

Duratek



Bristol-Myers Squibb
Former Radiopharmaceutical
Production Facility
Final Status Survey Report
Soil Analysis Detailed Results



APPENDIX C
BOOK 4 of 4
September 2003

**APPENDIX C
BRISTOL-MYERS SQUIBB
FORMER RADIOPHARMACEUTICAL PRODUCTION FACILITY
FINAL STATUS SURVEY
SOIL ANALYSIS DETAILED RESULTS**

for the

**Bristol-Myers Squibb
Former Radiopharmaceutical Production Facility
Characterization Report**

REVISION 0
SEPTEMBER 2003

**Prepared By:
Duratek, Inc.
Commercial Services
1009 Commerce Park Drive
Oak Ridge, TN 37830**

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BMS-D0100-002	10/31/02	L5188-05	B-124 Valve Pit #2	1
BMS-D0100-003	12/17/02	L5188-02	B-124 Tank Vault #3	1
BMS-D0100-004	12/19/02	L5188-03	B-124 Tank Vault #4	1
BMS-E0200-001	10/22/02	L5188-06	Soil Sample	1
BMS-E0200-002	10/22/02	L5188-07	Soil Sample	1
BMS-E0200-003	10/22/02	L5188-08	Soil Sample	1
BMS-2600-018	2/6/03	L5186-01	Soil Sample	2
BMS-2600-024	2/6/03	L5186-02	Soil Sample	2
BMS-2600-034	2/6/03	L5186-03	Soil Sample	2
BMS-2600-035	2/6/03	L5186-04	Soil Sample	2
BMS-2600-040	2/6/03	L5186-05	Soil Sample	2
BMS-2600-067	2/7/03	L5186-06	Soil Sample	2
BMS-2600-069	2/7/03	L5186-07	Soil Sample	2
BMS-2600-095	2/6/03	L5186-08	Soil Sample	2
BMS-2600-099	2/6/03	L5186-09	Soil Sample	2
BMS-2600-107	2/6/03	L5186-10	Soil Sample	2
BMS-2600-164	2/7/03	L5186-11	Soil Sample	2
BMS-2600-170	2/10/03	L5186-12	Soil Sample	2
BMS-2600-241	2/13/03	L5186-13	Soil Sample	2
BMS-2600-259	2/6/03	L5186-14	Soil Sample	2
BMS-2600-278	2/13/03	L5186-15	Soil Sample	2
BMS-2600-338	2/5/03	L5186-16	Soil Sample	2
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BMS-2700-005	1/28/03	L5185-02	Soil Sample	3
BMS-2700-009	1/28/03	L5185-03	Soil Sample	3
BMS-2700-013	1/28/03	L5185-04	Soil Sample	3
BMS-2700-038	1/28/03	L5185-05	Soil Sample	3
BMS-2700-040	1/28/03	L5185-06	Soil Sample	3
BMS-2700-058	1/28/03	L5185-07	Soil Sample	3
BMS-2700-060	1/28/03	L5185-08	Soil Sample	3
BMS-2700-090	2/25/03	L5185-09	Soil Sample	3
BMS-2700-094	2/6/03	L5185-10	Soil Sample	3

**BRISTOL-MYERS SQUIBB
FINAL STATUS REPORT**

APPENDIX C

Sample ID	Date	Laboratory ID	Remarks	Tab
BMS-2700-101	2/6/03	L5185-11	Soil Sample	3
BMS-2700-112	1/28/03	L5185-12	Soil Sample	3
BMS-2700-140	1/28/03	L5185-13	Soil Sample	3
BMS-2700-144	1/28/03	L5185-14	Soil Sample	3
BMS-2700-145	1/28/03	L5185-15	Soil Sample	3
BMS-2700-164	1/28/03	L5185-16	Soil Sample	3
BMS-SM-391	2/21/03	L5185-17	Soil Sample, Rm 150 Trench 12.16' from wall, 35" deep	3
BMS-SC-141	12/18/02	L5185-18	MINITEC Cave Smear	3
BMS-A0300-1	3/21/03	L5187-01	Room 150/152 Soil	4
BMS-A0300-2	3/21/03	L5187-02	Room 150/152 Soil	4
BMS-A0300-3	3/21/03	L5187-03	Room 150/152 Soil	4
BMS-A0300-4	3/21/03	L5187-04	Room 150/152 Soil	4
BMS-A0300-5	3/21/03	L5187-05	Room 150/152 Soil	4
BMS-A0300-6	3/21/03	L5187-06	Room 150/152 Soil	4
BMS-A0300-7	3/21/03	L5187-07	Room 150/152 Soil	4
BMS-A0300-8	3/21/03	L5187-08	Room 150/152 Soil	4
BMS-A0300-9	3/21/03	L5187-09	Room 150/152 Soil	4
BMS-A0300-10	3/21/03	L5187-10	Room 150/152 Soil	4
BMS-A0300-11	3/21/03	L5187-11	Room 150/152 Soil	4
BMS-A0300-12	3/21/03	L5187-12	Room 150/152 Soil	4
BMS-A0300-13	3/21/03	L5187-13	Room 150/152 Soil	4
BMS-A0300-14	3/21/03	L5187-14	Room 150/152 Soil	4
BMS-A0300-15	3/21/03	L5187-15	Room 150/152 Soil	4
BMS-A0300-16	3/21/03	L5187-16	Room 150/152 Soil	4
BMS-A0300-17	3/21/03	L5187-17	Room 150/152 Soil	4
BMS-E0200-21	3/26/03	L5348-01	Soil Package E0100	5
BMS-E0200-55	3/26/03	L5348-02	Soil Package E0100	5
BMS-E0200-116	3/26/03	L5348-03	Soil Package E0100	5
BMS-E0200-129	3/26/03	L5348-04	Soil Package E0100	5
BMS-E0200-135	3/26/03	L5348-05	Soil Package E0100	5
BMS-E0200-180	3/26/03	L5348-06	Soil Package E0100	5
BMS-E0200-260	3/26/03	L5348-07	Soil Package E0100	5
BMS-E0200-281	3/26/03	L5348-08	Soil Package E0100	5
BMS-E0200-362	3/26/03	L5348-09	Soil Package E0100	5
BMS-E0200-371	3/26/03	L5348-10	Soil Package E0100	5

**BRISTOL-MYERS SQUIBB
FINAL STATUS REPORT**

APPENDIX C

Sample ID	Date	Laboratory ID	Remarks	Tab
BMS-E0200-402	3/26/03	L5348-11	Soil Package E0100	5
BMS-E0200-552	3/26/03	L5348-12	Soil Package E0100	5
BMS-E0200-592	3/26/03	L5348-13	Soil Package E0100	5
BMS-E0200-658	3/26/03	L5348-14	Soil Package E0100	5
BMS-E0200-693	3/26/03	L5348-15	Soil Package E0100	5
BMS-E0200-726	3/26/03	L5348-16	Soil Package E0100	5

An AREVA and Siemens Company

DURATEK, INC. DATA PACKETS

Samples
L5188-01 - L5188-08



FRAMATOME ANP

ENVIRONMENTAL LABORATORY

29 Research Drive

Westborough, MA 01581-3913

(508) 898-9970 Fax (508) 836-9815

**FRAMATOME ANP DE&S ENVIRONMENTAL LABORATORY SAMPLE SUBMISSION FORM
(ENVIRONMENTAL/BIOASSAY SAMPLES)**

Name/Address of Client Representative:

(Person(s) who should receive the results)

Phone: _____ Fax: _____

MULTIPLIER MAY APPLY)

[illegible]

Chain of Custody		Field Treatment/Comments	SPECIFY METHOD	ELAB ACCEPTANCE STAMP
Relinquished By:	Date:	Batch # 4	(Internal Lab Use ONLY)	<div style="border: 1px solid black; padding: 5px; text-align: center;"> FRAMATOME ACCEP APR 04 2003 MONITORING </div>
Collected By:	Phone Number:		RA-226 (A)	
Received By: <i>Am</i>	Date: <i>2/21/03</i>		RADIUMA_EPA	
ELAB Comments: <i>25188</i>			RA-228 (PROC. 1300)	
			RA-228_EPA (PROC. 1311)	
		I-131LL (BETA/GAMMA)		
		I-131LL (GAS PROPORTIONAL)		
		OTHER		

Client: Duratek, Inc
Project: Bristol Myers Squibb

Duratek Purchase Order # 15313

Samples Collected by
Betty Kjos & Doug Kjos, Duratek

CHAIN OF CUSTODY RECORD

FRAMATOME
ACC

FEB 25 2003

MONITOR

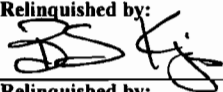
11.11

Duratek, Inc.
628 Gallaher Road
Kingston, Tn. 37763

Project Manager: Paul Ely
(732)-519-3341-office
(865)-414-1973-cell

Page 1 of 1

Sample ID	date	time	matrix	preservative	number of containers										Remarks
Tank Vault West Side#1	12-12-02		S	N/A	1										
Bldg. 124 Under Tank Vault D0100 #3	12-17-02		S	N/A	1										
Bldg. 124 Under Tank Vault D0100 #4	12-19-02		S	N/A	1										
Bldg. 124 Valve Pit #1 D0100	10-31-02		S	N/A	1										
Bldg. 124 Valve Pit #2 D0100	10-31-02		S	N/A	1										
E0200 #1	10-22-02		S	N/A	1										
E0200 #2	10-22-02		S	N/A	1										
E0200 #3	10-22-02		S	N/A	1										

Relinquished by: 	Date: 2-21-03	Time: 0930	Received by:	Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Remarks:	

Matrix codes: s-Soil, m-Misc Solid, V-Vegetation, L-Sludge, W-Water, G-Ground Water, D-Drinking Water, Z-Waste Water, M-Misc Liquid, F-Filter



Framatome ANP
Login Chain of Custody Report (In01)
Apr. 04, 2003
03:30 PM

Login Number: L5188
Account: 00435 Duratek Inc
Project: OTHER ENVIRON-DUR Duratek Other Environmental **Page: 1 of 1**

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due Date	Start Date Comments	Volume
L5188-01	TANK VAULT	12-DEC-02 12:00	21-FEB-03			
Soil	S GAMMA SPECTROME Hold:					
L5188-02	BLDG124 UNDER TANK	17-DEC-02 12:00	21-FEB-03			
Soil	S GAMMA SPECTROME Hold:					
L5188-03	BLDG124 UNDER TANK	19-DEC-02 12:00	21-FEB-03			
Soil	S GAMMA SPECTROME Hold:					
L5188-04	BLDG124 VALVE PIT	31-OCT-02 12:00	21-FEB-03			
Soil	S GAMMA SPECTROME Hold:					
L5188-05	BLDG124 VALVE PIT	31-OCT-02 12:00	21-FEB-03			
Soil	S GAMMA SPECTROME Hold:					
L5188-06	EO200 #1	22-OCT-02 12:00	21-FEB-03			
Soil	S GAMMA SPECTROME Hold:					
L5188-07	EO200 #2	22-OCT-02 12:00	21-FEB-03			
Soil	S GAMMA SPECTROME Hold:					
L5188-08	EO200 #3	22-OCT-02 12:00	21-FEB-03			
Soil	S GAMMA SPECTROME Hold:					

Signature : *Dee Gordon*
Date : 4-4-03

April 10, 2003

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

ATT: Paul Ely

Dear Paul Ely :

Framatome-ANP Environmental Laboratory received the samples listed below from your company on 21-FEB-03. Please verify that the data and requested analyses are correct. Analysis reports will be submitted when the requested analyses have been completed and the results approved.

<u>Media</u>	<u>Client ID</u>	<u>Site</u>	<u>Reference Date</u>	<u>Lab Sample #</u>	<u>Analysis Requested</u>
Soil	TANK VAULT	WEST SIDE #1	12-DEC-02 12:00	L5188-01	GAMMA SPECTROMETRY
Soil	BLDG124 UNDER TANK	VAULT D0100#3	17-DEC-02 12:00	L5188-02	GAMMA SPECTROMETRY
Soil	BLDG124 UNDER TANK	VAULT D0100#4	19-DEC-02 12:00	L5188-03	GAMMA SPECTROMETRY
Soil	BLDG124 VALVE PIT #1	D0100	31-OCT-02 12:00	L5188-04	GAMMA SPECTROMETRY
Soil	BLDG124 VALVE PIT #2	D0100	31-OCT-02 12:00	L5188-05	GAMMA SPECTROMETRY
Soil	EO200 #1		22-OCT-02 12:00	L5188-06	GAMMA SPECTROMETRY
Soil	EO200 #2		22-OCT-02 12:00	L5188-07	GAMMA SPECTROMETRY
Soil	EO200 #3		22-OCT-02 12:00	L5188-08	GAMMA SPECTROMETRY

If you have any questions regarding these samples, please contact me at (508)898-9970, ext. 2557 or email:
Sakshi.Punjabi@Framatome-anp.com.

Sincerely,


Sakshi Punjabi
Sample Receipt Technician 4/10/03

Notes:

c:

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 02/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5188-01 **Client ID** TANK VAULT WEST SIDE #1 **Product** GAMMA SPECTROMETRY
Reference Date 12/12/02 **Analysis Date** 04/21/03 **Matrix** Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	1.598E+00	+/- 3.7E-02	8.8E-02	1.5E-01		bc
Ag-108m	-8.5E-03	+/- 7.9E-03	7.9E-03	2.7E-02		
Ag-110m	-1.2E-02	+/- 1.7E-02	1.7E-02	6.0E-02		
Ba-140	-2.7E+01	+/- 3.6E+01	3.6E+01	1.2E+02		
Be-7	-4.2E-01	+/- 4.1E-01	4.1E-01	1.4E+00		
Ce-141	2.8E-01	+/- 2.2E-01	2.2E-01	7.1E-01		
Ce-144	8E-03	+/- 6.6E-02	6.6E-02	2.2E-01		
Co-57	1.12E-02	+/- 9.0E-03	9.0E-03	3.0E-02		
Co-58	-2.5E-02	+/- 3.1E-02	3.1E-02	1.1E-01		
Co-60	4.6E-03	+/- 9.6E-03	9.6E-03	3.2E-02	3.8E-02	
Cr-51	2.1E+00	+/- 1.7E+00	1.7E+00	5.5E+00		
Cs-134	-3E-03	+/- 1.0E-02	1.0E-02	3.5E-02		
Cs-137	-6.7E-03	+/- 9.2E-03	9.2E-03	3.1E-02	1.1E+00	
Fe-59	-1.3E-01	+/- 1.4E-01	1.4E-01	4.9E-01		
I-131	-7.9E+02	+/- 6.3E+02	6.3E+02	2.1E+03		
K-40	3.199E+01	+/- 3.9E-01	1.6E+00	3.8E-01		bc
La-140	0E+00	+/- 1.9E+01	1.9E+01	6.5E+01		
Mn-54	2.9E-02	+/- 1.0E-02	1.0E-02	3.3E-02		
Nb-95	2.4E-01	+/- 1.6E-01	1.6E-01	5.2E-01		
Ru-103	-9.5E-02	+/- 8.3E-02	8.4E-02	2.9E-01		
Ru-106	-3E-02	+/- 1.1E-01	1.1E-01	3.6E-01		
Sb-124	0E+00	+/- 6.4E-02	6.4E-02	2.2E-01		
Sb-125	1.9E-02	+/- 2.5E-02	2.5E-02	8.3E-02		
Se-75	-1.9E-02	+/- 2.3E-02	2.3E-02	7.6E-02		
Zn-65	8.9E-02	+/- 6.2E-02	6.2E-02	2.0E-01		
Zr-95	5.6E-01	+/- 3.2E-01	3.2E-01	1.0E+00		

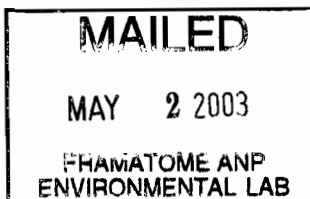
Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/30/03
Receipt Date 02/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

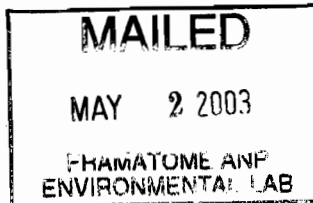
Lab. Sample No. L5188-02 Client ID BLDG124 UNDER TANK VAULT D0100#3 Product GAMMA SPECTROMETRY
Reference Date 12/17/02 Analysis Date 04/28/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.71E-01	+/- 2.9E-02	3.5E-02	1.0E-01		bc
Ag-108m	-5.2E-03	+/- 6.2E-03	6.2E-03	2.2E-02		
Ag-110m	-2.1E-02	+/- 1.2E-02	1.2E-02	4.5E-02		
Ba-140	3E+00	+/- 2.7E+01	2.7E+01	9.5E+01		
Be-7	-5.2E-01	+/- 3.0E-01	3.0E-01	1.1E+00		
Ce-141	-1.9E-01	+/- 1.8E-01	1.8E-01	6.2E-01		
Ce-144	-6.5E-02	+/- 6.4E-02	6.4E-02	2.2E-01		
Co-57	2.22E-02	+/- 8.2E-03	8.3E-03	2.7E-02		
Co-58	-9E-03	+/- 2.2E-02	2.2E-02	7.9E-02		
Co-60	-2E-03	+/- 6.9E-03	6.9E-03	2.5E-02	3.8E-02	
Cr-51	-1.4E+00	+/- 1.5E+00	1.5E+00	5.2E+00		
Cs-134	4.6E-02	+/- 2.6E-02	2.6E-02	8.6E-02		
Cs-137	7.7E-03	+/- 7.7E-03	7.7E-03	2.6E-02	1.1E+00	
Fe-59	-8E-02	+/- 1.1E-01	1.1E-01	4.0E-01		
I-131	-3.7E+02	+/- 5.8E+02	5.8E+02	2.0E+03		
K-40	1.439E+01	+/- 3.1E-01	7.8E-01	2.3E-01		bc
La-140	-2E+00	+/- 1.6E+01	1.6E+01	5.4E+01		
Mn-54	-1.15E-02	+/- 9.0E-03	9.0E-03	3.3E-02		
Nb-95	3.7E-02	+/- 9.0E-02	9.0E-02	3.1E-01		
Ru-103	1.01E-01	+/- 5.8E-02	5.8E-02	1.9E-01		
Ru-106	-8.7E-02	+/- 7.8E-02	7.8E-02	2.8E-01		
Sb-124	4E-03	+/- 4.1E-02	4.1E-02	1.5E-01		
Sb-125	-1.8E-02	+/- 2.1E-02	2.1E-02	7.4E-02		
Se-75	-2.6E-02	+/- 1.7E-02	1.7E-02	6.1E-02		
Zn-65	-2.6E-02	+/- 4.1E-02	4.1E-02	1.4E-01		
Zr-95	3.7E-02	+/- 8.3E-02	8.3E-02	2.8E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/2/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 02/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

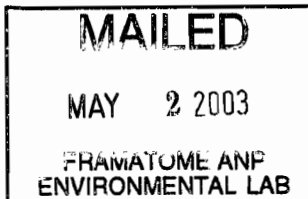
Lab. Sample No. L5188-03 Client ID BLDG124 UNDER TANK VAULT D0100#4 Product GAMMA SPECTROMETRY
Reference Date 12/19/02 Analysis Date 04/21/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.5E-01	+/- 2.1E-02	2.7E-02	8.7E-02		bc
Ag-108m	-2.5E-03	+/- 4.6E-03	4.6E-03	1.6E-02		
Ag-110m	-2.5E-02	+/- 1.0E-02	1.0E-02	3.7E-02		
Ba-140	7E+00	+/- 1.3E+01	1.3E+01	4.4E+01		
Be-7	0E+00	+/- 2.1E-01	2.1E-01	7.0E-01		
Ce-141	-1.7E-01	+/- 1.3E-01	1.3E-01	4.4E-01		
Ce-144	-2.3E-02	+/- 4.0E-02	4.0E-02	1.3E-01		
Co-57	5.2E-03	+/- 5.0E-03	5.0E-03	1.7E-02		
Co-58	-2E-03	+/- 1.7E-02	1.7E-02	5.9E-02		
Co-60	-3.1E-03	+/- 6.1E-03	6.1E-03	2.1E-02	3.8E-02	
Cr-51	4.2E-01	+/- 9.1E-01	9.1E-01	3.1E+00		
Cs-134	-1.7E-02	+/- 2.1E-02	2.1E-02	7.1E-02		
Cs-137	-1.6E-03	+/- 5.9E-03	5.9E-03	2.0E-02	1.1E+00	
Fe-59	1.4E-02	+/- 8.1E-02	8.1E-02	2.7E-01		
I-131	6E+01	+/- 2.1E+02	2.1E+02	7.0E+02		
K-40	2.055E+01	+/- 2.6E-01	1.1E+00	2.4E-01		bc
La-140	-2.9E+00	+/- 7.6E+00	7.6E+00	2.6E+01		
Mn-54	7.4E-03	+/- 7.1E-03	7.2E-03	2.4E-02		
Nb-95	5.1E-02	+/- 8.9E-02	8.9E-02	3.0E-01		
Ru-103	-1.26E-01	+/- 3.9E-02	4.0E-02	1.4E-01		
Ru-106	-4.1E-02	+/- 6.3E-02	6.3E-02	2.1E-01		
Sb-124	-4.7E-02	+/- 4.1E-02	4.1E-02	1.5E-01		
Sb-125	3E-02	+/- 1.6E-02	1.6E-02	5.2E-02		
Se-75	1E-03	+/- 1.2E-02	1.2E-02	3.9E-02		
Zn-65	9.4E-02	+/- 3.3E-02	3.4E-02	1.1E-01		
Zr-95	-1.6E-01	+/- 4.9E-01	4.9E-01	1.6E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 02/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5188-04 Client ID BLDG124 VALVE PIT #1 D0100 Product GAMMA SPECTROMETRY
Reference Date 10/31/02 Analysis Date 04/21/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	8.51E-01 +/- 2.5E-02	4.9E-02	9.4E-02		bc
Ag-108m	2.3E-03 +/- 5.0E-03	5.0E-03	1.7E-02		
Ag-110m	-5E-03 +/- 1.3E-02	1.3E-02	4.4E-02		
Ba-140	0E+00 +/- 2.6E+02	2.6E+02	8.7E+02		
Be-7	-3E-02 +/- 4.2E-01	4.2E-01	1.4E+00		
Ce-141	-1.04E+00 +/- 4.9E-01	5.0E-01	1.7E+00		
Ce-144	1.48E-01 +/- 5.1E-02	5.1E-02	1.6E-01		
Co-57	6E-03 +/- 6.6E-03	6.6E-03	2.2E-02		
Co-58	-3.1E-02 +/- 3.0E-02	3.1E-02	1.1E-01		
Co-60	1.8E-03 +/- 6.7E-03	6.7E-03	2.3E-02	3.8E-02	
Cr-51	1.6E+00 +/- 3.5E+00	3.5E+00	1.2E+01		
Cs-134	-9.6E-03 +/- 7.5E-03	7.5E-03	2.6E-02		
Cs-137	-5.4E-03 +/- 6.4E-03	6.4E-03	2.2E-02	1.1E+00	
Fe-59	-2.2E-01 +/- 1.7E-01	1.7E-01	6.1E-01		
I-131	-8E+03 +/- 1.6E+04	1.6E+04	5.4E+04		
K-40	1.12E+01 +/- 2.2E-01	6.0E-01	3.0E-01		bc
La-140	1.2E+02 +/- 1.2E+02	1.2E+02	3.9E+02		
Mn-54	-7E-04 +/- 9.7E-03	9.7E-03	3.3E-02		
Nb-95	-3.1E-01 +/- 2.8E-01	2.8E-01	9.6E-01		
Ru-103	3E-02 +/- 1.2E-01	1.2E-01	4.1E-01		
Ru-106	3.7E-02 +/- 8.3E-02	8.3E-02	2.8E-01		
Sb-124	-8.5E-02 +/- 7.7E-02	7.7E-02	2.8E-01		
Sb-125	-1.9E-02 +/- 1.8E-02	1.8E-02	6.0E-02		
Se-75	-2.6E-02 +/- 2.0E-02	2.0E-02	6.8E-02		
Zn-65	2.3E-02 +/- 4.5E-02	4.5E-02	1.5E-01		
Zr-95	1.4E-01 +/- 4.0E-01	4.0E-01	1.3E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

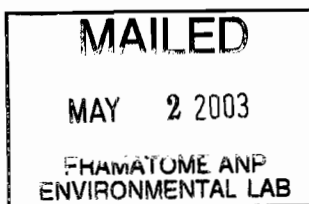
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/2/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/23/03
Receipt Date 02/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5188-05 Client ID BLDG124 VALVE PIT #2 D0100 Product GAMMA SPECTROMETRY
Reference Date 10/31/02 Analysis Date 04/22/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	1.96E-01 +/- 2.3E-02	2.5E-02	9.6E-02		bc
Ag-108m	-4.3E-03 +/- 4.9E-03	4.9E-03	1.7E-02		
Ag-110m	-2E-03 +/- 1.2E-02	1.2E-02	4.2E-02		
Ba-140	1.1E+02 +/- 2.0E+02	2.0E+02	6.9E+02		
Be-7	8E-02 +/- 4.0E-01	4.0E-01	1.3E+00		
Ce-141	4E-01 +/- 2.7E-01	2.7E-01	8.8E-01		
Ce-144	8.9E-02 +/- 4.6E-02	4.6E-02	1.5E-01		
Co-57	7.7E-03 +/- 5.9E-03	5.9E-03	1.9E-02		
Co-58	4E-03 +/- 2.9E-02	2.9E-02	9.9E-02		
Co-60	7.5E-03 +/- 6.5E-03	6.5E-03	2.2E-02	3.8E-02	
Cr-51	-2.3E+00 +/- 3.2E+00	3.2E+00	1.1E+01		
Cs-134	3.4E-02 +/- 3.0E-02	3.0E-02	9.9E-02		
Cs-137	-2E-04 +/- 5.9E-03	5.9E-03	2.0E-02	1.1E+00	
Fe-59	-2.5E-01 +/- 1.8E-01	1.9E-01	6.4E-01		
I-131	9E+03 +/- 1.6E+04	1.6E+04	5.4E+04		
K-40	2.126E+01 +/- 2.8E-01	1.1E+00	2.5E-01		bc
La-140	1E+01 +/- 1.1E+02	1.1E+02	3.8E+02		
Mn-54	-8.6E-03 +/- 8.5E-03	8.5E-03	3.0E-02		
Nb-95	-4E-02 +/- 1.7E-01	1.7E-01	5.9E-01		
Ru-103	-3.5E-02 +/- 9.6E-02	9.6E-02	3.3E-01		
Ru-106	-2.7E-02 +/- 7.4E-02	7.4E-02	2.5E-01		
Sb-124	-2.7E-02 +/- 6.6E-02	6.6E-02	2.4E-01		
Sb-125	1E-02 +/- 1.7E-02	1.7E-02	5.6E-02		
Se-75	1.5E-02 +/- 1.6E-02	1.6E-02	5.2E-02		
Zn-65	3.1E-02 +/- 3.8E-02	3.8E-02	1.2E-01		
Zr-95	-7E-02 +/- 1.1E-01	1.1E-01	3.9E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

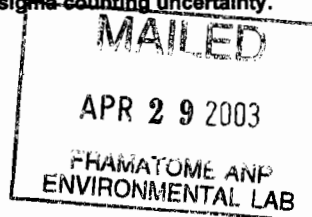
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/24/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/23/03
Receipt Date 02/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5188-06 Client ID EO200 #1
Reference Date 10/22/02 Analysis Date 04/21/03

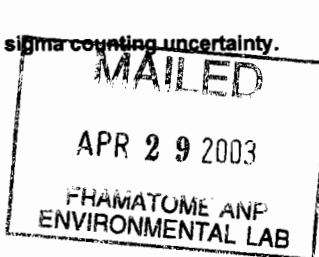
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	1.452E+00 +/- 3.9E-02	8.3E-02	1.3E-01		bc
Ag-108m	6.9E-03 +/- 8.1E-03	8.1E-03	2.7E-02		
Ag-110m	2E-02 +/- 1.9E-02	1.9E-02	6.4E-02		
Ba-140	4E+02 +/- 5.2E+02	5.2E+02	1.7E+03		
Be-7	9.3E-01 +/- 7.3E-01	7.3E-01	2.4E+00		
Ce-141	5.4E-01 +/- 7.0E-01	7.0E-01	2.3E+00		
Ce-144	0E+00 +/- 1.0E-01	1.0E-01	3.4E-01		
Co-57	-2E-02 +/- 1.3E-02	1.3E-02	4.4E-02		
Co-58	-3.9E-02 +/- 4.9E-02	4.9E-02	1.7E-01		
Co-60	3.7E-03 +/- 9.5E-03	9.5E-03	3.3E-02	3.8E-02	
Cr-51	1.69E+01 +/- 7.1E+00	7.1E+00	2.3E+01		
Cs-134	3.7E-02 +/- 3.9E-02	3.9E-02	1.3E-01		
Cs-137	-2.1E-02 +/- 1.0E-02	1.0E-02	3.7E-02	1.1E+00	
Fe-59	-3.9E-01 +/- 3.2E-01	3.2E-01	1.1E+00		
I-131	9E+03 +/- 5.3E+04	5.3E+04	1.8E+05		
K-40	2.743E+01 +/- 4.1E-01	1.4E+00	3.2E-01		bc
La-140	6.8E+02 +/- 3.0E+02	3.0E+02	9.6E+02		
Mn-54	1.9E-02 +/- 1.4E-02	1.4E-02	4.6E-02		
Nb-95	-1.4E-01 +/- 3.4E-01	3.4E-01	1.2E+00		
Ru-103	3.6E-01 +/- 1.9E-01	1.9E-01	6.1E-01		
Ru-106	-3E-01 +/- 1.1E-01	1.1E-01	4.0E-01		
Sb-124	-1.1E-01 +/- 1.0E-01	1.0E-01	3.9E-01		
Sb-125	3.5E-02 +/- 2.9E-02	2.9E-02	9.5E-02		
Se-75	-5.9E-02 +/- 3.2E-02	3.3E-02	1.1E-01		
Zn-65	-7.8E-02 +/- 7.1E-02	7.1E-02	2.4E-01		
Zr-95	0E+00 +/- 1.2E+00	1.2E+00	3.9E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/24/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/23/03
Receipt Date 02/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5188-07 Client ID EO200 #2
Reference Date 10/22/02 Analysis Date 04/21/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	1.095E+00 +/- 3.4E-02	6.5E-02	1.3E-01		bc
Ag-108m	-7.7E-03 +/- 7.5E-03	7.5E-03	2.6E-02		
Ag-110m	-2.4E-02 +/- 1.7E-02	1.7E-02	5.9E-02		
Ba-140	-2.2E+02 +/- 4.7E+02	4.7E+02	1.6E+03		
Be-7	3.5E-01 +/- 6.8E-01	6.8E-01	2.3E+00		
Ce-141	2.2E-01 +/- 6.2E-01	6.2E-01	2.1E+00		
Ce-144	-2.9E-01 +/- 1.5E-01	1.5E-01	5.1E-01		
Co-57	-1.4E-02 +/- 1.0E-02	1.0E-02	3.5E-02		
Co-58	1.27E-01 +/- 4.3E-02	4.3E-02	1.4E-01		
Co-60	-2.7E-03 +/- 7.6E-03	7.6E-03	2.7E-02	3.8E-02	
Cr-51	-6.6E+00 +/- 5.7E+00	5.7E+00	2.0E+01		
Cs-134	1E-04 +/- 8.9E-03	8.9E-03	3.0E-02		
Cs-137	-5.5E-03 +/- 7.9E-03	7.9E-03	2.8E-02	1.1E+00	
Fe-59	-3E-02 +/- 2.8E-01	2.8E-01	9.5E-01		
I-131	-2.2E+04 +/- 4.3E+04	4.3E+04	1.5E+05		
K-40	2.062E+01 +/- 3.4E-01	1.1E+00	2.9E-01		bc
La-140	-3E+01 +/- 2.6E+02	2.6E+02	8.8E+02		
Mn-54	0E+00 +/- 1.2E-02	1.2E-02	4.2E-02		
Nb-95	-4.3E-01 +/- 3.0E-01	3.0E-01	1.0E+00		
Ru-103	-2.4E-01 +/- 1.8E-01	1.8E-01	6.3E-01		
Ru-106	-1.48E-01 +/- 9.9E-02	1.0E-01	3.5E-01		
Sb-124	5.2E-02 +/- 8.7E-02	8.7E-02	3.0E-01		
Sb-125	-2.1E-02 +/- 2.3E-02	2.3E-02	7.8E-02		
Se-75	-2.2E-02 +/- 2.9E-02	2.9E-02	9.7E-02		
Zn-65	-9.4E-02 +/- 6.2E-02	6.3E-02	2.1E-01		
Zr-95	2.3E-01 +/- 6.9E-01	6.9E-01	2.3E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty
c Peak was found

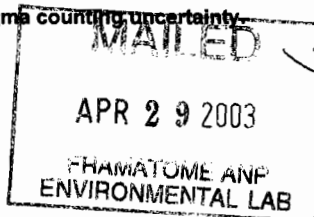
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi

Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/06/03
Receipt Date 02/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5188-08 Client ID EO200 #3
Reference Date 10/22/02 Analysis Date 05/02/03

Product GAMMA SPECTROMETRY
Matrix Soil

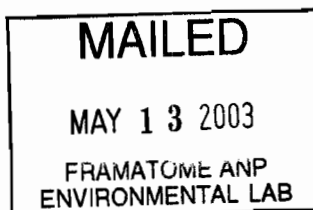
Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	8.39E-01 +/- 4.1E-02	5.9E-02	1.4E-01		bc
Ag-108m	2.3E-03 +/- 8.1E-03	8.1E-03	2.8E-02		
Ag-110m	2.2E-02 +/- 2.0E-02	2.0E-02	6.6E-02		
Ba-140	6.5E+02 +/- 8.8E+02	8.8E+02	3.0E+03		
Be-7	1.5E+00 +/- 8.1E-01	8.1E-01	2.6E+00		
Ce-141	1.14E+00 +/- 8.6E-01	8.6E-01	2.8E+00		
Ce-144	-7E-02 +/- 1.0E-01	1.0E-01	3.5E-01		
Co-57	-1.2E-02 +/- 1.3E-02	1.3E-02	4.4E-02		
Co-58	-6.1E-02 +/- 5.0E-02	5.0E-02	1.8E-01		
Co-60	-8.9E-03 +/- 9.1E-03	9.1E-03	3.3E-02	3.8E-02	
Cr-51	-1.38E+01 +/- 8.7E+00	8.8E+00	3.1E+01		
Cs-134	3.8E-02 +/- 3.7E-02	3.7E-02	1.2E-01		
Cs-137	-9.1E-03 +/- 9.6E-03	9.6E-03	3.4E-02	1.1E+00	
Fe-59	-3E-02 +/- 3.2E-01	3.2E-01	1.1E+00		
I-131	-6E+04 +/- 1.4E+05	1.4E+05	4.7E+05		
K-40	1.815E+01 +/- 3.8E-01	9.8E-01	3.2E-01		bc
La-140	-3.9E+02 +/- 5.3E+02	5.3E+02	1.9E+03		
Mn-54	3.1E-02 +/- 1.3E-02	1.3E-02	4.2E-02		
Nb-95	-1.2E-01 +/- 4.4E-01	4.4E-01	1.5E+00		
Ru-103	2.6E-01 +/- 2.2E-01	2.2E-01	7.3E-01		
Ru-106	-8E-02 +/- 1.1E-01	1.1E-01	4.0E-01		
Sb-124	-1.2E-01 +/- 1.0E-01	1.0E-01	4.1E-01		
Sb-125	1.7E-02 +/- 2.9E-02	2.9E-02	9.9E-02		
Se-75	3.1E-02 +/- 3.3E-02	3.3E-02	1.1E-01		
Zn-65	-3.4E-02 +/- 6.7E-02	6.7E-02	2.3E-01		
Zr-95	-4.3E+01 +/- 1.7E+01	1.7E+01	5.6E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by
J.M. Raimondi
J.M. Raimondi
Sample Control Manager



GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5188-01 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: TANK VAULT WEST SIDE #1
Collect Start Date/Time: _____
Collect Stop Date/Time: 12-12-02 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5176

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 132.4 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9020

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/7/03 01624 Det No.: 5 Spectrum No.: 1116865
Counted by: gn
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5188-01	Product	: GAMMA SPECTROMETRY
Client Id	: TANK VAULT	Matrix	: SO01 Soil
Site	: WEST SIDE #1		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 12/12/02 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	132.4		
Sample Weight-Dry	g			
Aliquot Weight	g	132.4		
FINAL WEIGHT	kg	.1324		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5188-01 analyzed by emm1461 on 04/25/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5188-01 ✓

Sample ID: NONE

Code: 1116805

Sampling Start: 12/12/2002 12:00:00 | Counting Start: 04/21/2003 16:23:45
Sampling Stop: 12/12/2002 12:00:00 | Decay Time. 3.12E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 60000 Sec
Sample Size 1.32E-001 kg | Real Time 60053 Sec
Collection Efficiency 1.0000 | Spc. File 1116805.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Energy(keV)= 0.00 + 0.661*Ch + 1.74E-07*Ch^2 + 0.00E+00*Ch^3 04/21/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

=====

PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.54	81.00	0	80	132	2408	1.12	a NET< CL HiResid
2	58.16	88.00	0	80	132	2408	1.13	b NET< CL HiResid
3	63.53	96.12	188	55	88	1445	0.63	c HiResid
4	74.84	113.23	2154	91	129	3065	1.20	a
5	77.11	116.67	3032	88	113	2554	1.02	b
6	84.24	127.45	377	65	102	2102	1.17	a
7	87.24	131.98	1116	70	102	2102	1.06	b
8	89.92	136.05	758	76	117	2522	1.20	c
9	92.87	140.50	1828	91	131	2942	1.49	d
10	99.42	150.42	92	54	87	1681	0.86	e
11	105.46	159.54	123	76	124	2613	1.03	NET< CL
12	128.95	195.09	325	74	119	2403	1.29	
13	143.75	217.47	171	66	106	2072	0.88	
14	153.60	232.37	162	79	129	2627	0.89	
15	185.94	281.30	1518	82	119	2245	1.46	
16	197.82	299.27	113	59	95	1683	1.24	a
17	199.31	301.51	76	37	58	842	0.62	b
18	209.30	316.62	521	68	106	1919	1.33	
19	235.87	356.81	113	41	64	919	0.81	a
20	238.57	360.91	6739	97	86	1378	1.21	b
21	241.55	365.40	1342	69	97	1608	1.52	c
22	270.04	408.51	665	62	93	1380	1.79	
23	277.19	419.32	335	59	93	1360	1.95	Wide Pk
24	295.10	446.40	2063	63	71	929	1.33	a
25	300.07	453.92	434	48	71	929	1.22	b

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
26	327.77	495.82	333	66	105	1517	1.22	
27	338.25	511.68	1245	64	87	1208	1.38	
28	351.83	532.21	3336	80	91	1214	1.38	
29	365.90	553.49	30	44	73	897	0.60	NET< CL
30	402.65	609.07	57	28	45	453	0.92	a
31	409.23	619.02	174	35	53	566	1.04	b
32	439.56	664.89	83	54	88	1012	1.57	NET< CL
33	462.95	700.27	343	50	76	857	1.52	
34	510.77	772.59	2102	65	77	820	2.43	Wide Pk
35	558.28	844.43	-4	43	71	750	0.12	NET< CL
36	583.14	882.02	2090	62	69	705	1.50	
37	609.23	921.47	2361	62	65	661	1.68	
38	665.50	1006.57	24	27	44	417	0.51	NET< CL
39	727.23	1099.90	370	40	58	577	1.77	
40	740.61	1120.14	78	44	71	700	2.13	
41	755.03	1141.93	13	32	52	476	0.44	NET< CL
42	768.36	1162.09	188	26	36	293	1.09	a
43	772.28	1168.01	80	24	36	293	1.16	b
44	785.82	1188.48	75	33	52	476	1.22	
45	794.87	1202.17	227	30	43	362	1.53	a
46	802.43	1213.60	32	19	29	207	0.83	b
47	830.74	1256.41	29	19	29	212	0.84	a NET< CL
48	835.30	1263.29	72	25	39	319	1.37	b
49	860.67	1301.65	328	35	50	411	1.83	
50	881.51	1333.15	12	33	53	469	0.38	NET< CL
51	911.21	1378.06	1410	51	57	512	1.60	
52	934.13	1412.71	98	33	51	435	1.33	
53	964.80	1459.07	281	29	39	301	1.59	a
54	968.97	1465.37	816	37	39	301	1.62	b
55	1000.94	1513.71	50	30	47	388	1.24	
56	1120.29	1694.12	481	42	58	524	1.83	
57	1155.28	1747.01	46	34	55	478	1.40	NET< CL
58	1238.18	1872.30	148	38	60	560	1.64	
59	1281.39	1937.61	8	22	35	243	0.23	NET< CL
60	1377.57	2082.97	155	25	35	206	2.60	a
61	1385.81	2095.42	50	17	26	138	1.65	b
62	1408.21	2129.27	36	23	36	227	1.01	
63	1460.92	2208.93	7471	89	34	190	2.13	
64	1588.33	2401.45	64	21	32	190	1.52	
65	1621.00	2450.80	27	15	23	104	1.86	a
66	1630.88	2465.73	48	14	19	81	1.43	b
67	1660.89	2511.08	32	19	29	132	4.30	Wide Pk
68	1729.79	2615.17	118	18	24	92	2.16	
69	1764.69	2667.90	450	27	26	110	2.00	
70	1847.69	2793.29	53	17	26	108	1.52	
71	2103.57	3179.81	121	19	26	109	3.92	Wide Pk
72	2204.77	3332.65	129	18	23	93	2.47	
73	2447.79	3699.62	38	16	24	89	2.26	
74	2614.62	3951.52	836	31	18	51	2.68	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	53.54	0	80	132	7312	282	441	
3	63.53	188	55	88	27	59	97	NET<CL
4	74.84	2154	91	129	2014	95	138	
5	77.11	3032	88	113	2948	90	117	
6	84.24	377	65	102	300	67	107	
7	87.24	1116	70	102	1045	73	108	
9	92.87	1828	91	131	1343	93	141	
13	143.75	171	66	106	87	68	111	NET<CL
15	185.94	1518	82	119	1192	85	128	
16	197.82	113	59	95	-70	63	104	NET<CL
18	209.30	521	68	106	484	71	111	
20	238.57	6739	97	86	6559	100	96	
24	295.10	2063	63	71	1950	66	81	
27	338.25	1245	64	87	1245	65	91	
28	351.83	3337	80	91	3115	82	99	
34	510.77	2102	65	77	695	71	108	
35	558.28	-4	43	71	-50	46	77	NET<CL
36	583.14	2090	62	69	2011	64	75	
37	609.23	2361	62	65	2214	65	73	
39	727.23	370	40	58	349	42	61	
46	802.43	32	19	29	-25	23	38	NET<CL
49	860.67	328	35	50	326	37	53	
51	911.21	1410	51	57	1334	53	62	
54	968.97	816	37	39	786	39	44	
55	1000.94	50	30	47	16	32	52	NET<CL
56	1120.29	481	42	58	453	43	61	
60	1377.57	155	25	35	147	26	38	
63	1460.92	7471	89	34	7349	90	43	
64	1588.33	64	21	32	66	22	34	
69	1764.69	451	27	26	418	28	31	
70	1847.69	53	17	26	50	19	30	
74	2614.62	836	31	18	739	32	27	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.65 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	53.54	7312	Pb-214	46	7 of 7	100.00	1.00	
4	74.84	2014	Pb-214	596	7 of 7	100.00	1.00	
			Pb-212	1284	5 of 6	99.30	0.99	
			Tl-208	127	7 of 9	98.43	0.98	
5	77.11	2948	Pb-214	1023	7 of 7	100.00	1.00	
			Pb-212	2265	5 of 6	99.30	0.99	
6	84.24	300	Tl-208	70	7 of 9	98.43	0.98	
7	87.24	1045	Cd-109	. . . . .	1 of 1	100.00	1.50	
			Pb-212	1237	5 of 6	99.30	1.49	
8	89.92	758	Cd-109	. . . . .	1 of 1	100.00	1.50	
9	92.87	1343	AcTh-228	509	18 of 36	91.21	0.91	
			Th-234	. . . . .	1 of 2	58.74	0.59	LowScore
10	99.42	92	AcTh-228	159	18 of 36	98.43	1.48	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
			1120DEsc	. . . . .	0 of 0	. . .	0.65	
12	128.95	325	AcTh-228	477	18 of 36	98.43	1.48	
14	153.60	162	AcTh-228	146	18 of 36	94.77	1.45	
15	185.94	1192	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	78.03	0.78	
17	199.31	76	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
18	209.30	484	AcTh-228	617	18 of 36	97.47	1.47	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
19	235.87	113	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
20	238.57	6559	Pb-212	8261	5 of 6	99.30	0.99	
21	241.55	1342	Pb-214	874	7 of 7	100.00	1.00	
			La-140	. . . . .	0 of 0	. . .	0.00	Decay
22	270.04	665	AcTh-228	422	18 of 36	94.15	0.94	
23	277.19	335	Tl-208	276	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
24	295.10	1950	Pb-214	1950	7 of 7	100.00	1.50	
25	300.07	434	Pb-212	428	5 of 6	99.30	1.49	
26	327.77	333	AcTh-228	327	18 of 36	95.62	1.46	
			Bi-212	4	4 of 13	82.79	0.83	
			La-140	. . . . .	0 of 0	. . .	0.00	Decay
27	338.25	1245	AcTh-228	1115	18 of 36	94.77	1.45	
28	351.83	3115	Pb-214	5098	7 of 7	100.00	1.00	
30	402.65	57	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Se-75	. . . . .	1 of 5	6.62	0.57	LowScore

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
31	409.23	174	AcTh-228	185	18 of 36	95.62	1.46	
33	462.95	344	AcTh-228	349	18 of 36	95.62	1.46	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
34	510.77	131	Annul	. . . . .	1 of 1	100.00	1.50	Split
77	510.77	565	Tl-208	565	7 of 9	100.00	1.50	AutoAdd
36	583.14	2011	Tl-208	2016	7 of 9	100.00	1.50	
37	609.23	2214	Bi-214	2474	14 of 33	91.20	1.41	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.65	
39	727.23	146	1238SEsc	. . . . .	0 of 0	. . .	0.65	Split
76	727.23	202	Bi-212	202	4 of 13	100.00	1.50	AutoAdd
40	740.61	78	Unknown	. . . . .	. . . . .	. . .	. . .
			Mo-99	. . . . .	0 of 0	. . .	0.00	Decay
42	768.36	188	Bi-214	210	14 of 33	95.56	1.46	
			Pa-234	. . . . .	1 of 2	26.32	0.26	LowScore
43	772.28	80	AcTh-228	84	18 of 36	95.62	1.46	
			TeI-132	. . . . .	0 of 0	. . .	0.00	Decay
44	785.82	21	Bi-212	53	4 of 13	100.00	1.50	Split
75	785.82	54	Pb-214	54	7 of 7	100.00	1.50	AutoAdd
45	794.87	227	AcTh-228	245	18 of 36	95.62	1.46	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
48	835.30	72	Mn-54	. . . . .	1 of 1	100.00	1.50	
			AcTh-228	90	18 of 36	97.47	1.47	
49	860.67	326	Tl-208	221	7 of 9	100.00	1.50	
51	911.21	1334	AcTh-228	1328	18 of 36	95.62	1.46	
52	934.13	98	Bi-214	116	14 of 33	96.71	1.47	
53	964.80	281	AcTh-228	238	18 of 36	94.15	1.44	
54	968.97	786	AcTh-228	755	18 of 36	95.62	1.46	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
56	1120.29	453	Bi-214	476	14 of 33	93.27	1.43	
58	1238.18	148	Bi-214	174	14 of 33	96.71	1.47	
60	1377.57	147	Bi-214	110	14 of 33	91.20	1.41	
61	1385.81	50	Bi-214	21	14 of 33	90.67	1.41	
			Ag-110m	. . . . .	1 of 15	9.17	0.59	LowScore
62	1408.21	36	Bi-214	66	14 of 33	98.05	1.48	
			Cs-Sum	. . . . .	1 of 6	25.00	0.75	
63	1460.92	7349	K-40	. . . . .	1 of 1	100.00	1.50	
64	1588.33	66	AcTh-228	112	18 of 36	98.43	1.48	
65	1621.00	27	Bi-212	45	4 of 13	100.00	1.50	
66	1630.88	48	AcTh-228	58	18 of 36	96.48	1.46	
67	1660.89	32	Bi-214	27	14 of 33	91.20	1.41	
68	1729.79	118	Bi-214	67	14 of 33	91.20	1.41	
69	1764.69	418	Bi-214	348	14 of 33	91.20	1.41	
70	1847.69	50	Bi-214	45	14 of 33	91.20	1.41	
71	2103.57	121	2615SEsc	. . . . .	0 of 0	. . .	0.65	
72	2204.77	129	Bi-214	94	14 of 33	91.20	1.41	
73	2447.79	38	Bi-214	27	14 of 33	91.20	1.41	
74	2614.62	739	Tl-208	807	7 of 9	100.00	1.50	

L5188-01 analyzed by emml461 on 04/25/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-01

Sample ID: NONE

Code: 1116805

 Sampling Start: 12/12/2002 12:00:00 | Counting Start: 04/21/2003 16:23:45
 Sampling Stop: 12/12/2002 12:00:00 | Decay Time. 3.12e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 60000 Sec
 Sample Size 1.32e-001 kg | Real Time 60053 Sec
 Collection Efficiency 1.0000 | Spectrum File 1116805.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Efficiency File: WT1SS005.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[5.28E-03*En^-3.33E+00 + 1.03E+02*En^7.42E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes
Pb-214	Average:x	1.44E+03 +- 2.81E+01	. . . . .		*
	53.23	2.30E+05 +- 8.86E+03	2.79E+04		++
	74.81	I.D.	. . . . .	
	77.11	I.D.	. . . . .	
	241.98	2.23E+03 +- 1.15E+02	3.27E+02		++
	295.21	1.45E+03 +- 4.93E+01	1.23E+02		++
	351.92	1.36E+03 +- 3.59E+01	8.78E+01		++
	785.91	1.45E+03 +- 1.24E+03	4.11E+03		+
Tl-208	Average:x	1.55E+03 +- 3.85E+01	. . . . .		*
	84.90	I.D.	. . . . .	
	277.35	1.88E+03 +- 3.32E+02	1.05E+03		++
	510.84	I.D.	. . . . .	
	583.14	1.56E+03 +- 4.99E+01	1.19E+02		++
	860.37	2.28E+03 +- 2.61E+02	7.68E+02		++
	2614.66	1.48E+03 +- 6.36E+01	1.14E+02		++
Cd-109	88.03	I.D.	. . . . .	
AcTh-228	Average:x	1.60E+03 +- 3.72E+01	. . . . .		*
	93.35	I.D.	. . . . .	
	99.45	9.15E+02 +- 5.33E+02	1.75E+03		+
	129.08	1.08E+03 +- 2.47E+02	7.98E+02		++
	154.20	1.74E+03 +- 8.52E+02	2.80E+03		+
	209.28	1.24E+03 +- 1.82E+02	5.76E+02		++
	270.23	2.48E+03 +- 2.32E+02	7.06E+02		++
	327.64	1.60E+03 +- 3.18E+02	1.02E+03		++
	338.32	1.72E+03 +- 9.05E+01	2.54E+02		++
	409.51	1.48E+03 +- 2.96E+02	9.25E+02		++
	463.00	1.55E+03 +- 2.25E+02	6.99E+02		++

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration		MDA	Flags	Notes
		(pCi/kg)			
	772.17	1.50E+03	+- 4.41E+02	1.39E+03		+
	794.70	1.46E+03	+- 1.93E+02	5.69E+02		+
	911.07	1.58E+03	+- 6.22E+01	1.50E+02		+
	964.60	1.85E+03	+- 1.91E+02	5.31E+02		+
	969.11	1.62E+03	+- 8.03E+01	1.89E+02		+
	1588.00	9.34E+02	+- 3.14E+02	1.00E+03		+
	1630.40	1.31E+03	+- 3.69E+02	1.12E+03		+
Ce-141	145.44	N 2.75E+02	+- 2.16E+02	7.14E+02		x
Ra-226	186.22	3.84E+03	+- 2.74E+02	8.34E+02		+
Pb-212	Average:x	1.81E+03	+- 2.73E+01	. . . .		*
	238.63	1.81E+03	+- 2.75E+01	5.36E+01		+
	300.09	1.84E+03	+- 2.03E+02	6.13E+02		+
Annul	511.00	3.57E+01	+- 3.37E+01	1.11E+02		+
Bi-214	Average:x	1.20E+03	+- 2.90E+01	. . . .		*
	609.31	1.16E+03	+- 3.40E+01	7.82E+01		+
	768.36	1.07E+03	+- 1.47E+02	4.26E+02		+
	934.06	1.02E+03	+- 3.41E+02	1.10E+03		+
	1120.29	1.14E+03	+- 1.08E+02	3.15E+02		+
	1238.11	1.03E+03	+- 2.66E+02	8.48E+02		+
	1377.67	1.59E+03	+- 2.79E+02	8.41E+02		+
	1385.31	2.85E+03	+- 9.87E+02	3.12E+03		+
	1407.98	6.61E+02	+- 4.11E+02	1.35E+03		+
	1661.28	1.44E+03	+- 8.29E+02	2.72E+03		+
	1729.59	2.09E+03	+- 3.22E+02	8.98E+02		+
	1764.49	1.41E+03	+- 9.37E+01	2.17E+02		+
	1847.42	1.33E+03	+- 5.13E+02	1.64E+03		+
	2204.22	1.63E+03	+- 2.30E+02	6.26E+02		+
	2447.86	1.64E+03	+- 6.85E+02	2.19E+03		+
Bi-212	Average:x	4.75E+02	+- 1.95E+02	. . . .		+
	785.46	3.08E+02	+- 8.50E+02	2.83E+03		+
	1620.62	4.92E+02	+- 2.74E+02	8.95E+02		+
	727.17	4.75E+02	+- 2.95E+02	9.70E+02		+
Mn-54	834.83	2.95E+01	+- 1.03E+01	3.29E+01		+
K-40	1460.81	3.20E+04	+- 3.90E+02	3.84E+02		+
Am-241	59.54	N 1.21E+02	+- 4.26E+01	1.39E+021		x lbase
Co-57	122.06	N 1.12E+01	+- 9.00E+00	2.97E+01		x
Ce-144	133.54	N 7.91E+00	+- 6.55E+01	2.19E+02r		x rbase
Se-75	264.65	N-1.88E+01	+- 2.25E+01	7.60E+011		x lbase
Cr-51	320.08	N 2.10E+03	+- 1.67E+03	5.53E+03		x
I-131	364.48	N-7.88E+05	+- 6.29E+05	2.14E+06		x
Sb-125	427.89	N 1.88E+01	+- 2.48E+01	8.26E+01		x
Ag-108m	433.93	N-8.50E+00	+- 7.86E+00	2.68E+01		x
Be-7	477.59	N-4.23E+02	+- 4.07E+02	1.38E+03		x
La-140	487.03	N-8.88E+01	+- 1.94E+04	6.52E+04		x
Ru-103	497.08	N-9.47E+01	+- 8.34E+01	2.85E+02		x
Ba-140	537.32	N-2.71E+04	+- 3.62E+04	1.23E+05		x
Cs-134	604.70	N-3.12E+00	+- 1.02E+01	3.45E+011		x lbase
Ru-106	621.84	N-2.52E+01	+- 1.07E+02	3.60E+02		x
Cs-137	661.65	N-6.69E+00	+- 9.17E+00	3.13E+01		x
Zr-95	724.18	N 5.55E+02	+- 3.16E+02	1.04E+03P		x PIC
Nb-95	765.79	N 2.39E+02	+- 1.58E+02	5.21E+02P		x PIC
Co-58	810.76	N-2.49E+01	+- 3.06E+01	1.05E+02		x

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes
	ENERGY E (keV)					
Ag-110m	884.67	N-1.20E+01 +- 1.74E+01	5.95E+01		x	
Fe-59	1099.22	N-1.25E+02 +- 1.44E+02	4.95E+02		x	
Zn-65	1115.52	N 8.91E+01 +- 6.17E+01	2.03E+02P		x	PIC
Co-60	1332.49	N 4.64E+00 +- 9.55E+00	3.23E+01		x	
Sb-124	1691.02	N 0.00E+00 +- 6.44E+01	2.25E+02		x	

MEASURED TOTAL: 4.40E+04 +- 1.06E+03 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	58.16	88.00	0	80	132	2408	1.13	Deleted
3	63.53	96.12	27	59	97	1445	0.63	Deleted
11	105.46	159.54	123	76	124	2613	1.03	Deleted
16	197.82	299.27	-70	63	104	1683	1.24	Deleted
17	199.31	301.51	76	37	58	842	0.62	Unknown
19	235.87	356.81	113	41	64	919	0.81	Unknown
29	365.90	553.49	30	44	73	897	0.60	Deleted
30	402.65	609.07	57	28	45	453	0.92	Unknown
32	439.56	664.89	83	54	88	1012	1.57	Deleted
35	558.28	844.43	-50	46	77	750	0.12	Deleted
38	665.50	1006.57	24	27	44	417	0.51	Deleted
39	727.23	1099.90	146	132	217	577	1.77	1238SEsc
40	740.61	1120.14	78	44	71	700	2.13	Unknown
41	755.03	1141.93	13	32	52	476	0.44	Deleted
46	802.43	1213.60	-25	23	38	207	0.83	Deleted
47	830.74	1256.41	29	19	29	213	0.84	Deleted
50	881.51	1333.15	12	33	53	469	0.38	Deleted
55	1000.94	1513.71	16	32	52	388	1.24	Deleted
57	1155.28	1747.01	46	34	55	479	1.40	Deleted
59	1281.39	1937.61	8	22	35	243	0.23	Deleted
71	2103.57	3179.81	121	19	26	109	3.92	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	143.75	217.47	87N	68	111	2072	0.88	NET< CL
78	59.54	90.08	169N	60	96	1841	1.13	LBase
79	122.06	184.66	74N	59	96	1670	1.18	NET< CL
80	133.54	202.03	7N	55	91	1658	1.19	NET< CL
81	264.65	400.35	-40N	48	79	1163	1.28	NET< CL
82	320.08	484.19	52N	41	67	835	1.32	NET< CL
83	364.48	551.34	-50N	40	67	821	1.36	NET< CL
84	427.89	647.24	27N	36	58	619	1.40	NET< CL

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 NET/MDA PEAK RESULTS
 =====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
85	433.93	656.38	-40N	37	62	660	1.41	NET< CL
86	477.59	722.41	-40N	38	64	700	1.44	NET< CL
87	487.03	736.68	-0N	36	60	610	1.44	NET< CL
88	497.08	751.88	-41N	36	60	606	1.45	NET< CL
89	537.32	812.73	-26N	35	58	567	1.48	NET< CL
90	604.70	914.63	-11N	37	60	624	1.52	NET< CL
								LBase
91	621.84	940.54	-8N	33	55	510	1.54	NET< CL
92	661.65	1000.74	-22N	30	50	491	1.56	NET< CL
93	724.18	1095.29	214N	122	199	798	1.60	PIC
94	765.79	1158.20	63N	42	67	601	1.63	NET< CL
								PIC
95	810.76	1226.19	-23N	28	47	411	1.66	NET< CL
96	884.67	1337.94	-19N	27	46	385	1.71	NET< CL
97	1099.22	1662.27	-25N	28	48	394	1.86	NET< CL
98	1115.52	1686.91	82N	57	92	781	1.87	NET< CL
								PIC
99	1332.49	2014.84	10N	21	34	227	2.01	NET< CL
100	1691.02	2556.60	0N	14	22	92	2.25	NET< CL

c:\seeker\Results\L5188-01.RES Analysis Results Saved.

