E+02	48.18	1.03E-02	1.16E-03
	21	609.86	2.92E+02	51.00	9.94E-03	1.11E-03
	22	642.00	3.42E+01	33.84	9.53E-03	1.04E-03
	23	662.02	4.75E+01	38.04	9.29E-03	9.99E-04
	24	727.24	3.65E+01	33.77	8.60E-03	8.88E-04
	25	770.86	3.99E+01	24.17	8.20E-03	8.14E-04
	26	796.04	3.79E+01	25.98	7.99E-03	7.72E-04
	27	809.81	5.00E+01	42.24	7.88E-03	7.48E-04
	28	861.41	2.20E+01	23.45	7.50E-03	6.61E-04
	29	912.12	8.40E+01	41.17	7.16E-03	5.95E-04
	30	934.63	1.55E+01	19.29	7.02E-03	5.88E-04
M	31	969.83	6.58E+01	23.21	6.82E-03	5.78E-04
m	32	977.85	1.81E+01	16.34	6.78E-03	5.76E-04
	33	1120.78	7.08E+01	30.02	6.10E-03	5.33E-04
	34	1238.23	2.73E+01	31.13	5.67E-03	5.02E-04
M	35	1265.19	1.67E+01	15.56	5.58E-03	4.96E-04
m	36	1271.08	1.52E+01	12.66	5.56E-03	4.94E-04
	37	1280.35	2.21E+01	25.00	5.54E-03	4.92E-04
	38	1301.31	1.60E+01	16.00	5.47E-03	4.87E-04
	39	1333.55	2.30E+01	15.68	5.38E-03	4.80E-04
	40	1378.29	2.60E+01	17.26	5.26E-03	4.71E-04
	41	1394.16	6.13E+01	20.01	5.21E-03	4.68E-04
	42	1408.63	1.10E+01	8.60	5.18E-03	4.65E-04
M	43	1461.70	6.08E+02	50.93	5.05E-03	4.54E-04
m	44	1467.84	9.45E+00	9.81	5.03E-03	4.53E-04
	45	1477.71	1.17E+01	10.20	5.01E-03	4.51E-04
	46	1496.44	1.01E+01	13.42	4.97E-03	4.47E-04
	47	1589.08	1.41E+01	14.06	4.78E-03	4.29E-04
	48	1765.26	5.86E+01	19.49	4.48E-03	3.94E-04
	49	1923.02	8.50E+00	11.31	4.26E-03	3.80E-04
	50	2104.96	7.50E+00	9.41	4.06E-03	3.80E-04
	51	2167.66	1.00E+01	6.32	4.00E-03	3.80E-04
	52	2204.70	9.75E+00	8.26	3.97E-03	3.80E-04
	53	2265.89	7.36E+00	8.28	3.92E-03	3.80E-04
	54	2275.75	4.58E+00	5.74	3.91E-03	3.80E-04
	55	2615.78	7.91E+01	18.55	3.68E-03	3.80E-04

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

M = First peak in a multiplet region
 m = Other peak in a multiplet region
 F = Fitted singlet
 Errors quoted at 2.000 sigma

BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 5/21/2014 9:23:04AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000007617.CNF

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
	1	31.29	5.89E+01	53.37			5.89E+01	5.34E+01
M	2	75.16	1.95E+02	74.35			1.95E+02	7.44E+01
m	3	77.82	3.10E+02	75.58	1.09E+01	8.37E+00	2.99E+02	7.60E+01
	4	93.08	3.12E+02	92.07	1.32E+02	2.91E+01	1.80E+02	9.66E+01
	5	186.31	1.87E+02	82.02	5.94E+01	8.16E+00	1.28E+02	8.24E+01
M	6	238.94	5.34E+02	60.30	1.72E+01	6.24E+00	5.16E+02	6.06E+01
m	7	242.03	1.24E+02	50.91			1.24E+02	5.09E+01
	8	278.01	4.53E+01	53.28			4.53E+01	5.33E+01
M	9	295.69	2.28E+02	45.78			2.28E+02	4.58E+01
m	10	300.55	4.48E+01	42.33			4.48E+01	4.23E+01
	11	328.36	5.15E+01	46.30			5.15E+01	4.63E+01
	12	338.66	1.18E+02	48.62			1.18E+02	4.86E+01
	13	352.21	4.04E+02	68.03	1.11E+01	4.49E+00	3.93E+02	6.82E+01
	14	441.08	4.04E+01	36.47			4.04E+01	3.65E+01
	15	463.80	5.86E+01	32.54			5.86E+01	3.25E+01
M	16	470.98	2.69E+01	25.40			2.69E+01	2.54E+01
m	17	477.04	2.21E+01	24.92			2.21E+01	2.49E+01
	18	503.10	3.10E+01	35.12			3.10E+01	3.51E+01
	19	511.45	1.25E+02	43.03	8.78E+01	5.42E+00	3.68E+01	4.34E+01
	20	583.69	1.87E+02	48.18	9.14E+00	3.61E+00	1.78E+02	4.83E+01
	21	609.86	2.92E+02	51.00	6.12E+00	3.28E+00	2.86E+02	5.11E+01
	22	642.00	3.42E+01	33.84			3.42E+01	3.38E+01
	23	662.02	4.75E+01	38.04	3.30E+00	3.41E+00	4.42E+01	3.82E+01
	24	727.24	3.65E+01	33.77			3.65E+01	3.38E+01
	25	770.86	3.99E+01	24.17			3.99E+01	2.42E+01
	26	796.04	3.79E+01	25.98			3.79E+01	2.60E+01
	27	809.81	5.00E+01	42.24			5.00E+01	4.22E+01
	28	861.41	2.20E+01	23.45			2.20E+01	2.35E+01
	29	912.12	8.40E+01	41.17	4.41E+00	3.09E+00	7.96E+01	4.13E+01
	30	934.63	1.55E+01	19.29			1.55E+01	1.93E+01
M	31	969.83	6.58E+01	23.21	1.52E+00	3.02E+00	6.43E+01	2.34E+01
m	32	977.85	1.81E+01	16.34			1.81E+01	1.63E+01
	33	1120.78	7.08E+01	30.02	3.90E+00	2.61E+00	6.69E+01	3.01E+01
	34	1238.23	2.73E+01	31.13			2.73E+01	3.11E+01
M	35	1265.19	1.67E+01	15.56			1.67E+01	1.56E+01

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
m	36	1271.08	1.52E+01	12.66			1.52E+01	1.27E+01
	37	1280.35	2.21E+01	25.00			2.21E+01	2.50E+01
	38	1301.31	1.60E+01	16.00			1.60E+01	1.60E+01
	39	1333.55	2.30E+01	15.68			2.30E+01	1.57E+01
	40	1378.29	2.60E+01	17.26			2.60E+01	1.73E+01
	41	1394.16	6.13E+01	20.01			6.13E+01	2.00E+01
	42	1408.63	1.10E+01	8.60			1.10E+01	8.60E+00
M	43	1461.70	6.08E+02	50.93	6.79E+00	2.40E+00	6.01E+02	5.10E+01
m	44	1467.84	9.45E+00	9.81			9.45E+00	9.81E+00
	45	1477.71	1.17E+01	10.20			1.17E+01	1.02E+01
	46	1496.44	1.01E+01	13.42			1.01E+01	1.34E+01
	47	1589.08	1.41E+01	14.06			1.41E+01	1.41E+01
	48	1765.26	5.86E+01	19.49	1.87E+00	1.45E+00	5.67E+01	1.95E+01
	49	1923.02	8.50E+00	11.31			8.50E+00	1.13E+01
	50	2104.96	7.50E+00	9.41			7.50E+00	9.41E+00
	51	2167.66	1.00E+01	6.32			1.00E+01	6.32E+00
	52	2204.70	9.75E+00	8.26			9.75E+00	8.26E+00
	53	2265.89	7.36E+00	8.28			7.36E+00	8.28E+00
	54	2275.75	4.58E+00	5.74			4.58E+00	5.74E+00
	55	2615.78	7.91E+01	18.55	4.19E+00	1.57E+00	7.49E+01	1.86E+01

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

AREA CORRECTION REPORT REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 5/21/2014 9:23:04AM
Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000007617.CNF

Corrected Area is: Original * Peak Ratio - Background

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Corrected Area	Corrected Uncert.
	1	31.29	5.89E+01	53.37			5.89E+01	5.34E+01
M	2	75.16	1.95E+02	74.35			1.95E+02	7.44E+01
m	3	77.82	3.10E+02	75.58	1.09E+01	8.37E+00	2.99E+02	7.60E+01
	4	93.08	3.12E+02	92.07	1.32E+02	2.91E+01	1.80E+02	9.66E+01
	5	186.31	1.87E+02	82.02	5.94E+01	8.16E+00	1.28E+02	8.24E+01
M	6	238.94	5.34E+02	60.30	1.72E+01	6.24E+00	5.16E+02	6.06E+01
m	7	242.03	1.24E+02	50.91			1.24E+02	5.09E+01
	8	278.01	4.53E+01	53.28			4.53E+01	5.33E+01

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Corrected Area	Corrected Uncert.
M	9	295.69	2.28E+02	45.78			2.28E+02	4.58E+01
m	10	300.55	4.48E+01	42.33			4.48E+01	4.23E+01
	11	328.36	5.15E+01	46.30			5.15E+01	4.63E+01
	12	338.66	1.18E+02	48.62			1.18E+02	4.86E+01
	13	352.21	4.04E+02	68.03	1.11E+01	4.49E+00	3.93E+02	6.82E+01
	14	441.08	4.04E+01	36.47			4.04E+01	3.65E+01
	15	463.80	5.86E+01	32.54			5.86E+01	3.25E+01
M	16	470.98	2.69E+01	25.40			2.69E+01	2.54E+01
m	17	477.04	2.21E+01	24.92			2.21E+01	2.49E+01
	18	503.10	3.10E+01	35.12			3.10E+01	3.51E+01
	19	511.45	1.25E+02	43.03	8.78E+01	5.42E+00	3.68E+01	4.34E+01
	20	583.69	1.87E+02	48.18	9.14E+00	3.61E+00	1.78E+02	4.83E+01
	21	609.86	2.92E+02	51.00	6.12E+00	3.28E+00	2.86E+02	5.11E+01
	22	642.00	3.42E+01	33.84			3.42E+01	3.38E+01
	23	662.02	4.75E+01	38.04	3.30E+00	3.41E+00	4.42E+01	3.82E+01
	24	727.24	3.65E+01	33.77			3.65E+01	3.38E+01
	25	770.86	3.99E+01	24.17			3.99E+01	2.42E+01
	26	796.04	3.79E+01	25.98			3.79E+01	2.60E+01
	27	809.81	5.00E+01	42.24			5.00E+01	4.22E+01
	28	861.41	2.20E+01	23.45			2.20E+01	2.35E+01
	29	912.12	8.40E+01	41.17	4.41E+00	3.09E+00	7.96E+01	4.13E+01
	30	934.63	1.55E+01	19.29			1.55E+01	1.93E+01
M	31	969.83	6.58E+01	23.21	1.52E+00	3.02E+00	6.43E+01	2.34E+01
m	32	977.85	1.81E+01	16.34			1.81E+01	1.63E+01
	33	1120.78	7.08E+01	30.02	3.90E+00	2.61E+00	6.69E+01	3.01E+01
	34	1238.23	2.73E+01	31.13			2.73E+01	3.11E+01
M	35	1265.19	1.67E+01	15.56			1.67E+01	1.56E+01
m	36	1271.08	1.52E+01	12.66			1.52E+01	1.27E+01
	37	1280.35	2.21E+01	25.00			2.21E+01	2.50E+01
	38	1301.31	1.60E+01	16.00			1.60E+01	1.60E+01
	39	1333.55	2.30E+01	15.68			2.30E+01	1.57E+01
	40	1378.29	2.60E+01	17.26			2.60E+01	1.73E+01
	41	1394.16	6.13E+01	20.01			6.13E+01	2.00E+01
	42	1408.63	1.10E+01	8.60			1.10E+01	8.60E+00
M	43	1461.70	6.08E+02	50.93	6.79E+00	2.40E+00	6.01E+02	5.10E+01
m	44	1467.84	9.45E+00	9.81			9.45E+00	9.81E+00
	45	1477.71	1.17E+01	10.20			1.17E+01	1.02E+01
	46	1496.44	1.01E+01	13.42			1.01E+01	1.34E+01
	47	1589.08	1.41E+01	14.06			1.41E+01	1.41E+01
	48	1765.26	5.86E+01	19.49	1.87E+00	1.45E+00	5.67E+01	1.95E+01
	49	1923.02	8.50E+00	11.31			8.50E+00	1.13E+01
	50	2104.96	7.50E+00	9.41			7.50E+00	9.41E+00
	51	2167.66	1.00E+01	6.32			1.00E+01	6.32E+00
	52	2204.70	9.75E+00	8.26			9.75E+00	8.26E+00
	53	2265.89	7.36E+00	8.28			7.36E+00	8.28E+00
	54	2275.75	4.58E+00	5.74			4.58E+00	5.74E+00
	55	2615.78	7.91E+01	18.55	4.19E+00	1.57E+00	7.49E+01	1.86E+01

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield(%)	Activity (pCi/grams)	Activity Uncertainty
BE-7	0.952	477.59 *	10.42	1.79E-01	2.03E-01
K-40	0.881	1460.81 *	10.67	1.07E+01	1.34E+00
CO-58	0.867	810.76 *	99.40	6.44E-02	5.48E-02
GA-67	0.916	93.31 *	35.70	5.07E-01	7.12E-01
		208.95	2.24		
		300.22 *	16.00	4.54E-01	7.30E-01
CS-137	0.979	661.65 *	85.12	5.37E-02	4.68E-02
BI-212	0.764	727.17 *	11.80	3.45E-01	3.22E-01
		1620.62	2.75		
PB-212	0.984	238.63 *	44.60	5.54E-01	7.92E-02
		300.09 *	3.41	7.32E-01	6.94E-01
BI-214	0.947	609.31 *	46.30	5.96E-01	1.26E-01
		1120.29 *	15.10	6.97E-01	3.20E-01
		1764.49 *	15.80	7.70E-01	2.74E-01
		2204.22 *	4.98	4.74E-01	4.04E-01
PB-214	0.979	295.21 *	19.19	6.55E-01	1.42E-01
		351.92 *	37.19	6.59E-01	1.32E-01
RA-226	0.998	186.21 *	3.28	1.63E+00	3.16E+00
AM-243	0.962	74.67 *	66.00	1.03E-01	4.04E-02

* = Energy line found in the spectrum.

- = Manually added nuclide.

? = Manually edited nuclide.

Energy Tolerance : 1.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 2.000sigma

UNIDENTIFIED PEAKS

Peak Locate Performed on : 5/21/2014 9:23:04AM
 Peak Locate From Channel : 1
 Peak Locate To Channel : 4096

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

	Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
	1	31.29	1.63608E-02	45.30		
m	3	77.82	8.31279E-02	12.71	Tol.	TI-44
m	7	242.03	3.44231E-02	20.54		
	8	278.01	1.25729E-02	58.86	Tol.	NP-239 CM-243
	11	328.36	1.43180E-02	44.92	Tol.	LA-140
	12	338.66	3.27980E-02	20.59	Tol.	AC-228
	14	441.08	1.12244E-02	45.13		
	15	463.80	1.62845E-02	27.75	Tol.	SB-125
M	16	470.98	7.46847E-03	47.23		
	18	503.10	8.61590E-03	56.62		
	19	511.45	1.02268E-02	58.90		
	20	583.69	4.95292E-02	13.55	Tol.	TL-208
	22	642.00	9.50926E-03	49.42		
	25	770.86	1.10961E-02	30.25		
	26	796.04	1.05296E-02	34.27	Sum	
	28	861.41	6.11111E-03	53.30		
	29	912.12	2.21123E-02	25.93	Tol.	LU-172
	30	934.63	4.29293E-03	62.40		
M	31	969.83	1.78518E-02	18.21	Tol.	AC-228
m	32	977.85	5.02109E-03	45.20		
	34	1238.23	7.59044E-03	56.96	Tol.	CO-56
M	35	1265.19	4.64361E-03	46.55		
m	36	1271.08	4.21154E-03	41.75	Sum	
	37	1280.35	6.14943E-03	56.48		
	38	1301.31	4.44444E-03	50.00		
	39	1333.55	6.38889E-03	34.10		
	40	1378.29	7.21866E-03	33.20		
	41	1394.16	1.70211E-02	16.32		
	42	1408.63	3.05556E-03	39.10	Tol.	EU-152
m	44	1467.84	2.62526E-03	51.90		
	45	1477.71	3.25163E-03	43.56		
	46	1496.44	2.81944E-03	66.09		
	47	1589.08	3.90377E-03	50.03		
	49	1923.02	2.36111E-03	66.55		
	50	2104.96	2.08333E-03	62.72		
	51	2167.66	2.77778E-03	31.62		
	53	2265.89	2.04545E-03	56.20		
	54	2275.75	1.27315E-03	62.67		
	55	2615.78	2.07993E-02	12.43		

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000sigma

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)		Yield(%)	Activity (pCi/grams)	Activity Uncertainty
BE-7	0.95	477.59	*	10.42	1.79E-01	2.03E-01
K-40	0.88	1460.81	*	10.67	1.07E+01	1.34E+00
CO-58	0.86	810.76	*	99.40	6.44E-02	5.48E-02
GA-67	0.91	93.31	*	35.70	5.07E-01	7.12E-01
		208.95		2.24		
		300.22	*	16.00	4.54E-01	7.30E-01
CS-137	0.97	661.65	*	85.12	5.37E-02	4.68E-02
BI-212	0.76	727.17	*	11.80	3.45E-01	3.22E-01
		1620.62		2.75		
PB-212	0.98	238.63	*	44.60	5.54E-01	7.92E-02
		300.09	*	3.41	7.32E-01	6.94E-01
BI-214	0.94	609.31	*	46.30	5.96E-01	1.26E-01
		1120.29	*	15.10	6.97E-01	3.20E-01
		1764.49	*	15.80	7.70E-01	2.74E-01
		2204.22	*	4.98	4.74E-01	4.04E-01
PB-214	0.97	295.21	*	19.19	6.55E-01	1.42E-01
		351.92	*	37.19	6.59E-01	1.32E-01
RA-226	0.99	186.21	*	3.28	1.63E+00	3.16E+00
AM-243	0.96	74.67	*	66.00	1.03E-01	4.04E-02

* = Energy line found in the spectrum.

- = Manually added nuclide.

? = Manually edited nuclide.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 1.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 2.000sigma

INTERFERENCE CORRECTED REPORT

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/grams)	Wt mean Activity Uncertainty	Comments
BE-7	0.952	1.79E-01	2.03E-01	
K-40	0.881	1.07E+01	1.34E+00	
CO-58	0.867	6.44E-02	5.48E-02	
GA-67	0.916	3.92E-01	3.46E-01	
CS-137	0.979	5.37E-02	4.68E-02	
BI-212	0.764	3.45E-01	3.22E-01	
PB-212	0.984	5.48E-01	7.88E-02	
BI-214	0.947	6.24E-01	1.04E-01	
PB-214	0.979	6.58E-01	9.65E-02	
RA-226	0.998	1.63E+00	3.16E+00	
AM-243	0.962	1.03E-01	4.04E-02	

- ? = 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 2.000sigma

Analysis Report for 1405081-03
 J1TLD8 SAF: RC-189

UNIDENTIFIED PEAKS

Peak Locate Performed on : 5/21/2014 9:23:04AM
 Peak Locate From Channel : 1
 Peak Locate To Channel : 4096

Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
	1	31.29	1.63608E-02	45.30	
m	3	77.82	8.31279E-02	12.71	Tol. TI-44
m	7	242.03	3.44231E-02	20.54	
	8	278.01	1.25729E-02	58.86	Tol. NP-239 CM-243
	11	328.36	1.43180E-02	44.92	Tol. LA-140
	12	338.66	3.27980E-02	20.59	Tol. AC-228
	14	441.08	1.12244E-02	45.13	
	15	463.80	1.62845E-02	27.75	Tol. SB-125
M	16	470.98	7.46847E-03	47.23	
	18	503.10	8.61590E-03	56.62	
	19	511.45	1.02268E-02	58.90	
	20	583.69	4.95292E-02	13.55	Tol. TL-208
	22	642.00	9.50926E-03	49.42	
	25	770.86	1.10961E-02	30.25	
	26	796.04	1.05296E-02	34.27	Sum
	28	861.41	6.11111E-03	53.30	
	29	912.12	2.21123E-02	25.93	Tol. LU-172
	30	934.63	4.29293E-03	62.40	
M	31	969.83	1.78518E-02	18.21	Tol. AC-228
m	32	977.85	5.02109E-03	45.20	
	34	1238.23	7.59044E-03	56.96	Tol. CO-56
M	35	1265.19	4.64361E-03	46.55	
m	36	1271.08	4.21154E-03	41.75	Sum
	37	1280.35	6.14943E-03	56.48	
	38	1301.31	4.44444E-03	50.00	
	39	1333.55	6.38889E-03	34.10	
	40	1378.29	7.21866E-03	33.20	
	41	1394.16	1.70211E-02	16.32	
	42	1408.63	3.05556E-03	39.10	Tol. EU-152
m	44	1467.84	2.62526E-03	51.90	
	45	1477.71	3.25163E-03	43.56	
	46	1496.44	2.81944E-03	66.09	
	47	1589.08	3.90377E-03	50.03	
	49	1923.02	2.36111E-03	66.55	

Analysis Report for 1405081-03
 J1TLD8 SAF: RC-189

Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
50	2104.96	2.08333E-03	62.72		
51	2167.66	2.77778E-03	31.62		
53	2265.89	2.04545E-03	56.20		
54	2275.75	1.27315E-03	62.67		
55	2615.78	2.07993E-02	12.43		

M = First peak in a multiplet region
 m = Other peak in a multiplet region
 F = Fitted singlet
 Errors quoted at 2.000sigma

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	BE-7	477.59	*	10.42	1.79E-01	6.61E-01
+	NA-22	1274.54		99.94	-3.62E-02	4.59E-02
+	NA-24	1368.53		99.99	-5.70E+00	7.53E+00
		2754.09		99.86	0.00E+00	7.53E+00
+	AL-26	1808.65		99.76	-6.82E-03	2.62E-02
+	K-40	1460.81	*	10.67	1.07E+01	7.68E-01
+	AR-41	1293.64		99.16	1.43E+18	3.55E+18
+	TI-44	67.88		94.40	-3.06E-03	3.90E-02
		78.34		96.00	8.06E-02	5.09E-02
+	SC-46	889.25		99.98	2.90E-03	4.30E-02
		1120.51		99.99	1.17E-01	8.41E-02
+	V-48	983.52		99.98	-8.11E-04	5.14E-02
		1312.10		97.50	-6.84E-03	5.95E-02
+	CR-51	320.08		9.83	5.65E-02	3.77E-01
+	MN-54	834.83		99.97	-1.39E-02	4.29E-02
+	CO-56	846.75		99.96	9.73E-03	4.44E-02
		1037.75		14.03	-2.20E-02	3.83E-01
		1238.25		67.00	1.16E-01	1.14E-01
		1771.40		15.51	1.45E-02	2.63E-01
		2598.48		16.90	-8.94E-03	1.73E-01
+	CO-57	122.06		85.51	-5.23E-02	3.39E-02
		136.48		10.60	5.73E-02	2.97E-01
+	CO-58	810.76	*	99.40	6.44E-02	8.78E-02
+	FE-59	1099.22		56.50	-2.01E-02	8.49E-02

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
	FE-59	1291.56	43.20	7.65E-02	8.49E-02	1.30E-01
+	CO-60	1173.22	100.00	-2.64E-02	5.59E-02	5.59E-02
		1332.49	100.00	2.75E-02		5.61E-02
+	ZN-65	1115.52	50.75	4.63E-03	1.01E-01	1.01E-01
+	GA-67	93.31	* 35.70	5.07E-01	4.36E-01	4.36E-01
		208.95	2.24	3.00E+00		4.41E+00
		300.22	* 16.00	4.54E-01		1.41E+00
+	SE-75	121.11	16.70	1.43E-01	5.38E-02	1.87E-01
		136.00	59.20	9.73E-03		5.51E-02
		264.65	59.80	1.88E-02		5.38E-02
		279.53	25.20	5.78E-02		1.24E-01
		400.65	11.40	1.06E-01		3.01E-01
+	RB-82	776.52	13.00	-1.46E-01	3.26E-01	3.26E-01
+	RB-83	520.41	46.00	2.32E-02	9.14E-02	9.14E-02
		529.64	30.30	4.79E-02		1.34E-01
		552.65	16.40	1.08E-01		2.65E-01
+	KR-85	513.99	0.43	1.50E+01	1.30E+01	1.30E+01
+	SR-85	513.99	99.27	6.94E-02	5.98E-02	5.98E-02
+	Y-88	898.02	93.40	-1.63E-04	4.14E-02	4.97E-02
		1836.01	99.38	4.56E-03		4.14E-02
+	NB-93M	16.57	9.43	-9.29E-01	6.76E-01	6.76E-01
+	NB-94	702.63	100.00	-1.96E-02	4.01E-02	4.01E-02
		871.10	100.00	-1.79E-02		4.47E-02
+	NB-95	765.79	99.81	7.03E-03	4.80E-02	4.80E-02
+	NB-95M	235.69	25.00	-2.65E+00	3.70E-01	3.70E-01
+	ZR-95	724.18	43.70	-1.41E-02	7.92E-02	1.11E-01
		756.72	55.30	1.37E-02		7.92E-02
+	MO-99	181.06	6.20	4.29E-01	1.16E+00	1.78E+00
		739.58	12.80	-3.05E-01		1.16E+00
		778.00	4.50	-1.50E+00		3.05E+00
+	RU-103	497.08	89.00	-4.72E-03	4.55E-02	4.55E-02
+	RU-106	621.84	9.80	1.42E-01	4.46E-01	4.46E-01
+	AG-108M	433.93	89.90	1.92E-02	4.02E-02	4.02E-02
		614.37	90.40	-1.11E-02		4.33E-02
		722.95	90.50	-4.96E-03		4.94E-02
+	CD-109	88.03	3.72	5.52E-01	1.06E+00	1.06E+00
+	AG-110M	657.75	93.14	-1.48E-02	4.84E-02	4.84E-02
		677.61	10.53	-2.23E-02		3.93E-01
		706.67	16.46	1.31E-01		2.68E-01
		763.93	21.98	4.84E-02		1.94E-01
		884.67	71.63	3.04E-02		6.41E-02
		1384.27	23.94	-1.77E-01		1.66E-01
+	CD-113M	263.70	0.02	-6.29E+01	1.27E+02	1.27E+02
+	SN-113	255.12	1.93	-5.21E-01	4.85E-02	1.57E+00
		391.69	64.90	-1.63E-02		4.85E-02
+	TE123M	159.00	84.10	-1.10E-03	3.79E-02	3.79E-02
+	SB-124	602.71	97.87	2.75E-03	4.31E-02	4.31E-02
		645.85	7.26	-1.12E-01		5.86E-01

Analysis Report for 1405081-03

J11TLD8 SAF: RC-189

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
	SB-124	722.78	11.10	-4.29E-02	4.31E-02	4.27E-01
		1691.02	49.00	-2.37E-02		5.43E-02
+	I-125	35.49	6.49	2.67E-01	6.35E-01	6.35E-01
+	SB-125	176.33	6.89	-2.63E-01	1.31E-01	4.45E-01
		427.89	29.33	6.66E-02		1.31E-01
		463.38	10.35	4.50E-01		4.22E-01
		600.56	17.80	6.75E-02		2.30E-01
		635.90	11.32	-3.13E-02		3.49E-01
+	SB-126	414.70	83.30	-7.57E-03	5.07E-02	5.07E-02
		666.33	99.60	1.18E-02		6.74E-02
		695.00	99.60	-2.47E-02		5.88E-02
		720.50	53.80	-2.02E-02		1.06E-01
+	SN-126	87.57	37.00	5.51E-02	1.06E-01	1.06E-01
+	SB-127	473.00	25.00	5.00E-02	2.78E-01	3.84E-01
		685.20	35.70	-1.50E-01		2.78E-01
		783.80	14.70	4.31E-01		8.19E-01
+	I-129	29.78	57.00	2.83E-02	9.14E-02	9.14E-02
		33.60	13.20	6.34E-02		3.25E-01
		39.58	7.52	9.14E-02		4.80E-01
+	I-131	284.30	6.05	1.69E-01	5.79E-02	7.27E-01
		364.48	81.20	-6.80E-04		5.79E-02
		636.97	7.26	-1.23E-01		8.11E-01
		722.89	1.80	-3.85E-01		3.83E+00
+	TE-132	49.72	13.10	-8.59E-01	1.04E-01	7.56E-01
		228.16	88.00	-2.51E-02		1.04E-01
+	BA-133	81.00	33.00	-4.13E-01	5.62E-02	1.05E-01
		302.84	17.80	7.97E-02		1.86E-01
		356.01	60.00	-2.60E-01		5.62E-02
+	I-133	529.87	86.30	8.97E-01	2.51E+00	2.51E+00
+	CS-134	563.23	8.38	-2.95E-03	4.48E-02	4.78E-01
		569.32	15.43	-3.32E-02		2.62E-01
		604.70	97.60	6.91E-03		4.48E-02
		795.84	85.40	3.03E-02		5.39E-02
		801.93	8.73	-2.78E-01		4.37E-01
+	CS-135	268.24	16.00	-2.45E-02	2.04E-01	2.04E-01
+	I-135	1131.51	22.50	7.91E+03	4.64E+04	7.30E+04
		1260.41	28.60	7.35E+03		4.64E+04
		1678.03	9.54	-3.70E+04		8.83E+04
+	CS-136	153.22	7.46	1.83E-01	5.10E-02	5.72E-01
		163.89	4.61	-2.90E-04		8.76E-01
		176.55	13.56	-3.12E-02		2.95E-01
		273.65	12.66	-1.23E-01		3.10E-01
		340.57	48.50	1.05E-01		1.07E-01
		818.50	99.70	-2.92E-04		5.10E-02
		1048.07	79.60	-1.89E-02		6.79E-02
		1235.34	19.70	-2.24E-03		4.56E-01
+	CS-137	661.65	* 85.12	5.37E-02	7.48E-02	7.48E-02
+	LA-138	788.74	34.00	-2.89E-03	6.23E-02	1.25E-01
		1435.80	66.00	-8.38E-05		6.23E-02