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 12/12/2002 12:00:00 | Counting Start: 04/21/2003 16:23:45
 Sampling Stop: 12/12/2002 12:00:00 | Decay Time. 3.12E+03 Hrs
 Buildup Time. 0.00E+00 Hrs | Live Time 60000 Sec
 Sample Size 1.32E-01 kg | Real Time 60053 Sec
 Collection Efficiency 1.0000 | Spectrum File 1116805.spc

Detector #: 5

Energy(keV)= -0.00 + 0.661*Ch + 1.74E-07*Ch^2 + 1.74E-07*Ch^3 04/21/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS005.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[5.28e-03*En^-3.33e+00 + 1.03e+02*En^ 7.42e-01] 02/06/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-214	1.44E+03	2.81E+01	< 8.78E+01	4.33E+01	1.00E+00	MEAS +
Tl-208	1.55E+03	3.85E+01	< 1.14E+02	5.43E+01	9.99E-01	MEAS +
AcTh-228	1.60E+03	3.72E+01	< 1.50E+02	7.36E+01	9.99E-01	MEAS +
Ce-141	2.75E+02	2.16E+02	< 7.14E+02	3.53E+02	6.18E-02	NET
Ra-226	3.84E+03	2.74E+02	< 8.34E+02	4.12E+02	1.00E+00	MEAS +
Pb-212	1.81E+03	2.73E+01	< 5.36E+01	2.64E+01	1.00E+00	MEAS +
Annul	3.57E+01	3.37E+01	< 1.11E+02	5.52E+01	7.81E-01	MEAS +
Bi-214	1.20E+03	2.90E+01	< 7.82E+01	3.84E+01	1.00E+00	MEAS +
Bi-212	4.75E+02	1.95E+02	< 8.95E+02	4.23E+02	9.99E-01	MEAS +
Mn-54	2.95E+01	1.03E+01	< 3.30E+01	1.59E+01	7.49E-01	MEAS +
K-40	3.20E+04	3.90E+02	< 3.84E+02	1.86E+02	1.00E+00	MEAS +
Am-241	1.21E+02	4.26E+01	< 1.39E+02	6.84E+01	9.99E-01	NET
Co-57	1.12E+01	9.00E+00	< 2.97E+01	1.46E+01	7.16E-01	NET
Ce-144	7.91E+00	6.55E+01	< 2.19E+02	1.08E+02	7.28E-01	NET
Se-75	-1.88E+01	2.25E+01	< 7.60E+01	3.73E+01	4.70E-01	NET
Cr-51	2.10E+03	1.67E+03	< 5.53E+03	2.71E+03	3.82E-02	NET
I-131	-7.88E+05	6.29E+05	< 2.14E+06	1.05E+06	1.30E-05	NET
Sb-125	1.88E+01	2.48E+01	< 8.26E+01	4.04E+01	9.14E-01	NET
Ag-108m	-8.50E+00	7.86E+00	< 2.68E+01	1.31E+01	9.98E-01	NET
Be-7	-4.23E+02	4.06E+02	< 1.38E+03	6.78E+02	1.84E-01	NET
La-140	-8.88E+01	1.94E+04	< 6.52E+04	3.19E+04	8.48E-04	NET
Ru-103	-9.47E+01	8.34E+01	< 2.85E+02	1.39E+02	1.00E-01	NET
Ba-140	-2.72E+04	3.62E+04	< 1.23E+05	6.02E+04	8.48E-04	NET
Cs-134	-3.12E+00	1.02E+01	< 3.45E+01	1.69E+01	8.87E-01	NET
Ru-106	-2.52E+01	1.06E+02	< 3.60E+02	1.76E+02	7.82E-01	NET
Cs-137	-6.69E+00	9.17E+00	< 3.14E+01	1.53E+01	9.92E-01	NET
Zr-95	5.55E+02	3.16E+02	< 1.04E+03	5.16E+02	2.43E-01	NET
Nb-95	2.39E+02	1.58E+02	< 5.21E+02	2.55E+02	7.58E-02	NET
Co-58	-2.49E+01	3.06E+01	< 1.05E+02	5.11E+01	2.79E-01	NET
Ag-110m	-1.20E+01	1.74E+01	< 5.95E+01	2.89E+01	6.96E-01	NET
Fe-59	-1.25E+02	1.44E+02	< 4.95E+02	2.40E+02	1.32E-01	NET
Zn-65	8.92E+01	6.17E+01	< 2.03E+02	1.00E+02	6.91E-01	NET
Co-60	4.64E+00	9.55E+00	< 3.23E+01	1.55E+01	9.54E-01	NET

L5188-01 analyzed by emm1461 on 04/25/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
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Sb-124	0.00E+00	6.44E+01	< 2.25E+02	1.06E+02	2.22E-01	NET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5188-02

Client: Duratek Inc

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BLDG124 UNDER TANK VAUL

Collect Start Date/Time: _____

Collect Stop Date/Time: 12-17-02 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1.1; Co-60 .038

Count by Date: _____
(if required)

Delay Date: _____
(if required)

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5176

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 725.0 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: R9020

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: April 17, 2008 Det No.: 8 Spectrum No.: 1187208

Counted by: [Signature]

Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5188-02
Client Id : BLDG124 UNDER TANK
Site : VAULT D0100#3
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 12/17/02 12:00

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	725		
Sample Weight-Dry	g			
Aliquot Weight	g	725		
FINAL WEIGHT	kg	.725		
Container			WT5S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5188-02 analyzed by emml461 on 04/28/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-02 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1187208

 Sampling Start: 12/17/2002 12:00:00 | Counting Start: 04/28/2003 17:28:08
 Sampling Stop: 12/17/2002 12:00:00 | Decay Time. 3.17E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 10000 Sec
 Sample Size 7.25E-001 kg | Real Time 10011 Sec
 Collection Efficiency 1.0000 | Spc. File 1187208.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Energy(keV)= 0.15 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/25/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.37	95.42	44	34	55	559	0.77	NET< CL
2	74.96	112.91	244	40	61	684	1.27	a
3	77.04	116.05	419	38	53	570	1.01	b
4	86.98	131.05	120	32	49	488	1.17	a
5	90.14	135.82	72	27	42	391	0.79	b
6	92.78	139.80	282	46	70	781	1.75	c
7	120.92	182.28	-5	35	58	567	0.78	NET< CL
8	185.98	280.46	240	40	60	530	1.35	
9	209.35	315.74	30	33	54	464	0.66	NET< CL
10	238.63	359.94	934	38	38	273	1.31	a
11	241.81	364.74	203	32	48	364	1.83	b
12	269.81	406.99	102	32	50	352	1.57	
13	295.25	445.39	270	26	32	195	1.22	a
14	300.07	452.66	57	19	28	162	0.98	b
15	338.49	510.64	139	28	42	280	1.14	
16	351.98	531.00	558	35	43	274	1.44	
17	409.17	617.33	21	21	34	187	0.75	NET< CL
18	463.24	698.94	76	23	35	170	2.27	Wide Pk
19	510.85	770.79	354	26	30	159	2.71	Wide Pk
20	583.11	879.85	322	25	30	145	1.54	
21	609.36	919.48	422	27	28	132	1.85	
22	727.62	1097.96	82	18	26	111	1.46	
23	768.30	1159.36	14	16	26	116	0.49	NET< CL
24	795.19	1199.94	56	18	27	106	2.28	
25	860.57	1298.62	20	15	24	95	0.86	NET< CL
26	911.27	1375.14	243	22	27	110	1.87	
27	933.57	1408.80	28	17	27	110	1.28	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	969.08	1462.39	85	20	29	141	1.19	
29	1120.54	1690.99	63	18	26	109	1.63	
30	1461.01	2204.85	2256	48	14	32	2.31	
31	1764.88	2663.48	63	11	13	26	1.51	
32	2203.55	3325.56	19	8	12	23	1.59	
33	2614.91	3946.41	152	13	5	3	2.97	

L5188-02 analyzed by emm1461 on 04/28/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.37	44	34	55	4	34	56	NET<CL
2	74.96	244	40	61	226	40	61	
3	77.04	419	38	53	406	38	54	
6	92.78	282	46	70	178	46	72	
8	185.98	241	40	60	172	40	62	
10	238.63	934	38	38	887	39	40	
11	241.81	203	32	48	193	33	48	
12	269.81	102	32	50	104	32	51	
13	295.25	270	26	32	260	26	33	
15	338.49	139	28	42	132	28	43	
16	351.98	559	35	43	527	35	44	
19	510.85	354	26	30	106	27	40	
20	583.11	322	25	30	305	26	31	
21	609.36	422	27	28	393	27	30	
23	768.30	14	16	26	9	16	26	NET<CL
26	911.27	243	22	27	232	23	27	
28	969.08	85	20	29	76	20	30	
29	1120.54	63	18	26	56	18	26	
30	1461.01	2256	48	14	2236	48	16	
31	1764.88	63	11	13	56	11	14	
32	2203.55	19	9	12	17	9	12	
33	2614.91	152	13	5	137	13	8	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.96	226	Pb-212	171	5 of 6	100.00	1.50	
			Pb-214	88	5 of 7	98.65	0.99	
			Tl-208	18	4 of 9	89.51	0.90	
3	77.04	99	Pb-214	158	5 of 7	98.65	0.99	Split
36	77.04	307	Pb-212	307	5 of 6	100.00	1.50	AutoAdd
4	86.98	120	Pb-212	173	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
5	90.14	72	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
6	92.78	109	Th-234	. . . . .	1 of 2	58.74	0.59	Split
35	92.78	69	AcTh-228	69	7 of 36	68.57	1.19	AutoAdd
8	185.98	172	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
10	238.63	887	Pb-212	1022	5 of 6	100.00	1.50	
11	241.81	193	Pb-214	127	5 of 7	100.00	1.50	
			La-140	. . . . .	0 of 0	. . . . .	0.00	Decay
12	269.81	104	AcTh-228	59	7 of 36	72.35	1.22	
13	295.25	260	Pb-214	323	5 of 7	100.00	1.50	
14	300.07	57	Pb-212	61	5 of 6	100.00	1.50	
15	338.49	132	AcTh-228	173	7 of 36	83.78	1.34	
16	351.98	527	Pb-214	483	5 of 7	100.00	1.50	
18	463.24	76	AcTh-228	51	7 of 36	75.67	1.26	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
19	510.85	19	Annul	. . . . .	1 of 1	100.00	1.50	Split
34	510.85	86	Tl-208	86	4 of 9	91.56	1.42	AutoAdd
20	583.11	305	Tl-208	317	4 of 9	91.56	1.42	
21	609.36	393	Bi-214	312	5 of 33	82.54	1.33	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
22	727.62	82	Bi-212	. . . . .	1 of 13	81.10	0.81	
			Te-129m	. . . . .	1 of 2	18.72	0.19	LowScore
24	795.19	56	AcTh-228	38	7 of 36	75.67	1.26	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
26	911.27	232	AcTh-228	186	7 of 36	77.40	1.27	
27	933.57	29	Bi-214	20	5 of 33	77.45	1.27	
28	969.08	76	AcTh-228	132	7 of 36	94.23	1.44	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
29	1120.54	56	Bi-214	84	5 of 33	94.43	1.44	
30	1461.01	2236	K-40	. . . . .	1 of 1	100.00	1.50	
31	1764.88	56	Bi-214	64	5 of 33	82.54	1.33	
32	2203.55	17	Bi-214	17	5 of 33	82.54	1.33	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
33	2614.91	137	Tl-208	137	4 of 9	91.56	1.42	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-02

Sample ID: SOIL/SEDI Duratek Inc

Code: 1187208

 Sampling Start: 12/17/2002 12:00:00 | Counting Start: 04/28/2003 17:28:08
 Sampling Stop: 12/17/2002 12:00:00 | Decay Time: 3.17e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 10000 Sec
 Sample Size 7.25e-001 kg | Real Time 10011 Sec
 Collection Efficiency 1.0000 | Spectrum File 1187208.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5188-02.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS
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Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
Pb-212	Average:x	4.19E+02 +- 1.81E+01			*
	74.81	I.D.	. . . .	. . . .			. . . . .
	77.12	I.D.	. . . .	. . . .			. . . . .
	87.30	I.D.	. . . .	. . . .			. . . . .
	238.63	4.20E+02 +- 1.83E+01	3.95E+01		++		. . . . .
	300.09	4.05E+02 +- 1.34E+02	4.25E+02		++		. . . . .
Pb-214	Average:x	3.69E+02 +- 1.97E+01	. . . .			*	. . . . .
	77.11	I.D.	. . . .	. . . .			. . . . .
	241.98	5.50E+02 +- 9.25E+01	2.83E+02		++		. . . . .
	295.21	3.26E+02 +- 3.25E+01	8.73E+01		++		. . . . .
	351.92	3.82E+02 +- 2.57E+01	6.64E+01		++		. . . . .
Th-234	92.59	3.81E+02 +- 2.79E+02	9.20E+02		+		. . . . .
Ra-226	186.22	9.64E+02 +- 2.23E+02	7.07E+02		++		. . . . .
AcTh-228	Average:x	3.71E+02 +- 2.92E+01	. . . .			*	. . . . .
	270.23	6.56E+02 +- 2.05E+02	6.59E+02		++		. . . . .
	338.32	3.04E+02 +- 6.52E+01	2.02E+02		++		. . . . .
	463.00	5.57E+02 +- 1.69E+02	5.33E+02		++		. . . . .
	794.70	5.55E+02 +- 1.79E+02	5.63E+02		++		. . . . .
	911.07	4.21E+02 +- 4.09E+01	1.04E+02		++		. . . . .
	969.11	2.39E+02 +- 6.36E+01	1.97E+02		++		. . . . .
	93.35	I.D.	. . . .	. . . .			. . . . .
Annil	511.00	8.62E+00 +- 2.05E+01	6.85E+01		+		. . . . .
Tl-208	Average:x	3.82E+02 +- 2.37E+01	. . . .			*	. . . . .
	583.14	3.78E+02 +- 3.17E+01	7.96E+01		++		. . . . .
	2614.66	3.86E+02 +- 3.57E+01	5.28E+01		++		. . . . .
	510.84	I.D.	. . . .	. . . .			. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Bi-214	Average: x	3.12E+02 +- 1.97E+01	. . . . .	*		. . . . .
	609.31	3.28E+02 +- 2.25E+01	5.25E+01	++		. . . . .
	934.06	4.54E+02 +- 2.77E+02	9.11E+02	+		. . . . .
	1120.29	2.14E+02 +- 6.73E+01	2.11E+02	++		. . . . .
	1764.49	2.77E+02 +- 5.50E+01	1.48E+02	++		. . . . .
	2204.22	3.09E+02 +- 1.55E+02	4.96E+02	+		. . . . .
Bi-212	727.17	3.00E+02 +- 6.69E+01	2.01E+02	++		. . . . .
K-40	1460.81	1.44E+04 +- 3.11E+02	2.26E+02	++		. . . . .
Am-241	59.54	N-7.42E+00 +- 3.92E+01	1.33E+02	x		. . . . .
Co-57	122.06	N 2.22E+01 +- 8.21E+00	2.65E+01	x		. . . . .
Ce-144	133.54	N-6.48E+01 +- 6.40E+01	2.20E+02	x		. . . . .
Ce-141	145.44	N-1.92E+02 +- 1.80E+02	6.19E+02	x		. . . . .
Se-75	264.65	N-2.59E+01 +- 1.74E+01	6.13E+01	x	lbase	. . . . .
Cr-51	320.08	N-1.42E+03 +- 1.48E+03	5.16E+03	x		. . . . .
I-131	364.48	N-3.70E+05 +- 5.84E+05	2.04E+06	x		. . . . .
Sb-125	427.89	N-1.85E+01 +- 2.09E+01	7.36E+01	x		. . . . .
Ag-108m	433.93	N-5.22E+00 +- 6.17E+00	2.17E+01	x		. . . . .
Be-7	477.59	N-5.24E+02 +- 2.97E+02	1.07E+03	x		. . . . .
La-140	487.03	N-1.90E+03 +- 1.56E+04	5.42E+04	x		. . . . .
Ru-103	497.08	N 1.01E+02 +- 5.80E+01	1.90E+02	x		. . . . .
Ba-140	537.32	N 2.58E+03 +- 2.75E+04	9.52E+04	x		. . . . .
Cs-134	604.70	N 4.64E+01 +- 2.63E+01	8.64E+01	x	PIC	. . . . .
Ru-106	621.84	N-8.71E+01 +- 7.82E+01	2.80E+02	x		. . . . .
Cs-137	661.65	N 7.73E+00 +- 7.66E+00	2.57E+01	x		Y.
Zr-95	724.18	N 3.73E+01 +- 8.27E+01	2.77E+02	x	LHROI	. . . . .
Nb-95	765.79	N 3.69E+01 +- 9.03E+01	3.10E+02	x		. . . . .
Co-58	810.76	N-8.55E+00 +- 2.22E+01	7.89E+01	x		. . . . .
Mn-54	834.83	N-1.15E+01 +- 8.96E+00	3.25E+01	x		. . . . .
Ag-110m	884.67	N-2.06E+01 +- 1.22E+01	4.55E+01	x		. . . . .
Fe-59	1099.22	N-8.15E+01 +- 1.13E+02	4.03E+02	x		. . . . .
Zn-65	1115.52	N-2.60E+01 +- 4.06E+01	1.43E+02	x	PIC	. . . . .
Co-60	1332.49	N-2.03E+00 +- 6.88E+00	2.48E+01	x		Y.
Sb-124	1691.02	N 4.24E+00 +- 4.06E+01	1.52E+02	x		. . . . .

MEASURED TOTAL: 1.79E+04 +- 1.01E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.37	95.42	4	34	56	559	0.77	Deleted
5	90.14	135.82	72	27	42	391	0.79	Unknown
7	120.92	182.28	-5	35	58	567	0.78	Deleted
9	209.35	315.74	30	33	54	464	0.66	Deleted
17	409.17	617.33	21	21	34	187	0.75	Deleted
23	768.30	1159.36	9	16	26	116	0.49	Deleted
25	860.57	1298.62	20	15	24	95	0.86	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
37	59.54	89.64	-6N	32	52	504	1.24	NET< CL
38	122.06	184.00	83N	31	48	428	1.29	
39	133.54	201.32	-31N	31	51	484	1.30	NET< CL
40	145.44	219.28	-33N	31	52	496	1.31	NET< CL
41	264.65	399.21	-32N	21	37	247	1.39	NET< CL
								LBase
42	320.08	482.86	-20N	21	35	211	1.43	NET< CL
43	364.48	549.88	-12N	19	32	176	1.46	NET< CL
44	427.89	645.58	-16N	18	31	162	1.50	NET< CL
45	433.93	654.70	-15N	18	30	155	1.51	NET< CL
46	477.59	720.59	-30N	17	29	146	1.53	NET< CL
47	487.03	734.84	-2N	16	27	126	1.54	NET< CL
48	497.08	750.01	26N	15	23	104	1.55	
49	537.32	810.74	1N	15	24	116	1.57	NET< CL
50	604.70	912.44	104N	59	96	236	1.62	PIC
51	621.84	938.31	-17N	15	26	125	1.63	NET< CL
52	661.65	998.39	16N	16	25	118	1.66	NET< CL
53	724.18	1092.77	9N	20	32	95	1.70	NET< CL
								LHRoi
54	765.79	1155.57	6N	15	24	105	1.73	NET< CL
55	810.76	1223.44	-5N	13	22	87	1.76	NET< CL
56	834.83	1259.77	-18N	14	24	108	1.77	NET< CL
57	884.67	1334.99	-21N	12	22	88	1.81	NET< CL
58	1099.22	1658.81	-10N	14	24	102	1.95	NET< CL
59	1115.52	1683.41	-16N	25	42	170	1.96	NET< CL
								PIC
60	1332.49	2010.88	-3N	10	17	53	2.10	NET< CL
61	1691.02	2552.00	1N	6	9	15	2.34	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 12/17/2002 12:00:00 | Counting Start: 04/28/2003 17:28:08
Sampling Stop: 12/17/2002 12:00:00 | Decay Time. . . . . 3.17E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 10000 Sec
Sample Size . . . . . 7.25E-01 kg | Real Time . . . . . 10011 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1187208.spc
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Detector #: 8

Energy(keV)= 0.15 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/25/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

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Efficiency File: . . . .WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[ 5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998
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Library File: SOILA.LIB LSF File: L5188-02.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	4.20E+02	1.81E+01	< 3.95E+01	1.91E+01	1.00E+00	MEAS +	YES
Pb-214	3.69E+02	1.97E+01	< 6.63E+01	3.22E+01	1.00E+00	MEAS +	YES
Th-234	3.81E+02	2.79E+02	< 9.20E+02	4.55E+02	1.00E+00	MEAS +	YES
Ra-226	9.64E+02	2.23E+02	< 7.07E+02	3.46E+02	1.00E+00	MEAS +	YES
AcTh-228	3.71E+02	2.92E+01	< 1.04E+02	4.97E+01	1.00E+00	MEAS +	YES
Ann1l	8.62E+00	2.05E+01	< 6.85E+01	3.37E+01	7.78E-01	MEAS +	YES
Tl-208	3.82E+02	2.37E+01	< 5.28E+01	2.26E+01	1.00E+00	MEAS +	YES
Bi-214	3.12E+02	1.97E+01	< 5.25E+01	2.51E+01	9.99E-01	MEAS +	YES
Bi-212	3.00E+02	6.69E+01	< 2.01E+02	9.56E+01	1.00E+00	MEAS +	YES
K-40	1.44E+04	3.11E+02	< 2.26E+02	1.04E+02	1.00E+00	MEAS +	YES
Am-241	-7.42E+00	3.92E+01	< 1.33E+02	6.46E+01	9.99E-01	NET	YES
Co-57	2.22E+01	8.21E+00	< 2.65E+01	1.29E+01	7.13E-01	NET	YES
Ce-144	-6.48E+01	6.40E+01	< 2.20E+02	1.07E+02	7.24E-01	NET	YES
Ce-141	-1.92E+02	1.80E+02	< 6.19E+02	3.02E+02	5.96E-02	NET	YES
Se-75	-2.59E+01	1.74E+01	< 6.13E+01	2.95E+01	4.65E-01	NET	YES
Cr-51	-1.42E+03	1.48E+03	< 5.16E+03	2.48E+03	3.66E-02	NET	YES
I-131	-3.70E+05	5.84E+05	< 2.04E+06	9.77E+05	1.12E-05	NET	YES
Sb-125	-1.85E+01	2.09E+01	< 7.36E+01	3.52E+01	9.13E-01	NET	YES
Ag-108m	-5.22E+00	6.17E+00	< 2.17E+01	1.04E+01	9.98E-01	NET	YES
Be-7	-5.24E+02	2.97E+02	< 1.07E+03	5.13E+02	1.80E-01	NET	YES
La-140	-1.90E+03	1.56E+04	< 5.42E+04	2.58E+04	7.71E-04	NET	YES
Ru-103	1.01E+02	5.80E+01	< 1.90E+02	8.96E+01	9.73E-02	NET	YES
Ba-140	2.58E+03	2.75E+04	< 9.52E+04	4.51E+04	7.71E-04	NET	YES
Cs-134	4.65E+01	2.63E+01	< 8.64E+01	4.26E+01	8.85E-01	NET	YES
Ru-106	-8.71E+01	7.82E+01	< 2.80E+02	1.33E+02	7.80E-01	NET	YES
Cs-137	7.72E+00	7.66E+00	< 2.57E+01	1.22E+01	9.92E-01	NET	YES
Zr-95	3.73E+01	8.27E+01	< 2.77E+02	1.33E+02	2.39E-01	NET	YES
Nb-95	3.69E+01	9.03E+01	< 3.10E+02	1.46E+02	7.32E-02	NET	YES
Co-58	-8.56E+00	2.22E+01	< 7.89E+01	3.71E+01	2.74E-01	NET	YES
Mn-54	-1.15E+01	8.96E+00	< 3.25E+01	1.54E+01	7.46E-01	NET	YES
Ag-110m	-2.06E+01	1.22E+01	< 4.55E+01	2.14E+01	6.93E-01	NET	YES
Fe-59	-8.15E+01	1.13E+02	< 4.03E+02	1.91E+02	1.28E-01	NET	YES
Zn-65	-2.60E+01	4.06E+01	< 1.43E+02	6.91E+01	6.87E-01	NET	YES

L5188-02 analyzed by emm1461 on 04/28/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	-2.03E+00	6.88E+00	< 2.48E+01	1.15E+01	9.53E-01	NET	YES
Sb-124	4.24E+00	4.06E+01	< 1.52E+02	6.62E+01	2.18E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5188-03 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BLDG124 UNDER TANK VAUL
Collect Start Date/Time: _____
Collect Stop Date/Time: 12-19-02 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG5176

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 177.7 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9020

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 12/19/02 1626 Det No.: 8 Spectrum No.: 1116808
Counted by: 62
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5188-03	Product	: GAMMA SPECTROMETRY
Client Id	: BLDG124 UNDER TANK	Matrix	: S001 Soil
Site	: VAULT D0100#4		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 12/19/02 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	177.7		
Sample Weight-Dry	g			
Aliquot Weight	g	177.7		
FINAL WEIGHT	kg	.1777		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5188-03 analyzed by emm1461 on 04/25/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-03 ✓

Sample ID: NONE

Code: 1116808

 Sampling Start: 12/19/2002 12:00:00 | Counting Start: 04/21/2003 16:25:59
 Sampling Stop: 12/19/2002 12:00:00 | Decay Time. 2.96E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 60000 Sec
 Sample Size 1.78E-001 kg | Real Time 60053 Sec
 Collection Efficiency 1.0000 | Spc. File 1116808.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Energy(keV) = -0.05 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/21/2003
 FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003
 Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.07	78.67	-17051	739	1235	19432	156.79	NET< CL Wide Pk
2	63.04	95.23	311	67	107	1939	1.39	
3	74.58	112.64	854	65	96	1708	1.37	a
4	76.85	116.07	1200	68	96	1708	1.24	b
5	84.04	126.92	244	69	111	1959	1.65	a
6	87.04	131.45	597	66	100	1714	1.49	b
7	89.59	135.29	280	44	66	979	0.97	c
8	92.52	139.71	1081	69	100	1714	1.50	d
9	139.68	210.90	64	45	73	1074	1.11	a NET< CL
10	143.93	217.31	75	39	62	859	0.94	b
11	162.93	245.99	-27	54	89	1351	0.80	NET< CL
12	185.68	280.32	676	70	106	1666	1.33	
13	197.96	298.86	90	65	105	1640	1.33	NET< CL
14	209.37	316.07	37	58	95	1415	0.38	NET< CL
15	222.10	335.30	4	50	82	1143	0.08	NET< CL
16	238.39	359.88	2240	64	71	931	1.29	a
17	241.38	364.40	479	58	89	1241	1.80	b
18	270.09	407.71	248	45	69	811	1.49	a
19	276.45	417.31	132	66	106	1390	2.63	b Wide Pk
20	294.94	445.22	734	48	66	744	1.52	a
21	299.71	452.43	133	42	66	744	1.42	b
22	327.91	494.98	84	46	74	867	1.12	
23	338.04	510.28	424	49	73	845	1.43	
24	351.76	530.98	1328	58	74	816	1.43	
25	401.63	606.25	34	39	63	631	1.69	NET< CL
26	409.36	617.92	38	39	63	620	0.72	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	462.65	698.34	178	37	56	499	1.66	
28	510.71	770.88	1657	54	59	613	2.56	Wide Pk
29	558.13	842.45	64	41	66	652	1.04	NET< CL
30	569.57	859.71	13	25	41	361	0.28	NET< CL
31	583.03	880.02	729	42	52	469	1.53	
32	609.13	919.42	885	48	61	616	1.67	
33	720.16	1086.99	46	20	30	208	1.13	a
34	727.32	1097.80	177	27	38	291	1.61	b
35	754.74	1139.19	26	33	54	451	1.24	NET< CL
36	767.76	1158.84	113	35	54	462	2.51	Wide Pk
37	785.53	1185.65	58	33	53	444	1.52	
38	794.74	1199.56	44	30	47	392	0.85	NET< CL
39	859.31	1297.01	70	35	56	460	1.07	
40	911.06	1375.12	459	36	48	380	1.69	
41	949.32	1432.86	38	39	64	527	1.04	NET< CL
42	964.73	1456.12	72	22	33	224	1.20	a
43	968.92	1462.45	298	30	40	298	1.78	b
44	1120.29	1690.89	235	31	44	354	2.17	a MANUAL
45	1238.80	1869.77	75	33	52	485	2.51	
46	1377.96	2079.80	26	21	34	194	1.85	NET< CL
47	1409.18	2126.91	45	19	30	149	3.69	Wide Pk
48	1460.82	2204.84	7115	86	30	148	2.20	
49	1509.48	2278.28	24	17	27	116	2.48	NET< CL
50	1621.67	2447.62	25	17	27	116	1.76	NET< CL
51	1729.44	2610.26	60	18	27	106	2.05	
52	1764.71	2663.50	215	20	23	81	2.56	
53	2103.19	3174.35	79	16	22	80	3.50	
54	2204.22	3326.84	51	16	23	83	2.31	
55	2614.57	3946.15	361	21	16	41	3.05	
56	1120.34	1690.98	222	36	54	434	1.69	DELETED

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	52.07	-17051	739	1235	-9830	785	1302	NET<CL
2	63.04	311	67	107	38	70	114	NET<CL
3	74.58	854	65	96	746	67	100	
4	76.85	1200	68	96	1029	71	105	
5	84.04	244	69	111	159	72	117	
6	87.04	597	66	100	480	73	114	
8	92.52	1081	69	100	414	74	117	
9	139.68	64	45	73	16	47	77	NET<CL
10	143.93	75	39	62	-4	41	68	NET<CL
12	185.68	676	70	106	321	74	118	
13	197.96	90	65	105	-1	67	111	NET<CL
16	238.39	2240	64	71	1965	67	83	
17	241.38	479	58	89	353	61	96	
20	294.94	734	48	66	473	52	78	
22	327.91	84	46	74	89	49	79	
23	338.04	424	49	73	367	52	80	
24	351.76	1328	58	74	948	61	87	
27	462.65	178	37	56	171	39	60	
28	510.71	1657	54	59	143	61	98	
29	558.13	65	41	66	7	43	71	NET<CL
30	569.57	13	25	41	-25	29	49	NET<CL
31	583.03	729	42	52	651	44	60	
32	609.13	885	48	61	545	51	75	
36	767.76	113	35	54	77	36	57	
40	911.06	459	36	48	403	38	53	
43	968.92	298	30	40	260	31	44	
44	1120.29	235	31	44	183	32	48	
45	1238.80	75	33	53	70	34	55	
46	1377.96	26	21	34	-4	23	38	NET<CL
48	1460.82	7115	86	30	6981	87	40	
51	1729.44	60	18	27	49	20	30	
52	1764.71	215	20	23	146	22	30	
54	2204.22	51	16	23	32	17	27	
55	2614.57	361	21	16	271	23	26	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.60 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.58	746	Pb-212	424	5 of 6	100.00	1.00	
			Pb-214	182	6 of 7	100.00	1.00	
			Tl-208	47	6 of 9	93.08	0.93	
4	76.85	280	Pb-214	323	6 of 7	100.00	1.00	Split
59	76.85	749	Pb-212	749	5 of 6	100.00	1.00	AutoAdd
5	84.04	159	Tl-208	25	6 of 9	93.08	1.43	
6	87.04	87	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
58	87.04	393	Pb-212	393	5 of 6	100.00	1.50	AutoAdd
7	89.59	280	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	92.52	414	AcTh-228	176	8 of 36	72.20	0.72	
			Th-234	. . . . .	1 of 2	58.74	0.59	LowScore
12	185.68	321	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
16	238.39	1965	Pb-212	2783	5 of 6	100.00	1.00	
17	241.38	353	Pb-214	237	6 of 7	100.00	1.50	
			La-140	. . . . .	0 of 0	. . . . .	0.00	Decay
18	270.09	248	AcTh-228	136	8 of 36	74.32	1.24	
19	276.45	132	Tl-208	92	6 of 9	94.57	1.45	
			Ba-133	. . . . .	1 of 5	5.46	0.55	LowScore
20	294.94	473	Pb-214	790	6 of 7	100.00	1.50	
21	299.71	133	Pb-212	134	5 of 6	100.00	1.50	
22	327.91	89	AcTh-228	108	8 of 36	83.17	1.33	
			Bi-212	4	3 of 13	69.12	1.19	
			La-140	. . . . .	0 of 0	. . . . .	0.00	Decay
23	338.04	367	AcTh-228	378	8 of 36	79.89	1.30	
24	351.76	948	Pb-214	1349	6 of 7	100.00	1.50	
27	462.65	171	AcTh-228	114	8 of 36	76.95	1.27	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
28	510.71	143	Annul	. . . . .	1 of 1	100.00	1.50	
			Tl-208	190	6 of 9	94.57	1.45	
31	583.03	651	Tl-208	693	6 of 9	94.57	1.45	
32	609.13	545	Bi-214	921	7 of 33	100.00	1.00	
			1120SEsc	. . . . .	0 of 0	. . . . .	0.60	
			1120SEsc	. . . . .	0 of 0	. . . . .	0.60	
33	720.16	46	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
34	727.32	177	Bi-212	241	3 of 13	83.48	1.33	
36	767.76	77	Bi-214	57	7 of 33	92.92	1.43	
37	785.53	30	Pb-214	15	6 of 7	100.00	1.50	Split
57	785.53	28	Bi-212	28	3 of 13	83.48	1.33	AutoAdd

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
39	859.31	71	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
40	911.06	403	AcTh-228	490	8 of 36	83.17	1.33	
42	964.73	72	AcTh-228	79	8 of 36	83.17	1.33	
43	968.92	260	AcTh-228	249	8 of 36	79.89	1.30	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
44	1120.29	183	Bi-214	126	7 of 33	90.97	1.41	
45	1238.80	70	Bi-214	47	7 of 33	87.19	1.37	
47	1409.18	45	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
48	1460.82	6981	K-40	. . . . .	1 of 1	100.00	1.50	
51	1729.44	49	Bi-214	18	7 of 33	84.79	1.35	
52	1764.71	146	Bi-214	92	7 of 33	87.19	1.37	
53	2103.19	79	2615SEsc	. . . . .	0 of 0	. . . . .	0.60	
54	2204.22	32	Bi-214	26	7 of 33	95.90	1.46	
55	2614.57	271	Tl-208	251	6 of 9	94.57	1.45	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-03

Sample ID: NONE

Code: 1116808

 Sampling Start: 12/19/2002 12:00:00 | Counting Start: 04/21/2003 16:25:59
 Sampling Stop: 12/19/2002 12:00:00 | Decay Time. 2.96e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 60000 Sec
 Sample Size 1.78e-001 kg | Real Time 60053 Sec
 Collection Efficiency 1.0000 | Spectrum File 1116808.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[7.49E-03*En^-3.10E+00 + 9.34E+01*En^7.45E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 =====

MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes
	ENERGY E (keV)					
Pb-212	Average:x	3.66E+02 +- 1.24E+01		*	
	74.81	I.D.	. . . .	. . . .
	77.12	I.D.	. . . .	. . . .
	87.30	I.D.	. . . .	. . . .
	238.63	3.66E+02 +- 1.25E+01	3.14E+01		++	
	300.09	3.81E+02 +- 1.19E+02	3.85E+02		++	
Pb-214	Average:x	2.71E+02 +- 1.44E+01		*	
	77.11	I.D.	. . . .	. . . .
	241.98	3.95E+02 +- 6.84E+01	2.17E+02		++	
	295.21	2.37E+02 +- 2.60E+01	7.91E+01		++	
	351.92	2.78E+02 +- 1.79E+01	5.17E+01		++	
	785.91	5.37E+02 +- 1.04E+03	3.46E+03		+	
Tl-208	Average:x	3.51E+02 +- 1.85E+01		*	
	84.90	I.D.	. . . .	. . . .
	277.35	4.97E+02 +- 2.48E+02	8.12E+02		+	
	583.14	3.41E+02 +- 2.32E+01	6.38E+01		++	
	2614.66	3.67E+02 +- 3.08E+01	7.37E+01		++	
Cd-109	88.03	I.D.	. . . .	. . . .
AcTh-228	Average:x	3.50E+02 +- 2.07E+01		*	
	93.35	I.D.	. . . .	. . . .
	270.23	6.24E+02 +- 1.12E+02	3.53E+02		++	
	327.64	2.89E+02 +- 1.58E+02	5.19E+02		+	
	338.32	3.42E+02 +- 4.86E+01	1.51E+02		++	
	463.00	5.20E+02 +- 1.18E+02	3.73E+02		++	
	911.07	3.22E+02 +- 3.03E+01	8.68E+01		++	
	964.60	3.19E+02 +- 9.54E+01	3.01E+02		++	
	969.11	3.63E+02 +- 4.36E+01	1.27E+02		++	

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes
	ENERGY E	(keV)	(pCi/kg)			
Ra-226	186.22		6.97E+02 +- 1.60E+02		5.16E+02		+
Annul	511.00		2.61E+01 +- 1.11E+01		3.63E+01		+
Bi-214	Average:x		2.23E+02 +- 1.59E+01		. . . .		*
	609.31		1.93E+02 +- 1.81E+01		5.39E+01		+
	768.36		2.97E+02 +- 1.38E+02		4.52E+02		+
	1120.29		3.12E+02 +- 5.53E+01		1.70E+02		+
	1238.11		3.26E+02 +- 1.60E+02		5.25E+02		+
	1729.59		5.93E+02 +- 2.35E+02		7.54E+02		+
	1764.49		3.34E+02 +- 5.02E+01		1.44E+02		+
	2204.22		2.73E+02 +- 1.47E+02		4.81E+02		+
Bi-212	Average:x		2.81E+02 +- 4.24E+01		. . . .		*
	727.17		2.81E+02 +- 4.26E+01		1.26E+02		+
	785.46		2.81E+02 +- 4.76E+02		1.58E+03		+
K-40	1460.81		2.06E+04 +- 2.56E+02		2.42E+02		+
Am-241	59.54	N-2.53E+01 +- 3.14E+01			1.05E+02L		x LHROI
Co-57	122.06	N 5.18E+00 +- 4.99E+00			1.65E+01		x
Ce-144	133.54	N-2.27E+01 +- 3.97E+01			1.33E+02		x
Ce-141	145.44	N-1.74E+02 +- 1.30E+02			4.42E+02R		x RHROI
Se-75	264.65	N 6.09E-01 +- 1.17E+01			3.93E+011		x lbase
Cr-51	320.08	N 4.18E+02 +- 9.13E+02			3.05E+03		x
I-131	364.48	N 5.52E+04 +- 2.09E+05			7.00E+05		x
Sb-125	427.89	N 2.97E+01 +- 1.57E+01			5.16E+01		x
Ag-108m	433.93	N-2.46E+00 +- 4.60E+00			1.56E+01		x
Be-7	477.59	N-4.34E+00 +- 2.09E+02			7.04E+02		x
La-140	487.03	N-2.91E+03 +- 7.60E+03			2.58E+04		x
Ru-103	497.08	N-1.26E+02 +- 3.94E+01			1.41E+02		x#
Ba-140	537.32	N 7.41E+03 +- 1.30E+04			4.36E+04		x
Cs-134	604.70	N-1.66E+01 +- 2.14E+01			7.13E+01P		x PIC
Ru-106	621.84	N-4.07E+01 +- 6.26E+01			2.14E+02		x
Cs-137	661.65	N-1.65E+00 +- 5.91E+00			2.01E+01		x
Zr-95	724.18	N-1.62E+02 +- 4.88E+02			1.61E+03P		x PIC
Nb-95	765.79	N 5.09E+01 +- 8.94E+01			3.00E+02P		x PIC
Co-58	810.76	N-2.05E+00 +- 1.72E+01			5.87E+01		x
Mn-54	834.83	N 7.35E+00 +- 7.15E+00			2.38E+01		x
Ag-110m	884.67	N-2.47E+01 +- 1.04E+01			3.69E+01		x
Fe-59	1099.22	N 1.42E+01 +- 8.10E+01			2.74E+02		x
Zn-65	1115.52	N 9.35E+01 +- 3.35E+01			1.09E+02P		x PIC
Co-60	1332.49	N-3.07E+00 +- 6.09E+00			2.11E+01		x
Sb-124	1691.02	N-4.71E+01 +- 4.08E+01			1.48E+02		x

MEASURED TOTAL: 2.31E+04 +- 5.51E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.07	78.67	-9830	785	1302	19432	156.79	Deleted
2	63.04	95.23	38	70	114	1939	1.39	Deleted
7	89.59	135.29	280	44	66	979	0.97	Unknown
9	139.68	210.90	16	47	77	1074	1.11	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
10	143.93	217.31	-4	41	68	859	0.94	Deleted
11	162.93	245.99	-27	54	89	1351	0.80	Deleted
13	197.96	298.86	-1	67	111	1640	1.33	Deleted
14	209.37	316.07	37	58	95	1415	0.38	Deleted
15	222.10	335.30	4	50	82	1143	0.08	Deleted
25	401.63	606.25	34	39	63	631	1.69	Deleted
26	409.36	617.92	38	39	63	620	0.72	Deleted
29	558.13	842.45	7	43	71	653	1.04	Deleted
30	569.57	859.71	-25	29	49	361	0.28	Deleted
33	720.16	1086.99	46	20	30	208	1.13	Unknown
35	754.74	1139.19	26	33	54	451	1.24	Deleted
38	794.74	1199.56	45	30	47	392	0.85	Deleted
39	859.31	1297.01	71	35	56	461	1.07	Unknown
41	949.32	1432.86	38	39	64	527	1.04	Deleted
46	1377.96	2079.80	-4	23	38	194	1.85	Deleted
47	1409.18	2126.91	45	19	30	149	3.69	Unknown
49	1509.48	2278.28	24	17	27	116	2.48	Deleted
50	1621.67	2447.62	25	17	27	116	1.76	Deleted
53	2103.19	3174.35	79	16	22	80	3.50	2615SEsc
56	1120.34	1690.98	222	36	54	434	1.69	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
60	59.54	89.94	-62N	77	128	1504	1.24	NET< CL LHRoi
61	122.06	184.30	52N	50	82	1229	1.29	NET< CL
62	133.54	201.63	-29N	51	84	1305	1.30	NET< CL
63	145.44	219.59	-95N	71	119	1311	1.31	NET< CL RHRoi
64	264.65	399.51	2N	38	63	739	1.39	NET< CL LBase
65	320.08	483.17	18N	40	66	733	1.43	NET< CL
66	364.48	550.18	10N	36	59	592	1.46	NET< CL
67	427.89	645.88	64N	34	54	494	1.50	
68	433.93	655.00	-17N	32	54	492	1.50	NET< CL
69	477.59	720.89	-1N	32	53	474	1.53	NET< CL
70	487.03	735.14	-12N	31	51	447	1.54	NET< CL
71	497.08	750.31	-90N	28	49	475	1.55	NET< CL
72	537.32	811.04	15N	27	44	381	1.57	NET< CL
73	604.70	912.73	-89N	115	189	1072	1.62	NET< CL PIC
74	621.84	938.60	-19N	29	49	437	1.63	NET< CL
75	661.65	998.69	-8N	29	47	415	1.66	NET< CL
76	724.18	1093.06	-100N	301	495	554	1.70	NET< CL PIC
77	765.79	1155.86	23N	40	66	551	1.73	NET< CL PIC
78	810.76	1223.73	-3N	25	42	320	1.76	NET< CL
79	834.83	1260.06	27N	26	42	331	1.77	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
80	884.67	1335.28	-59N	25	43	335	1.81	NET< CL
81	1099.22	1659.10	5N	26	43	327	1.95	NET< CL
82	1115.52	1683.70	130N	47	74	582	1.96	PIC
83	1332.49	2011.16	-10N	20	33	202	2.10	NET< CL
84	1691.02	2552.28	-16N	14	24	98	2.34	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE-----
Sampling Start: 12/19/2002 12:00:00 | Counting Start: 04/21/2003 16:25:59
Sampling Stop: 12/19/2002 12:00:00 | Decay Time. 2.96E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 60000 Sec
Sample Size 1.78E-01 kg | Real Time 60053 Sec
Collection Efficiency 1.0000 | Spectrum File1116808.spc

Detector #: 8

Energy(keV)= -0.05 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/21/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)Eff.=1/[7.49e-03*En^-3.10e+00 + 9.34e+01*En^ 7.45e-01] 02/06/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-212	3.66E+02	1.24E+01	< 3.14E+01	1.54E+01	1.00E+00	MEAS +
Pb-214	2.71E+02	1.44E+01	< 5.17E+01	2.54E+01	1.00E+00	MEAS +
Tl-208	3.51E+02	1.85E+01	< 6.38E+01	3.12E+01	9.99E-01	MEAS +
AcTh-228	3.50E+02	2.07E+01	< 8.68E+01	4.23E+01	9.99E-01	MEAS +
Ra-226	6.97E+02	1.60E+02	< 5.16E+02	2.55E+02	1.00E+00	MEAS +
Annil	2.61E+01	1.11E+01	< 3.63E+01	1.79E+01	7.91E-01	MEAS +
Bi-214	2.23E+02	1.59E+01	< 5.39E+01	2.65E+01	1.00E+00	MEAS +
Bi-212	2.81E+02	4.24E+01	< 1.26E+02	6.09E+01	9.99E-01	MEAS +
K-40	2.06E+04	2.56E+02	< 2.42E+02	1.17E+02	1.00E+00	MEAS +
Am-241	-2.53E+01	3.14E+01	< 1.05E+02	5.22E+01	9.99E-01	NET
Co-57	5.18E+00	4.99E+00	< 1.65E+01	8.13E+00	7.29E-01	NET
Ce-144	-2.27E+01	3.97E+01	< 1.34E+02	6.57E+01	7.40E-01	NET
Ce-141	-1.74E+02	1.30E+02	< 4.42E+02	2.18E+02	7.18E-02	NET
Se-75	6.09E-01	1.17E+01	< 3.93E+01	1.92E+01	4.89E-01	NET
Cr-51	4.18E+02	9.14E+02	< 3.05E+03	1.49E+03	4.55E-02	NET
I-131	5.52E+04	2.09E+05	< 7.00E+05	3.42E+05	2.38E-05	NET
Sb-125	2.97E+01	1.57E+01	< 5.16E+01	2.52E+01	9.19E-01	NET
Ag-108m	-2.46E+00	4.60E+00	< 1.56E+01	7.62E+00	9.98E-01	NET
Be-7	-4.34E+00	2.08E+02	< 7.04E+02	3.43E+02	2.01E-01	NET
La-140	-2.91E+03	7.60E+03	< 2.58E+04	1.26E+04	1.24E-03	NET
Ru-103	-1.26E+02	3.94E+01	< 1.41E+02	6.84E+01	1.13E-01	NET
Ba-140	7.41E+03	1.30E+04	< 4.36E+04	2.12E+04	1.24E-03	NET
Cs-134	-1.65E+01	2.14E+01	< 7.12E+01	3.54E+01	8.93E-01	NET
Ru-106	-4.07E+01	6.26E+01	< 2.14E+02	1.04E+02	7.93E-01	NET
Cs-137	-1.65E+00	5.91E+00	< 2.01E+01	9.77E+00	9.92E-01	NET
Zr-95	-1.62E+02	4.88E+02	< 1.61E+03	8.04E+02	2.63E-01	NET
Nb-95	5.09E+01	8.94E+01	< 3.00E+02	1.47E+02	8.70E-02	NET
Co-58	-2.05E+00	1.72E+01	< 5.87E+01	2.84E+01	2.99E-01	NET
Mn-54	7.35E+00	7.15E+00	< 2.38E+01	1.15E+01	7.61E-01	NET
Ag-110m	-2.48E+01	1.04E+01	< 3.69E+01	1.79E+01	7.10E-01	NET
Fe-59	1.42E+01	8.11E+01	< 2.74E+02	1.33E+02	1.47E-01	NET
Zn-65	9.35E+01	3.35E+01	< 1.09E+02	5.34E+01	7.05E-01	NET
Co-60	-3.07E+00	6.09E+00	< 2.11E+01	1.01E+01	9.56E-01	NET

L5188-03 analyzed by emm1461 on 04/25/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
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Sb-124	-4.71E+01	4.08E+01	< 1.48E+02	6.99E+01	2.41E-01	NET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5188-04 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BLDG124 VALVE PIT #1 D0100
Collect Start Date/Time: _____
Collect Stop Date/Time: 10-31-02 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5770

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 163.5 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9020

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 11/10/03 01:02:25 Det No.: 6 Spectrum No.: 1116806
Counted by: [Signature]
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5188-04	Product	: GAMMA SPECTROMETRY
Client Id	: BLDG124 VALVE PIT	Matrix	: S001 Soil
Site	: #1 D0100		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 10/31/02 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	163.5		
Sample Weight-Dry	g			
Aliquot Weight	g	163.5		
FINAL WEIGHT	kg	.1635		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5188-04 analyzed by emml461 on 04/25/2003

SEEKER: G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5188-04

Sample ID: NONE

Code: 1116806

Sampling Start: 10/31/2002 12:00:00 | Counting Start: 04/21/2003 16:24:41
Sampling Stop: 10/31/2002 12:00:00 | Decay Time: 4.13E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 60000 Sec
Sample Size 1.63E-001 kg | Real Time 60053 Sec
Collection Efficiency 1.0000 | Spc. File 1116806.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV)= 0.13 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.88	79.70	-23691	878	1466	27058	649.59	NET< CL Wide Pk
2	63.37	95.56	876	86	133	2807	1.18	
3	74.92	113.01	1317	78	114	2388	1.39	a
4	77.17	116.40	1858	74	99	1990	0.99	b
5	84.41	127.34	398	58	89	1593	1.16	a
6	87.27	131.67	789	68	102	1912	1.25	b
7	90.04	135.86	544	59	89	1593	1.13	c
8	92.83	140.07	2461	85	114	2231	1.45	d
9	110.03	166.06	115	45	71	1130	0.83	a
10	112.95	170.48	128	45	71	1130	0.77	b
11	128.83	194.46	256	72	116	2141	0.96	
12	143.90	217.24	167	64	103	1825	0.86	
13	153.93	232.39	89	56	90	1505	1.05	NET< CL
14	163.39	246.70	58	34	54	727	0.60	a
15	166.76	251.78	19	33	54	727	0.57	b NET< CL
16	183.05	276.39	96	52	84	1311	1.29	a
17	185.93	280.75	1584	65	84	1311	1.27	b
18	197.93	298.88	182	78	127	2220	2.31	Wide Pk
19	209.40	316.21	308	59	93	1482	1.27	
20	238.71	360.51	4320	80	76	1065	1.25	a
21	241.55	364.79	748	59	85	1242	1.59	b
22	270.41	408.40	320	45	68	861	1.21	a
23	277.41	418.98	120	38	60	718	1.04	b
24	295.26	445.95	1018	51	65	774	1.24	a
25	300.09	453.25	253	33	48	516	0.95	b
26	328.10	495.57	213	51	80	1003	1.16	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	338.41	511.15	780	51	70	844	1.25	
28	352.00	531.69	1798	62	74	863	1.35	
29	409.02	617.84	122	45	72	776	1.50	
30	462.86	699.20	210	43	67	670	1.29	
31	511.01	771.96	1836	58	65	633	2.31	Wide Pk
32	558.84	844.23	30	33	54	467	1.08	NET< CL
33	569.72	860.67	6	33	54	463	0.16	NET< CL
34	583.30	881.20	1388	51	58	502	1.56	
35	609.41	920.64	1306	52	62	568	1.60	
36	651.83	984.74	41	28	45	369	2.57	NET< CL Wide Pk
37	693.28	1047.37	17	24	40	333	0.51	NET< CL
38	727.62	1099.27	372	37	51	434	2.12	
39	767.94	1160.20	83	31	50	426	1.87	
40	786.12	1187.66	74	28	44	334	1.97	
41	795.01	1201.09	188	26	36	248	1.50	a
42	803.11	1213.33	96	22	32	213	1.33	b
43	830.66	1254.97	-8	33	55	468	0.39	NET< CL
44	860.77	1300.47	144	31	47	362	1.23	
45	911.34	1376.87	1025	41	43	300	1.79	
46	933.61	1410.53	45	27	44	314	1.06	
47	965.13	1458.15	159	26	38	255	1.94	a
48	969.02	1464.04	565	32	35	227	1.63	b
49	1001.04	1512.42	105	27	42	285	1.15	
50	1120.81	1693.39	328	33	45	297	2.12	
51	1155.78	1746.23	33	31	50	351	1.71	NET< CL
52	1238.59	1871.36	100	30	46	355	1.71	
53	1377.87	2081.82	46	22	34	191	0.87	
54	1408.59	2128.25	10	21	34	198	0.40	NET< CL
55	1461.01	2207.46	3397	62	34	182	2.25	
56	1588.50	2400.09	67	16	22	95	1.84	a
57	1592.77	2406.54	41	15	22	95	1.95	b
58	1621.10	2449.36	45	17	25	106	2.61	a
59	1630.92	2464.20	28	12	17	62	1.49	b
60	1728.79	2612.07	38	17	26	109	1.39	
61	1764.92	2666.67	258	22	25	99	2.28	
62	1846.97	2790.65	35	15	23	86	1.78	
63	2103.64	3178.49	66	16	23	80	2.95	
64	2204.51	3330.91	54	15	22	81	1.48	
65	2614.78	3950.85	571	26	15	39	2.53	

 SEEKER' BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	52.88	-23691	878	1466	-14428	929	1540	NET<CL
2	63.37	876	86	133	139	91	148	NET<CL
3	74.92	1317	78	114	1175	81	121	
4	77.17	1858	74	99	1749	77	106	
5	84.41	398	58	89	170	65	105	
6	87.27	789	68	102	706	70	106	
7	90.04	544	59	89	444	63	97	
8	92.83	2461	85	114	704	91	143	
9	110.03	115	45	71	-8	52	85	NET<CL
10	112.95	128	45	71	47	49	79	NET<CL
12	143.90	167	64	103	-33	67	111	NET<CL
14	163.39	58	34	54	-30	42	70	NET<CL
17	185.93	1584	65	84	596	71	110	
18	197.93	182	78	127	82	81	132	NET<CL
20	238.71	4320	80	76	4026	83	87	
21	241.55	748	59	85	694	61	90	
22	270.41	320	45	68	275	48	74	
23	277.41	120	38	60	87	43	69	
24	295.26	1018	51	65	895	55	75	
27	338.41	781	51	70	740	54	78	
28	352.00	1798	62	74	1639	65	83	
31	511.01	1836	58	65	430	64	100	
32	558.84	30	33	54	-13	37	61	NET<CL
33	569.72	6	33	54	-28	37	61	NET<CL
34	583.30	1388	51	58	1267	54	66	
35	609.41	1307	52	62	1157	55	71	
37	693.28	17	24	40	-10	29	47	NET<CL
38	727.62	372	37	51	346	38	55	
42	803.11	96	22	32	35	25	39	NET<CL
45	911.34	1025	41	43	952	43	49	
48	969.02	565	32	35	545	34	40	
49	1001.04	105	27	42	15	30	49	NET<CL
50	1120.81	328	33	45	304	34	48	
55	1461.01	3397	62	34	3253	63	43	
61	1764.92	258	22	25	232	23	29	
65	2614.78	571	26	15	468	27	26	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.60 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.92	1175	Pb-212	853	5 of 6	99.30	0.99	
			Pb-214	306	6 of 7	98.66	0.99	
			Tl-208	83	7 of 9	98.43	0.98	
4	77.17	1749	Pb-214	546	6 of 7	100.00	1.00	
			Pb-212	1480	5 of 6	99.30	0.99	
5	84.41	170	Tl-208	45	7 of 9	98.43	1.48	
6	87.27	706	Pb-212	814	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
7	90.04	444	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	92.83	704	AcTh-228	360	14 of 36	88.74	0.89	
			Th-234	. . . . .	1 of 2	58.74	0.59	LowScore
11	128.83	256	AcTh-228	327	14 of 36	95.59	1.46	
16	183.05	96	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
17	185.93	596	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
19	209.40	308	AcTh-228	420	14 of 36	97.30	1.47	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
20	238.71	4026	Pb-212	4569	5 of 6	100.00	1.00	
21	241.55	694	Pb-214	430	6 of 7	100.00	1.00	
			La-140	. . . . .	0 of 0	. . . . .	0.00	Decay
22	270.41	275	AcTh-228	287	14 of 36	93.29	1.43	
23	277.41	87	Tl-208	172	7 of 9	100.00	1.50	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
24	295.26	895	Pb-214	1544	6 of 7	100.00	1.00	
25	300.09	253	Pb-212	267	5 of 6	100.00	1.50	
26	328.10	213	AcTh-228	222	14 of 36	93.29	1.43	
			Bi-212	7	4 of 13	82.79	0.83	
			La-140	. . . . .	0 of 0	. . . . .	0.00	Decay
27	338.41	740	AcTh-228	779	14 of 36	93.29	1.43	
28	352.00	1639	Pb-214	2637	6 of 7	100.00	1.00	
29	409.02	123	AcTh-228	126	14 of 36	93.29	1.43	
30	462.86	210	AcTh-228	238	14 of 36	93.29	1.43	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
31	511.01	82	Annil	. . . . .	1 of 1	100.00	1.50	Split
67	511.01	348	Tl-208	348	7 of 9	100.00	1.50	AutoAdd
34	583.30	1267	Tl-208	1206	7 of 9	100.00	1.50	
35	609.41	1157	Bi-214	1373	10 of 33	95.73	1.46	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1121SEsc	. . . . .	0 of 0	. . . . .	0.60	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
38	727.62	346	Bi-212	350	4 of 13	100.00	1.50	
39	767.94	83	Bi-214	112	10 of 33	100.00	1.50	
40	786.12	19	Pb-214	. . . . .	6 of 7	100.00	1.50	Split
66	786.12	55	Bi-212	55	4 of 13	100.00	1.50	AutoAdd
41	795.01	188	AcTh-228	166	14 of 36	91.44	1.41	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
44	860.77	145	Tl-208	138	7 of 9	100.00	1.50	
45	911.34	952	AcTh-228	880	14 of 36	93.29	1.43	
46	933.61	45	Bi-214	62	10 of 33	100.00	1.50	
47	965.13	159	AcTh-228	164	14 of 36	93.29	1.43	
48	969.02	545	AcTh-228	514	14 of 36	93.29	1.43	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
50	1120.81	304	Bi-214	248	10 of 33	93.09	1.43	
52	1238.59	100	Bi-214	92	10 of 33	95.73	1.46	
53	1377.87	46	Bi-214	59	10 of 33	100.00	1.50	
55	1461.01	3253	K-40	. . . . .	1 of 1	100.00	1.50	
56	1588.50	67	AcTh-228	76	14 of 36	93.29	1.43	
57	1592.77	41	2615DEsc	. . . . .	0 of 0	. . .	0.60	
58	1621.10	45	Bi-212	45	4 of 13	100.00	1.50	
59	1630.92	28	AcTh-228	40	14 of 36	98.34	1.48	
60	1728.79	38	Bi-214	36	10 of 33	95.73	1.46	
61	1764.92	232	Bi-214	185	10 of 33	93.09	1.43	
62	1846.97	35	Bi-214	24	10 of 33	88.61	1.39	
63	2103.64	66	2615SEsc	. . . . .	0 of 0	. . .	0.60	
64	2204.51	54	Bi-214	51	10 of 33	95.73	1.46	
65	2614.78	468	Tl-208	496	7 of 9	100.00	1.50	

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5188-04

Sample ID: NONE

Code: 1116806

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Sampling Start: 10/31/2002 12:00:00 | Counting Start: 04/21/2003 16:24:41
Sampling Stop: 10/31/2002 12:00:00 | Decay Time. . . . . 4.13e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 60000 Sec
Sample Size . . . . . 1.63e-001 kg | Real Time . . . . . 60053 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1116806.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Efficiency File: WT1SS006.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[4.58E-03*En^-3.34E+00 + 1.01E+02*En^7.37E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

MEASURED or MDA CONCENTRATIONS

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              N
      ENERGY E   Concentration
Nuclide   (keV)   (pCi/kg      )   MDA   Flags   Notes
-----
Pb-212   Average:x 8.85E+02 +- 1.80E+01   . . . .   *
          74.81     I.D.      . . . .   . . . .
          87.30     I.D.      . . . .   . . . .
          238.63    8.86E+02 +- 1.82E+01   3.90E+01   +*
          300.09    8.55E+02 +- 1.13E+02   3.35E+02   +*
Pb-214   Average:x 5.74E+02 +- 1.80E+01   . . . .   *
          77.11     I.D.      . . . .   . . . .
          241.98    9.18E+02 +- 8.04E+01   2.42E+02   +*
          295.21    5.31E+02 +- 3.24E+01   9.06E+01   +*
          351.92    5.69E+02 +- 2.24E+01   5.84E+01   +*
          785.91    4.07E+02 +- 1.03E+03   3.44E+03   +
Tl-208   Average:x 7.60E+02 +- 2.56E+01   . . . .   *
          84.90     I.D.      . . . .   . . . .
          277.35    3.91E+02 +- 1.92E+02   6.30E+02   +
          510.84    I.D.      . . . .   . . . .
          583.14    7.83E+02 +- 3.31E+01   8.33E+01   +*
          860.37    8.03E+02 +- 1.72E+02   5.37E+02   +*
          2614.66   7.38E+02 +- 4.22E+01   8.62E+01   +*
AcTh-228 Average:x 8.51E+02 +- 2.49E+01   . . . .   *
          93.35     I.D.      . . . .   . . . .
          129.08    6.68E+02 +- 1.89E+02   6.15E+02   +*
          209.28    6.32E+02 +- 1.22E+02   3.87E+02   +*
          270.23    8.16E+02 +- 1.43E+02   4.50E+02   +*
          327.64    8.18E+02 +- 1.94E+02   6.21E+02   +*
          338.32    8.15E+02 +- 6.00E+01   1.74E+02   +*
          409.51    8.30E+02 +- 3.07E+02   9.99E+02   +
          463.00    7.51E+02 +- 1.56E+02   4.93E+02   +*
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MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes
	ENERGY E		(pCi/kg)			
	(keV)						
	794.70		9.57E+02 +- 1.30E+02		3.76E+02		+
	911.07		8.93E+02 +- 4.01E+01		9.39E+01		+
	964.60		8.28E+02 +- 1.38E+02		4.13E+02		+
	969.11		8.91E+02 +- 5.53E+01		1.36E+02		+
	1588.00		7.46E+02 +- 1.76E+02		5.25E+02		+
	1630.40		6.09E+02 +- 2.47E+02		7.79E+02		+
Ra-226	186.22		1.53E+03 +- 1.82E+02		5.70E+02		+
Annul	511.00		1.92E+01 +- 2.63E+01		8.69E+01		+
Bi-214	Average:x		5.06E+02 +- 1.97E+01		. . . .		*
	609.31		4.82E+02 +- 2.30E+01		6.05E+01		+
	768.36		3.75E+02 +- 1.43E+02		4.62E+02		+
	934.06		3.73E+02 +- 2.26E+02		7.42E+02		+
	1120.29		6.08E+02 +- 6.80E+01		1.97E+02		+
	1238.11		5.46E+02 +- 1.63E+02		5.18E+02		+
	1377.67		3.96E+02 +- 1.85E+02		6.00E+02		+
	1729.59		5.30E+02 +- 2.38E+02		7.68E+02		+
	1764.49		6.20E+02 +- 6.21E+01		1.62E+02		+
	1847.42		7.36E+02 +- 3.19E+02		1.02E+03		+
	2204.22		5.43E+02 +- 1.55E+02		4.75E+02		+
Bi-212	Average:x		6.45E+02 +- 6.77E+01		. . . .		*
	727.17		6.45E+02 +- 7.13E+01		2.10E+02		+
	785.46		6.45E+02 +- 4.73E+02		1.56E+03		+
	1620.62		6.55E+02 +- 2.40E+02		7.63E+02		+
K-40	1460.81		1.12E+04 +- 2.16E+02		3.05E+02		+
Am-241	59.54	N	6.11E+01 +- 2.85E+01		9.34E+011		x lbase
Co-57	122.06	N	5.95E+00 +- 6.58E+00		2.18E+01		x
Ce-144	133.54	N	1.48E+02 +- 5.08E+01		1.65E+02r		x rbase
Ce-141	145.44	N	1.04E+03 +- 4.93E+02		1.68E+03R		x RHROI
Se-75	264.65	N	2.63E+01 +- 2.01E+01		6.84E+011		x lbase
Cr-51	320.08	N	1.56E+03 +- 3.47E+03		1.16E+04		x
I-131	364.48	N	8.44E+06 +- 1.60E+07		5.42E+07		x
Sb-125	427.89	N	1.94E+01 +- 1.75E+01		6.03E+01		x
Ag-108m	433.93	N	2.35E+00 +- 5.04E+00		1.69E+01		x
Be-7	477.59	N	2.90E+01 +- 4.15E+02		1.41E+03		x
La-140	487.03	N	1.16E+05 +- 1.16E+05		3.85E+05		x
Ru-103	497.08	N	3.31E+01 +- 1.21E+02		4.05E+02		x
Ba-140	537.32	N	3.49E+03 +- 2.57E+05		8.69E+05		x
Cs-134	604.70	N	9.64E+00 +- 7.46E+00		2.56E+011		x lbase
Ru-106	621.84	N	3.73E+01 +- 8.30E+01		2.79E+02		x
Cs-137	661.65	N	5.45E+00 +- 6.36E+00		2.19E+01		x
Zr-95	724.18	N	1.42E+02 +- 4.01E+02		1.33E+03P		x PIC
Nb-95	765.79	N	3.09E+02 +- 2.80E+02		9.56E+02P		x PIC
Co-58	810.76	N	3.11E+01 +- 3.05E+01		1.06E+02		x
Mn-54	834.83	N	7.13E-01 +- 9.74E+00		3.31E+01		x
Ag-110m	884.67	N	5.08E+00 +- 1.29E+01		4.44E+01		x
Fe-59	1099.22	N	2.17E+02 +- 1.74E+02		6.08E+02		x
Zn-65	1115.52	N	2.35E+01 +- 4.51E+01		1.50E+02P		x PIC
Co-60	1332.49	N	1.83E+00 +- 6.75E+00		2.30E+01		x
Sb-124	1691.02	N	8.52E+01 +- 7.70E+01		2.81E+02		x

MEASURED TOTAL: 1.70E+04 +- 5.98E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.88	79.70	-14428	929	1540	27058	649.59	Deleted
2	63.37	95.56	139	91	148	2807	1.18	Deleted
7	90.04	135.86	444	63	97	1593	1.13	Unknown
9	110.03	166.05	-8	52	85	1130	0.83	Deleted
10	112.95	170.48	47	49	79	1130	0.77	Deleted
12	143.90	217.24	-33	67	111	1825	0.86	Deleted
13	153.93	232.39	89	56	90	1505	1.05	Deleted
14	163.39	246.70	-30	42	70	727	0.60	Deleted
15	166.76	251.79	19	33	54	727	0.57	Deleted
16	183.05	276.39	96	52	84	1311	1.29	Unknown
18	197.93	298.88	82	81	132	2220	2.31	Deleted
32	558.84	844.23	-13	37	61	467	1.08	Deleted
33	569.72	860.67	-28	37	61	463	0.16	Deleted
36	651.83	984.74	41	28	45	369	2.57	Deleted
37	693.28	1047.37	-10	29	47	333	0.51	Deleted
42	803.11	1213.33	35	25	39	213	1.33	Deleted
43	830.66	1254.97	-9	33	55	468	0.39	Deleted
49	1001.04	1512.42	15	30	49	285	1.15	Deleted
51	1155.78	1746.23	33	31	50	351	1.71	Deleted
54	1408.59	2128.25	10	21	34	198	0.40	Deleted
57	1592.77	2406.54	41	15	22	95	1.95	2615DEsc
63	2103.64	3178.49	66	16	23	80	2.95	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
68	59.54	89.77	116N	54	87	1541	1.13	LBase
69	122.06	184.24	45N	50	81	1314	1.12	NET< CL
70	133.54	201.59	143N	49	78	1233	1.13	RBase
71	145.44	219.57	-169N	80	136	1697	1.13	NET< CL RHRoi
72	264.65	399.70	-55N	42	70	910	1.21	NET< CL LBase
73	320.08	483.46	17N	38	62	707	1.25	NET< CL
74	364.48	550.55	-18N	34	56	589	1.29	NET< CL
75	427.89	646.36	-34N	31	51	488	1.35	NET< CL
76	433.93	655.49	14N	30	49	444	1.35	NET< CL
77	477.59	721.46	-2N	29	47	411	1.40	NET< CL
78	487.03	735.73	28N	28	45	380	1.40	NET< CL
79	497.08	750.91	9N	31	51	438	1.41	NET< CL
80	537.32	811.72	-0N	32	52	394	1.45	NET< CL
81	604.70	913.53	-42N	32	54	503	1.51	NET< CL LBase
82	621.84	939.43	14N	30	49	410	1.53	NET< CL
83	661.65	999.58	-22N	26	44	375	1.57	NET< CL
84	724.18	1094.07	44N	123	203	604	1.62	NET< CL PIC
85	765.79	1156.94	-45N	40	68	534	1.66	NET< CL PIC
86	810.76	1224.90	-24N	23	39	288	1.70	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
87	834.83	1261.27	-2N	27	45	374	1.72	NET< CL
88	884.67	1336.58	-9N	23	38	267	1.76	NET< CL
89	1099.22	1660.77	-28N	23	38	254	1.92	NET< CL
90	1115.52	1685.40	24N	47	76	530	1.93	NET< CL
								PIC
91	1332.49	2013.25	5N	18	30	168	2.08	NET< CL
92	1691.02	2555.01	-14N	13	22	87	2.26	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

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Sampling Start: 10/31/2002 12:00:00 | Counting Start: 04/21/2003 16:24:41
Sampling Stop: 10/31/2002 12:00:00 | Decay Time. . . . . 4.13E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 60000 Sec
Sample Size . . . . . 1.63E-01 kg | Real Time . . . . . 60053 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1116806.spc

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Detector #: 6

Energy(keV)= 0.13 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS006.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[4.58e-03*En^-3.34e+00 + 1.01e+02*En^ 7.37e-01] 02/06/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-212	8.85E+02	1.80E+01	< 3.90E+01	1.92E+01	1.00E+00	MEAS +
Pb-214	5.74E+02	1.80E+01	< 5.84E+01	2.87E+01	1.00E+00	MEAS +
Tl-208	7.60E+02	2.55E+01	< 8.33E+01	4.08E+01	9.99E-01	MEAS +
AcTh-228	8.51E+02	2.49E+01	< 9.39E+01	4.57E+01	9.99E-01	MEAS +
Ra-226	1.52E+03	1.82E+02	< 5.70E+02	2.82E+02	1.00E+00	MEAS +
Annil	1.92E+01	2.63E+01	< 8.69E+01	4.31E+01	7.21E-01	MEAS +
Bi-214	5.06E+02	1.97E+01	< 6.05E+01	2.97E+01	1.00E+00	MEAS +
Bi-212	6.45E+02	6.77E+01	< 2.10E+02	1.02E+02	9.99E-01	MEAS +
K-40	1.12E+04	2.16E+02	< 3.05E+02	1.48E+02	1.00E+00	MEAS +
Am-241	6.11E+01	2.85E+01	< 9.34E+01	4.60E+01	9.99E-01	NET
Co-57	5.95E+00	6.58E+00	< 2.18E+01	1.07E+01	6.43E-01	NET
Ce-144	1.48E+02	5.08E+01	< 1.65E+02	8.10E+01	6.57E-01	NET
Ce-141	-1.04E+03	4.92E+02	< 1.68E+03	8.31E+02	2.53E-02	NET
Se-75	-2.63E+01	2.01E+01	< 6.84E+01	3.36E+01	3.68E-01	NET
Cr-51	1.56E+03	3.48E+03	< 1.16E+04	5.68E+03	1.34E-02	NET
I-131	-8.44E+06	1.60E+07	< 5.42E+07	2.65E+07	3.48E-07	NET
Sb-125	-1.94E+01	1.75E+01	< 6.03E+01	2.94E+01	8.88E-01	NET
Ag-108m	2.35E+00	5.04E+00	< 1.69E+01	8.22E+00	9.97E-01	NET
Be-7	-2.90E+01	4.15E+02	< 1.41E+03	6.84E+02	1.07E-01	NET
La-140	1.16E+05	1.16E+05	< 3.85E+05	1.87E+05	8.71E-05	NET
Ru-103	3.31E+01	1.20E+02	< 4.05E+02	1.97E+02	4.79E-02	NET
Ba-140	-3.49E+03	2.57E+05	< 8.69E+05	4.23E+05	8.71E-05	NET
Cs-134	-9.64E+00	7.46E+00	< 2.56E+01	1.25E+01	8.53E-01	NET
Ru-106	3.73E+01	8.30E+01	< 2.78E+02	1.36E+02	7.23E-01	NET
Cs-137	-5.45E+00	6.36E+00	< 2.19E+01	1.06E+01	9.89E-01	NET
Zr-95	1.42E+02	4.01E+02	< 1.32E+03	6.58E+02	1.54E-01	NET
Nb-95	-3.09E+02	2.80E+02	< 9.56E+02	4.69E+02	3.30E-02	NET
Co-58	-3.11E+01	3.05E+01	< 1.06E+02	5.12E+01	1.85E-01	NET
Mn-54	-7.14E-01	9.74E+00	< 3.31E+01	1.60E+01	6.82E-01	NET
Ag-110m	-5.08E+00	1.29E+01	< 4.44E+01	2.15E+01	6.20E-01	NET
Fe-59	-2.17E+02	1.74E+02	< 6.08E+02	2.94E+02	6.86E-02	NET
Zn-65	2.35E+01	4.50E+01	< 1.50E+02	7.37E+01	6.13E-01	NET
Co-60	1.83E+00	6.75E+00	< 2.30E+01	1.10E+01	9.40E-01	NET

L5188-04 analyzed by emm1461 on 04/25/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
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Sb-124	-8.52E+01	7.70E+01	< 2.81E+02	1.32E+02	1.37E-01	NET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5188-05 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BLDG124 VALVE PIT #2 D0100
Collect Start Date/Time: _____
Collect Stop Date/Time: 10-31-02 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5176

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 187.6 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9020

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 12/30/02 17:10 Det No.: 8 Spectrum No.: 1127108
Counted by: EM
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5188-05	Product	: GAMMA SPECTROMETRY
Client Id	: BLDG124 VALVE PIT	Matrix	: SO01 Soil
Site	: #2 D0100		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 10/31/02 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	187.6		
Sample Weight-Dry	g			
Aliquot Weight	g	187.6		
FINAL WEIGHT	kg	.1876		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5188-05 analyzed by emml461 on 04/22/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-05 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1127108

 Sampling Start: 10/31/2002 12:00:00 | Counting Start: 04/22/2003 17:09:36
 Sampling Stop: 10/31/2002 12:00:00 | Decay Time: 4.16E+003 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time: 50000 Sec
 Sample Size: 1.88E-001 kg | Real Time: 50024 Sec
 Collection Efficiency: 1.0000 | Spc. File: 1127108.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Energy(keV)= 0.02 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/22/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.13	80.17	-13425	664	1108	15470	232.03	NET< CL Wide Pk
2	63.05	95.14	283	59	93	1464	1.17	
3	72.02	108.67	128	59	94	1522	1.56	a
4	74.57	112.52	498	50	73	1088	1.01	b
5	76.83	115.93	620	51	73	1088	1.09	c
6	86.95	131.20	197	47	73	1078	1.05	a
7	92.53	139.63	752	63	94	1510	1.45	b
8	139.51	210.54	76	29	45	498	0.65	a
9	143.43	216.46	66	40	64	830	1.14	b
10	158.79	239.63	7	63	104	1505	0.16	NET< CL
11	185.59	280.09	395	51	78	1028	1.18	
12	197.62	298.25	117	62	101	1400	2.13	a Wide Pk
13	202.07	304.97	10	25	41	420	0.67	b NET< CL
14	205.03	309.43	22	31	50	560	0.95	c NET< CL
15	208.91	315.28	25	31	50	560	0.86	d NET< CL
16	238.43	359.84	1316	52	61	693	1.30	a
17	241.37	364.28	254	45	69	808	1.58	b
18	270.18	407.76	45	44	71	799	0.89	NET< CL
19	282.31	426.07	16	51	84	973	0.44	NET< CL
20	294.90	445.08	486	39	53	523	1.31	a
21	300.18	453.04	85	34	53	523	1.30	b
22	328.00	495.04	15	47	78	840	0.50	NET< CL
23	337.95	510.05	251	42	64	653	1.28	
24	351.72	530.83	778	51	70	716	1.33	
25	463.05	698.87	33	32	52	427	1.39	NET< CL
26	510.81	770.96	1457	52	59	539	2.67	Wide Pk

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	557.99	842.16	27	30	49	421	0.63	NET< CL
28	582.98	879.88	466	38	51	430	1.53	
29	609.09	919.29	551	41	55	499	1.60	
30	726.96	1097.20	73	28	44	332	1.21	
31	786.24	1186.67	0	26	42	307	0.01	NET< CL
32	861.05	1299.58	54	29	45	338	2.36	
33	911.07	1375.07	263	33	48	360	1.46	
34	950.45	1434.52	48	32	52	379	2.80	NET< CL Wide Pk
35	968.97	1462.46	140	31	47	356	1.55	
36	1001.47	1511.52	11	25	40	279	0.43	NET< CL
37	1120.58	1691.30	52	29	47	358	1.05	
38	1377.65	2079.29	22	19	30	148	1.19	NET< CL
39	1460.80	2204.79	6463	82	28	129	2.18	
40	1728.60	2609.00	11	14	23	83	0.53	NET< CL
41	1764.70	2663.49	110	18	23	84	1.75	
42	2204.00	3326.53	30	13	19	62	3.42	
43	2614.74	3946.47	232	18	17	40	4.14	Wide Pk

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	53.13	-13425	664	1108	-7408	699	1159	NET<CL
2	63.05	283	59	93	55	61	99	NET<CL
4	74.57	498	50	73	408	51	77	
5	76.83	620	51	73	478	54	82	
6	86.95	197	47	73	99	53	86	
7	92.53	752	63	94	196	67	108	
8	139.51	76	29	45	35	31	50	NET<CL
9	143.43	66	40	64	-0	42	68	NET<CL
11	185.59	395	51	78	100	55	89	
12	197.62	117	62	101	53	64	104	NET<CL
16	238.43	1316	52	61	1086	55	72	
17	241.37	254	45	69	149	48	76	
20	294.90	486	39	53	268	42	64	
22	328.00	15	47	78	19	49	81	NET<CL
23	337.95	251	42	64	204	45	70	
24	351.72	778	51	70	461	53	80	
25	463.05	33	32	52	27	34	55	NET<CL
26	510.81	1457	52	59	196	57	91	
27	557.99	27	30	49	-20	32	54	NET<CL
28	582.98	466	38	51	401	40	57	
29	609.09	551	41	55	269	44	67	
33	911.07	263	33	48	216	35	52	
35	968.97	140	31	47	108	32	49	
36	1001.47	11	25	40	-7	26	43	NET<CL
37	1120.58	53	29	47	9	31	50	NET<CL
38	1377.65	22	19	30	-2	20	33	NET<CL
39	1460.80	6463	82	28	6352	83	36	
40	1728.60	11	14	23	2	15	25	NET<CL
41	1764.70	110	18	23	53	19	29	
42	2204.00	30	13	19	14	14	22	NET<CL
43	2614.74	232	18	17	156	19	24	

 SEEKER . LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	72.02	128	Tl-208	16	6 of 9	95.73	1.46	
4	74.57	408	Pb-212	235	5 of 6	100.00	1.00	
			Tl-208	16	6 of 9	95.73	0.96	Matched
			Pb-214	92	5 of 7	100.00	1.00	
			Tl-208	28	6 of 9	95.73	0.96	
5	76.83	478	Pb-212	406	5 of 6	100.00	1.50	
			Tl-208	28	6 of 9	95.73	0.96	
			Pb-214	163	5 of 7	100.00	1.00	
6	86.95	99	Pb-212	222	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
7	92.53	110	Th-234	. . . . .	1 of 2	100.00	1.50	Split
45	92.53	86	AcTh-228	86	4 of 36	61.35	1.11	AutoAdd
11	185.59	100	U-235	. . . . .	1 of 3	100.00	1.50	
			Ra-226	. . . . .	1 of 1	100.00	1.50	
16	238.43	1086	Pb-212	1264	5 of 6	100.00	1.50	
17	241.37	149	Pb-214	121	5 of 7	100.00	1.50	
			La-140	. . . . .	0 of 0	. . . .	0.00	Decay
20	294.90	268	Pb-214	275	5 of 7	100.00	1.50	
21	300.18	85	Pb-212	71	5 of 6	100.00	1.50	
23	337.95	204	AcTh-228	186	4 of 36	72.02	1.22	
24	351.72	461	Pb-214	473	5 of 7	100.00	1.50	
26	510.81	81	Annil	. . . . .	1 of 1	100.00	1.50	Split
44	510.81	114	Tl-208	114	6 of 9	97.05	1.47	AutoAdd
28	582.98	401	Tl-208	425	6 of 9	100.00	1.50	
29	609.09	269	Bi-214	341	2 of 33	80.44	1.30	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
30	726.96	73	Bi-212	. . . . .	1 of 13	100.00	1.50	
32	861.05	54	Tl-208	45	6 of 9	97.05	1.47	
33	911.07	216	AcTh-228	228	4 of 36	74.94	1.25	
35	968.97	108	AcTh-228	132	4 of 36	82.68	1.33	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
39	1460.80	6352	K-40	. . . . .	1 of 1	100.00	1.50	
41	1764.70	53	Bi-214	41	2 of 33	80.44	1.30	
43	2614.74	156	Tl-208	161	6 of 9	97.05	1.47	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-05

Sample ID: SOIL/SEDI Duratek Inc

Code: 1127108

 Sampling Start: 10/31/2002 12:00:00 | Counting Start: 04/22/2003 17:09:36
 Sampling Stop: 10/31/2002 12:00:00 | Decay Time. 4.16e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 50000 Sec
 Sample Size 1.88e-001 kg | Real Time 50024 Sec
 Collection Efficiency 1.0000 | Spectrum File 1127108.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[7.49E-03*En^-3.10E+00 + 9.34E+01*En^7.45E-01] 02/06/1998

 Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5188-05.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Tl-208	Average:x	2.40E+02 +- 1.84E+01	. . . . .		*	. . . . .
	72.80	I.D.	. . . . .			. . . . .
	510.84	I.D.	. . . . .			. . . . .
	583.14	2.39E+02 +- 2.38E+01	6.94E+01		++	. . . . .
	860.37	2.88E+02 +- 1.53E+02	5.02E+02		+	. . . . .
Pb-212	2614.66	2.40E+02 +- 2.97E+01	7.87E+01		++	. . . . .
	Average:x	2.30E+02 +- 1.15E+01	. . . . .		*	. . . . .
	74.81	I.D.	. . . . .			. . . . .
	77.12	I.D.	. . . . .			. . . . .
	87.30	I.D.	. . . . .			. . . . .
Pb-214	238.63	2.30E+02 +- 1.15E+01	3.09E+01		++	. . . . .
	300.09	2.76E+02 +- 1.09E+02	3.54E+02		+	. . . . .
Th-234	92.59	1.62E+02 +- 1.72E+02	5.66E+02		+	. . . . .
U-235	185.72	1.50E+01 +- 8.24E+00	2.71E+01		+	. . . . .
Pb-214	Average:x	1.55E+02 +- 1.39E+01	. . . . .		*	. . . . .
	241.98	1.89E+02 +- 6.04E+01	1.95E+02		++	. . . . .
	295.21	1.53E+02 +- 2.40E+01	7.42E+01		++	. . . . .
	351.92	1.54E+02 +- 1.77E+01	5.41E+01		++	. . . . .
AcTh-228	Average:x	1.96E+02 +- 2.32E+01	. . . . .		*	. . . . .
	338.32	2.16E+02 +- 4.74E+01	1.51E+02		++	. . . . .
	911.07	1.96E+02 +- 3.15E+01	9.64E+01		++	. . . . .
	969.11	1.71E+02 +- 5.01E+01	1.60E+02		++	. . . . .
Annul	93.35	I.D.	. . . . .			. . . . .
	511.00	1.85E+01 +- 2.26E+01	7.46E+01		+	. . . . .
Bi-214	Average:x	1.11E+02 +- 1.66E+01	. . . . .		*	. . . . .
	609.31	1.08E+02 +- 1.76E+01	5.47E+01		++	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E		(pCi/kg)				
	(keV)							
Bi-212	1764.49		1.37E+02 +- 4.94E+01		1.57E+02		+	. . . . .
	727.17		1.32E+02 +- 5.02E+01		1.62E+02		+	. . . . .
K-40	1460.81		2.13E+04 +- 2.77E+02		2.51E+02		+	. . . . .
Am-241	59.54	N	2.28E+01 +- 3.16E+01		1.04E+02L		x	LHROI
Co-57	122.06	N	7.73E+00 +- 5.87E+00		1.94E+01		x	. . . . .
Ce-144	133.54	N	8.93E+01 +- 4.56E+01		1.50E+02		x	. . . . .
Ce-141	145.44	N	3.99E+02 +- 2.67E+02		8.80E+02		x	. . . . .
Ra-226	186.22	N	1.67E+02 +- 1.62E+02		5.33E+02R		x	RHROI
Se-75	264.65	N	1.48E+01 +- 1.58E+01		5.24E+01		x	. . . . .
Cr-51	320.08	N	2.34E+03 +- 3.17E+03		1.08E+04		x	. . . . .
I-131	364.48	N	9.15E+06 +- 1.61E+07		5.40E+07		x	. . . . .
Sb-125	427.89	N	9.81E+00 +- 1.66E+01		5.57E+01		x	. . . . .
Ag-108m	433.93	N	4.25E+00 +- 4.89E+00		1.68E+01		x	. . . . .
Be-7	477.59	N	8.02E+01 +- 3.96E+02		1.34E+03		x	. . . . .
La-140	487.03	N	6.98E+03 +- 1.11E+05		3.77E+05		x	. . . . .
Ru-103	497.08	N	3.53E+01 +- 9.59E+01		3.28E+02		x	. . . . .
Ba-140	537.32	N	1.07E+05 +- 2.04E+05		6.86E+05		x	. . . . .
Cs-134	604.70	N	3.36E+01 +- 3.01E+01		9.91E+01P		x	PIC
Ru-106	621.84	N	2.67E+01 +- 7.42E+01		2.53E+02		x	. . . . .
Cs-137	661.65	N	2.35E-01 +- 5.92E+00		2.01E+01		x	Y.
Zr-95	724.18	N	6.97E+01 +- 1.12E+02		3.85E+02L		x	LHROI
Nb-95	765.79	N	4.31E+01 +- 1.71E+02		5.85E+02		x	. . . . .
Co-58	810.76	N	3.80E+00 +- 2.92E+01		9.91E+01		x	. . . . .
Mn-54	834.83	N	8.65E+00 +- 8.53E+00		2.96E+01		x	. . . . .
Ag-110m	884.67	N	1.64E+00 +- 1.24E+01		4.23E+01		x	. . . . .
Fe-59	1099.22	N	2.49E+02 +- 1.85E+02		6.44E+02		x	. . . . .
Zn-65	1115.52	N	3.13E+01 +- 3.75E+01		1.23E+02L		x	LHROI
Co-60	1332.49	N	7.45E+00 +- 6.46E+00		2.15E+01		x	Y.
Sb-124	1691.02	N	2.70E+01 +- 6.63E+01		2.38E+02		x	. . . . .

MEASURED TOTAL: 2.25E+04 +- 6.13E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.13	80.17	-7408	699	1159	15470	232.03	Deleted
2	63.05	95.14	55	61	99	1464	1.17	Deleted
8	139.51	210.54	35	31	50	498	0.65	Deleted
9	143.43	216.46	-0	42	68	830	1.14	Deleted
10	158.79	239.63	7	63	104	1505	0.16	Deleted
12	197.62	298.25	53	64	104	1400	2.13	Deleted
13	202.07	304.97	10	25	41	420	0.67	Deleted
14	205.03	309.43	22	31	50	560	0.95	Deleted
15	208.91	315.28	25	31	50	560	0.86	Deleted
18	270.18	407.76	45	44	71	799	0.89	Deleted
19	282.31	426.07	16	51	84	973	0.44	Deleted
22	328.00	495.04	19	49	81	840	0.50	Deleted
25	463.05	698.87	27	34	55	427	1.39	Deleted
27	557.99	842.16	-20	32	54	421	0.63	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
31	786.24	1186.67	-0	26	42	307	0.01	Deleted
34	950.45	1434.52	48	32	52	379	2.80	Deleted
36	1001.47	1511.52	-7	26	43	279	0.43	Deleted
37	1120.58	1691.30	9	31	50	358	1.05	Deleted
38	1377.65	2079.29	-2	20	33	148	1.19	Deleted
40	1728.60	2609.00	2	15	25	83	0.53	Deleted
42	2204.00	3326.53	14	14	22	62	3.42	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
46	59.54	89.84	49N	68	111	1131	1.24	NET< CL LHRoi
47	122.06	184.20	60N	46	74	1008	1.29	NET< CL
48	133.54	201.53	89N	45	73	989	1.30	
49	145.44	219.49	66N	44	71	943	1.31	NET< CL
50	186.22	281.04	68N	66	107	1052	1.33	NET< CL RHRoi
51	264.65	399.42	32N	34	55	567	1.39	NET< CL
52	320.08	483.08	-26N	35	58	580	1.43	NET< CL
53	364.48	550.09	19N	33	54	492	1.46	NET< CL
54	427.89	645.80	18N	30	49	414	1.50	NET< CL
55	433.93	654.92	-26N	30	51	436	1.51	NET< CL
56	477.59	720.81	6N	28	46	359	1.53	NET< CL
57	487.03	735.06	2N	27	44	324	1.54	NET< CL
58	497.08	750.23	-9N	25	42	341	1.55	NET< CL
59	537.32	810.96	13N	25	40	322	1.57	NET< CL
60	604.70	912.66	151N	135	221	884	1.62	NET< CL PIC
61	621.84	938.53	-10N	28	46	390	1.63	NET< CL
62	661.65	998.62	-1N	25	41	318	1.66	NET< CL
63	724.18	1093.00	-22N	35	59	326	1.70	NET< CL LHRoi
64	765.79	1155.80	-6N	25	42	291	1.73	NET< CL
65	810.76	1223.68	3N	23	38	264	1.76	NET< CL
66	834.83	1260.01	-25N	25	41	317	1.77	NET< CL
67	884.67	1335.23	-3N	23	37	257	1.81	NET< CL
68	1099.22	1659.06	-33N	24	41	296	1.95	NET< CL
69	1115.52	1683.66	33N	40	64	339	1.96	NET< CL LHRoi
70	1332.49	2011.14	21N	18	29	155	2.10	NET< CL
71	1691.02	2552.28	-5N	11	19	61	2.34	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 10/31/2002 12:00:00 | Counting Start: 04/22/2003 17:09:36
Sampling Stop: 10/31/2002 12:00:00 | Decay Time. . . . . 4.16E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 50000 Sec
Sample Size . . . . . 1.88E-01 kg | Real Time . . . . . 50024 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1127108.spc
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Detector #: 8

Energy(keV)= 0.02 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/22/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[7.49e-03*En^-3.10e+00 + 9.34e+01*En^ 7.45e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5188-05.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Tl-208	2.40E+02	1.84E+01	< 6.94E+01	3.39E+01	1.00E+00	MEAS +	YES
Pb-212	2.30E+02	1.15E+01	< 3.09E+01	1.51E+01	1.00E+00	MEAS +	YES
Th-234	1.62E+02	1.72E+02	< 5.66E+02	2.81E+02	1.00E+00	MEAS +	YES
U-235	1.50E+01	8.24E+00	< 2.70E+01	1.33E+01	1.00E+00	MEAS +	YES
Pb-214	1.55E+02	1.39E+01	< 5.41E+01	2.66E+01	1.00E+00	MEAS +	YES
AcTh-228	1.96E+02	2.32E+01	< 9.64E+01	4.70E+01	1.00E+00	MEAS +	YES
Annil	1.85E+01	2.26E+01	< 7.46E+01	3.70E+01	7.20E-01	MEAS +	YES
Bi-214	1.11E+02	1.66E+01	< 5.47E+01	2.68E+01	1.00E+00	MEAS +	YES
Bi-212	1.32E+02	5.02E+01	< 1.62E+02	7.87E+01	1.00E+00	MEAS +	YES
K-40	2.13E+04	2.77E+02	< 2.51E+02	1.21E+02	1.00E+00	MEAS +	YES
Am-241	2.28E+01	3.16E+01	< 1.04E+02	5.14E+01	9.99E-01	NET	YES
Co-57	7.72E+00	5.87E+00	< 1.94E+01	9.51E+00	6.42E-01	NET	YES
Ce-144	8.93E+01	4.56E+01	< 1.50E+02	7.34E+01	6.55E-01	NET	YES
Ce-141	3.99E+02	2.67E+02	< 8.80E+02	4.32E+02	2.47E-02	NET	YES
Ra-226	1.67E+02	1.62E+02	< 5.33E+02	2.63E+02	1.00E+00	NET	YES
Se-75	1.48E+01	1.58E+01	< 5.24E+01	2.56E+01	3.66E-01	NET	YES
Cr-51	-2.34E+03	3.17E+03	< 1.08E+04	5.27E+03	1.30E-02	NET	YES
I-131	9.15E+06	1.62E+07	< 5.40E+07	2.63E+07	3.20E-07	NET	YES
Sb-125	9.81E+00	1.66E+01	< 5.57E+01	2.71E+01	8.88E-01	NET	YES
Ag-108m	-4.25E+00	4.89E+00	< 1.68E+01	8.17E+00	9.97E-01	NET	YES
Be-7	8.02E+01	3.96E+02	< 1.34E+03	6.49E+02	1.05E-01	NET	YES
La-140	6.98E+03	1.11E+05	< 3.77E+05	1.83E+05	8.26E-05	NET	YES
Ru-103	-3.53E+01	9.59E+01	< 3.28E+02	1.59E+02	4.71E-02	NET	YES
Ba-140	1.07E+05	2.04E+05	< 6.86E+05	3.32E+05	8.26E-05	NET	YES
Cs-134	3.36E+01	3.01E+01	< 9.91E+01	4.93E+01	8.52E-01	NET	YES
Ru-106	-2.67E+01	7.42E+01	< 2.53E+02	1.23E+02	7.21E-01	NET	YES
Cs-137	-2.35E-01	5.92E+00	< 2.01E+01	9.75E+00	9.89E-01	NET	YES
Zr-95	-6.97E+01	1.12E+02	< 3.85E+02	1.88E+02	1.53E-01	NET	YES
Nb-95	-4.31E+01	1.71E+02	< 5.85E+02	2.83E+02	3.24E-02	NET	YES
Co-58	3.80E+00	2.92E+01	< 9.91E+01	4.78E+01	1.83E-01	NET	YES
Mn-54	-8.65E+00	8.53E+00	< 2.96E+01	1.43E+01	6.81E-01	NET	YES
Ag-110m	-1.64E+00	1.24E+01	< 4.23E+01	2.04E+01	6.18E-01	NET	YES
Fe-59	-2.49E+02	1.85E+02	< 6.44E+02	3.12E+02	6.76E-02	NET	YES

L5188-05 analyzed by emml461 on 04/22/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Zn-65	3.13E+01	3.75E+01	< 1.24E+02	6.05E+01	6.11E-01	NET	YES
Co-60	7.45E+00	6.46E+00	< 2.15E+01	1.03E+01	9.39E-01	NET	YES
Sb-124	-2.70E+01	6.63E+01	< 2.38E+02	1.11E+02	1.36E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5188-06 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: EO200 #1
Collect Start Date/Time: _____
Collect Stop Date/Time: 10-22-02 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5176

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 489.6 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9020

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 12/19/02 140 Det No.: 8 Spectrum No.: 1114408
Counted by: WJ
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5188-06
Client Id : EO200 #1
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 10/22/02 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	489.6		
Sample Weight-Dry	g			
Aliquot Weight	g	489.6		
FINAL WEIGHT	kg	.4896		
Container			WT5S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5188-06 analyzed by emml461 on 04/23/2003
 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-06

Sample ID: NONE

Code: 1114408

 Sampling Start: 10/22/2002 12:00:00 | Counting Start: 04/21/2003 10:40:24
 Sampling Stop: 10/22/2002 12:00:00 | Decay Time: 4.34E+003 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time 16774 Sec
 Sample Size 4.90E-001 kg | Real Time 16794 Sec
 Collection Efficiency 1.0000 | Spc. File 1114408.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Energy(keV) = -0.05 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/21/2003
 FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.50 | Sigma Multiplier: 1.00 | Search Start/End: . 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.06	95.26	139	62	100	1703	1.20	
2	74.65	112.75	1236	74	106	1926	1.46	a
3	76.91	116.15	1600	64	83	1376	1.18	b
4	83.81	126.58	271	49	76	1168	1.01	a
5	87.05	131.46	597	58	87	1402	1.33	b
6	89.65	135.39	450	57	87	1402	1.27	c
7	92.72	140.02	865	66	98	1636	1.60	d
8	99.00	149.51	97	41	65	935	0.76	e
9	105.21	158.87	29	51	83	1263	0.31	NET< CL
10	128.86	194.56	174	57	91	1404	1.13	
11	185.76	280.44	600	59	89	1251	1.63	
12	209.05	315.59	413	63	99	1357	1.94	Wide Pk
13	238.44	359.95	3969	73	61	684	1.31	a
14	241.36	364.35	674	53	76	912	1.76	b
15	269.95	407.50	357	37	53	516	1.34	a
16	277.29	418.59	158	61	98	1118	2.87	b Wide Pk
17	295.02	445.35	948	44	51	481	1.25	a
18	299.86	452.65	211	38	57	561	1.57	b
19	327.76	494.76	211	41	63	620	1.41	
20	338.11	510.37	729	48	66	645	1.55	
21	351.71	530.90	1578	55	62	576	1.36	
22	409.63	618.33	74	34	55	477	0.90	
23	462.79	698.55	204	34	50	396	1.51	
24	510.73	770.91	852	41	48	398	1.97	
25	582.99	879.97	1391	48	50	389	1.49	
26	609.14	919.44	1315	46	46	341	1.77	
27	727.06	1097.41	271	31	43	306	1.53	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	768.20	1159.50	30	25	40	289	0.89	NET< CL
29	785.42	1185.49	71	21	31	193	1.53	a
30	794.85	1199.73	155	24	35	221	1.77	b
31	835.65	1261.29	23	24	39	261	0.57	NET< CL
32	860.32	1298.54	149	25	35	206	1.84	
33	911.17	1375.28	933	38	37	224	1.81	
34	934.26	1410.12	53	23	37	221	1.27	
35	964.78	1456.19	162	22	30	172	1.58	a
36	968.86	1462.35	513	30	33	197	1.69	b
37	1120.43	1691.11	258	31	44	282	1.84	
38	1237.94	1868.46	116	30	46	344	2.43	
39	1378.18	2080.13	41	16	25	109	2.30	
40	1460.79	2204.80	4865	71	24	94	2.20	
41	1588.36	2397.34	8	16	26	123	0.23	NET< CL
42	1729.62	2610.53	36	12	17	49	2.50	
43	1764.56	2663.27	232	18	17	47	2.18	
44	2103.41	3174.68	70	13	16	46	2.78	
45	2204.11	3326.67	74	13	17	48	2.84	
46	2614.52	3946.08	580	25	10	16	2.98	

L5188-06 analyzed by emml461 on 04/23/2003

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.06	139	62	100	62	62	101	NET<CL
2	74.65	1236	74	106	1206	74	107	
3	76.91	1600	64	83	1552	64	84	
4	83.81	271	49	76	247	49	77	
5	87.05	597	58	87	564	59	89	
7	92.72	865	66	98	679	67	101	
8	99.00	97	41	65	92	41	66	
11	185.76	600	59	89	501	60	91	
13	238.44	3969	73	61	3892	73	63	
14	241.36	674	53	76	638	53	77	
17	295.02	948	44	51	875	44	54	
19	327.76	211	41	63	212	41	63	
20	338.11	729	48	66	713	49	67	
21	351.71	1578	55	62	1472	55	65	
23	462.79	204	34	50	202	34	50	
24	510.73	852	41	48	429	42	60	
25	582.99	1391	48	50	1369	48	51	
26	609.14	1315	46	46	1220	46	49	
28	768.20	30	25	40	20	25	40	NET<CL
33	911.17	933	38	37	918	38	38	
34	934.26	53	23	37	51	24	37	
36	968.86	513	30	33	502	30	33	
37	1120.43	258	31	44	243	31	44	
38	1237.94	116	30	46	114	30	47	
39	1378.18	41	16	25	33	17	26	
40	1460.79	4865	71	24	4828	71	27	
42	1729.62	36	12	17	33	12	18	
43	1764.56	232	18	17	213	19	19	
45	2204.11	74	13	17	69	13	17	
46	2614.52	580	25	10	555	25	14	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.65	1206	Pb-212	764	5 of 6	99.30	0.99	
			Tl-208	44	8 of 9	99.30	0.99	
			Pb-214	258	6 of 7	98.66	0.99	
			Tl-208	78	8 of 9	99.30	0.99	
3	76.91	1552	Pb-214	461	6 of 7	100.00	1.00	
			Tl-208	78	8 of 9	99.30	0.99	
			Pb-212	1333	5 of 6	100.00	1.00	
4	83.81	247	Tl-208	43	8 of 9	99.30	0.99	
5	87.05	564	Pb-212	741	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	89.65	450	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	92.72	372	Th-234	. . . . .	1 of 2	58.74	0.59	Split
49	92.72	307	AcTh-228	307	13 of 36	83.43	0.83	AutoAdd
8	99.00	92	AcTh-228	95	13 of 36	86.49	1.36	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
			1120DEsc	. . . . .	0 of 0	. . .	0.50	
10	128.86	174	AcTh-228	284	13 of 36	91.23	1.41	
11	185.76	501	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
12	209.05	413	AcTh-228	369	13 of 36	85.92	1.36	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
13	238.44	3892	Pb-212	4346	5 of 6	100.00	1.50	
14	241.36	638	Pb-214	386	6 of 7	100.00	1.00	
			La-140	. . . . .	0 of 0	. . .	0.00	Decay
15	269.95	357	AcTh-228	256	13 of 36	85.16	1.35	
16	277.29	158	Tl-208	173	8 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
17	295.02	875	Pb-214	925	6 of 7	100.00	1.50	
18	299.86	211	Pb-212	263	5 of 6	100.00	1.50	
19	327.76	212	AcTh-228	204	13 of 36	86.49	1.36	
			Bi-212	5	3 of 13	69.12	0.69	
			La-140	. . . . .	0 of 0	. . .	0.00	Decay
20	338.11	713	AcTh-228	712	13 of 36	86.49	1.36	
21	351.71	1472	Pb-214	2494	6 of 7	100.00	1.00	
22	409.63	74	AcTh-228	118	13 of 36	91.23	1.41	
23	462.79	202	AcTh-228	225	13 of 36	87.36	1.37	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
24	510.73	59	Annul	. . . . .	1 of 1	100.00	1.50	Split