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	CE-139	165.85	80.35	3.46E-03	3.90E-02	3.90E-02
+	BA-140	162.64	6.70	-5.34E-02	1.99E-01	6.05E-01
		304.84	4.50	-1.53E-01		8.38E-01
		423.70	3.20	1.03E-01		1.56E+00
		437.55	2.00	4.65E-01		2.34E+00
		537.32	25.00	3.54E-02		1.99E-01
+	LA-140	328.77	20.50	1.92E-01	6.22E-02	2.28E-01
		487.03	45.50	4.92E-02		1.06E-01
		815.85	23.50	5.29E-02		2.25E-01
		1596.49	95.49	1.34E-02		6.22E-02
+	CE-141	145.44	48.40	4.32E-02	7.66E-02	7.66E-02
+	CE-143	57.36	11.80	-1.01E+00	1.10E+00	3.48E+00
		293.26	42.00	-1.96E+00		1.10E+00
		664.55	5.20	5.65E-01		1.34E+01
+	CE-144	133.54	10.80	-3.55E-03	2.92E-01	2.92E-01
+	PM-144	476.78	42.00	1.74E-03	4.05E-02	9.18E-02
		618.01	98.60	-1.30E-02		4.05E-02
		696.49	99.49	2.45E-02		4.67E-02
+	PM-145	36.85	21.70	5.24E-02	9.70E-02	1.80E-01
		37.36	39.70	2.83E-02		9.70E-02
		42.30	15.10	-1.27E-04		2.26E-01
		72.40	2.31	-1.56E+00		1.82E+00
+	PM-146	453.90	39.94	-4.96E-02	9.39E-02	9.39E-02
		735.90	14.01	-3.64E-02		3.05E-01
		747.13	13.10	1.94E-01		3.22E-01
+	ND-147	91.11	28.90	-3.32E-01	1.93E-01	1.93E-01
		531.02	13.10	9.61E-02		4.12E-01
+	PM-149	285.90	3.10	-1.08E+00	4.57E+00	4.57E+00
+	EU-152	121.78	20.50	-2.15E-01	1.40E-01	1.40E-01
		244.69	5.40	5.33E-02		6.40E-01
		344.27	19.13	-4.72E-02		1.55E-01
		778.89	9.20	7.85E-02		4.58E-01
		964.01	10.40	6.61E-02		5.06E-01
		1085.78	7.22	-2.29E-01		6.84E-01
		1112.02	9.60	2.07E-01		5.53E-01
		1407.95	14.94	-1.41E-01		2.50E-01
+	GD-153	97.43	31.30	1.51E-02	9.61E-02	9.61E-02
		103.18	22.20	-1.24E-01		1.34E-01
+	EU-154	123.07	40.50	4.95E-03	7.39E-02	7.39E-02
		723.30	19.70	-2.28E-02		2.27E-01
		873.19	11.50	-5.84E-02		3.90E-01
		996.32	10.30	2.99E-03		4.22E-01
		1004.76	17.90	1.27E-01		3.04E-01
		1274.45	35.50	-1.02E-01		1.29E-01
+	EU-155	86.50	30.90	7.45E-02	1.27E-01	1.27E-01
		105.30	20.70	3.45E-02		1.47E-01
+	EU-156	811.77	10.40	-7.24E-02	5.06E-01	5.06E-01
		1153.47	7.20	1.90E-01		9.62E-01
		1230.71	8.90	-9.00E-02		9.65E-01

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	HO-166M	184.41	72.60	7.93E-02	5.36E-02	5.36E-02
		280.45	29.60	-3.74E-02		9.55E-02
		410.94	11.10	4.99E-02		3.10E-01
		711.69	54.10	2.34E-03		7.35E-02
+	TM-171	66.72	0.14	-4.40E+01	2.65E+01	2.65E+01
+	HF-172	81.75	4.52	-8.64E-03	2.68E-01	7.63E-01
		125.81	11.30	-1.85E-01		2.68E-01
+	LU-172	181.53	20.60	3.92E-02	1.38E-01	2.50E-01
		810.06	16.63	3.36E-02		4.55E-01
		912.12	15.25	1.15E+00		8.80E-01
		1093.66	62.50	1.32E-02		1.38E-01
+	LU-173	100.72	5.24	2.20E-01	1.56E-01	5.84E-01
		272.11	21.20	3.82E-02		1.56E-01
+	HF-175	343.40	84.00	-1.13E-02	3.70E-02	3.70E-02
+	LU-176	88.34	13.30	1.53E-01	3.19E-02	2.94E-01
		201.83	86.00	5.91E-03		3.77E-02
		306.78	94.00	2.14E-03		3.19E-02
+	TA-182	67.75	41.20	-7.22E-03	9.21E-02	9.21E-02
		1121.30	34.90	3.31E-01		2.38E-01
		1189.05	16.23	8.82E-02		3.79E-01
		1221.41	26.98	2.48E-02		2.48E-01
		1231.02	11.44	-5.74E-02		6.16E-01
+	IR-192	308.46	29.68	-4.85E-03	8.40E-02	1.05E-01
		468.07	48.10	-9.85E-02		8.40E-02
+	HG-203	279.19	77.30	1.92E-02	4.32E-02	4.32E-02
+	BI-207	569.67	97.72	7.39E-03	4.12E-02	4.12E-02
		1063.62	74.90	-2.65E-02		5.69E-02
		583.14	30.22	5.31E-01		2.35E-01
+	TL-208	860.37	4.48	1.79E-03	2.35E-01	1.14E+00
		2614.66	35.85	5.73E-01		3.26E-01
		262.00	45.00	-1.40E-02		6.49E-02
+	BI-210M	300.00	23.00	-2.42E-01	6.49E-02	1.55E-01
		46.50	4.25	6.92E-01		8.82E-01
+	PB-210	404.84	2.90	-6.50E-01	1.05E+00	1.05E+00
+	PB-211	831.96	2.90	-8.89E-01	1.05E+00	1.50E+00
		727.17	* 11.80	3.45E-01		5.17E-01
+	BI-212	1620.62	2.75	-4.40E-01	5.17E-01	1.29E+00
		238.63	* 44.60	5.54E-01		1.40E-01
		300.09	* 3.41	7.32E-01		2.28E+00
+	BI-214	609.31	* 46.30	5.96E-01	1.37E-01	1.37E-01
		1120.29	* 15.10	6.97E-01		4.62E-01
		1764.49	* 15.80	7.70E-01		3.15E-01
		2204.22	* 4.98	4.74E-01		5.64E-01
		295.21	* 19.19	6.55E-01		1.58E-01
+	PB-214	351.92	* 37.19	6.59E-01	1.58E-01	1.58E-01
		401.80	6.50	2.32E-01		5.08E-01
+	RN-219	401.80	6.50	2.32E-01	5.08E-01	5.08E-01
+	RA-223	323.87	3.88	2.81E-01	8.50E-01	8.50E-01
+	RA-224	240.98	3.95	6.81E+00	1.61E+00	1.61E+00

Analysis Report for 1405081-03
 J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+ RA-225	40.00	31.00	2.78E-02	1.46E-01	1.46E-01
+ RA-226	186.21 *	3.28	1.63E+00	1.69E+00	1.69E+00
+ TH-227	50.10	8.40	-4.58E-01	3.07E-01	4.03E-01
	236.00	11.50	-2.20E+00		3.07E-01
	256.20	6.30	-1.70E-01		4.65E-01
+ AC-228	338.32	11.40	4.48E-01	2.89E-01	3.64E-01
	911.07	27.70	3.62E-01		2.89E-01
	969.11	16.60	5.56E-01		4.35E-01
+ TH-230	48.44	16.90	8.34E-02	2.19E-01	2.19E-01
	62.85	4.60	8.97E-01		8.68E-01
	67.67	0.37	-7.81E-01		9.95E+00
+ PA-231	283.67	1.60	4.13E-01	1.43E+00	1.78E+00
	302.67	2.30	6.16E-01		1.43E+00
+ TH-231	25.64	14.70	-5.78E-01	4.74E-01	4.74E-01
	84.21	6.40	-2.16E-01		5.42E-01
+ PA-233	311.98	38.60	-1.36E-02	9.01E-02	9.01E-02
+ PA-234	131.20	20.40	3.65E-03	1.57E-01	1.57E-01
	733.99	8.80	3.50E-02		4.84E-01
	946.00	12.00	-3.03E-02		3.57E-01
+ PA-234M	1001.03	0.92	-2.55E-01	5.48E+00	5.48E+00
+ TH-234	63.29	3.80	1.08E+00	1.05E+00	1.05E+00
+ U-235	143.76	10.50	-8.86E-02	3.11E-01	3.11E-01
	163.35	4.70	-5.80E-02		6.58E-01
	205.31	4.70	9.19E-02		6.76E-01
+ NP-237	86.50	12.60	1.82E-01	3.10E-01	3.10E-01
+ NP-239	106.10	22.70	2.64E-01	5.94E-01	5.94E-01
	228.18	10.70	-3.12E-01		1.29E+00
	277.60	14.10	4.97E-01		9.82E-01
+ AM-241	59.54	35.90	-1.05E-01	9.34E-02	9.34E-02
+ AM-243	74.67 *	66.00	1.03E-01	9.93E-02	9.93E-02
+ CM-243	209.75	3.29	6.64E-01	2.26E-01	1.03E+00
	228.14	10.60	-7.17E-02		2.96E-01
	277.60	14.00	1.14E-01		2.26E-01

- + = 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
 ? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
+ BE-7	477.59	* 10.42	6.61E-01	6.61E-01	1.79E-01	3.20E-01
NA-22	1274.54	99.94	4.59E-02	4.59E-02	-3.62E-02	2.06E-02
NA-24	1368.53	99.99	7.96E+00	7.53E+00	-5.70E+00	3.33E+00
	2754.09	99.86	7.53E+00		0.00E+00	2.82E+00
AL-26	1808.65	99.76	2.62E-02	2.62E-02	-6.82E-03	1.01E-02
+ K-40	1460.81	* 10.67	7.68E-01	7.68E-01	1.07E+01	3.60E-01
AR-41	1293.64	99.16	3.55E+18	3.55E+18	1.43E+18	1.60E+18
TI-44	67.88	94.40	3.90E-02	3.90E-02	-3.06E-03	1.90E-02
	78.34	96.00	5.09E-02		8.06E-02	2.50E-02
SC-46	889.25	99.98	4.30E-02	4.30E-02	2.90E-03	1.97E-02
	1120.51	99.99	8.41E-02		1.17E-01	3.98E-02
V-48	983.52	99.98	5.14E-02	5.14E-02	-8.11E-04	2.33E-02
	1312.10	97.50	5.95E-02		-6.84E-03	2.67E-02
CR-51	320.08	9.83	3.77E-01	3.77E-01	5.65E-02	1.80E-01
MN-54	834.83	99.97	4.29E-02	4.29E-02	-1.39E-02	1.97E-02
CO-56	846.75	99.96	4.44E-02	4.44E-02	9.73E-03	2.04E-02
	1037.75	14.03	3.83E-01		-2.20E-02	1.76E-01
	1238.25	67.00	1.14E-01		1.16E-01	5.32E-02
	1771.40	15.51	2.63E-01		1.45E-02	1.12E-01
	2598.48	16.90	1.73E-01		-8.94E-03	6.49E-02
CO-57	122.06	85.51	3.39E-02	3.39E-02	-5.23E-02	1.64E-02
	136.48	10.60	2.97E-01		5.73E-02	1.44E-01
+ CO-58	810.76	* 99.40	8.78E-02	8.78E-02	6.44E-02	4.22E-02
FE-59	1099.22	56.50	8.49E-02	8.49E-02	-2.01E-02	3.84E-02
	1291.56	43.20	1.30E-01		7.65E-02	5.93E-02
CO-60	1173.22	100.00	5.59E-02	5.59E-02	-2.64E-02	2.57E-02
	1332.49	100.00	5.61E-02		2.75E-02	2.56E-02
ZN-65	1115.52	50.75	1.01E-01	1.01E-01	4.63E-03	4.61E-02
+ GA-67	93.31	* 35.70	4.36E-01	4.36E-01	5.07E-01	2.14E-01
	208.95	2.24	4.41E+00		3.00E+00	2.13E+00
	300.22	* 16.00	1.41E+00		4.54E-01	6.92E-01
SE-75	121.11	16.70	1.87E-01	5.38E-02	1.43E-01	9.07E-02
	136.00	59.20	5.51E-02		9.73E-03	2.67E-02
	264.65	59.80	5.38E-02		1.88E-02	2.57E-02
	279.53	25.20	1.24E-01		5.78E-02	5.89E-02
	400.65	11.40	3.01E-01		1.06E-01	1.42E-01
RB-82	776.52	13.00	3.26E-01	3.26E-01	-1.46E-01	1.49E-01
RB-83	520.41	46.00	9.14E-02	9.14E-02	2.32E-02	4.31E-02
	529.64	30.30	1.34E-01		4.79E-02	6.31E-02
	552.65	16.40	2.65E-01		1.08E-01	1.25E-01
KR-85	513.99	0.43	1.30E+01	1.30E+01	1.50E+01	6.23E+00
SR-85	513.99	99.27	5.98E-02	5.98E-02	6.94E-02	2.87E-02
Y-88	898.02	93.40	4.97E-02	4.14E-02	-1.63E-04	2.29E-02
	1836.01	99.38	4.14E-02		4.56E-03	1.76E-02
NB-93M	16.57	9.43	6.76E-01	6.76E-01	-9.29E-01	3.14E-01

Analysis Report for 1405081-03
 J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
NB-94	702.63	100.00	4.01E-02	4.01E-02	-1.96E-02	1.86E-02
	871.10	100.00	4.47E-02		-1.79E-02	2.06E-02
NB-95	765.79	99.81	4.80E-02	4.80E-02	7.03E-03	2.22E-02
NB-95M	235.69	25.00	3.70E-01	3.70E-01	-2.65E+00	1.78E-01
ZR-95	724.18	43.70	1.11E-01	7.92E-02	-1.41E-02	5.20E-02
	756.72	55.30	7.92E-02		1.37E-02	3.66E-02
MO-99	181.06	6.20	1.78E+00	1.16E+00	4.29E-01	8.60E-01
	739.58	12.80	1.16E+00		-3.05E-01	5.36E-01
	778.00	4.50	3.05E+00		-1.50E+00	1.40E+00
RU-103	497.08	89.00	4.55E-02	4.55E-02	-4.72E-03	2.14E-02
RU-106	621.84	9.80	4.46E-01	4.46E-01	1.42E-01	2.09E-01
AG-108M	433.93	89.90	4.02E-02	4.02E-02	1.92E-02	1.90E-02
	614.37	90.40	4.33E-02		-1.11E-02	2.02E-02
	722.95	90.50	4.94E-02		-4.96E-03	2.30E-02
CD-109	88.03	3.72	1.06E+00	1.06E+00	5.52E-01	5.17E-01
AG-110M	657.75	93.14	4.84E-02	4.84E-02	-1.48E-02	2.27E-02
	677.61	10.53	3.93E-01		-2.23E-02	1.83E-01
	706.67	16.46	2.68E-01		1.31E-01	1.25E-01
	763.93	21.98	1.94E-01		4.84E-02	9.00E-02
	884.67	71.63	6.41E-02		3.04E-02	2.96E-02
	1384.27	23.94	1.66E-01		-1.77E-01	7.23E-02
CD-113M	263.70	0.02	1.27E+02	1.27E+02	-6.29E+01	6.04E+01
SN-113	255.12	1.93	1.57E+00	4.85E-02	-5.21E-01	7.49E-01
	391.69	64.90	4.85E-02		-1.63E-02	2.28E-02
TE123M	159.00	84.10	3.79E-02	3.79E-02	-1.10E-03	1.83E-02
SB-124	602.71	97.87	4.31E-02	4.31E-02	2.75E-03	2.02E-02
	645.85	7.26	5.86E-01		-1.12E-01	2.73E-01
	722.78	11.10	4.27E-01		-4.29E-02	1.99E-01
	1691.02	49.00	5.43E-02		-2.37E-02	2.10E-02
	35.49	6.49	6.35E-01	6.35E-01	2.67E-01	3.06E-01
SB-125	176.33	6.89	4.45E-01	1.31E-01	-2.63E-01	2.14E-01
	427.89	29.33	1.31E-01		6.66E-02	6.22E-02
	463.38	10.35	4.22E-01		4.50E-01	2.01E-01
	600.56	17.80	2.30E-01		6.75E-02	1.08E-01
	635.90	11.32	3.49E-01		-3.13E-02	1.62E-01
	414.70	83.30	5.07E-02	5.07E-02	-7.57E-03	2.38E-02
SB-126	666.33	99.60	6.74E-02		1.18E-02	3.18E-02
	695.00	99.60	5.88E-02		-2.47E-02	2.74E-02
	720.50	53.80	1.06E-01		-2.02E-02	4.92E-02
	87.57	37.00	1.06E-01	1.06E-01	5.51E-02	5.16E-02
SB-127	473.00	25.00	3.84E-01	2.78E-01	5.00E-02	1.81E-01
	685.20	35.70	2.78E-01		-1.50E-01	1.29E-01
	783.80	14.70	8.19E-01		4.31E-01	3.83E-01
I-129	29.78	57.00	9.14E-02	9.14E-02	2.83E-02	4.42E-02
	33.60	13.20	3.25E-01		6.34E-02	1.57E-01
	39.58	7.52	4.80E-01		9.14E-02	2.31E-01
I-131	284.30	6.05	7.27E-01	5.79E-02	1.69E-01	3.45E-01
	364.48	81.20	5.79E-02		-6.80E-04	2.73E-02
	636.97	7.26	8.11E-01		-1.23E-01	3.77E-01
	722.89	1.80	3.83E+00		-3.85E-01	1.79E+00
TE-132	49.72	13.10	7.56E-01	1.04E-01	-8.59E-01	3.66E-01
	228.16	88.00	1.04E-01		-2.51E-02	4.98E-02
BA-133	81.00	33.00	1.05E-01	5.62E-02	-4.13E-01	5.11E-02

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
BA-133	302.84	17.80	1.86E-01	5.62E-02	7.97E-02	8.85E-02
	356.01	60.00	5.62E-02		-2.60E-01	2.67E-02
I-133	529.87	86.30	2.51E+00	2.51E+00	8.97E-01	1.18E+00
CS-134	563.23	8.38	4.78E-01	4.48E-02	-2.95E-03	2.24E-01
	569.32	15.43	2.62E-01		-3.32E-02	1.23E-01
	604.70	97.60	4.48E-02		6.91E-03	2.11E-02
	795.84	85.40	5.39E-02		3.03E-02	2.51E-02
	801.93	8.73	4.37E-01		-2.78E-01	2.00E-01
CS-135	268.24	16.00	2.04E-01	2.04E-01	-2.45E-02	9.74E-02
I-135	1131.51	22.50	7.30E+04	4.64E+04	7.91E+03	3.36E+04
	1260.41	28.60	4.64E+04		7.35E+03	2.07E+04
	1678.03	9.54	8.83E+04		-3.70E+04	3.50E+04
CS-136	153.22	7.46	5.72E-01	5.10E-02	1.83E-01	2.77E-01
	163.89	4.61	8.76E-01		-2.90E-04	4.23E-01
	176.55	13.56	2.95E-01		-3.12E-02	1.42E-01
	273.65	12.66	3.10E-01		-1.23E-01	1.48E-01
	340.57	48.50	1.07E-01		1.05E-01	5.12E-02
	818.50	99.70	5.10E-02		-2.92E-04	2.33E-02
	1048.07	79.60	6.79E-02		-1.89E-02	3.07E-02
	1235.34	19.70	4.56E-01		-2.24E-03	2.13E-01
+ CS-137	661.65	* 85.12	7.48E-02	7.48E-02	5.37E-02	3.58E-02
LA-138	788.74	34.00	1.25E-01	6.23E-02	-2.89E-03	5.77E-02
	1435.80	66.00	6.23E-02		-8.38E-05	2.73E-02
CE-139	165.85	80.35	3.90E-02	3.90E-02	3.46E-03	1.88E-02
BA-140	162.64	6.70	6.05E-01	1.99E-01	-5.34E-02	2.92E-01
	304.84	4.50	8.38E-01		-1.53E-01	3.97E-01
	423.70	3.20	1.56E+00		1.03E-01	7.40E-01
	437.55	2.00	2.34E+00		4.65E-01	1.10E+00
	537.32	25.00	1.99E-01		3.54E-02	9.34E-02
LA-140	328.77	20.50	2.28E-01	6.22E-02	1.92E-01	1.09E-01
	487.03	45.50	1.06E-01		4.92E-02	5.01E-02
	815.85	23.50	2.25E-01		5.29E-02	1.03E-01
	1596.49	95.49	6.22E-02		1.34E-02	2.74E-02
CE-141	145.44	48.40	7.66E-02	7.66E-02	4.32E-02	3.71E-02
CE-143	57.36	11.80	3.48E+00	1.10E+00	-1.01E+00	1.68E+00
	293.26	42.00	1.10E+00		-1.96E+00	5.30E-01
	664.55	5.20	1.34E+01		5.65E-01	6.34E+00
CE-144	133.54	10.80	2.92E-01	2.92E-01	-3.55E-03	1.42E-01
PM-144	476.78	42.00	9.18E-02	4.05E-02	1.74E-03	4.33E-02
	618.01	98.60	4.05E-02		-1.30E-02	1.89E-02
	696.49	99.49	4.67E-02		2.45E-02	2.19E-02
PM-145	36.85	21.70	1.80E-01	9.70E-02	5.24E-02	8.67E-02
	37.36	39.70	9.70E-02		2.83E-02	4.68E-02
	42.30	15.10	2.26E-01		-1.27E-04	1.09E-01
	72.40	2.31	1.82E+00		-1.56E+00	8.90E-01
PM-146	453.90	39.94	9.39E-02	9.39E-02	-4.96E-02	4.44E-02
	735.90	14.01	3.05E-01		-3.64E-02	1.42E-01
	747.13	13.10	3.22E-01		1.94E-01	1.49E-01
ND-147	91.11	28.90	1.93E-01	1.93E-01	-3.32E-01	9.40E-02
	531.02	13.10	4.12E-01		9.61E-02	1.94E-01
PM-149	285.90	3.10	4.57E+00	4.57E+00	-1.08E+00	2.17E+00
EU-152	121.78	20.50	1.40E-01	1.40E-01	-2.15E-01	6.74E-02
	244.69	5.40	6.40E-01		5.33E-02	3.08E-01

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
EU-152	344.27	19.13	1.55E-01	1.40E-01	-4.72E-02	7.32E-02
	778.89	9.20	4.58E-01		7.85E-02	2.11E-01
	964.01	10.40	5.06E-01		6.61E-02	2.35E-01
	1085.78	7.22	6.84E-01		-2.29E-01	3.13E-01
	1112.02	9.60	5.53E-01		2.07E-01	2.54E-01
	1407.95	14.94	2.50E-01		-1.41E-01	1.08E-01
GD-153	97.43	31.30	9.61E-02	9.61E-02	1.51E-02	4.65E-02
	103.18	22.20	1.34E-01		-1.24E-01	6.47E-02
EU-154	123.07	40.50	7.39E-02	7.39E-02	4.95E-03	3.57E-02
	723.30	19.70	2.27E-01		-2.28E-02	1.06E-01
	873.19	11.50	3.90E-01		-5.84E-02	1.80E-01
	996.32	10.30	4.22E-01		2.99E-03	1.92E-01
	1004.76	17.90	3.04E-01		1.27E-01	1.41E-01
EU-155	1274.45	35.50	1.29E-01	1.27E-01	-1.02E-01	5.79E-02
	86.50	30.90	1.27E-01		7.45E-02	6.18E-02
EU-156	105.30	20.70	1.47E-01	5.06E-01	3.45E-02	7.14E-02
	811.77	10.40	5.06E-01		-7.24E-02	2.33E-01
HO-166M	1153.47	7.20	9.62E-01	5.36E-02	1.90E-01	4.43E-01
	1230.71	8.90	9.65E-01		-9.00E-02	4.50E-01
	184.41	72.60	5.36E-02		7.93E-02	2.61E-02
	280.45	29.60	9.55E-02		-3.74E-02	4.53E-02
	410.94	11.10	3.10E-01		4.99E-02	1.47E-01
TM-171	711.69	54.10	7.35E-02	2.65E+01	2.34E-03	3.40E-02
	66.72	0.14	2.65E+01		-4.40E+01	1.29E+01
HF-172	81.75	4.52	7.63E-01	2.68E-01	-8.64E-03	3.71E-01
	125.81	11.30	2.68E-01		-1.85E-01	1.30E-01
LU-172	181.53	20.60	2.50E-01	1.38E-01	3.92E-02	1.20E-01
	810.06	16.63	4.55E-01		3.36E-02	2.11E-01
	912.12	15.25	8.80E-01		1.15E+00	4.20E-01
	1093.66	62.50	1.38E-01		1.32E-02	6.34E-02
LU-173	100.72	5.24	5.84E-01	1.56E-01	2.20E-01	2.83E-01
	272.11	21.20	1.56E-01		3.82E-02	7.45E-02
HF-175	343.40	84.00	3.70E-02	3.70E-02	-1.13E-02	1.75E-02
LU-176	88.34	13.30	2.94E-01	3.19E-02	1.53E-01	1.44E-01
	201.83	86.00	3.77E-02		5.91E-03	1.82E-02
	306.78	94.00	3.19E-02		2.14E-03	1.51E-02
TA-182	67.75	41.20	9.21E-02	9.21E-02	-7.22E-03	4.48E-02
	1121.30	34.90	2.38E-01		3.31E-01	1.13E-01
	1189.05	16.23	3.79E-01		8.82E-02	1.75E-01
	1221.41	26.98	2.48E-01		2.48E-02	1.15E-01
	1231.02	11.44	6.16E-01		-5.74E-02	2.87E-01
	308.46	29.68	1.05E-01		8.40E-02	-4.85E-03	4.98E-02
IR-192	468.07	48.10	8.40E-02	4.32E-02	-9.85E-02	3.97E-02
	279.19	77.30	4.32E-02		1.92E-02	2.06E-02
BI-207	569.67	97.72	4.12E-02	4.12E-02	7.39E-03	1.93E-02
	1063.62	74.90	5.69E-02		-2.65E-02	2.57E-02
TL-208	583.14	30.22	2.35E-01	2.35E-01	5.31E-01	1.13E-01
	860.37	4.48	1.14E+00		1.79E-03	5.32E-01
	2614.66	35.85	3.26E-01		5.73E-01	1.53E-01
BI-210M	262.00	45.00	6.49E-02	6.49E-02	-1.40E-02	3.09E-02
	300.00	23.00	1.55E-01		-2.42E-01	7.40E-02
PB-210	46.50	4.25	8.82E-01	8.82E-01	6.92E-01	4.28E-01
PB-211	404.84	2.90	1.05E+00	1.05E+00	-6.50E-01	4.92E-01

Analysis Report for 1405081-03

J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
	831.96	2.90	1.50E+00	1.05E+00	-8.89E-01	6.92E-01
+ BI-212	727.17 *	11.80	5.17E-01	5.17E-01	3.45E-01	2.45E-01
	1620.62	2.75	1.29E+00		-4.40E-01	5.44E-01
+ PB-212	238.63 *	44.60	1.40E-01	1.40E-01	5.54E-01	6.88E-02
	300.09 *	3.41	2.28E+00		7.32E-01	1.12E+00
+ BI-214	609.31 *	46.30	1.37E-01	1.37E-01	5.96E-01	6.58E-02
	1120.29 *	15.10	4.62E-01		6.97E-01	2.17E-01
	1764.49 *	15.80	3.15E-01		7.70E-01	1.39E-01
	2204.22 *	4.98	5.64E-01		4.74E-01	2.16E-01
+ PB-214	295.21 *	19.19	3.99E-01	1.58E-01	6.55E-01	1.96E-01
	351.92 *	37.19	1.58E-01		6.59E-01	7.66E-02
	401.80	6.50	5.08E-01	5.08E-01	2.32E-01	2.40E-01
	323.87	3.88	8.50E-01	8.50E-01	2.81E-01	4.05E-01
	240.98	3.95	1.61E+00	1.61E+00	6.81E+00	7.88E-01
	40.00	31.00	1.46E-01	1.46E-01	2.78E-02	7.03E-02
+ RA-226	186.21 *	3.28	1.69E+00	1.69E+00	1.63E+00	8.29E-01
TH-227	50.10	8.40	4.03E-01	3.07E-01	-4.58E-01	1.95E-01
	236.00	11.50	3.07E-01		-2.20E+00	1.48E-01
	256.20	6.30	4.65E-01		-1.70E-01	2.22E-01
AC-228	338.32	11.40	3.64E-01	2.89E-01	4.48E-01	1.75E-01
	911.07	27.70	2.89E-01		3.62E-01	1.38E-01
	969.11	16.60	4.35E-01		5.56E-01	2.06E-01
TH-230	48.44	16.90	2.19E-01	2.19E-01	8.34E-02	1.06E-01
	62.85	4.60	8.68E-01		8.97E-01	4.23E-01
	67.67	0.37	9.95E+00		-7.81E-01	4.85E+00
PA-231	283.67	1.60	1.78E+00	1.43E+00	4.13E-01	8.45E-01
	302.67	2.30	1.43E+00		6.16E-01	6.84E-01
TH-231	25.64	14.70	4.74E-01	4.74E-01	-5.78E-01	2.30E-01
	84.21	6.40	5.42E-01		-2.16E-01	2.64E-01
PA-233	311.98	38.60	9.01E-02	9.01E-02	-1.36E-02	4.28E-02
PA-234	131.20	20.40	1.57E-01	1.57E-01	3.65E-03	7.63E-02
	733.99	8.80	4.84E-01		3.50E-02	2.25E-01
	946.00	12.00	3.57E-01		-3.03E-02	1.63E-01
PA-234M	1001.03	0.92	5.48E+00	5.48E+00	-2.55E-01	2.53E+00
TH-234	63.29	3.80	1.05E+00	1.05E+00	1.08E+00	5.11E-01
U-235	143.76	10.50	3.11E-01	3.11E-01	-8.86E-02	1.51E-01
	163.35	4.70	6.58E-01		-5.80E-02	3.18E-01
	205.31	4.70	6.76E-01		9.19E-02	3.26E-01
NP-237	86.50	12.60	3.10E-01	3.10E-01	1.82E-01	1.51E-01
NP-239	106.10	22.70	5.94E-01	5.94E-01	2.64E-01	2.88E-01
	228.18	10.70	1.29E+00		-3.12E-01	6.17E-01
	277.60	14.10	9.82E-01		4.97E-01	4.69E-01
AM-241	59.54	35.90	9.34E-02	9.34E-02	-1.05E-01	4.53E-02
+ AM-243	74.67 *	66.00	9.93E-02	9.93E-02	1.03E-01	4.89E-02
CM-243	209.75	3.29	1.03E+00	2.26E-01	6.64E-01	4.97E-01
	228.14	10.60	2.96E-01		-7.17E-02	1.42E-01
	277.60	14.00	2.26E-01		1.14E-01	1.08E-01

- + = 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

Analysis Report for 1405081-03
J1TLD8 SAF: RC-189

No Action Level results available for reporting purposes.