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
48	510.73	370	Tl-208	370	8 of 9	100.00	1.50	AutoAdd
25	582.99	1369	Tl-208	1293	8 of 9	100.00	1.50	
26	609.14	1220	Bi-214	1186	8 of 33	85.06	1.35	
			Ru-103		1 of 2	5.92	0.06	LowScore
			1120SEsc		0 of 0	. . .	0.50	
27	727.06	271	Bi-212	271	3 of 13	83.48	1.33	
			1238SEsc		0 of 0	. . .	0.50	
29	785.42	28	Pb-214	26	6 of 7	100.00	1.50	Split
47	785.42	43	Bi-212	43	3 of 13	83.48	1.33	AutoAdd
30	794.85	155	AcTh-228	165	13 of 36	86.49	1.36	
			Cs-134		1 of 9	46.67	0.47	LowScore
32	860.32	149	Tl-208	153	8 of 9	100.00	1.50	
33	911.17	918	AcTh-228	895	13 of 36	86.49	1.36	
34	934.26	51	Bi-214	63	8 of 33	89.26	1.39	
35	964.78	162	AcTh-228	164	13 of 36	86.49	1.36	
36	968.86	502	AcTh-228	525	13 of 36	86.49	1.36	
			Sb-124		1 of 13	1.04	0.01	LowScore
37	1120.43	243	Bi-214	266	8 of 33	87.12	1.37	
38	1237.94	114	Bi-214	97	8 of 33	82.84	1.33	
39	1378.18	33	Bi-214	63	8 of 33	95.13	1.45	
40	1460.79	4828	K-40		1 of 1	100.00	1.50	
42	1729.62	33	Bi-214	39	8 of 33	89.26	1.39	
43	1764.56	213	Bi-214	204	8 of 33	84.05	1.34	
44	2103.41	71	2615SEsc		0 of 0	. . .	0.50	
45	2204.11	69	Bi-214	56	8 of 33	82.84	1.33	
46	2614.52	555	Tl-208	608	8 of 9	100.00	1.50	

L5188-06 analyzed by emml461 on 04/23/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-06

Sample ID: NONE

Code: 1114408

 Sampling Start: 10/22/2002 12:00:00 | Counting Start: 04/21/2003 10:40:24
 Sampling Stop: 10/22/2002 12:00:00 | Decay Time. 4.34e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 16774 Sec
 Sample Size 4.90e-001 kg | Real Time 16794 Sec
 Collection Efficiency 1.0000 | Spectrum File 1114408.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
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MEASURED or MDA CONCENTRATIONS
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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes
Pb-212	Average:x	1.62E+03 +- 3.03E+01		*
	74.81	I.D. . . . .	. . . . .	
	87.30	I.D. . . . .	. . . . .	
	238.63	1.63E+03 +- 3.06E+01	5.39E+01		++
	300.09	1.33E+03 +- 2.38E+02	7.40E+02		++
Pb-214	Average:x	9.80E+02 +- 2.80E+01	. . . . .		*
	77.11	I.D. . . . .	. . . . .	
	241.98	1.60E+03 +- 1.33E+02	3.93E+02		++
	295.21	9.70E+02 +- 4.88E+01	1.22E+02		++
	351.92	9.42E+02 +- 3.53E+01	8.53E+01		++
	785.91	1.03E+03 +- 1.33E+03	4.44E+03		+
Tl-208	Average:x	1.45E+03 +- 3.96E+01	. . . . .		*
	84.90	I.D. . . . .	. . . . .	
	277.35	1.32E+03 +- 5.10E+02	1.67E+03		+
	510.84	I.D. . . . .	. . . . .	
	583.14	1.50E+03 +- 5.30E+01	1.15E+02		++
	860.37	1.42E+03 +- 2.37E+02	7.04E+02		++
	2614.66	1.38E+03 +- 6.21E+01	7.40E+01		++
Cd-109	88.03	I.D. . . . .	. . . . .	
Th-234	92.59	1.15E+03 +- 3.58E+02	1.17E+03		++
AcTh-228	Average:x	1.45E+03 +- 3.92E+01	. . . . .		*
	99.45	1.41E+03 +- 6.25E+02	2.04E+03		+
	129.08	8.94E+02 +- 2.92E+02	9.49E+02		++
	209.28	1.62E+03 +- 2.49E+02	7.88E+02		++
	270.23	2.00E+03 +- 2.08E+02	6.07E+02		++
	327.64	1.51E+03 +- 2.92E+02	9.16E+02		++
	338.32	1.45E+03 +- 9.92E+01	2.78E+02		++

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration		MDA	Flags	Notes
		(pCi/kg)			
	409.51	9.10E+02	+- 4.26E+02	1.39E+03		+
	463.00	1.31E+03	+- 2.19E+02	6.71E+02		++
	794.70	1.37E+03	+- 2.16E+02	6.35E+02		++
	911.07	1.47E+03	+- 6.11E+01	1.26E+02		++
	964.60	1.44E+03	+- 1.95E+02	5.49E+02		++
	969.11	1.40E+03	+- 8.44E+01	1.94E+02		++
	93.35	I.D.	. . . .	. . . .
Ra-226	186.22	2.48E+03	+- 2.95E+02	9.13E+02		++
Annul	511.00	2.52E+01	+- 3.14E+01	1.04E+02		+
Bi-214	Average:x	8.92E+02	+- 2.90E+01	. . . .		*
	609.31	8.99E+02	+- 3.38E+01	7.43E+01		++
	934.06	7.12E+02	+- 3.32E+02	1.08E+03		+
	1120.29	8.21E+02	+- 1.05E+02	3.08E+02		++
	1238.11	1.04E+03	+- 2.77E+02	8.77E+02		++
	1377.67	4.67E+02	+- 2.36E+02	7.68E+02		+
	1729.59	7.47E+02	+- 2.78E+02	8.67E+02		+
	1764.49	9.26E+02	+- 8.08E+01	1.76E+02		++
	2204.22	1.10E+03	+- 2.15E+02	6.02E+02		++
Bi-212	Average:x	8.80E+02	+- 9.94E+01	. . . .		*
	727.17	8.80E+02	+- 1.01E+02	2.90E+02		++
	785.46	8.80E+02	+- 6.11E+02	2.02E+03		+
K-40	1460.81	2.74E+04	+- 4.05E+02	3.17E+02		++
Am-241	59.54	N 2.40E+01	+- 7.66E+01	2.54E+02L	x	LHROI
Co-57	122.06	N-1.96E+01	+- 1.29E+01	4.38E+01	x	
Ce-144	133.54	N-2.08E+00	+- 1.02E+02	3.41E+02r	x	rbase
Ce-141	145.44	N 5.43E+02	+- 6.99E+02	2.32E+03	x	
Se-75	264.65	N-5.87E+01	+- 3.24E+01	1.12E+02l	x	lbase
Cr-51	320.08	N 1.69E+04	+- 7.08E+03	2.30E+04	x	
I-131	364.48	N 8.97E+06	+- 5.29E+07	1.78E+08	x	
Sb-125	427.89	N 3.49E+01	+- 2.86E+01	9.49E+01	x	
Ag-108m	433.93	N 6.90E+00	+- 8.11E+00	2.71E+01	x	
Be-7	477.59	N 9.28E+02	+- 7.29E+02	2.42E+03	x	
La-140	487.03	N 6.78E+05	+- 2.97E+05	9.65E+05	x	
Ru-103	497.08	N 3.61E+02	+- 1.88E+02	6.15E+02	x	
Ba-140	537.32	N 4.00E+05	+- 5.16E+05	1.73E+06	x	
Cs-134	604.70	N 3.67E+01	+- 3.87E+01	1.28E+02P	x	PIC
Ru-106	621.84	N-2.97E+02	+- 1.12E+02	4.02E+02	x	
Cs-137	661.65	N-2.14E+01	+- 1.03E+01	3.66E+01	x	
Zr-95	724.18	N-2.48E+01	+- 1.19E+03	3.93E+03P	x	PIC
Nb-95	765.79	N-1.40E+02	+- 3.44E+02	1.18E+03	x	
Co-58	810.76	N-3.89E+01	+- 4.86E+01	1.70E+02	x	
Mn-54	834.83	N 1.88E+01	+- 1.38E+01	4.56E+01	x	
Ag-110m	884.67	N 1.98E+01	+- 1.91E+01	6.39E+01	x	
Fe-59	1099.22	N-3.92E+02	+- 3.18E+02	1.11E+03	x	
Zn-65	1115.52	N-7.80E+01	+- 7.10E+01	2.41E+02P	x	PIC
Co-60	1332.49	N 3.65E+00	+- 9.51E+00	3.26E+01	x	
Sb-124	1691.02	N-1.13E+02	+- 1.03E+02	3.89E+02	x	

MEASURED TOTAL: 3.84E+04 +- 1.35E+03 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.06	95.26	62	62	101	1703	1.20	Deleted
9	105.21	158.87	29	51	83	1263	0.31	Deleted
28	768.20	1159.50	20	25	40	289	0.89	Deleted
31	835.65	1261.29	23	24	39	261	0.57	Deleted
41	1588.36	2397.34	8	16	26	123	0.23	Deleted
44	2103.41	3174.68	71	13	16	46	2.78	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
50	59.54	89.94	22N	70	115	1218	1.24	NET< CL LHRoi
51	122.06	184.30	-73N	48	80	1193	1.29	NET< CL
52	133.54	201.63	-1N	49	81	1202	1.30	NET< CL RBase
53	145.44	219.59	38N	49	79	1140	1.31	NET< CL
54	264.65	399.51	-62N	34	58	619	1.39	NET< CL LBase
55	320.08	483.17	80N	34	53	483	1.43	
56	364.48	550.18	5N	29	48	399	1.46	NET< CL
57	427.89	645.88	34N	27	44	333	1.50	NET< CL
58	433.93	655.00	23N	27	43	317	1.50	NET< CL
59	477.59	720.89	32N	25	40	274	1.53	NET< CL
60	487.03	735.14	58N	25	40	268	1.54	
61	497.08	750.31	45N	23	36	263	1.55	
62	537.32	811.04	18N	23	36	263	1.57	NET< CL
63	604.70	912.73	89N	94	154	604	1.62	NET< CL PIC
64	621.84	938.60	-60N	23	39	284	1.63	NET< CL
65	661.65	998.69	-50N	24	41	317	1.66	NET< CL
66	724.18	1093.06	-4N	192	316	439	1.70	NET< CL PIC
67	765.79	1155.86	-10N	24	40	292	1.73	NET< CL
68	810.76	1223.73	-16N	20	33	207	1.76	NET< CL
69	834.83	1260.06	30N	22	35	227	1.77	NET< CL
70	884.67	1335.28	20N	19	31	176	1.81	NET< CL
71	1099.22	1659.10	-27N	21	36	230	1.95	NET< CL
72	1115.52	1683.70	-47N	42	71	464	1.96	NET< CL PIC
73	1332.49	2011.16	6N	16	25	119	2.10	NET< CL
74	1691.02	2552.28	-10N	9	16	47	2.34	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

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Sampling Start: 10/22/2002 12:00:00 | Counting Start: 04/21/2003 10:40:24
Sampling Stop: 10/22/2002 12:00:00 | Decay Time. . . . . 4.34E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 16774 Sec
Sample Size . . . . . 4.90E-01 kg | Real Time . . . . . 16794 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1114408.spc
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Detector #: 8

Energy(keV)= -0.05 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/21/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-212	1.62E+03	3.03E+01	< 5.39E+01	2.64E+01	1.00E+00	MEAS +
Pb-214	9.80E+02	2.80E+01	< 8.53E+01	4.18E+01	9.99E-01	MEAS +
Tl-208	1.45E+03	3.96E+01	< 7.39E+01	3.36E+01	9.98E-01	MEAS +
Th-234	1.15E+03	3.58E+02	< 1.17E+03	5.80E+02	9.99E-01	MEAS +
AcTh-228	1.45E+03	3.92E+01	< 1.26E+02	6.08E+01	9.98E-01	MEAS +
Ra-226	2.48E+03	2.95E+02	< 9.13E+02	4.50E+02	1.00E+00	MEAS +
Annil	2.52E+01	3.14E+01	< 1.04E+02	5.13E+01	7.09E-01	MEAS +
Bi-214	8.92E+02	2.90E+01	< 7.43E+01	3.61E+01	9.99E-01	MEAS +
Bi-212	8.80E+02	9.94E+01	< 2.90E+02	1.40E+02	9.98E-01	MEAS +
K-40	2.74E+04	4.05E+02	< 3.18E+02	1.51E+02	1.00E+00	MEAS +
Am-241	2.40E+01	7.66E+01	< 2.54E+02	1.25E+02	9.99E-01	NET
Co-57	-1.96E+01	1.29E+01	< 4.38E+01	2.15E+01	6.29E-01	NET
Ce-144	-2.08E+00	1.02E+02	< 3.41E+02	1.68E+02	6.43E-01	NET
Ce-141	5.43E+02	6.99E+02	< 2.32E+03	1.14E+03	2.11E-02	NET
Se-75	-5.87E+01	3.24E+01	< 1.12E+02	5.48E+01	3.51E-01	NET
Cr-51	1.69E+04	7.08E+03	< 2.30E+04	1.12E+04	1.08E-02	NET
I-131	8.97E+06	5.29E+07	< 1.78E+08	8.68E+07	1.67E-07	NET
Sb-125	3.50E+01	2.86E+01	< 9.49E+01	4.61E+01	8.83E-01	NET
Ag-108m	6.90E+00	8.11E+00	< 2.71E+01	1.31E+01	9.97E-01	NET
Be-7	9.28E+02	7.30E+02	< 2.42E+03	1.17E+03	9.56E-02	NET
La-140	6.78E+05	2.97E+05	< 9.65E+05	4.66E+05	5.49E-05	NET
Ru-103	3.62E+02	1.88E+02	< 6.15E+02	2.96E+02	4.12E-02	NET
Ba-140	4.00E+05	5.16E+05	< 1.73E+06	8.34E+05	5.49E-05	NET
Cs-134	3.67E+01	3.87E+01	< 1.28E+02	6.33E+01	8.46E-01	NET
Ru-106	-2.97E+02	1.12E+02	< 4.02E+02	1.94E+02	7.11E-01	NET
Cs-137	-2.14E+01	1.03E+01	< 3.66E+01	1.77E+01	9.89E-01	NET
Zr-95	-2.48E+01	1.19E+03	< 3.93E+03	1.96E+03	1.41E-01	NET
Nb-95	-1.40E+02	3.44E+02	< 1.18E+03	5.71E+02	2.79E-02	NET
Co-58	-3.90E+01	4.86E+01	< 1.70E+02	8.15E+01	1.70E-01	NET
Mn-54	1.88E+01	1.38E+01	< 4.56E+01	2.20E+01	6.69E-01	NET
Ag-110m	1.98E+01	1.91E+01	< 6.39E+01	3.06E+01	6.05E-01	NET
Fe-59	-3.92E+02	3.18E+02	< 1.12E+03	5.37E+02	6.01E-02	NET
Zn-65	-7.80E+01	7.10E+01	< 2.41E+02	1.18E+02	5.99E-01	NET

L5188-06 analyzed by emml461 on 04/23/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
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Co-60	3.65E+00	9.51E+00	< 3.25E+01	1.54E+01	9.37E-01	NET
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Sb-124	-1.13E+02	1.03E+02	< 3.89E+02	1.80E+02	1.24E-01	NET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5188-07 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: EO200 #2
Collect Start Date/Time: _____
Collect Stop Date/Time: 10-22-02 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5176

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 542.2 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R 9020

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/21/03 01:03:49 Det No.: 5 Spectrum No.: 1114408
Counted by: EN
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5188-07	Product	: GAMMA SPECTROMETRY
Client Id	: EO200 #2	Matrix	: SO01 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 10/22/02 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	542.2		
Sample Weight-Dry	g			
Aliquot Weight	g	542.2		
FINAL WEIGHT	kg	.5422		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-07 ✓

Sample ID: NONE

Code: 1114405

 Sampling Start: 10/22/2002 12:00:00 | Counting Start: 04/21/2003 10:38:49
 Sampling Stop: 10/22/2002 12:00:00 | Decay Time. 4.34E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 17203 Sec
 Sample Size 5.42E-001 kg | Real Time 17223 Sec
 Collection Efficiency 1.0000 | Spc. File 1114405.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Energy(keV)= 0.12 + 0.661*Ch + 1.92E-07*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.25 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.77	96.31	107	50	81	1205	0.74	
2	74.98	113.27	854	59	84	1318	1.36	a
3	77.28	116.76	1165	56	74	1098	1.04	b
4	84.25	127.30	171	44	68	943	1.04	a
5	87.45	132.14	573	59	88	1321	1.48	b
6	90.10	136.15	318	45	68	943	1.07	c
7	93.12	140.72	747	65	98	1509	1.79	d Wide Pk
8	105.53	159.49	104	65	105	1623	1.61	NET< CL
9	129.73	196.11	128	59	95	1431	1.04	
10	154.45	233.52	94	55	89	1251	0.88	
11	186.09	281.38	490	56	84	1116	1.52	
12	209.64	317.00	266	46	70	840	1.26	
13	238.69	360.95	3044	66	60	655	1.24	a
14	241.55	365.28	592	51	74	873	1.82	b Wide Pk
15	270.35	408.86	252	39	59	592	1.47	
16	277.72	420.01	78	44	71	744	1.28	
17	295.26	446.53	753	40	49	436	1.35	a
18	300.10	453.85	178	29	42	363	1.17	b
19	328.05	496.14	68	41	66	646	0.52	
20	338.42	511.82	646	45	61	548	1.38	
21	351.89	532.19	1210	51	61	544	1.34	
22	409.59	619.48	94	31	49	381	1.26	
23	462.71	699.83	172	33	49	358	1.63	
24	510.70	772.41	766	40	48	320	2.18	Wide Pk
25	583.18	882.04	1076	42	44	284	1.42	
26	609.30	921.54	1084	42	44	286	1.66	
27	666.03	1007.32	22	23	38	248	2.05	NET< CL
28	727.34	1100.04	283	30	41	261	1.88	

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
29	755.07	1141.97	28	22	34	205	0.75	NET< CL
30	768.10	1161.68	27	25	40	279	0.57	NET< CL
31	785.84	1188.49	35	18	27	149	1.57 a	
32	794.98	1202.32	137	23	33	191	2.05 b	
33	860.36	1301.17	172	26	36	202	1.76	
34	911.16	1377.99	720	36	39	236	1.68	
35	964.70	1458.94	120	22	32	181	1.85 a	
36	968.96	1465.38	452	27	27	141	1.49 b	
37	1001.27	1514.22	17	22	35	190	0.60	NET< CL
38	1120.34	1694.22	200	28	39	226	1.91	
39	1238.65	1873.06	74	29	46	315	1.38	
40	1408.31	2129.48	41	15	23	85	1.96	
41	1460.89	2208.95	3850	64	23	83	2.07	
42	1588.14	2401.23	25	14	22	85	0.75	
43	1730.18	2615.84	34	11	16	43	2.21	
44	1764.75	2668.08	174	17	17	48	2.23	
45	1847.77	2793.50	20	10	15	38	1.55	
46	2103.27	3179.44	63	13	16	43	4.36	Wide Pk
47	2204.22	3331.91	64	12	15	35	2.71	
48	2614.65	3951.63	445	22	10	15	2.82	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.77	107	50	81	61	51	82	NET<CL
2	74.98	854	59	84	814	60	86	
3	77.28	1165	56	74	1141	57	75	
4	84.25	171	44	68	149	44	69	
5	87.45	573	59	88	552	59	89	
7	93.12	747	65	98	608	66	100	
11	186.09	490	56	84	397	56	86	
12	209.64	266	46	70	255	46	71	
13	238.69	3044	66	60	2992	66	61	
17	295.26	753	40	49	720	41	51	
20	338.42	647	45	61	646	45	61	
21	351.89	1210	51	61	1146	51	63	
24	510.70	766	40	48	363	41	60	
25	583.18	1077	42	44	1054	43	45	
26	609.30	1084	42	44	1041	43	46	
28	727.34	283	30	41	277	30	42	
33	860.36	172	26	36	171	26	36	
34	911.16	721	36	39	699	36	40	
36	968.96	452	27	27	443	27	28	
37	1001.27	17	22	35	7	22	36	NET<CL
38	1120.34	201	28	39	192	28	40	
41	1460.89	3850	64	23	3815	64	25	
42	1588.14	25	14	22	26	14	22	
44	1764.75	174	17	17	165	17	18	
45	1847.77	20	10	15	19	11	16	
48	2614.65	445	22	10	417	22	13	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.98	814	Pb-214	185	6 of 7	100.00	1.00	
			Pb-212	537	5 of 6	99.30	0.99	
			Tl-208	55	7 of 9	98.43	0.98	
3	77.28	1141	Pb-212	939	5 of 6	100.00	1.00	
			Pb-214	332	6 of 7	100.00	1.00	
4	84.25	149	Tl-208	31	7 of 9	98.43	1.48	
5	87.45	20	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
52	87.45	532	Pb-212	532	5 of 6	100.00	1.50	AutoAdd
6	90.10	318	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
7	93.12	376	Th-234	. . . . .	1 of 2	58.74	0.59	Split
51	93.12	231	AcTh-228	231	14 of 36	86.54	0.87	AutoAdd
9	129.73	128	AcTh-228	224	14 of 36	96.45	1.46	
			La-140	. . . . .	0 of 0	. . . . .	0.00	Decay
10	154.45	94	AcTh-228	70	14 of 36	88.33	1.38	
11	186.09	397	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
12	209.64	255	AcTh-228	298	14 of 36	94.74	1.45	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
13	238.69	2992	Pb-212	3627	5 of 6	100.00	1.00	
14	241.55	592	Pb-214	319	6 of 7	100.00	1.00	
			La-140	. . . . .	0 of 0	. . . . .	0.00	Decay
15	270.35	253	AcTh-228	207	14 of 36	89.12	1.39	
16	277.72	78	Tl-208	135	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
			Se-75	. . . . .	1 of 5	15.66	0.66	
17	295.26	720	Pb-214	1150	6 of 7	100.00	1.50	
18	300.10	178	Pb-212	204	5 of 6	100.00	1.50	
19	328.05	68	AcTh-228	165	14 of 36	100.00	1.50	
			Bi-212	5	3 of 13	69.12	1.19	
			La-140	. . . . .	0 of 0	. . . . .	0.00	Decay
20	338.42	646	AcTh-228	556	14 of 36	90.52	1.41	
21	351.89	1146	Pb-214	2304	6 of 7	100.00	1.00	
22	409.59	94	AcTh-228	94	14 of 36	91.44	1.41	
23	462.71	172	AcTh-228	179	14 of 36	92.34	1.42	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
24	510.70	76	Annul	. . . . .	1 of 1	100.00	1.50	Split
50	510.70	286	Tl-208	286	7 of 9	100.00	1.50	AutoAdd
25	583.18	1054	Tl-208	1011	7 of 9	100.00	1.50	
26	609.30	1041	Bi-214	980	8 of 33	84.38	1.34	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
			Ru-103		1 of 2	5.92	0.06	LowScore
			1120SEsc		0 of 0	. . .	0.50	
28	727.34	277	Bi-212	227	3 of 13	83.48	1.33	
31	785.84	35	Pb-214	22	6 of 7	100.00	1.50	
			Bi-212	44	3 of 13	83.48	1.33	
32	794.98	137	AcTh-228	130	14 of 36	90.52	1.41	
			Cs-134		1 of 9	46.67	0.47	LowScore
33	860.36	171	Tl-208	117	7 of 9	100.00	1.50	
34	911.16	699	AcTh-228	731	14 of 36	92.34	1.42	
35	964.70	120	AcTh-228	130	14 of 36	92.34	1.42	
36	968.96	443	AcTh-228	404	14 of 36	90.52	1.41	
			Sb-124		1 of 13	1.04	0.01	LowScore
38	1120.34	192	Bi-214	226	8 of 33	85.56	1.36	
39	1238.65	74	Bi-214	82	8 of 33	85.56	1.36	
40	1408.31	9	Cs-Sum		1 of 6	16.67	0.67	Split
49	1408.31	32	Bi-214	32	8 of 33	81.71	1.32	AutoAdd
41	1460.89	3815	K-40		1 of 1	100.00	1.50	
42	1588.14	26	AcTh-228	63	14 of 36	100.00	1.50	
43	1730.18	34	Bi-214	33	8 of 33	84.38	1.34	
44	1764.75	165	Bi-214	174	8 of 33	84.38	1.34	
45	1847.77	19	Bi-214	22	8 of 33	85.56	1.36	
46	2103.27	63	2615SEsc		0 of 0	. . .	0.50	
47	2204.22	64	Bi-214	47	8 of 33	80.54	1.31	
48	2614.65	417	Tl-208	472	7 of 9	100.00	1.50	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5188-07

Sample ID: NONE

Code: 1114405

 Sampling Start: 10/22/2002 12:00:00 | Counting Start: 04/21/2003 10:38:49
 Sampling Stop: 10/22/2002 12:00:00 | Decay Time. 4.34e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 17203 Sec
 Sample Size 5.42e-001 kg | Real Time 17223 Sec
 Collection Efficiency 1.0000 | Spectrum File 1114405.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46E-03*En^-3.56E+00 + 1.55E+02*En^6.66E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
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MEASURED or MDA CONCENTRATIONS
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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes
Pb-214	Average:x	7.40E+02 +- 2.44E+01		*
	74.81	I.D. . . . .	. . . .	
	241.98	1.40E+03 +- 1.21E+02	3.57E+02		++
	295.21	7.51E+02 +- 4.25E+01	1.08E+02		++
	351.92	6.91E+02 +- 3.08E+01	7.74E+01		++
	785.91	1.20E+03 +- 6.15E+02	2.00E+03		+
Pb-212	Average:x	1.17E+03 +- 2.57E+01	. . . .		*
	77.12	I.D. . . . .	. . . .	
	87.30	I.D. . . . .	. . . .	
	238.63	1.18E+03 +- 2.60E+01	4.94E+01		++
	300.09	1.05E+03 +- 1.72E+02	5.20E+02		++
Tl-208	Average:x	1.06E+03 +- 3.32E+01	. . . .		*
	84.90	I.D. . . . .	. . . .	
	277.35	6.16E+02 +- 3.48E+02	1.14E+03		+
	510.84	I.D. . . . .	. . . .	
	583.14	1.09E+03 +- 4.41E+01	9.64E+01		++
	860.37	1.55E+03 +- 2.33E+02	6.86E+02		++
	2614.66	9.93E+02 +- 5.23E+01	7.04E+01		++
Cd-109	88.03	I.D. . . . .	. . . .	
Th-234	92.59	1.16E+03 +- 3.52E+02	1.15E+03		++
AcTh-228	Average:x	1.09E+03 +- 3.43E+01	. . . .		*
	129.08	6.32E+02 +- 2.90E+02	9.50E+02		+
	154.20	1.48E+03 +- 8.64E+02	2.84E+03		+
	209.28	9.44E+02 +- 1.70E+02	5.34E+02		++
	270.23	1.33E+03 +- 2.06E+02	6.35E+02		++
	327.64	4.52E+02 +- 2.75E+02	9.05E+02		+
	338.32	1.24E+03 +- 8.66E+01	2.41E+02		++
	409.51	1.09E+03 +- 3.65E+02	1.18E+03		+

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N		Concentration (pCi/kg)	MDA	Flags	Notes
		E					
	463.00			1.05E+03 +- 2.00E+02	6.19E+02		+
	794.70			1.15E+03 +- 1.95E+02	5.78E+02		+
	911.07			1.06E+03 +- 5.48E+01	1.26E+02		+
	964.60			1.01E+03 +- 1.89E+02	5.67E+02		+
	969.11			1.17E+03 +- 7.14E+01	1.54E+02		+
	1588.00			4.52E+02 +- 2.51E+02	8.21E+02		+
	93.35			I.D.			
Ra-226	186.22			1.85E+03 +- 2.61E+02	8.14E+02		+
Annul	511.00			3.09E+01 +- 2.89E+01	9.55E+01		+
Bi-214	Average:	x		7.14E+02 +- 2.56E+01			*
	609.31			7.26E+02 +- 2.98E+01	6.60E+01		+
	1120.29			6.16E+02 +- 8.92E+01	2.63E+02		+
	1238.11			6.44E+02 +- 2.55E+02	8.27E+02		+
	1407.98			7.14E+02 +- 4.84E+02	1.60E+03		+
	1729.59			7.35E+02 +- 2.47E+02	7.56E+02		+
	1764.49			6.82E+02 +- 7.05E+01	1.64E+02		+
	1847.42			6.08E+02 +- 3.39E+02	1.10E+03		+
	2204.22			9.75E+02 +- 1.82E+02	4.86E+02		+
Bi-212	727.17			8.52E+02 +- 9.31E+01	2.64E+02		+
Cs-Sum	1406.63			I.D.			
K-40	1460.81			2.06E+04 +- 3.44E+02	2.88E+02		+
Am-241	59.54	N		1.53E+01 +- 4.80E+01	1.61E+021	x	lbase
Co-57	122.06	N		1.36E+01 +- 1.04E+01	3.54E+01	x	
Ce-144	133.54	N		2.86E+02 +- 1.51E+02	5.07E+02P	x	PIC
Ce-141	145.44	N		2.17E+02 +- 6.16E+02	2.06E+03	x	
Se-75	264.65	N		2.23E+01 +- 2.86E+01	9.75E+01	x	
Cr-51	320.08	N		6.56E+03 +- 5.65E+03	1.95E+04	x	
I-131	364.48	N		2.20E+07 +- 4.30E+07	1.47E+08	x	
Sb-125	427.89	N		2.07E+01 +- 2.25E+01	7.82E+01	x	
Ag-108m	433.93	N		7.66E+00 +- 7.49E+00	2.59E+01	x	
Be-7	477.59	N		3.49E+02 +- 6.80E+02	2.29E+03	x	
La-140	487.03	N		2.59E+04 +- 2.57E+05	8.76E+05	x	
Ru-103	497.08	N		2.38E+02 +- 1.82E+02	6.35E+02	x	
Ba-140	537.32	N		2.23E+05 +- 4.73E+05	1.63E+06	x	
Cs-134	604.70	N		1.29E-01 +- 8.90E+00	3.03E+011	x	lbase
Ru-106	621.84	N		1.48E+02 +- 9.93E+01	3.51E+02	x	
Cs-137	661.65	N		5.51E+00 +- 7.94E+00	2.77E+01	x	
Zr-95	724.18	N		2.32E+02 +- 6.86E+02	2.27E+03P	x	PIC
Nb-95	765.79	N		4.31E+02 +- 2.97E+02	1.04E+03	x	
Co-58	810.76	N		1.27E+02 +- 4.28E+01	1.35E+02	x	
Mn-54	834.83	N		0.00E+00 +- 1.22E+01	4.16E+01	x	
Ag-110m	884.67	N		2.35E+01 +- 1.65E+01	5.91E+01	x	
Fe-59	1099.22	N		3.16E+01 +- 2.76E+02	9.48E+02	x	
Zn-65	1115.52	N		9.40E+01 +- 6.25E+01	2.14E+02P	x	PIC
Co-60	1332.49	N		2.72E+00 +- 7.58E+00	2.69E+01	x	
Sb-124	1691.02	N		5.21E+01 +- 8.66E+01	3.03E+02	x	

MEASURED TOTAL: 2.93E+04 +- 1.22E+03 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.77	96.31	61	51	82	1205	0.74	Deleted
6	90.10	136.15	318	45	68	943	1.07	Unknown
8	105.53	159.49	104	65	105	1623	1.61	Deleted
27	666.03	1007.32	22	23	38	248	2.05	Deleted
29	755.07	1141.97	28	22	34	205	0.75	Deleted
30	768.10	1161.68	27	25	40	279	0.57	Deleted
37	1001.27	1514.22	7	22	36	190	0.60	Deleted
46	2103.27	3179.44	63	13	16	43	4.36	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
53	59.54	89.91	13N	40	66	874	1.13	NET< CL LBase
54	122.06	184.51	-53N	40	67	900	1.18	NET< CL
55	133.54	201.88	-144N	76	127	1993	1.19	NET< CL PIC
56	145.44	219.88	16N	45	74	984	1.20	NET< CL
57	264.65	400.23	-25N	32	53	527	1.28	NET< CL
58	320.08	484.08	-33N	28	48	421	1.32	NET< CL
59	364.48	551.24	-13N	25	42	329	1.36	NET< CL
60	427.89	647.16	-21N	23	38	272	1.40	NET< CL
61	433.93	656.30	-27N	26	44	327	1.41	NET< CL
62	477.59	722.33	13N	25	40	275	1.44	NET< CL
63	487.03	736.61	-2N	23	38	247	1.44	NET< CL
64	497.08	751.81	-31N	24	40	273	1.45	NET< CL
65	537.32	812.67	-10N	22	36	226	1.48	NET< CL
66	604.70	914.58	0N	23	38	243	1.52	NET< CL LBase
67	621.84	940.50	-32N	21	36	222	1.53	NET< CL
68	661.65	1000.70	-14N	20	33	213	1.56	NET< CL
69	724.18	1095.26	39N	117	192	350	1.60	NET< CL PIC
70	765.79	1158.18	-32N	22	37	259	1.63	NET< CL
71	810.76	1226.18	55N	19	28	145	1.66	
72	834.83	1262.58	0N	20	34	210	1.68	NET< CL
73	884.67	1337.94	-25N	18	30	167	1.71	NET< CL
74	1099.22	1662.30	-2N	20	32	182	1.86	NET< CL
75	1115.52	1686.94	-59N	39	66	390	1.87	NET< CL PIC
76	1332.49	2014.89	-5N	13	22	93	2.01	NET< CL
77	1691.02	2556.68	5N	8	13	32	2.25	NET< CL

c:\seeker\Results\L5188-07.RES Analysis Results Saved.

 SEEKER ANALYSIS SUMMARY
 Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Sample ID : NONE

 Sampling Start: 10/22/2002 12:00:00 | Counting Start: 04/21/2003 10:38:49
 Sampling Stop: 10/22/2002 12:00:00 | Decay Time. 4.34E+03 Hrs
 Buildup Time. 0.00E+00 Hrs | Live Time 17203 Sec
 Sample Size 5.42E-01 kg | Real Time 17223 Sec
 Collection Efficiency 1.0000 | Spectrum File 1114405.spc

Detector #: 5
 Energy(keV)= 0.12 + 0.661*Ch + 1.92E-07*Ch^2 + 1.92E-07*Ch^3 04/18/2003
 FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003
 Where En = Sqrt(Energy in keV)

 Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
=====						
Pb-214	7.40E+02	2.44E+01	< 7.74E+01	3.79E+01	9.99E-01	MEAS +
Pb-212	1.17E+03	2.58E+01	< 4.94E+01	2.42E+01	1.00E+00	MEAS +
Tl-208	1.06E+03	3.32E+01	< 7.04E+01	3.20E+01	9.98E-01	MEAS +
Th-234	1.16E+03	3.52E+02	< 1.15E+03	5.70E+02	9.99E-01	MEAS +
AcTh-228	1.10E+03	3.43E+01	< 1.26E+02	6.11E+01	9.98E-01	MEAS +
Ra-226	1.84E+03	2.61E+02	< 8.14E+02	4.01E+02	1.00E+00	MEAS +
Annil	3.09E+01	2.89E+01	< 9.56E+01	4.72E+01	7.09E-01	MEAS +
Bi-214	7.14E+02	2.55E+01	< 6.60E+01	3.20E+01	9.99E-01	MEAS +
Bi-212	8.52E+02	9.31E+01	< 2.64E+02	1.28E+02	9.98E-01	MEAS +
K-40	2.06E+04	3.44E+02	< 2.88E+02	1.37E+02	1.00E+00	MEAS +
Am-241	1.53E+01	4.80E+01	< 1.61E+02	7.87E+01	9.99E-01	NET
Co-57	-1.36E+01	1.04E+01	< 3.54E+01	1.74E+01	6.29E-01	NET
Ce-144	-2.86E+02	1.51E+02	< 5.07E+02	2.51E+02	6.43E-01	NET
Ce-141	2.17E+02	6.16E+02	< 2.06E+03	1.01E+03	2.11E-02	NET
Se-75	-2.22E+01	2.86E+01	< 9.75E+01	4.75E+01	3.51E-01	NET
Cr-51	-6.56E+03	5.65E+03	< 1.95E+04	9.48E+03	1.08E-02	NET
I-131	-2.20E+07	4.30E+07	< 1.47E+08	7.14E+07	1.67E-07	NET
Sb-125	-2.07E+01	2.25E+01	< 7.82E+01	3.78E+01	8.83E-01	NET
Ag-108m	-7.66E+00	7.49E+00	< 2.59E+01	1.26E+01	9.97E-01	NET
Be-7	3.49E+02	6.80E+02	< 2.29E+03	1.11E+03	9.56E-02	NET
La-140	-2.59E+04	2.57E+05	< 8.76E+05	4.23E+05	5.49E-05	NET
Ru-103	-2.38E+02	1.82E+02	< 6.35E+02	3.07E+02	4.12E-02	NET
Ba-140	-2.23E+05	4.73E+05	< 1.63E+06	7.87E+05	5.49E-05	NET
Cs-134	1.29E-01	8.90E+00	< 3.03E+01	1.46E+01	8.46E-01	NET
Ru-106	-1.48E+02	9.93E+01	< 3.51E+02	1.69E+02	7.11E-01	NET
Cs-137	-5.51E+00	7.94E+00	< 2.77E+01	1.33E+01	9.89E-01	NET
Zr-95	2.32E+02	6.86E+02	< 2.27E+03	1.13E+03	1.41E-01	NET
Nb-95	-4.31E+02	2.97E+02	< 1.04E+03	5.04E+02	2.79E-02	NET
Co-58	1.27E+02	4.28E+01	< 1.36E+02	6.46E+01	1.70E-01	NET
Mn-54	0.00E+00	1.22E+01	< 4.16E+01	2.00E+01	6.69E-01	NET
Ag-110m	-2.35E+01	1.65E+01	< 5.91E+01	2.83E+01	6.05E-01	NET
Fe-59	-3.16E+01	2.76E+02	< 9.48E+02	4.55E+02	6.01E-02	NET
Zn-65	-9.40E+01	6.25E+01	< 2.14E+02	1.05E+02	5.99E-01	NET
Co-60	-2.72E+00	7.58E+00	< 2.69E+01	1.26E+01	9.37E-01	NET

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
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Sb-124	5.21E+01	8.66E+01	< 3.03E+02	1.37E+02	1.24E-01	NET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5188-08 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: EO200 #3
Collect Start Date/Time: _____
Collect Stop Date/Time: 10-22-02 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5176

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 620.2 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9020

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/02/03 1749 Det No.: 8 Spectrum No.: 1227308
Counted by: Qh
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5188-08
Client Id : EO200 #3
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 10/22/02 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	620.2		
Sample Weight-Dry	g			
Aliquot Weight	g	620.2		
FINAL WEIGHT	kg	.6202		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5188-08 analyzed by emml461 on 05/02/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5188-08

Sample ID: SOIL/SEDI Duratek Inc

Code: 1227308

Sampling Start: 10/22/2002 12:00:00 | Counting Start: 05/02/2003 17:43:54
Sampling Stop: 10/22/2002 12:00:00 | Decay Time. 4.61E+003 Hrs
Buildup Time. 0.00E+000 Hrs / Live Time 10000 Sec
Sample Size 6.20E-001 kg | Real Time 10012 Sec
Collection Efficiency 1.0000 | Spc. File 1227308.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Energy(keV)= 0.06 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/02/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.63	94.44	66	44	71	864	1.15	NET< CL
2	74.50	112.35	517	51	75	965	1.49	a
3	76.89	115.96	730	49	67	827	1.37	b
4	86.99	131.20	187	38	59	692	1.00	a HiResid
5	89.84	135.51	107	32	50	554	0.79	b HiResid
6	92.48	139.49	248	39	59	692	1.08	c HiResid
7	98.78	149.00	0	30	50	554	0.79	d NET< CL HiResid
8	105.41	159.00	8	25	41	416	0.64	e NET< CL HiResid
9	128.90	194.45	75	47	75	896	0.78	NET< CL
10	143.61	216.66	66	44	71	788	1.40	NET< CL
11	154.51	233.11	39	50	81	920	1.65	NET< CL
12	185.76	280.28	321	47	71	750	2.09	Wide Pk
13	209.07	315.45	151	43	69	696	1.18	
14	238.39	359.70	1826	51	45	382	1.22	a
15	241.30	364.09	401	43	62	573	1.98	b Wide Pk
16	270.16	407.66	169	30	45	344	1.53	a
17	277.23	418.33	79	26	40	295	1.20	b
18	295.02	445.17	422	28	32	209	1.15	a
19	299.73	452.29	120	25	37	251	1.25	b
20	327.30	493.90	90	34	54	400	1.33	
21	338.09	510.17	353	35	49	360	1.40	
22	351.73	530.76	790	40	46	312	1.55	
23	409.29	617.64	54	31	50	323	1.37	
24	462.76	698.34	98	26	40	242	1.44	
25	510.75	770.77	476	30	33	195	2.11	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
26	583.03	879.86	666	32	32	165	1.55	
27	609.12	919.23	643	33	35	199	1.65	
28	665.32	1004.06	21	17	27	135	2.54	NET< CL Wide Pk
29	727.47	1097.86	147	24	34	180	2.21	
30	767.64	1158.49	18	22	36	212	0.56	NET< CL
31	795.00	1199.78	51	18	28	125	1.72	
32	860.14	1298.09	78	18	25	109	2.03	
33	911.08	1374.98	443	28	30	143	1.83	
34	934.27	1409.98	46	19	29	122	2.65	Wide Pk
35	969.11	1462.56	151	26	37	219	1.34	
36	1120.30	1690.74	144	22	30	130	2.18	
37	1238.21	1868.71	43	20	32	169	2.05	
38	1377.53	2078.97	11	13	21	66	0.96	NET< CL
39	1460.86	2204.75	2432	51	19	56	2.24	
40	1508.21	2276.21	19	11	17	43	1.03	
41	1729.36	2609.99	22	10	14	30	1.52	
42	1764.48	2663.00	111	13	12	22	2.34	
43	2103.13	3174.11	33	9	11	20	4.38	Wide Pk
44	2204.54	3327.16	26	9	12	24	2.01	
45	2614.64	3946.12	276	17	9	11	2.84	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.63	66	44	71	26	44	72	NET<CL
2	74.50	517	51	75	499	51	76	
3	76.89	730	49	67	717	49	67	
6	92.48	248	39	59	144	39	61	
7	98.78	0	30	50	-3	30	50	NET<CL
10	143.61	66	44	71	54	44	71	NET<CL
12	185.76	321	47	71	253	47	73	
14	238.39	1826	51	45	1779	51	47	
15	241.30	401	43	62	391	43	63	
16	270.16	169	30	45	171	30	45	
18	295.02	422	28	32	412	29	33	
21	338.09	353	35	49	346	36	50	
22	351.73	790	40	46	759	40	47	
25	510.75	476	30	33	228	30	43	
26	583.03	666	32	32	649	32	33	
27	609.12	643	33	35	615	33	36	
30	767.64	19	22	36	13	22	36	NET<CL
33	911.08	443	28	30	432	28	31	
35	969.11	151	26	37	142	26	38	
36	1120.30	145	22	30	137	22	30	
37	1238.21	43	20	32	40	20	32	
39	1460.86	2432	51	19	2413	51	20	
41	1729.36	22	10	14	21	10	15	
42	1764.48	111	13	12	104	13	13	
44	2204.54	27	9	12	24	9	12	
45	2614.64	276	17	9	261	17	11	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.50	499	Pb-212	353	5 of 6	100.00	1.50	
			Tl-208	21	7 of 9	98.64	0.99	
			Pb-214	128	5 of 7	98.65	0.99	
			Tl-208	37	7 of 9	98.64	0.99	
3	76.89	717	Pb-212	628	5 of 6	100.00	1.50	
			Tl-208	37	7 of 9	98.64	0.99	
			Pb-214	230	5 of 7	98.65	0.99	
4	86.99	187	Cd-109	. . . . .	1 of 1	100.00	1.50	
			Pb-212	343	5 of 6	100.00	1.00	
5	89.84	107	Cd-109	. . . . .	1 of 1	100.00	1.50	
6	92.48	144	AcTh-228	145	10 of 36	82.15	1.32	
			Th-234	. . . . .	1 of 2	100.00	1.00	
12	185.76	253	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
13	209.07	151	AcTh-228	176	10 of 36	84.50	1.34	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
14	238.39	1779	Pb-212	2138	5 of 6	100.00	1.50	
15	241.30	391	Pb-214	189	5 of 7	98.65	0.99	
			La-140	. . . . .	0 of 0	. . . .	0.00	Decay
16	270.16	171	AcTh-228	112	10 of 36	78.65	1.29	
17	277.23	79	Tl-208	82	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
18	295.02	412	Pb-214	438	5 of 7	100.00	1.50	
19	299.73	120	Pb-212	122	5 of 6	100.00	1.50	
20	327.30	90	AcTh-228	97	10 of 36	82.15	1.32	
			Bi-212	3	2 of 13	59.32	1.09	
			La-140	. . . . .	0 of 0	. . . .	0.00	Decay
21	338.09	346	AcTh-228	305	10 of 36	82.15	1.32	
22	351.73	759	Pb-214	. . . . .	5 of 7	100.00	1.00	
23	409.29	54	AcTh-228	56	10 of 36	82.15	1.32	
24	462.76	98	AcTh-228	107	10 of 36	82.15	1.32	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
25	510.75	52	Annul	. . . . .	1 of 1	100.00	1.50	Split
46	510.75	176	Tl-208	176	7 of 9	100.00	1.50	AutoAdd
26	583.03	649	Tl-208	621	7 of 9	100.00	1.50	
27	609.12	615	Bi-214	614	8 of 33	87.55	1.38	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . . .	0.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
29	727.47	147	Bi-212	4852	2 of 13	81.27	1.31	
31	795.00	51	AcTh-228	79	10 of 36	87.64	1.38	
			Cs-134		1 of 9	46.67	0.97	
32	860.14	78	Tl-208	73	7 of 9	100.00	1.50	
33	911.08	432	AcTh-228	365	10 of 36	82.15	1.32	
34	934.27	47	Bi-214	32	8 of 33	83.26	1.33	
35	969.11	142	AcTh-228	246	10 of 36	92.83	0.93	
			Sb-124		1 of 13	1.04	0.01	LowScore
36	1120.30	137	Bi-214	134	8 of 33	87.55	1.38	
37	1238.21	40	Bi-214	50	8 of 33	89.57	1.40	
39	1460.86	2413	K-40		1 of 1	100.00	1.50	
40	1508.21	19	Bi-214	16	8 of 33	86.33	1.36	
41	1729.36	21	Bi-214	20	8 of 33	86.33	1.36	
42	1764.48	104	Bi-214	104	8 of 33	87.55	1.38	
43	2103.13	33	2615SEsc		0 of 0	. . .	0.50	
44	2204.54	24	Bi-214	28	8 of 33	89.57	1.40	
45	2614.64	261	Tl-208	292	7 of 9	100.00	1.50	