DATA REVIEW COMMENTS REPORT

<i>Creation Date</i>	<i>Comment</i>	<i>User</i>
----------------------	----------------	-------------

No Data Review Comments Entered.

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: J1TLD8 SAF: RC-189

Elapsed Live time: 3600
 Elapsed Real Time: 3601

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	57	109	122	160	167	77
25:	97	70	47	48	50	64	54	64
33:	54	30	48	52	47	51	49	55
41:	39	46	44	55	47	65	108	57
49:	58	52	71	61	58	67	61	61
57:	63	75	59	70	77	68	108	176
65:	91	91	94	99	85	93	96	104
73:	108	108	210	193	210	282	104	86
81:	92	68	86	96	100	91	125	156
89:	92	102	112	106	197	168	92	58
97:	56	57	83	65	68	64	54	62
105:	60	85	71	61	64	72	70	79
113:	72	73	68	76	58	60	82	54
121:	60	62	57	44	79	63	55	63
129:	83	70	64	54	68	70	60	64
137:	63	65	57	51	65	68	59	69
145:	69	65	75	64	58	55	62	63
153:	52	72	68	60	51	49	65	56
161:	53	52	58	57	47	54	54	45
169:	45	55	52	42	66	50	48	56
177:	38	51	52	51	48	41	55	42
185:	60	114	113	57	43	43	45	37
193:	48	43	33	40	40	44	49	45
201:	48	48	46	52	43	48	36	40
209:	60	72	45	34	43	34	35	46
217:	57	38	32	33	44	29	37	43
225:	40	47	36	36	39	35	43	35
233:	39	31	41	38	47	80	359	171
241:	55	99	88	38	34	29	27	26
249:	31	26	40	31	34	20	34	26
257:	32	32	31	36	25	18	32	28
265:	31	28	39	31	32	39	49	30
273:	26	24	31	29	29	37	34	22
281:	22	22	18	19	31	28	17	29
289:	38	27	24	22	20	28	99	159
297:	43	28	34	35	48	28	23	20
305:	27	23	15	23	29	25	22	17
313:	27	28	30	20	16	32	24	24
321:	23	29	34	24	19	26	23	47
329:	38	17	27	15	23	17	25	29
337:	25	31	86	29	29	21	16	26
345:	18	15	19	23	21	29	48	177
353:	185	36	23	21	23	16	20	19
361:	25	17	18	15	17	22	21	16

369: 18 15 17 13 25 17 21 16

Sample Title: J1TLD8 SAF: RC-189

Channel	15	14	13	14	17	18	12	22
377:	15	14	13	14	17	18	12	22
385:	12	14	27	20	18	21	14	19
393:	14	15	23	17	17	17	17	19
401:	26	20	14	15	15	11	23	20
409:	19	17	24	21	18	17	15	16
417:	17	14	16	15	18	17	14	15
425:	19	19	14	20	13	10	21	12
433:	11	12	23	6	15	4	16	17
441:	15	25	13	18	7	12	15	10
449:	15	25	9	17	15	19	13	17
457:	10	22	11	11	12	15	23	44
465:	11	17	11	9	11	18	24	13
473:	12	13	8	13	20	11	16	15
481:	14	15	3	10	10	7	9	20
489:	17	13	5	14	13	13	14	10
497:	11	10	16	10	10	7	18	15
505:	22	8	9	11	17	22	56	46
513:	34	17	12	15	11	15	15	14
521:	9	10	13	17	13	8	8	13
529:	12	10	14	15	12	9	9	16
537:	18	13	4	8	9	6	9	11
545:	9	14	12	10	12	12	14	12
553:	13	16	10	13	8	11	10	11
561:	5	16	11	14	9	13	13	11
569:	8	10	13	11	13	12	7	6
577:	12	9	8	8	13	14	71	97
585:	30	16	13	14	9	12	9	12
593:	13	10	12	9	8	10	12	12
601:	6	9	11	14	8	10	12	20
609:	71	165	77	10	8	13	6	10
617:	6	12	5	18	9	11	13	11
625:	12	10	9	6	10	6	10	12
633:	11	10	1	12	6	11	11	7
641:	16	18	9	9	14	4	7	10
649:	10	12	14	10	12	11	8	7
657:	11	11	17	13	9	33	23	12
665:	15	11	10	14	13	7	8	11
673:	15	6	6	7	10	6	13	11
681:	7	6	9	10	8	13	6	5
689:	7	18	8	5	12	9	13	8
697:	10	11	14	9	3	10	5	12
705:	7	8	9	8	11	9	6	5
713:	10	3	8	4	9	4	9	9
721:	10	6	11	11	11	7	13	30
729:	17	5	8	9	8	8	11	6
737:	7	9	8	10	8	9	3	8
745:	11	4	8	6	12	5	6	1
753:	7	8	11	7	7	3	5	10
761:	5	11	9	8	6	8	5	6
769:	13	13	15	8	9	5	0	8
777:	12	3	4	6	9	8	11	7
785:	11	9	13	6	10	4	3	5
793:	9	5	13	14	5	7	5	10

801: 2 5 3 5 8 13 7 12

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8
809:	13	4	8	4	6	5	6	4
817:	8	7	6	3	5	6	6	6
825:	7	8	6	9	11	10	6	7
833:	4	5	5	7	15	2	8	8
841:	11	5	6	6	3	5	9	9
849:	4	8	2	8	4	7	7	7
857:	8	4	9	8	11	17	12	3
865:	9	12	6	10	7	6	4	7
873:	9	4	6	11	6	7	14	4
881:	6	10	7	7	5	8	5	5
889:	3	5	5	7	4	5	6	6
897:	9	2	8	6	8	6	10	5
905:	4	11	10	12	5	7	27	54
913:	32	13	11	11	8	9	8	7
921:	5	3	6	1	3	7	5	10
929:	5	4	4	3	6	8	12	6
937:	6	3	6	9	3	4	5	5
945:	5	4	4	8	6	12	3	9
953:	9	9	2	5	6	4	13	4
961:	11	5	4	6	8	13	9	6
969:	22	34	18	7	5	6	10	9
977:	4	10	3	6	10	5	4	1
985:	1	3	8	5	7	8	6	5
993:	6	4	2	4	7	5	7	4
1001:	5	12	10	5	6	11	7	5
1009:	6	7	8	4	2	10	3	6
1017:	12	9	6	4	6	6	4	11
1025:	5	3	2	6	7	7	1	3
1033:	9	6	5	5	6	6	7	7
1041:	11	7	6	11	4	4	4	6
1049:	5	3	3	4	2	4	5	4
1057:	1	8	7	10	4	6	3	4
1065:	6	3	4	4	5	3	12	2
1073:	8	5	4	7	5	4	3	6
1081:	4	11	3	8	5	2	4	9
1089:	9	8	6	10	6	3	10	6
1097:	2	4	4	6	3	6	3	6
1105:	5	4	0	11	5	8	9	6
1113:	5	7	5	4	4	3	12	21
1121:	30	31	7	5	6	7	9	7
1129:	4	6	10	4	10	2	8	3
1137:	5	8	1	5	6	5	7	8
1145:	10	6	2	9	9	5	4	8
1153:	8	6	6	8	6	3	6	5
1161:	5	4	9	5	5	2	8	8
1169:	6	4	8	4	4	13	9	4
1177:	13	8	2	3	5	7	7	7
1185:	6	9	2	11	8	5	8	9
1193:	4	8	4	5	6	4	7	12
1201:	6	4	10	3	5	6	3	5
1209:	1	6	8	6	11	6	5	9
1217:	4	7	6	11	7	12	5	10
1225:	9	12	8	6	15	12	5	12

1233: 8 8 13 3 9 14 16 11

Sample Title: J1TLD8 SAF: RC-189

Channel	8	8	13	3	9	14	16	11
1241:	9	2	1	8	7	6	8	6
1249:	4	4	4	7	4	3	4	6
1257:	1	3	6	2	3	2	2	5
1265:	10	6	4	4	3	3	11	8
1273:	1	3	3	4	5	2	6	7
1281:	10	10	5	3	3	4	4	2
1289:	5	4	11	6	3	1	4	2
1297:	2	2	5	1	7	6	7	2
1305:	2	4	2	3	5	5	3	6
1313:	4	1	2	3	7	5	2	5
1321:	4	3	4	7	3	1	5	6
1329:	3	2	2	3	11	12	6	2
1337:	1	3	6	1	3	6	5	3
1345:	3	3	1	2	3	6	4	3
1353:	3	2	1	2	2	3	3	0
1361:	3	1	6	4	1	1	1	1
1369:	2	0	1	3	5	2	3	7
1377:	3	8	11	3	2	0	0	0
1385:	4	5	5	3	3	3	3	2
1393:	1	4	4	2	3	4	1	3
1401:	2	4	5	6	0	1	0	3
1409:	8	2	0	1	2	2	1	1
1417:	2	0	1	0	1	1	2	1
1425:	2	1	2	1	2	2	1	2
1433:	3	2	4	2	3	1	2	4
1441:	2	1	4	2	2	2	2	1
1449:	1	2	2	1	2	3	3	2
1457:	2	4	6	38	172	269	106	26
1465:	6	2	1	6	1	0	4	2
1473:	3	4	0	3	6	2	6	0
1481:	0	2	1	3	0	3	1	2
1489:	2	1	2	1	3	0	0	3
1497:	5	3	3	0	1	4	1	2
1505:	2	4	2	3	3	9	2	1
1513:	5	1	2	2	1	2	2	3
1521:	2	3	0	4	1	1	0	3
1529:	0	2	1	0	2	2	0	1
1537:	0	1	3	1	0	2	3	2
1545:	3	1	3	1	0	1	4	0
1553:	0	0	0	1	1	4	1	3
1561:	3	0	2	0	0	2	2	1
1569:	1	0	2	0	1	1	0	1
1577:	1	3	0	0	1	0	2	4
1585:	4	1	0	4	12	3	4	4
1593:	1	5	1	2	4	2	1	3
1601:	2	1	0	2	6	1	0	1
1609:	3	1	0	1	2	1	1	3
1617:	2	0	1	2	1	1	3	2
1625:	1	3	0	1	2	4	2	3
1633:	2	2	2	0	1	3	1	2
1641:	1	2	1	1	1	1	0	0
1649:	3	0	2	2	0	2	0	2
1657:	0	2	1	1	0	1	2	1

1665: 1 0 1 1 3 1 0 0

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8
1673:	1	2	0	0	1	3	0	0
1681:	1	2	1	0	2	0	3	0
1689:	0	0	0	0	1	3	0	1
1697:	4	1	1	1	1	0	1	0
1705:	1	1	1	0	1	1	0	1
1713:	2	1	0	1	0	1	1	2
1721:	0	2	2	1	3	2	0	2
1729:	1	6	5	5	2	1	1	2
1737:	1	1	0	1	1	1	1	2
1745:	2	0	1	0	0	1	1	0
1753:	0	0	0	0	1	1	0	0
1761:	2	1	1	5	22	22	8	3
1769:	1	1	2	1	1	0	1	1
1777:	0	0	0	0	1	1	1	0
1785:	0	2	3	1	0	0	0	2
1793:	2	0	0	1	2	0	1	1
1801:	1	1	2	0	0	0	1	0
1809:	0	1	1	0	1	0	1	1
1817:	0	0	1	1	2	3	0	1
1825:	1	0	0	1	1	2	0	0
1833:	0	1	0	2	1	2	2	3
1841:	1	1	1	0	1	0	1	3
1849:	1	2	3	0	0	0	1	0
1857:	1	1	1	0	0	0	1	0
1865:	0	2	0	3	0	1	2	0
1873:	1	0	0	0	1	0	0	1
1881:	1	1	2	0	0	2	1	0
1889:	3	1	2	1	1	1	0	1
1897:	1	0	0	1	1	1	1	0
1905:	2	2	1	0	2	0	0	3
1913:	1	2	0	1	2	1	2	1
1921:	1	5	0	4	3	0	1	1
1929:	1	0	0	0	1	0	0	1
1937:	0	1	0	0	0	0	0	0
1945:	2	1	0	0	1	1	0	1
1953:	0	2	3	1	2	2	1	0
1961:	3	2	0	0	0	0	1	0
1969:	1	0	0	2	0	1	0	1
1977:	1	1	0	2	2	2	2	2
1985:	1	1	2	2	0	1	1	0
1993:	1	1	2	0	0	2	2	0
2001:	2	1	1	0	0	0	0	0
2009:	0	0	3	2	0	0	3	2
2017:	0	0	1	0	0	2	1	0
2025:	0	0	2	0	0	0	0	0
2033:	1	0	3	1	2	1	0	1
2041:	0	0	1	1	0	0	0	0
2049:	1	0	0	1	1	1	1	0
2057:	0	1	0	1	2	2	0	0
2065:	2	1	0	0	0	0	2	1
2073:	0	1	0	1	0	1	0	1
2081:	1	2	0	0	0	2	1	1
2089:	2	3	1	2	2	0	1	1

2097: 2 0 1 0 0 0 2 2

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8
2105:	4	1	3	0	1	1	2	0
2113:	0	0	0	2	2	0	0	3
2121:	2	0	2	0	1	2	0	1
2129:	0	0	1	0	0	1	1	0
2137:	1	0	1	0	0	2	0	0
2145:	0	1	2	1	1	0	0	1
2153:	1	1	0	1	0	1	0	1
2161:	0	0	0	1	1	1	0	3
2169:	1	3	0	0	0	1	0	1
2177:	2	0	0	0	2	0	0	2
2185:	0	0	0	1	0	4	0	1
2193:	0	1	0	2	1	1	0	1
2201:	1	0	0	2	4	3	1	0
2209:	0	1	1	0	1	1	0	1
2217:	1	1	0	1	1	3	1	1
2225:	3	0	0	0	0	1	1	1
2233:	2	0	1	0	0	2	1	1
2241:	1	1	1	1	0	1	2	0
2249:	2	1	0	0	0	1	0	1
2257:	0	1	0	0	1	1	0	0
2265:	4	2	4	0	0	0	0	1
2273:	0	0	2	3	1	0	0	0
2281:	2	0	1	0	1	2	0	1
2289:	1	0	0	1	1	0	0	0
2297:	0	2	1	1	0	1	0	1
2305:	1	0	0	1	0	0	1	2
2313:	0	1	0	0	1	0	1	0
2321:	0	1	1	0	2	0	1	0
2329:	3	1	1	0	1	0	0	1
2337:	1	1	1	2	0	0	0	0
2345:	0	1	0	1	1	2	0	1
2353:	0	1	1	1	1	1	4	1
2361:	0	0	2	1	1	1	0	4
2369:	2	2	1	0	0	1	2	1
2377:	1	2	1	1	1	0	0	0
2385:	1	0	0	0	3	0	0	1
2393:	1	0	1	0	3	0	1	1
2401:	1	0	2	0	0	1	2	1
2409:	0	1	1	0	1	0	4	0
2417:	0	1	0	1	1	0	2	0
2425:	2	0	0	1	1	1	1	1
2433:	0	2	1	0	2	0	1	0
2441:	2	0	0	1	1	0	0	3
2449:	2	0	0	3	1	0	1	0
2457:	1	2	1	1	0	0	0	0
2465:	0	1	0	2	1	0	1	1
2473:	0	2	0	0	0	2	1	1
2481:	0	4	0	0	0	0	0	0
2489:	1	1	1	1	1	1	2	1
2497:	0	0	0	1	0	0	1	0
2505:	2	0	1	0	1	0	0	1
2513:	0	1	1	1	0	0	0	1
2521:	0	0	0	0	0	0	0	0

2529: 0 2 0 0 0 1 1 0

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8
2537:	0	1	0	0	2	0	0	1
2545:	0	0	1	0	0	0	0	0
2553:	0	1	0	0	0	0	0	0
2561:	0	1	2	0	0	0	1	0
2569:	0	0	1	0	2	0	0	0
2577:	1	0	0	0	0	0	0	0
2585:	1	0	0	0	0	0	0	0
2593:	0	0	0	1	0	1	0	0
2601:	0	1	0	1	0	1	0	0
2609:	0	2	1	0	3	5	20	35
2617:	11	4	3	0	0	0	0	0
2625:	1	1	1	0	2	0	0	0
2633:	0	0	0	0	0	1	0	1
2641:	0	1	0	1	1	0	1	0
2649:	0	0	0	0	1	0	0	0
2657:	0	0	0	0	0	1	0	1
2665:	0	0	0	1	1	0	0	0
2673:	0	0	0	3	0	0	0	0
2681:	0	0	0	1	0	1	0	0
2689:	0	1	0	1	0	0	0	0
2697:	2	0	0	0	1	1	0	0
2705:	1	0	0	0	0	0	0	0
2713:	0	0	0	0	0	0	0	0
2721:	1	0	0	0	1	0	1	0
2729:	0	1	1	0	1	0	0	0
2737:	0	2	0	1	0	0	0	0
2745:	0	0	0	1	0	1	0	1
2753:	0	0	0	0	1	0	0	0
2761:	0	2	0	0	0	0	0	0
2769:	0	0	0	1	0	0	1	0
2777:	1	0	0	1	0	1	1	0
2785:	0	0	0	0	0	0	0	0
2793:	0	0	0	0	0	0	0	0
2801:	0	0	1	0	0	0	0	0
2809:	0	0	0	0	0	0	0	0
2817:	1	0	1	0	0	0	0	0
2825:	0	0	0	0	0	1	0	0
2833:	0	0	0	0	0	1	0	1
2841:	0	0	0	1	0	0	2	0
2849:	1	1	0	1	1	0	0	0
2857:	0	1	0	0	0	0	0	0
2865:	1	0	0	0	0	0	0	0
2873:	0	0	0	0	0	0	0	1
2881:	0	1	0	0	0	0	0	1
2889:	0	0	1	0	0	0	0	1
2897:	0	0	0	0	0	0	0	0
2905:	0	0	0	0	1	1	1	0
2913:	0	1	0	0	1	0	0	0
2921:	0	0	0	0	0	2	0	0
2929:	0	0	0	0	0	1	0	0
2937:	0	0	0	0	0	0	0	2
2945:	0	0	0	0	0	1	0	0
2953:	0	0	0	1	0	0	0	1

2961: 0 1 0 0 0 1 1 1

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8	9
2969:	0	1	0	0	1	0	0	0	0
2977:	0	0	0	0	0	0	0	0	0
2985:	1	0	0	0	0	0	0	0	0
2993:	1	0	1	0	0	0	0	0	1
3001:	0	1	0	0	0	0	0	1	0
3009:	0	1	0	0	1	0	0	0	0
3017:	0	0	1	0	0	0	0	0	0
3025:	1	0	0	0	0	0	0	0	0
3033:	1	0	0	0	0	0	0	1	0
3041:	0	0	0	0	0	0	1	0	0
3049:	1	0	0	0	0	0	0	0	0
3057:	0	0	0	0	0	0	0	0	1
3065:	0	0	0	0	0	0	1	0	0
3073:	0	0	0	0	0	0	1	0	1
3081:	1	0	0	0	0	0	0	0	0
3089:	0	0	0	0	0	0	1	0	0
3097:	0	0	1	0	0	0	1	0	0
3105:	0	0	0	0	0	0	0	0	0
3113:	0	0	0	0	0	0	0	0	0
3121:	0	0	1	0	0	0	0	0	0
3129:	0	1	0	0	0	0	0	0	0
3137:	0	0	0	0	1	0	0	0	1
3145:	0	0	0	0	2	0	0	0	0
3153:	1	0	0	1	0	0	0	0	0
3161:	0	0	0	0	0	0	0	0	0
3169:	0	0	1	0	0	0	0	0	0
3177:	0	0	0	0	0	0	0	0	0
3185:	0	0	1	0	0	0	1	0	0
3193:	1	0	0	1	0	0	1	0	0
3201:	0	0	0	0	0	0	2	0	0
3209:	0	1	0	1	0	0	0	1	0
3217:	1	1	1	1	0	0	0	1	0
3225:	0	0	1	0	0	0	0	0	0
3233:	0	0	0	0	1	1	0	0	0
3241:	0	0	0	0	0	0	0	0	0
3249:	1	0	0	0	0	0	0	0	0
3257:	0	0	0	0	0	0	0	0	0
3265:	0	0	1	0	0	0	1	0	0
3273:	0	0	0	0	0	0	0	0	0
3281:	0	0	0	0	0	0	1	0	0
3289:	0	0	0	0	1	0	0	0	0
3297:	0	0	0	1	1	0	0	0	0
3305:	0	1	1	0	0	1	0	1	0
3313:	0	0	1	0	0	0	0	1	0
3321:	0	1	0	0	0	1	0	1	0
3329:	0	0	0	0	0	0	0	0	0
3337:	0	0	0	1	0	0	0	1	0
3345:	1	1	0	0	0	0	0	0	1
3353:	0	1	0	1	0	0	0	0	0
3361:	0	0	1	0	0	0	0	0	0
3369:	1	0	0	0	1	0	0	0	0
3377:	0	1	0	0	0	0	0	0	0
3385:	0	0	0	0	0	0	0	0	1

3393: 0 0 1 0 0 0 0 0 0

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8	9
3401:	0	0	0	0	0	0	0	0	0
3409:	0	1	1	0	0	1	0	0	0
3417:	0	0	0	0	0	0	0	0	0
3425:	0	0	0	0	0	0	0	0	0
3433:	0	1	0	0	1	1	0	0	0
3441:	0	0	0	0	0	0	0	0	0
3449:	0	0	0	1	0	0	0	0	0
3457:	0	0	0	1	0	0	0	0	0
3465:	0	0	1	0	0	0	0	0	0
3473:	0	0	0	0	0	0	0	0	0
3481:	0	0	1	0	0	0	0	0	0
3489:	0	0	0	0	1	1	1	0	0
3497:	0	0	0	0	0	0	0	0	0
3505:	1	0	0	0	0	0	0	0	0
3513:	0	0	1	0	0	0	0	0	0
3521:	1	0	0	0	0	0	0	0	0
3529:	1	0	0	0	0	1	0	0	0
3537:	0	2	0	0	0	0	0	0	1
3545:	0	0	0	0	0	2	0	0	0
3553:	0	0	0	0	0	0	0	1	0
3561:	0	0	0	0	0	0	0	0	0
3569:	0	0	0	0	0	0	0	0	0
3577:	0	0	0	0	0	0	0	0	0
3585:	0	0	0	0	0	1	0	1	0
3593:	0	0	0	0	1	0	0	0	0
3601:	0	0	0	0	0	0	0	0	0
3609:	0	0	0	0	0	0	0	0	0
3617:	0	0	0	0	0	1	0	0	0
3625:	0	0	0	0	0	0	0	0	0
3633:	1	0	0	0	1	0	1	0	0
3641:	0	0	0	0	0	0	0	0	0
3649:	0	0	0	0	1	1	0	0	0
3657:	0	0	0	0	0	0	1	0	0
3665:	0	0	0	0	0	1	0	0	0
3673:	0	0	1	0	0	0	0	1	0
3681:	0	1	0	0	0	1	0	0	1
3689:	0	0	0	0	0	0	0	0	0
3697:	0	0	0	0	0	0	0	0	0
3705:	0	0	0	0	0	0	0	0	0
3713:	0	1	1	0	0	0	0	0	0
3721:	0	0	0	0	0	0	1	0	0
3729:	0	0	0	0	0	0	0	0	0
3737:	1	0	0	0	1	0	0	0	0
3745:	0	0	0	0	0	0	0	0	1
3753:	1	0	0	0	0	0	0	0	0
3761:	1	0	0	0	0	0	0	1	0
3769:	0	0	0	0	0	0	0	1	0
3777:	0	0	0	0	1	0	0	1	0
3785:	0	0	0	0	0	0	0	1	0
3793:	0	1	0	0	0	0	0	1	0
3801:	0	0	0	0	0	0	0	0	0
3809:	0	0	0	0	1	0	0	0	0
3817:	0	0	0	0	0	0	0	0	1

3825: 0 0 1 0 0 0 1 0

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8
3833:	0	0	0	0	0	0	0	0
3841:	0	0	0	1	1	1	0	0
3849:	0	0	0	0	0	0	0	0
3857:	0	0	0	0	0	0	0	0
3865:	1	0	1	0	1	1	0	0
3873:	0	0	0	0	0	0	0	0
3881:	0	0	0	0	0	0	0	0
3889:	0	0	1	0	0	0	0	0
3897:	0	0	0	0	0	0	0	0
3905:	0	0	0	1	0	0	1	0
3913:	1	1	0	0	0	0	0	1
3921:	0	0	0	0	0	0	0	0
3929:	0	0	0	0	0	0	0	0
3937:	0	0	0	0	0	0	0	0
3945:	0	0	0	0	0	0	0	0
3953:	0	0	0	0	0	0	1	0
3961:	0	0	1	0	0	0	0	0
3969:	0	0	0	1	0	0	0	0
3977:	1	0	1	0	0	0	1	0
3985:	0	0	0	0	0	0	0	0
3993:	0	0	0	0	0	0	0	0
4001:	0	0	0	0	0	1	0	0
4009:	1	0	0	0	2	1	0	0
4017:	0	1	0	0	0	0	1	0
4025:	0	0	1	0	1	0	1	0
4033:	0	0	0	1	0	0	0	0
4041:	1	0	0	0	0	0	0	0
4049:	0	0	0	0	0	0	0	0
4057:	1	0	0	0	0	0	0	0
4065:	0	0	1	0	0	0	1	0
4073:	0	0	0	0	0	0	0	0
4081:	0	0	1	0	1	0	0	0
4089:	0	1	0	0	0	0	0	1



Analysis Report for 1405081-04
J1TLD8 SAF: RC-189

GAMMA SPECTRUM ANALYSIS

Sample Identification : 1405081-04
Sample Description : J1TLD8 SAF: RC-189
Sample Type : SOIL

Sample Size : 7.816E+02 grams
Facility : Countroom

Sample Taken On : 5/16/2014 8:20:37AM
Acquisition Started : 5/21/2014 9:27:34AM

Procedure : GAS-1302 pCi
Operator : Administrator
Detector Name : GE1
Geometry : GAS-1302
Live Time : 3600.0 seconds
Real Time : 3601.0 seconds

Dead Time : 0.03 %

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 1 - 4096
Peak Area Range (in channels) : 18 - 4096
Identification Energy Tolerance : 1.000 keV

Energy Calibration Used Done On : 1/9/2014
Efficiency Calibration Used Done On : 8/24/2013
Efficiency Calibration Description :

Sample Number : 7782

AG
5/21/14

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

ENERGY CALIBRATION REPORT

Detector Name : GE1

ENERGY CALIBRATION COEFFICIENTS

Energy Calibrate Performed on : 1/9/2014 1:23:31PM
 by : Administrator
 Energy Calibrate Type : POLY

$$\text{Energy (keV)} = -0.103 + 0.999 \cdot \text{ch} + 2.92\text{E-}08 \cdot \text{ch}^2 + 0.00\text{E+}00 \cdot \text{ch}^3$$

SHAPE CALIBRATION COEFFICIENTS

Shape Calibrate Performed on : 1/9/2014 1:23:31PM
 by : Administrator

$$\text{FWHM} = 1.024 + 3.14\text{E-}02 \cdot \text{E}^{1/2}$$

$$\text{LOW TAIL} = 5.10\text{E-}01 + 7.66\text{E-}04 \cdot \text{E}$$

ENERGY CALIBRATION RESULTS TABLE

<i>Centroid Channel</i>	<i>Centroid error</i>	<i>Energy (keV)</i>
88.25	0.18	88.03
122.23	0.27	122.06
166.05	0.19	165.85
279.28	0.12	279.19
391.81	0.04	391.69
661.78	0.05	661.65
898.18	0.04	898.02
1173.39	0.04	1173.22
1332.64	0.04	1332.49
1836.16	0.03	1836.01

SHAPE CALIBRATION RESULTS TABLE

<i>Energy (keV)</i>	<i>FWHM channels</i>	<i>FWHM error</i>	<i>TAIL channels</i>	<i>TAIL error</i>
-------------------------	--------------------------	-----------------------	--------------------------	-----------------------

Analysis Report for 1405081-04
 J1TLD8 SAF: RC-189

Energy (keV)	FWHM channels	FWHM error	TAIL channels	TAIL error
88.03	1.28	0.45	0.51	0.51
122.06	1.41	0.68	0.62	1.02
165.85	1.41	0.31	0.51	0.43
279.19	1.72	0.37	0.96	0.99
391.69	1.67	0.10	0.91	0.31
661.65	1.83	0.11	1.03	0.37
898.02	1.93	0.09	1.14	0.42
1173.22	2.10	0.09	1.37	0.47
1332.49	2.15	0.09	1.56	0.81
1836.01	2.40	0.08	1.99	1.61

EFFICIENCY CALIBRATION REPORT

Detector Name : GE1
 Geometry Description : GAS-1302
 Efficiency Calibration Performed on : 8/24/2013 10:48:49AM
 by : Administrator
 Efficiency Type Used : EMPIRICA
 Certificate File :

Efficiency Triplets

Energy	% Efficiency	Error	Computed	Error	% Difference
59.54	2.56E+00	9.13E-02			
88.03	2.76E+00	1.31E-01			
122.06	2.76E+00	1.18E-01			
165.85	2.45E+00	9.84E-02			
279.19	1.81E+00	7.07E-02			
391.69	1.36E+00	5.43E-02			
661.65	9.59E-01	4.02E-02			
898.02	7.16E-01	2.85E-02			
1173.22	5.98E-01	2.47E-02			
1332.49	5.46E-01	2.25E-02			
1836.01	4.30E-01	1.76E-02			

DUAL Efficiency Calibration Equation

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Single Equation Terms

Offset : 3.26E+00
Slope : -1.39E+01
Quadratic : 7.29E+00
Cubic : -1.60E+00
4th Order : 1.57E-01
5th Order : -5.83E-03
6th Order : 0.00E+00
7th Order : 0.00E+00
8th Order : 0.00E+00
9th Order : 0.00E+00

EMPIRICAL Efficiency Calibration Equation

Empirical Equation Terms

Scaling : 9.48E+02
Offset : -4.97E+00
Slope : 7.88E-01
Quadratic : 8.64E-02
Cubic : -7.25E-02
4th Order : 0.00E+00
5th Order : 0.00E+00

LINEAR Efficiency Calibration Equation

Linear Equation Terms

Offset : -1.35E-04
Slope : -2.24E+00
Quadratic : 2.36E+02
Cubic : -2.99E+04
4th Order : 1.68E+06
5th Order : -3.59E+07
6th Order : 0.00E+00
7th Order : 0.00E+00
8th Order : 0.00E+00
9th Order : 0.00E+00