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5188-08

Sample ID: SOIL/SEDI Duratek Inc

Code: 1227308

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Sampling Start: 10/22/2002 12:00:00 | Counting Start: 05/02/2003 17:43:54
Sampling Stop: 10/22/2002 12:00:00 | Decay Time. . . . . 4.61e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 10000 Sec
Sample Size . . . . . 6.20e-001 kg | Real Time . . . . . 10012 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1227308.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998
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Library File: . . . . . SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: . . . . . L5188-08.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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              N
      ENERGY E   Concentration
Nuclide  (keV)   (pCi/kg)   )   MDA   Flags   Notes   MDC
-----
Pb-212  Average:x 9.84E+02 +- 2.80E+01   . . . .   *   . . . . .
          74.81   I.D.   . . . .   . . . .   . . . . .
          77.12   I.D.   . . . .   . . . .   . . . . .
          238.63  9.84E+02 +- 2.82E+01  5.37E+01   +*   . . . . .
          300.09  1.00E+03 +- 2.08E+02  6.38E+02   +*   . . . . .
Cd-109   88.03   I.D.   . . . .   . . . .   . . . . .
AcTh-228 Average:x 8.39E+02 +- 4.10E+01   . . . .   *   . . . . .
          93.35   I.D.   . . . .   . . . .   . . . . .
          209.28  7.84E+02 +- 2.26E+02  7.26E+02   +*   . . . . .
          270.23  1.26E+03 +- 2.25E+02  6.90E+02   +*   . . . . .
          327.64  8.46E+02 +- 3.20E+02  1.04E+03   +   . . . . .
          338.32  9.32E+02 +- 9.57E+01  2.75E+02   +*   . . . . .
          409.51  8.87E+02 +- 5.08E+02  1.67E+03   +   . . . . .
          463.00  8.35E+02 +- 2.27E+02  7.15E+02   +*   . . . . .
          794.70  5.96E+02 +- 2.13E+02  6.76E+02   +   . . . . .
          911.07  9.17E+02 +- 5.95E+01  1.37E+02   +*   . . . . .
          969.11  5.26E+02 +- 9.58E+01  2.90E+02   +*   . . . . .
Ra-226   186.22  1.65E+03 +- 3.08E+02  9.71E+02   +*   . . . . .
Pb-214  Average:x 6.50E+02 +- 2.58E+01   . . . .   *   . . . . .
          241.98  1.30E+03 +- 1.43E+02  4.25E+02   +*   . . . . .
          295.21  6.04E+02 +- 4.20E+01  1.01E+02   +*   . . . . .
          351.92  6.43E+02 +- 3.37E+01  8.23E+01   +*   . . . . .
Tl-208  Average:x 9.09E+02 +- 3.55E+01   . . . .   *   . . . . .
          277.35  8.79E+02 +- 2.87E+02  9.16E+02   +*   . . . . .
          510.84   I.D.   . . . .   . . . .   . . . . .
          583.14  9.40E+02 +- 4.68E+01  9.86E+01   +*   . . . . .

```

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
Annul Bi-214	860.37	9.84E+02 +- 2.22E+02	6.67E+02	++		. . . . .
	2614.66	8.58E+02 +- 5.74E+01	8.05E+01	++		. . . . .
	511.00	3.02E+01 +- 3.05E+01	1.01E+02	+		. . . . .
	Average:x	5.99E+02 +- 2.76E+01	. . . . .	*		. . . . .
	609.31	6.00E+02 +- 3.23E+01	7.33E+01	++		. . . . .
	934.06	8.67E+02 +- 3.49E+02	1.12E+03	+		. . . . .
	1120.29	6.13E+02 +- 9.71E+01	2.81E+02	++		. . . . .
	1238.11	4.80E+02 +- 2.48E+02	8.08E+02	+		. . . . .
	1509.23	6.95E+02 +- 4.23E+02	1.39E+03	+		. . . . .
	1729.59	6.24E+02 +- 3.00E+02	9.59E+02	+		. . . . .
Bi-212 K-40 Am-241 Co-57 Ce-144 Ce-141 Se-75 Cr-51 I-131 Sb-125 Ag-108m Be-7 La-140 Ru-103 Ba-140 Cs-134 Ru-106 Cs-137 Zr-95 Nb-95 Co-58 Mn-54 Ag-110m Fe-59 Zn-65 Co-60 Sb-124	1764.49	5.98E+02 +- 7.43E+01	1.66E+02	++		. . . . .
	2204.22	5.12E+02 +- 1.90E+02	5.81E+02	+		. . . . .
	727.17	6.31E+02 +- 1.03E+02	3.04E+02	++		. . . . .
	1460.81	1.81E+04 +- 3.81E+02	3.24E+02	++		. . . . .
	59.54	N-1.85E+02 +- 5.43E+01	1.91E+02	x#		. . . . .
	122.06	N-1.17E+01 +- 1.29E+01	4.40E+01	x		. . . . .
	133.54	N-6.51E+01 +- 1.03E+02	3.49E+02	x		. . . . .
	145.44	N 1.14E+03 +- 8.59E+02	2.84E+03	x		. . . . .
	264.65	N 3.08E+01 +- 3.32E+01	1.11E+021	x	lbase	. . . . .
	320.08	N-1.38E+04 +- 8.74E+03	3.07E+04	x		. . . . .
Cs-137 Zr-95 Nb-95 Co-58 Mn-54 Ag-110m Fe-59 Zn-65 Co-60 Sb-124	364.48	N-6.37E+07 +- 1.37E+08	4.72E+08	x		. . . . .
	427.89	N 1.74E+01 +- 2.94E+01	9.90E+01	x		. . . . .
	433.93	N 2.28E+00 +- 8.11E+00	2.76E+01	x		. . . . .
	477.59	N 1.50E+03 +- 8.11E+02	2.65E+03	x		. . . . .
	487.03	N-3.87E+05 +- 5.31E+05	1.86E+06	x		. . . . .
	497.08	N 2.59E+02 +- 2.19E+02	7.30E+02	x		. . . . .
	537.32	N 6.49E+05 +- 8.79E+05	2.97E+06	x		. . . . .
	604.70	N 3.79E+01 +- 3.69E+01	1.22E+02P	x	PIC	. . . . .
	621.84	N-8.04E+01 +- 1.15E+02	4.03E+02	x		. . . . .
	661.65	N-9.06E+00 +- 9.61E+00	3.40E+01	x		Y.	
Zr-95 Nb-95 Co-58 Mn-54 Ag-110m Fe-59 Zn-65 Co-60 Sb-124	724.18	N-4.34E+04 +- 1.70E+04	5.60E+04P	x	PIC	. . . . .
	765.79	N-1.18E+02 +- 4.36E+02	1.51E+03	x		. . . . .
	810.76	N-6.12E+01 +- 5.00E+01	1.81E+02	x		. . . . .
	834.83	N 3.15E+01 +- 1.31E+01	4.21E+01	x		. . . . .
	884.67	N 2.17E+01 +- 1.96E+01	6.57E+01	x		. . . . .
	1099.22	N-2.62E+01 +- 3.24E+02	1.13E+03	x		. . . . .
	1115.52	N-3.40E+01 +- 6.71E+01	2.34E+02P	x	PIC	. . . . .
	1332.49	N-8.91E+00 +- 9.05E+00	3.33E+01	x		Y.	
	1691.02	N-1.16E+02 +- 1.03E+02	4.14E+02	x		. . . . .

MEASURED TOTAL: 2.44E+04 +- 9.80E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.63	94.44	26	44	72	865	1.15	Deleted
7	98.78	149.00	-3	30	50	554	0.79	Deleted
8	105.41	159.00	8	25	41	416	0.64	Deleted
9	128.90	194.45	75	47	75	896	0.78	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
10	143.61	216.66	54	44	71	788	1.40	Deleted
11	154.51	233.11	39	50	81	920	1.65	Deleted
28	665.32	1004.06	21	17	27	135	2.54	Deleted
30	767.64	1158.49	13	22	36	213	0.56	Deleted
38	1377.53	2078.97	11	13	21	66	0.96	Deleted
43	2103.13	3174.11	33	9	11	20	4.38	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
47	59.54	89.77	-128N	38	65	769	1.24	NET< CL
48	122.06	184.13	-32N	35	59	640	1.29	NET< CL
49	133.54	201.46	-23N	36	60	672	1.30	NET< CL
50	145.44	219.42	47N	35	57	605	1.31	NET< CL
51	264.65	399.34	23N	25	40	296	1.39	NET< CL
								LBase
52	320.08	483.00	-37N	24	40	274	1.43	NET< CL
53	364.48	550.01	-10N	22	36	225	1.46	NET< CL
54	427.89	645.71	13N	21	34	200	1.50	NET< CL
55	433.93	654.83	6N	20	33	184	1.51	NET< CL
56	477.59	720.72	34N	18	28	137	1.53	
57	487.03	734.97	-14N	19	31	165	1.54	NET< CL
58	497.08	750.14	20N	17	26	138	1.55	NET< CL
59	537.32	810.87	12N	16	25	124	1.57	NET< CL
60	604.70	912.57	69N	67	110	290	1.62	NET< CL
								PIC
61	621.84	938.44	-12N	17	29	152	1.63	NET< CL
62	661.65	998.52	-16N	17	29	152	1.66	NET< CL
63	724.18	1092.89	-4683N	1834	3019	231	1.70	NET< CL
								PIC
64	765.79	1155.70	-5N	19	31	174	1.73	NET< CL
65	810.76	1223.57	-17N	14	24	105	1.76	NET< CL
66	834.83	1259.90	37N	15	23	101	1.77	
67	884.67	1335.12	16N	14	23	97	1.81	NET< CL
68	1099.22	1658.93	-1N	14	23	91	1.95	NET< CL
69	1115.52	1683.53	-15N	29	50	227	1.96	NET< CL
								PIC
70	1332.49	2011.00	-11N	11	19	68	2.10	NET< CL
71	1691.02	2552.12	-7N	6	11	22	2.34	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 10/22/2002 12:00:00 | Counting Start: 05/02/2003 17:43:54
Sampling Stop: 10/22/2002 12:00:00 | Decay Time. . . . . 4.61E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 10000 Sec
Sample Size . . . . . 6.20E-01 kg | Real Time . . . . . 10012 Sec
Collection Efficiency . . . . 1.0000 | Spectrum File . . . . . 1227308.spc
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Detector #: 8

Energy(keV)= 0.06 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/02/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5188-08.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	9.84E+02	2.80E+01	< 5.37E+01	2.61E+01	1.00E+00	MEAS +	YES
AcTh-228	8.39E+02	4.10E+01	< 1.37E+02	6.58E+01	1.00E+00	MEAS +	YES
Ra-226	1.65E+03	3.08E+02	< 9.71E+02	4.77E+02	1.00E+00	MEAS +	YES
Pb-214	6.50E+02	2.58E+01	< 8.23E+01	4.00E+01	9.99E-01	MEAS +	YES
Tl-208	9.09E+02	3.55E+01	< 8.05E+01	3.58E+01	1.00E+00	MEAS +	YES
Annil	3.02E+01	3.05E+01	< 1.01E+02	4.97E+01	6.94E-01	MEAS +	YES
Bi-214	5.99E+02	2.76E+01	< 7.33E+01	3.53E+01	9.99E-01	MEAS +	YES
Bi-212	6.31E+02	1.03E+02	< 3.04E+02	1.46E+02	1.00E+00	MEAS +	YES
K-40	1.82E+04	3.81E+02	< 3.24E+02	1.52E+02	1.00E+00	MEAS +	YES
Am-241	-1.85E+02	5.43E+01	< 1.91E+02	9.33E+01	9.99E-01	NET	YES
Co-57	-1.17E+01	1.29E+01	< 4.40E+01	2.15E+01	6.12E-01	NET	YES
Ce-144	-6.51E+01	1.03E+02	< 3.49E+02	1.71E+02	6.26E-01	NET	YES
Ce-141	1.14E+03	8.59E+02	< 2.84E+03	1.39E+03	1.66E-02	NET	YES
Se-75	3.08E+01	3.32E+01	< 1.11E+02	5.35E+01	3.29E-01	NET	YES
Cr-51	-1.38E+04	8.74E+03	< 3.07E+04	1.48E+04	8.15E-03	NET	YES
I-131	-6.37E+07	1.37E+08	< 4.72E+08	2.28E+08	6.33E-08	NET	YES
Sb-125	1.74E+01	2.94E+01	< 9.90E+01	4.76E+01	8.77E-01	NET	YES
Ag-108m	2.28E+00	8.11E+00	< 2.76E+01	1.32E+01	9.97E-01	NET	YES
Be-7	1.50E+03	8.11E+02	< 2.65E+03	1.26E+03	8.26E-02	NET	YES
La-140	-3.87E+05	5.31E+05	< 1.86E+06	8.90E+05	2.98E-05	NET	YES
Ru-103	2.59E+02	2.19E+02	< 7.30E+02	3.47E+02	3.38E-02	NET	YES
Ba-140	6.49E+05	8.79E+05	< 2.97E+06	1.41E+06	2.98E-05	NET	YES
Cs-134	3.80E+01	3.69E+01	< 1.22E+02	6.02E+01	8.38E-01	NET	YES
Ru-106	-8.04E+01	1.14E+02	< 4.03E+02	1.92E+02	6.96E-01	NET	YES
Cs-137	-9.06E+00	9.61E+00	< 3.40E+01	1.62E+01	9.88E-01	NET	YES
Zr-95	-4.34E+04	1.70E+04	< 5.60E+04	2.80E+04	1.25E-01	NET	YES
Nb-95	-1.18E+02	4.36E+02	< 1.51E+03	7.22E+02	2.24E-02	NET	YES
Co-58	-6.12E+01	5.00E+01	< 1.81E+02	8.58E+01	1.52E-01	NET	YES
Mn-54	3.15E+01	1.31E+01	< 4.21E+01	1.99E+01	6.53E-01	NET	YES
Ag-110m	2.17E+01	1.96E+01	< 6.57E+01	3.10E+01	5.87E-01	NET	YES
Fe-59	-2.62E+01	3.24E+02	< 1.13E+03	5.34E+02	5.05E-02	NET	YES
Zn-65	-3.40E+01	6.71E+01	< 2.34E+02	1.14E+02	5.80E-01	NET	YES
Co-60	-8.90E+00	9.05E+00	< 3.32E+01	1.55E+01	9.33E-01	NET	YES

L5188-08 analyzed by emml461 on 05/02/2003
Activity Units: pCi/kg
Nuclide 'Activity Uncertainty MDA CL ACT DECAY FLAG SEN MET
=====

Sb-124	-1.16E+02	1.03E+02	< 4.14E+02	1.84E+02	1.09E-01	NET	YES
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PERFORMED BY: _____

REVIEWED BY: _____

DURATEK, INC. DATA PACKETS

Samples
L5186-01 - L5186-16



FRAMATOME ANP

ENVIRONMENTAL LABORATORY
29 Research Drive
Westborough, MA 01581-3913
(508) 898-9970 Fax (508) 836-9815

10/2

Name/Address of Client Representative:

(Person(s) who should receive the results)

Phone: _____ Fax: _____

[illegible]

Chain of Custody		Field Treatment/Comments	SPECIFY METHOD	ELAB ACCEPTANCE STAMP
Relinquished By:	Date:	<i>Batch # 2</i>	(Internal Lab Use ONLY)	<div style="border: 1px solid black; padding: 5px; text-align: center;"> FRAMATOME NIP EL ACCEPTED APR 04 2003 <i>W. J. [Signature]</i> </div>
Collected By:	Phone Number:		RA-226 (A)	
Received By: <i>Om</i>	Date: <i>3/13/03</i>		RADIUMA_EPA	
ELAB Comments: <i>L5186</i>			RA-226 (PROC. 1300)	
			RA-226_EPA (PROC. 1311)	
		I-131LL (BETA/GAMMA)		
		I-131LL (GAS PROPORTIONAL)		
		OTHER		

2012

Name/Address of Client Representative: _____

(Person(s) who should receive the results) _____

Phone: _____ Fax: _____

Working Days (SPECIFY NUMBER)[illegible]

Chain of Custody		Field Treatment/Comments	SPECIFY METHOD	ELAB ACCEPTANCE STAMP
Relinquished By:	Date:	<i>Batch # 2</i>	(Internal Lab Use ONLY)	<div style="border: 1px solid black; padding: 5px;"> FRAMATOME ACCEPTANCE <div style="text-align: center;"> APR 04 2003 MONITOR <i>HAL</i> </div> </div>
Collected By:	Phone Number:		RA-226 (A)	
Received By: <i>DM</i>	Date: <i>7/3/03</i>		RADIUM_EPA	
ELAB Comments: <i>LS186</i>			RA-228 (PROC. 1300)	
			RA-228_EPA (PROC. 1311)	
		I-131LL (BETA/GAMMA)		
		I-131LL (GAS PROPORTIONAL)		
		OTHER		

2
Client: Duratek, Inc
Project: Bristol-Myers Squibb

Duratek Purchase Order # 15313

Samples Collected by
Betty & Doug Kjos, Don Schumaker

Batch #2

CHAIN OF CUSTODY RECORD BMS-002

Duratek, Inc.
628 Gallaher Road
Kingston, Tn. 37763

Project Manager: Paul Ely
(732) 519-3341-BMS Office
(865) 376-8243-Duratek Office
(865) 414-1973-cell

Page 1 of 2

Sample ID	date	Sample turnaround time	matrix	preservative	number of containers	Gamma-spec									Remarks
BMS-2600-018	2/6/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-024	2/6/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-034	2/6/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-035	2/6/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-040	2/6/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-067	2/7/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-069	2/7/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-095	2/6/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-099	2/6/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-107	2/6/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-164	2/7/03	Std	S	N/A	1	X									Soil Sample
Relinquished by: <i>Le R. J. J.</i>	Date: <i>2/13/03</i>	Time: <i>1000</i>	Received by:	Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Remarks:					

Matrix codes: s-Soil, m-Misc Solid, V-Vegetation, L-Sludge, W-Water, G-Ground Water, D-Drinking Water, Z-Waste Water, M-Misc Liquid, F-Filter or Smear

**Framatome ANP****Login Chain of Custody Report (In01)**

Apr. 04, 2003

03:30 PM

Login Number: L5186**Account:** 00435

Duratek Inc

Project: OTHER ENVIRON-DUR Duratek Other Environmental**Page:** 1 of 1

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due Date	Start Date Comments	Volume
L5186-01	BMS-2600-018	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-02	BMS-2600-024	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-03	BMS-2600-034	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-04	BMS-2600-035	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-05	BMS-2600-040	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-06	BMS-2600-067	07-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-07	BMS-2600-069	07-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-08	BMS-2600-095	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-09	BMS-2600-099	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-10	BMS-2600-107	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-11	BMS-2600-164	07-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-12	BMS-2600-170	10-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-13	BMS-2600-241	13-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-14	BMS-2600-259	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-15	BMS-2600-278	13-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5186-16	BMS-2600-338	05-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				

Signature : Dore A. Keardon
Date : 4-4-03

Client: Duratek, Inc
Project: Bristol-Myers Squibb

Duratek Purchase Order # 15313

Samples Collected by
Betty & Doug Kjos, Don Schumaker

Batch #2

CHAIN OF CUSTODY RECORD BMS-002

Duratek, Inc.
628 Gallaher Road
Kingston, Tn. 37763

Project Manager: Paul Ely
(732) 519-3341-BMS Office
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(865) 414-1973-cell

Page 2 of 2

Sample ID	date	Sample turnaround time	matrix	preservative	number of containers	Gamma-spec									Remarks
BMS-2600-170	2/10/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-241	2/13/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-259	2/6/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-278	2/13/03	Std	S	N/A	1	X									Soil Sample
BMS-2600-338	2/5/03	Std	S	N/A	1	X									Soil Sample
Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:								
<i>Rel. R. Noj</i>	<i>3/13/03</i>	<i>1000</i>													
Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Remarks:									

Matrix codes: s-Soil, m-Misc Solid, V-Vegetation, L-Sludge, W-Water, G-Ground Water, D-Drinking Water, Z-Waste Water, M-Misc Liquid, F-Filter or Smear

April 10, 2003

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903
ATT: Paul Ely

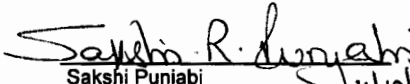
Dear Paul Ely :

Framatome-ANP Environmental Laboratory received the samples listed below from your company on 13-MAR-03. Please verify that the data and requested analyses are correct. Analysis reports will be submitted when the requested analyses have been completed and the results approved.

<u>Media</u>	<u>Client ID</u>	<u>Site</u>	<u>Reference Date</u>	<u>Lab Sample #</u>	<u>Analysis Requested</u>
Soil	BMS-2600-018		06-FEB-03 12:00	L5186-01	GAMMA SPECTROMETRY
Soil	BMS-2600-024		06-FEB-03 12:00	L5186-02	GAMMA SPECTROMETRY
Soil	BMS-2600-034		06-FEB-03 12:00	L5186-03	GAMMA SPECTROMETRY
Soil	BMS-2600-035		06-FEB-03 12:00	L5186-04	GAMMA SPECTROMETRY
Soil	BMS-2600-040		06-FEB-03 12:00	L5186-05	GAMMA SPECTROMETRY
Soil	BMS-2600-067		07-FEB-03 12:00	L5186-06	GAMMA SPECTROMETRY
Soil	BMS-2600-069		07-FEB-03 12:00	L5186-07	GAMMA SPECTROMETRY
Soil	BMS-2600-095		06-FEB-03 12:00	L5186-08	GAMMA SPECTROMETRY
Soil	BMS-2600-099		06-FEB-03 12:00	L5186-09	GAMMA SPECTROMETRY
Soil	BMS-2600-107		06-FEB-03 12:00	L5186-10	GAMMA SPECTROMETRY
Soil	BMS-2600-164		07-FEB-03 12:00	L5186-11	GAMMA SPECTROMETRY
Soil	BMS-2600-170		10-FEB-03 12:00	L5186-12	GAMMA SPECTROMETRY
Soil	BMS-2600-241		13-FEB-03 12:00	L5186-13	GAMMA SPECTROMETRY
Soil	BMS-2600-259		06-FEB-03 12:00	L5186-14	GAMMA SPECTROMETRY
Soil	BMS-2600-278		13-FEB-03 12:00	L5186-15	GAMMA SPECTROMETRY
Soil	BMS-2600-338		05-FEB-03 12:00	L5186-16	GAMMA SPECTROMETRY

If you have any questions regarding these samples, please contact me at (508)898-9970, ext. 2557 or email:
Sakshi.Punjabi@Framatome-anp.com.

Sincerely,


Sakshi Punjabi
Sample Receipt Technician 4/10/03

Notes:

c:

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/14/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-01 Client ID BMS-2600-018
Reference Date 02/06/03 Analysis Date 04/11/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	2.74E-01	+/- 3.6E-02	3.8E-02	1.3E-01		bc
Ag-108m	-3.7E-03	+/- 6.8E-03	6.8E-03	2.5E-02		
Ag-110m	-1E-02	+/- 1.4E-02	1.4E-02	5.3E-02		
Ba-140	-4.3E-01	+/- 8.5E-01	8.5E-01	3.1E+00		
Be-7	-1.5E-01	+/- 1.4E-01	1.4E-01	5.2E-01		
Ce-141	5.2E-02	+/- 4.3E-02	4.3E-02	1.4E-01		
Ce-144	-2E-03	+/- 5.4E-02	5.4E-02	1.9E-01		
Co-57	-5E-04	+/- 6.8E-03	6.8E-03	2.3E-02		
Co-58	-3.3E-02	+/- 1.3E-02	1.3E-02	5.5E-02		
Co-60	-1.09E-02	+/- 9.4E-03	9.5E-03	3.7E-02	3.8E-02	
Cr-51	1.4E-01	+/- 3.1E-01	3.1E-01	1.1E+00		
Cs-134	-8.3E-03	+/- 8.0E-03	8.1E-03	3.0E-02		
Cs-137	2.66E-02	+/- 9.9E-03	1.0E-02	3.1E-02	1.1E+00	
Fe-59	1.7E-02	+/- 5.0E-02	5.0E-02	1.8E-01		
I-131	2.1E+00	+/- 1.9E+00	1.9E+00	6.3E+00		
K-40	9.7E+00	+/- 3.8E-01	6.2E-01	3.3E-01		bc
La-140	-1.8E-01	+/- 4.3E-01	4.3E-01	1.6E+00		
Mn-54	-4E-03	+/- 9.0E-03	9.0E-03	3.3E-02		
Nb-95	-1.8E-02	+/- 2.8E-02	2.8E-02	1.0E-01		
Ru-103	-1.5E-02	+/- 2.3E-02	2.3E-02	8.4E-02		
Ru-106	-8.1E-02	+/- 8.8E-02	8.8E-02	3.2E-01		
Sb-124	-1.4E-02	+/- 2.7E-02	2.7E-02	1.1E-01		
Sb-125	-4.6E-02	+/- 2.1E-02	2.1E-02	8.2E-02		
Se-75	0E+00	+/- 1.3E-02	1.3E-02	4.7E-02		
Zn-65	-6E-03	+/- 2.3E-02	2.3E-02	8.5E-02		
Zr-95	-3E-02	+/- 3.8E-02	3.8E-02	1.4E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

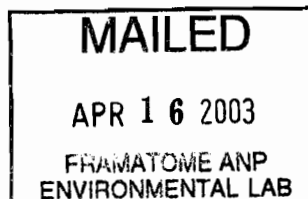
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/14/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-02 Client ID BMS-2600-024
Reference Date 02/06/03 Analysis Date 04/11/03

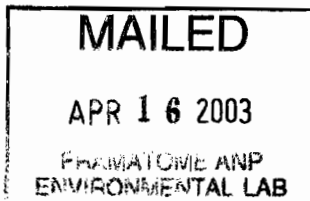
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	7.12E-01 +/- 3.7E-02	5.1E-02	1.3E-01		bc
Ag-108m	-2.6E-03 +/- 8.1E-03	8.1E-03	2.8E-02		
Ag-110m	1E-02 +/- 1.2E-02	1.2E-02	4.3E-02		
Ba-140	1.32E+00 +/- 8.9E-01	8.9E-01	2.9E+00		
Be-7	-1.4E-01 +/- 1.6E-01	1.6E-01	5.6E-01		
Ce-141	2.5E-02 +/- 5.6E-02	5.6E-02	1.9E-01		
Ce-144	-9E-02 +/- 7.3E-02	7.3E-02	2.5E-01		
Co-57	9E-04 +/- 9.2E-03	9.2E-03	3.1E-02		
Co-58	-3E-03 +/- 1.5E-02	1.5E-02	5.4E-02		
Co-60	8.6E-03 +/- 9.5E-03	9.5E-03	3.2E-02	3.8E-02	
Cr-51	-2.1E-01 +/- 3.7E-01	3.7E-01	1.3E+00		
Cs-134	1.3E-02 +/- 3.6E-02	3.6E-02	1.2E-01		
Cs-137	1.95E-02 +/- 9.9E-03	9.9E-03	3.2E-02	1.1E+00	
Fe-59	5.5E-02 +/- 4.5E-02	4.5E-02	1.5E-01		
I-131	2.2E+00 +/- 2.1E+00	2.1E+00	7.1E+00		
K-40	1.293E+01 +/- 3.4E-01	7.3E-01	2.9E-01		bc
La-140	-1E-02 +/- 5.2E-01	5.2E-01	1.8E+00		
Mn-54	-1.4E-03 +/- 9.6E-03	9.6E-03	3.4E-02		
Nb-95	1.9E-02 +/- 3.2E-02	3.2E-02	1.1E-01		
Ru-103	-4.7E-02 +/- 2.3E-02	2.3E-02	8.4E-02		
Ru-106	8.2E-02 +/- 9.1E-02	9.2E-02	3.1E-01		
Sb-124	-5E-03 +/- 3.0E-02	3.0E-02	1.1E-01		
Sb-125	-1E-03 +/- 2.7E-02	2.7E-02	9.3E-02		
Se-75	-2E-03 +/- 1.6E-02	1.6E-02	5.4E-02		
Zn-65	6E-03 +/- 4.6E-02	4.6E-02	1.5E-01		
Zr-95	-1.5E-01 +/- 3.8E-01	3.8E-01	1.3E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/15/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-03 Client ID BMS-2600-034
Reference Date 02/06/03 Analysis Date 04/11/03

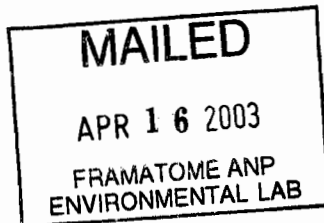
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	4.96E-01 +/- 3.1E-02	4.0E-02	1.1E-01		bc
Ag-108m	-1.13E-02 +/- 6.1E-03	6.1E-03	2.2E-02		
Ag-110m	5E-03 +/- 1.1E-02	1.1E-02	3.7E-02		
Ba-140	1.27E+00 +/- 7.9E-01	7.9E-01	2.6E+00		
Be-7	1E-02 +/- 1.2E-01	1.2E-01	4.1E-01		
Ce-141	5E-03 +/- 3.7E-02	3.7E-02	1.2E-01		
Ce-144	-2.3E-02 +/- 4.1E-02	4.1E-02	1.4E-01		
Co-57	3.9E-03 +/- 5.3E-03	5.3E-03	1.8E-02		
Co-58	-1.9E-02 +/- 1.3E-02	1.3E-02	4.7E-02		
Co-60	-9.6E-03 +/- 8.1E-03	8.1E-03	3.1E-02	3.8E-02	
Cr-51	-9E-02 +/- 2.3E-01	2.3E-01	8.0E-01		
Cs-134	-6.5E-03 +/- 6.5E-03	6.5E-03	2.3E-02		
Cs-137	2.2E-02 +/- 1.0E-02	1.0E-02	3.3E-02	1.1E+00	c
Fe-59	-6.4E-02 +/- 4.2E-02	4.2E-02	1.6E-01		
I-131	1E+00 +/- 1.4E+00	1.4E+00	4.8E+00		
K-40	1.243E+01 +/- 3.3E-01	7.0E-01	2.4E-01		bc
La-140	-3E-02 +/- 3.8E-01	3.8E-01	1.3E+00		
Mn-54	3.1E-03 +/- 8.9E-03	8.9E-03	3.1E-02		
Nb-95	-1.5E-02 +/- 2.9E-02	2.9E-02	1.0E-01		
Ru-103	-8E-03 +/- 1.9E-02	1.9E-02	6.6E-02		
Ru-106	4.1E-02 +/- 6.9E-02	6.9E-02	2.4E-01		
Sb-124	0E+00 +/- 2.3E-02	2.3E-02	8.7E-02		
Sb-125	-7E-03 +/- 2.0E-02	2.0E-02	6.8E-02		
Se-75	-3.4E-02 +/- 1.1E-02	1.1E-02	4.0E-02		
Zn-65	-2.2E-02 +/- 3.9E-02	3.9E-02	1.4E-01		
Zr-95	-2.97E+00 +/- 9.2E-01	9.3E-01	3.1E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/15/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-04 **Client ID** BMS-2600-035
Reference Date 02/06/03 **Analysis Date** 04/11/03

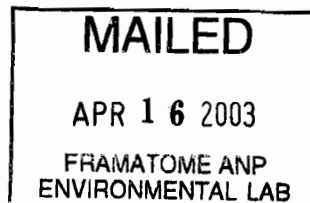
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.59E-01 +/- 1.6E-02	2.4E-02	5.4E-02		bc
Ag-108m	-1.9E-03 +/- 3.9E-03	3.9E-03	1.3E-02		
Ag-110m	-1.6E-03 +/- 6.5E-03	6.5E-03	2.3E-02		
Ba-140	2.6E-01 +/- 2.0E-01	2.0E-01	6.6E-01		
Be-7	5E-03 +/- 7.8E-02	7.8E-02	2.6E-01		
Ce-141	1.8E-02 +/- 2.7E-02	2.7E-02	8.9E-02		
Ce-144	-6.5E-02 +/- 3.7E-02	3.7E-02	1.3E-01		
Co-57	7.24E-02 +/- 5.3E-03	6.5E-03	1.6E-02		bc
Co-58	-9E-04 +/- 7.1E-03	7.1E-03	2.5E-02		
Co-60	1E-03 +/- 4.6E-03	4.6E-03	1.6E-02	3.8E-02	
Cr-51	-1.8E-01 +/- 1.9E-01	1.9E-01	6.5E-01		
Cs-134	-5.5E-03 +/- 6.1E-03	6.1E-03	2.1E-02		
Cs-137	1.55E-02 +/- 5.9E-03	6.0E-03	1.9E-02	1.1E+00	c
Fe-59	3.4E-02 +/- 2.5E-02	2.5E-02	8.1E-02		
I-131	-1.4E+00 +/- 1.1E+00	1.1E+00	3.9E+00		
K-40	9.87E+00 +/- 1.8E-01	5.3E-01	1.6E-01		bc
La-140	3E-01 +/- 2.3E-01	2.3E-01	7.5E-01		
Mn-54	2.4E-03 +/- 5.0E-03	5.0E-03	1.7E-02		
Nb-95	1.5E-02 +/- 1.6E-02	1.6E-02	5.3E-02		
Ru-103	-9E-03 +/- 1.1E-02	1.1E-02	3.9E-02		
Ru-106	5.1E-02 +/- 4.5E-02	4.5E-02	1.5E-01		
Sb-124	-1E-02 +/- 1.4E-02	1.4E-02	5.1E-02		
Sb-125	1.6E-02 +/- 1.2E-02	1.2E-02	4.0E-02		
Se-75	2.7E-03 +/- 7.5E-03	7.5E-03	2.5E-02		
Zn-65	-1.2E-02 +/- 2.4E-02	2.4E-02	8.3E-02		
Zr-95	1.6E-02 +/- 1.4E-02	1.4E-02	4.7E-02		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/14/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-05 Client ID BMS-2600-040
Reference Date 02/06/03 Analysis Date 04/11/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.95E-01 +/- 3.9E-02	4.4E-02	1.4E-01		bc
Ag-108m	-1.24E-02 +/- 7.6E-03	7.6E-03	2.9E-02		
Ag-110m	7E-03 +/- 1.6E-02	1.6E-02	5.5E-02		
Ba-140	1.52E+00 +/- 9.1E-01	9.1E-01	3.0E+00		
Be-7	-9E-02 +/- 1.5E-01	1.5E-01	5.5E-01		
Ce-141	-1.7E-02 +/- 4.6E-02	4.6E-02	1.6E-01		
Ce-144	-5.6E-02 +/- 6.1E-02	6.1E-02	2.1E-01		
Co-57	2.23E-02 +/- 8.3E-03	8.3E-03	2.6E-02		
Co-58	-1.6E-02 +/- 1.4E-02	1.4E-02	5.5E-02		
Co-60	-4.3E-03 +/- 8.6E-03	8.6E-03	3.4E-02	3.8E-02	
Cr-51	-1E-01 +/- 3.3E-01	3.3E-01	1.2E+00		
Cs-134	-9.6E-03 +/- 8.5E-03	8.5E-03	3.2E-02		
Cs-137	1.6E-02 +/- 1.0E-02	1.0E-02	3.4E-02	1.1E+00	
Fe-59	0E+00 +/- 4.9E-02	4.9E-02	1.8E-01		
I-131	5E-01 +/- 2.1E+00	2.1E+00	7.3E+00		
K-40	9.07E+00 +/- 3.8E-01	5.9E-01	3.4E-01		bc
La-140	7.7E-01 +/- 4.9E-01	4.9E-01	1.6E+00		
Mn-54	-1.95E-02 +/- 9.4E-03	9.5E-03	3.8E-02		
Nb-95	-1.2E-02 +/- 2.9E-02	2.9E-02	1.1E-01		
Ru-103	-7E-03 +/- 2.4E-02	2.4E-02	8.7E-02		
Ru-106	-1.35E-01 +/- 9.3E-02	9.3E-02	3.5E-01		
Sb-124	0E+00 +/- 2.2E-02	2.2E-02	9.4E-02		
Sb-125	-2.2E-02 +/- 2.5E-02	2.5E-02	9.0E-02		
Se-75	1E-03 +/- 1.3E-02	1.3E-02	4.5E-02		
Zn-65	-6.9E-02 +/- 2.6E-02	2.7E-02	1.1E-01		
Zr-95	-3.4E-02 +/- 6.2E-02	6.2E-02	2.2E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

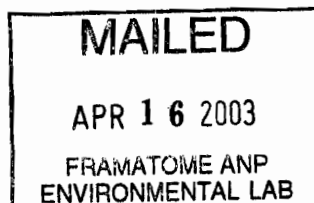
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/16/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-06 Client ID BMS-2600-067
Reference Date 02/07/03 Analysis Date 04/14/03

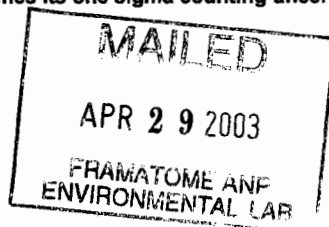
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	4.14E-01 +/- 2.5E-02	3.2E-02	1.0E-01		bc
Ag-108m	-1.08E-02 +/- 5.0E-03	5.0E-03	1.8E-02		
Ag-110m	1.55E-02 +/- 9.9E-03	9.9E-03	3.2E-02		
Ba-140	-3.9E-01 +/- 6.8E-01	6.8E-01	2.4E+00		
Be-7	-4E-02 +/- 1.1E-01	1.1E-01	3.7E-01		
Ce-141	2.5E-02 +/- 3.4E-02	3.4E-02	1.1E-01		
Ce-144	-5.8E-02 +/- 4.1E-02	4.1E-02	1.4E-01		
Co-57	6.4E-03 +/- 5.4E-03	5.4E-03	1.8E-02		
Co-58	-1.3E-02 +/- 1.0E-02	1.0E-02	3.7E-02		
Co-60	2E-04 +/- 7.1E-03	7.1E-03	2.5E-02	3.8E-02	
Cr-51	2.8E-01 +/- 2.4E-01	2.4E-01	7.9E-01		
Cs-134	0E+00 +/- 2.6E-02	2.6E-02	8.5E-02		
Cs-137	8.9E-03 +/- 7.5E-03	7.5E-03	2.5E-02	1.1E+00	
Fe-59	1.3E-02 +/- 3.5E-02	3.5E-02	1.2E-01		
I-131	-7E-01 +/- 1.8E+00	1.8E+00	6.1E+00		
K-40	1.074E+01 +/- 2.7E-01	6.0E-01	2.4E-01		bc
La-140	0E+00 +/- 3.8E-01	3.8E-01	1.3E+00		
Mn-54	8.7E-03 +/- 6.4E-03	6.4E-03	2.1E-02		
Nb-95	9E-03 +/- 2.4E-02	2.4E-02	8.1E-02		
Ru-103	2E-02 +/- 1.7E-02	1.7E-02	5.8E-02		
Ru-106	-2.2E-02 +/- 6.5E-02	6.5E-02	2.3E-01		
Sb-124	1.6E-02 +/- 2.0E-02	2.0E-02	6.9E-02		
Sb-125	-4E-03 +/- 1.7E-02	1.7E-02	5.7E-02		
Se-75	1.2E-02 +/- 1.0E-02	1.0E-02	3.3E-02		
Zn-65	4E-03 +/- 3.6E-02	3.6E-02	1.2E-01		
Zr-95	-7.2E+00 +/- 2.5E+00	2.5E+00	8.1E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/24/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/14/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-07 Client ID BMS-2600-069
Reference Date 02/07/03 Analysis Date 04/11/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	4.72E-01 +/- 3.1E-02	3.9E-02	9.9E-02		bc
Ag-108m	-1.1E-02 +/- 6.8E-03	6.8E-03	2.4E-02		
Ag-110m	1E-03 +/- 1.0E-02	1.0E-02	3.6E-02		
Ba-140	5.3E-01 +/- 7.2E-01	7.2E-01	2.4E+00		
Be-7	-9E-02 +/- 1.4E-01	1.4E-01	4.8E-01		
Ce-141	-1.9E-02 +/- 4.4E-02	4.4E-02	1.5E-01		
Ce-144	-5.1E-02 +/- 6.0E-02	6.0E-02	2.0E-01		
Co-57	8.3E-03 +/- 7.5E-03	7.6E-03	2.5E-02		
Co-58	-1.7E-02 +/- 1.2E-02	1.2E-02	4.4E-02		
Co-60	-7.4E-03 +/- 7.0E-03	7.0E-03	2.6E-02	3.8E-02	
Cr-51	3E-02 +/- 2.9E-01	2.9E-01	9.8E-01		
Cs-134	4.7E-02 +/- 2.9E-02	2.9E-02	9.5E-02		
Cs-137	5.4E-03 +/- 8.1E-03	8.1E-03	2.8E-02	1.1E+00	
Fe-59	1.5E-02 +/- 3.5E-02	3.5E-02	1.2E-01		
I-131	-2E-01 +/- 1.6E+00	1.6E+00	5.5E+00		
K-40	1.056E+01 +/- 2.8E-01	6.0E-01	2.5E-01		bc
La-140	-2E-02 +/- 3.9E-01	3.9E-01	1.3E+00		
Mn-54	9.2E-03 +/- 8.6E-03	8.6E-03	2.9E-02		
Nb-95	4.7E-02 +/- 3.7E-02	3.7E-02	1.2E-01		
Ru-103	-1E-03 +/- 1.8E-02	1.8E-02	6.2E-02		
Ru-106	2.5E-02 +/- 7.7E-02	7.7E-02	2.6E-01		
Sb-124	1.4E-02 +/- 2.5E-02	2.5E-02	9.0E-02		
Sb-125	-1E-03 +/- 2.3E-02	2.3E-02	7.8E-02		
Se-75	-2.2E-02 +/- 1.3E-02	1.3E-02	4.5E-02		
Zn-65	-6E-02 +/- 3.8E-02	3.8E-02	1.3E-01		
Zr-95	-6.9E+00 +/- 3.0E+00	3.0E+00	9.9E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager

MAILED

APR 16 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/15/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-08 Client ID BMS-2600-095

Reference Date 02/06/03 Analysis Date 04/11/03

Product GAMMA SPECTROMETRY

Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)			TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	5.09E-01	+/-	3.2E-02	4.1E-02	1.1E-01		bc
Ag-108m	0E+00	+/-	6.0E-03	6.0E-03	2.1E-02		
Ag-110m	-1.9E-03	+/-	9.9E-03	9.9E-03	3.5E-02		
Ba-140	4.2E-01	+/-	8.0E-01	8.0E-01	2.7E+00		
Be-7	7E-02	+/-	1.2E-01	1.2E-01	4.0E-01		
Ce-141	7.5E-02	+/-	4.2E-02	4.2E-02	1.4E-01		
Ce-144	-8.9E-02	+/-	5.4E-02	5.4E-02	1.9E-01		
Co-57	-2E-04	+/-	7.0E-03	7.0E-03	2.4E-02		
Co-58	8E-03	+/-	1.3E-02	1.3E-02	4.5E-02		
Co-60	-1.17E-02	+/-	7.3E-03	7.4E-03	2.8E-02	3.8E-02	
Cr-51	-4E-01	+/-	2.9E-01	2.9E-01	1.0E+00		
Cs-134	3.1E-03	+/-	7.6E-03	7.6E-03	2.6E-02		
Cs-137	1.35E-02	+/-	7.6E-03	7.6E-03	2.5E-02	1.1E+00	
Fe-59	1.9E-02	+/-	4.1E-02	4.1E-02	1.4E-01		
I-131	8E-01	+/-	1.7E+00	1.7E+00	5.8E+00		
K-40	1.13E+01	+/-	3.0E-01	6.4E-01	3.0E-01		bc
La-140	-1.1E-01	+/-	4.0E-01	4.0E-01	1.4E+00		
Mn-54	-1.15E-02	+/-	8.6E-03	8.7E-03	3.2E-02		
Nb-95	-1.1E-02	+/-	2.5E-02	2.5E-02	9.0E-02		
Ru-103	-1.2E-02	+/-	2.1E-02	2.1E-02	7.4E-02		
Ru-106	5E-03	+/-	7.4E-02	7.4E-02	2.6E-01		
Sb-124	-4E-03	+/-	2.2E-02	2.2E-02	8.3E-02		
Sb-125	-1E-02	+/-	1.9E-02	1.9E-02	6.8E-02		
Se-75	-8E-03	+/-	1.4E-02	1.4E-02	4.7E-02		
Zn-65	3.9E-02	+/-	3.9E-02	3.9E-02	1.3E-01		
Zr-95	-1.09E-01	+/-	4.5E-02	4.6E-02	1.7E-01		

- Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

MAILED

APR 16 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/14/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-09 Client ID BMS-2600-099
Reference Date 02/06/03 Analysis Date 04/11/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.07E-01 +/- 3.0E-02	3.4E-02	1.1E-01		bc
Ag-108m	5.4E-03 +/- 6.9E-03	6.9E-03	2.3E-02		
Ag-110m	1.5E-02 +/- 1.2E-02	1.2E-02	3.9E-02		
Ba-140	9.2E-01 +/- 8.0E-01	8.1E-01	2.7E+00		
Be-7	-9E-02 +/- 1.3E-01	1.3E-01	4.6E-01		
Ce-141	5.6E-02 +/- 4.5E-02	4.5E-02	1.5E-01		
Ce-144	-3E-02 +/- 5.2E-02	5.2E-02	1.8E-01		
Co-57	-5.6E-03 +/- 6.6E-03	6.6E-03	2.3E-02		
Co-58	1.5E-02 +/- 1.2E-02	1.2E-02	3.9E-02		
Co-60	-9E-03 +/- 7.3E-03	7.3E-03	2.8E-02	3.8E-02	
Cr-51	-6E-02 +/- 2.7E-01	2.7E-01	9.3E-01		
Cs-134	1.1E-03 +/- 7.5E-03	7.5E-03	2.6E-02		
Cs-137	1E-04 +/- 7.8E-03	7.8E-03	2.7E-02	1.1E+00	
Fe-59	6E-03 +/- 4.3E-02	4.3E-02	1.5E-01		
I-131	1E+00 +/- 1.6E+00	1.6E+00	5.5E+00		
K-40	1.368E+01 +/- 3.3E-01	7.6E-01	2.5E-01		bc
La-140	2.2E-01 +/- 4.2E-01	4.2E-01	1.4E+00		
Mn-54	1.11E-02 +/- 8.3E-03	8.3E-03	2.8E-02		
Nb-95	2.4E-02 +/- 4.0E-02	4.0E-02	1.3E-01		
Ru-103	5E-03 +/- 2.2E-02	2.2E-02	7.4E-02		
Ru-106	2E-02 +/- 7.1E-02	7.1E-02	2.5E-01		
Sb-124	1.5E-02 +/- 2.0E-02	2.0E-02	7.3E-02		
Sb-125	-3.1E-02 +/- 2.0E-02	2.0E-02	7.1E-02		
Se-75	1E-03 +/- 1.3E-02	1.3E-02	4.5E-02		
Zn-65	1.1E-02 +/- 4.4E-02	4.4E-02	1.5E-01		
Zr-95	-9.2E-02 +/- 4.3E-02	4.3E-02	1.6E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

MAILED

APR 16 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/15/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-10 Client ID BMS-2600-107
Reference Date 02/06/03 Analysis Date 04/11/03

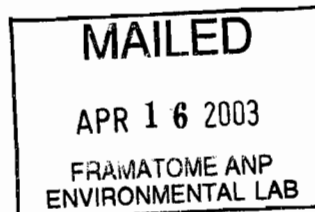
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	6.33E-01	+/- 1.9E-02	3.7E-02	8.9E-02		bc
Ag-108m	-3.1E-03	+/- 3.7E-03	3.7E-03	1.2E-02		
Ag-110m	1.17E-02	+/- 7.2E-03	7.2E-03	2.4E-02		
Ba-140	-5E-01	+/- 2.0E-01	2.0E-01	7.2E-01		
Be-7	-3E-03	+/- 7.4E-02	7.4E-02	2.5E-01		
Ce-141	8.5E-02	+/- 3.9E-02	3.9E-02	1.3E-01		
Ce-144	4.7E-02	+/- 2.5E-02	2.6E-02	8.3E-02		
Co-57	1E-03	+/- 3.2E-03	3.2E-03	1.1E-02		
Co-58	1.8E-03	+/- 7.4E-03	7.4E-03	2.5E-02		
Co-60	8E-04	+/- 5.0E-03	5.0E-03	1.7E-02	3.8E-02	
Cr-51	-1E-01	+/- 1.7E-01	1.7E-01	5.6E-01		
Cs-134	1E-03	+/- 5.8E-03	5.8E-03	1.9E-02		
Cs-137	2.44E-02	+/- 6.1E-03	6.3E-03	2.0E-02	1.1E+00	bc
Fe-59	1.4E-02	+/- 2.3E-02	2.3E-02	7.8E-02		
I-131	5E-01	+/- 1.1E+00	1.1E+00	3.7E+00		
K-40	1.183E+01	+/- 1.6E-01	6.1E-01	2.7E-01		bc
La-140	-5.8E-01	+/- 2.3E-01	2.3E-01	8.3E-01		
Mn-54	2.8E-03	+/- 5.3E-03	5.3E-03	1.8E-02		
Nb-95	-5.2E-02	+/- 2.4E-02	2.4E-02	8.1E-02		
Ru-103	-2E-03	+/- 1.2E-02	1.2E-02	4.0E-02		
Ru-106	-4.9E-02	+/- 4.7E-02	4.8E-02	1.6E-01		
Sb-124	4E-03	+/- 1.8E-02	1.8E-02	6.2E-02		
Sb-125	1.6E-02	+/- 1.2E-02	1.2E-02	3.9E-02		
Se-75	-4.9E-03	+/- 7.4E-03	7.4E-03	2.5E-02		
Zn-65	7E-03	+/- 1.2E-02	1.2E-02	4.1E-02		
Zr-95	1.4E-02	+/- 1.5E-02	1.5E-02	4.8E-02		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/14/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-11 Client ID BMS-2600-164
Reference Date 02/07/03 Analysis Date 04/11/03

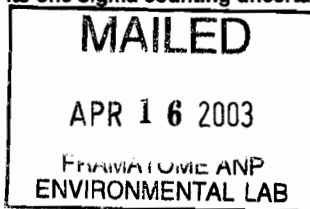
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	6.31E-01 +/- 3.2E-02	4.5E-02	1.2E-01		bc
Ag-108m	1E-04 +/- 7.0E-03	7.0E-03	2.4E-02		
Ag-110m	1.2E-02 +/- 1.1E-02	1.1E-02	3.9E-02		
Ba-140	-3E-02 +/- 7.9E-01	7.9E-01	2.7E+00		
Be-7	-1.1E-01 +/- 1.5E-01	1.5E-01	5.2E-01		
Ce-141	1.45E-01 +/- 5.1E-02	5.1E-02	1.6E-01		
Ce-144	5.6E-02 +/- 6.2E-02	6.2E-02	2.1E-01		
Co-57	-7E-04 +/- 7.7E-03	7.7E-03	2.6E-02		
Co-58	-1.9E-02 +/- 1.4E-02	1.4E-02	5.1E-02		
Co-60	-2.4E-03 +/- 7.8E-03	7.8E-03	2.8E-02	3.8E-02	
Cr-51	4E-02 +/- 2.9E-01	2.9E-01	9.9E-01		
Cs-134	2E-03 +/- 8.0E-03	8.0E-03	2.7E-02		
Cs-137	7.4E-03 +/- 8.7E-03	8.7E-03	2.9E-02	1.1E+00	
Fe-59	-2.2E-02 +/- 4.3E-02	4.3E-02	1.5E-01		
I-131	1E-01 +/- 1.7E+00	1.7E+00	5.9E+00		
K-40	1.058E+01 +/- 3.0E-01	6.1E-01	2.8E-01		bc
La-140	-4.9E-01 +/- 4.6E-01	4.6E-01	1.6E+00		
Mn-54	5.2E-03 +/- 9.1E-03	9.1E-03	3.1E-02		
Nb-95	-1E-03 +/- 4.0E-02	4.0E-02	1.4E-01		
Ru-103	-1.9E-02 +/- 2.4E-02	2.4E-02	8.3E-02		
Ru-106	1.35E-01 +/- 7.2E-02	7.3E-02	2.3E-01		
Sb-124	-2.3E-02 +/- 2.3E-02	2.3E-02	9.3E-02		
Sb-125	4E-03 +/- 2.1E-02	2.1E-02	7.3E-02		
Se-75	-1.5E-02 +/- 1.6E-02	1.6E-02	5.4E-02		
Zn-65	3.7E-02 +/- 4.4E-02	4.4E-02	1.5E-01		
Zr-95	-6.2E+00 +/- 3.1E+00	3.1E+00	1.0E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/14/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-12 Client ID BMS-2600-170
Reference Date 02/10/03 Analysis Date 04/11/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	8.9E-01 +/- 3.7E-02	5.8E-02	1.3E-01		bc
Ag-108m	-1.03E-02 +/- 7.1E-03	7.1E-03	2.5E-02		
Ag-110m	-2E-03 +/- 1.3E-02	1.3E-02	4.7E-02		
Ba-140	1E-02 +/- 7.4E-01	7.4E-01	2.5E+00		
Be-7	7E-02 +/- 1.4E-01	1.4E-01	4.8E-01		
Ce-141	7.6E-02 +/- 4.8E-02	4.8E-02	1.6E-01		
Ce-144	-6.6E-02 +/- 6.7E-02	6.8E-02	2.3E-01		
Co-57	1.14E-02 +/- 8.3E-03	8.3E-03	2.7E-02		
Co-58	-2E-02 +/- 1.5E-02	1.5E-02	5.4E-02		
Co-60	-2.5E-03 +/- 8.8E-03	8.8E-03	3.2E-02	3.8E-02	
Cr-51	-1.9E-01 +/- 3.2E-01	3.2E-01	1.1E+00		
Cs-134	-7.2E-03 +/- 8.8E-03	8.8E-03	3.1E-02		
Cs-137	4E-02 +/- 1.1E-02	1.2E-02	3.5E-02	1.1E+00	bc
Fe-59	0E+00 +/- 4.3E-02	4.3E-02	1.5E-01		
I-131	-1.4E+00 +/- 1.4E+00	1.4E+00	5.0E+00		
K-40	1.324E+01 +/- 3.4E-01	7.4E-01	3.2E-01		bc
La-140	2.4E-01 +/- 3.8E-01	3.8E-01	1.3E+00		
Mn-54	8.9E-03 +/- 9.8E-03	9.8E-03	3.3E-02		
Nb-95	-2.9E-02 +/- 4.5E-02	4.5E-02	1.6E-01		
Ru-103	-3.1E-02 +/- 2.4E-02	2.4E-02	8.5E-02		
Ru-106	-4E-02 +/- 8.6E-02	8.7E-02	3.0E-01		
Sb-124	0E+00 +/- 2.6E-02	2.6E-02	9.6E-02		
Sb-125	1.2E-02 +/- 2.4E-02	2.4E-02	8.1E-02		
Se-75	4E-03 +/- 1.6E-02	1.6E-02	5.5E-02		
Zn-65	-2.6E-02 +/- 4.9E-02	4.9E-02	1.7E-01		
Zr-95	-1.13E+01 +/- 3.7E+00	3.7E+00	1.2E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

MAILED

APR 16 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/15/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-13 Client ID BMS-2600-241
Reference Date 02/13/03 Analysis Date 04/11/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	4.69E-01 +/- 2.0E-02	3.1E-02	7.5E-02		bc
Ag-108m	-9E-04 +/- 4.6E-03	4.6E-03	1.6E-02		
Ag-110m	-3.9E-03 +/- 7.6E-03	7.6E-03	2.7E-02		
Ba-140	-2.4E-01 +/- 3.9E-01	3.9E-01	1.3E+00		
Be-7	-1.59E-01 +/- 8.8E-02	8.8E-02	3.1E-01		
Ce-141	5.5E-02 +/- 2.8E-02	2.8E-02	9.0E-02		
Ce-144	7E-03 +/- 6.0E-02	6.0E-02	2.0E-01		
Co-57	1.139E-01 +/- 7.8E-03	9.7E-03	2.3E-02		bc
Co-58	1.8E-03 +/- 8.1E-03	8.1E-03	2.8E-02		
Co-60	3.01E-02 +/- 4.7E-03	4.9E-03	1.7E-02	3.8E-02	bc
Cr-51	-1E-02 +/- 1.6E-01	1.6E-01	5.4E-01		
Cs-134	-5.4E-03 +/- 5.2E-03	5.2E-03	1.8E-02		
Cs-137	6.77E-02 +/- 7.4E-03	8.1E-03	2.1E-02	1.1E+00	bc
Fe-59	-8E-03 +/- 2.3E-02	2.3E-02	8.1E-02		
I-131	8E-02 +/- 6.4E-01	6.4E-01	2.2E+00		
K-40	1.025E+01 +/- 2.0E-01	5.5E-01	1.7E-01		bc
La-140	3.3E-01 +/- 2.0E-01	2.0E-01	6.6E-01		
Mn-54	1.2E-03 +/- 5.6E-03	5.6E-03	1.9E-02		
Nb-95	-2.2E-02 +/- 2.4E-02	2.4E-02	8.1E-02		
Ru-103	-5E-03 +/- 1.3E-02	1.3E-02	4.5E-02		
Ru-106	2.5E-02 +/- 4.6E-02	4.6E-02	1.5E-01		
Sb-124	-7E-03 +/- 1.3E-02	1.3E-02	4.8E-02		
Sb-125	-4E-03 +/- 1.3E-02	1.3E-02	4.5E-02		
Se-75	-2E-03 +/- 8.8E-03	8.8E-03	3.0E-02		
Zn-65	-1E-03 +/- 2.0E-02	2.0E-02	6.7E-02		
Zr-95	-5E+00 +/- 1.9E+00	1.9E+00	6.3E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

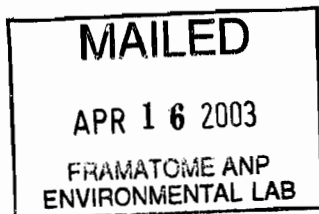
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/14/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-14 Client ID BMS-2600-259
Reference Date 02/06/03 Analysis Date 04/11/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	1.83E-01 +/- 2.9E-02	3.1E-02	1.2E-01		bc
Ag-108m	-5.4E-03 +/- 5.5E-03	5.5E-03	2.0E-02		
Ag-110m	2E-03 +/- 1.1E-02	1.1E-02	3.9E-02		
Ba-140	6E-02 +/- 6.5E-01	6.5E-01	2.3E+00		
Be-7	-5E-02 +/- 1.2E-01	1.2E-01	4.1E-01		
Ce-141	-3.1E-02 +/- 3.3E-02	3.3E-02	1.1E-01		
Ce-144	1.5E-02 +/- 3.7E-02	3.7E-02	1.3E-01		
Co-57	-6E-03 +/- 4.5E-03	4.5E-03	1.6E-02		
Co-58	-5E-03 +/- 1.2E-02	1.2E-02	4.4E-02		
Co-60	-3.5E-03 +/- 8.1E-03	8.1E-03	3.0E-02	3.8E-02	
Cr-51	2E-02 +/- 2.0E-01	2.0E-01	7.1E-01		
Cs-134	-3.1E-02 +/- 3.4E-02	3.4E-02	1.2E-01		
Cs-137	2.35E-02 +/- 7.9E-03	7.9E-03	2.4E-02	1.1E+00	
Fe-59	7.9E-02 +/- 3.9E-02	3.9E-02	1.3E-01		
I-131	1.6E+00 +/- 1.4E+00	1.4E+00	4.7E+00		
K-40	1.041E+01 +/- 3.4E-01	6.2E-01	2.7E-01		bc
La-140	6E-02 +/- 3.7E-01	3.7E-01	1.3E+00		
Mn-54	3.3E-03 +/- 7.7E-03	7.7E-03	2.7E-02		
Nb-95	-7E-03 +/- 2.8E-02	2.8E-02	9.9E-02		
Ru-103	5E-03 +/- 1.9E-02	1.9E-02	6.7E-02		
Ru-106	1.9E-02 +/- 5.9E-02	5.9E-02	2.1E-01		
Sb-124	-2.1E-02 +/- 2.4E-02	2.4E-02	9.9E-02		
Sb-125	-3E-03 +/- 1.9E-02	1.9E-02	6.8E-02		
Se-75	6.2E-03 +/- 9.8E-03	9.8E-03	3.3E-02		
Zn-65	-6.6E-02 +/- 2.2E-02	2.3E-02	8.9E-02		
Zr-95	-7.5E-02 +/- 3.5E-02	3.5E-02	1.3E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

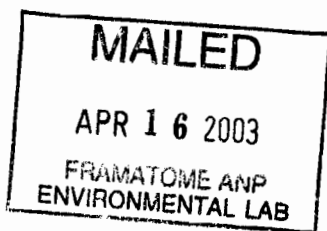
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/14/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-15 Client ID BMS-2600-278
Reference Date 02/13/03 Analysis Date 04/11/03

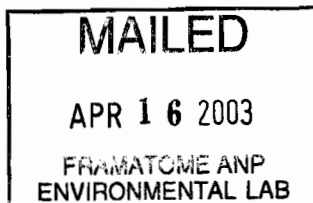
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	2.77E-01 +/- 4.5E-02	4.7E-02	1.4E-01		bc
Ag-108m	4.9E-03 +/- 8.3E-03	8.3E-03	2.9E-02		
Ag-110m	4E-03 +/- 1.2E-02	1.2E-02	4.5E-02		
Ba-140	-1.39E+00 +/- 6.1E-01	6.1E-01	2.5E+00		
Be-7	6E-02 +/- 1.5E-01	1.5E-01	5.4E-01		
Ce-141	-6E-03 +/- 4.2E-02	4.2E-02	1.5E-01		
Ce-144	-2E-02 +/- 6.1E-02	6.1E-02	2.1E-01		
Co-57	1.12E-02 +/- 8.2E-03	8.2E-03	2.7E-02		
Co-58	2E-03 +/- 1.2E-02	1.2E-02	4.5E-02		
Co-60	1.13E-02 +/- 9.3E-03	9.3E-03	3.2E-02	3.8E-02	
Cr-51	-5E-02 +/- 2.9E-01	2.9E-01	1.0E+00		
Cs-134	-7E-03 +/- 4.7E-02	4.7E-02	1.6E-01		
Cs-137	3.63E-01 +/- 2.3E-02	3.0E-02	4.0E-02	1.1E+00	bc
Fe-59	3.1E-02 +/- 3.5E-02	3.5E-02	1.2E-01		
I-131	-3E-01 +/- 1.3E+00	1.3E+00	4.6E+00		
K-40	3.06E+00 +/- 2.5E-01	2.9E-01	4.0E-01		bc
La-140	3.8E-01 +/- 3.4E-01	3.4E-01	1.2E+00		
Mn-54	-1.06E-02 +/- 9.8E-03	9.8E-03	3.8E-02		
Nb-95	-3.6E-02 +/- 2.3E-02	2.3E-02	9.4E-02		
Ru-103	7E-03 +/- 2.2E-02	2.2E-02	7.9E-02		
Ru-106	-3E-02 +/- 9.0E-02	9.0E-02	3.3E-01		
Sb-124	1.5E-02 +/- 2.4E-02	2.4E-02	9.2E-02		
Sb-125	-4.1E-02 +/- 2.4E-02	2.4E-02	9.3E-02		
Se-75	1.2E-02 +/- 1.6E-02	1.6E-02	5.4E-02		
Zn-65	-1E-02 +/- 2.4E-02	2.4E-02	9.1E-02		
Zr-95	-4.6E-02 +/- 3.6E-02	3.6E-02	1.4E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/15/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5186-16 Client ID BMS-2600-338
Reference Date 02/05/03 Analysis Date 04/11/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	7.85E-01 +/- 1.5E-02	4.2E-02	5.3E-02		bc
Ag-108m	-2.8E-03 +/- 2.9E-03	2.9E-03	9.9E-03		
Ag-110m	5E-03 +/- 5.5E-03	5.5E-03	1.8E-02		
Ba-140	-4.7E-01 +/- 3.9E-01	3.9E-01	1.3E+00		
Be-7	2.1E-02 +/- 6.0E-02	6.0E-02	2.0E-01		
Ce-141	-5.3E-02 +/- 2.7E-02	2.7E-02	9.1E-02		
Ce-144	1.6E-02 +/- 2.1E-02	2.1E-02	6.8E-02		
Co-57	1.8E-03 +/- 2.6E-03	2.6E-03	8.5E-03		
Co-58	5.3E-03 +/- 5.6E-03	5.6E-03	1.9E-02		
Co-60	2E-03 +/- 4.0E-03	4.0E-03	1.3E-02	3.8E-02	
Cr-51	-7E-02 +/- 1.3E-01	1.3E-01	4.5E-01		
Cs-134	3.2E-03 +/- 3.7E-03	3.7E-03	1.3E-02		
Cs-137	1E-04 +/- 6.0E-03	6.0E-03	2.0E-02	1.1E+00	
Fe-59	-3.3E-02 +/- 1.7E-02	1.7E-02	6.1E-02		
I-131	-3.7E-01 +/- 9.6E-01	9.6E-01	3.2E+00		
K-40	2.676E+00 +/- 8.8E-02	1.6E-01	2.0E-01		bc
La-140	5E-02 +/- 2.1E-01	2.1E-01	7.2E-01		
Mn-54	-2.5E-03 +/- 4.2E-03	4.2E-03	1.4E-02		
Nb-95	4E-02 +/- 1.7E-02	1.7E-02	5.4E-02		
Ru-103	1.2E-03 +/- 9.6E-03	9.6E-03	3.2E-02		
Ru-106	-1.8E-02 +/- 3.7E-02	3.7E-02	1.3E-01		
Sb-124	2.6E-02 +/- 1.6E-02	1.6E-02	5.2E-02		
Sb-125	4E-04 +/- 9.4E-03	9.4E-03	3.1E-02		
Se-75	3.8E-03 +/- 5.2E-03	5.2E-03	1.7E-02		
Zn-65	4.5E-02 +/- 1.8E-02	1.8E-02	5.9E-02		
Zr-95	-5.9E-02 +/- 6.6E-02	6.6E-02	2.2E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager

MAILED

APR 16 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-01 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-018
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-06-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 747.6 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/11/03 0131Z Det No.: 4 Spectrum No.: 1015509
Counted by: en
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5186-01
Client Id : BMS-2600-018
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/06/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	747.6		
Sample Weight-Dry	g			
Aliquot Weight	g	747.6		
FINAL WEIGHT	kg	.7476		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5186-01 analyzed by emml461 on 04/11/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5186-01 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1015504

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 13:12:11
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 8430 Sec
Sample Size 7.48E-001 kg | Real Time 8434 Sec
Collection Efficiency 1.0000 | Spc. File 1015504.spc

Detector #: 4 (Canberra sn 10923050 det#4)
Energy(keV)= 0.85 + 0.662*Ch + -1.27E-07*Ch^2 + 3.49E-11*Ch^3 04/11/2003
FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

=====

PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	60.13	89.61	19	19	30	201	0.89 a	NET< CL
2	63.86	95.25	98	26	40	302	1.36 b	
3	75.14	112.29	222	35	51	417	1.75 a	Wide Pk
4	77.58	115.99	240	24	31	209	0.91 b	
5	87.81	131.46	81	16	21	123	0.51 a	
6	90.26	135.15	47	25	39	308	1.04 b	
7	93.11	139.47	112	20	27	185	0.73 c	
8	144.67	217.41	12	17	28	171	0.40	NET< CL
9	186.71	280.96	71	25	38	251	1.33	
10	239.13	360.20	375	25	25	125	1.03 a	
11	242.03	364.59	105	22	32	175	1.42 b	
12	270.74	407.99	16	19	31	163	0.77	NET< CL
13	295.59	445.57	144	21	29	132	1.27	
14	314.94	474.81	2	16	25	111	0.08	NET< CL
15	338.96	511.13	64	17	24	102	1.25	
16	352.43	531.50	253	22	26	107	1.38	
17	463.82	699.90	30	15	24	84	0.90	
18	510.86	771.02	101	16	21	63	2.03 a	
19	511.94	772.65	64	12	15	42	1.38 b	
20	583.60	881.01	132	17	20	58	1.38	
21	609.86	920.70	185	18	18	52	1.61	
22	795.05	1200.71	10	10	15	40	0.56	NET< CL
23	911.74	1377.13	77	13	16	41	1.97	
24	968.88	1463.53	60	14	19	59	2.54	Wide Pk
25	1120.90	1693.36	25	11	16	44	1.25	
26	1461.23	2207.89	708	27	9	15	2.28	
27	1765.33	2667.56	22	7	8	10	1.71	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	2615.23	3951.65	40	6	0	0	3.11	

L5186-01 analyzed by emml461 on 04/11/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	63.86	98	27	40	57	27	42	
3	75.14	222	35	51	199	35	52	
4	77.58	240	24	31	212	24	32	
5	87.81	81	16	21	69	16	22	
6	90.26	47	25	39	39	25	40	NET<CL
7	93.11	112	20	27	18	20	32	NET<CL
8	144.67	12	17	28	4	17	28	NET<CL
9	186.71	71	25	38	30	25	40	NET<CL
10	239.13	375	25	25	340	25	27	
11	242.03	105	22	32	91	22	33	
13	295.59	144	21	29	123	21	30	
15	338.96	64	17	24	58	17	25	
16	352.43	253	22	26	214	23	28	
17	463.82	30	15	24	28	16	24	
18	510.86	101	16	21	-22	16	28	NET<CL
20	583.60	133	17	20	122	17	21	
21	609.86	185	18	18	157	18	20	
23	911.74	77	13	16	71	13	17	
24	968.88	60	14	19	58	14	20	
25	1120.90	25	11	16	20	11	17	
26	1461.23	708	27	9	699	27	11	
27	1765.33	22	7	8	18	7	8	
28	2615.23	40	6	0	32	6	5	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	63.86	57	Th-234	. . . . .	1 of 2	41.26	0.91	
3	75.14	199	Pb-212	147	4 of 6	100.00	1.50	
			Pb-214	51	5 of 7	100.00	1.00	
			Pb-212	86	4 of 6	95.97	0.96	
			Tl-208	9	4 of 9	89.51	0.90	
			Pb-212	147	4 of 6	100.00	1.50	
4	77.58	212	Pb-214	. . . . .	0 of 0	. . . .	. . . .
			Pb-214	90	5 of 7	100.00	1.00	
5	87.81	69	Pb-212	82	4 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
10	239.13	340	Pb-212	452	4 of 6	100.00	1.50	
11	242.03	91	Pb-214	57	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
13	295.59	123	Pb-214	132	5 of 7	100.00	1.50	
15	338.96	58	AcTh-228	71	4 of 36	86.98	1.37	
16	352.43	214	Pb-214	229	5 of 7	100.00	1.50	
17	463.82	28	AcTh-228	20	4 of 36	73.11	1.23	
			Sb-125	. . . . .	1 of 8	13.67	0.64	LowScore
19	511.94	34	Annil	. . . . .	1 of 1	100.00	1.50	Split
29	511.94	30	Tl-208	30	4 of 9	91.56	1.42	AutoAdd
20	583.60	122	Tl-208	108	4 of 9	94.37	1.44	
21	609.86	157	Bi-214	112	3 of 33	93.94	1.44	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
23	911.74	71	AcTh-228	80	4 of 36	82.67	1.33	
24	968.88	58	AcTh-228	40	4 of 36	73.11	1.23	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
25	1120.90	20	Bi-214	31	3 of 33	100.00	1.50	
26	1461.23	699	K-40	. . . . .	1 of 1	100.00	1.50	
27	1765.33	18	Bi-214	22	3 of 33	93.94	1.44	
28	2615.23	32	Tl-208	49	4 of 9	100.00	1.50	

L5186-01 analyzed by emml461 on 04/11/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5186-01

Sample ID: SOIL/SEDI Duratek Inc

Code: 1015504

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 13:12:11
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54e+003 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 8430 Sec
Sample Size 7.48e-001 kg | Real Time 8434 Sec
Collection Efficiency 1.0000 | Spectrum File 1015504.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 4 (Canberra sn 10923050 det#4)

Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)

Eff.=1/[1.58E-02*En^-3.09E+00 + 2.56E+02*En^7.93E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File: L5186-01.LSF (SOIL/SEDI: Duratek Inc)

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Th-234	63.29	7.04E+02 +- 3.28E+02	1.07E+03		+
Pb-212	238.63	2.74E+02 +- 1.99E+01	8.61E+01		+	. . . . .
	77.12	I.D. . . . .	. . . . .			. . . . .
	87.30	I.D. . . . .	. . . . .			. . . . .
Pb-214	Average:x	2.83E+02 +- 2.41E+01	. . . . .		*	. . . . .
	77.11	I.D. . . . .	. . . . .			. . . . .
	241.98	4.41E+02 +- 1.07E+02	3.30E+02		+	. . . . .
	295.21	2.68E+02 +- 4.68E+01	1.38E+02		+	. . . . .
	351.92	2.77E+02 +- 2.92E+01	7.66E+01		+	. . . . .
Ra-226	186.22 N	2.74E+02 +- 2.30E+02	7.62E+02		x	. . . . .
AcTh-228	Average:x	2.74E+02 +- 3.60E+01	. . . . .		*	. . . . .
	338.32	2.36E+02 +- 6.93E+01	2.15E+02		+	. . . . .
	463.00	3.82E+02 +- 2.11E+02	6.89E+02		+	. . . . .
	911.07	2.60E+02 +- 4.87E+01	1.34E+02		+	. . . . .
	969.11	3.73E+02 +- 9.13E+01	2.71E+02		+	. . . . .
Annil	511.00	2.47E+01 +- 1.55E+01	5.11E+01		+	. . . . .
Tl-208	Average:x	2.50E+02 +- 2.87E+01	. . . . .		*	. . . . .
	583.14	2.87E+02 +- 3.96E+01	1.05E+02		+	. . . . .
	2614.66	2.08E+02 +- 4.18E+01	8.22E+01		+	. . . . .
	510.84	I.D. . . . .	. . . . .			. . . . .
Bi-214	Average:x	2.37E+02 +- 2.52E+01	. . . . .		*	. . . . .
	609.31	2.51E+02 +- 2.82E+01	6.97E+01		+	. . . . .
	1120.29	1.55E+02 +- 8.91E+01	2.91E+02		+	. . . . .
	1764.49	1.94E+02 +- 7.20E+01	2.12E+02		+	. . . . .
K-40	1460.81	9.70E+03 +- 3.78E+02	3.35E+02		+	. . . . .
Am-241	59.54 N	2.45E+01 +- 3.09E+01	1.04E+021		x lbase	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N	E	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Co-57	122.06	N-5.21E-01	+-	6.77E+00	2.32E+01		x	. . . . .
Ce-144	133.54	N-2.31E+00	+-	5.39E+01	1.85E+02		x	. . . . .
Ce-141	145.44	N 5.18E+01	+-	4.29E+01	1.43E+02		x	. . . . .
Se-75	264.65	N-4.68E-01	+-	1.34E+01	4.68E+01		x	. . . . .
Cr-51	320.08	N 1.36E+02	+-	3.10E+02	1.06E+03		x	. . . . .
I-131	364.48	N 2.14E+03	+-	1.88E+03	6.32E+03		x	. . . . .
Sb-125	427.89	N-4.59E+01	+-	2.12E+01	8.20E+01		x	. . . . .
Ag-108m	433.93	N-3.73E+00	+-	6.80E+00	2.47E+01		x	. . . . .
Be-7	477.59	N-1.48E+02	+-	1.41E+02	5.22E+02		x	. . . . .
La-140	487.03	N-1.76E+02	+-	4.26E+02	1.55E+03		x	. . . . .
Ru-103	497.08	N-1.53E+01	+-	2.31E+01	8.43E+01		x	. . . . .
Ba-140	537.32	N-4.33E+02	+-	8.52E+02	3.11E+03		x	. . . . .
Cs-134	604.70	N-8.27E+00	+-	8.04E+00	2.99E+01		x	lbase
Ru-106	621.84	N-8.09E+01	+-	8.75E+01	3.24E+02		x	. . . . .
Cs-137	661.65	N 2.66E+01	+-	9.87E+00	3.06E+01		x	Y.
Zr-95	724.18	N-3.05E+01	+-	3.81E+01	1.41E+02		x	. . . . .
Nb-95	765.79	N-1.78E+01	+-	2.79E+01	1.04E+02		x	. . . . .
Co-58	810.76	N-3.35E+01	+-	1.33E+01	5.53E+01		x	. . . . .
Mn-54	834.83	N-3.97E+00	+-	8.97E+00	3.33E+01		x	. . . . .
Ag-110m	884.67	N-9.83E+00	+-	1.41E+01	5.26E+01		x	. . . . .
Fe-59	1099.22	N 1.70E+01	+-	4.97E+01	1.76E+02		x	. . . . .
Zn-65	1115.52	N-5.65E+00	+-	2.33E+01	8.55E+01		x	lbase
Co-60	1332.49	N-1.09E+01	+-	9.44E+00	3.74E+01		x	Y.
Sb-124	1691.02	N-1.42E+01	+-	2.66E+01	1.13E+02		x	. . . . .

MEASURED TOTAL: 1.17E+04 +- 8.55E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	60.13	89.61	19	19	30	201	0.89	Deleted
6	90.26	135.15	39	25	40	308	1.04	Deleted
7	93.11	139.47	18	20	32	185	0.73	Deleted
8	144.67	217.41	4	17	28	171	0.40	Deleted
12	270.74	407.99	16	19	31	163	0.77	Deleted
14	314.94	474.81	2	16	25	111	0.08	Deleted
18	510.86	771.02	-22	16	28	63	2.03	Deleted
22	795.05	1200.71	10	10	15	41	0.56	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
9	186.71	280.96	30N	25	40	251	1.33	NET< CL
30	59.54	88.72	17N	21	34	228	0.98	NET< CL
								LBase
31	122.06	183.23	-2N	19	32	208	1.04	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
32	133.54	200.58	-1N	19	32	206	1.05	NET< CL
33	145.44	218.57	24N	20	32	206	1.06	NET< CL
34	264.65	398.79	-1N	14	24	113	1.17	NET< CL
35	320.08	482.59	6N	14	22	91	1.21	NET< CL
36	364.49	549.72	14N	12	19	69	1.25	NET< CL
37	427.90	645.60	-23N	11	19	68	1.30	NET< CL
38	433.94	654.73	-6N	11	18	60	1.30	NET< CL
39	477.60	720.74	-11N	10	18	60	1.34	NET< CL
40	487.04	735.02	-4N	10	16	49	1.34	NET< CL
41	497.09	750.21	-7N	11	18	59	1.35	NET< CL
42	537.34	811.06	-5N	10	17	51	1.38	NET< CL
43	604.73	912.94	-10N	10	17	51	1.43	NET< CL
								LBase
44	621.87	938.86	-9N	10	17	51	1.44	NET< CL
45	661.68	999.06	29N	11	15	39	1.47	
46	724.23	1093.62	-8N	10	17	48	1.52	NET< CL
47	765.84	1156.54	-6N	9	15	45	1.55	NET< CL
48	810.82	1224.55	-19N	8	14	41	1.58	NET< CL
49	834.77	1260.75	-4N	8	14	38	1.60	NET< CL
50	884.62	1336.13	-6N	9	15	40	1.64	NET< CL
51	1099.25	1660.63	3N	9	14	37	1.79	NET< CL
52	1115.56	1685.29	-2N	8	14	35	1.80	NET< CL
								LBase
53	1332.51	2013.29	-8N	7	12	25	1.95	NET< CL
54	1691.07	2555.33	-2N	4	7	8	2.20	NET< CL

L5186-01 analyzed by emml461 on 04/11/2003

 S E E K E R A N A L Y S I S S U M M A R Y
 Environmental Laboratory
 Environmental Gamma Isotopic Analysis

 Sample ID : SOIL/SEDI Duratek Inc

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 13:12:11
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54E+03 Hrs
 Buildup Time. 0.00E+00 Hrs | Live Time 8430 Sec
 Sample Size 7.48E-01 kg | Real Time 8434 Sec
 Collection Efficiency 1.0000 | Spectrum File 1015504.spc

Detector #: 4
 Energy(keV)= 0.85 + 0.662*Ch + -1.27E-07*Ch^2 + -1.27E-07*Ch^3 04/11/2003
 FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003
 Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
 Eff.=1/[1.58e-02*En^-3.09e+00 + 2.56e+02*En^ 7.93e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5186-01.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	7.04E+02	3.28E+02	< 1.07E+03	5.17E+02	9.99E-01	MEAS +	YES
Pb-212	2.74E+02	1.99E+01	< 8.61E+01	4.20E+01	9.96E-01	MEAS +	YES
Pb-214	2.83E+02	2.41E+01	< 7.66E+01	3.65E+01	9.99E-01	MEAS +	YES
Ra-226	2.74E+02	2.30E+02	< 7.62E+02	3.69E+02	1.00E+00	NET	YES
AcTh-228	2.74E+02	3.60E+01	< 1.34E+02	6.19E+01	1.00E+00	MEAS +	YES
Annul	2.47E+01	1.55E+01	< 5.11E+01	2.45E+01	8.86E-01	MEAS +	YES
Tl-208	2.50E+02	2.88E+01	< 8.22E+01	3.22E+01	1.00E+00	MEAS +	YES
Bi-214	2.37E+02	2.52E+01	< 6.97E+01	3.27E+01	9.99E-01	MEAS +	YES
K-40	9.70E+03	3.78E+02	< 3.35E+02	1.49E+02	1.00E+00	MEAS +	YES
Am-241	2.45E+01	3.09E+01	< 1.04E+02	4.99E+01	1.00E+00	NET	YES
Co-57	-5.21E-01	6.77E+00	< 2.32E+01	1.11E+01	8.49E-01	NET	YES
Ce-144	-2.32E+00	5.39E+01	< 1.85E+02	8.88E+01	8.55E-01	NET	YES
Ce-141	5.18E+01	4.29E+01	< 1.43E+02	6.84E+01	2.55E-01	NET	YES
Se-75	-4.68E-01	1.34E+01	< 4.68E+01	2.21E+01	6.90E-01	NET	YES
Cr-51	1.36E+02	3.10E+02	< 1.06E+03	5.02E+02	2.01E-01	NET	YES
I-131	2.14E+03	1.88E+03	< 6.32E+03	2.95E+03	3.99E-03	NET	YES
Sb-125	-4.59E+01	2.12E+01	< 8.20E+01	3.83E+01	9.57E-01	NET	YES
Ag-108m	-3.73E+00	6.80E+00	< 2.46E+01	1.15E+01	9.99E-01	NET	YES
Be-7	-1.48E+02	1.41E+02	< 5.22E+02	2.43E+02	4.35E-01	NET	YES
La-140	-1.76E+02	4.26E+02	< 1.55E+03	7.16E+02	3.10E-02	NET	YES
Ru-103	-1.53E+01	2.31E+01	< 8.43E+01	3.92E+01	3.23E-01	NET	YES
Ba-140	-4.33E+02	8.52E+02	< 3.11E+03	1.44E+03	3.10E-02	NET	YES
Cs-134	-8.27E+00	8.04E+00	< 2.99E+01	1.39E+01	9.43E-01	NET	YES
Ru-106	-8.09E+01	8.75E+01	< 3.24E+02	1.50E+02	8.86E-01	NET	YES
Cs-137	2.66E+01	9.87E+00	< 3.06E+01	1.40E+01	9.96E-01	NET	YES
Zr-95	-3.05E+01	3.81E+01	< 1.41E+02	6.52E+01	5.00E-01	NET	YES
Nb-95	-1.78E+01	2.79E+01	< 1.04E+02	4.75E+01	2.82E-01	NET	YES
Co-58	-3.35E+01	1.33E+01	< 5.53E+01	2.53E+01	5.34E-01	NET	YES
Mn-54	-3.97E+00	8.97E+00	< 3.33E+01	1.51E+01	8.68E-01	NET	YES
Ag-110m	-9.83E+00	1.41E+01	< 5.26E+01	2.41E+01	8.37E-01	NET	YES
Fe-59	1.70E+01	4.97E+01	< 1.76E+02	8.01E+01	3.70E-01	NET	YES
Zn-65	-5.65E+00	2.33E+01	< 8.55E+01	3.89E+01	8.34E-01	NET	YES
Co-60	-1.09E+01	9.44E+00	< 3.74E+01	1.68E+01	9.77E-01	NET	YES

L5186-01 analyzed by emm1461 on 04/11/2003
Activity Units: pCi/kg
Nuclide Activity Uncertainty MDA CL ACT DECAY FLAG SEN MET
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Sb-124	-1.42E+01	2.66E+01	< 1.13E+02	4.67E+01	4.78E-01	NET	YES
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-02 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-024
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-06-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 532.8 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/1/03 11:15 Det No.: 8 Spectrum No.: 1014608
Counted by: EL
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5186-02
Client Id : BMS-2600-024
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/06/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	532.8		
Sample Weight-Dry	g			
Aliquot Weight	g	532.8		
FINAL WEIGHT	kg	.5328		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-02

Sample ID: SOIL/SEDI Duratek Inc

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 11:15:27
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 10429 Sec
 Sample Size 5.33E-001 kg | Real Time 10440 Sec
 Collection Efficiency 1.0000 | Spc. File 1014608.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Energy(keV)= -0.01 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003
 FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.38	95.65	48	45	73	844	0.62	NET< CL
2	74.56	112.53	461	51	76	904	1.67	a
3	76.90	116.07	645	45	61	678	1.22	b
4	86.89	131.15	180	30	44	435	0.95	a
5	89.58	135.19	98	33	52	543	1.06	b
6	92.65	139.83	261	40	59	652	1.35	c
7	104.95	158.39	-22	44	72	774	0.98	NET< CL
8	163.49	246.75	22	33	55	508	0.49	NET< CL
9	185.91	280.58	216	47	73	732	1.30	
10	209.32	315.91	46	42	68	645	0.73	NET< CL
11	238.40	359.79	1264	44	41	318	1.28	a
12	241.40	364.32	321	42	62	530	2.16	b Wide Pk
13	270.02	407.52	64	30	47	348	1.35	
14	294.99	445.19	385	29	36	235	1.36	a
15	299.65	452.22	61	23	36	235	1.34	b
16	327.67	494.52	54	28	45	302	1.21	
17	338.08	510.22	280	31	44	282	1.52	
18	351.71	530.80	756	38	44	286	1.39	
19	408.94	617.17	35	19	29	156	1.06	
20	462.70	698.29	86	25	38	195	2.11	
21	510.70	770.74	397	27	31	162	2.29	Wide Pk
22	582.96	879.79	444	28	30	150	1.61	
23	609.15	919.31	623	31	30	145	1.59	
24	661.05	997.64	25	17	27	125	1.19	NET< CL
25	727.29	1097.61	117	19	26	114	1.67	
26	767.62	1158.47	19	17	28	132	0.78	NET< CL
27	785.25	1185.07	44	16	25	95	2.41	
28	794.83	1199.53	94	18	24	92	2.21	

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
29	840.32	1268.18	12	14	23	92	1.38	NET< CL
30	860.66	1298.88	64	17	25	96	1.51	
31	911.08	1374.98	283	23	25	98	1.82	
32	964.08	1454.96	48	15	22	82	1.95	a
33	968.99	1462.37	192	18	20	73	1.78	b
34	1120.06	1690.36	123	20	27	114	2.22	
35	1237.34	1867.35	77	19	27	122	2.41	
36	1378.48	2080.36	32	12	17	53	1.79	
37	1460.76	2204.53	1563	40	14	30	2.27	
38	1729.62	2610.28	17	8	11	22	2.07	
39	1764.20	2662.47	108	13	13	25	2.30	
40	2103.06	3173.86	25	9	13	27	2.94	
41	2614.52	3945.73	191	15	10	16	3.30	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.38	48	45	73	0	45	74	NET<CL
2	74.56	461	51	76	443	51	76	
3	76.90	645	45	61	615	45	62	
4	86.89	180	30	44	159	31	46	
6	92.65	261	40	59	145	40	62	
9	185.91	216	47	73	155	47	74	
11	238.40	1264	44	41	1216	44	43	
12	241.40	321	42	62	299	42	63	
14	294.99	385	29	36	340	29	38	
16	327.67	55	28	45	55	29	45	
17	338.08	280	31	44	270	32	44	
18	351.71	757	38	44	690	39	46	
20	462.70	86	25	38	85	25	38	
21	510.70	397	27	31	134	28	41	
22	582.96	444	28	30	430	28	31	
23	609.15	623	31	30	564	31	33	
26	767.62	19	17	28	13	17	28	NET<CL
31	911.08	283	23	25	274	23	26	
32	964.08	48	15	22	42	15	22	
33	968.99	192	18	20	185	18	20	
34	1120.06	123	20	27	114	20	28	
35	1237.34	77	19	27	76	19	27	
36	1378.48	32	12	17	27	12	18	
37	1460.76	1563	40	14	1540	40	16	
38	1729.62	17	8	11	15	8	12	
39	1764.20	108	13	13	96	13	14	
41	2614.52	191	15	10	175	15	12	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.56	443	Pb-212	232	5 of 6	100.00	1.00	
			Tl-208	14	7 of 9	96.39	0.96	
			Pb-214	116	6 of 7	100.00	1.00	
			Tl-208	25	7 of 9	96.39	0.96	
3	76.90	615	Pb-214	208	6 of 7	100.00	1.00	
			Tl-208	25	7 of 9	96.39	0.96	
			Pb-212	413	5 of 6	100.00	1.00	
4	86.89	159	Pb-212	227	5 of 6	100.00	1.50	
			Tl-208	14	7 of 9	96.39	0.96	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
5	89.58	98	Cd-109	. . . . .	1 of 1	100.00	1.50	
6	92.65	43	Th-234	. . . . .	1 of 2	100.00	1.00	Split
44	92.65	102	AcTh-228	102	10 of 36	82.96	1.33	AutoAdd
9	185.91	155	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
11	238.40	1216	Pb-212	1776	5 of 6	100.00	1.00	
12	241.40	299	Pb-214	167	6 of 7	100.00	1.00	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
13	270.02	64	AcTh-228	87	10 of 36	88.50	1.38	
14	294.99	340	Pb-214	414	6 of 7	100.00	1.50	
15	299.65	61	Pb-212	79	5 of 6	100.00	1.50	
16	327.67	55	AcTh-228	69	10 of 36	88.50	1.38	
			Bi-212	2	3 of 13	69.12	1.19	
			La-140	11743	2 of 15	23.26	0.23	LowScore
17	338.08	270	AcTh-228	233	10 of 36	83.80	1.34	
18	351.71	690	Pb-214	1174	6 of 7	100.00	1.50	
19	408.94	35	AcTh-228	39	10 of 36	86.76	1.37	
20	462.70	85	AcTh-228	75	10 of 36	83.80	1.34	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
21	510.70	16	Annul	. . . . .	1 of 1	100.00	1.50	Split
43	510.70	118	Tl-208	118	7 of 9	97.07	1.47	AutoAdd
22	582.96	430	Tl-208	413	7 of 9	97.07	1.47	
23	609.15	564	Bi-214	564	6 of 33	80.69	1.31	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.50	
25	727.29	117	Bi-212	144	3 of 13	83.48	1.33	
27	785.25	25	Pb-214	12	6 of 7	100.00	1.50	Split
42	785.25	19	Bi-212	19	3 of 13	83.48	1.33	AutoAdd
28	794.83	94	AcTh-228	54	10 of 36	79.31	1.29	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
30	860.66	64	Tl-208	48	7 of 9	97.07	1.47	
31	911.08	274	AcTh-228	328	10 of 36	86.76	1.37	
32	964.08	42	AcTh-228	55	10 of 36	88.50	1.38	
33	968.99	185	AcTh-228	171	10 of 36	85.32	1.35	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
34	1120.06	114	Bi-214	124	6 of 33	81.83	1.32	
35	1237.34	76	Bi-214	45	6 of 33	75.01	1.25	
36	1378.48	27	Bi-214	29	6 of 33	81.83	1.32	
37	1460.76	1540	K-40	. . . . .	1 of 1	100.00	1.50	
38	1729.62	15	Bi-214	18	6 of 33	83.72	1.34	
39	1764.20	96	Bi-214	96	6 of 33	80.69	1.31	
40	2103.06	25	2615SEsc	. . . . .	0 of 0	. . .	0.50	
41	2614.52	175	Tl-208	193	7 of 9	97.07	1.47	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-02

Sample ID: SOIL/SEDI Duratek Inc

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 11:15:27
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 10429 Sec
 Sample Size 5.33e-001 kg | Real Time 10440 Sec
 Collection Efficiency 1.0000 | Spectrum File 1014608.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5186-02.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

		N						
	ENERGY E		Concentration					
Nuclide	(keV)	(pCi/kg)	MDA	Flags	Notes	MDC	
<hr/>								
Pb-212	Average:x	7.49E+02	+ - 2.68E+01	. . . .		*	. . . .
	74.81	I.D.	. . . .	. . . .			. . . .
	87.30	I.D.	. . . .	. . . .			. . . .
	238.63	7.51E+02	+ - 2.70E+01	5.53E+01		+	. . . .
	300.09	5.72E+02	+ - 2.15E+02	6.90E+02		+	. . . .
Pb-214	Average:x	6.35E+02	+ - 2.85E+01	. . . .		*	. . . .
	77.11	I.D.	. . . .	. . . .			. . . .
	241.98	1.11E+03	+ - 1.55E+02	4.74E+02		+	. . . .
	295.21	5.56E+02	+ - 4.81E+01	1.28E+02		+	. . . .
	351.92	6.53E+02	+ - 3.64E+01	9.02E+01		+	. . . .
	785.91	1.38E+03	+ - 1.55E+03	5.16E+03		+	. . . .
Cd-109	88.03	I.D.	. . . .	. . . .			. . . .
Th-234	92.59	1.95E+02	+ - 3.15E+02	1.04E+03		+	. . . .
Ra-226	186.22	1.13E+03	+ - 3.41E+02	1.10E+03		+	. . . .
AcTh-228	Average:x	7.12E+02	+ - 3.71E+01	. . . .		*	. . . .
	270.23	5.28E+02	+ - 2.44E+02	7.96E+02		+	. . . .
	327.64	5.81E+02	+ - 3.00E+02	9.81E+02		+	. . . .
	338.32	8.13E+02	+ - 9.49E+01	2.74E+02		+	. . . .
	409.51	6.38E+02	+ - 3.39E+02	1.11E+03		+	. . . .
	463.00	8.10E+02	+ - 2.36E+02	7.47E+02		+	. . . .
	794.70	1.22E+03	+ - 2.31E+02	6.70E+02		+	. . . .
	911.07	6.48E+02	+ - 5.40E+01	1.29E+02		+	. . . .
	964.60	5.52E+02	+ - 1.96E+02	6.18E+02		+	. . . .
	969.11	7.63E+02	+ - 7.59E+01	1.80E+02		+	. . . .
	93.35	I.D.	. . . .	. . . .			. . . .
Annul	511.00	8.27E+00	+ - 2.45E+01	8.16E+01		+	. . . .
Tl-208	Average:x	6.80E+02	+ - 3.48E+01	. . . .		*	. . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration		MDA	Flags	Notes	MDC
		(pCi/kg)				
	583.14	6.96E+02	+- 4.54E+01	1.05E+02		++	. . . . .
	860.37	8.99E+02	+- 2.41E+02	7.40E+02		++	. . . . .
	2614.66	6.44E+02	+- 5.57E+01	9.93E+01		++	. . . . .
	510.84	I.D.	. . . . .	. . . . .			. . . . .
Bi-214	Average:x	6.14E+02	+- 2.93E+01	. . . . .		*	. . . . .
	609.31	6.14E+02	+- 3.37E+01	7.42E+01		++	. . . . .
	1120.29	5.67E+02	+- 9.93E+01	2.89E+02		++	. . . . .
	1238.11	1.02E+03	+- 2.53E+02	7.72E+02		++	. . . . .
	1377.67	5.69E+02	+- 2.53E+02	8.09E+02		+	. . . . .
	1729.59	5.22E+02	+- 2.75E+02	8.83E+02		+	. . . . .
	1764.49	6.16E+02	+- 8.39E+01	2.00E+02		++	. . . . .
Bi-212	Average:x	5.62E+02	+- 9.19E+01	. . . . .		*	. . . . .
	727.17	5.62E+02	+- 9.26E+01	2.65E+02		++	. . . . .
	785.46	5.64E+02	+- 7.08E+02	2.37E+03		+	. . . . .
K-40	1460.81	1.29E+04	+- 3.40E+02	2.92E+02		++	. . . . .
Am-241	59.54	N-1.29E+02	+- 5.53E+01	1.93E+02		x	. . . . .
Co-57	122.06	N 8.81E-01	+- 9.23E+00	3.11E+01		x	. . . . .
Ce-144	133.54	N-9.01E+01	+- 7.29E+01	2.51E+02		x	. . . . .
Ce-141	145.44	N 2.48E+01	+- 5.58E+01	1.87E+02		x	. . . . .
Se-75	264.65	N-2.13E+00	+- 1.58E+01	5.42E+011		x lbase	. . . . .
Cr-51	320.08	N-2.14E+02	+- 3.74E+02	1.29E+03		x	. . . . .
I-131	364.48	N 2.19E+03	+- 2.13E+03	7.11E+03		x	. . . . .
Sb-125	427.89	N-1.19E+00	+- 2.70E+01	9.29E+01		x	. . . . .
Ag-108m	433.93	N-2.62E+00	+- 8.10E+00	2.81E+01		x	. . . . .
Be-7	477.59	N-1.45E+02	+- 1.58E+02	5.58E+02		x	. . . . .
La-140	487.03	N-1.02E+01	+- 5.25E+02	1.81E+03		x	. . . . .
Ru-103	497.08	N-4.74E+01	+- 2.26E+01	8.36E+01		x	. . . . .
Ba-140	537.32	N 1.32E+03	+- 8.85E+02	2.92E+03		x	. . . . .
Cs-134	604.70	N 1.30E+01	+- 3.59E+01	1.19E+02P		x PIC	. . . . .
Ru-106	621.84	N 8.23E+01	+- 9.14E+01	3.08E+02		x	. . . . .
Cs-137	661.65	N 1.94E+01	+- 9.90E+00	3.22E+01		x Y.	. . . . .
Zr-95	724.18	N-1.46E+02	+- 3.85E+02	1.27E+03P		x PIC	. . . . .
Nb-95	765.79	N 1.90E+01	+- 3.24E+01	1.10E+02		x	. . . . .
Co-58	810.76	N-3.43E+00	+- 1.52E+01	5.36E+01		x	. . . . .
Mn-54	834.83	N-1.43E+00	+- 9.58E+00	3.36E+01		x	. . . . .
Ag-110m	884.67	N 9.53E+00	+- 1.25E+01	4.26E+01		x	. . . . .
Fe-59	1099.22	N 5.46E+01	+- 4.51E+01	1.51E+02		x	. . . . .
Zn-65	1115.52	N 6.26E+00	+- 4.56E+01	1.55E+02P		x PIC	. . . . .
Co-60	1332.49	N 8.63E+00	+- 9.45E+00	3.21E+01		x Y.	. . . . .
Sb-124	1691.02	N-5.05E+00	+- 2.96E+01	1.10E+02		x	. . . . .

MEASURED TOTAL: 1.82E+04 +- 1.27E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.38	95.65	0	45	74	844	0.62	Deleted
7	104.95	158.39	-22	44	72	774	0.98	Deleted
8	163.49	246.75	22	33	55	508	0.49	Deleted
10	209.32	315.91	46	42	68	645	0.73	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	661.05	997.64	25	17	27	125	1.19	Deleted
26	767.62	1158.47	13	17	28	132	0.78	Deleted
29	840.32	1268.18	12	14	23	92	1.38	Deleted
40	2103.06	3173.86	25	9	13	27	2.94	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
45	59.54	89.87	-80N	34	58	628	1.24	NET< CL
46	122.06	184.22	3N	31	52	493	1.29	NET< CL
47	133.54	201.54	-39N	32	53	518	1.30	NET< CL
48	145.44	219.50	14N	32	52	489	1.31	NET< CL
49	264.65	399.41	-3N	22	37	250	1.39	NET< CL
								LBase
50	320.08	483.06	-13N	22	37	237	1.43	NET< CL
51	364.48	550.07	20N	19	31	162	1.46	NET< CL
52	427.89	645.76	-1N	19	31	167	1.50	NET< CL
53	433.93	654.88	-6N	18	30	153	1.51	NET< CL
54	477.59	720.77	-15N	17	28	135	1.53	NET< CL
55	487.03	735.02	-0N	17	28	135	1.54	NET< CL
56	497.08	750.18	-31N	15	26	133	1.55	NET< CL
57	537.32	810.91	22N	15	23	106	1.57	NET< CL
58	604.70	912.60	24N	66	108	276	1.62	NET< CL
								PIC
59	621.84	938.47	14N	16	25	114	1.63	NET< CL
60	661.65	998.55	31N	16	24	109	1.66	
61	724.18	1092.91	-57N	149	245	184	1.70	NET< CL
								PIC
62	765.79	1155.71	9N	16	25	114	1.73	NET< CL
63	810.76	1223.58	-3N	13	22	90	1.76	NET< CL
64	834.83	1259.90	-2N	13	22	91	1.77	NET< CL
65	884.67	1335.12	9N	12	19	65	1.81	NET< CL
66	1099.22	1658.91	15N	13	20	69	1.95	NET< CL
67	1115.52	1683.51	4N	26	42	159	1.96	NET< CL
								PIC
68	1332.49	2010.95	10N	11	17	55	2.10	NET< CL
69	1691.02	2552.03	-1N	7	12	24	2.34	NET< CL

c:\seeker\Results\L5186-02.RES Analysis Results Saved.

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 11:15:27
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 10429 Sec
Sample Size 5.33E-01 kg | Real Time 10440 Sec
Collection Efficiency 1.0000 | Spectrum File 1014608.spc

Detector #: 8

Energy(keV)= -0.01 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998 .

Library File: SOILA.LIB LSF File: L5186-02.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	7.49E+02	2.68E+01	< 5.53E+01	2.68E+01	9.99E-01	MEAS +	YES
Pb-214	6.35E+02	2.85E+01	< 9.02E+01	4.38E+01	1.00E+00	MEAS +	YES
Th-234	1.95E+02	3.15E+02	< 1.04E+03	5.16E+02	1.00E+00	MEAS +	YES
Ra-226	1.13E+03	3.41E+02	< 1.10E+03	5.41E+02	1.00E+00	MEAS +	YES
AcTh-228	7.12E+02	3.71E+01	< 1.28E+02	6.11E+01	1.00E+00	MEAS +	YES
Annil	8.27E+00	2.45E+01	< 8.16E+01	4.01E+01	8.86E-01	MEAS +	YES
Tl-208	6.80E+02	3.48E+01	< 9.93E+01	4.47E+01	1.00E+00	MEAS +	YES
Bi-214	6.14E+02	2.93E+01	< 7.42E+01	3.56E+01	1.00E+00	MEAS +	YES
Bi-212	5.62E+02	9.18E+01	< 2.65E+02	1.26E+02	1.00E+00	MEAS +	YES
K-40	1.29E+04	3.40E+02	< 2.92E+02	1.35E+02	1.00E+00	MEAS +	YES
Am-241	-1.29E+02	5.53E+01	< 1.92E+02	9.41E+01	1.00E+00	NET	YES
Co-57	8.81E-01	9.23E+00	< 3.11E+01	1.52E+01	8.49E-01	NET	YES
Ce-144	-9.01E+01	7.29E+01	< 2.51E+02	1.22E+02	8.55E-01	NET	YES
Ce-141	2.48E+01	5.58E+01	< 1.87E+02	9.12E+01	2.55E-01	NET	YES
Se-75	-2.13E+00	1.58E+01	< 5.42E+01	2.61E+01	6.90E-01	NET	YES
Cr-51	-2.14E+02	3.74E+02	< 1.29E+03	6.22E+02	2.02E-01	NET	YES
I-131	2.19E+03	2.13E+03	< 7.11E+03	3.41E+03	4.01E-03	NET	YES
Sb-125	-1.19E+00	2.70E+01	< 9.29E+01	4.45E+01	9.57E-01	NET	YES
Ag-108m	-2.62E+00	8.10E+00	< 2.81E+01	1.34E+01	9.99E-01	NET	YES
Be-7	-1.45E+02	1.58E+02	< 5.58E+02	2.66E+02	4.36E-01	NET	YES
La-140	-1.02E+01	5.25E+02	< 1.81E+03	8.64E+02	3.11E-02	NET	YES
Ru-103	-4.74E+01	2.26E+01	< 8.36E+01	3.97E+01	3.24E-01	NET	YES
Ba-140	1.32E+03	8.85E+02	< 2.92E+03	1.38E+03	3.11E-02	NET	YES
Cs-134	1.30E+01	3.59E+01	< 1.19E+02	5.89E+01	9.43E-01	NET	YES
Ru-106	8.23E+01	9.14E+01	< 3.08E+02	1.46E+02	8.87E-01	NET	YES
Cs-137	1.95E+01	9.90E+00	< 3.22E+01	1.52E+01	9.96E-01	NET	YES
Zr-95	-1.46E+02	3.85E+02	< 1.27E+03	6.34E+02	5.00E-01	NET	YES
Nb-95	1.90E+01	3.24E+01	< 1.10E+02	5.24E+01	2.82E-01	NET	YES
Co-58	-3.43E+00	1.52E+01	< 5.36E+01	2.53E+01	5.34E-01	NET	YES
Mn-54	-1.43E+00	9.59E+00	< 3.36E+01	1.59E+01	8.68E-01	NET	YES
Ag-110m	9.53E+00	1.25E+01	< 4.26E+01	1.99E+01	8.37E-01	NET	YES
Fe-59	5.46E+01	4.51E+01	< 1.51E+02	7.06E+01	3.70E-01	NET	YES
Zn-65	6.26E+00	4.57E+01	< 1.55E+02	7.49E+01	8.34E-01	NET	YES
Co-60	8.63E+00	9.45E+00	< 3.21E+01	1.49E+01	9.77E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	-5.05E+00	2.96E+01	< 1.10E+02	4.93E+01	4.79E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-03 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-034
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-06-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____
Work Group ID: 5/23

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 686.7 g

Filter/Smear Data

Volume: _____
Units: _____
Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/11/03 01736 Det No.: 3 Spectrum No.: 1017303
Counted by: [Signature]
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5186-03
Client Id : BMS-2600-034

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/06/03 12:00

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	681.7		
Sample Weight-Dry	g			
Aliquot Weight	g	681.7		
FINAL WEIGHT	kg	.6817		
Container			WT5S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5186-03 analyzed by emml461 on 04/11/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5186-03 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1017303

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 17:35:31
Sampling Stop: 02/06/2003 12:00:00 | Decay Time: 1.54E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 15000 Sec
Sample Size 6.82E-001 kg | Real Time 15006 Sec
Collection Efficiency 1.0000 | Spc. File 1017303.spc

Detector #: 3 (Canberra sn 10923049 det#3)

Energy(keV)= 0.42 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.10	94.75	137	43	68	843	0.81	
2	72.51	108.99	14	20	32	279	0.46	a NET< CL HiResid
3	74.57	112.09	596	43	59	697	1.05	b HiResid
4	76.98	115.74	479	42	59	697	1.18	c HiResid
5	80.53	121.11	10	31	50	557	0.88	d NET< CL HiResid
6	83.90	126.21	69	32	50	557	0.82	e HiResid
7	87.03	130.94	406	46	67	836	1.35	f HiResid Wide Pk
8	89.56	134.77	142	43	67	836	1.25	g HiResid
9	92.44	139.11	408	41	59	697	1.11	h HiResid
10	128.60	193.78	35	36	58	625	0.35	NET< CL
11	149.43	225.28	1	25	41	370	0.02	NET< CL
12	185.79	280.23	258	35	52	499	1.23	
13	209.16	315.58	148	30	45	375	1.39	
14	238.43	359.83	1290	43	39	310	0.99	a
15	241.45	364.39	234	31	45	372	1.25	b
16	269.91	407.42	196	36	54	405	2.07	a Wide Pk
17	277.01	418.15	57	21	32	202	1.06	b
18	294.33	444.33	47	35	57	418	2.34	a NET< CL Wide Pk
19	294.97	445.31	349	26	31	190	1.14	b
20	327.63	494.67	40	22	35	227	0.75	
21	338.15	510.57	249	29	40	268	1.28	
22	351.71	531.07	631	32	34	194	1.29	
23	409.92	619.08	22	22	36	201	0.85	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	452.34	683.21	56	19	29	132	2.21	Wide Pk
25	462.91	699.19	71	19	28	135	1.78	Wide Pk
26	470.00	709.91	24	17	26	119	1.24	NET< CL
27	505.12	763.00	10	10	15	58	0.64	a NET< CL
28	510.78	771.56	355	31	40	211	2.41	b Wide Pk
29	583.06	880.83	391	28	32	156	1.37	
30	609.18	920.33	473	27	28	120	1.50	
31	661.10	998.81	40	19	29	122	1.33	
32	727.10	1098.59	55	18	26	117	1.31	
33	768.10	1160.57	30	9	12	34	0.74	a
34	772.55	1167.30	27	11	17	56	1.03	b
35	785.72	1187.20	3	15	24	91	0.19	NET< CL
36	794.84	1200.99	31	16	24	95	0.96	
37	860.14	1299.71	46	14	20	70	1.23	
38	911.09	1376.75	230	21	24	92	1.96	
39	968.90	1464.13	102	20	28	129	1.33	
40	1119.83	1692.31	67	17	24	99	1.55	
41	1238.46	1871.65	25	17	27	119	1.10	NET< CL
42	1460.79	2207.77	1501	39	11	20	2.29	
43	1764.38	2666.74	67	10	10	16	5.37	Wide Pk
44	2614.58	3952.07	175	14	9	11	2.91	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY03.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.10	137	43	68	72	43	69	
3	74.57	596	43	59	551	44	60	
4	76.98	479	42	59	426	42	60	
6	83.90	69	32	50	31	32	52	NET<CL
7	87.03	406	46	67	377	46	68	
9	92.44	408	41	59	274	41	62	
12	185.79	258	35	52	189	36	54	
13	209.16	148	30	45	143	30	46	
14	238.43	1290	43	39	1233	43	42	
15	241.45	234	31	45	211	31	46	
18	294.33	47	35	57	4	35	58	NET<CL
21	338.15	249	29	40	235	29	41	
22	351.71	631	32	34	561	33	37	
25	462.91	71	19	28	70	19	29	
28	510.78	355	31	40	161	31	47	
29	583.06	391	28	32	372	28	34	
30	609.18	473	27	28	416	28	31	
32	727.10	55	18	26	53	18	27	
33	768.10	30	9	12	23	9	13	
38	911.09	230	21	24	219	21	25	
39	968.90	102	20	28	99	20	28	
40	1119.83	67	17	24	56	17	25	
41	1238.46	25	17	27	22	17	27	NET<CL
42	1460.79	1501	39	11	1485	39	13	
43	1764.38	67	10	10	58	10	11	
44	2614.58	175	14	9	162	14	11	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	63.10	72	Th-234	72	2 of 2	100.00	1.50	
3	74.57	551	Tl-208	37	7 of 9	98.64	0.99	
			Tl-208	21	7 of 9	98.64	0.99	
			Pb-214	142	5 of 7	97.33	0.97	
			Pb-212	306	4 of 6	95.97	0.96	
4	76.98	426	Pb-212	559	4 of 6	95.97	1.46	
			Pb-214	250	5 of 7	100.00	1.00	
7	87.03	107	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
47	87.03	270	Pb-212	270	4 of 6	95.97	1.46	AutoAdd
8	89.56	142	Cd-109	. . . . .	1 of 1	100.00	1.50	
9	92.44	110	AcTh-228	111	10 of 36	77.31	0.77	Split
46	92.44	164	Th-234	164	2 of 2	100.00	1.50	AutoAdd
12	185.79	189	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
13	209.16	143	AcTh-228	113	10 of 36	82.57	1.33	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
14	238.43	1233	Pb-212	1064	4 of 6	95.97	1.46	
15	241.45	211	Pb-214	154	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
16	269.91	196	AcTh-228	78	10 of 36	77.31	0.77	
17	277.01	57	Tl-208	60	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
19	294.98	349	Pb-214	343	5 of 7	100.00	1.50	
20	327.63	40	AcTh-228	60	10 of 36	96.66	1.47	
			Bi-212	1	3 of 13	61.06	1.11	
			La-140	7919	2 of 15	23.26	0.23	LowScore
21	338.15	235	AcTh-228	198	10 of 36	82.57	1.33	
22	351.71	561	Pb-214	670	5 of 7	100.00	1.50	
24	452.34	56	Bi-212	2	3 of 13	61.43	1.11	
25	462.91	70	AcTh-228	61	10 of 36	82.57	1.33	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
28	510.78	46	Annil	. . . . .	1 of 1	100.00	1.50	Split
45	510.78	116	Tl-208	116	7 of 9	100.00	1.50	AutoAdd
29	583.06	372	Tl-208	476	7 of 9	100.00	1.50	
30	609.18	416	Bi-214	337	4 of 33	79.50	1.29	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
31	661.10	40	Cs-137	. . . . .	1 of 1	100.00	1.50	
32	727.10	53	Bi-212	1367	3 of 13	100.00	1.00	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
33	768.10	23	Bi-214	36	4 of 33	100.00	1.50	
			Pa-234	. . . . .	1 of 2	26.32	0.76	
34	772.55	27	AcTh-228	14	10 of 36	79.58	1.30	
			TeI-132	. . . . .	0 of 0	. . .	0.00	Decay
36	794.84	31	AcTh-228	41	10 of 36	96.66	1.47	
			Cs-134	. . . . .	1 of 9	46.67	0.97	
37	860.14	46	Tl-208	44	7 of 9	100.00	1.50	
38	911.09	219	AcTh-228	235	10 of 36	84.17	1.34	
39	968.90	99	AcTh-228	131	10 of 36	92.78	1.43	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
40	1119.83	56	Bi-214	80	4 of 33	96.51	1.47	
42	1460.79	1485	K-40	. . . . .	1 of 1	100.00	1.50	
43	1764.38	58	Bi-214	56	4 of 33	79.50	1.29	
44	2614.58	162	Tl-208	132	7 of 9	100.00	1.50	

L5186-03 analyzed by emm1461 on 04/11/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-03

Sample ID: SOIL/SEDI Duratek Inc

Code: 1017303

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 17:35:31
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time: 1.54e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 15000 Sec
 Sample Size 6.82e-001 kg | Real Time 15006 Sec
 Collection Efficiency 1.0000 | Spectrum File 1017303.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Canberra sn 10923049 det#3)
 Efficiency File: WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[3.20E-02*En^-2.77E+00 + 2.47E+02*En^8.30E-01] 04/30/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5186-03.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS
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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Th-234	Average:x	4.64E+02 +- 2.10E+02			
	63.29	4.64E+02 +- 2.76E+02	9.08E+02		+	. . . . .
	92.59	4.64E+02 +- 3.22E+02	1.06E+03		+	. . . . .
Tl-208	Average:x	5.59E+02 +- 3.13E+01	. . . . .		*	. . . . .
	74.97	I.D.	. . . . .			. . . . .
	277.35	5.36E+02 +- 1.94E+02	6.19E+02		+	. . . . .
	510.84	I.D.	. . . . .			. . . . .
	583.14	5.14E+02 +- 3.89E+01	9.69E+01		++	. . . . .
	860.37	5.95E+02 +- 1.80E+02	5.51E+02		++	. . . . .
	2614.66	6.56E+02 +- 5.79E+01	9.75E+01		++	. . . . .
Pb-212	238.63	5.63E+02 +- 1.97E+01	5.63E+01		++	. . . . .
	77.12	I.D.	. . . . .			. . . . .
	87.30	I.D.	. . . . .			. . . . .
Cd-109	88.03	I.D.	. . . . .			. . . . .
AcTh-228	Average:x	4.96E+02 +- 3.08E+01	. . . . .		*	. . . . .
	93.35	I.D.	. . . . .			. . . . .
	209.28	6.02E+02 +- 1.27E+02	3.95E+02		++	. . . . .
	270.23	1.22E+03 +- 2.22E+02	6.89E+02		++	. . . . .
	327.64	3.26E+02 +- 1.81E+02	5.93E+02		+	. . . . .
	338.32	5.51E+02 +- 6.83E+01	1.98E+02		++	. . . . .
	463.00	5.49E+02 +- 1.52E+02	4.71E+02		++	. . . . .
	772.17	9.16E+02 +- 3.86E+02	1.22E+03		+	. . . . .
	794.70	3.68E+02 +- 1.86E+02	6.06E+02		+	. . . . .
	911.07	4.77E+02 +- 4.59E+01	1.13E+02		++	. . . . .
	969.11	3.80E+02 +- 7.63E+01	2.28E+02		++	. . . . .
Ra-226	186.22	9.82E+02 +- 1.86E+02	5.80E+02		++	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	N Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-214	Average:x	4.31E+02 +- 1.90E+01	. . . . .	*		. . . . .
	241.98	5.79E+02 +- 8.63E+01	2.59E+02	++		. . . . .
	295.21	4.36E+02 +- 3.29E+01	8.00E+01	++		. . . . .
	351.92	4.16E+02 +- 2.42E+01	5.69E+01	++		. . . . .
Bi-212	Average:x	2.36E+02 +- 7.55E+01	. . . . .	*		. . . . .
	452.83	5.43E+03 +- 1.85E+03	5.86E+03	+		. . . . .
	727.17	2.27E+02 +- 7.55E+01	2.38E+02	++		. . . . .
Annil	511.00	1.93E+01 +- 2.31E+01	7.65E+01	+		. . . . .
Bi-214	Average:x	3.71E+02 +- 2.25E+01	. . . . .	*		. . . . .
	609.31	3.90E+02 +- 2.59E+01	6.01E+01	++		. . . . .
	768.36	2.43E+02 +- 9.66E+01	3.01E+02	+		. . . . .
	1120.29	2.66E+02 +- 7.98E+01	2.48E+02	++		. . . . .
	1764.49	3.86E+02 +- 6.81E+01	1.68E+02	++		. . . . .
Cs-137	661.65	2.16E+01 +- 1.01E+01	3.28E+01	+		. . . . .
K-40	1460.81	1.24E+04 +- 3.30E+02	2.44E+02	++		. . . . .
Am-241	59.54	N 1.27E+01 +- 2.19E+01	7.34E+011	x	lbase	. . . . .
Co-57	122.06	N 3.94E+00 +- 5.26E+00	1.76E+01	x		. . . . .
Ce-144	133.54	N-2.31E+01 +- 4.14E+01	1.42E+02	x		. . . . .
Ce-141	145.44	N 5.27E+00 +- 3.66E+01	1.24E+02	x		. . . . .
Se-75	264.65	N-3.41E+01 +- 1.08E+01	3.98E+011	x#	lbase	. . . . .
Cr-51	320.08	N-9.31E+01 +- 2.30E+02	7.99E+02	x		. . . . .
I-131	364.48	N 9.53E+02 +- 1.43E+03	4.84E+03	x		. . . . .
Sb-125	427.89	N-6.92E+00 +- 1.96E+01	6.81E+01	x		. . . . .
Ag-108m	433.93	N-1.13E+01 +- 6.09E+00	2.21E+01	x		. . . . .
Be-7	477.59	N 7.82E+00 +- 1.18E+02	4.10E+02	x		. . . . .
La-140	487.03	N-2.58E+01 +- 3.85E+02	1.34E+03	x		. . . . .
Ru-103	497.08	N-7.66E+00 +- 1.88E+01	6.63E+01	x		. . . . .
Ba-140	537.32	N 1.27E+03 +- 7.91E+02	2.60E+03	x		. . . . .
Cs-134	604.70	N-6.55E+00 +- 6.48E+00	2.33E+011	x	lbase	. . . . .
Ru-106	621.84	N 4.06E+01 +- 6.88E+01	2.35E+02	x		. . . . .
Zr-95	724.18	N-2.97E+03 +- 9.23E+02	3.06E+03P	x#	PIC	. . . . .
Nb-95	765.79	N-1.50E+01 +- 2.92E+01	1.03E+02P	x	PIC	. . . . .
Co-58	810.76	N-1.88E+01 +- 1.27E+01	4.71E+01	x		. . . . .
Mn-54	834.83	N 3.13E+00 +- 8.92E+00	3.07E+01	x		. . . . .
Ag-110m	884.67	N 4.85E+00 +- 1.08E+01	3.73E+01	x		. . . . .
Fe-59	1099.22	N-6.44E+01 +- 4.19E+01	1.55E+02	x		. . . . .
Zn-65	1115.52	N-2.15E+01 +- 3.92E+01	1.35E+02P	x	PIC	. . . . .
Co-60	1332.49	N-9.64E+00 +- 8.10E+00	3.06E+01	x		Y.
Sb-124	1691.02	N 0.00E+00 +- 2.28E+01	8.68E+01	x		. . . . .

MEASURED TOTAL: 1.66E+04 +- 9.58E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	72.51	108.99	14	20	32	279	0.46	Deleted
5	80.53	121.11	10	31	50	557	0.88	Deleted
6	83.90	126.21	31	32	52	557	0.82	Deleted
10	128.60	193.78	35	36	58	625	0.35	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
11	149.43	225.28	1	25	41	370	0.02	Deleted
18	294.33	444.33	4	35	58	418	2.34	Deleted
23	409.92	619.08	22	22	36	201	0.85	Deleted
26	470.00	709.91	24	17	26	119	1.24	Deleted
27	505.12	763.00	10	10	15	58	0.64	Deleted
35	785.72	1187.20	3	15	24	91	0.19	Deleted
41	1238.46	1871.65	22	17	27	119	1.10	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
48	59.54	89.38	17N	29	47	485	0.90	NET< CL LBase
49	122.06	183.90	20N	27	43	416	0.95	NET< CL
50	133.54	201.25	-15N	26	44	425	0.96	NET< CL
51	145.44	219.24	4N	30	49	480	0.97	NET< CL
52	264.65	399.46	-64N	20	36	260	1.07	NET< CL LBase
53	320.08	483.26	-7N	18	29	174	1.12	NET< CL
54	364.48	550.38	11N	16	26	133	1.16	NET< CL
55	427.89	646.25	-6N	17	28	147	1.21	NET< CL
56	433.93	655.38	-31N	17	29	155	1.21	NET< CL
57	477.59	721.38	1N	15	25	114	1.25	NET< CL
58	487.03	735.65	-1N	15	25	112	1.26	NET< CL
59	497.08	750.85	-6N	15	25	112	1.26	NET< CL
60	537.32	811.68	25N	16	24	108	1.30	
61	604.70	913.55	-14N	14	24	103	1.35	NET< CL LBase
62	621.84	939.46	8N	14	22	88	1.37	NET< CL
63	724.18	1094.17	-1294N	403	665	178	1.45	NET< CL PIC
64	765.79	1157.08	-8N	16	26	91	1.48	NET< CL PIC
65	810.76	1225.07	-18N	12	21	78	1.52	NET< CL
66	834.83	1261.45	5N	14	22	85	1.54	NET< CL
67	884.67	1336.80	5N	11	18	63	1.58	NET< CL
68	1099.22	1661.16	-19N	12	22	86	1.75	NET< CL
69	1115.52	1685.80	-13N	23	39	156	1.77	NET< CL PIC
70	1332.49	2013.81	-11N	10	17	48	1.94	NET< CL
71	1691.02	2555.84	0N	5	9	14	2.23	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 17:35:31
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. . . . . 1.54E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 15000 Sec
Sample Size . . . . . 6.82E-01 kg | Real Time . . . . . 15006 Sec
Collection Efficiency . . . . 1.0000 | Spectrum File . . . . . 1017303.spc
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Detector #: 3

Energy(keV)= 0.42 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 7.91E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[3.20e-02*En^-2.77e+00 + 2.47e+02*En^ 8.30e-01] 04/30/1998