PEAK-TO-TOTAL CALIBRATION REPORT

Peak-to-Total Efficiency Calibration Equation

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

PEAK LOCATE REPORT

Peak Locate Performed on : 5/21/2014 10:27:38AM
 Peak Locate From Channel : 1
 Peak Locate To Channel : 4096
 Peak Search Sensitivity : 2.50

Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
1	63.43	63.53	0.0000	0.00
2	75.12	75.23	0.0000	0.00
3	77.72	77.83	0.0000	0.00
4	86.83	86.95	0.0000	0.00
5	92.87	92.98	0.0000	0.00
6	186.29	186.40	0.0000	0.00
7	210.52	210.64	0.0000	0.00
8	238.99	239.11	0.0000	0.00
9	242.03	242.15	0.0000	0.00
10	270.91	271.03	0.0000	0.00
11	296.12	296.24	0.0000	0.00
12	339.04	339.16	0.0000	0.00
13	349.18	349.31	0.0000	0.00
14	352.39	352.52	0.0000	0.00
15	503.11	503.25	0.0000	0.00
16	511.64	511.78	0.0000	0.00
17	564.26	564.40	0.0000	0.00
18	583.84	583.98	0.0000	0.00
19	609.91	610.05	0.0000	0.00
20	615.48	615.62	0.0000	0.00
21	662.08	662.22	0.0000	0.00
22	727.45	727.60	0.0000	0.00
23	794.92	795.07	0.0000	0.00
24	880.08	880.23	0.0000	0.00
25	911.96	912.11	0.0000	0.00
26	934.71	934.86	0.0000	0.00
27	969.88	970.04	0.0000	0.00
28	1006.26	1006.42	0.0000	0.00
29	1080.63	1080.79	0.0000	0.00
30	1121.87	1122.03	0.0000	0.00
31	1189.02	1189.18	0.0000	0.00
32	1238.52	1238.68	0.0000	0.00
33	1356.61	1356.76	0.0000	0.00
34	1378.06	1378.22	0.0000	0.00
35	1381.84	1382.00	0.0000	0.00
36	1416.12	1416.27	0.0000	0.00
37	1461.77	1461.92	0.0000	0.00
38	1510.07	1510.23	0.0000	0.00
39	1516.94	1517.10	0.0000	0.00
40	1549.43	1549.59	0.0000	0.00
41	1613.34	1613.50	0.0000	0.00
42	1630.04	1630.19	0.0000	0.00

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

<i>Peak No.</i>	<i>Energy (keV)</i>	<i>Centroid Channel</i>	<i>Centroid Uncertainty</i>	<i>Peak Significance</i>
43	1732.15	1732.30	0.0000	0.00
44	1765.76	1765.91	0.0000	0.00
45	1848.50	1848.65	0.0000	0.00
46	1966.35	1966.50	0.0000	0.00
47	2076.44	2076.58	0.0000	0.00
48	2127.00	2127.14	0.0000	0.00
49	2204.56	2204.70	0.0000	0.00
50	2292.83	2292.96	0.0000	0.00
51	2615.68	2615.79	0.0000	0.00

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 5/21/2014 10:27:38AM

Peak Analysis From Channel : 1

Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
	1	63.43	60 - 67	63.53	2.05E+02	87.98	1.16E+03	1.48
M	2	75.12	72 - 83	75.23	2.56E+02	76.69	9.27E+02	1.57
m	3	77.72	72 - 83	77.83	3.76E+02	81.91	9.05E+02	1.58
	4	86.83	84 - 89	86.95	1.10E+02	78.13	1.14E+03	0.94
	5	92.87	90 - 96	92.98	2.40E+02	85.37	1.12E+03	1.77
	6	186.29	183 - 190	186.40	1.67E+02	74.24	8.07E+02	1.84
	7	210.52	207 - 213	210.64	5.76E+01	59.93	6.09E+02	1.23
M	8	238.99	234 - 249	239.11	5.68E+02	62.33	3.16E+02	1.66
m	9	242.03	234 - 249	242.15	1.25E+02	51.70	2.77E+02	1.66
	10	270.91	268 - 273	271.03	5.12E+01	39.96	2.78E+02	2.50
	11	296.12	292 - 303	296.24	2.24E+02	77.36	6.36E+02	1.58
	12	339.04	336 - 343	339.16	1.19E+02	49.11	3.21E+02	1.91
M	13	349.18	348 - 357	349.31	1.93E+01	20.76	1.04E+02	1.74
m	14	352.39	348 - 357	352.52	3.44E+02	46.85	1.90E+02	1.73
	15	503.11	500 - 506	503.25	4.00E+01	26.36	9.59E+01	4.64
	16	511.64	507 - 519	511.78	2.32E+02	49.28	1.79E+02	2.69
	17	564.26	561 - 567	564.40	2.08E+01	25.60	1.02E+02	3.70
	18	583.84	579 - 588	583.98	1.78E+02	46.98	2.10E+02	1.66
M	19	609.91	604 - 618	610.05	2.89E+02	39.45	8.60E+01	1.82
m	20	615.48	604 - 618	615.62	2.06E+01	26.84	1.13E+02	2.18
	21	662.08	660 - 665	662.22	5.31E+01	28.02	1.20E+02	1.79
	22	727.45	724 - 732	727.60	4.91E+01	31.54	1.26E+02	1.45
	23	794.92	791 - 800	795.07	2.60E+01	27.84	9.80E+01	2.05
	24	880.08	877 - 884	880.23	1.77E+01	19.60	5.25E+01	4.08
	25	911.96	907 - 916	912.11	1.25E+02	34.64	9.92E+01	1.65
	26	934.71	931 - 941	934.86	3.79E+01	27.89	8.63E+01	2.49
	27	969.88	967 - 974	970.04	4.96E+01	32.31	1.27E+02	1.56
	28	1006.26	1004 - 1009	1006.42	1.42E+01	17.83	4.97E+01	2.48
	29	1080.63	1077 - 1085	1080.79	1.86E+01	23.32	7.29E+01	1.54
	30	1121.87	1117 - 1130	1122.03	1.01E+02	33.27	8.11E+01	3.44
	31	1189.02	1185 - 1196	1189.18	3.07E+01	30.72	1.05E+02	3.20
	32	1238.52	1235 - 1242	1238.68	2.98E+01	23.92	7.43E+01	4.84
	33	1356.61	1353 - 1359	1356.76	1.01E+01	10.82	1.38E+01	2.96
M	34	1378.06	1373 - 1384	1378.22	1.33E+01	13.01	1.72E+01	2.41
m	35	1381.84	1373 - 1384	1382.00	9.27E+00	9.34	1.04E+01	2.19
	36	1416.12	1414 - 1422	1416.27	9.00E+00	12.37	1.80E+01	2.88
	37	1461.77	1458 - 1467	1461.92	6.57E+02	52.92	2.39E+01	2.14
	38	1510.07	1507 - 1514	1510.23	1.05E+01	10.58	1.10E+01	1.76
	39	1516.94	1514 - 1519	1517.10	9.00E+00	8.12	6.00E+00	2.03
	40	1549.43	1547 - 1551	1549.59	8.75E+00	6.80	2.50E+00	1.39

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	FWHM (keV)
41	1613.34	1610 -	1615	1613.50	6.00E+00	4.90	0.00E+00	1.16
42	1630.04	1625 -	1635	1630.19	1.16E+01	13.07	1.68E+01	8.53
43	1732.15	1728 -	1735	1732.30	8.07E+00	10.20	1.19E+01	3.76
44	1765.76	1762 -	1772	1765.91	8.05E+01	19.14	6.96E+00	2.43
45	1848.50	1844 -	1853	1848.65	1.13E+01	12.29	1.54E+01	1.41
46	1966.35	1963 -	1969	1966.50	8.00E+00	5.66	0.00E+00	1.66
47	2076.44	2073 -	2079	2076.58	8.30E+00	7.23	3.40E+00	3.57
48	2127.00	2124 -	2130	2127.14	7.00E+00	5.29	0.00E+00	1.98
49	2204.56	2200 -	2208	2204.70	1.58E+01	10.98	8.50E+00	1.61
50	2292.83	2290 -	2295	2292.96	5.50E+00	6.08	3.00E+00	1.84
51	2615.68	2611 -	2621	2615.79	7.39E+01	18.39	6.14E+00	2.09

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 2.000sigma

PEAK ANALYSIS REPORT

Peak Analysis Performed on : 5/21/2014 10:27:38AM

Peak Analysis From Channel : 1

Peak Analysis To Channel : 4096

Peak No.	Energy (keV)	ROI start	ROI end	Net Peak Area	Net Area Uncertainty	Continuum Counts	Critical Level
	1	60 -	67	2.05E+02	87.98	1.16E+03	6.84E+01
M	2	72 -	83	2.56E+02	76.69	9.27E+02	5.01E+01
m	3	72 -	83	3.76E+02	81.91	9.05E+02	4.95E+01
	4	84 -	89	1.10E+02	78.13	1.14E+03	6.19E+01
	5	90 -	96	2.40E+02	85.37	1.12E+03	6.54E+01
	6	183 -	190	1.67E+02	74.24	8.07E+02	5.72E+01
	7	207 -	213	5.76E+01	59.93	6.09E+02	4.77E+01
M	8	234 -	249	5.68E+02	62.33	3.16E+02	2.92E+01
m	9	234 -	249	1.25E+02	51.70	2.77E+02	2.74E+01
	10	268 -	273	5.12E+01	39.96	2.78E+02	3.07E+01
	11	292 -	303	2.24E+02	77.36	6.36E+02	2.68E+01
	12	336 -	343	1.19E+02	49.11	3.21E+02	3.62E+01
M	13	348 -	357	1.93E+01	20.76	1.04E+02	1.68E+01
m	14	348 -	357	3.44E+02	46.85	1.90E+02	2.27E+01
	15	500 -	506	4.00E+01	26.36	9.59E+01	1.90E+01
	16	507 -	519	2.32E+02	49.28	1.79E+02	3.18E+01
	17	561 -	567	2.08E+01	25.60	1.02E+02	1.97E+01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

	Peak No.	Energy (keV)	ROI start	ROI end	Net Peak Area	Net Area Uncertainty	Continuum Counts	Critical Level
	18	583.84	579 -	588	1.78E+02	46.98	2.10E+02	3.18E+01
M	19	609.91	604 -	618	2.89E+02	39.45	8.60E+01	1.52E+01
m	20	615.48	604 -	618	2.06E+01	26.84	1.13E+02	1.75E+01
	21	662.08	660 -	665	5.31E+01	28.02	1.20E+02	1.97E+01
	22	727.45	724 -	732	4.91E+01	31.54	1.26E+02	2.32E+01
	23	794.92	791 -	800	2.60E+01	27.84	9.80E+01	2.13E+01
	24	880.08	877 -	884	1.77E+01	19.60	5.25E+01	1.45E+01
	25	911.96	907 -	916	1.25E+02	34.64	9.92E+01	2.17E+01
	26	934.71	931 -	941	3.79E+01	27.89	8.63E+01	2.06E+01
	27	969.88	967 -	974	4.96E+01	32.31	1.27E+02	4.21E+01
	28	1006.26	1004 -	1009	1.42E+01	17.83	4.97E+01	1.33E+01
	29	1080.63	1077 -	1085	1.86E+01	23.32	7.29E+01	1.78E+01
	30	1121.87	1117 -	1130	1.01E+02	33.27	8.11E+01	2.18E+01
	31	1189.02	1185 -	1196	3.07E+01	30.72	1.05E+02	2.36E+01
	32	1238.52	1235 -	1242	2.98E+01	23.92	7.43E+01	1.75E+01
	33	1356.61	1353 -	1359	1.01E+01	10.82	1.38E+01	7.20E+00
M	34	1378.06	1373 -	1384	1.33E+01	13.01	1.72E+01	6.82E+00
m	35	1381.84	1373 -	1384	9.27E+00	9.34	1.04E+01	5.30E+00
	36	1416.12	1414 -	1422	9.00E+00	12.37	1.80E+01	8.89E+00
	37	1461.77	1458 -	1467	6.57E+02	52.92	2.39E+01	1.08E+01
	38	1510.07	1507 -	1514	1.05E+01	10.58	1.10E+01	6.88E+00
	39	1516.94	1514 -	1519	9.00E+00	8.12	6.00E+00	4.50E+00
	40	1549.43	1547 -	1551	8.75E+00	6.80	2.50E+00	2.76E+00
	41	1613.34	1610 -	1615	6.00E+00	4.90	0.00E+00	0.00E+00
	42	1630.04	1625 -	1635	1.16E+01	13.07	1.68E+01	9.16E+00
	43	1732.15	1728 -	1735	8.07E+00	10.20	1.19E+01	6.96E+00
	44	1765.76	1762 -	1772	8.05E+01	19.14	6.96E+00	5.46E+00
	45	1848.50	1844 -	1853	1.13E+01	12.29	1.54E+01	8.45E+00
	46	1966.35	1963 -	1969	8.00E+00	5.66	0.00E+00	0.00E+00
	47	2076.44	2073 -	2079	8.30E+00	7.23	3.40E+00	3.59E+00
	48	2127.00	2124 -	2130	7.00E+00	5.29	0.00E+00	0.00E+00
	49	2204.56	2200 -	2208	1.58E+01	10.98	8.50E+00	6.23E+00
	50	2292.83	2290 -	2295	5.50E+00	6.08	3.00E+00	3.18E+00
	51	2615.68	2611 -	2621	7.39E+01	18.39	6.14E+00	5.36E+00

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 2.000sigma

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

PEAK WITH NID REPORT

Peak Analysis Performed on : 5/21/2014 10:27:38AM

Peak Analysis From Channel : 1

Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Peak Match Tolerance : 1.000 keV

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	Tentative Nuclide	
1	63.43	60 -	67	63.53	2.05E+02	87.98	1.16E+03	TH-234 TH-230	
M m	2	75.12	72 -	83	75.23	2.56E+02	76.69	9.27E+02	AM-243
	3	77.72	72 -	83	77.83	3.76E+02	81.91	9.05E+02	TI-44
	4	86.83	84 -	89	86.95	1.10E+02	78.13	1.14E+03	NP-237 EU-155 SN-126
	5	92.87	90 -	96	92.98	2.40E+02	85.37	1.12E+03	GA-67
	6	186.29	183 -	190	186.40	1.67E+02	74.24	8.07E+02	RA-226
	7	210.52	207 -	213	210.64	5.76E+01	59.93	6.09E+02	CM-243
M m	8	238.99	234 -	249	239.11	5.68E+02	62.33	3.16E+02	PB-212
	9	242.03	234 -	249	242.15	1.25E+02	51.70	2.77E+02	.....
	10	270.91	268 -	273	271.03	5.12E+01	39.96	2.78E+02	.....
	11	296.12	292 -	303	296.24	2.24E+02	77.36	6.36E+02	PB-214
	12	339.04	336 -	343	339.16	1.19E+02	49.11	3.21E+02	AC-228
M m	13	349.18	348 -	357	349.31	1.93E+01	20.76	1.04E+02	.....
	14	352.39	348 -	357	352.52	3.44E+02	46.85	1.90E+02	PB-214
	15	503.11	500 -	506	503.25	4.00E+01	26.36	9.59E+01	.....
	16	511.64	507 -	519	511.78	2.32E+02	49.28	1.79E+02	.....
	17	564.26	561 -	567	564.40	2.08E+01	25.60	1.02E+02	.....
	18	583.84	579 -	588	583.98	1.78E+02	46.98	2.10E+02	TL-208
M m	19	609.91	604 -	618	610.05	2.89E+02	39.45	8.60E+01	BI-214
	20	615.48	604 -	618	615.62	2.06E+01	26.84	1.13E+02	.....
	21	662.08	660 -	665	662.22	5.31E+01	28.02	1.20E+02	CS-137
	22	727.45	724 -	732	727.60	4.91E+01	31.54	1.26E+02	BI-212
	23	794.92	791 -	800	795.07	2.60E+01	27.84	9.80E+01	CS-134
	24	880.08	877 -	884	880.23	1.77E+01	19.60	5.25E+01	.....
	25	911.96	907 -	916	912.11	1.25E+02	34.64	9.92E+01	LU-172 AC-228
	26	934.71	931 -	941	934.86	3.79E+01	27.89	8.63E+01	.....
	27	969.88	967 -	974	970.04	4.96E+01	32.31	1.27E+02	AC-228
	28	1006.26	1004 -	1009	1006.42	1.42E+01	17.83	4.97E+01	.....
	29	1080.63	1077 -	1085	1080.79	1.86E+01	23.32	7.29E+01	.....
	30	1121.87	1117 -	1130	1122.03	1.01E+02	33.27	8.11E+01	TA-182
	31	1189.02	1185 -	1196	1189.18	3.07E+01	30.72	1.05E+02	TA-182
	32	1238.52	1235 -	1242	1238.68	2.98E+01	23.92	7.43E+01	CO-56
	33	1356.61	1353 -	1359	1356.76	1.01E+01	10.82	1.38E+01	.....
M m	34	1378.06	1373 -	1384	1378.22	1.33E+01	13.01	1.72E+01	.....
	35	1381.84	1373 -	1384	1382.00	9.27E+00	9.34	1.04E+01	.....
	36	1416.12	1414 -	1422	1416.27	9.00E+00	12.37	1.80E+01	.....
	37	1461.77	1458 -	1467	1461.92	6.57E+02	52.92	2.39E+01	K-40

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Peak No.	Energy (keV)	ROI start	ROI end	Peak Centroid	Net Peak Area	Net Area Uncertainty	Continuum Counts	Tentative Nuclide
38	1510.07	1507 -	1514	1510.23	1.05E+01	10.58	1.10E+01	.....
39	1516.94	1514 -	1519	1517.10	9.00E+00	8.12	6.00E+00	.....
40	1549.43	1547 -	1551	1549.59	8.75E+00	6.80	2.50E+00	.....
41	1613.34	1610 -	1615	1613.50	6.00E+00	4.90	0.00E+00	.....
42	1630.04	1625 -	1635	1630.19	1.16E+01	13.07	1.68E+01	.....
43	1732.15	1728 -	1735	1732.30	8.07E+00	10.20	1.19E+01	.....
44	1765.76	1762 -	1772	1765.91	8.05E+01	19.14	6.96E+00	.....
45	1848.50	1844 -	1853	1848.65	1.13E+01	12.29	1.54E+01	.....
46	1966.35	1963 -	1969	1966.50	8.00E+00	5.66	0.00E+00	.....
47	2076.44	2073 -	2079	2076.58	8.30E+00	7.23	3.40E+00	.....
48	2127.00	2124 -	2130	2127.14	7.00E+00	5.29	0.00E+00	.....
49	2204.56	2200 -	2208	2204.70	1.58E+01	10.98	8.50E+00	BI-214
50	2292.83	2290 -	2295	2292.96	5.50E+00	6.08	3.00E+00	.....
51	2615.68	2611 -	2621	2615.79	7.39E+01	18.39	6.14E+00	.....

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 2.000sigma

PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 5/21/2014 10:27:38AM

	Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty
	1	63.43	2.05E+02	87.98	2.63E-02	1.95E-03
M	2	75.12	2.56E+02	76.69	2.74E-02	2.29E-03
m	3	77.72	3.76E+02	81.91	2.76E-02	2.36E-03
	4	86.83	1.10E+02	78.13	2.78E-02	2.62E-03
	5	92.87	2.40E+02	85.37	2.79E-02	2.67E-03
	6	186.29	1.67E+02	74.24	2.30E-02	1.90E-03
	7	210.52	5.76E+01	59.93	2.16E-02	1.78E-03
M	8	238.99	5.68E+02	62.33	2.01E-02	1.63E-03
m	9	242.03	1.25E+02	51.70	1.99E-02	1.61E-03
	10	270.91	5.12E+01	39.96	1.85E-02	1.47E-03
	11	296.12	2.24E+02	77.36	1.74E-02	1.44E-03
	12	339.04	1.19E+02	49.11	1.58E-02	1.49E-03
M	13	349.18	1.93E+01	20.76	1.55E-02	1.51E-03
m	14	352.39	3.44E+02	46.85	1.54E-02	1.51E-03
	15	503.11	4.00E+01	26.36	1.16E-02	1.33E-03
	16	511.64	2.32E+02	49.28	1.15E-02	1.31E-03

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

	Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty
	17	564.26	2.08E+01	25.60	1.06E-02	1.20E-03
	18	583.84	1.78E+02	46.98	1.03E-02	1.16E-03
M	19	609.91	2.89E+02	39.45	9.94E-03	1.11E-03
m	20	615.48	2.06E+01	26.84	9.86E-03	1.09E-03
	21	662.08	5.31E+01	28.02	9.29E-03	9.98E-04
	22	727.45	4.91E+01	31.54	8.60E-03	8.88E-04
	23	794.92	2.60E+01	27.84	8.00E-03	7.74E-04
	24	880.08	1.77E+01	19.60	7.37E-03	6.30E-04
	25	911.96	1.25E+02	34.64	7.16E-03	5.95E-04
	26	934.71	3.79E+01	27.89	7.02E-03	5.88E-04
	27	969.88	4.96E+01	32.31	6.82E-03	5.78E-04
	28	1006.26	1.42E+01	17.83	6.63E-03	5.67E-04
	29	1080.63	1.86E+01	23.32	6.28E-03	5.45E-04
	30	1121.87	1.01E+02	33.27	6.10E-03	5.33E-04
	31	1189.02	3.07E+01	30.72	5.84E-03	5.14E-04
	32	1238.52	2.98E+01	23.92	5.67E-03	5.02E-04
	33	1356.61	1.01E+01	10.82	5.31E-03	4.75E-04
M	34	1378.06	1.33E+01	13.01	5.26E-03	4.71E-04
m	35	1381.84	9.27E+00	9.34	5.25E-03	4.70E-04
	36	1416.12	9.00E+00	12.37	5.16E-03	4.63E-04
	37	1461.77	6.57E+02	52.92	5.05E-03	4.54E-04
	38	1510.07	1.05E+01	10.58	4.94E-03	4.45E-04
	39	1516.94	9.00E+00	8.12	4.93E-03	4.43E-04
	40	1549.43	8.75E+00	6.80	4.86E-03	4.37E-04
	41	1613.34	6.00E+00	4.90	4.73E-03	4.24E-04
	42	1630.04	1.16E+01	13.07	4.70E-03	4.21E-04
	43	1732.15	8.07E+00	10.20	4.53E-03	4.00E-04
	44	1765.76	8.05E+01	19.14	4.48E-03	3.94E-04
	45	1848.50	1.13E+01	12.29	4.36E-03	3.80E-04
	46	1966.35	8.00E+00	5.66	4.21E-03	3.80E-04
	47	2076.44	8.30E+00	7.23	4.09E-03	3.80E-04
	48	2127.00	7.00E+00	5.29	4.04E-03	3.80E-04
	49	2204.56	1.58E+01	10.98	3.97E-03	3.80E-04
	50	2292.83	5.50E+00	6.08	3.89E-03	3.80E-04
	51	2615.68	7.39E+01	18.39	3.68E-03	3.80E-04

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 5/21/2014 10:27:38AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000007617.CNF

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Subtracted Area	Subtracted Uncert.
	1	63.43	2.05E+02	87.98	9.01E+01	8.97E+00	1.15E+02	8.84E+01
M	2	75.12	2.56E+02	76.69			2.56E+02	7.67E+01
m	3	77.72	3.76E+02	81.91	1.09E+01	8.37E+00	3.65E+02	8.23E+01
	4	86.83	1.10E+02	78.13			1.10E+02	7.81E+01
	5	92.87	2.40E+02	85.37	1.32E+02	2.91E+01	1.08E+02	9.02E+01
	6	186.29	1.67E+02	74.24	5.94E+01	8.16E+00	1.07E+02	7.47E+01
	7	210.52	5.76E+01	59.93			5.76E+01	5.99E+01
M	8	238.99	5.68E+02	62.33	1.72E+01	6.24E+00	5.51E+02	6.26E+01
m	9	242.03	1.25E+02	51.70			1.25E+02	5.17E+01
	10	270.91	5.12E+01	39.96			5.12E+01	4.00E+01
	11	296.12	2.24E+02	77.36			2.24E+02	7.74E+01
	12	339.04	1.19E+02	49.11			1.19E+02	4.91E+01
M	13	349.18	1.93E+01	20.76			1.93E+01	2.08E+01
m	14	352.39	3.44E+02	46.85	1.11E+01	4.49E+00	3.33E+02	4.71E+01
	15	503.11	4.00E+01	26.36			4.00E+01	2.64E+01
	16	511.64	2.32E+02	49.28	8.78E+01	5.42E+00	1.45E+02	4.96E+01
	17	564.26	2.08E+01	25.60			2.08E+01	2.56E+01
	18	583.84	1.78E+02	46.98	9.14E+00	3.61E+00	1.69E+02	4.71E+01
M	19	609.91	2.89E+02	39.45	6.12E+00	3.28E+00	2.83E+02	3.96E+01
m	20	615.48	2.06E+01	26.84			2.06E+01	2.68E+01
	21	662.08	5.31E+01	28.02	3.30E+00	3.41E+00	4.98E+01	2.82E+01
	22	727.45	4.91E+01	31.54			4.91E+01	3.15E+01
	23	794.92	2.60E+01	27.84			2.60E+01	2.78E+01
	24	880.08	1.77E+01	19.60			1.77E+01	1.96E+01
	25	911.96	1.25E+02	34.64	4.41E+00	3.09E+00	1.21E+02	3.48E+01
	26	934.71	3.79E+01	27.89			3.79E+01	2.79E+01
	27	969.88	4.96E+01	32.31	1.52E+00	3.02E+00	4.80E+01	3.25E+01
	28	1006.26	1.42E+01	17.83			1.42E+01	1.78E+01
	29	1080.63	1.86E+01	23.32			1.86E+01	2.33E+01
	30	1121.87	1.01E+02	33.27			1.01E+02	3.33E+01
	31	1189.02	3.07E+01	30.72			3.07E+01	3.07E+01
	32	1238.52	2.98E+01	23.92			2.98E+01	2.39E+01
	33	1356.61	1.01E+01	10.82			1.01E+01	1.08E+01
M	34	1378.06	1.33E+01	13.01			1.33E+01	1.30E+01
m	35	1381.84	9.27E+00	9.34			9.27E+00	9.34E+00
	36	1416.12	9.00E+00	12.37			9.00E+00	1.24E+01
	37	1461.77	6.57E+02	52.92	6.79E+00	2.40E+00	6.50E+02	5.30E+01
	38	1510.07	1.05E+01	10.58			1.05E+01	1.06E+01
	39	1516.94	9.00E+00	8.12			9.00E+00	8.12E+00
	40	1549.43	8.75E+00	6.80			8.75E+00	6.80E+00
	41	1613.34	6.00E+00	4.90			6.00E+00	4.90E+00
	42	1630.04	1.16E+01	13.07			1.16E+01	1.31E+01
	43	1732.15	8.07E+00	10.20			8.07E+00	1.02E+01
	44	1765.76	8.05E+01	19.14	1.87E+00	1.45E+00	7.86E+01	1.92E+01
	45	1848.50	1.13E+01	12.29			1.13E+01	1.23E+01
	46	1966.35	8.00E+00	5.66			8.00E+00	5.66E+00
	47	2076.44	8.30E+00	7.23			8.30E+00	7.23E+00
	48	2127.00	7.00E+00	5.29			7.00E+00	5.29E+00
	49	2204.56	1.58E+01	10.98			1.58E+01	1.10E+01
	50	2292.83	5.50E+00	6.08			5.50E+00	6.08E+00
	51	2615.68	7.39E+01	18.39	4.19E+00	1.57E+00	6.97E+01	1.85E+01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

M = First peak in a multiplet region
 m = Other peak in a multiplet region
 F = Fitted singlet
 Errors quoted at 2.000sigma

AREA CORRECTION REPORT REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 5/21/2014 10:27:38AM
 Ref. Peak Energy : 0.00 Reference Date :
 Peak Ratio : 0.00 Uncertainty : 0.00
 Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000007617.CNF

Corrected Area is: Original * Peak Ratio - Background

Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Corrected Area	Corrected Uncert.	
	1	63.43	2.05E+02	87.98	9.01E+01	8.97E+00	1.15E+02	8.84E+01
M	2	75.12	2.56E+02	76.69			2.56E+02	7.67E+01
m	3	77.72	3.76E+02	81.91	1.09E+01	8.37E+00	3.65E+02	8.23E+01
	4	86.83	1.10E+02	78.13			1.10E+02	7.81E+01
	5	92.87	2.40E+02	85.37	1.32E+02	2.91E+01	1.08E+02	9.02E+01
	6	186.29	1.67E+02	74.24	5.94E+01	8.16E+00	1.07E+02	7.47E+01
	7	210.52	5.76E+01	59.93			5.76E+01	5.99E+01
M	8	238.99	5.68E+02	62.33	1.72E+01	6.24E+00	5.51E+02	6.26E+01
m	9	242.03	1.25E+02	51.70			1.25E+02	5.17E+01
	10	270.91	5.12E+01	39.96			5.12E+01	4.00E+01
	11	296.12	2.24E+02	77.36			2.24E+02	7.74E+01
	12	339.04	1.19E+02	49.11			1.19E+02	4.91E+01
M	13	349.18	1.93E+01	20.76			1.93E+01	2.08E+01
m	14	352.39	3.44E+02	46.85	1.11E+01	4.49E+00	3.33E+02	4.71E+01
	15	503.11	4.00E+01	26.36			4.00E+01	2.64E+01
	16	511.64	2.32E+02	49.28	8.78E+01	5.42E+00	1.45E+02	4.96E+01
	17	564.26	2.08E+01	25.60			2.08E+01	2.56E+01
	18	583.84	1.78E+02	46.98	9.14E+00	3.61E+00	1.69E+02	4.71E+01
M	19	609.91	2.89E+02	39.45	6.12E+00	3.28E+00	2.83E+02	3.96E+01
m	20	615.48	2.06E+01	26.84			2.06E+01	2.68E+01
	21	662.08	5.31E+01	28.02	3.30E+00	3.41E+00	4.98E+01	2.82E+01
	22	727.45	4.91E+01	31.54			4.91E+01	3.15E+01
	23	794.92	2.60E+01	27.84			2.60E+01	2.78E+01
	24	880.08	1.77E+01	19.60			1.77E+01	1.96E+01
	25	911.96	1.25E+02	34.64	4.41E+00	3.09E+00	1.21E+02	3.48E+01
	26	934.71	3.79E+01	27.89			3.79E+01	2.79E+01
	27	969.88	4.96E+01	32.31	1.52E+00	3.02E+00	4.80E+01	3.25E+01
	28	1006.26	1.42E+01	17.83			1.42E+01	1.78E+01
	29	1080.63	1.86E+01	23.32			1.86E+01	2.33E+01
	30	1121.87	1.01E+02	33.27			1.01E+02	3.33E+01
	31	1189.02	3.07E+01	30.72			3.07E+01	3.07E+01
	32	1238.52	2.98E+01	23.92			2.98E+01	2.39E+01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