Library File: SOILA.LIB LSF File: L5186-03.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	4.64E+02	2.10E+02	< 9.08E+02	4.46E+02	9.99E-01	MEAS +	YES
Tl-208	5.59E+02	3.14E+01	< 9.69E+01	4.33E+01	9.99E-01	MEAS +	YES
Pb-212	5.63E+02	1.97E+01	< 5.63E+01	2.75E+01	9.98E-01	MEAS +	YES
AcTh-228	4.96E+02	3.08E+01	< 1.13E+02	5.38E+01	9.99E-01	MEAS +	YES
Ra-226	9.82E+02	1.86E+02	< 5.80E+02	2.83E+02	1.00E+00	MEAS +	YES
Pb-214	4.30E+02	1.90E+01	< 5.69E+01	2.75E+01	9.99E-01	MEAS +	YES
Bi-212	2.36E+02	7.55E+01	< 2.38E+02	1.13E+02	9.99E-01	MEAS +	YES
Annil	1.93E+01	2.31E+01	< 7.65E+01	3.77E+01	8.85E-01	MEAS +	YES
Bi-214	3.71E+02	2.25E+01	< 6.01E+01	2.88E+01	9.99E-01	MEAS +	YES
Cs-137	2.16E+01	1.01E+01	< 3.28E+01	1.57E+01	9.96E-01	MEAS +	YES
K-40	1.24E+04	3.30E+02	< 2.44E+02	1.11E+02	1.00E+00	MEAS +	YES
Am-241	1.27E+01	2.19E+01	< 7.34E+01	3.57E+01	1.00E+00	NET	YES
Co-57	3.94E+00	5.26E+00	< 1.76E+01	8.52E+00	8.48E-01	NET	YES
Ce-144	-2.31E+01	4.14E+01	< 1.42E+02	6.88E+01	8.55E-01	NET	YES
Ce-141	5.27E+00	3.66E+01	< 1.24E+02	6.01E+01	2.54E-01	NET	YES
Se-75	-3.42E+01	1.08E+01	< 3.98E+01	1.92E+01	6.89E-01	NET	YES
Cr-51	-9.31E+01	2.30E+02	< 7.99E+02	3.82E+02	2.00E-01	NET	YES
I-131	9.53E+02	1.43E+03	< 4.84E+03	2.30E+03	3.91E-03	NET	YES
Sb-125	-6.91E+00	1.96E+01	< 6.81E+01	3.25E+01	9.57E-01	NET	YES
Ag-108m	-1.13E+01	6.09E+00	< 2.21E+01	1.06E+01	9.99E-01	NET	YES
Be-7	7.82E+00	1.18E+02	< 4.10E+02	1.94E+02	4.34E-01	NET	YES
La-140	-2.58E+01	3.85E+02	< 1.34E+03	6.34E+02	3.06E-02	NET	YES
Ru-103	-7.66E+00	1.88E+01	< 6.63E+01	3.14E+01	3.22E-01	NET	YES
Ba-140	1.27E+03	7.90E+02	< 2.60E+03	1.23E+03	3.06E-02	NET	YES
Cs-134	-6.55E+00	6.48E+00	< 2.34E+01	1.10E+01	9.42E-01	NET	YES
Ru-106	4.06E+01	6.88E+01	< 2.35E+02	1.11E+02	8.86E-01	NET	YES
Zr-95	-2.96E+03	9.23E+02	< 3.06E+03	1.52E+03	4.98E-01	NET	YES
Nb-95	-1.50E+01	2.92E+01	< 1.03E+02	4.89E+01	2.80E-01	NET	YES
Co-58	-1.88E+01	1.27E+01	< 4.71E+01	2.22E+01	5.33E-01	NET	YES
Mn-54	3.13E+00	8.92E+00	< 3.07E+01	1.45E+01	8.67E-01	NET	YES
Ag-110m	4.85E+00	1.08E+01	< 3.73E+01	1.74E+01	8.37E-01	NET	YES
Fe-59	-6.44E+01	4.20E+01	< 1.56E+02	7.32E+01	3.68E-01	NET	YES
Zn-65	-2.15E+01	3.92E+01	< 1.35E+02	6.53E+01	8.33E-01	NET	YES

L5186-03 analyzed by emm1461 on 04/11/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	-9.64E+00	8.10E+00	< 3.05E+01	1.41E+01	9.77E-01	NET	YES
Sb-124	0.00E+00	2.28E+01	< 8.68E+01	3.76E+01	4.77E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

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CLIENT INFORMATION

Lab Sample Number: L5186-04 Count by Date: _____
 (if required)
 Client: Duratek Inc Delay Date: _____
 (if required)
 Project: OTHER ENVIRON-DUR
 Sample Matrix: Soil
 Sample Description: BMS-2600-035
 Collect Start Date/Time: _____
 Collect Stop Date/Time: 02-06-03 12:00
 Product: GAMMA SPECTROMETRY
 Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
 (if required)
 Total Sample Weight: _____ g
 (if required)
 Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
 Dry Weight: _____ g
 Aliquot Weight: _____ g
 Sample Geometry: _____

Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
 (if required)
 Wet Weight: _____ g
 Dry Weight: _____ g
 Aliquot Weight: 731.6 g

Filter/Smear Data

Volume: _____
 Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/11/03 1503 Det No.: 3 Spectrum No.: 1016203

Counted by: en

Recount Date/Time: 4/11/03 1738 Det No.: 8 Spectrum No.: 1017308

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5186-04
Client Id : BMS-2600-035
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/06/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	731.6		
Sample Weight-Dry	g			
Aliquot Weight	g	731.6		
FINAL WEIGHT	kg	.7316		
Container			WT5S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5186-04 analyzed by emml461 on 04/11/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-04

Not stored

Sample ID: SOIL/SEDI Duratek Inc

Code: 1016203

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 15:03:18
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 7666 Sec
 Sample Size 7.32E-001 kg | Real Time 7668 Sec
 Collection Efficiency 1.0000 | Spc. File 1016203.spc

Detector #: 3 (Canberra sn 10923049 det#3)
 Energy(keV)= 0.42 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003
 FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 0.00E+00*En^3 02/18/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.08	88.68	26	14	21	125	0.50	a
2	62.92	94.49	47	15	21	125	0.53	b
3	73.25	110.10	72	26	41	334	1.10	a
4	74.75	112.37	192	22	29	200	0.63	b
5	76.88	115.60	320	28	35	267	0.80	c
6	86.79	130.57	48	19	29	200	0.55	a
7	89.46	134.62	53	15	22	134	0.46	b
8	92.77	139.61	151	31	47	401	1.40	c Wide Pk
9	98.92	148.91	36	25	40	303	1.04	NET< CL
10	121.88	183.62	189	28	39	284	1.21	
11	128.25	193.25	49	28	44	335	1.51	Wide Pk
12	168.70	254.40	2	20	33	206	0.09	NET< CL
13	185.36	279.60	88	15	20	101	0.61	a
14	186.36	281.10	37	14	20	101	0.65	b
15	238.42	359.81	530	28	26	132	1.04	a
16	241.60	364.61	72	14	18	79	0.61	b
17	269.85	407.33	15	25	40	225	0.69	NET< CL
18	294.85	445.12	166	21	28	130	1.28	
19	328.03	495.29	9	16	26	118	0.33	NET< CL
20	338.17	510.61	69	16	22	93	1.14	
21	351.77	531.17	308	22	22	86	1.26	
22	510.60	771.28	157	18	22	77	2.25	Wide Pk
23	582.90	880.59	136	16	19	57	1.34	
24	609.08	920.17	226	19	20	60	1.37	
25	726.93	1098.33	34	12	17	45	1.35	
26	911.16	1376.85	84	14	18	52	1.58	
27	968.89	1464.13	56	13	18	55	1.80	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	1120.26	1692.96	58	13	17	48	1.11	
29	1460.72	2207.68	695	27	10	18	2.05	
30	1764.47	2666.88	31	8	10	17	1.43	
31	2614.22	3951.53	52	8	6	7	2.59	

L5186-04 analyzed by emm1461 on 04/11/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY03.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	62.92	47	15	21	14	15	24	NET<CL
3	73.25	72	26	41	49	26	42	
5	76.88	320	28	35	293	28	36	
6	86.79	48	19	29	33	19	29	
8	92.77	151	31	47	82	31	49	
9	98.92	36	25	41	36	25	41	NET<CL
13	185.36	88	15	20	53	16	23	
15	238.42	530	28	26	501	28	27	
16	241.60	72	14	18	60	14	19	
18	294.85	167	21	28	144	21	29	
20	338.17	69	16	22	62	16	23	
21	351.77	308	22	23	272	22	25	
22	510.60	157	18	22	58	19	28	
23	582.90	136	16	19	126	17	20	
24	609.08	226	19	20	197	19	22	
25	726.93	34	12	17	33	12	17	
26	911.16	84	14	18	78	14	18	
27	968.89	56	13	18	54	13	18	
28	1120.26	58	13	17	52	13	18	
29	1460.72	695	27	10	687	27	11	
30	1764.47	31	8	10	27	8	11	
31	2614.22	52	8	6	46	8	8	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0

Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	59.08	22	Am-241	. . . . .	1 of 3	100.00	1.50	Split
34	59.08	4	AcTh-228	4	6 of 36	58.95	1.09	AutoAdd
3	73.25	49	Pb-214	63	5 of 7	100.00	1.50	
			Tl-208	7	6 of 9	91.69	1.42	
			Pb-212	136	4 of 6	100.00	1.00	Matched
			Tl-208	12	6 of 9	91.69	1.42	
4	74.75	192	Pb-212	136	4 of 6	95.97	1.46	
			Tl-208	7	6 of 9	91.04	0.91	
			Pb-214	63	5 of 7	100.00	1.00	
			Tl-208	12	6 of 9	91.04	0.91	
5	76.88	293	Pb-212	238	4 of 6	95.97	1.46	
			Tl-208	12	6 of 9	91.04	0.91	
			Pb-214	111	5 of 7	100.00	1.00	
6	86.79	33	Cd-109	. . . . .	1 of 1	100.00	1.50	
			Tl-208	6	6 of 9	91.69	1.42	
			Pb-212	124	4 of 6	100.00	1.00	
7	89.46	53	Cd-109	. . . . .	1 of 1	100.00	1.50	
8	92.77	42	Th-234	. . . . .	1 of 2	58.74	1.09	Split
33	92.77	40	AcTh-228	40	6 of 36	65.77	1.16	AutoAdd
10	121.88	189	Co-57	. . . . .	1 of 4	100.00	1.00	
			Se-75	. . . . .	1 of 5	9.69	0.10	LowScore
11	128.25	49	AcTh-228	34	6 of 36	72.57	1.23	
13	185.36	53	U-235	. . . . .	1 of 3	100.00	1.00	
			Ra-226	. . . . .	1 of 1	100.00	1.50	Matched
14	186.36	37	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.50	
15	238.42	501	Pb-212	678	4 of 6	95.97	0.96	
16	241.60	60	Pb-214	71	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
18	294.85	144	Pb-214	157	5 of 7	100.00	1.50	
20	338.17	62	AcTh-228	81	6 of 36	83.49	1.33	
21	351.77	272	Pb-214	236	5 of 7	100.00	1.50	
22	510.60	20	Annul	. . . . .	1 of 1	100.00	1.50	Split
32	510.60	37	Tl-208	37	6 of 9	91.69	1.42	AutoAdd
23	582.90	126	Tl-208	146	6 of 9	94.46	1.44	
24	609.08	197	Bi-214	222	3 of 33	81.87	1.32	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
25	726.93	33	Bi-212	. . . . .	1 of 13	100.00	1.50	
26	911.16	78	AcTh-228	83	6 of 36	80.07	1.30	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
27	968.89	54	AcTh-228	44	6 of 36	75.63	1.26	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
28	1120.26	52	Bi-214	39	3 of 33	74.63	1.25	
29	1460.72	687	K-40	. . . . .	1 of 1	100.00	1.50	
30	1764.47	27	Bi-214	29	3 of 33	81.87	1.32	
31	2614.22	46	Tl-208	45	6 of 9	94.46	1.44	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-04

Sample ID: SOIL/SEDI Duratek Inc

Code: 1016203

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 15:03:18
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time: 1.54e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 7666 Sec
 Sample Size 7.32e-001 kg | Real Time 7668 Sec
 Collection Efficiency 1.0000 | Spectrum File 1016203.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Canberra sn 10923049 det#3)
 Efficiency File: WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[3.20E-02*En^-2.77E+00 + 2.47E+02*En^8.30E-01] 04/30/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5186-04.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS
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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Am-241	59.54	2.99E+01 +- 3.33E+01	1.11E+02		+
Pb-214	Average:x	3.50E+02 +- 2.41E+01	. . . . .		*	. . . . .
	74.81	I.D. . . . .	. . . . .			. . . . .
	241.98	3.01E+02 +- 6.95E+01	2.04E+02		++	. . . . .
	295.21	3.29E+02 +- 4.84E+01	1.37E+02		++	. . . . .
	351.92	3.68E+02 +- 3.02E+01	7.08E+01		++	. . . . .
Pb-212	238.63	4.14E+02 +- 2.30E+01	4.94E+01		++	. . . . .
	74.81	I.D. . . . .	. . . . .			. . . . .
	77.12	I.D. . . . .	. . . . .			. . . . .
Cd-109	88.03	I.D. . . . .	. . . . .			. . . . .
Th-234	92.59	2.18E+02 +- 2.77E+02	9.19E+02		+	. . . . .
Co-57	122.06	6.78E+01 +- 9.87E+00	2.91E+01		++	. . . . .
AcTh-228	Average:x	3.10E+02 +- 3.92E+01	. . . . .		*	. . . . .
	129.08	4.61E+02 +- 2.61E+02	8.56E+02		+	. . . . .
	338.32	2.64E+02 +- 6.88E+01	2.09E+02		++	. . . . .
	911.07	3.10E+02 +- 5.66E+01	1.57E+02		++	. . . . .
	969.11	3.80E+02 +- 9.39E+01	2.77E+02		++	. . . . .
	59.00	3.10E+02 +- 1.44E+03	4.90E+03		+	. . . . .
	93.35	I.D. . . . .	. . . . .			. . . . .
U-235	185.72	3.03E+01 +- 9.03E+00	2.79E+01		++	. . . . .
Ra-226	186.22	3.54E+02 +- 1.30E+02	4.10E+02		+	. . . . .
Annil	511.00	1.57E+01 +- 2.49E+01	8.33E+01		+	. . . . .
Tl-208	Average:x	3.24E+02 +- 3.43E+01	. . . . .		*	. . . . .
	583.14	3.17E+02 +- 4.15E+01	1.07E+02		++	. . . . .
	2614.66	3.38E+02 +- 6.10E+01	1.35E+02		++	. . . . .
	510.84	I.D. . . . .	. . . . .			. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration		MDA	Flags	Notes	MDC
		(pCi/kg)				
Bi-214	Average:x	3.43E+02	+ - 3.04E+01	. . . .	*		. . . . .
	609.31	3.36E+02	+ - 3.33E+01	8.05E+01	+		. . . . .
	1120.29	4.50E+02	+ - 1.12E+02	3.28E+02	+		. . . . .
	1764.49	3.21E+02	+ - 1.00E+02	2.91E+02	+		. . . . .
Bi-212	727.17	2.53E+02	+ - 9.20E+01	2.86E+02	+		. . . . .
K-40	1460.81	1.05E+04	+ - 4.14E+02	3.92E+02	+		. . . . .
Ce-144	133.54	N-1.53E+01	+ - 4.86E+01	1.69E+02r	x	rbase	. . . . .
Ce-141	145.44	N-4.20E+01	+ - 4.34E+01	1.52E+02	x		. . . . .
Se-75	264.65	N 3.68E+01	+ - 1.35E+01	4.24E+01	x		. . . . .
Cr-51	320.08	N-1.38E+02	+ - 2.82E+02	1.01E+03	x		. . . . .
I-131	364.48	N-6.43E+02	+ - 1.66E+03	5.99E+03	x		. . . . .
Sb-125	427.89	N-2.73E+01	+ - 2.55E+01	9.31E+01	x		. . . . .
Ag-108m	433.93	N 6.64E-01	+ - 7.43E+00	2.61E+01	x		. . . . .
Be-7	477.59	N-1.99E+02	+ - 1.44E+02	5.43E+02	x		. . . . .
La-140	487.03	N 4.66E+02	+ - 4.89E+02	1.66E+03	x		. . . . .
Ru-103	497.08	N-2.09E+01	+ - 2.26E+01	8.41E+01	x		. . . . .
Ba-140	537.32	N-4.61E+02	+ - 9.16E+02	3.34E+03	x		. . . . .
Cs-134	604.70	N-5.13E+00	+ - 4.25E+01	1.42E+02P	x	PIC	. . . . .
Ru-106	621.84	N-2.13E+02	+ - 8.21E+01	3.32E+02	x		. . . . .
Cs-137	661.65	N-1.10E+01	+ - 9.08E+00	3.45E+01	x		Y.
Zr-95	724.18	N-8.35E+01	+ - 5.94E+01	2.25E+02L	x	LHROI	. . . . .
Nb-95	765.79	N-3.96E+00	+ - 3.76E+01	1.34E+02	x		. . . . .
Co-58	810.76	N 2.83E+00	+ - 1.74E+01	6.17E+01	x		. . . . .
Mn-54	834.83	N 1.14E+01	+ - 1.03E+01	3.47E+01	x		. . . . .
Ag-110m	884.67	N 1.44E+01	+ - 1.24E+01	4.21E+01	x		. . . . .
Fe-59	1099.22	N-6.17E+01	+ - 5.85E+01	2.20E+02	x		. . . . .
Zn-65	1115.52	N 5.42E+01	+ - 5.52E+01	1.85E+02P	x	PIC	. . . . .
Co-60	1332.49	N-7.53E+00	+ - 8.60E+00	3.46E+01	x		Y.
Sb-124	1691.02	N 6.29E+01	+ - 3.51E+01	1.11E+02	x		. . . . .

MEASURED TOTAL: 1.32E+04 + - 1.14E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	62.92	94.49	14	15	24	125	0.53	Deleted
9	98.92	148.91	36	25	41	303	1.04	Deleted
12	168.70	254.40	2	20	33	206	0.09	Deleted
17	269.85	407.33	15	25	40	225	0.69	Deleted
19	328.03	495.29	9	16	26	118	0.33	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
35	133.54	201.25	-5N	17	28	175	0.96	NET< CL RBase

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
36	145.44	219.24	-19N	20	33	215	0.97	NET< CL
37	264.65	399.46	38N	14	20	84	1.07	
38	320.08	483.26	-6N	12	20	81	1.12	NET< CL
39	364.48	550.38	-4N	10	17	60	1.16	NET< CL
40	427.89	646.25	-13N	12	21	80	1.21	NET< CL
41	433.93	655.38	1N	11	18	62	1.21	NET< CL
42	477.59	721.38	-14N	10	18	58	1.25	NET< CL
43	487.03	735.65	10N	10	16	50	1.26	NET< CL
44	497.08	750.85	-9N	10	17	52	1.26	NET< CL
45	537.32	811.68	-5N	10	17	52	1.30	NET< CL
46	604.70	913.55	-6N	50	82	107	1.35	NET< CL
								PIC
47	621.84	939.46	-23N	9	17	51	1.37	NET< CL
48	661.65	999.64	-11N	9	16	47	1.40	NET< CL
49	724.18	1094.17	-20N	14	26	52	1.45	NET< CL
								LHRoi
50	765.79	1157.08	-1N	11	18	57	1.48	NET< CL
51	810.76	1225.07	2N	9	15	39	1.52	NET< CL
52	834.83	1261.45	10N	9	13	30	1.54	NET< CL
53	884.67	1336.80	8N	7	11	22	1.58	NET< CL
54	1099.22	1661.16	-10N	9	16	50	1.75	NET< CL
55	1115.52	1685.80	18N	18	29	81	1.77	NET< CL
								PIC
56	1332.49	2013.81	-5N	6	10	17	1.94	NET< CL
57	1691.02	2555.84	8N	4	6	6	2.23	

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 15:03:18
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. . . . . 1.54E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 7666 Sec
Sample Size . . . . . 7.32E-01 kg | Real Time . . . . . 7668 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1016203.spc
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Detector #: 3

Energy(keV)= 0.42 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 7.91E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[3.20e-02*En^-2.77e+00 + 2.47e+02*En^ 8.30e-01] 04/30/1998

Library File: SOILA.LIB LSF File: L5186-04.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Am-241	2.99E+01	3.33E+01	< 1.11E+02	5.38E+01	1.00E+00	MEAS +	YES
Pb-214	3.50E+02	2.41E+01	< 7.08E+01	3.36E+01	9.99E-01	MEAS +	YES
Pb-212	4.14E+02	2.30E+01	< 4.95E+01	2.36E+01	1.00E+00	MEAS +	YES
Th-234	2.18E+02	2.77E+02	< 9.19E+02	4.53E+02	9.99E-01	MEAS +	YES
Co-57	6.78E+01	9.87E+00	< 2.91E+01	1.41E+01	8.49E-01	MEAS +	YES
AcTh-228	3.10E+02	3.92E+01	< 1.57E+02	7.31E+01	1.00E+00	MEAS +	YES
U-235	3.03E+01	9.03E+00	< 2.79E+01	1.32E+01	1.00E+00	MEAS +	YES
Ra-226	3.54E+02	1.30E+02	< 4.10E+02	1.92E+02	1.00E+00	MEAS +	YES
Annil	1.57E+01	2.49E+01	< 8.33E+01	4.06E+01	8.85E-01	MEAS +	YES
Tl-208	3.24E+02	3.43E+01	< 1.07E+02	5.00E+01	1.00E+00	MEAS +	YES
Bi-214	3.43E+02	3.04E+01	< 8.05E+01	3.79E+01	9.99E-01	MEAS +	YES
Bi-212	2.53E+02	9.20E+01	< 2.86E+02	1.33E+02	1.00E+00	MEAS +	YES
K-40	1.05E+04	4.14E+02	< 3.92E+02	1.75E+02	1.00E+00	MEAS +	YES
Ce-144	-1.53E+01	4.86E+01	< 1.69E+02	8.06E+01	8.55E-01	NET	YES
Ce-141	-4.20E+01	4.34E+01	< 1.52E+02	7.31E+01	2.55E-01	NET	YES
Se-75	3.68E+01	1.35E+01	< 4.23E+01	1.99E+01	6.90E-01	NET	YES
Cr-51	-1.38E+02	2.82E+02	< 1.01E+03	4.73E+02	2.01E-01	NET	YES
I-131	-6.43E+02	1.66E+03	< 5.99E+03	2.78E+03	3.96E-03	NET	YES
Sb-125	-2.73E+01	2.55E+01	< 9.31E+01	4.37E+01	9.57E-01	NET	YES
Ag-108m	6.64E-01	7.43E+00	< 2.61E+01	1.22E+01	9.99E-01	NET	YES
Be-7	-1.99E+02	1.44E+02	< 5.43E+02	2.52E+02	4.35E-01	NET	YES
La-140	4.66E+02	4.89E+02	< 1.66E+03	7.67E+02	3.09E-02	NET	YES
Ru-103	-2.09E+01	2.26E+01	< 8.41E+01	3.89E+01	3.23E-01	NET	YES
Ba-140	-4.60E+02	9.16E+02	< 3.34E+03	1.54E+03	3.09E-02	NET	YES
Cs-134	-5.13E+00	4.25E+01	< 1.42E+02	6.99E+01	9.43E-01	NET	YES
Ru-106	-2.12E+02	8.21E+01	< 3.32E+02	1.54E+02	8.86E-01	NET	YES
Cs-137	-1.10E+01	9.08E+00	< 3.45E+01	1.59E+01	9.96E-01	NET	YES
Zr-95	-8.35E+01	5.94E+01	< 2.25E+02	1.07E+02	4.99E-01	NET	YES
Nb-95	-3.96E+00	3.76E+01	< 1.34E+02	6.22E+01	2.81E-01	NET	YES
Co-58	2.83E+00	1.74E+01	< 6.17E+01	2.83E+01	5.34E-01	NET	YES
Mn-54	1.14E+01	1.03E+01	< 3.47E+01	1.58E+01	8.67E-01	NET	YES
Ag-110m	1.44E+01	1.24E+01	< 4.20E+01	1.86E+01	8.37E-01	NET	YES
Fe-59	-6.17E+01	5.85E+01	< 2.20E+02	1.02E+02	3.69E-01	NET	YES

L5186-04 analyzed by emml461 on 04/11/2003
Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Zn-65	5.42E+01	5.52E+01	< 1.85E+02	8.83E+01	8.34E-01	NET	YES
Co-60	-7.53E+00	8.60E+00	< 3.46E+01	1.52E+01	9.77E-01	NET	YES
Sb-124	6.29E+01	3.51E+01	< 1.11E+02	4.48E+01	4.78E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-04

Stred

Sample ID: SOIL/SEDI Duratek Inc

Code: 1017308

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 17:37:36
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 20000 Sec
 Sample Size 7.32E-001 kg | Real Time 20018 Sec
 Collection Efficiency 1.0000 | Spc. File 1017308.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Energy(keV)= 0.80 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003
 FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 0.50 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	61.15	91.08	56	38	61	754	1.11	a NET< CL
2	63.95	95.31	178	50	79	1056	1.55	b
3	75.41	112.61	525	52	77	1100	1.31	a
4	77.72	116.09	720	49	67	917	1.12	b
5	85.30	127.53	121	60	97	1388	1.90	a Wide Pk
6	87.87	131.42	307	51	80	1079	1.49	b
7	90.34	135.14	212	56	88	1233	1.73	c
8	93.11	139.32	509	68	105	1542	2.23	d Wide Pk
9	96.35	144.21	2	26	43	462	0.64	e NET< CL
10	99.54	149.03	67	33	53	617	0.96	f
11	102.07	152.83	8	43	71	925	1.20	g NET< CL
12	106.47	159.49	29	38	62	771	1.04	h NET< CL
13	111.06	166.41	59	54	88	1233	1.66	i NET< CL
14	119.39	178.98	29	37	61	739	1.03	a NET< CL
15	122.68	183.95	647	49	69	887	1.27	b
16	129.78	194.66	58	47	77	1003	0.80	NET< CL
17	137.05	205.63	83	26	39	402	0.65	a MANUAL
18	143.89	215.96	22	45	73	915	0.49	NET< CL
19	152.54	229.01	19	43	70	845	1.47	NET< CL
20	167.66	251.83	0	42	68	797	0.00	NET< CL
21	186.68	280.55	332	41	60	658	1.29	a HiResid
22	190.30	286.00	7	22	37	329	0.67	b NET< CL HiResid
23	209.75	315.36	128	32	49	488	1.11	a
24	216.18	325.07	18	39	63	682	1.53	b NET< CL
25	226.09	340.02	8	30	49	488	0.22	NET< CL
26	239.19	359.79	1727	52	52	504	1.38	a
27	242.23	364.39	306	43	65	672	1.81	b

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	252.36	379.67	26	33	54	492	0.50	NET< CL
29	259.73	390.79	9	25	41	339	0.43	NET< CL
30	270.75	407.43	161	31	46	385	1.39 a	
31	277.77	418.01	56	35	57	513	1.68 b	NET< CL
32	295.76	445.17	442	37	50	425	1.41 a	
33	300.59	452.45	53	28	44	364	1.24 b	
34	315.28	474.64	24	35	57	484	0.84	NET< CL
35	328.81	495.05	46	33	54	453	1.32	NET< CL
36	338.95	510.35	342	38	54	429	1.33	
37	352.44	530.71	806	42	52	393	1.38	
38	373.53	562.54	13	17	28	172	0.97 a	NET< CL
39	378.05	569.36	20	15	23	129	0.73 b	NET< CL
40	387.30	583.33	10	18	29	184	0.96 a	NET< CL
41	391.72	590.00	6	15	24	138	0.74 b	NET< CL
42	403.22	607.35	23	25	40	272	1.42 a	NET< CL
43	409.85	617.36	74	18	26	155	0.90 b	
44	445.39	671.00	3	13	21	113	0.76 a	NET< CL
45	452.37	681.53	11	24	39	264	1.58 b	NET< CL
46	463.70	698.63	100	25	38	228	1.73	
47	494.19	744.66	-20	26	44	267	1.16	NET< CL
48	511.30	770.48	612	36	43	308	2.23 a	
49	513.41	773.65	77	22	33	215	1.47 b	
50	535.48	806.97	13	17	28	164	1.70	NET< CL
51	564.89	851.36	17	25	41	279	1.43	NET< CL
52	583.79	879.88	579	33	37	244	1.55	
53	609.88	919.25	644	37	43	308	1.55	
54	662.43	998.56	65	25	39	234	2.17	
55	706.52	1065.11	17	17	27	156	0.67	NET< CL
56	721.64	1087.93	17	17	28	151	1.44 a	NET< CL
57	727.74	1097.14	111	18	25	130	1.25 b	
58	767.22	1156.72	51	28	45	288	1.49	
59	795.05	1198.72	54	21	33	179	1.61	
60	861.12	1298.44	95	22	32	164	1.85	
61	905.03	1364.71	22	15	24	116	1.57 a	NET< CL
62	911.86	1375.02	394	26	27	133	1.70 b	
63	927.56	1398.72	16	12	18	76	1.00 a	NET< CL
64	934.47	1409.14	35	15	23	107	1.50 b	
65	965.22	1455.56	90	18	25	116	1.77 a	
66	969.68	1462.28	250	23	27	130	1.85 b	
67	1000.34	1508.56	71	21	32	150	3.22	Wide Pk
68	1081.81	1631.52	24	23	37	186	2.52	NET< CL
69	1120.82	1690.39	123	24	36	201	1.75	
70	1223.13	1844.80	-3	18	30	172	0.20	NET< CL
71	1238.22	1867.58	47	21	33	202	1.69	
72	1377.63	2077.99	48	15	22	77	3.77	Wide Pk
73	1408.82	2125.07	2	14	22	86	0.70	NET< CL
74	1461.49	2204.55	3142	57	21	69	2.20	
75	1509.26	2276.65	11	12	19	58	1.71	NET< CL
76	1588.54	2396.31	45	14	19	57	2.81	
77	1621.47	2446.01	20	7	8	16	1.35 a	
78	1631.08	2460.51	26	9	13	29	2.30 b	
79	1729.07	2608.40	34	11	15	32	4.38	Wide Pk
80	1765.13	2662.82	145	15	15	36	2.35	

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
81	1832.06	2763.84	14	9	14	32	1.24	NET< CL
82	1847.74	2787.50	19	9	13	31	2.55	
83	2104.32	3174.74	35	10	13	28	3.12	
84	2205.01	3326.71	24	9	13	28	1.68	
85	2615.18	3945.76	260	18	12	23	3.26	
86	137.07	205.66	15	41	68	849	0.19	NET< CL DELETED

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	63.95	178	50	79	86	50	81	
3	75.41	525	52	77	489	52	78	
4	77.72	720	49	67	663	50	70	
5	85.30	121	60	97	92	60	98	NET<CL
6	87.87	307	51	80	268	52	82	
8	93.11	509	68	105	287	68	109	
10	99.54	67	33	53	62	34	54	
18	143.89	22	45	73	-4	45	74	NET<CL
21	186.68	332	41	60	214	41	64	
26	239.19	1727	52	52	1636	53	56	
27	242.23	306	43	65	264	44	67	
32	295.76	442	37	50	355	37	53	
35	328.81	46	33	54	47	34	54	NET<CL
36	338.95	342	38	54	323	38	55	
37	352.44	806	42	52	679	43	56	
46	463.70	100	25	38	98	26	39	
48	511.30	612	36	43	107	37	59	
52	583.79	579	33	37	553	34	39	
53	609.88	644	37	43	530	37	48	
58	767.22	51	28	45	42	28	46	NET<CL
62	911.86	394	26	27	375	26	28	
64	934.47	35	15	23	33	16	24	
66	969.68	250	23	27	238	23	28	
67	1000.34	71	21	32	64	21	33	
69	1120.82	123	25	36	106	25	37	
71	1238.22	47	21	33	45	21	34	
72	1377.63	48	15	22	39	15	23	
74	1461.49	3142	57	21	3097	58	24	
79	1729.07	35	11	15	31	11	15	
80	1765.13	145	15	15	122	15	18	
84	2205.01	24	9	13	17	9	14	
85	2615.18	260	18	12	230	18	16	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File:ENVA.LIB (Environmental Library (Kocher 1981))

Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	63.95	86	Th-234	86	2 of 2	100.00	1.50	
3	75.41	489	Pb-212	322	5 of 6	100.00	1.00	
			Pb-214	117	5 of 7	98.65	0.99	
			Tl-208	32	5 of 9	94.86	0.95	
4	77.72	663	Pb-212	561	5 of 6	100.00	1.50	
			Pb-214	210	5 of 7	98.65	0.99	
6	87.87	268	Pb-212	310	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
7	90.34	212	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	93.11	40	AcTh-228	135	13 of 36	85.31	1.35	Split
87	93.11	246	Th-234	246	2 of 2	100.00	1.50	AutoAdd
10	99.54	62	AcTh-228	42	13 of 36	89.19	1.39	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
			1121DEsc	. . . . .	0 of 0	. . . . .	0.50	
15	122.68	647	Co-57	673	2 of 4	100.00	1.50	
17	137.05	83	Co-57	80	2 of 4	100.00	1.50	
21	186.68	214	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
23	209.75	128	AcTh-228	167	13 of 36	93.74	1.44	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
26	239.19	1636	Pb-212	1858	5 of 6	100.00	1.50	
27	242.23	264	Pb-214	168	5 of 7	100.00	1.50	
30	270.75	161	AcTh-228	114	13 of 36	89.19	1.39	
32	295.76	355	Pb-214	405	5 of 7	100.00	1.50	
33	300.59	53	Pb-212	110	5 of 6	100.00	1.50	
36	338.95	323	AcTh-228	316	13 of 36	93.74	1.44	
37	352.44	679	Pb-214	1036	5 of 7	100.00	1.50	
43	409.85	74	AcTh-228	52	13 of 36	89.19	1.39	
46	463.70	98	AcTh-228	100	13 of 36	93.74	1.44	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
48	511.30	107	Annil	. . . . .	1 of 1	100.00	1.50	
			Tl-208	153	5 of 9	97.02	1.47	
49	513.41	77	Sr-85	. . . . .	1 of 1	100.00	1.50	
52	583.79	553	Tl-208	523	5 of 9	97.02	1.47	
53	609.88	530	Bi-214	621	9 of 33	95.22	1.45	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1121SEsc	. . . . .	0 of 0	. . . . .	0.50	
54	662.43	65	Cs-137	. . . . .	1 of 1	100.00	1.50	
57	727.74	111	Bi-212	143	2 of 13	100.00	1.50	
59	795.05	54	AcTh-228	74	13 of 36	93.74	1.44	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
			Cs-134		1 of 9	46.67	0.97	
60	861.12	95	Tl-208	61	5 of 9	97.02	1.47	
62	911.86	375	AcTh-228	426	13 of 36	93.74	1.44	
64	934.47	33	Bi-214	29	9 of 33	93.26	1.43	
65	965.22	90	AcTh-228	72	13 of 36	90.58	1.41	
66	969.68	238	AcTh-228	230	13 of 36	92.21	1.42	
67	1000.34	64	Pa-234		1 of 2	100.00	1.00	
69	1120.82	106	Bi-214	123	9 of 33	95.22	1.45	
71	1238.22	45	Bi-214	45	9 of 33	95.22	1.45	
72	1377.63	39	Bi-214	29	9 of 33	91.16	1.41	
74	1461.49	3097	K-40		1 of 1	100.00	1.50	
76	1588.54	45	AcTh-228	35	13 of 36	90.58	1.41	
77	1621.47	20	Bi-212	15	2 of 13	100.00	1.50	
78	1631.08	26	AcTh-228	18	13 of 36	89.19	1.39	
79	1729.07	31	Bi-214	18	9 of 33	89.88	1.40	
80	1765.13	122	Bi-214	90	9 of 33	91.16	1.41	
82	1847.74	19	Bi-214	12	9 of 33	91.16	1.41	
83	2104.32	35	2615SEsc		0 of 0	. . .	0.50	
84	2205.01	17	Bi-214	26	9 of 33	95.22	1.45	
85	2615.18	230	Tl-208	243	5 of 9	97.02	1.47	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-04

Sample ID: SOIL/SEDI Duratek Inc

Code: 1017308

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 17:37:36
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 20000 Sec
 Sample Size 7.32e-001 kg | Real Time 20018 Sec
 Collection Efficiency 1.0000 | Spectrum File 1017308.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

Library File: ENVA.LIB (Environmental Library (Kocher 1981))
 LSF File: L5186-04.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS

		N							
	ENERGY	E	Concentration						
Nuclide	(keV)	(pCi/kg	)	MDA	Flags	Notes	MDC	

Th-234	Average:x	4.27E+02	+ - 1.90E+02	. . . .			. . . .
	63.29	4.27E+02	+ - 2.47E+02	8.11E+02		+		
	92.59	4.27E+02	+ - 2.98E+02	9.82E+02		+		
Pb-212	Average:x	3.80E+02	+ - 1.23E+01	. . . .		*	. . . .
	74.81	I.D.	. . . .	. . . .			. . . .
	77.12	I.D.	. . . .	. . . .			. . . .
	87.30	I.D.	. . . .	. . . .			. . . .
	238.63	3.83E+02	+ - 1.24E+01	2.67E+01		+*		
	300.09	1.86E+02	+ - 9.88E+01	3.23E+02		+		
AcTh-228	Average:x	3.59E+02	+ - 1.60E+01	. . . .		*	. . . .
	93.35	I.D.	. . . .	. . . .			. . . .
	99.45	5.28E+02	+ - 2.88E+02	9.44E+02		+		
	209.28	2.80E+02	+ - 7.03E+01	2.22E+02		+*		
	270.23	5.05E+02	+ - 9.56E+01	2.95E+02		+*		
	338.32	3.69E+02	+ - 4.35E+01	1.29E+02		+*		
	409.51	5.15E+02	+ - 1.26E+02	3.85E+02		+*		
	463.00	3.54E+02	+ - 9.25E+01	2.90E+02		+*		
	794.70	2.69E+02	+ - 1.06E+02	3.40E+02		+		
	911.07	3.37E+02	+ - 2.33E+01	5.36E+01		+*		
	964.60	4.48E+02	+ - 8.92E+01	2.63E+02		+*		
	969.11	3.71E+02	+ - 3.62E+01	9.32E+01		+*		
	1588.00	4.58E+02	+ - 1.39E+02	4.24E+02		+*		
	1630.40	5.19E+02	+ - 1.82E+02	5.54E+02		+		
	Co-57	Average:x	7.24E+01	+ - 5.34E+00		*	
		122.06	7.22E+01	+ - 5.49E+00	1.58E+01		+*	
136.48		7.51E+01	+ - 2.32E+01	7.37E+01		+*		
Ra-226	186.22	5.94E+02	+ - 1.15E+02	3.61E+02		+*		

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-214	Average:x	2.43E+02 +- 1.25E+01	. . . .	*		. . . . .
	241.98	3.72E+02 +- 6.16E+01	1.92E+02	++		. . . . .
	295.21	2.21E+02 +- 2.33E+01	6.78E+01	++		. . . . .
	351.92	2.44E+02 +- 1.54E+01	4.10E+01	++		. . . . .
Annul	511.00	2.06E+01 +- 7.18E+00	2.32E+01	+		. . . . .
Sr-85	513.99	2.65E+01 +- 7.51E+00	2.36E+01	++		. . . . .
Tl-208	Average:x	3.35E+02 +- 1.57E+01	. . . .	*		. . . . .
	583.14	3.39E+02 +- 2.06E+01	4.99E+01	++		. . . . .
	860.37	5.11E+02 +- 1.18E+02	3.62E+02	++		. . . . .
	2614.66	3.21E+02 +- 2.50E+01	4.76E+01	++		. . . . .
Bi-214	Average:x	2.29E+02 +- 1.31E+01	. . . .	*		. . . . .
	609.31	2.19E+02 +- 1.53E+01	4.06E+01	++		. . . . .
	934.06	2.59E+02 +- 1.24E+02	4.00E+02	+		. . . . .
	1120.29	2.00E+02 +- 4.68E+01	1.45E+02	++		. . . . .
	1238.11	2.33E+02 +- 1.10E+02	3.58E+02	+		. . . . .
	1377.67	3.07E+02 +- 1.22E+02	3.88E+02	+		. . . . .
	1729.59	3.95E+02 +- 1.40E+02	4.30E+02	+		. . . . .
	1764.49	2.97E+02 +- 3.78E+01	9.39E+01	++		. . . . .
	1847.42	3.53E+02 +- 1.74E+02	5.57E+02	+		. . . . .
	2204.22	1.55E+02 +- 8.41E+01	2.72E+02	+		. . . . .
Cs-137	661.65	1.55E+01 +- 5.93E+00	1.91E+01	+		. . . . .
Bi-212	Average:x	2.10E+02 +- 3.13E+01	. . . .	*		. . . . .
	727.17	2.02E+02 +- 3.34E+01	9.52E+01	++		. . . . .
	1620.62	2.61E+02 +- 8.82E+01	2.53E+02	+		. . . . .
Pa-234	1001.03	2.02E+03 +- 6.74E+02	2.14E+03	+		. . . . .
K-40	1460.81	9.87E+03 +- 1.83E+02	1.62E+02	++		. . . . .
Am-241	59.54	N 7.11E+01 +- 2.44E+01	7.91E+011	x	lbase	. . . . .
Ce-144	133.54	N-6.50E+01 +- 3.70E+01	1.27E+021	x	lbase	. . . . .
Ce-141	145.44	N 1.81E+01 +- 2.68E+01	8.92E+01	x		. . . . .
Se-75	264.65	N 2.70E+00 +- 7.46E+00	2.51E+01	x		. . . . .
Cr-51	320.08	N-1.78E+02 +- 1.88E+02	6.46E+02	x		. . . . .
I-131	364.48	N-1.38E+03 +- 1.14E+03	3.95E+03	x		. . . . .
Sb-125	427.89	N 1.56E+01 +- 1.21E+01	4.01E+01	x		. . . . .
Ag-108m	433.93	N-1.93E+00 +- 3.90E+00	1.34E+01	x		. . . . .
Be-7	477.59	N 5.41E+00 +- 7.76E+01	2.65E+02	x		. . . . .
Ru-103	497.08	N-9.05E+00 +- 1.11E+01	3.87E+01	x		. . . . .
Ru-106	621.84	N 5.14E+01 +- 4.54E+01	1.51E+02	x		. . . . .
Zr-95	756.72	N 1.60E+01 +- 1.40E+01	4.66E+01	x		. . . . .
Nb-95	765.79	N 1.51E+01 +- 1.57E+01	5.26E+01	x		. . . . .
Cs-134	795.84	N-5.47E+00 +- 6.12E+00	2.13E+01P	x	PIC	. . . . .
Co-58	810.76	N-8.72E-01 +- 7.14E+00	2.48E+01	x		. . . . .
Mn-54	834.83	N 2.44E+00 +- 4.98E+00	1.69E+01	x		. . . . .
Ag-110m	884.67	N-1.61E+00 +- 6.54E+00	2.28E+01	x		. . . . .
Fe-59	1099.22	N 3.42E+01 +- 2.45E+01	8.11E+01	x		. . . . .
Zn-65	1115.52	N-1.21E+01 +- 2.45E+01	8.28E+01P	x	PIC	. . . . .
Co-60	1332.49	N 9.83E-01 +- 4.65E+00	1.61E+01	x	Y.	. . . . .
Ba-140	1596.49	N 2.61E+02 +- 1.98E+02	6.56E+02P	x	PIC	. . . . .
La-140	1596.49	N 3.00E+02 +- 2.27E+02	7.54E+02P	x	PIC	. . . . .
Sb-124	1691.02	N-1.03E+01 +- 1.36E+01	5.11E+01	x		. . . . .

MEASURED TOTAL: 1.48E+04 +- 1.29E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	61.15	91.08	56	38	61	754	1.11	Deleted
5	85.30	127.53	92	60	98	1388	1.90	Deleted
7	90.34	135.14	212	56	88	1233	1.73	Unknown
9	96.35	144.21	2	26	43	463	0.64	Deleted
11	102.07	152.83	8	43	71	925	1.20	Deleted
12	106.47	159.49	29	38	62	771	1.04	Deleted
13	111.06	166.41	59	54	88	1233	1.66	Deleted
14	119.39	178.98	29	37	61	739	1.03	Deleted
16	129.78	194.66	58	47	77	1003	0.80	Deleted
18	143.89	215.96	-4	45	74	915	0.49	Deleted
19	152.54	229.01	19	43	70	845	1.47	Deleted
20	167.66	251.83	0	42	68	797	0.00	Deleted
22	190.30	286.00	7	22	37	329	0.67	Deleted
24	216.18	325.07	18	39	63	683	1.53	Deleted
25	226.09	340.02	8	30	49	488	0.22	Deleted
28	252.36	379.67	26	33	54	492	0.50	Deleted
29	259.73	390.79	9	25	41	339	0.43	Deleted
31	277.77	418.01	56	35	57	513	1.68	Deleted
34	315.28	474.64	25	35	57	485	0.84	Deleted
35	328.81	495.05	47	34	54	453	1.32	Deleted
38	373.53	562.54	13	17	28	172	0.97	Deleted
39	378.05	569.36	20	15	23	129	0.73	Deleted
40	387.30	583.33	10	18	29	184	0.96	Deleted
41	391.72	590.00	6	15	24	138	0.74	Deleted
42	403.22	607.35	23	25	40	272	1.42	Deleted
44	445.39	671.00	3	13	21	113	0.76	Deleted
45	452.37	681.53	11	24	39	264	1.58	Deleted
47	494.19	744.66	-20	26	44	267	1.16	Deleted
50	535.48	806.97	13	17	28	164	1.70	Deleted
51	564.89	851.36	17	25	41	279	1.43	Deleted
55	706.52	1065.11	17	17	27	156	0.67	Deleted
56	721.64	1087.93	17	17	28	151	1.44	Deleted
58	767.22	1156.72	42	28	46	288	1.49	Deleted
61	905.03	1364.71	22	15	24	116	1.57	Deleted
63	927.56	1398.72	16	12	18	76	1.00	Deleted
68	1081.81	1631.52	24	23	37	186	2.52	Deleted
70	1223.13	1844.80	-3	18	30	172	0.20	Deleted
73	1408.82	2125.07	2	14	22	86	0.70	Deleted
75	1509.26	2276.65	11	12	19	58	1.71	Deleted
81	1832.06	2763.84	14	9	14	32	1.24	Deleted
83	2104.32	3174.74	35	10	13	28	3.12	2615SEsc
86	137.07	205.66	15	41	68	849	0.19	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
88	59.54	88.65	116N	40	63	737	1.24	LBase
89	133.54	200.34	-74N	42	71	926	1.30	NET< CL LBase
90	145.44	218.30	27N	40	65	783	1.31	NET< CL
91	264.65	398.22	10N	28	45	376	1.39	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
92	320.08	481.87	-28N	29	49	412	1.43	NET< CL
93	364.48	548.89	-32N	26	44	336	1.46	NET< CL
94	427.89	644.59	29N	22	36	218	1.50	NET< CL
95	433.93	653.70	-11N	23	38	247	1.51	NET< CL
96	477.59	719.60	2N	22	35	214	1.53	NET< CL
97	497.08	749.01	-16N	19	32	200	1.55	NET< CL
98	621.84	937.31	23N	20	32	195	1.63	NET< CL
99	756.72	1140.88	20N	17	28	142	1.72	NET< CL
100	765.79	1154.56	19N	20	32	186	1.73	NET< CL
101	795.84	1199.92	-19N	22	36	179	1.75	NET< CL
								PIC
102	810.76	1222.44	-2N	16	27	135	1.76	NET< CL
103	834.83	1258.76	9N	18	30	164	1.77	NET< CL
104	884.67	1333.98	-4N	16	27	134	1.81	NET< CL
105	1099.22	1657.79	25N	18	29	142	1.95	NET< CL
106	1115.52	1682.40	-18N	36	60	344	1.96	NET< CL
								PIC
107	1332.49	2009.86	3N	14	23	99	2.10	NET< CL
108	1596.49	2408.30	24N	18	29	82	2.28	NET< CL
								PIC
109	1596.49	2408.30	24N	18	29	82	2.28	NET< CL
								PIC
110	1691.02	2550.97	-6N	8	15	37	2.34	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start:      02/06/2003 12:00:00 | Counting Start:      04/11/2003 17:37:36
Sampling Stop:       02/06/2003 12:00:00 | Decay Time. . . . . 1.54E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 20000 Sec
Sample Size . . . . . 7.32E-01 kg | Real Time . . . . . 20018 Sec
Collection Efficiency . . . . 1.0000 | Spectrum File . . . . . 1017308.spc
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Detector #: 8

Energy(keV)= 0.80 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998

Library File: ENVA.LIB LSF File: L5186-04.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	4.26E+02	1.90E+02	< 8.11E+02	3.99E+02	1.00E+00	MEAS +	YES
Pb-212	3.80E+02	1.23E+01	< 2.67E+01	1.31E+01	1.00E+00	MEAS +	YES
AcTh-228	3.59E+02	1.59E+01	< 5.36E+01	2.56E+01	1.00E+00	MEAS +	YES
Co-57	7.24E+01	5.34E+00	< 1.58E+01	7.73E+00	8.48E-01	MEAS +	YES
Ra-226	5.94E+02	1.15E+02	< 3.61E+02	1.77E+02	1.00E+00	MEAS +	YES
Pb-214	2.43E+02	1.26E+01	< 4.10E+01	2.00E+01	1.00E+00	MEAS +	YES
Annil	2.06E+01	7.18E+00	< 2.32E+01	1.13E+01	8.85E-01	MEAS +	YES
Sr-85	2.65E+01	7.51E+00	< 2.36E+01	1.13E+01	5.03E-01	MEAS +	YES
Tl-208	3.35E+02	1.57E+01	< 4.76E+01	2.19E+01	1.00E+00	MEAS +	YES
Bi-214	2.29E+02	1.31E+01	< 4.06E+01	1.97E+01	1.00E+00	MEAS +	YES
Cs-137	1.55E+01	5.93E+00	< 1.91E+01	9.23E+00	9.96E-01	MEAS +	YES
Bi-212	2.10E+02	3.13E+01	< 9.52E+01	4.51E+01	1.00E+00	MEAS +	YES
Pa-234	2.02E+03	6.74E+02	< 2.14E+03	1.03E+03	1.00E+00	MEAS +	YES
K-40	9.87E+03	1.84E+02	< 1.62E+02	7.69E+01	1.00E+00	MEAS +	YES
Am-241	7.11E+01	2.44E+01	< 7.91E+01	3.87E+01	1.00E+00	NET	YES
Ce-144	-6.50E+01	3.70E+01	< 1.27E+02	6.22E+01	8.55E-01	NET	YES
Ce-141	1.81E+01	2.68E+01	< 8.92E+01	4.37E+01	2.54E-01	NET	YES
Se-75	2.70E+00	7.46E+00	< 2.51E+01	1.22E+01	6.89E-01	NET	YES
Cr-51	-1.78E+02	1.88E+02	< 6.46E+02	3.14E+02	2.00E-01	NET	YES
I-131	-1.38E+03	1.14E+03	< 3.95E+03	1.92E+03	3.90E-03	NET	YES
Sb-125	1.56E+01	1.21E+01	< 4.01E+01	1.93E+01	9.57E-01	NET	YES
Ag-108m	-1.93E+00	3.90E+00	< 1.34E+01	6.49E+00	9.99E-01	NET	YES
Be-7	5.41E+00	7.76E+01	< 2.65E+02	1.28E+02	4.34E-01	NET	YES
Ru-103	-9.05E+00	1.11E+01	< 3.87E+01	1.86E+01	3.22E-01	NET	YES
Ru-106	5.14E+01	4.54E+01	< 1.51E+02	7.25E+01	8.86E-01	NET	YES
Zr-95	1.60E+01	1.40E+01	< 4.65E+01	2.22E+01	4.98E-01	NET	YES
Nb-95	1.51E+01	1.57E+01	< 5.26E+01	2.52E+01	2.80E-01	NET	YES
Cs-134	-5.47E+00	6.12E+00	< 2.13E+01	1.03E+01	9.42E-01	NET	YES
Co-58	-8.72E-01	7.14E+00	< 2.48E+01	1.18E+01	5.33E-01	NET	YES
Mn-54	2.44E+00	4.98E+00	< 1.69E+01	8.09E+00	8.67E-01	NET	YES
Ag-110m	-1.61E+00	6.54E+00	< 2.28E+01	1.08E+01	8.36E-01	NET	YES
Fe-59	3.42E+01	2.45E+01	< 8.11E+01	3.87E+01	3.68E-01	NET	YES
Zn-65	-1.21E+01	2.45E+01	< 8.28E+01	4.05E+01	8.33E-01	NET	YES
Co-60	9.83E-01	4.65E+00	< 1.61E+01	7.59E+00	9.77E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Ba-140	2.60E+02	1.98E+02	< 6.56E+02	3.13E+02	3.06E-02	NET	YES
La-140	3.00E+02	2.27E+02	< 7.54E+02	3.60E+02	3.06E-02	NET	YES
Sb-124	-1.03E+01	1.36E+01	< 5.11E+01	2.34E+01	4.77E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-05 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-040
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-06-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 760.2 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/11/02 1059 Det No.: 4 Spectrum No.: 1014104
Counted by: EN
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5186-05
Client Id : BMS-2600-040
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/06/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	760.2		
Sample Weight-Dry	g			
Aliquot Weight	g	760.2		
FINAL WEIGHT	kg	.7602		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-05

Sample ID: SOIL/SEDI Duratek Inc

Code: 1014104

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 10:59:15
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.53E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 7526 Sec
 Sample Size 7.60E-001 kg | Real Time 7529 Sec
 Collection Efficiency 1.0000 | Spc. File 1014104.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.85 + 0.662*Ch + -1.27E-07*Ch^2 + 3.49E-11*Ch^3 04/11/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.60 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.88	95.27	46	23	36	268	0.80	
2	75.32	112.57	148	23	32	223	0.83	a
3	77.51	115.89	191	24	32	223	0.90	b
4	87.68	131.25	14	25	40	330	0.28	NET< CL
5	92.66	138.78	60	18	26	170	0.58	a
6	93.72	140.38	101	16	20	114	0.51	b
7	122.63	184.08	32	27	43	321	0.58	NET< CL
8	186.25	280.26	84	24	37	230	1.16	
9	209.77	315.82	48	19	30	162	0.83	
10	239.07	360.12	413	25	24	118	1.10	a
11	242.19	364.83	101	20	28	142	1.27	b
12	295.65	445.66	92	22	33	168	0.91	
13	338.70	510.74	105	18	25	99	1.29	
14	352.41	531.47	250	22	26	105	1.35	
15	462.77	698.32	30	15	23	75	1.36	
16	511.18	771.51	127	17	22	67	1.71	
17	583.66	881.10	144	18	21	68	1.33	
18	609.66	920.40	185	17	17	44	1.63	
19	727.57	1098.68	27	12	17	45	1.15	
20	911.59	1376.91	112	14	15	36	1.56	
21	969.17	1463.97	38	12	17	45	1.01	
22	1461.18	2207.81	601	25	8	12	2.11	
23	1765.28	2667.49	34	8	8	11	2.10	
24	2615.06	3951.40	42	7	6	5	3.92	

 SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.88	46	23	36	9	23	38	NET<CL
2	75.32	148	23	32	128	23	33	
3	77.51	191	24	32	166	24	33	
4	87.68	14	25	40	3	25	41	NET<CL
5	92.66	60	18	26	-24	18	31	NET<CL
8	186.25	84	24	37	47	24	38	
9	209.77	48	19	30	46	19	30	
10	239.07	413	25	24	382	25	26	
11	242.19	101	20	28	88	20	28	
12	295.65	92	22	33	73	22	34	
13	338.70	105	18	25	100	18	25	
14	352.41	250	22	26	214	22	28	
15	462.77	30	15	23	28	15	23	
16	511.18	127	17	22	17	18	28	NET<CL
17	583.66	145	18	21	135	18	22	
18	609.66	185	17	17	160	17	19	
20	911.59	112	14	15	107	14	16	
21	969.17	38	12	17	36	12	17	
22	1461.18	601	25	8	593	25	10	
23	1765.28	34	8	8	30	8	9	
24	2615.06	42	7	6	35	7	7	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.65 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	75.32	128	Pb-214	82	5 of 7	100.00	1.50	
			Pb-214	46	5 of 7	100.00	1.00	
			Pb-212	95	3 of 6	86.53	1.37	
			Tl-208	10	3 of 9	80.26	0.80	
			Pb-212	171	3 of 6	90.16	1.40	
3	77.51	166	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Pb-214	82	5 of 7	100.00	1.00	
			Pb-212	171	3 of 6	90.16	1.40	Matched
6	93.72	101	AcTh-228	46	6 of 36	69.22	0.69	
			Th-234	. . . . .	1 of 2	58.74	0.59	LowScore
8	186.25	47	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.50	
9	209.77	46	AcTh-228	49	6 of 36	79.35	1.29	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
10	239.07	382	Pb-212	415	3 of 6	90.16	1.40	
11	242.19	88	Pb-214	57	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
12	295.65	73	Pb-214	152	5 of 7	100.00	1.00	
13	338.70	100	AcTh-228	84	6 of 36	74.81	1.25	
14	352.41	214	Pb-214	251	5 of 7	100.00	1.50	
15	462.77	28	AcTh-228	26	6 of 36	74.81	1.25	
			Sb-125	. . . . .	1 of 8	13.67	0.64	LowScore
17	583.66	135	Tl-208	96	3 of 9	84.61	1.35	
18	609.66	160	Bi-214	207	2 of 33	75.57	1.26	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
19	727.57	27	Bi-212	. . . . .	1 of 13	100.00	1.50	
			Te-129m	. . . . .	1 of 2	18.72	0.69	
20	911.59	107	AcTh-228	106	6 of 36	74.81	1.25	
21	969.17	36	AcTh-228	67	6 of 36	93.66	1.44	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
22	1461.18	593	K-40	. . . . .	1 of 1	100.00	1.50	
23	1765.28	30	Bi-214	23	2 of 33	68.00	1.18	
24	2615.06	35	Tl-208	49	3 of 9	89.66	1.40	

Version 1.9.2

Environmental Gamma Isotopic Analysis

LSN: L5186-05

Sample ID: SOIL/SEDI Duratek Inc

Code: 1014104

Sampling Start:	02/06/2003 12:00:00	Counting Start:	04/11/2003 10:59:15
Sampling Stop:	02/06/2003 12:00:00	Decay Time.	1.53e+003 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	7526 Sec
Sample Size	7.60e-001 kg	Real Time	7529 Sec
Collection Efficiency	1.0000	Spectrum File	.1014104.spc
Type I		Type I & II	
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Canberra sn 10923050 det#4)

Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)

$$\text{Eff.} = 1 / [1.58\text{E-}02 * \text{En}^{-3.09\text{E}+00} + 2.56\text{E}+02 * \text{En}^{7.93\text{E-}01}] \quad 02/09/1998$$