	Peak No.	Energy (keV)	Original Area	Orig. Area Uncertainty	Ambient Background	Backgr. Uncert.	Corrected Area	Corrected Uncert.
	33	1356.61	1.01E+01	10.82			1.01E+01	1.08E+01
M	34	1378.06	1.33E+01	13.01			1.33E+01	1.30E+01
m	35	1381.84	9.27E+00	9.34			9.27E+00	9.34E+00
	36	1416.12	9.00E+00	12.37			9.00E+00	1.24E+01
	37	1461.77	6.57E+02	52.92	6.79E+00	2.40E+00	6.50E+02	5.30E+01
	38	1510.07	1.05E+01	10.58			1.05E+01	1.06E+01
	39	1516.94	9.00E+00	8.12			9.00E+00	8.12E+00
	40	1549.43	8.75E+00	6.80			8.75E+00	6.80E+00
	41	1613.34	6.00E+00	4.90			6.00E+00	4.90E+00
	42	1630.04	1.16E+01	13.07			1.16E+01	1.31E+01
	43	1732.15	8.07E+00	10.20			8.07E+00	1.02E+01
	44	1765.76	8.05E+01	19.14	1.87E+00	1.45E+00	7.86E+01	1.92E+01
	45	1848.50	1.13E+01	12.29			1.13E+01	1.23E+01
	46	1966.35	8.00E+00	5.66			8.00E+00	5.66E+00
	47	2076.44	8.30E+00	7.23			8.30E+00	7.23E+00
	48	2127.00	7.00E+00	5.29			7.00E+00	5.29E+00
	49	2204.56	1.58E+01	10.98			1.58E+01	1.10E+01
	50	2292.83	5.50E+00	6.08			5.50E+00	6.08E+00
	51	2615.68	7.39E+01	18.39	4.19E+00	1.57E+00	6.97E+01	1.85E+01

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 2.000sigma

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield(%)	Activity (pCi/grams)	Activity Uncertainty
K-40	0.864	1460.81 *	10.67	1.16E+01	1.43E+00
GA-67	0.509	93.31 *	35.70	3.06E-01	4.73E-01
		208.95	2.24		
		300.22	16.00		
SN-126	0.917	87.57 *	37.00	1.03E-01	7.35E-02
CS-137	0.971	661.65 *	85.12	6.06E-02	3.49E-02
EU-155	0.349	86.50 *	30.90	1.24E-01	8.82E-02
		105.30	20.70		
BI-212	0.754	727.17 *	11.80	4.65E-01	3.02E-01
		1620.62	2.75		
PB-212	0.875	238.63 *	44.60	5.92E-01	8.27E-02
		300.09	3.41		

Analysis Report for 1405081-04
 J1TLD8 SAF: RC-189

Nuclide Name	Id Confidence	Energy (keV)	Yield(%)	Activity (pCi/grams)	Activity Uncertainty
BI-214	0.468	609.31 *	46.30	5.90E-01	1.06E-01
		1120.29	15.10		
		1764.49	15.80		
		2204.22 *	4.98		
PB-214	0.934	295.21 *	19.19	7.66E-01	5.39E-01
		351.92 *	37.19	6.43E-01	2.28E-01
RA-226	0.999	186.21 *	3.28	5.60E-01	9.63E-02
AC-228	0.897	338.32 *	11.40	1.36E+00	2.67E+00
		911.07 *	27.70	6.33E-01	2.68E-01
		969.11 *	16.60	5.86E-01	1.75E-01
TH-234	0.997	63.29 *	3.80	4.07E-01	2.77E-01
NP-237	0.983	86.50 *	12.60	1.10E+00	8.55E-01
AM-243	0.968	74.67 *	66.00	3.03E-01	2.16E-01
				1.36E-01	4.23E-02

* = Energy line found in the spectrum.
 - = Manually added nuclide.
 ? = Manually edited nuclide.
 Energy Tolerance : 1.000 keV
 Nuclide confidence index threshold = 0.30
 Errors quoted at 2.000sigma

UNIDENTIFIED PEAKS

Peak Locate Performed on : 5/21/2014 10:27:38AM
 Peak Locate From Channel : 1
 Peak Locate To Channel : 4096

Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
m 3	77.72	1.01293E-01	11.29	Tol.	TI-44
7	210.52	1.59937E-02	52.04	Tol.	CM-243
m 9	242.03	3.46004E-02	20.75		
10	270.91	1.42120E-02	39.05		
M 13	349.18	5.36451E-03	53.75		
15	503.11	1.11237E-02	32.92		
16	511.64	4.01429E-02	17.15		
17	564.26	5.77546E-03	61.57		
18	583.84	4.69065E-02	13.95	Tol.	TL-208
m 20	615.48	5.71231E-03	65.26		
23	794.92	7.22407E-03	53.52	Tol.	CS-134
24	880.08	4.92740E-03	55.24		
26	934.71	1.05144E-02	36.84		
28	1006.26	3.93162E-03	63.00		
29	1080.63	5.15404E-03	62.85	Sum	
30	1121.87	2.81837E-02	16.40	Tol.	TA-182

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide	
	31	1189.02	8.53748E-03	49.98	Tol.	TA-182
	32	1238.52	8.28565E-03	40.09		
	33	1356.61	2.80229E-03	53.61		
M	34	1378.06	3.68963E-03	48.97		
m	35	1381.84	2.57513E-03	50.38		
	36	1416.12	2.50000E-03	68.72		
	38	1510.07	2.91667E-03	50.40		
	39	1516.94	2.50000E-03	45.13		
	40	1549.43	2.43056E-03	38.86	Sum	
	41	1613.34	1.66667E-03	40.82		
	42	1630.04	3.22917E-03	56.20		
	43	1732.15	2.24206E-03	63.17		
	44	1765.76	2.18454E-02	12.20		
	45	1848.50	3.14327E-03	54.30		
	46	1966.35	2.22222E-03	35.36		
	47	2076.44	2.30556E-03	43.54		
	48	2127.00	1.94444E-03	37.80		
	50	2292.83	1.52778E-03	55.30		
	51	2615.68	1.93717E-02	13.23		

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 2.000sigma

NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield(%)	Activity (pCi/grams)	Activity Uncertainty	
K-40	0.86	1460.81	*	10.67	1.16E+01	1.43E+00
GA-67	0.50	93.31	*	35.70	3.06E-01	4.73E-01
		208.95		2.24		
		300.22		16.00		
SN-126	0.91	87.57	*	37.00	1.03E-01	7.35E-02
CS-137	0.97	661.65	*	85.12	6.06E-02	3.49E-02
EU-155	0.34	86.50	*	30.90	1.24E-01	8.82E-02
		105.30		20.70		
BI-212	0.75	727.17	*	11.80	4.65E-01	3.02E-01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Nuclide Name	Id Confidence	Energy (keV)	Yield(%)	Activity (pCi/grams)	Activity Uncertainty
BI-212	0.75	1620.62	2.75		
PB-212	0.87	238.63 *	44.60	5.92E-01	8.27E-02
		300.09	3.41		
BI-214	0.46	609.31 *	46.30	5.90E-01	1.06E-01
		1120.29	15.10		
		1764.49	15.80		
		2204.22 *	4.98	7.66E-01	5.39E-01
PB-214	0.93	295.21 *	19.19	6.43E-01	2.28E-01
		351.92 *	37.19	5.60E-01	9.63E-02
RA-226	0.99	186.21 *	3.28	1.36E+00	2.67E+00
AC-228	0.89	338.32 *	11.40	6.33E-01	2.68E-01
		911.07 *	27.70	5.86E-01	1.75E-01
		969.11 *	16.60	4.07E-01	2.77E-01
TH-234	0.99	63.29 *	3.80	1.10E+00	8.55E-01
NP-237	0.98	86.50 *	12.60	3.03E-01	2.16E-01
AM-243	0.96	74.67 *	66.00	1.36E-01	4.23E-02

* = Energy line found in the spectrum.

- = Manually added nuclide.

? = Manually edited nuclide.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 1.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 2.000sigma

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/grams)	Wt mean Activity Uncertainty	Comments
K-40	0.864	1.16E+01	1.43E+00	
GA-67	0.509	3.06E-01	4.73E-01	
? SN-126	0.917	1.03E-01	7.35E-02	
CS-137	0.971	6.06E-02	3.49E-02	
? EU-155	0.349	1.24E-01	8.82E-02	
BI-212	0.754	4.65E-01	3.02E-01	
PB-212	0.875	5.92E-01	8.27E-02	
BI-214	0.468	5.96E-01	1.04E-01	
PB-214	0.934	5.72E-01	8.87E-02	
RA-226	0.999	1.36E+00	2.67E+00	
AC-228	0.897	5.58E-01	1.30E-01	

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/grams)	Wt mean Activity Uncertainty	Comments
?	TH-234 0.997	1.10E+00	8.55E-01	
	NP-237 0.983	3.03E-01	2.16E-01	
	AM-243 0.968	1.36E-01	4.23E-02	

- ? = 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 2.000sigma

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

UNIDENTIFIED PEAKS

Peak Locate Performed on : 5/21/2014 10:27:38AM
 Peak Locate From Channel : 1
 Peak Locate To Channel : 4096

	Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
m	3	77.72	1.01293E-01	11.29	Tol.	TI-44
	7	210.52	1.59937E-02	52.04	Tol.	CM-243
m	9	242.03	3.46004E-02	20.75		
	10	270.91	1.42120E-02	39.05		
M	13	349.18	5.36451E-03	53.75		
	15	503.11	1.11237E-02	32.92		
	16	511.64	4.01429E-02	17.15		
	17	564.26	5.77546E-03	61.57		
	18	583.84	4.69065E-02	13.95	Tol.	TL-208
m	20	615.48	5.71231E-03	65.26		
	23	794.92	7.22407E-03	53.52	Tol.	CS-134
	24	880.08	4.92740E-03	55.24		
	26	934.71	1.05144E-02	36.84		
	28	1006.26	3.93162E-03	63.00		
	29	1080.63	5.15404E-03	62.85	Sum	
	30	1121.87	2.81837E-02	16.40	Tol.	TA-182
	31	1189.02	8.53748E-03	49.98	Tol.	TA-182
	32	1238.52	8.28565E-03	40.09		
	33	1356.61	2.80229E-03	53.61		
M	34	1378.06	3.68963E-03	48.97		
m	35	1381.84	2.57513E-03	50.38		
	36	1416.12	2.50000E-03	68.72		
	38	1510.07	2.91667E-03	50.40		
	39	1516.94	2.50000E-03	45.13		
	40	1549.43	2.43056E-03	38.86	Sum	
	41	1613.34	1.66667E-03	40.82		
	42	1630.04	3.22917E-03	56.20		
	43	1732.15	2.24206E-03	63.17		
	44	1765.76	2.18454E-02	12.20		
	45	1848.50	3.14327E-03	54.30		
	46	1966.35	2.22222E-03	35.36		
	47	2076.44	2.30556E-03	43.54		
	48	2127.00	1.94444E-03	37.80		
	50	2292.83	1.52778E-03	55.30		
	51	2615.68	1.93717E-02	13.23		

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

M = First peak in a multiplet region
 m = Other peak in a multiplet region
 F = Fitted singlet
 Errors quoted at 2.000sigma

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	BE-7	477.59	10.42	3.37E-01	4.46E-01	4.46E-01
+	NA-22	1274.54	99.94	2.35E-02	5.25E-02	5.25E-02
+	NA-24	1368.53	99.99	-1.20E+00	7.91E+00	1.15E+01
		2754.09	99.86	2.45E-01		7.91E+00
+	AL-26	1808.65	99.76	3.82E-03	3.46E-02	3.46E-02
+	K-40	1460.81	* 10.67	1.16E+01	4.69E-01	4.69E-01
+	@ AR-41	1293.64	99.16	0.00E+00	1.00E+26	1.00E+26
+	TI-44	67.88	94.40	-9.40E-03	3.65E-02	3.65E-02
		78.34	96.00	7.99E-02		5.27E-02
+	SC-46	889.25	99.98	-1.20E-02	4.14E-02	4.14E-02
		1120.51	99.99	1.27E-01		8.19E-02
+	V-48	983.52	99.98	0.00E+00	5.83E-02	5.83E-02
		1312.10	97.50	-1.22E-02		6.36E-02
+	CR-51	320.08	9.83	6.85E-02	3.48E-01	3.48E-01
+	MN-54	834.83	99.97	9.17E-03	4.37E-02	4.37E-02
+	CO-56	846.75	99.96	-3.23E-02	3.78E-02	3.78E-02
		1037.75	14.03	6.84E-02		3.86E-01
		1238.25	67.00	7.13E-02		1.06E-01
		1771.40	15.51	8.69E-03		3.00E-01
		2598.48	16.90	5.80E-02		2.11E-01
+	CO-57	122.06	85.51	2.11E-03	3.49E-02	3.49E-02
		136.48	10.60	-2.22E-02		2.97E-01
+	CO-58	810.76	99.40	-7.14E-03	4.42E-02	4.42E-02
+	FE-59	1099.22	56.50	-7.63E-03	8.98E-02	8.98E-02
		1291.56	43.20	-1.21E-03		1.18E-01
+	CO-60	1173.22	100.00	1.24E-02	5.04E-02	5.70E-02
		1332.49	100.00	6.35E-03		5.04E-02
+	ZN-65	1115.52	50.75	-2.24E-02	8.28E-02	8.28E-02
+	GA-67	93.31	* 35.70	3.06E-01	4.17E-01	4.17E-01
		208.95	2.24	3.48E-01		4.52E+00
		300.22	16.00	-1.22E+00		6.21E-01
+	SE-75	121.11	16.70	4.59E-02	4.83E-02	1.82E-01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
	SE-75	136.00	59.20	-2.16E-02	4.83E-02	5.42E-02
		264.65	59.80	-4.61E-04		4.83E-02
		279.53	25.20	-2.07E-02		1.30E-01
		400.65	11.40	-6.58E-02		2.95E-01
+	RB-82	776.52	13.00	7.84E-02	3.90E-01	3.90E-01
+	RB-83	520.41	46.00	4.00E-03	7.89E-02	7.89E-02
		529.64	30.30	0.00E+00		1.23E-01
		552.65	16.40	-2.45E-02		2.49E-01
+	KR-85	513.99	0.43	2.61E+01	1.42E+01	1.42E+01
+	SR-85	513.99	99.27	1.20E-01	6.53E-02	6.53E-02
+	Y-88	898.02	93.40	1.03E-02	3.43E-02	4.92E-02
		1836.01	99.38	-1.01E-02		3.43E-02
+	NB-93M	16.57	9.43	-4.58E-01	5.68E-01	5.68E-01
+	NB-94	702.63	100.00	2.30E-03	4.15E-02	4.43E-02
		871.10	100.00	4.80E-03		4.15E-02
+	NB-95	765.79	99.81	1.58E-02	5.65E-02	5.65E-02
+	NB-95M	235.69	25.00	-2.70E+00	3.88E-01	3.88E-01
+	ZR-95	724.18	43.70	4.84E-03	8.99E-02	1.07E-01
		756.72	55.30	4.66E-02		8.99E-02
+	MO-99	181.06	6.20	-3.19E-01	1.08E+00	1.87E+00
		739.58	12.80	-5.74E-02		1.08E+00
		778.00	4.50	-8.63E-01		3.50E+00
+	RU-103	497.08	89.00	-5.02E-03	4.21E-02	4.21E-02
+	RU-106	621.84	9.80	6.61E-02	4.18E-01	4.18E-01
+	AG-108M	433.93	89.90	-2.87E-02	4.00E-02	4.00E-02
		614.37	90.40	-3.37E-01		4.65E-02
		722.95	90.50	2.28E-03		4.65E-02
+	CD-109	88.03	3.72	2.99E-01	1.07E+00	1.07E+00
+	AG-110M	657.75	93.14	-7.69E-03	4.47E-02	4.47E-02
		677.61	10.53	5.02E-02		3.81E-01
		706.67	16.46	2.45E-02		2.82E-01
		763.93	21.98	-1.73E-01		2.11E-01
		884.67	71.63	5.56E-03		5.60E-02
		1384.27	23.94	4.50E-02		1.74E-01
+	CD-113M	263.70	0.02	1.55E+00	1.23E+02	1.23E+02
+	SN-113	255.12	1.93	-3.43E-01	4.99E-02	1.57E+00
		391.69	64.90	-8.48E-03		4.99E-02
+	TE123M	159.00	84.10	-9.55E-03	3.59E-02	3.59E-02
+	SB-124	602.71	97.87	9.33E-03	4.57E-02	4.57E-02
		645.85	7.26	-1.97E-01		5.60E-01
		722.78	11.10	1.97E-02		4.01E-01
		1691.02	49.00	-1.25E-02		8.81E-02
+	I-125	35.49	6.49	-3.91E-01	6.42E-01	6.42E-01
+	SB-125	176.33	6.89	2.49E-03	1.28E-01	4.49E-01
		427.89	29.33	1.13E-02		1.28E-01
		463.38	10.35	1.94E-01		4.05E-01
		600.56	17.80	9.89E-02		2.28E-01
		635.90	11.32	2.08E-01		3.59E-01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	SB-126	414.70	83.30	-4.48E-03	4.82E-02	4.82E-02
		666.33	99.60	7.33E-03		6.88E-02
		695.00	99.60	-1.56E-02		5.81E-02
		720.50	53.80	2.96E-02		1.04E-01
+	SN-126	87.57 *	37.00	1.03E-01	1.18E-01	1.18E-01
+	SB-127	473.00	25.00	-1.53E-01	3.05E-01	3.83E-01
		685.20	35.70	4.80E-03		3.05E-01
		783.80	14.70	1.22E-01		7.61E-01
+	I-129	29.78	57.00	2.20E-03	8.57E-02	8.57E-02
		33.60	13.20	1.60E-02		3.20E-01
		39.58	7.52	-7.04E-03		4.93E-01
+	I-131	284.30	6.05	-4.80E-02	5.41E-02	7.47E-01
		364.48	81.20	-7.90E-03		5.41E-02
		636.97	7.26	8.78E-02		8.40E-01
		722.89	1.80	1.77E-01		3.62E+00
+	TE-132	49.72	13.10	-1.35E+00	1.08E-01	6.86E-01
		228.16	88.00	9.66E-03		1.08E-01
+	BA-133	81.00	33.00	-4.96E-01	5.50E-02	1.04E-01
		302.84	17.80	-9.81E-03		1.74E-01
		356.01	60.00	-2.58E-01		5.50E-02
+	I-133	529.87	86.30	0.00E+00	2.39E+00	2.39E+00
+	CS-134	563.23	8.38	2.51E-01	4.53E-02	4.75E-01
		569.32	15.43	-5.03E-02		2.43E-01
		604.70	97.60	4.03E-03		4.53E-02
		795.84	85.40	2.97E-02		5.56E-02
		801.93	8.73	1.55E-02		4.52E-01
+	CS-135	268.24	16.00	7.10E-03	1.83E-01	1.83E-01
+	I-135	1131.51	22.50	1.46E+04	5.84E+04	7.26E+04
		1260.41	28.60	1.80E+04		5.84E+04
		1678.03	9.54	-8.29E+04		9.05E+04
+	CS-136	153.22	7.46	1.03E-01	5.89E-02	5.58E-01
		163.89	4.61	5.00E-01		9.23E-01
		176.55	13.56	5.91E-03		3.01E-01
		273.65	12.66	-1.54E-01		3.15E-01
		340.57	48.50	1.30E-01		1.10E-01
		818.50	99.70	3.65E-04		5.89E-02
		1048.07	79.60	1.77E-02		8.23E-02
		1235.34	19.70	-5.16E-02		4.06E-01
+	CS-137	661.65 *	85.12	6.06E-02	5.21E-02	5.21E-02
+	LA-138	788.74	34.00	4.56E-02	5.90E-02	1.23E-01
		1435.80	66.00	-1.22E-02		5.90E-02
+	CE-139	165.85	80.35	2.50E-02	4.06E-02	4.06E-02
+	BA-140	162.64	6.70	-1.71E-01	1.96E-01	6.15E-01
		304.84	4.50	-2.76E-02		8.90E-01
		423.70	3.20	1.65E-01		1.49E+00
		437.55	2.00	8.51E-01		2.51E+00
		537.32	25.00	8.47E-02		1.96E-01
+	LA-140	328.77	20.50	6.87E-02	4.84E-02	2.16E-01
		487.03	45.50	7.21E-03		1.04E-01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
LA-140	815.85	23.50	-5.38E-02	4.84E-02	2.40E-01
	1596.49	95.49	-4.86E-03		4.84E-02
+ CE-141	145.44	48.40	2.81E-02	7.33E-02	7.33E-02
+ CE-143	57.36	11.80	4.34E-02	1.13E+00	3.54E+00
	293.26	42.00	-2.02E+00		1.13E+00
	664.55	5.20	3.05E+00		1.45E+01
+ CE-144	133.54	10.80	-4.63E-02	2.97E-01	2.97E-01
+ PM-144	476.78	42.00	2.54E-02	4.22E-02	1.02E-01
	618.01	98.60	-6.71E-03		4.22E-02
	696.49	99.49	-2.27E-03		4.34E-02
+ PM-145	36.85	21.70	6.56E-02	9.65E-02	1.79E-01
	37.36	39.70	3.54E-02		9.65E-02
	42.30	15.10	-7.01E-02		2.31E-01
	72.40	2.31	5.47E-02		1.88E+00
+ PM-146	453.90	39.94	1.33E-02	9.07E-02	9.07E-02
	735.90	14.01	9.06E-02		2.92E-01
	747.13	13.10	-2.90E-02		2.81E-01
+ ND-147	91.11	28.90	-3.70E-01	1.93E-01	1.93E-01
	531.02	13.10	-1.19E-01		3.65E-01
+ PM-149	285.90	3.10	-1.82E+00	4.52E+00	4.52E+00
+ EU-152	121.78	20.50	8.70E-03	1.44E-01	1.44E-01
	244.69	5.40	-2.15E-01		6.51E-01
	344.27	19.13	1.93E-02		1.56E-01
	778.89	9.20	-3.41E-02		4.78E-01
	964.01	10.40	2.10E-01		5.69E-01
	1085.78	7.22	-1.81E-01		6.44E-01
	1112.02	9.60	-1.47E-02		3.83E-01
	1407.95	14.94	9.70E-02		3.55E-01
+ GD-153	97.43	31.30	6.05E-02	1.01E-01	1.01E-01
	103.18	22.20	-1.39E-01		1.32E-01
+ EU-154	123.07	40.50	-1.68E-02	7.33E-02	7.33E-02
	723.30	19.70	1.05E-02		2.14E-01
	873.19	11.50	1.14E-02		3.41E-01
	996.32	10.30	-3.15E-02		4.74E-01
	1004.76	17.90	4.45E-02		2.96E-01
	1274.45	35.50	6.60E-02		1.47E-01
+ EU-155	86.50	* 30.90	1.24E-01	1.42E-01	1.42E-01
	105.30	20.70	6.08E-02		1.50E-01
+ EU-156	811.77	10.40	1.90E-01	5.37E-01	5.37E-01
	1153.47	7.20	-1.33E-01		8.94E-01
	1230.71	8.90	2.26E-01		8.89E-01
+ HO-166M	184.41	72.60	9.52E-02	5.56E-02	5.56E-02
	280.45	29.60	-4.84E-02		1.02E-01
	410.94	11.10	-9.10E-02		2.86E-01
	711.69	54.10	6.84E-03		8.27E-02
+ TM-171	66.72	0.14	3.79E+00	2.56E+01	2.56E+01
+ HF-172	81.75	4.52	-9.32E-01	2.63E-01	7.59E-01
	125.81	11.30	-3.78E-01		2.63E-01
+ LU-172	181.53	20.60	-4.14E-03	1.43E-01	2.69E-01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)	
	LU-172	810.06	16.63	4.49E-02	1.43E-01	4.33E-01
		912.12	15.25	1.88E+00		9.17E-01
		1093.66	62.50	4.00E-02		1.43E-01
+	LU-173	100.72	5.24	1.24E-01	1.59E-01	5.83E-01
		272.11	21.20	1.03E-01		1.59E-01
+	HF-175	343.40	84.00	4.60E-03	3.72E-02	3.72E-02
+	LU-176	88.34	13.30	8.30E-02	3.25E-02	2.98E-01
		201.83	86.00	4.28E-04		3.65E-02
		306.78	94.00	-7.19E-03		3.25E-02
+	TA-182	67.75	41.20	-2.22E-02	8.63E-02	8.63E-02
		1121.30	34.90	3.59E-01		2.32E-01
		1189.05	16.23	2.23E-01		3.92E-01
		1221.41	26.98	4.95E-02		2.24E-01
		1231.02	11.44	1.44E-01		5.66E-01
+	IR-192	308.46	29.68	-5.92E-03	8.52E-02	1.12E-01
		468.07	48.10	-2.07E-02		8.52E-02
+	HG-203	279.19	77.30	1.81E-02	4.64E-02	4.64E-02
+	BI-207	569.67	97.72	1.64E-02	3.97E-02	3.97E-02
		1063.62	74.90	2.90E-02		6.56E-02
+	TL-208	583.14	30.22	5.09E-01	2.36E-01	2.36E-01
		860.37	4.48	6.18E-01		1.08E+00
		2614.66	35.85	5.33E-01		3.15E-01
+	BI-210M	262.00	45.00	9.48E-03	6.58E-02	6.58E-02
		300.00	23.00	-2.90E-01		1.47E-01
+	PB-210	46.50	4.25	8.18E-01	8.63E-01	8.63E-01
+	PB-211	404.84	2.90	-5.12E-01	1.13E+00	1.13E+00
		831.96	2.90	-9.16E-01		1.43E+00
+	BI-212	727.17	* 11.80	4.65E-01	4.66E-01	4.66E-01
		1620.62	2.75	2.47E-01		1.39E+00
+	PB-212	238.63	* 44.60	5.92E-01	1.67E-01	1.67E-01
		300.09	3.41	-1.95E+00		9.92E-01
+	BI-214	609.31	* 46.30	5.90E-01	1.64E-01	1.64E-01
		1120.29	15.10	7.37E-01		5.13E-01
		1764.49	15.80	8.92E-01		5.98E-01
		2204.22	* 4.98	7.66E-01		7.38E-01
+	PB-214	295.21	* 19.19	6.43E-01	1.38E-01	3.45E-01
		351.92	* 37.19	5.60E-01		1.38E-01
+	RN-219	401.80	6.50	1.01E-01	5.13E-01	5.13E-01
+	RA-223	323.87	3.88	-3.82E-01	7.42E-01	7.42E-01
+	RA-224	240.98	3.95	7.00E+00	1.65E+00	1.65E+00
+	RA-225	40.00	31.00	-2.15E-03	1.50E-01	1.50E-01
+	RA-226	186.21	* 3.28	1.36E+00	1.54E+00	1.54E+00
+	TH-227	50.10	8.40	-7.13E-01	3.19E-01	3.63E-01
		236.00	11.50	-2.22E+00		3.19E-01
		256.20	6.30	3.76E-02		4.78E-01
+	AC-228	338.32	* 11.40	6.33E-01	2.28E-01	4.00E-01
		911.07	* 27.70	5.86E-01		2.28E-01
		969.11	* 16.60	4.07E-01		7.39E-01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

	Nuclide Name	Energy (keV)	Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	TH-230	48.44	16.90	1.20E-01	2.06E-01	2.06E-01
		62.85	4.60	1.61E+00		9.03E-01
		67.67	0.37	-2.40E+00		9.33E+00
+	PA-231	283.67	1.60	-1.17E-01	1.34E+00	1.82E+00
		302.67	2.30	-7.58E-02		1.34E+00
+	TH-231	25.64	14.70	-4.21E-01	4.65E-01	4.65E-01
		84.21	6.40	2.55E-02		5.55E-01
+	PA-233	311.98	38.60	-8.57E-03	9.37E-02	9.37E-02
+	PA-234	131.20	20.40	1.36E-01	1.68E-01	1.68E-01
		733.99	8.80	3.84E-02		4.64E-01
		946.00	12.00	-6.15E-02		3.82E-01
+	PA-234M	1001.03	0.92	2.63E+00	5.89E+00	5.89E+00
+	TH-234	63.29	*	3.80	1.38E+00	1.38E+00
+	U-235	143.76	10.50	1.71E-01	3.12E-01	3.12E-01
		163.35	4.70	-1.86E-01		6.67E-01
		205.31	4.70	-3.99E-02		6.62E-01
+	NP-237	86.50	*	3.03E-01	3.46E-01	3.46E-01
+	NP-239	106.10	22.70	-1.33E-01	6.09E-01	6.09E-01
		228.18	10.70	1.20E-01		1.35E+00
		277.60	14.10	8.74E-01		1.07E+00
+	AM-241	59.54	35.90	1.06E-02	9.29E-02	9.29E-02
+	AM-243	74.67	*	1.36E-01	1.08E-01	1.08E-01
+	CM-243	209.75	3.29	5.29E-01	2.43E-01	1.07E+00
		228.14	10.60	2.73E-02		3.06E-01
		277.60	14.00	1.98E-01		2.43E-01

- + = 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
 ? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
BE-7	477.59	10.42	4.46E-01	4.46E-01	3.37E-01	2.12E-01
NA-22	1274.54	99.94	5.25E-02	5.25E-02	2.35E-02	2.39E-02
NA-24	1368.53	99.99	1.15E+01	7.91E+00	-1.20E+00	5.09E+00
	2754.09	99.86	7.91E+00		2.45E-01	2.96E+00
AL-26	1808.65	99.76	3.46E-02	3.46E-02	3.82E-03	1.44E-02
+ K-40	1460.81	* 10.67	4.69E-01	4.69E-01	1.16E+01	2.10E-01
@ AR-41	1293.64	99.16	1.00E+26	1.00E+26	0.00E+00	1.00E+20
TI-44	67.88	94.40	3.65E-02	3.65E-02	-9.40E-03	1.77E-02
	78.34	96.00	5.27E-02		7.99E-02	2.58E-02
SC-46	889.25	99.98	4.14E-02	4.14E-02	-1.20E-02	1.89E-02
	1120.51	99.99	8.19E-02		1.27E-01	3.87E-02
V-48	983.52	99.98	5.83E-02	5.83E-02	0.00E+00	2.67E-02
	1312.10	97.50	6.36E-02		-1.22E-02	2.88E-02
CR-51	320.08	9.83	3.48E-01	3.48E-01	6.85E-02	1.65E-01
MN-54	834.83	99.97	4.37E-02	4.37E-02	9.17E-03	2.02E-02
CO-56	846.75	99.96	3.78E-02	3.78E-02	-3.23E-02	1.71E-02
	1037.75	14.03	3.86E-01		6.84E-02	1.78E-01
	1238.25	67.00	1.06E-01		7.13E-02	4.96E-02
	1771.40	15.51	3.00E-01		8.69E-03	1.31E-01
	2598.48	16.90	2.11E-01		5.80E-02	8.38E-02
CO-57	122.06	85.51	3.49E-02	3.49E-02	2.11E-03	1.69E-02
	136.48	10.60	2.97E-01		-2.22E-02	1.44E-01
CO-58	810.76	99.40	4.42E-02	4.42E-02	-7.14E-03	2.04E-02
FE-59	1099.22	56.50	8.98E-02	8.98E-02	-7.63E-03	4.09E-02
	1291.56	43.20	1.18E-01		-1.21E-03	5.29E-02
CO-60	1173.22	100.00	5.70E-02	5.04E-02	1.24E-02	2.63E-02
	1332.49	100.00	5.04E-02		6.35E-03	2.28E-02
ZN-65	1115.52	50.75	8.28E-02	8.28E-02	-2.24E-02	3.72E-02
+ GA-67	93.31	* 35.70	4.17E-01	4.17E-01	3.06E-01	2.05E-01
	208.95	2.24	4.52E+00		3.48E-01	2.18E+00
	300.22	16.00	6.21E-01		-1.22E+00	2.97E-01
SE-75	121.11	16.70	1.82E-01	4.83E-02	4.59E-02	8.82E-02
	136.00	59.20	5.42E-02		-2.16E-02	2.62E-02
	264.65	59.80	4.83E-02		-4.61E-04	2.30E-02
	279.53	25.20	1.30E-01		-2.07E-02	6.21E-02
	400.65	11.40	2.95E-01		-6.58E-02	1.39E-01
RB-82	776.52	13.00	3.90E-01	3.90E-01	7.84E-02	1.81E-01
RB-83	520.41	46.00	7.89E-02	7.89E-02	4.00E-03	3.69E-02
	529.64	30.30	1.23E-01		0.00E+00	5.76E-02
	552.65	16.40	2.49E-01		-2.45E-02	1.17E-01
KR-85	513.99	0.43	1.42E+01	1.42E+01	2.61E+01	6.82E+00
SR-85	513.99	99.27	6.53E-02	6.53E-02	1.20E-01	3.15E-02
Y-88	898.02	93.40	4.92E-02	3.43E-02	1.03E-02	2.26E-02
	1836.01	99.38	3.43E-02		-1.01E-02	1.41E-02
NB-93M	16.57	9.43	5.68E-01	5.68E-01	-4.58E-01	2.60E-01
NB-94	702.63	100.00	4.43E-02	4.15E-02	2.30E-03	2.07E-02
	871.10	100.00	4.15E-02		4.80E-03	1.90E-02
NB-95	765.79	99.81	5.65E-02	5.65E-02	1.58E-02	2.65E-02
NB-95M	235.69	25.00	3.88E-01	3.88E-01	-2.70E+00	1.87E-01
ZR-95	724.18	43.70	1.07E-01	8.99E-02	4.84E-03	4.97E-02
	756.72	55.30	8.99E-02		4.66E-02	4.20E-02
MO-99	181.06	6.20	1.87E+00	1.08E+00	-3.19E-01	9.02E-01
	739.58	12.80	1.08E+00		-5.74E-02	4.95E-01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
MO-99	778.00	4.50	3.50E+00	1.08E+00	-8.63E-01	1.62E+00
RU-103	497.08	89.00	4.21E-02	4.21E-02	-5.02E-03	1.97E-02
RU-106	621.84	9.80	4.18E-01	4.18E-01	6.61E-02	1.95E-01
AG-108M	433.93	89.90	4.00E-02	4.00E-02	-2.87E-02	1.89E-02
	614.37	90.40	4.65E-02		-3.37E-01	2.18E-02
	722.95	90.50	4.65E-02		2.28E-03	2.16E-02
CD-109	88.03	3.72	1.07E+00	1.07E+00	2.99E-01	5.23E-01
AG-110M	657.75	93.14	4.47E-02	4.47E-02	-7.69E-03	2.08E-02
	677.61	10.53	3.81E-01		5.02E-02	1.77E-01
	706.67	16.46	2.82E-01		2.45E-02	1.32E-01
	763.93	21.98	2.11E-01		-1.73E-01	9.83E-02
	884.67	71.63	5.60E-02		5.56E-03	2.55E-02
	1384.27	23.94	1.74E-01		4.50E-02	7.66E-02
CD-113M	263.70	0.02	1.23E+02	1.23E+02	1.55E+00	5.86E+01
SN-113	255.12	1.93	1.57E+00	4.99E-02	-3.43E-01	7.47E-01
	391.69	64.90	4.99E-02		-8.48E-03	2.35E-02
TE123M	159.00	84.10	3.59E-02	3.59E-02	-9.55E-03	1.73E-02
SB-124	602.71	97.87	4.57E-02	4.57E-02	9.33E-03	2.14E-02
	645.85	7.26	5.60E-01		-1.97E-01	2.60E-01
	722.78	11.10	4.01E-01		1.97E-02	1.86E-01
	1691.02	49.00	8.81E-02		-1.25E-02	3.79E-02
I-125	35.49	6.49	6.42E-01	6.42E-01	-3.91E-01	3.09E-01
SB-125	176.33	6.89	4.49E-01	1.28E-01	2.49E-03	2.16E-01
	427.89	29.33	1.28E-01		1.13E-02	6.06E-02
	463.38	10.35	4.05E-01		1.94E-01	1.93E-01
	600.56	17.80	2.28E-01		9.89E-02	1.07E-01
	635.90	11.32	3.59E-01		2.08E-01	1.68E-01
SB-126	414.70	83.30	4.82E-02	4.82E-02	-4.48E-03	2.26E-02
	666.33	99.60	6.88E-02		7.33E-03	3.25E-02
	695.00	99.60	5.81E-02		-1.56E-02	2.71E-02
	720.50	53.80	1.04E-01		2.96E-02	4.84E-02
+ SN-126	87.57	* 37.00	1.18E-01	1.18E-01	1.03E-01	5.77E-02
SB-127	473.00	25.00	3.83E-01	3.05E-01	-1.53E-01	1.81E-01
	685.20	35.70	3.05E-01		4.80E-03	1.42E-01
	783.80	14.70	7.61E-01		1.22E-01	3.53E-01
I-129	29.78	57.00	8.57E-02	8.57E-02	2.20E-03	4.13E-02
	33.60	13.20	3.20E-01		1.60E-02	1.54E-01
	39.58	7.52	4.93E-01		-7.04E-03	2.38E-01
I-131	284.30	6.05	7.47E-01	5.41E-02	-4.80E-02	3.55E-01
	364.48	81.20	5.41E-02		-7.90E-03	2.54E-02
	636.97	7.26	8.40E-01		8.78E-02	3.91E-01
	722.89	1.80	3.62E+00		1.77E-01	1.68E+00
TE-132	49.72	13.10	6.86E-01	1.08E-01	-1.35E+00	3.31E-01
	228.16	88.00	1.08E-01		9.66E-03	5.20E-02
BA-133	81.00	33.00	1.04E-01	5.50E-02	-4.96E-01	5.08E-02
	302.84	17.80	1.74E-01		-9.81E-03	8.25E-02
	356.01	60.00	5.50E-02		-2.58E-01	2.61E-02
I-133	529.87	86.30	2.39E+00	2.39E+00	0.00E+00	1.12E+00
CS-134	563.23	8.38	4.75E-01	4.53E-02	2.51E-01	2.23E-01
	569.32	15.43	2.43E-01		-5.03E-02	1.13E-01
	604.70	97.60	4.53E-02		4.03E-03	2.13E-02
	795.84	85.40	5.56E-02		2.97E-02	2.59E-02
	801.93	8.73	4.52E-01		1.55E-02	2.07E-01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
CS-135	268.24	16.00	1.83E-01	1.83E-01	7.10E-03	8.71E-02
I-135	1131.51	22.50	7.26E+04	5.84E+04	1.46E+04	3.30E+04
	1260.41	28.60	5.84E+04		1.80E+04	2.64E+04
	1678.03	9.54	9.05E+04		-8.29E+04	3.50E+04
CS-136	153.22	7.46	5.58E-01	5.89E-02	1.03E-01	2.70E-01
	163.89	4.61	9.23E-01		5.00E-01	4.47E-01
	176.55	13.56	3.01E-01		5.91E-03	1.45E-01
	273.65	12.66	3.15E-01		-1.54E-01	1.50E-01
	340.57	48.50	1.10E-01		1.30E-01	5.29E-02
	818.50	99.70	5.89E-02		3.65E-04	2.73E-02
	1048.07	79.60	8.23E-02		1.77E-02	3.79E-02
	1235.34	19.70	4.06E-01		-5.16E-02	1.88E-01
+ CS-137	661.65	* 85.12	5.21E-02	5.21E-02	6.06E-02	2.44E-02
LA-138	788.74	34.00	1.23E-01	5.90E-02	4.56E-02	5.66E-02
	1435.80	66.00	5.90E-02		-1.22E-02	2.57E-02
CE-139	165.85	80.35	4.06E-02	4.06E-02	2.50E-02	1.96E-02
BA-140	162.64	6.70	6.15E-01	1.96E-01	-1.71E-01	2.97E-01
	304.84	4.50	8.90E-01		-2.76E-02	4.23E-01
	423.70	3.20	1.49E+00		1.65E-01	7.06E-01
	437.55	2.00	2.51E+00		8.51E-01	1.19E+00
	537.32	25.00	1.96E-01		8.47E-02	9.18E-02
LA-140	328.77	20.50	2.16E-01	4.84E-02	6.87E-02	1.03E-01
	487.03	45.50	1.04E-01		7.21E-03	4.87E-02
	815.85	23.50	2.40E-01		-5.38E-02	1.11E-01
	1596.49	95.49	4.84E-02		-4.86E-03	2.04E-02
CE-141	145.44	48.40	7.33E-02	7.33E-02	2.81E-02	3.55E-02
CE-143	57.36	11.80	3.54E+00	1.13E+00	4.34E-02	1.71E+00
	293.26	42.00	1.13E+00		-2.02E+00	5.41E-01
	664.55	5.20	1.45E+01		3.05E+00	6.91E+00
CE-144	133.54	10.80	2.97E-01	2.97E-01	-4.63E-02	1.44E-01
PM-144	476.78	42.00	1.02E-01	4.22E-02	2.54E-02	4.82E-02
	618.01	98.60	4.22E-02		-6.71E-03	1.98E-02
	696.49	99.49	4.34E-02		-2.27E-03	2.02E-02
PM-145	36.85	21.70	1.79E-01	9.65E-02	6.56E-02	8.62E-02
	37.36	39.70	9.65E-02		3.54E-02	4.65E-02
	42.30	15.10	2.31E-01		-7.01E-02	1.12E-01
	72.40	2.31	1.88E+00		5.47E-02	9.22E-01
PM-146	453.90	39.94	9.07E-02	9.07E-02	1.33E-02	4.28E-02
	735.90	14.01	2.92E-01		9.06E-02	1.35E-01
	747.13	13.10	2.81E-01		-2.90E-02	1.28E-01
ND-147	91.11	28.90	1.93E-01	1.93E-01	-3.70E-01	9.41E-02
	531.02	13.10	3.65E-01		-1.19E-01	1.70E-01
PM-149	285.90	3.10	4.52E+00	4.52E+00	-1.82E+00	2.15E+00
EU-152	121.78	20.50	1.44E-01	1.44E-01	8.70E-03	6.96E-02
	244.69	5.40	6.51E-01		-2.15E-01	3.14E-01
	344.27	19.13	1.56E-01		1.93E-02	7.36E-02
	778.89	9.20	4.78E-01		-3.41E-02	2.22E-01
	964.01	10.40	5.69E-01		2.10E-01	2.66E-01
	1085.78	7.22	6.44E-01		-1.81E-01	2.93E-01
	1112.02	9.60	3.83E-01		-1.47E-02	1.70E-01
	1407.95	14.94	3.55E-01		9.70E-02	1.61E-01
GD-153	97.43	31.30	1.01E-01	1.01E-01	6.05E-02	4.90E-02
	103.18	22.20	1.32E-01		-1.39E-01	6.38E-02

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)	Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
EU-154	123.07	40.50	7.33E-02	7.33E-02	-1.68E-02	3.54E-02
	723.30	19.70	2.14E-01		1.05E-02	9.92E-02
	873.19	11.50	3.41E-01		1.14E-02	1.55E-01
	996.32	10.30	4.74E-01		-3.15E-02	2.18E-01
	1004.76	17.90	2.96E-01		4.45E-02	1.37E-01
+ EU-155	1274.45	35.50	1.47E-01		6.60E-02	6.71E-02
	86.50 *	30.90	1.42E-01	1.42E-01	1.24E-01	6.93E-02
EU-156	105.30	20.70	1.50E-01		6.08E-02	7.27E-02
	811.77	10.40	5.37E-01	5.37E-01	1.90E-01	2.48E-01
HO-166M	1153.47	7.20	8.94E-01		-1.33E-01	4.09E-01
	1230.71	8.90	8.89E-01		2.26E-01	4.12E-01
	184.41	72.60	5.56E-02	5.56E-02	9.52E-02	2.70E-02
	280.45	29.60	1.02E-01		-4.84E-02	4.87E-02
TM-171	410.94	11.10	2.86E-01		-9.10E-02	1.34E-01
	711.69	54.10	8.27E-02		6.84E-03	3.86E-02
HF-172	66.72	0.14	2.56E+01	2.56E+01	3.79E+00	1.24E+01
LU-172	81.75	4.52	7.59E-01	2.63E-01	-9.32E-01	3.69E-01
	125.81	11.30	2.63E-01		-3.78E-01	1.27E-01
LU-173	181.53	20.60	2.69E-01	1.43E-01	-4.14E-03	1.30E-01
	810.06	16.63	4.33E-01		4.49E-02	2.00E-01
	912.12	15.25	9.17E-01		1.88E+00	4.39E-01
LU-176	1093.66	62.50	1.43E-01		4.00E-02	6.59E-02
	100.72	5.24	5.83E-01	1.59E-01	1.24E-01	2.82E-01
TA-182	272.11	21.20	1.59E-01		1.03E-01	7.61E-02
	343.40	84.00	3.72E-02	3.72E-02	4.60E-03	1.76E-02
	88.34	13.30	2.98E-01	3.25E-02	8.30E-02	1.45E-01
	201.83	86.00	3.65E-02		4.28E-04	1.76E-02
IR-192	306.78	94.00	3.25E-02		-7.19E-03	1.54E-02
	67.75	41.20	8.63E-02	8.63E-02	-2.22E-02	4.20E-02
	1121.30	34.90	2.32E-01		3.59E-01	1.10E-01
	1189.05	16.23	3.92E-01		2.23E-01	1.82E-01
	1221.41	26.98	2.24E-01		4.95E-02	1.03E-01
HG-203	1231.02	11.44	5.66E-01		1.44E-01	2.62E-01
	308.46	29.68	1.12E-01	8.52E-02	-5.92E-03	5.32E-02
BI-207	468.07	48.10	8.52E-02		-2.07E-02	4.03E-02
	279.19	77.30	4.64E-02	4.64E-02	1.81E-02	2.22E-02
TL-208	569.67	97.72	3.97E-02	3.97E-02	1.64E-02	1.86E-02
	1063.62	74.90	6.56E-02		2.90E-02	3.01E-02
BI-210M	583.14	30.22	2.36E-01	2.36E-01	5.09E-01	1.14E-01
	860.37	4.48	1.08E+00		6.18E-01	5.02E-01
	2614.66	35.85	3.15E-01		5.33E-01	1.48E-01
PB-210	262.00	45.00	6.58E-02	6.58E-02	9.48E-03	3.14E-02
	300.00	23.00	1.47E-01		-2.90E-01	7.03E-02
PB-211	46.50	4.25	8.63E-01	8.63E-01	8.18E-01	4.18E-01
	404.84	2.90	1.13E+00	1.13E+00	-5.12E-01	5.32E-01
+ BI-212	831.96	2.90	1.43E+00		-9.16E-01	6.55E-01
	727.17 *	11.80	4.66E-01	4.66E-01	4.65E-01	2.20E-01
+ PB-212	1620.62	2.75	1.39E+00		2.47E-01	5.96E-01
	238.63 *	44.60	1.67E-01	1.67E-01	5.92E-01	8.19E-02
+ BI-214	300.09	3.41	9.92E-01		-1.95E+00	4.74E-01
	609.31 *	46.30	1.64E-01	1.64E-01	5.90E-01	7.90E-02
	1120.29	15.10	5.13E-01		7.37E-01	2.42E-01
	1764.49	15.80	5.98E-01		8.92E-01	2.81E-01

Analysis Report for 1405081-04

J1TLD8 SAF: RC-189

Nuclide Name	Energy (keV)		Yield(%)	Line MDA (pCi/grams)	Nuclide MDA (pCi/grams)	Activity (pCi/grams)	Dec. Level (pCi/grams)
	2204.22	*	4.98	7.38E-01	1.64E-01	7.66E-01	3.03E-01
+	PB-214		19.19	3.45E-01	1.38E-01	6.43E-01	1.69E-01
	351.92	*	37.19	1.38E-01		5.60E-01	6.69E-02
	RN-219		6.50	5.13E-01	5.13E-01	1.01E-01	2.42E-01
	RA-223		3.88	7.42E-01	7.42E-01	-3.82E-01	3.50E-01
	RA-224		3.95	1.65E+00	1.65E+00	7.00E+00	8.09E-01
	RA-225		31.00	1.50E-01	1.50E-01	-2.15E-03	7.25E-02
+	RA-226	*	3.28	1.54E+00	1.54E+00	1.36E+00	7.50E-01
	TH-227		8.40	3.63E-01	3.19E-01	-7.13E-01	1.75E-01
			11.50	3.19E-01		-2.22E+00	1.54E-01
			6.30	4.78E-01		3.76E-02	2.28E-01
+	AC-228	*	11.40	4.00E-01	2.28E-01	6.33E-01	1.93E-01
		*	27.70	2.28E-01		5.86E-01	1.07E-01
		*	16.60	7.39E-01		4.07E-01	3.58E-01
	TH-230		16.90	2.06E-01	2.06E-01	1.20E-01	9.96E-02
			4.60	9.03E-01		1.61E+00	4.41E-01
			0.37	9.33E+00		-2.40E+00	4.53E+00
	PA-231		1.60	1.82E+00	1.34E+00	-1.17E-01	8.66E-01
			2.30	1.34E+00		-7.58E-02	6.38E-01
	TH-231		14.70	4.65E-01	4.65E-01	-4.21E-01	2.25E-01
			6.40	5.55E-01		2.55E-02	2.70E-01
	PA-233		38.60	9.37E-02	9.37E-02	-8.57E-03	4.46E-02
	PA-234		20.40	1.68E-01	1.68E-01	1.36E-01	8.15E-02
			8.80	4.64E-01		3.84E-02	2.15E-01
			12.00	3.82E-01		-6.15E-02	1.75E-01
	PA-234M		0.92	5.89E+00	5.89E+00	2.63E+00	2.73E+00
+	TH-234	*	3.80	1.38E+00	1.38E+00	1.10E+00	6.79E-01
	U-235		10.50	3.12E-01	3.12E-01	1.71E-01	1.51E-01
			4.70	6.67E-01		-1.86E-01	3.22E-01
			4.70	6.62E-01		-3.99E-02	3.18E-01
+	NP-237	*	12.60	3.46E-01	3.46E-01	3.03E-01	1.70E-01
	NP-239		22.70	6.09E-01	6.09E-01	-1.33E-01	2.95E-01
			10.70	1.35E+00		1.20E-01	6.47E-01
			14.10	1.07E+00		8.74E-01	5.14E-01
	AM-241		35.90	9.29E-02	9.29E-02	1.06E-02	4.50E-02
+	AM-243	*	66.00	1.08E-01	1.08E-01	1.36E-01	5.35E-02
	CM-243		3.29	1.07E+00	2.43E-01	5.29E-01	5.17E-01
			10.60	3.06E-01		2.73E-02	1.47E-01
			14.00	2.43E-01		1.98E-01	1.17E-01

+ = 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

Analysis Report for 1405081-04
J1TLD8 SAF: RC-189

No Action Level results available for reporting purposes.

DATA REVIEW COMMENTS REPORT

<i>Creation Date</i>	<i>Comment</i>	<i>User</i>
----------------------	----------------	-------------

No Data Review Comments Entered.

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: J1TLD8 SAF: RC-189

Elapsed Live time: 3600
Elapsed Real Time: 3601

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	1	38	63	77	151	141	67
25:	94	75	39	51	49	47	46	52
33:	55	45	49	39	48	52	56	42
41:	53	51	53	52	54	55	112	54
49:	45	45	47	49	55	66	60	70
57:	56	73	57	61	82	72	120	191
65:	99	82	80	89	78	75	93	98
73:	110	113	258	193	226	321	109	89
81:	87	74	72	102	109	105	95	178
89:	91	111	110	95	199	156	68	60
97:	72	66	74	82	60	46	71	61
105:	61	74	78	73	75	72	74	62
113:	85	68	51	74	59	56	58	56
121:	56	58	70	55	58	68	59	52
129:	90	88	72	65	72	68	60	60
137:	65	58	67	60	71	62	57	80
145:	70	63	47	51	55	72	57	56
153:	75	58	54	47	45	49	56	53
161:	42	57	61	70	45	64	56	44
169:	37	62	66	42	47	43	50	50
177:	46	58	51	56	57	47	55	59
185:	50	119	131	52	54	50	50	43
193:	55	51	48	45	34	54	50	53
201:	38	50	41	41	41	51	41	46
209:	51	75	48	51	50	33	46	57
217:	42	47	43	42	51	42	39	39
225:	39	38	36	47	38	48	41	39
233:	36	37	36	39	44	101	379	187
241:	68	106	74	41	40	39	30	33
249:	31	19	26	27	27	31	27	33
257:	27	35	35	28	29	29	28	29
265:	20	23	26	22	24	40	48	42
273:	14	31	29	28	40	48	28	33
281:	18	25	32	31	19	17	29	22
289:	27	28	28	25	25	35	79	143
297:	57	31	28	40	32	25	22	31
305:	17	29	23	33	20	28	26	30
313:	28	17	27	27	27	20	23	25
321:	20	23	14	17	23	22	20	33
329:	32	26	24	17	31	27	24	19
337:	22	46	79	50	25	21	17	21
345:	17	21	19	15	32	18	40	165
353:	175	32	22	18	17	25	18	12
361:	19	15	19	10	18	12	21	14

369: 21 20 16 14 20 16 17 19

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8
377:	26	15	11	11	15	16	18	16
385:	24	19	13	20	15	17	18	9
393:	18	26	25	16	19	27	14	16
401:	18	22	22	18	19	11	21	28
409:	20	17	26	12	8	19	15	17
417:	15	9	17	20	15	10	22	15
425:	14	15	14	10	12	28	17	13
433:	11	13	11	11	23	12	25	11
441:	18	17	12	18	14	19	17	12
449:	14	13	14	12	17	13	20	9
457:	8	10	13	15	13	8	18	29
465:	14	26	14	13	14	16	7	16
473:	9	14	18	19	18	22	12	16
481:	21	13	12	13	12	6	12	11
489:	10	17	11	9	14	8	13	13
497:	15	6	9	7	16	11	17	16
505:	17	4	8	12	15	40	73	65
513:	31	18	17	10	15	10	8	7
521:	8	15	14	6	9	11	13	7
529:	6	13	14	7	10	8	12	9
537:	16	10	8	11	7	8	16	8
545:	9	6	16	11	14	17	11	12
553:	7	8	9	15	14	9	11	12
561:	6	8	15	12	14	11	6	6
569:	10	15	11	8	17	11	5	12
577:	19	17	11	14	18	12	57	101
585:	32	17	13	8	7	10	7	11
593:	9	11	10	6	6	9	10	9
601:	14	13	11	7	12	13	15	15
609:	69	153	84	9	10	12	11	19
617:	8	7	9	10	8	13	13	5
625:	11	13	7	10	12	11	6	8
633:	11	10	8	15	7	9	6	7
641:	4	11	4	13	4	3	12	8
649:	13	12	13	12	6	7	3	15
657:	10	8	5	5	18	39	26	18
665:	7	20	11	13	7	13	9	9
673:	3	6	10	4	7	7	11	12
681:	5	12	7	10	7	12	7	13
689:	7	14	11	13	10	8	10	7
697:	11	7	7	13	3	12	10	9
705:	10	10	8	14	7	13	9	8
713:	6	10	14	10	5	10	10	9
721:	8	12	5	4	10	9	15	36
729:	17	7	5	9	9	10	5	6
737:	8	4	10	6	4	8	5	9
745:	6	5	5	6	3	6	6	6
753:	6	8	9	11	8	8	13	10
761:	8	6	12	9	11	5	11	14
769:	16	16	7	7	8	8	6	7
777:	15	6	7	7	7	6	14	4
785:	6	11	9	3	12	3	3	7
793:	7	6	14	11	9	8	7	3

801: 10 5 4 7 5 6 7 3

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8
809:	10	6	8	9	5	5	9	7
817:	5	6	11	8	7	9	7	9
825:	7	6	9	12	8	3	5	5
833:	4	9	9	8	8	4	7	7
841:	10	6	6	4	4	3	6	5
849:	4	5	10	9	5	4	7	7
857:	2	4	6	8	15	13	6	5
865:	8	3	8	8	7	6	7	3
873:	3	6	5	5	1	5	9	8
881:	7	9	2	3	4	4	7	6
889:	6	6	2	4	7	9	8	4
897:	8	8	6	6	4	4	3	4
905:	12	5	7	5	5	7	36	68
913:	22	13	10	2	6	7	8	6
921:	6	3	9	8	9	4	13	7
929:	7	1	4	6	7	10	16	12
937:	6	4	5	4	7	3	6	5
945:	4	7	7	9	5	9	8	6
953:	7	6	5	8	3	9	12	4
961:	8	9	5	8	12	23	7	10
969:	24	43	18	4	5	2	5	6
977:	5	5	10	7	7	4	3	5
985:	6	4	13	5	2	12	6	7
993:	5	5	6	6	5	6	12	6
1001:	8	12	4	8	2	12	7	8
1009:	2	4	6	4	3	3	6	2
1017:	4	8	8	5	9	6	1	4
1025:	8	5	5	2	8	11	2	4
1033:	6	4	7	10	10	9	2	7
1041:	3	5	8	3	3	5	7	8
1049:	1	11	9	4	6	6	8	6
1057:	2	2	5	5	4	10	5	7
1065:	6	3	6	2	4	5	3	4
1073:	5	8	4	3	4	5	5	12
1081:	8	4	5	6	6	3	7	4
1089:	4	7	7	9	4	9	7	2
1097:	8	3	7	0	9	6	4	2
1105:	8	5	5	3	1	3	1	7
1113:	2	1	5	2	2	7	7	24
1121:	26	20	14	5	5	5	9	10
1129:	4	4	3	8	4	7	4	3
1137:	5	7	5	5	9	6	7	8
1145:	4	10	10	9	6	7	4	3
1153:	7	4	5	9	7	7	5	9
1161:	7	2	6	3	7	9	7	6
1169:	4	3	3	9	11	8	6	8
1177:	4	9	10	9	3	6	11	2
1185:	5	8	4	13	8	9	9	5
1193:	5	7	6	4	6	3	7	7
1201:	9	6	11	10	7	5	7	9
1209:	6	7	7	6	9	5	5	5
1217:	6	7	5	6	5	3	10	10
1225:	9	6	4	11	5	10	9	6

1233: 7 7 4 11 4 13 14 11

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8	9
1241:	8	2	6	5	6	3	6	7	
1249:	6	5	7	4	3	6	5	3	
1257:	1	4	2	3	6	5	6	4	
1265:	6	2	5	2	6	3	2	5	
1273:	8	3	4	3	4	8	2	5	
1281:	3	4	4	4	8	6	2	4	
1289:	6	2	2	7	4	3	3	6	
1297:	3	5	3	7	2	4	4	2	
1305:	3	2	8	7	1	6	5	3	
1313:	7	5	3	2	4	5	5	5	
1321:	2	2	4	2	3	3	5	2	
1329:	4	4	2	3	5	5	8	3	
1337:	6	3	4	1	0	3	2	5	
1345:	4	0	2	3	1	3	1	3	
1353:	0	2	2	5	3	5	0	1	
1361:	4	5	3	4	1	2	2	3	
1369:	4	2	5	1	2	5	2	4	
1377:	2	7	4	6	2	5	1	0	
1385:	2	4	4	2	2	1	1	4	
1393:	2	3	0	3	2	3	4	4	
1401:	4	1	4	6	7	4	0	4	
1409:	5	7	4	2	2	0	4	4	
1417:	5	2	1	1	1	0	2	1	
1425:	0	2	2	5	3	3	4	3	
1433:	1	0	5	1	3	2	3	1	
1441:	3	1	2	2	3	0	2	3	
1449:	1	1	0	0	3	1	3	4	
1457:	2	1	2	30	183	292	133	17	
1465:	7	3	1	1	1	2	5	1	
1473:	0	3	1	3	2	1	4	0	
1481:	1	0	0	0	2	2	0	1	
1489:	2	3	2	3	1	2	0	4	
1497:	0	2	0	2	1	2	1	2	
1505:	2	1	1	1	3	6	3	1	
1513:	1	0	1	2	5	4	0	1	
1521:	3	2	2	2	1	0	0	1	
1529:	2	0	4	1	2	2	1	1	
1537:	0	3	2	4	3	2	4	2	
1545:	1	1	0	1	3	6	0	0	
1553:	1	0	0	2	0	3	0	1	
1561:	2	1	2	0	2	0	3	3	
1569:	0	1	2	1	3	1	0	2	
1577:	2	2	1	3	3	3	3	1	
1585:	2	1	0	3	3	3	0	2	
1593:	2	1	3	2	0	2	2	0	
1601:	2	1	2	5	0	2	1	0	
1609:	0	0	0	1	1	4	0	0	
1617:	0	3	0	1	4	2	2	0	
1625:	1	3	0	1	2	2	3	4	
1633:	1	3	0	2	0	1	0	1	
1641:	0	2	1	0	2	2	1	1	
1649:	1	2	0	0	1	3	2	1	
1657:	1	2	1	0	3	0	3	0	

1665: 0 0 2 0 1 1 3 1

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8	9
1673:	2	1	1	0	1	1	0	1	
1681:	0	2	3	1	1	2	2	1	
1689:	0	1	6	1	3	1	3	2	
1697:	1	1	0	1	1	1	0	1	
1705:	2	0	0	0	0	0	2	0	
1713:	2	2	0	2	2	1	0	0	
1721:	1	1	2	1	0	0	1	1	
1729:	0	1	4	3	2	3	0	1	
1737:	0	3	0	1	0	0	1	1	
1745:	3	0	1	2	0	0	2	1	
1753:	1	1	0	1	0	3	2	0	
1761:	0	0	0	9	26	28	11	3	
1769:	2	2	2	1	0	1	1	3	
1777:	0	1	2	1	2	0	0	1	
1785:	0	1	1	0	3	1	0	3	
1793:	0	0	1	0	2	0	1	0	
1801:	1	1	0	1	0	0	1	0	
1809:	1	1	3	1	1	2	0	1	
1817:	0	0	1	0	2	1	1	1	
1825:	0	0	2	2	2	1	1	0	
1833:	0	2	2	0	1	1	0	1	
1841:	2	1	0	1	1	1	1	3	
1849:	7	2	1	2	0	2	2	0	
1857:	0	0	1	0	0	1	1	1	
1865:	1	0	1	0	1	1	3	3	
1873:	0	1	2	1	1	3	1	2	
1881:	0	0	0	1	0	1	0	2	
1889:	1	2	2	2	1	0	2	0	
1897:	2	2	1	0	0	2	0	0	
1905:	0	1	0	0	1	0	1	0	
1913:	0	1	2	0	2	2	0	0	
1921:	2	0	1	4	0	2	0	0	
1929:	0	1	0	0	0	0	2	1	
1937:	2	0	2	1	2	1	2	2	
1945:	0	0	0	0	2	1	1	0	
1953:	0	0	2	0	1	0	0	0	
1961:	0	0	0	1	0	2	4	1	
1969:	0	0	1	1	1	0	1	1	
1977:	0	1	1	0	0	1	1	0	
1985:	0	0	1	0	1	2	0	0	
1993:	1	0	1	4	1	0	1	0	
2001:	0	1	0	1	0	0	2	1	
2009:	1	1	0	0	0	1	3	1	
2017:	1	1	2	0	1	1	0	0	
2025:	0	0	1	0	0	0	0	0	
2033:	0	1	1	2	0	2	0	0	
2041:	2	1	1	2	0	1	3	0	
2049:	1	0	0	1	2	1	1	2	
2057:	0	0	0	1	0	4	0	1	
2065:	1	0	1	1	1	1	1	1	
2073:	0	1	2	2	2	3	0	0	
2081:	0	0	0	1	2	1	1	2	
2089:	0	1	1	0	1	0	0	1	

2097: 2 0 0 0 2 0 4 2

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8
2105:	1	0	3	0	2	1	0	0
2113:	0	0	1	0	1	0	0	2
2121:	1	1	0	0	0	2	3	1
2129:	1	0	0	2	0	0	0	3
2137:	1	1	0	1	2	0	1	1
2145:	1	0	0	1	2	0	0	0
2153:	0	0	1	2	1	1	1	0
2161:	0	1	2	1	1	0	0	0
2169:	0	0	1	0	0	1	0	1
2177:	0	1	0	0	0	3	1	2
2185:	1	0	2	1	1	1	1	0
2193:	1	2	1	1	2	1	1	1
2201:	3	0	1	2	8	4	1	0
2209:	0	1	0	1	0	1	2	1
2217:	1	3	1	0	1	0	1	1
2225:	1	1	2	0	0	1	1	0
2233:	1	0	0	2	0	0	2	1
2241:	0	1	0	1	0	1	0	0
2249:	0	1	1	0	0	0	0	1
2257:	2	0	0	2	2	0	0	0
2265:	0	1	1	1	1	0	1	1
2273:	1	0	2	1	1	0	0	0
2281:	0	0	2	0	0	0	1	1
2289:	0	0	1	1	2	3	0	1
2297:	0	0	1	2	2	1	0	2
2305:	0	1	1	1	0	0	0	0
2313:	0	2	1	2	1	0	0	2
2321:	1	0	2	1	1	0	1	1
2329:	0	1	1	2	0	0	0	1
2337:	2	0	1	0	0	1	0	1
2345:	0	1	0	0	1	1	0	0
2353:	0	1	0	1	1	0	1	2
2361:	1	2	1	1	1	1	1	1
2369:	0	1	2	0	1	2	0	1
2377:	0	0	0	0	0	0	1	1
2385:	0	0	0	0	1	3	0	1
2393:	1	1	1	0	1	0	1	0
2401:	0	2	1	2	0	0	0	2
2409:	0	1	0	0	1	0	1	0
2417:	0	1	0	0	0	0	1	0
2425:	1	0	0	1	1	1	1	0
2433:	1	1	0	0	0	1	0	0
2441:	0	0	1	0	1	0	1	2
2449:	1	2	0	1	0	0	1	1
2457:	0	1	1	2	1	1	2	1
2465:	0	1	1	0	1	1	2	1
2473:	0	1	1	1	1	0	0	1
2481:	3	0	0	0	1	0	0	0
2489:	1	0	2	0	0	1	0	1
2497:	0	0	0	1	0	0	0	0
2505:	0	1	0	0	0	0	1	1
2513:	0	0	0	0	0	1	0	1
2521:	0	2	0	0	2	0	0	0

2529: 0 0 1 0 1 1 1 0

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8	9
2537:	0	1	0	1	0	1	0	1	
2545:	1	1	1	0	1	1	1	0	
2553:	1	0	0	0	0	1	1	0	
2561:	0	0	0	0	1	0	0	2	
2569:	0	0	0	0	0	0	0	0	
2577:	0	0	0	0	3	0	0	0	
2585:	0	1	1	0	0	1	0	0	
2593:	0	0	0	0	1	1	0	1	
2601:	1	0	1	0	0	1	0	0	
2609:	0	0	0	2	0	5	21	31	
2617:	11	5	1	1	0	1	1	0	
2625:	0	1	0	0	0	1	0	0	
2633:	0	0	0	0	0	0	0	0	
2641:	0	0	1	0	0	0	1	1	
2649:	0	0	0	0	0	0	0	0	
2657:	0	0	0	0	0	0	0	1	
2665:	0	0	0	0	1	0	0	0	
2673:	0	1	0	1	0	0	0	0	
2681:	0	0	0	0	0	1	0	0	
2689:	0	0	1	1	0	0	0	0	
2697:	2	0	1	0	0	0	1	1	
2705:	0	0	0	0	0	0	0	1	
2713:	0	0	1	0	0	0	0	0	
2721:	0	0	0	0	0	0	1	0	
2729:	0	0	1	0	1	0	0	1	
2737:	1	1	0	0	0	0	0	0	
2745:	1	0	1	1	0	0	0	1	
2753:	1	0	0	0	1	0	0	0	
2761:	0	0	0	0	0	0	0	0	
2769:	1	0	0	0	0	0	0	1	
2777:	0	0	0	1	0	0	0	0	
2785:	0	0	0	0	0	0	0	0	
2793:	0	0	0	0	0	0	1	0	
2801:	0	0	0	0	0	0	0	1	
2809:	0	1	0	0	1	0	0	0	
2817:	0	0	0	0	0	0	0	0	
2825:	1	0	0	0	0	0	0	0	
2833:	0	0	0	0	0	1	0	1	
2841:	0	1	0	0	0	1	0	1	
2849:	0	0	0	0	0	0	0	0	
2857:	0	0	2	0	0	0	0	0	
2865:	0	0	0	0	1	2	0	0	
2873:	0	0	0	0	0	2	0	0	
2881:	1	0	1	0	0	0	1	0	
2889:	0	0	0	0	0	0	0	0	
2897:	0	0	0	0	0	0	0	0	
2905:	0	0	0	0	0	0	0	0	
2913:	0	2	0	0	0	0	0	0	
2921:	0	0	0	0	0	0	0	0	
2929:	0	0	0	0	0	0	0	0	
2937:	0	0	1	1	0	0	0	1	
2945:	0	0	0	0	0	0	0	0	
2953:	0	1	0	0	0	0	1	0	

2961: 2 0 0 0 1 0 0 0

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8
2969:	0	0	0	1	0	1	0	0
2977:	0	2	0	0	0	0	0	1
2985:	0	2	0	3	0	1	0	0
2993:	0	0	1	0	0	0	0	0
3001:	0	0	0	0	0	0	0	0
3009:	1	0	0	0	0	1	0	0
3017:	0	0	2	0	0	0	0	1
3025:	0	0	0	0	0	0	0	0
3033:	0	0	0	0	0	0	0	1
3041:	0	0	0	0	0	0	1	0
3049:	0	0	0	0	1	0	0	0
3057:	0	0	0	0	0	1	0	0
3065:	1	0	0	0	1	0	0	0
3073:	0	0	0	0	0	0	1	0
3081:	0	0	0	0	0	1	1	0
3089:	0	0	0	0	0	0	0	0
3097:	1	1	1	0	0	0	0	0
3105:	0	0	0	0	0	1	0	0
3113:	0	1	0	2	0	0	1	0
3121:	1	0	1	0	0	0	1	0
3129:	0	0	0	0	1	0	0	0
3137:	0	0	0	0	0	0	0	0
3145:	0	1	0	0	0	0	1	0
3153:	0	0	0	0	0	0	0	0
3161:	1	0	1	0	1	0	1	0
3169:	0	0	0	0	0	0	0	0
3177:	0	0	0	0	0	1	1	0
3185:	0	0	0	0	0	1	0	0
3193:	1	0	0	2	0	1	0	1
3201:	0	0	0	0	0	0	0	0
3209:	0	0	0	0	0	0	0	0
3217:	0	0	0	0	1	0	0	0
3225:	1	0	0	0	0	0	0	0
3233:	0	1	0	0	0	0	0	0
3241:	0	1	0	0	0	0	1	0
3249:	0	0	0	0	0	0	1	2
3257:	0	0	0	1	0	0	0	0
3265:	0	0	0	0	0	0	0	1
3273:	0	0	0	0	1	0	1	0
3281:	1	0	0	0	0	0	0	0
3289:	0	1	0	0	0	0	0	0
3297:	0	0	0	0	0	0	0	0
3305:	0	0	0	0	0	0	0	0
3313:	0	1	0	0	0	0	1	1
3321:	0	0	0	0	0	0	0	0
3329:	0	0	0	0	0	0	0	0
3337:	0	0	0	0	0	0	0	0
3345:	0	0	1	0	0	0	0	1
3353:	0	0	0	1	0	0	0	0
3361:	0	0	0	1	0	0	0	0
3369:	0	0	1	0	0	0	0	0
3377:	0	0	1	0	0	0	0	0
3385:	1	0	0	0	0	0	0	0

3393: 0 0 0 0 0 0 1 1

Sample Title: J1TLD8 SAF: RC-189

Channel								
3401:	0	0	0	0	0	0	0	0
3409:	0	1	0	0	0	0	0	0
3417:	0	0	0	1	0	0	0	0
3425:	0	0	0	0	0	1	0	0
3433:	0	0	1	0	1	0	0	0
3441:	0	0	0	0	0	0	0	0
3449:	1	0	0	0	0	0	1	1
3457:	0	0	0	0	0	0	0	0
3465:	0	0	0	0	0	0	0	0
3473:	0	0	0	0	0	0	0	0
3481:	1	0	0	0	0	0	0	0
3489:	0	0	0	0	0	0	0	0
3497:	0	0	1	0	0	0	0	0
3505:	1	0	0	1	0	0	0	1
3513:	0	0	0	0	0	0	0	0
3521:	0	0	0	0	0	0	0	0
3529:	0	0	0	0	0	0	0	0
3537:	0	0	0	0	0	0	0	0
3545:	0	0	0	0	0	0	0	0
3553:	0	0	0	0	0	0	0	0
3561:	0	0	0	0	0	0	0	1
3569:	0	0	0	0	0	0	0	0
3577:	1	0	0	0	0	0	0	0
3585:	0	0	0	0	0	0	0	0
3593:	0	0	0	0	0	0	0	0
3601:	0	1	0	0	1	0	0	0
3609:	0	0	0	0	0	0	1	0
3617:	1	0	0	0	0	0	0	0
3625:	0	0	0	1	0	0	1	0
3633:	0	0	1	0	0	0	0	0
3641:	0	0	0	1	0	0	0	0
3649:	1	0	0	0	1	0	0	0
3657:	0	1	0	0	0	0	0	1
3665:	0	0	0	0	0	0	0	0
3673:	0	0	0	0	0	0	0	1
3681:	0	0	1	0	0	0	0	0
3689:	0	0	0	0	0	0	0	0
3697:	0	1	0	0	0	0	0	0
3705:	0	1	0	0	1	0	0	1
3713:	0	0	1	0	0	1	0	0
3721:	0	0	0	0	1	0	0	0
3729:	0	2	1	1	0	1	0	0
3737:	0	0	0	1	0	1	0	0
3745:	0	0	0	0	0	0	0	0
3753:	0	0	0	0	1	0	0	1
3761:	0	0	0	1	0	0	0	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	0	0	0	0	1
3785:	0	0	0	0	0	0	0	0
3793:	0	0	1	0	0	0	1	0
3801:	0	0	0	0	0	1	0	0
3809:	0	1	0	0	0	1	0	0
3817:	1	0	0	0	2	0	0	0

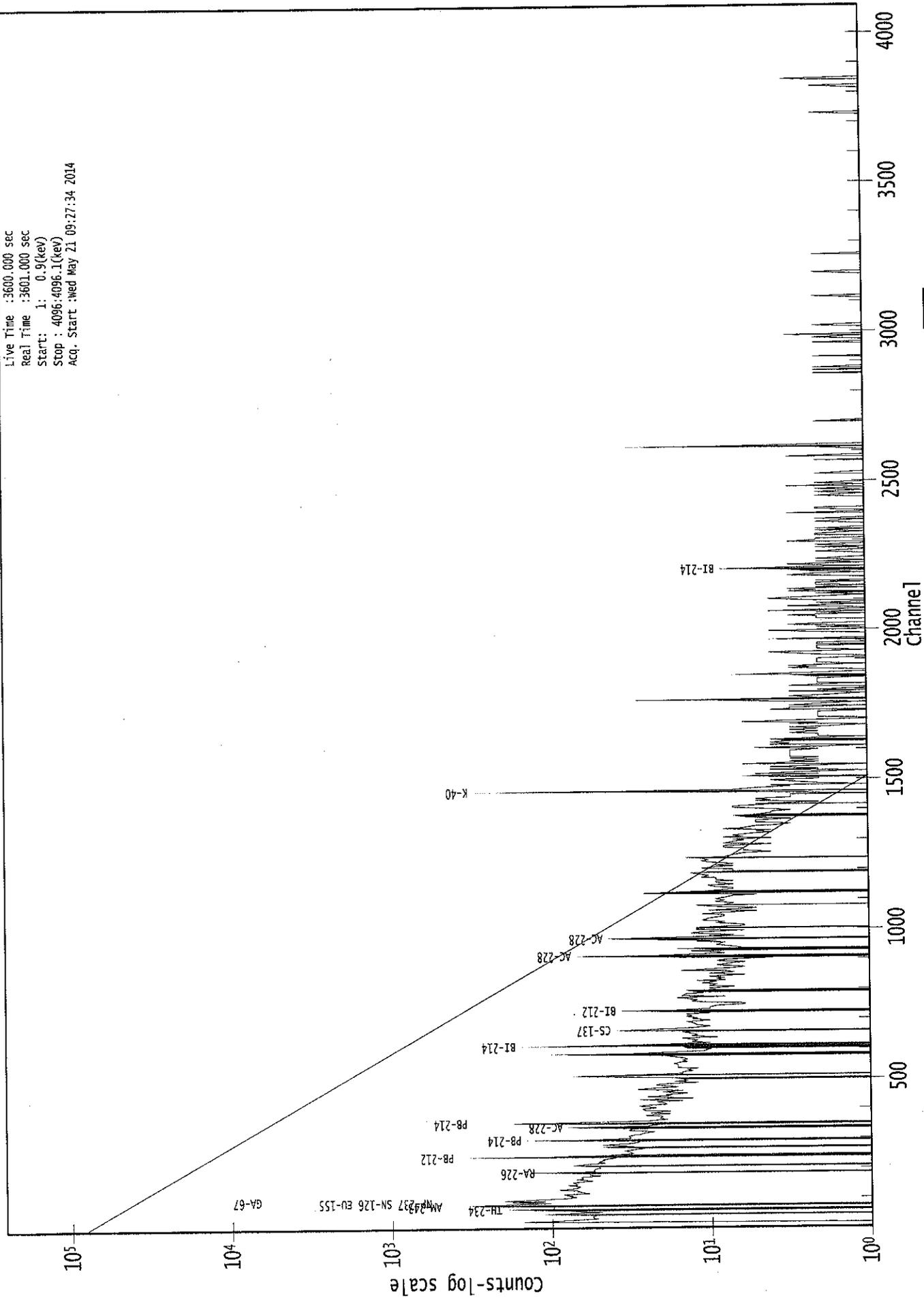
3825: 0 0 0 0 0 0 0 0 0

Sample Title: J1TLD8 SAF: RC-189

Channel	1	2	3	4	5	6	7	8	9
3833:	0	0	0	0	0	0	0	0	0
3841:	0	2	0	0	3	1	0	0	0
3849:	0	0	1	0	0	0	1	0	0
3857:	0	0	0	0	1	0	1	1	1
3865:	1	0	0	0	0	0	0	0	0
3873:	0	1	0	0	0	0	1	0	0
3881:	0	1	1	0	1	0	0	0	0
3889:	0	0	0	0	0	0	0	0	0
3897:	0	0	0	0	0	0	1	1	1
3905:	0	0	0	0	0	0	0	1	1
3913:	0	0	0	0	0	1	1	0	0
3921:	0	0	0	0	0	0	1	0	0
3929:	0	0	0	0	0	0	0	0	0
3937:	0	0	0	0	0	0	0	0	0
3945:	0	0	0	0	0	0	1	0	0
3953:	0	0	0	0	0	0	0	1	1
3961:	0	0	0	0	0	0	0	0	0
3969:	0	1	0	0	0	1	0	0	0
3977:	0	0	0	0	0	0	0	1	1
3985:	1	0	0	0	0	0	0	0	0
3993:	0	0	0	0	0	0	0	0	0
4001:	0	0	1	0	0	1	0	0	0
4009:	0	0	1	0	0	0	0	0	0
4017:	0	0	0	1	0	0	1	0	0
4025:	0	1	0	0	0	0	1	0	0
4033:	0	0	0	0	0	0	0	0	0
4041:	0	0	0	0	0	0	0	0	0
4049:	0	0	1	1	0	0	0	0	0
4057:	0	0	0	1	0	0	0	0	0
4065:	0	1	0	0	0	0	0	0	0
4073:	0	0	0	0	0	0	0	0	0
4081:	0	0	1	0	0	0	0	0	0
4089:	0	0	0	0	0	1	0	0	0

0000007782.CNF

Live Time :3600.000 sec
Real Time :3601.000 sec
Start: 1: 0.9(kev)
Stop : 4096.4096.1(kev)
Acq. Start :Wed May 21 09:27:34 2014



ROI Type: 2

ROI Type: 1

 ***** GENIE QUALITY ASSURANCE *****

Last Results Report
 5/21/14 5:47:14 AM

c
JTL

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D000000001GAF-13C.QCK

Detector: GE1
 Geometry: <None>
 Certificate: GAF-13
 Sample ID: QA Calibration C
 Sample Desc: QA Count
 Sample Quantity: 1.0000E+000
 Sample Date: 7/1/13 12:00:00 AM
 Measurement Date: 5/21/14 5:31:30 AM
 Elapsed Live Time: 900.0 seconds
 Elapsed Real Time: 928.9 seconds

Parameter Description [Mean +/- Std. Dev.]	Value	Deviation/Flags < LU : SD : UD : BS >
Peak Centroid 59.54 keV	6.0092E+001	
Boundary Limits: [5.800E+001, 6.100E+001]		< : : >
Trend Test: The last 9 samples exhibit a bias trend.		
Peak Centroid 661.65 keV	6.6231E+002	
Boundary Limits: [6.602E+002, 6.632E+002]		< : : >
Trend Test: The last 9 samples exhibit a bias trend.		
Peak Centroid 1332.49 keV	1.3335E+003	
Boundary Limits: [1.331E+003, 1.334E+003]		< : : >
Trend Test: The last 9 samples exhibit a bias trend.		
Peak Centroid 1836.01 keV	1.8371E+003	
Boundary Limits: [1.835E+003, 1.838E+003]		< : : >
Trend Test: The last 9 samples exhibit a bias trend.		
Peak FWHM Am-241	1.2409E+000	
Boundary Limits: [5.000E-001, 3.000E+000]		< : : >
Trend Test: The last 9 samples exhibit a bias trend.		
Peak FWHM Cs-137	1.8763E+000	
Boundary Limits: [5.000E-001, 3.000E+000]		< : : >
Peak FWHM Co-60	2.2882E+000	
Boundary Limits: [5.000E-001, 3.000E+000]		< : : >
Peak FWHM Y-90	2.4602E+000	
Boundary Limits: [5.000E-001, 3.000E+000]		< : : >
DC ACTIVITY AM-241	1.5085E+004	
Boundary Limits: [1.229E-002, 1.825E-002]		< : : >

Decay corrected activity 6.8017E+003
 Boundary Limits: [4.986E-003, 7.479E-003] < : : : >

Parameter Description Value Deviation/Flags
 [Mean +/- Std. Dev.] < LU : SD : UD : BS >

Decay corrected activity 1.0412E+004
 Boundary Limits: [7.859E-003, 1.179E-002] < : : : >

Decay corrected activity 2.1317E+004
 Boundary Limits: [1.694E-002, 2.542E-002] < : : : >

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

 ***** GENIE QUALITY ASSURANCE *****

Last Results Report
 5/21/14 5:47:24 AM

C
JAW

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D000000002GAS-1301C.QC

Detector: GE2
 Geometry: <None>
 Certificate: GAS-1301
 Sample ID: QA Calibration C
 Sample Desc: QA Count
 Sample Quantity: 1.0000E+000
 Sample Date: 7/1/13 12:00:00 AM
 Measurement Date: 5/21/14 5:31:38 AM
 Elapsed Live Time: 900.0 seconds
 Elapsed Real Time: 928.5 seconds

Parameter Description [Mean +/- Std. Dev.]	Value	Deviation/Flags < LU : SD : UD : BS >
Peak centroid 59.54 keV	6.0000E+001	
Boundary Limits: [5.800E+001, 6.100E+001]		< : : : >
Trend Test: The last 9 samples exhibit a bias trend.		
Peak centroid 661.65 keV	6.6134E+002	
Boundary Limits: [6.602E+002, 6.632E+002]		< : : : >
Peak centroid 1332.49 ke	1.3318E+003	
Boundary Limits: [1.331E+003, 1.334E+003]		< : : : >
Peak centroid 1836.01 ke	1.8351E+003	
Boundary Limits: [1.835E+003, 1.838E+003]		< : : : >
Trend Test: The last 9 samples exhibit a bias trend.		
Peak FWHM AM-241	1.4761E+000	
Boundary Limits: [5.000E-001, 3.000E+000]		< : : : >
Trend Test: The last 9 samples exhibit a bias trend.		
Peak FWHM CS-137	1.9467E+000	
Boundary Limits: [5.000E-001, 3.000E+000]		< : : : >
Peak FWHM CO-60	2.1521E+000	
Boundary Limits: [5.000E-001, 3.000E+000]		< : : : >
Peak FWHM Y-90	2.5556E+000	
Boundary Limits: [5.000E-001, 3.000E+000]		< : : : >
QC Activity AM-241	1.5277E+005	
Boundary Limits: [1.247E-001, 1.886E-001]		< : : : >
QC ACTIVITY CS-137	6.5565E+004	
Boundary Limits: [5.103E-002, 7.655E-002]		< : : : >

DC ACTIVITY CO-60 1.0390E+005
 Boundary Limits: [8.043E-002, 1.206E-001] < : : : >

Parameter Description Value Deviation/Flags
 [Mean +/- Std. Dev.] < LU : SD : UD : BS >

DC ACTIVITY Y-88 2.2295E+005
 Boundary Limits: [1.734E-001, 2.601E-001] < : : : >

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

```

*****
*****      G E N I E    Q U A L I T Y    A S S U R A N C E      *****
*****

```

Last Results Report
 5/21/14 6:10:56 AM

C
8/2

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D0000000001B.QCK

```

Detector:      GE1
Geometry:      <None>
Certificate:   <None>
Sample ID:     QA Background Ch
Sample Desc:   QA Count
Sample Quantity: 1.0000E+000
Sample Date:   5/21/14 5:55:43 AM
Measurement Date: 5/21/14 5:55:45 AM
Elapsed Live Time: 900.0 seconds
Elapsed Real Time: 900.1 seconds

```

Parameter Description [Mean +/- Std. Dev.]	Value	Deviation/Flags < LU : SD : UD : BS >
DAILY BKG CT RATE GE1 [SD: 2.1667E+000 +/- 0.633]	2.1600E+000	-1.0541E-002 < : : : >
Trend Test: The last	9 samples exhibit a bias trend.	

```

Flags Key:  LU = Lower/Upper Bounds Test      (Ab = Above, Be = Below)
             SD = Sample Driven N-Sigma Test  (In = Investigate, Ac = Action)
             UD = User Driven N-Sigma Test    (In = Investigate, Ac = Action)
             BS = Measurement Bias Test       (In = Investigate, Ac = Action)

```

```

*****
*****  G E N I E  Q U A L I T Y  A S S U R A N C E  *****
*****

```

Last Results Report
5/21/14 6:28:13 AM

J/2L

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D0000000002B.QCK

```

Detector:      GE2
Geometry:     <None>
Certificate:   <None>
Sample ID:    QA Background Ch
Sample Desc:  QA Count
Sample Quantity: 1.0000E+000
Sample Date:  5/21/14 6:13:00 AM
Measurement Date: 5/21/14 6:13:02 AM
Elapsed Live Time: 900.0 seconds
Elapsed Real Time: 900.1 seconds

```

Parameter Description [Mean +/- Std. Dev.]	Value	Deviation/Flags < LU : SD : UD : BS >
DAILY BKG CT RATE GE2 [SD: 4.8059E+000+/- 0.204]	4.5967E+000	-1.0239E+000 < : : : >

```

Flags Key:  LU = Lower/Upper Bounds Test      (Ab = Above, Be = Below)
             SD = Sample Driven N-Sigma Test  (In = Investigate, Ac = Action)
             UD = User Driven N-Sigma Test    (In = Investigate, Ac = Action)
             BS = Measurement Bias Test       (In = Investigate, Ac = Action)

```



May 28, 2014

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354

Re: RC-189 Soil
Work Order: 349077
SDG: XP0093

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on May 20, 2014. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 1616.

Sincerely,

Orlette Johnson
Project Manager

Purchase Order: 1510
Chain of Custody: RC-189-293
Enclosures



Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	3
Laboratory Certifications.....	6
Metals Analysis.....	8
Case Narrative.....	9
Sample Data Summary.....	16
Quality Control Summary.....	20
Miscellaneous.....	28
General Chem Analysis.....	33
Case Narrative.....	34
Sample Data Summary.....	40
Quality Control Summary.....	43
Miscellaneous.....	45

Case Narrative

**Receipt Narrative
for
WC-HANFORD, INC.
SDG: XP0093
Work Order: 349077**

May 28, 2014

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on May 20, 2014 for analysis.

Sample Identification: The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
349077001	J1TLD8

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: General Chemistry and Metals.



Orlette Johnson
Project Manager

Chain of Custody and Supporting Documentation

Field Logbook No. *DWS 5/19/14* COA
 01N1042000
 Offsite Property No. *DWS*
A-131102 *5/19/14* *A131102*

Sample No.	Matrix	Sample Date	Sample Time	Sign/Print Names	Date/Time
J1TL8	SOIL	5-16-14	1648	<i>DWShea</i>	5/16/14 1141
				<i>FRIDGE 3B</i>	5/16/14 1307
				<i>DWSHEA</i>	5/19/14 0948
				<i>Fed Ex</i>	5/19/14 1055
				<i>P. Went Patricia Dent</i>	5-20-14 0855

POSSIBLE SAMPLE HAZARDS/REMARKS
 N/A

Special Handling and/or Storage	Preservation	Type of Container	No. of Container(s)	Volume	Sample Analysis
	None	G/P	1	250mL	See item (1) in Special Instructions
	Cool 4C	G/P	1	125mL	Chromium Hex - 7196 (Hexavalent Chromium)

CHAIN OF POSSESSION
 Relinquished By/Removed From
G. Stowe Date/Time 5-16-14 1141
 Relinquished By/Removed From
DWSHEA Date/Time 5/16/14 1307
 Relinquished By/Removed From
DWSHEA Date/Time 5/19/14 0948
 Relinquished By/Removed From
Fed Ex Date/Time 5/19/14 1055
 Relinquished By/Removed From
P. Went Patricia Dent Date/Time 5-20-14 0855

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)



XP0093



SAMPLE RECEIPT & REVIEW FORM

Client: WCHN		SDG/AR/COC/Work Order: 349077	
Received By: P. Dent		Date Received: 5-20-14	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		X	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0CPM
Classified Radioactive II or III by RSO?		X	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		X	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		X	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		X	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) 3c *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462966
3 Chain of custody documents included with shipment?	X			
4 Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?		X		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?		X		Sample ID's and containers affected:
7 Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	X			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11 Number of containers received match number indicated on COC?	X			Sample ID's affected: 2 of
12 Are sample containers identifiable as GEL provided?		X		clients
13 COC form is properly signed in relinquished/received sections?	X			
14 Carrier and tracking number.	X			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 1 7700 2398 8558-3c

Comments (Use Continuation Form if needed):

Laboratory Certifications

List of current GEL Certifications as of 28 May 2014

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-14-9
Utah NELAP	SC000122013-11
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Metals Analysis

Case Narrative

**Metals Fractional Narrative
WC-HANFORD, INC. (WCHN)
SDG XP0093
Work Order 349077**

Sample Analysis

Sample ID	Client ID
349077001	J1TLD8
1203092797	Method Blank (MB) ICP
1203092798	Laboratory Control Sample (LCS)
1203092804	349077001(J1TLD8L) Serial Dilution (SD)
1203092802	349077001(J1TLD8D) Sample Duplicate (DUP)
1203092803	349077001(J1TLD8S) Matrix Spike (MS)
1203096153	349077001(J1TLD8PS) Post Spike (PS)
1203092785	Method Blank (MB) ICP-MS
1203092786	Laboratory Control Sample (LCS)
1203092792	349077001(J1TLD8L) Serial Dilution (SD)
1203092790	349077001(J1TLD8D) Sample Duplicate (DUP)
1203092791	349077001(J1TLD8S) Matrix Spike (MS)
1203093276	Method Blank (MB) CVAA
1203093277	Laboratory Control Sample (LCS)
1203093284	349077001(J1TLD8L) Serial Dilution (SD)
1203093282	349077001(J1TLD8D) Sample Duplicate (DUP)
1203093283	349077001(J1TLD8S) Matrix Spike (MS)

The samples in this SDG were analyzed on a "dry weight" basis.

Method/Analysis Information

Analytical Batch:	1389644, 1389641 and 1389833
Prep Batch :	1389642, 1389639 and 1389829
Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-009 REV# 23, GL-MA-E-014 REV# 25 and GL-MA-E-010 REV# 27
Analytical Method:	SW846 3050B/6010C, SW846 3050B/6020A and SW846

7471B

Prep Method : SW846 3050B and SW846 7471B Prep

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 3607 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL/PQL Requirements

All PQL standards for 6010C met the control limits with the exception of the analyte antimony listed below. The sample concentrations were less than the MDL or greater than 2x the PQL, so the data is not adversely affected. 349077001 (J1TLD8)-ICP.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blanks (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 349077001 (J1TLD8)-ICP, ICP-MS and CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS did not meet the recommended quality control acceptance criteria for percent recoveries for all applicable analytes. Silicon recovered high. 1203092803 (J1TLD8)-ICP.

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of RL is used to evaluate the DUP results. All applicable analytes did not meet these requirements. Zinc, aluminum, copper, nickel, sodium, cobalt, and magnesium were outside the limit. 1203092802 (J1TLD8)-ICP.

Post Spike (PS) Recovery Statement

The percent recoveries (%R) obtained from the PS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The PS

did not meet the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the presence of matrix interferences. Silicon recovered high. 1203096153 (J1TLD8)-ICP.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes did not meet the established percent difference criteria for potassium. 1203092804 (J1TLD8)-ICP.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. Method SW-846 3050B is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Sample was diluted in order to bring raw values within the linear range of the instrument, and for the analytes interfered with, in order to ensure that the inter-element correction factors were valid. Titanium was over the linear range that affects Sb,Co,V and Zn. 349077001 (J1TLD8)-ICP. The ICPMS solid samples in this SDG were diluted the standard two times. ICP-MS.

Preparation Information

The samples in this SDG were prepared exactly according to the cited SOP.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change

from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports are included in the Miscellaneous Data section of the package. The following DER was generated for this SDG: 1297837. 1203092802 (J1TLD8), 1203092803 (J1TLD8) and 1203096153 (J1TLD8)-ICP.

Additional Comments

Additional comments were not required for this SDG.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer: _____  **Date:** 5/28/14 _____

DATA EXCEPTION REPORT

Mo.Day Yr. 28-MAY-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ICP	Test / Method: SW846 3050B/6010C	Matrix Type: Solid	Client Code: WCHN
Batch ID: 1389644	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 349076(XP0092),349077(XP0093)			
Application Issues: Failed Recovery for MS/PS Failed RPD for DUP			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed Recovery for MS/PS:</p> <p>QC 1203092800MS,1203092803MS, 1203096152PS, 1203096153PS</p> <p>2. Failed RPD for DUP:</p> <p>QC 1203092799DUP, 1203092802DUP</p>		<p>1. The matrix spike recovery failed outside of the control limits for silicon. The post spike failed outside the required control limits for silicon. This verifies the presence of a matrix interference. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported.</p> <p>2. The sample and sample duplicate % RPD failed outside the control limits for calcium, silicon, zinc, aluminum, copper, nickel, sodium, cobalt and magnesium due to possible sample non-homogeneity and/or matrix interference. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported.</p>	

Originator's Name:

Helen Camello 28-MAY-14

Data Validator/Group Leader:

Jamie Johnson 28-MAY-14

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

WCHN001 WC-HANFORD, INC.

Client SDG: XP0093 GEL Work Order: 349077 Project: RC-189 Soil

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Orlette Johnson.

Reviewed by



5/28/14

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: May 28, 2014

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-189 Soil

Client SDG: XP0093

Client Sample ID: J1TLD8
Sample ID: 349077001

Project: WCHN00613
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6010C	
6	SW846 3050B/6020A	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: May 28, 2014

Page 1 of 7

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington
Contact: Joan Kessner

Workorder: 349077

Client SDG: XP0093

Project Description: RC-189 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1389641										
QC1203092790	349077001	DUP									
Selenium	DU	0.321	DU	0.327	mg/kg	N/A			SKJ	05/22/14	18:32
QC1203092786	LCS										
Selenium	4.85		D	4.71	mg/kg		97.1	(80%-120%)		05/22/14	17:57
QC1203092785	MB										
Selenium			DU	0.291	mg/kg					05/22/14	17:54
QC1203092791	349077001	MS									
Selenium	4.70	DU	0.321	D	4.34	mg/kg	92.2	(75%-125%)		05/22/14	18:35
QC1203092792	349077001	SDILT									
Selenium	DU	-0.452	DU	1.61	ug/L	N/A		(0%-10%)		05/22/14	18:41
Metals Analysis-ICP											
Batch	1389644										
QC1203092802	349077001	DUP									
Aluminum	*	3890	*	2920	mg/kg	28.5*		(0%-20%)	HSC	05/23/14	18:21
Antimony	DU	1.67	DU	1.52	mg/kg	N/A				05/27/14	09:14
Arsenic	B	2.57	B	1.54	mg/kg	50.0 ^		(+/-2.77)		05/24/14	17:55
Barium		67.2		69.1	mg/kg	2.71		(0%-20%)		05/23/14	18:21
Beryllium		0.777		0.708	mg/kg	9.35 ^		(+/-0.462)			
Boron	U	1.01	U	0.924	mg/kg	N/A					
Cadmium		0.543		0.484	mg/kg	11.6 ^		(+/-0.462)			
Calcium		4910		4220	mg/kg	15.2		(0%-20%)			
Chromium		3.44		2.88	mg/kg	17.7		(0%-20%)		05/24/14	17:55
Cobalt	*D	11.2	*D	8.58	mg/kg	26.6*^		(+/-2.31)		05/27/14	09:14
Copper	*	19.5	*	14.1	mg/kg	32.3*		(0%-20%)		05/23/14	18:21
Iron		23000		19300	mg/kg	17.2		(0%-20%)			

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 349077

Client SDG: XP0093

Project Description: RC-189 Soil

Page 2 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1389644										
Lead		U	0.333	U	0.305	mg/kg	N/A		HSC	05/23/14	18:21
Magnesium		*	5560	*	4110	mg/kg	30.0*	(0%-20%)	JWJ	05/27/14	22:56
Manganese			272		223	mg/kg	20.0	(0%-20%)	HSC	05/23/14	18:21
Molybdenum		U	0.202	B	0.359	mg/kg	60.4 ^	(+/-0.924)			
Nickel		*	7.38	*	5.19	mg/kg	34.7*	(0%-20%)			
Potassium		M	410		362	mg/kg	12.4	(0%-20%)			
Silicon		N	447		378	mg/kg	16.9	(0%-20%)			
Silver		U	0.101	U	0.0924	mg/kg	N/A			05/24/14	17:55
Sodium		*	173	*	132	mg/kg	26.6*	(0%-20%)		05/23/14	18:21
Vanadium		D	68.1	D	65.3	mg/kg	4.30	(0%-20%)		05/27/14	09:14
Zinc		*D	48.7	*D	39.1	mg/kg	21.7*	(0%-20%)			
QC1203092798	LCS										
Aluminum			488		494	mg/kg		101 (80%-120%)		05/23/14	18:04
Antimony			48.8		50.2	mg/kg		103 (80%-120%)		05/27/14	08:42
Arsenic			48.8		51.3	mg/kg		105 (80%-120%)		05/24/14	17:38
Barium			48.8		48.9	mg/kg		100 (80%-120%)		05/23/14	18:04
Beryllium			48.8		50.1	mg/kg		103 (80%-120%)			
Boron			48.8		47.9	mg/kg		98.2 (80%-120%)			
Cadmium			48.8		49.2	mg/kg		101 (80%-120%)			
Calcium			488		486	mg/kg		99.5 (80%-120%)			
Chromium			48.8		50.7	mg/kg		104 (80%-120%)		05/24/14	17:38
Cobalt			48.8		49.4	mg/kg		101 (80%-120%)		05/27/14	08:42

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 349077

Client SDG: XP0093

Project Description: RC-189 Soil

Page 3 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1389644										
Copper	48.8			49.6	mg/kg		102	(80%-120%)	HSC	05/23/14	18:04
Iron	488			473	mg/kg		97	(80%-120%)			
Lead	48.8			49.9	mg/kg		102	(80%-120%)	JWJ	05/27/14	22:34
Magnesium	488			474	mg/kg		97.1	(80%-120%)	HSC	05/23/14	18:04
Manganese	48.8			49.1	mg/kg		100	(80%-120%)			
Molybdenum	48.8			47.7	mg/kg		97.8	(80%-120%)			
Nickel	48.8			47.6	mg/kg		97.5	(80%-120%)			
Potassium	488			463	mg/kg		94.8	(80%-120%)			
Silicon	488			426	mg/kg		87.2	(80%-120%)			
Silver	48.8			50.7	mg/kg		104	(80%-120%)		05/24/14	17:38
Sodium	488			501	mg/kg		103	(80%-120%)		05/23/14	18:04
Vanadium	48.8			51.9	mg/kg		106	(80%-120%)		05/27/14	08:42
Zinc	48.8			51.6	mg/kg		106	(80%-120%)			
QC1203092797	MB										
Aluminum			U	6.50	mg/kg					05/23/14	18:00
Antimony			B	0.493	mg/kg					05/27/14	08:39
Arsenic			U	0.478	mg/kg					05/24/14	17:34
Barium			U	0.0956	mg/kg					05/23/14	18:00
Beryllium			U	0.0956	mg/kg						
Boron			U	0.956	mg/kg						
Cadmium			U	0.0956	mg/kg						
Calcium			U	7.65	mg/kg						

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 349077

Client SDG: XP0093

Project Description: RC-189 Soil

Page 4 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1389644										
Chromium			U	0.143	mg/kg				HSC	05/24/14	17:34
Cobalt			U	0.143	mg/kg					05/27/14	08:39
Copper			U	0.287	mg/kg					05/23/14	18:00
Iron			U	7.65	mg/kg						
Lead			U	0.315	mg/kg				JWJ	05/27/14	22:31
Magnesium			U	8.13	mg/kg				HSC	05/23/14	18:00
Manganese			U	0.191	mg/kg						
Molybdenum			U	0.191	mg/kg						
Nickel			U	0.143	mg/kg						
Potassium			U	6.12	mg/kg						
Silicon			U	1.43	mg/kg						
Silver			U	0.0956	mg/kg					05/24/14	17:34
Sodium			U	6.69	mg/kg					05/23/14	18:00
Vanadium			U	0.0956	mg/kg					05/27/14	08:39
Zinc			U	0.382	mg/kg						
QC1203092803 349077001 MS											
Aluminum	486	*		3890	3650	mg/kg		N/A (75%-125%)		05/23/14	18:24
Antimony	48.6	DU	1.67	D	51.4	mg/kg		106 (75%-125%)		05/27/14	09:17
Arsenic	48.6	B	2.57		51.4	mg/kg		101 (75%-125%)		05/24/14	17:59
Barium	48.6		67.2		105	mg/kg		78.5 (75%-125%)		05/23/14	18:24
Beryllium	48.6		0.777		49.1	mg/kg		99.5 (75%-125%)			
Boron	48.6	U	1.01		46.3	mg/kg		95.4 (75%-125%)			

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 349077

Client SDG: XP0093

Project Description: RC-189 Soil

Page 5 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1389644										
Cadmium	48.6	0.543		47.3	mg/kg		96.2	(75%-125%)	HSC	05/23/14	18:24
Calcium	486	4910		4700	mg/kg		N/A	(75%-125%)			
Chromium	48.6	3.44		51.0	mg/kg		98	(75%-125%)		05/24/14	17:59
Cobalt	48.6	*D 11.2	D	61.2	mg/kg		103	(75%-125%)		05/27/14	09:17
Copper	48.6	* 19.5		67.0	mg/kg		97.9	(75%-125%)		05/23/14	18:24
Iron	486	23000		20400	mg/kg		N/A	(75%-125%)			
Lead	48.6	9.89		54.8	mg/kg		92.5	(75%-125%)	JWJ	05/27/14	22:58
Magnesium	486	* 4020		3660	mg/kg		N/A	(75%-125%)	HSC	05/23/14	18:24
Manganese	48.6	272		320	mg/kg		N/A	(75%-125%)			
Molybdenum	48.6	U 0.202		46.5	mg/kg		95.3	(75%-125%)			
Nickel	48.6	* 7.38		51.9	mg/kg		91.7	(75%-125%)			
Potassium	486	M 410		812	mg/kg		82.7	(75%-125%)			
Silicon	486	N 447	N	701	mg/kg		52.3*	(75%-125%)			
Silver	48.6	U 0.101		49.7	mg/kg		102	(75%-125%)		05/24/14	17:59
Sodium	486	* 173		696	mg/kg		108	(75%-125%)		05/23/14	18:24
Vanadium	48.6	D 68.1	D	117	mg/kg		102	(75%-125%)		05/27/14	09:17
Zinc	48.6	*D 48.7	D	94.1	mg/kg		93.5	(75%-125%)			
QC1203096153 349077001 PS											
Silicon	5000	N 4430		19200	ug/L		295*	(80%-120%)		05/27/14	09:08
QC1203092804 349077001 SDILT											
Aluminum		* 38500	D	8100	ug/L	5.09		(0%-10%)		05/23/14	18:27
Antimony		DU -8.97	DU	8.33	ug/L	N/A		(0%-10%)		05/27/14	09:21
Arsenic		B 25.4	DU	2.52	ug/L	N/A		(0%-10%)		05/24/14	18:02

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 349077

Client SDG: XP0093

Project Description: RC-189 Soil

Page 6 of 7

Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1389644										
Barium		666	D	135	ug/L	1.5		(0%-10%)	HSC	05/23/14	18:27
Beryllium		7.70	D	1.72	ug/L	11.5		(0%-10%)			
Boron	U	-2.68	DU	5.05	ug/L	N/A		(0%-10%)			
Cadmium		5.38	DU	0.505	ug/L	N/A		(0%-10%)			
Calcium		48700	D	9890	ug/L	1.66		(0%-10%)			
Chromium		34.1	D	6.84	ug/L	.352		(0%-10%)		05/24/14	18:02
Cobalt	*D	22.2	D	4.92	ug/L	10.6		(0%-10%)		05/27/14	09:21
Copper	*	193	D	35.8	ug/L	7.2		(0%-10%)		05/23/14	18:27
Iron		228000	D	47900	ug/L	5.2		(0%-10%)			
Lead		97.9	D	19.4	ug/L	1.12		(0%-10%)	JWJ	05/27/14	23:03
Magnesium	*	39800	D	8230	ug/L	3.42		(0%-10%)	HSC	05/23/14	18:27
Manganese		2690	D	558	ug/L	3.56		(0%-10%)			
Molybdenum	U	1.91	DU	1.01	ug/L	N/A		(0%-10%)			
Nickel	*	73.1	D	15.7	ug/L	7.6		(0%-10%)			
Potassium	M	4060	DM	713	ug/L	12.1*		(0%-10%)			
Silicon	N	4430	D	887	ug/L	.2		(0%-10%)			
Silver	U	0.158	DU	0.505	ug/L	N/A		(0%-10%)		05/24/14	18:02
Sodium	*	1710	D	364	ug/L	6.4		(0%-10%)		05/23/14	18:27
Vanadium	D	135	D	27.3	ug/L	1.03		(0%-10%)		05/27/14	09:21
Zinc	*D	96.4	D	18.6	ug/L	3.53		(0%-10%)			

Metals Analysis-Mercury

Batch 1389833

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 349077

Client SDG: XP0093

Project Description: RC-189 Soil

Page 7 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-Mercury											
Batch	1389833										
QC1203093282	349077001	DUP									
Mercury		U	0.00393	U	0.00393	mg/kg	N/A		NOR1	05/22/14	11:48
QC1203093277	LCS										
Mercury	0.118				0.112	mg/kg	94.8	(80%-120%)		05/22/14	11:31
QC1203093276	MB										
Mercury			U		0.00387	mg/kg				05/22/14	11:29
QC1203093283	349077001	MS									
Mercury	0.122	U	0.00393		0.124	mg/kg	100	(80%-120%)		05/22/14	11:49
QC1203093284	349077001	SDILT									
Mercury		U	0.032	DU	0.0196	ug/L	N/A	(0%-10%)		05/22/14	11:51

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
 ^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
 * Indicates that a Quality Control parameter was not within specifications.
 For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

Prep Logbook

Acid Digestion of Sediments, Sludges, and Soils

Batch ID: 1389642	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst: Jack Mabry	LCS	1203092798	Metals Spike Mix I	UI2087791-01	.25	mL
Method: SW846 3050B	LCS	1203092798	Metals Spike Mix II	UI2087793-06	.25	mL
Lab SOP: GL-MA-E-009 REV# 23	MS	1203092800	Metals Spike Mix I	UI2087791-01	.25	mL
Instrument: BAL-892	MS	1203092800	Metals Spike Mix II	UI2087793-06	.25	mL
	MS	1203092803	Metals Spike Mix I	UI2087791-01	.25	mL
	MS	1203092803	Metals Spike Mix II	UI2087793-06	.25	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1203092797 MB	21-MAY-2014 07:00:46	Soil	0.523	50	95.60229
1203092798 LCS	21-MAY-2014 07:00:46	Soil	0.512	50	97.65625
349076001	21-MAY-2014 07:00:46	Soil	0.506	50	98.81423
1203092799 DUP (349076001)	21-MAY-2014 07:00:46	Soil	0.563	50	88.80995
1203092800 MS (349076001)	21-MAY-2014 07:00:46	Soil	0.547	50	91.40768
1203092801 SDILT (349076001)	21-MAY-2014 07:00:46	Soil	0.506	50	98.81423
349077001	21-MAY-2014 07:00:46	Soil	0.503	50	99.40358
1203092802 DUP (349077001)	21-MAY-2014 07:00:46	Soil	0.55	50	90.90909
1203092803 MS (349077001)	21-MAY-2014 07:00:46	Soil	0.523	50	95.60229
1203092804 SDILT (349077001)	21-MAY-2014 07:00:46	Soil	0.503	50	99.40358

Reagent/Solvent Lot ID	Description	Amount	Comments:
2098276	HYDROCHLORIC ACID	10 mL	Block Temperature: 92 C
2098278	Concentrated Nitric Acid	1.25 mL	Thermometer ID: 119015 Hot Block ID: 13 Light brown powder with gray rocks.

Prep Logbook

Acid Digestion of Sediments, Sludges, and Soils

Batch ID: 1389639	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst: Jack Mabry	LCS	1203092786	ICP-MS spiking solution A	UI2087809-A	.25	mL
Method: SW846 3050B	LCS	1203092786	ICP-MS spiking solution B	UI2091844-B	.25	mL
Lab SOP: GL-MA-E-009 REV# 23	MS	1203092788	ICP-MS spiking solution A	UI2087809-A	.25	mL
Instrument: BAL-892	MS	1203092788	ICP-MS spiking solution B	UI2091844-B	.25	mL
	MS	1203092791	ICP-MS spiking solution A	UI2087809-A	.25	mL
	MS	1203092791	ICP-MS spiking solution B	UI2091844-B	.25	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1203092785 MB	21-MAY-2014 07:00:33	Soil	0.567	50	88.18342
1203092786 LCS	21-MAY-2014 07:00:33	Soil	0.515	50	97.08738
349076001	21-MAY-2014 07:00:33	Soil	0.548	50	91.24088
1203092787 DUP (349076001)	21-MAY-2014 07:00:33	Soil	0.533	50	93.80863
1203092788 MS (349076001)	21-MAY-2014 07:00:33	Soil	0.526	50	95.05703
1203092789 SDILT (349076001)	21-MAY-2014 07:00:33	Soil	0.548	50	91.24088
349077001	21-MAY-2014 07:00:33	Soil	0.522	50	95.78544
1203092790 DUP (349077001)	21-MAY-2014 07:00:33	Soil	0.513	50	97.46589
1203092791 MS (349077001)	21-MAY-2014 07:00:33	Soil	0.54	50	92.59259
1203092792 SDILT (349077001)	21-MAY-2014 07:00:33	Soil	0.522	50	95.78544

Reagent/Solvent Lot ID	Description	Amount	Comments:
1976094-02	Hydrogen Peroxide 30%	1.5 mL	Block Temperature: 92 C
2098278	Concentrated Nitric Acid	5 mL	Thermometer ID: 118631 Hot Block ID: 2 Light brown powder with grey rocks.

Prep Logbook

Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer

Batch ID:	1389829	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst:	Alan Stanley	LCS	1203093277	MHGSOILMSSPIKE	WHG140521-14	.3	mL
Method:	SW846 7471B Prep	MS	1203093283	MHGSOILMSSPIKE	WHG140521-14	.3	mL
Lab SOP:	GL-MA-E-010 REV# 27	MS	1203093289	MHGSOILMSSPIKE	WHG140521-14	.3	mL
Instrument:	Metals Manual Instrument	MSD	1203093290	MHGSOILMSSPIKE	WHG140521-14	.3	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1203093276 MB	21-MAY-2014 16:36:06	Soil	0.52	30	57.69231
1203093277 LCS	21-MAY-2014 16:36:06	Soil	0.51	30	58.82353
349076001	21-MAY-2014 16:36:06	Soil	0.509	30	58.9391
1203093288 DUP (349076001)	21-MAY-2014 16:36:06	Soil	0.522	30	57.47126
1203093289 MS (349076001)	21-MAY-2014 16:36:06	Soil	0.502	30	59.76096
1203093290 MSD (349076001)	21-MAY-2014 16:36:06	Soil	0.502	30	59.76096
1203093291 SDILT (349076001)	21-MAY-2014 16:36:06	Soil	0.509	30	58.9391
349077001	21-MAY-2014 16:36:06	Soil	0.52	30	57.69231
1203093282 DUP (349077001)	21-MAY-2014 16:36:06	Soil	0.519	30	57.80347
1203093283 MS (349077001)	21-MAY-2014 16:36:06	Soil	0.5	30	60
1203093284 SDILT (349077001)	21-MAY-2014 16:36:06	Soil	0.52	30	57.69231
349080003	21-MAY-2014 16:36:06	Sludge	0.503	30	59.64215

Reagent/Solvent Lot ID	Description	Amount	Comments:
140401-C	5% KMnO4 solution	7.5 mL	Digestion Start Date: 21-MAY-2014 16:36
2072331-C	Hg reducing agent	2 mL	Digestion End Date: 21-MAY-2014 17:06
2095240-1	NITRIC ACID	.375 mL	Block Temperature: 95 C
2108387-A	Hydrochloric Acid Conc.	1.125 mL	Thermometer ID: 119131
WHG140521-07	Mercury Working Standard 1st Source CAL S 0.2/CRA	30 uL	Hot Block ID: 6
WHG140521-08	Mercury Working Standard 1st Source CAL S 0.5	75 uL	The first QC was a soil and rock like material. The second QC was a grey sand and rock like material.
WHG140521-09	Mercury Working 1st Source CAL S 2.0	300 uL	
WHG140521-10	Mercury Working 1st Source CAL S 5.0/CCV	750 uL	
WHG140521-11	Mercury Working 1st Source CAL S 10.0	1500 uL	
WHG140521-12	Mercury Working 2nd Source S 5.0/ICV	750 uL	

Prep Logbook

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
Reagent/Solvent Lot ID	Description	Amount	Comments:		

General Chem Analysis

Case Narrative

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 349076001 (J1TLC3).

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203093698 (J1TLC3).

Matrix Spike Duplicate (MSD) Recovery Statement

The spike duplicate recovery falls outside of the established acceptance limits due to matrix interference: 1203093700 (J1TLC3).

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the spike and spike duplicate met the acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

The following DER was generated for this SDG: 1296234, 1203093698 (J1TLC3) and 1203093700 (J1TLC3).

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer:  Date: 27May14

DATA EXCEPTION REPORT

Mo.Day Yr. 22-MAY-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: VIS SPECTROMETER	Test / Method: SW846 7196A	Matrix Type: Solid	Client Code: WCHN
Batch ID: 1389983	Sample Numbers: See Below		
<p>Potentially affected work order(s)(SDG): 349076(XP0092),349077(XP0093)</p> <p>Application Issues: Failed Recovery for MS/PS Container scanning event for custody missed Failed Recovery for MSD/PSD</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Container scanning event for custody missed:</p> <p>349076 001</p> <p>349077 001</p> <p>2. Failed Recovery for MS/MSD:</p> <p>1203093698</p> <p>1203093700</p>		<p>1. Samples were not scanned to the analytical batch; however, samples were in the analyst's custody at the time of analysis.</p> <p>2.As the MS and MSD displayed similar recoveries, the failures were attributed to sample matrix interference and the data have been reported.</p>	

Originator's Name:
Sarah Carson 22-MAY-14

Data Validator/Group Leader:
Elzbieta Szulc 27-MAY-14

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis Report for

WCHN001 WC-HANFORD, INC.

Client SDG: XP0093 GEL Work Order: 349077 Project: RC-189 Soil

The Qualifiers in this report are defined as follows:

B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Orlette Johnson.

Reviewed by



GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: May 27, 2014

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-189 Soil

Client SDG: XP0093

Client Sample ID: J1TLD8
Sample ID: 349077001
Matrix: SOIL
Collect Date: 16-MAY-14 10:48
Receive Date: 20-MAY-14
Collector: Client
Moisture: 1.57%

Project: WCHN00613
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis											
SW846_7196A Hexavalent Chromium "Dry Weight Corrected"											
Hexavalent Chromium	U	0.117	0.117	0.390	mg/kg	1	EXM3	05/22/14	1333	1389983	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3060A	SW846_7196A Hexavalent Chromium in Soil	EXM3	05/21/14	1447	1389982

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7196A	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: May 27, 2014

Page 1 of 1

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington
Contact: Joan Kessner

Workorder: 349077

Client SDG: XP0093

Project Description: RC-189 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Spectrometric Analysis											
Batch	1389983										
QC1203093696	349076001	DUP									
Hexavalent Chromium		B	0.144	B	0.143	mg/kg	0.596 ^	(+/-0.402)	EXM3	05/22/14	13:21
QC1203093701	ILCS										
Hexavalent Chromium	7.99				7.08	mg/kg	88.6	(80%-120%)		05/22/14	12:09
QC1203093758	LCS										
Hexavalent Chromium	4.00				3.98	mg/kg	99.7	(80%-120%)		05/22/14	12:07
QC1203093695	MB										
Hexavalent Chromium				U	0.119	mg/kg				05/22/14	11:55
QC1203093698	349076001	MS									
Hexavalent Chromium	4.03	B	0.144		2.40	mg/kg	55.9*	(75%-125%)		05/22/14	13:27
QC1203093700	349076001	MSD									
Hexavalent Chromium	4.05	B	0.144		2.18	mg/kg	9.54	50.2*	(0%-30%)	05/22/14	13:29

Notes:

The Qualifiers in this report are defined as follows:

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

Moisture LogBook

Batch: 1389631

Analyst: LYT1

Date/Time: 21-MAY-2014

Procedure Code DRY WEIGHT

Procedure Description Dry Weight-Percent Moisture

Lab Sop: GL-OA-E-020

Sample St	Sample Id	Rpd(%)
DUP	1203092766	2.502

Sample Id	Sample Type	Original Hsn	Instrument	Run Time	Container Wt	Initial Wt	Final Wt (g)	Net Initial Wt (g)	Net Final Wt (g)	Moisture (%)
349077001	SAMPLE		BALHD2000D	06:18	6.996	33.347	32.933	26.351	25.937	1.57
1203092766	DUP	349077001	BALHD2000D	06:18	7.194	31.084	30.694	23.89	23.5	1.63

Comments:

A) Result = (Net Initial - Net Final) / Net Initial * 100

Note: Aliquot is used for the determination of the effective MDL and PQL in LIMS

Prep Logbook

Colorimetric Determination of Hexavalent Chromium

Batch ID: 1389982	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst: Erin McCance	ILCS	1203093701	100mg/kg for cr6	IMM140123-HVC	.08	g
Method: SW846 3060A	LCS	1203093758	Cr6 LCS 10mg/L	WD140515-1	.4	mL
Lab SOP: GL-GC-E-044 REV# 19	MS	1203093697	Cr6 Intermediate Spike 10mg/L	140522-Cr6	.4	mL
Instrument: Sartorius Balance B-001	MS	1203093698	Cr6 Intermediate Spike 10mg/L	140522-Cr6	.4	mL
	MSD	1203093699	Cr6 Intermediate Spike 10mg/L	140522-Cr6	.4	mL
	MSD	1203093700	Cr6 Intermediate Spike 10mg/L	140522-Cr6	.4	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)	pH Check
1203093695 MB	21-MAY-2014 14:47:00	Soil	1.0084	40	39.6668	7.5
1203093758 LCS	21-MAY-2014 14:47:00	Soil	1.0012	40	39.95206	7.5
1203093701 ILCS	21-MAY-2014 14:47:00	Soil	1.0016	40	39.9361	7.5
349076001	21-MAY-2014 14:47:00	Soil	1.0031	40	39.87638	7.5
1203093696 DUP (349076001)	21-MAY-2014 14:47:00	Soil	1.0091	40	39.63928	7.5
1203093697 MS (349076001)	21-MAY-2014 14:47:00	Soil	1.026	40	38.98635	7.5
1203093699 MSD (349076001)	21-MAY-2014 14:47:00	Soil	1.0353	40	38.63614	7.5
1203093698 MS (349076001)	21-MAY-2014 14:47:00	Soil	1.0063	40	39.74958	7.5
1203093700 MSD (349076001)	21-MAY-2014 14:47:00	Soil	1.0003	40	39.988	7.5
349077001	21-MAY-2014 14:47:00	Soil	1.0423	40	38.37667	7.5

Reagent/Solvent Lot ID	Description	Amount	Comments:
140109-C	MAGNESIUM CHLORIDE SOLUTION FOR CR+6	1 mL	
IMM140325-HVC	5M Nitric Acid Solution for Cr+6	2 mL	
IMM140515b-HVCS	DIGESTION SOLUTION FOR CR+6	20 mL	
IMM140520-HVCS	PHOSPHATE BUFFER SOLUTION FOR CR+6	.5 mL	