```
Library File: . . . . . SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: . . . . . L5186-05.LSF (SOIL/SEDI: Duratek Inc)
```

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	E	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-214	Average:	x	2.84E+02 +- 2.65E+01	. . . .	*		. . . . .
	77.11		I.D.	. . . .			. . . . .
	241.98		4.71E+02 +- 1.05E+02	3.18E+02	+	*	. . . . .
	295.21		1.76E+02 +- 5.33E+01	1.68E+02	+	*	. . . . .
	351.92		3.06E+02 +- 3.19E+01	8.32E+01	+	*	. . . . .
AcTh-228	Average:	x	3.95E+02 +- 3.91E+01	. . . .	*		. . . . .
	93.35		I.D.	. . . .			. . . . .
	209.28		3.74E+02 +- 1.58E+02	5.10E+02	+		. . . . .
	338.32		4.51E+02 +- 8.31E+01	2.42E+02	+	*	. . . . .
	463.00		4.24E+02 +- 2.21E+02	7.20E+02	+		. . . . .
	911.07		4.33E+02 +- 5.70E+01	1.38E+02	+	*	. . . . .
	969.11		2.58E+02 +- 8.41E+01	2.57E+02	+	*	. . . . .
Ra-226	186.22		4.78E+02 +- 2.46E+02	8.03E+02	+		. . . . .
Pb-212	238.63		3.36E+02 +- 2.22E+01	4.84E+01	+	*	. . . . .
Tl-208	Average:	x	3.08E+02 +- 3.49E+01	. . . .	*		. . . . .
	583.14		3.51E+02 +- 4.63E+01	1.22E+02	+	*	. . . . .
	2614.66		2.50E+02 +- 5.30E+01	1.24E+02	+	*	. . . . .
Bi-214	Average:	x	2.90E+02 +- 2.86E+01	. . . .	*		. . . . .
	609.31		2.82E+02 +- 3.01E+01	7.13E+01	+	*	. . . . .
	1764.49		3.65E+02 +- 9.19E+01	2.42E+02	+	*	. . . . .
Bi-212	727.17		2.12E+02 +- 9.16E+01	2.91E+02	+		. . . . .
K-40	1460.81		9.07E+03 +- 3.83E+02	3.36E+02	+	*	. . . . .
Am-241	59.54	N	7.39E+01 +- 3.44E+01	1.12E+02	1	x	lbase
Co-57	122.06	N	2.23E+01 +- 8.25E+00	2.64E+01		x	. . . . .
Ce-144	133.54	N	5.61E+01 +- 6.05E+01	2.12E+02		x	. . . . .
Ce-141	145.44	N	1.65E+01 +- 4.60E+01	1.59E+02		x	. . . . .
Se-75	264.65	N	8.59E-01 +- 1.28E+01	4.49E+01		x	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E		Concentration		MDA	Flags	Notes	MDC
	(keV)	N	(pCi/kg)				
Cr-51	320.08	N-9.93E+01	+-	3.28E+02	1.16E+03		x	. . . . .
I-131	364.48	N 5.01E+02	+-	2.10E+03	7.31E+03		x	. . . . .
Sb-125	427.89	N-2.20E+01	+-	2.47E+01	9.04E+01		x	. . . . .
Ag-108m	433.93	N-1.24E+01	+-	7.55E+00	2.85E+01		x	. . . . .
Be-7	477.59	N-8.89E+01	+-	1.50E+02	5.47E+02		x	. . . . .
La-140	487.03	N 7.70E+02	+-	4.86E+02	1.60E+03		x	. . . . .
Ru-103	497.08	N-7.23E+00	+-	2.40E+01	8.66E+01		x	. . . . .
Ba-140	537.32	N 1.52E+03	+-	9.09E+02	2.98E+03		x	. . . . .
Cs-134	604.70	N-9.55E+00	+-	8.49E+00	3.19E+011		x lbase	. . . . .
Ru-106	621.84	N-1.35E+02	+-	9.28E+01	3.53E+02		x	. . . . .
Cs-137	661.65	N 1.58E+01	+-	1.03E+01	3.41E+01		x	Y.
Zr-95	724.18	N-3.43E+01	+-	6.17E+01	2.22E+02L		x LHROI	. . . . .
Nb-95	765.79	N-1.17E+01	+-	2.91E+01	1.08E+02		x	. . . . .
Co-58	810.76	N-1.61E+01	+-	1.39E+01	5.46E+01		x	. . . . .
Mn-54	834.83	N-1.95E+01	+-	9.43E+00	3.81E+01		x	. . . . .
Ag-110m	884.67	N 7.22E+00	+-	1.55E+01	5.45E+01		x	. . . . .
Fe-59	1099.22	N 0.00E+00	+-	4.90E+01	1.78E+02		x	. . . . .
Zn-65	1115.52	N-6.85E+01	+-	2.64E+01	1.08E+02		x	. . . . .
Co-60	1332.49	N-4.27E+00	+-	8.61E+00	3.38E+01		x	Y.
Sb-124	1691.02	N 0.00E+00	+-	2.21E+01	9.39E+01		x	. . . . .

MEASURED TOTAL: 1.14E+04 +- 8.72E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.88	95.27	9	23	38	268	0.80	Deleted
3	77.51	115.89	166	24	33	223	0.90	Unknown
4	87.68	131.25	3	25	41	330	0.28	Deleted
5	92.66	138.78	-24	18	31	171	0.58	Deleted
7	122.63	184.08	32	27	43	321	0.58	Deleted
16	511.18	771.51	17	18	28	67	1.71	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	59.54	88.72	45N	21	33	216	0.98	LBase
26	122.06	183.23	58N	22	33	222	1.04	
27	133.54	200.58	-18N	20	33	223	1.05	NET< CL
28	145.44	218.57	-7N	20	32	205	1.06	NET< CL
29	264.65	398.79	1N	12	20	84	1.17	NET< CL
30	320.08	482.59	-4N	13	22	89	1.21	NET< CL
31	364.49	549.72	3N	13	21	78	1.25	NET< CL
32	427.90	645.60	-10N	11	19	68	1.30	NET< CL
33	433.94	654.73	-18N	11	19	67	1.30	NET< CL
34	477.60	720.74	-6N	10	17	54	1.34	NET< CL
35	487.04	735.02	16N	10	15	43	1.34	

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NET/MDA PEAK RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
36	497.09	750.21	-3N	10	17	51	1.35	NET< CL
37	537.34	811.06	16N	10	14	38	1.38	
38	604.73	912.94	-11N	10	17	48	1.43	NET< CL
								LBase
39	621.87	938.86	-14N	10	17	50	1.44	NET< CL
40	661.68	999.06	15N	10	15	40	1.47	
41	724.23	1093.62	-8N	14	25	48	1.52	NET< CL
								LHRoi
42	765.84	1156.54	-3N	8	14	39	1.55	NET< CL
43	810.82	1224.55	-8N	7	13	32	1.58	NET< CL
44	834.77	1260.75	-16N	8	14	41	1.60	NET< CL
45	884.62	1336.13	4N	9	14	35	1.64	NET< CL
46	1099.25	1660.63	0N	8	13	31	1.79	NET< CL
47	1115.56	1685.29	-22N	8	16	47	1.80	NET< CL
48	1332.51	2013.29	-3N	6	10	16	1.95	NET< CL
49	1691.07	2555.33	0N	3	5	4	2.20	NET< CL

c:\seeker\Results\L5186-05.RES Analysis Results Saved.

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 10:59:15
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.53E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 7526 Sec
Sample Size 7.60E-01 kg | Real Time 7529 Sec
Collection Efficiency 1.0000 | Spectrum File 1014104.spc

Detector #: 4

Energy(keV)= 0.85 + 0.662*Ch + -1.27E-07*Ch^2 + -1.27E-07*Ch^3 04/11/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
Eff.=1/[1.58e-02*En^-3.09e+00 + 2.56e+02*En^ 7.93e-01] 02/09/1998 .

Library File: SOILA.LIB LSF File: L5186-05.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-214	2.84E+02	2.65E+01	< 8.32E+01	3.97E+01	9.99E-01	MEAS +	YES
AcTh-228	3.95E+02	3.91E+01	< 1.38E+02	6.36E+01	1.00E+00	MEAS +	YES
Ra-226	4.78E+02	2.46E+02	< 8.03E+02	3.88E+02	1.00E+00	MEAS +	YES
Pb-212	3.36E+02	2.22E+01	< 4.83E+01	2.30E+01	1.00E+00	MEAS +	YES
Tl-208	3.08E+02	3.49E+01	< 1.22E+02	5.21E+01	1.00E+00	MEAS +	YES
Bi-214	2.90E+02	2.86E+01	< 7.13E+01	3.33E+01	9.99E-01	MEAS +	YES
Bi-212	2.12E+02	9.16E+01	< 2.91E+02	1.35E+02	1.00E+00	MEAS +	YES
K-40	9.07E+03	3.83E+02	< 3.36E+02	1.47E+02	1.00E+00	MEAS +	YES
Am-241	7.39E+01	3.44E+01	< 1.12E+02	5.36E+01	1.00E+00	NET	YES
Co-57	2.23E+01	8.25E+00	< 2.64E+01	1.27E+01	8.49E-01	NET	YES
Ce-144	-5.61E+01	6.05E+01	< 2.12E+02	1.02E+02	8.55E-01	NET	YES
Ce-141	-1.65E+01	4.60E+01	< 1.59E+02	7.64E+01	2.55E-01	NET	YES
Se-75	8.59E-01	1.28E+01	< 4.49E+01	2.11E+01	6.91E-01	NET	YES
Cr-51	-9.93E+01	3.28E+02	< 1.16E+03	5.45E+02	2.02E-01	NET	YES
I-131	5.01E+02	2.10E+03	< 7.31E+03	3.43E+03	4.02E-03	NET	YES
Sb-125	-2.20E+01	2.47E+01	< 9.04E+01	4.22E+01	9.57E-01	NET	YES
Ag-108m	-1.24E+01	7.55E+00	< 2.85E+01	1.33E+01	9.99E-01	NET	YES
Be-7	-8.89E+01	1.50E+02	< 5.47E+02	2.53E+02	4.36E-01	NET	YES
La-140	7.70E+02	4.86E+02	< 1.60E+03	7.34E+02	3.12E-02	NET	YES
Ru-103	-7.23E+00	2.40E+01	< 8.66E+01	4.00E+01	3.24E-01	NET	YES
Ba-140	1.52E+03	9.09E+02	< 2.98E+03	1.36E+03	3.12E-02	NET	YES
Cs-134	-9.55E+00	8.49E+00	< 3.19E+01	1.48E+01	9.43E-01	NET	YES
Ru-106	-1.35E+02	9.28E+01	< 3.53E+02	1.64E+02	8.87E-01	NET	YES
Cs-137	1.58E+01	1.03E+01	< 3.41E+01	1.57E+01	9.96E-01	NET	YES
Zr-95	-3.42E+01	6.18E+01	< 2.22E+02	1.05E+02	5.00E-01	NET	YES
Nb-95	-1.17E+01	2.91E+01	< 1.08E+02	4.91E+01	2.82E-01	NET	YES
Co-58	-1.61E+01	1.39E+01	< 5.46E+01	2.47E+01	5.35E-01	NET	YES
Mn-54	-1.95E+01	9.43E+00	< 3.82E+01	1.74E+01	8.68E-01	NET	YES
Ag-110m	7.22E+00	1.55E+01	< 5.45E+01	2.48E+01	8.37E-01	NET	YES
Fe-59	0.00E+00	4.90E+01	< 1.78E+02	8.07E+01	3.70E-01	NET	YES
Zn-65	-6.85E+01	2.64E+01	< 1.08E+02	4.97E+01	8.34E-01	NET	YES
Co-60	-4.27E+00	8.60E+00	< 3.38E+01	1.48E+01	9.77E-01	NET	YES
Sb-124	0.00E+00	2.21E+01	< 9.38E+01	3.63E+01	4.79E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
---------	----------	-------------	-----	--------	-------	------	---------

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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-06

Count by Date: _____
(if required)

Client: Duratek Inc

Delay Date: _____
(if required)

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMS-2600-067

Collect Start Date/Time: _____

Collect Stop Date/Time: 02-07-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 7050 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/14/03 1721

Det No.: 4

Spectrum No.: 1047204

Counted by: mba

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5186-06
Client Id : BMS-2600-067
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/07/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	705		
Sample Weight-Dry	g			
Aliquot Weight	g	705		
FINAL WEIGHT	kg	.705		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5186-06 analyzed by LRH on 04/14/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5186-06

Sample ID: SOIL/SEDI Duratek Inc

Code: 1047204

Sampling Start: 02/07/2003 12:00:00 | Counting Start: 04/14/2003 17:21:23
Sampling Stop: 02/07/2003 12:00:00 | Decay Time: 1.59E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time: 20000 Sec
Sample Size: 7.05E-001 kg | Real Time: 20006 Sec
Collection Efficiency: 1.0000 | Spc. File: 1047204.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.20 + 0.662*Ch + -1.34E-07*Ch^2 + 3.67E-11*Ch^3 04/14/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.29	95.37	173	46	72	954	0.97	
2	74.70	112.62	457	41	57	715	0.78	a
3	77.02	116.13	696	43	57	715	0.89	b
4	84.13	126.87	113	59	96	1364	1.88	a Wide Pk
5	87.13	131.40	292	41	61	758	1.14	b
6	89.86	135.54	196	30	43	454	0.58	c
7	92.77	139.93	596	49	70	909	1.40	d
8	128.81	194.41	78	41	65	783	0.71	
9	185.77	280.52	294	38	56	582	1.25	
10	201.98	305.03	16	34	55	564	0.44	NET< CL
11	209.06	315.73	79	37	59	586	1.14	
12	238.49	360.23	1301	44	42	357	1.01	a
13	241.33	364.52	288	37	54	499	1.42	b
14	257.84	389.49	24	33	53	451	0.69	NET< CL
15	270.05	407.94	74	31	49	407	1.07	
16	277.13	418.65	1	29	47	383	0.05	NET< CL
17	295.01	445.67	370	29	35	244	1.10	a
18	299.78	452.89	79	29	45	342	1.46	b
19	327.25	494.42	86	28	44	309	1.42	
20	338.23	511.02	256	29	39	265	1.34	
21	351.80	531.54	720	36	39	245	1.46	
22	409.37	618.57	29	25	41	265	1.04	NET< CL
23	462.88	699.48	78	23	35	191	1.20	
24	489.02	739.00	-8	23	38	216	0.55	NET< CL
25	510.78	771.89	432	33	42	245	2.08	Wide Pk
26	582.95	881.02	488	29	32	148	1.36	
27	609.03	920.46	552	30	30	135	1.53	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	661.48	999.76	7	16	26	126	0.21	NET< CL
29	726.98	1098.79	120	21	29	124	1.68	
30	768.15	1161.04	8	18	29	160	0.28	NET< CL
31	794.47	1200.83	10	18	30	144	0.68	NET< CL
32	860.12	1300.10	7	17	27	125	0.32	NET< CL
33	911.05	1377.10	317	25	28	125	1.59	
34	964.76	1458.31	27	10	15	56	0.85	a
35	968.63	1464.16	119	18	25	111	1.80	b
36	1120.34	1693.54	121	20	27	116	1.73	
37	1238.45	1872.12	50	19	29	136	1.52	
38	1377.65	2082.56	31	10	14	34	1.16	
39	1460.60	2207.96	1752	43	16	44	2.13	
40	1764.13	2666.79	80	12	14	32	2.53	
41	2614.58	3951.70	168	15	11	20	2.69	

L5186-06 analyzed by LRH on 04/14/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.29	173	46	72	76	46	74	
2	74.70	457	41	57	403	41	59	
3	77.02	696	43	57	629	44	59	
4	84.13	113	59	96	67	60	98	NET<CL
5	87.13	292	41	61	264	41	62	
6	89.86	196	30	43	178	30	44	
7	92.77	596	49	70	374	50	75	
9	185.77	294	38	56	196	39	60	
11	209.06	79	37	59	73	37	59	
12	238.49	1301	44	42	1218	44	45	
13	241.33	288	37	54	254	37	55	
17	295.01	370	29	35	319	29	38	
20	338.23	256	29	39	242	29	41	
21	351.80	720	36	39	626	36	44	
23	462.88	78	23	35	74	23	36	
25	510.78	432	33	42	139	34	52	
26	582.95	488	29	32	462	30	33	
27	609.03	552	30	30	485	30	34	
33	911.05	317	25	28	303	25	29	
35	968.63	119	18	25	114	19	25	
36	1120.34	121	20	27	107	20	28	
37	1238.45	50	19	29	47	19	29	
38	1377.65	31	10	14	28	10	14	
39	1460.60	1752	43	16	1731	43	18	
40	1764.13	80	12	14	69	13	16	
41	2614.58	168	15	11	148	15	14	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	63.29	76	Th-234	76	2 of 2	100.00	1.50	
2	74.70	403	Pb-212	311	5 of 6	100.00	1.50	
			Tl-208	21	5 of 9	90.39	0.90	
			Pb-214	142	5 of 7	98.65	0.99	
			Tl-208	38	5 of 9	90.39	0.90	
3	77.02	629	Pb-212	542	5 of 6	100.00	1.50	
			Pb-214	250	5 of 7	98.65	0.99	
5	87.13	264	Pb-212	286	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	89.86	178	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	92.77	188	AcTh-228	120	10 of 36	78.37	0.78	Split
43	92.77	186	Th-234	186	2 of 2	100.00	1.50	AutoAdd
8	128.81	78	AcTh-228	103	10 of 36	94.74	1.45	
9	185.77	196	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
11	209.06	73	AcTh-228	127	10 of 36	94.74	1.45	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
12	238.49	1218	Pb-212	1428	5 of 6	100.00	1.50	
13	241.33	254	Pb-214	159	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
15	270.05	74	AcTh-228	85	10 of 36	91.09	1.41	
17	295.01	319	Pb-214	382	5 of 7	100.00	1.50	
18	299.78	79	Pb-212	82	5 of 6	100.00	1.50	
19	327.25	86	AcTh-228	65	10 of 36	84.28	1.34	
			Bi-212	2	2 of 13	59.32	1.09	
			La-140	9614	2 of 15	23.26	0.23	LowScore
20	338.23	242	AcTh-228	222	10 of 36	87.50	1.37	
21	351.80	626	Pb-214	950	5 of 7	100.00	1.50	
23	462.88	74	AcTh-228	68	10 of 36	87.50	1.37	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
25	510.78	13	Annul	. . . . .	1 of 1	100.00	1.50	Split
42	510.78	127	Tl-208	127	5 of 9	91.63	1.42	AutoAdd
26	582.95	462	Tl-208	420	5 of 9	91.63	1.42	
27	609.03	485	Bi-214	514	5 of 33	84.34	1.34	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . . . .	0.50	
29	726.98	120	Bi-212	4155	2 of 13	81.27	1.31	
33	911.05	303	AcTh-228	223	10 of 36	85.81	1.36	
34	964.76	27	AcTh-228	47	10 of 36	94.74	1.45	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
35	968.63	114	AcTh-228	152	10 of 36	91.09	1.41	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
36	1120.34	107	Bi-214	98	5 of 33	82.57	1.33	
37	1238.45	47	Bi-214	36	5 of 33	79.14	1.29	
38	1377.65	28	Bi-214	23	5 of 33	79.14	1.29	
39	1460.60	1731	K-40	. . . . .	1 of 1	100.00	1.50	
40	1764.13	69	Bi-214	72	5 of 33	84.34	1.34	
41	2614.58	148	Tl-208	167	5 of 9	91.63	1.42	

L5186-06 analyzed by LRH on 04/14/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-06

Sample ID: SOIL/SEDI Duratek Inc Code: 1047204

 Sampling Start: 02/07/2003 12:00:00 | Counting Start: 04/14/2003 17:21:23
 Sampling Stop: 02/07/2003 12:00:00 | Decay Time: 1.59e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 20000 Sec
 Sample Size 7.05e-001 kg | Real Time 20006 Sec
 Collection Efficiency 1.0000 | Spectrum File 1047204.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 4 (Canberra sn 10923050 det#4)
 Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
 Eff.=1/[1.58E-02*En^-3.09E+00 + 2.56E+02*En^7.93E-01] 02/09/1998

 Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5186-06.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Th-234	Average:x	4.18E+02 +- 1.93E+02	. . . . .		
	63.29	4.18E+02 +- 2.53E+02	8.31E+02		+	. . . . .
	92.59	4.18E+02 +- 2.98E+02	9.82E+02		+	. . . . .
Pb-212	Average:x	4.37E+02 +- 1.59E+01	. . . . .		*	. . . . .
	74.81	I.D.	. . . . .			. . . . .
	77.12	I.D.	. . . . .			. . . . .
	87.30	I.D.	. . . . .			. . . . .
	238.63	4.37E+02 +- 1.60E+01	3.35E+01		++	. . . . .
	300.09	4.38E+02 +- 1.59E+02	5.14E+02		+	. . . . .
Cd-109	88.03	I.D.	. . . . .			. . . . .
AcTh-228	Average:x	4.14E+02 +- 2.47E+01	. . . . .		*	. . . . .
	93.35	I.D.	. . . . .			. . . . .
	129.08	3.16E+02 +- 1.65E+02	5.39E+02		+	. . . . .
	209.28	2.43E+02 +- 1.23E+02	4.02E+02		+	. . . . .
	270.23	3.60E+02 +- 1.51E+02	4.89E+02		+	. . . . .
	327.64	5.44E+02 +- 1.80E+02	5.78E+02		++	. . . . .
	338.32	4.43E+02 +- 5.35E+01	1.54E+02		++	. . . . .
	463.00	4.48E+02 +- 1.41E+02	4.46E+02		++	. . . . .
	911.07	4.97E+02 +- 4.09E+01	1.01E+02		++	. . . . .
	964.60	2.46E+02 +- 9.59E+01	3.00E+02		+	. . . . .
	969.11	3.28E+02 +- 5.37E+01	1.53E+02		++	. . . . .
Ra-226	186.22	8.05E+02 +- 1.60E+02	5.01E+02		++	. . . . .
Pb-214	Average:x	3.53E+02 +- 1.66E+01	. . . . .		*	. . . . .
	241.98	5.49E+02 +- 8.04E+01	2.45E+02		++	. . . . .
	295.21	3.12E+02 +- 2.85E+01	7.66E+01		++	. . . . .
	351.92	3.62E+02 +- 2.10E+01	5.18E+01		++	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
Annul	511.00	4.15E+00 +- 1.92E+01	6.40E+01			+	. . . . .
Tl-208	Average:x	4.70E+02 +- 2.53E+01	. . . . .			*	. . . . .
	583.14	4.88E+02 +- 3.12E+01	7.35E+01			++	. . . . .
	2614.66	4.35E+02 +- 4.33E+01	8.87E+01			++	. . . . .
	510.84	I.D. . . . .	. . . . .				. . . . .
Bi-214	Average:x	3.51E+02 +- 1.93E+01	. . . . .			*	. . . . .
	609.31	3.47E+02 +- 2.16E+01	5.07E+01			++	. . . . .
	1120.29	3.81E+02 +- 7.03E+01	2.07E+02			++	. . . . .
	1238.11	4.57E+02 +- 1.87E+02	5.99E+02			+	. . . . .
	1377.67	4.35E+02 +- 1.58E+02	4.85E+02			+	. . . . .
	1764.49	3.37E+02 +- 6.13E+01	1.64E+02			++	. . . . .
Bi-212	727.17	3.85E+02 +- 6.69E+01	1.96E+02			++	. . . . .
K-40	1460.81	1.07E+04 +- 2.67E+02	2.40E+02			++	. . . . .
Am-241	59.54 N	3.17E+01 +- 2.42E+01	8.00E+01	11		x lbase	. . . . .
Co-57	122.06 N	6.41E+00 +- 5.38E+00	1.78E+01			x	. . . . .
Ce-144	133.54 N	5.76E+01 +- 4.10E+01	1.41E+02	r		x rbase	. . . . .
Ce-141	145.44 N	2.48E+01 +- 3.40E+01	1.13E+02			x	. . . . .
Se-75	264.65 N	1.24E+01 +- 9.98E+00	3.31E+01			x	. . . . .
Cr-51	320.08 N	2.78E+02 +- 2.39E+02	7.94E+02			x	. . . . .
I-131	364.48 N	6.63E+02 +- 1.76E+03	6.08E+03			x	. . . . .
Sb-125	427.89 N	4.47E+00 +- 1.66E+01	5.75E+01			x	. . . . .
Ag-108m	433.93 N	1.08E+01 +- 4.97E+00	1.81E+01			x	. . . . .
Be-7	477.59 N	3.72E+01 +- 1.06E+02	3.70E+02			x	. . . . .
La-140	487.03 N	0.00E+00 +- 3.76E+02	1.30E+03			x	. . . . .
Ru-103	497.08 N	2.04E+01 +- 1.74E+01	5.81E+01			x	. . . . .
Ba-140	537.32 N	3.93E+02 +- 6.83E+02	2.41E+03			x	. . . . .
Cs-134	604.70 N	4.38E-01 +- 2.56E+01	8.52E+01	P		x PIC	. . . . .
Ru-106	621.84 N	2.21E+01 +- 6.48E+01	2.26E+02			x	. . . . .
Cs-137	661.65 N	8.90E+00 +- 7.46E+00	2.48E+01			x	Y.
Zr-95	724.18 N	7.16E+03 +- 2.46E+03	8.10E+03	P		x PIC	. . . . .
Nb-95	765.79 N	8.85E+00 +- 2.36E+01	8.07E+01			x	. . . . .
Co-58	810.76 N	1.31E+01 +- 1.02E+01	3.73E+01			x	. . . . .
Mn-54	834.83 N	8.68E+00 +- 6.42E+00	2.13E+01			x	. . . . .
Ag-110m	884.67 N	1.55E+01 +- 9.86E+00	3.25E+01			x	. . . . .
Fe-59	1099.22 N	1.31E+01 +- 3.49E+01	1.20E+02			x	. . . . .
Zn-65	1115.52 N	4.08E+00 +- 3.61E+01	1.22E+02	P		x PIC	. . . . .
Co-60	1332.49 N	2.36E-01 +- 7.11E+00	2.51E+01			x	Y.
Sb-124	1691.02 N	1.63E+01 +- 1.98E+01	6.94E+01			x	. . . . .

MEASURED TOTAL: 1.44E+04 +- 8.07E+02 pCi/kg

0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
4	84.13	126.87	67	60	98	1364	1.88	Deleted
10	201.98	305.03	16	34	55	564	0.44	Deleted
14	257.84	389.49	24	33	53	451	0.69	Deleted
16	277.13	418.65	1	29	47	383	0.05	Deleted
22	409.37	618.57	29	25	41	265	1.04	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	489.02	739.00	-8	23	38	216	0.55	Deleted
28	661.48	999.76	7	16	26	126	0.21	Deleted
30	768.15	1161.04	8	18	29	160	0.28	Deleted
31	794.47	1200.83	10	18	30	144	0.68	Deleted
32	860.12	1300.10	7	17	27	125	0.32	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
44	59.54	89.70	48N	36	59	698	0.98	NET< CL LBase
45	122.06	184.21	41N	34	56	625	1.04	NET< CL
46	133.54	201.57	-46N	33	55	614	1.05	NET< CL RBase
47	145.44	219.56	25N	34	55	577	1.06	NET< CL
48	264.65	399.78	29N	24	38	286	1.17	NET< CL
49	320.08	483.58	26N	22	36	237	1.21	NET< CL
50	364.49	550.71	-8N	21	35	231	1.25	NET< CL
51	427.90	646.59	-5N	19	31	175	1.30	NET< CL
52	433.94	655.72	-38N	18	31	170	1.30	NET< CL
53	477.60	721.74	-6N	17	28	150	1.34	NET< CL
54	487.04	736.01	0N	17	28	144	1.34	NET< CL
55	497.10	751.21	20N	17	27	136	1.35	NET< CL
56	537.34	812.06	-9N	16	26	127	1.38	NET< CL
57	604.73	913.95	-1N	71	118	273	1.43	NET< CL PIC
58	621.87	939.86	-6N	17	28	131	1.44	NET< CL
59	661.69	1000.07	21N	18	28	138	1.47	NET< CL
60	724.23	1094.63	-4017N	1379	2270	173	1.52	NET< CL PIC
61	765.85	1157.56	6N	16	26	133	1.55	NET< CL
62	810.70	1225.37	-16N	13	22	95	1.58	NET< CL
63	834.77	1261.77	18N	13	20	81	1.60	NET< CL
64	884.63	1337.15	21N	13	21	79	1.64	
65	1099.26	1661.66	5N	13	22	86	1.79	NET< CL
66	1115.56	1686.32	3N	28	47	215	1.80	NET< CL PIC
67	1332.53	2014.34	0N	11	19	60	1.95	NET< CL
68	1690.97	2556.21	5N	6	9	16	2.20	NET< CL

L5186-06 analyzed by LRH on 04/14/2003

S E E K E R A N A L Y S I S S U M M A R Y
Environmental Laboratory
Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/07/2003 12:00:00 | Counting Start: 04/14/2003 17:21:23
Sampling Stop: 02/07/2003 12:00:00 | Decay Time. 1.59E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 20000 Sec
Sample Size 7.05E-01 kg | Real Time 20006 Sec
Collection Efficiency 1.0000 | Spectrum File 1047204.spc

Detector #: 4

Energy(keV)= 0.20 + 0.662*Ch + -1.34E-07*Ch^2 + -1.34E-07*Ch^3 04/14/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)

Eff.=1/[1.58e-02*En^-3.09e+00 + 2.56e+02*En^ 7.93e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5186-06.LSF

Activity Units: pCi/kg

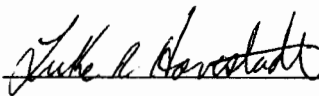
Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	4.18E+02	1.93E+02	< 8.31E+02	4.08E+02	1.00E+00	MEAS +	YES
Pb-212	4.37E+02	1.59E+01	< 3.35E+01	1.63E+01	1.00E+00	MEAS +	YES
AcTh-228	4.14E+02	2.48E+01	< 1.01E+02	4.81E+01	1.00E+00	MEAS +	YES
Ra-226	8.05E+02	1.60E+02	< 5.01E+02	2.45E+02	1.00E+00	MEAS +	YES
Pb-214	3.53E+02	1.66E+01	< 5.18E+01	2.51E+01	1.00E+00	MEAS +	YES
Annil	4.15E+00	1.92E+01	< 6.40E+01	3.15E+01	8.82E-01	MEAS +	YES
Tl-208	4.70E+02	2.53E+01	< 7.35E+01	3.53E+01	1.00E+00	MEAS +	YES
Bi-214	3.51E+02	1.93E+01	< 5.07E+01	2.44E+01	1.00E+00	MEAS +	YES
Bi-212	3.85E+02	6.69E+01	< 1.96E+02	9.36E+01	1.00E+00	MEAS +	YES
K-40	1.07E+04	2.67E+02	< 2.40E+02	1.12E+02	1.00E+00	MEAS +	YES
Am-241	3.17E+01	2.42E+01	< 8.00E+01	3.91E+01	1.00E+00	NET	YES
Co-57	6.41E+00	5.38E+00	< 1.78E+01	8.70E+00	8.44E-01	NET	YES
Ce-144	-5.76E+01	4.10E+01	< 1.41E+02	6.89E+01	8.51E-01	NET	YES
Ce-141	2.48E+01	3.40E+01	< 1.13E+02	5.53E+01	2.43E-01	NET	YES
Se-75	1.24E+01	9.98E+00	< 3.31E+01	1.60E+01	6.81E-01	NET	YES
Cr-51	2.78E+02	2.39E+02	< 7.94E+02	3.83E+02	1.90E-01	NET	YES
I-131	-6.62E+02	1.76E+03	< 6.08E+03	2.93E+03	3.29E-03	NET	YES
Sb-125	-4.47E+00	1.66E+01	< 5.75E+01	2.75E+01	9.56E-01	NET	YES
Ag-108m	-1.08E+01	4.97E+00	< 1.81E+01	8.67E+00	9.99E-01	NET	YES
Be-7	-3.72E+01	1.06E+02	< 3.70E+02	1.77E+02	4.23E-01	NET	YES
La-140	0.00E+00	3.76E+02	< 1.30E+03	6.19E+02	2.75E-02	NET	YES
Ru-103	2.04E+01	1.74E+01	< 5.81E+01	2.76E+01	3.11E-01	NET	YES
Ba-140	-3.93E+02	6.84E+02	< 2.41E+03	1.14E+03	2.75E-02	NET	YES
Cs-134	-4.38E-01	2.56E+01	< 8.52E+01	4.21E+01	9.41E-01	NET	YES
Ru-106	-2.20E+01	6.48E+01	< 2.26E+02	1.08E+02	8.83E-01	NET	YES
Cs-137	8.90E+00	7.46E+00	< 2.48E+01	1.19E+01	9.96E-01	NET	YES
Zr-95	-7.16E+03	2.46E+03	< 8.10E+03	4.04E+03	4.88E-01	NET	YES
Nb-95	8.85E+00	2.36E+01	< 8.07E+01	3.83E+01	2.69E-01	NET	YES
Co-58	-1.31E+01	1.02E+01	< 3.73E+01	1.76E+01	5.22E-01	NET	YES
Mn-54	8.68E+00	6.43E+00	< 2.14E+01	1.00E+01	8.63E-01	NET	YES
Ag-110m	1.55E+01	9.86E+00	< 3.25E+01	1.52E+01	8.32E-01	NET	YES
Fe-59	1.31E+01	3.49E+01	< 1.20E+02	5.65E+01	3.57E-01	NET	YES
Zn-65	4.08E+00	3.61E+01	< 1.22E+02	5.92E+01	8.28E-01	NET	YES

L5186-06 analyzed by LRH on 04/14/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	2.36E-01	7.11E+00	< 2.51E+01	1.17E+01	9.76E-01	NET	YES
Sb-124	1.63E+01	1.98E+01	< 6.94E+01	3.03E+01	4.66E-01	NET	YES

PERFORMED BY:



REVIEWED BY:

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-07 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-069
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-07-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____
Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 0.030 g

Filter/Smear Data

Volume: _____
Units: _____
Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/16/2014 3:22 Det No.: 8 Spectrum No.: 1016008
Counted by: EM
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5186-07
Client Id : BMS-2600-069
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/07/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	663		
Sample Weight-Dry	g			
Aliquot Weight	g	663		
FINAL WEIGHT	kg	.663		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5186-07 analyzed by emml461 on 04/11/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-07

Sample ID: SOIL/SEDI Duratek Inc

Code: 1016008

 Sampling Start: 02/07/2003 12:00:00 | Counting Start: 04/11/2003 14:31:54
 Sampling Stop: 02/07/2003 12:00:00 | Decay Time. 1.51E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 9775 Sec
 Sample Size 6.63E-001 kg | Real Time 9785 Sec
 Collection Efficiency 1.0000 | Spc. File 1016008.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Energy(keV)= -0.01 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003
 FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003
 Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.09	95.22	93	41	65	671	1.24	
2	74.62	112.62	355	48	73	852	1.62	a
3	76.87	116.01	463	42	59	639	1.24	b
4	84.00	126.78	39	28	45	445	0.78	a NET< CL
5	86.88	131.13	121	34	53	556	1.05	b
6	92.86	140.14	148	45	71	804	0.81	
7	104.44	157.63	-38	44	72	774	1.07	NET< CL
8	185.70	280.26	206	39	60	538	1.51	
9	208.87	315.22	66	30	48	396	1.20	
10	238.42	359.83	1079	41	40	296	1.28	a
11	241.31	364.19	265	34	50	395	1.63	b
12	270.28	407.90	78	30	47	324	1.16	
13	277.71	419.12	101	28	43	295	1.61	
14	294.98	445.18	403	30	36	222	1.58	a
15	299.98	452.72	68	17	24	127	0.82	b
16	327.78	494.68	59	25	39	247	0.78	
17	338.13	510.31	183	27	38	235	1.27	
18	351.75	530.86	588	35	40	242	1.29	
19	462.43	697.89	74	22	34	166	1.03	
20	510.67	770.70	342	26	31	162	2.13	
21	582.88	879.67	386	26	28	128	1.62	
22	609.15	919.32	576	30	29	142	1.81	
23	727.29	1097.61	101	20	28	118	2.15	
24	768.63	1160.00	60	18	27	117	2.28	
25	794.54	1199.09	34	15	23	90	1.18	
26	860.76	1299.04	32	14	21	80	2.81	Wide Pk
27	911.17	1375.11	266	21	22	77	1.80	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	968.78	1462.05	110	21	31	154	1.51	
29	1119.90	1690.12	108	19	26	98	1.90	
30	1238.05	1868.43	39	16	25	109	3.43	Wide Pk
31	1460.73	2204.48	1490	40	14	32	2.19	
32	1729.17	2609.61	22	8	11	20	2.00	
33	1764.65	2663.15	100	12	12	22	2.54	
34	2614.30	3945.41	145	13	8	9	2.78	

L5186-07 analyzed by emml461 on 04/11/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.09	93	41	65	49	41	66	NET<CL
2	74.62	355	48	73	337	48	74	
3	76.87	463	42	59	435	42	60	
4	84.00	39	28	45	25	28	46	NET<CL
5	86.88	121	34	53	102	34	54	
6	92.86	148	45	71	39	45	74	NET<CL
8	185.70	207	39	60	149	40	62	
10	238.42	1079	41	40	1034	41	42	
11	241.31	265	34	50	244	35	51	
14	294.98	403	30	36	361	30	38	
16	327.78	59	25	39	60	25	40	
17	338.13	183	27	38	174	27	39	
18	351.75	588	35	40	526	35	43	
19	462.43	74	22	34	72	22	34	
20	510.67	342	26	31	95	27	41	
21	582.88	387	26	28	374	26	29	
22	609.15	576	30	29	520	30	32	
24	768.63	60	18	27	54	18	28	
27	911.17	266	21	22	257	21	23	
28	968.78	110	21	31	104	21	31	
29	1119.90	109	19	26	100	19	26	
30	1238.05	39	16	25	38	16	25	
31	1460.73	1490	40	14	1468	40	16	
32	1729.17	22	8	11	20	8	12	
33	1764.65	100	12	12	88	12	13	
34	2614.30	145	13	8	130	13	10	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.62	337	Pb-212	202	5 of 6	100.00	1.50	
			Tl-208	11	8 of 9	99.30	0.99	
			Pb-214	99	5 of 7	98.65	0.99	
			Tl-208	20	8 of 9	99.30	0.99	
3	76.87	435	Pb-212	357	5 of 6	100.00	1.50	
			Tl-208	20	8 of 9	99.30	0.99	
			Pb-214	178	5 of 7	98.65	0.99	
5	86.88	102	Pb-212	201	5 of 6	100.00	1.50	
			Tl-208	11	8 of 9	99.30	1.49	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
8	185.70	149	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
9	208.87	66	AcTh-228	96	8 of 36	96.44	1.46	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
10	238.42	1034	Pb-212	1123	5 of 6	100.00	1.50	
11	241.31	244	Pb-214	142	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
12	270.28	78	AcTh-228	67	8 of 36	79.99	1.30	
13	277.71	101	Tl-208	44	8 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
			Se-75	. . . . .	1 of 5	14.63	0.15	LowScore
14	294.98	361	Pb-214	319	5 of 7	100.00	1.50	
15	299.97	68	Pb-212	70	5 of 6	100.00	1.50	
16	327.78	60	AcTh-228	52	8 of 36	79.99	1.30	
			Bi-212	2	2 of 13	59.32	1.09	
			La-140	9606	2 of 15	23.26	0.23	LowScore
17	338.13	174	AcTh-228	186	8 of 36	81.82	1.32	
18	351.75	526	Pb-214	667	5 of 7	100.00	1.50	
19	462.43	72	AcTh-228	57	8 of 36	78.66	1.29	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
20	510.67	95	Tl-208	96	8 of 9	100.00	1.50	
			Annil	. . . . .	1 of 1	100.00	1.50	
21	582.88	374	Tl-208	308	8 of 9	100.00	1.50	
22	609.15	520	Bi-214	504	6 of 33	81.52	1.32	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.50	
23	727.29	101	Bi-212	3240	2 of 13	81.27	1.31	
24	768.63	54	Bi-214	48	6 of 33	81.52	1.32	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
25	794.54	34	AcTh-228	43	8 of 36	88.56	1.39	
			Cs-134		1 of 9	46.67	0.97	
26	860.76	32	Tl-208	39	8 of 9	100.00	1.50	
27	911.17	257	AcTh-228	208	8 of 36	79.99	1.30	
28	968.78	104	AcTh-228	140	8 of 36	88.56	1.39	
			Sb-124		1 of 13	1.04	0.01	LowScore
29	1119.90	100	Bi-214	114	6 of 33	84.59	1.35	
30	1238.05	38	Bi-214	42	6 of 33	84.59	1.35	
31	1460.73	1468	K-40		1 of 1	100.00	1.50	
32	1729.17	20	Bi-214	17	6 of 33	81.52	1.32	
33	1764.65	88	Bi-214	87	6 of 33	81.52	1.32	
34	2614.30	130	Tl-208	165	8 of 9	100.00	1.50	

L5186-07 analyzed by emm1461 on 04/11/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-07

Sample ID: SOIL/SEDI Duratek Inc

Code: 1016008

 Sampling Start: 02/07/2003 12:00:00 | Counting Start: 04/11/2003 14:31:54
 Sampling Stop: 02/07/2003 12:00:00 | Decay Time: 1.51e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 9775 Sec
 Sample Size 6.63e-001 kg | Real Time 9785 Sec
 Collection Efficiency 1.0000 | Spectrum File 1016008.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5186-07.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	5.46E+02 +- 2.14E+01	. . . .		*	. . . . .
	74.81	I.D. . . . .	. . . .			. . . . .
	77.12	I.D. . . . .	. . . .			. . . . .
	87.30	I.D. . . . .	. . . .			. . . . .
	238.63	5.46E+02 +- 2.17E+01	4.57E+01		++	. . . . .
	300.09	5.46E+02 +- 1.33E+02	4.03E+02		++	. . . . .
Ra-226	186.22	9.32E+02 +- 2.48E+02	7.93E+02		++	. . . . .
AcTh-228	Average:x	4.72E+02 +- 3.06E+01	. . . .		*	. . . . .
	209.28	3.25E+02 +- 1.51E+02	4.91E+02		+	. . . . .
	270.23	5.51E+02 +- 2.11E+02	6.81E+02		+	. . . . .
	327.64	5.40E+02 +- 2.28E+02	7.37E+02		+	. . . . .
	338.32	4.48E+02 +- 7.00E+01	2.08E+02		++	. . . . .
	463.00	5.92E+02 +- 1.82E+02	5.75E+02		++	. . . . .
	794.70	3.80E+02 +- 1.68E+02	5.38E+02		+	. . . . .
	911.07	5.21E+02 +- 4.31E+01	9.88E+01		++	. . . . .
	969.11	3.67E+02 +- 7.55E+01	2.28E+02		++	. . . . .
Pb-214	Average:x	4.65E+02 +- 2.28E+01	. . . .		*	. . . . .
	241.98	7.77E+02 +- 1.10E+02	3.31E+02		++	. . . . .
	295.21	5.06E+02 +- 4.19E+01	1.10E+02		++	. . . . .
	351.92	4.26E+02 +- 2.81E+01	7.15E+01		++	. . . . .
Tl-208	Average:x	4.72E+02 +- 2.66E+01	. . . .		*	. . . . .
	277.35	1.07E+03 +- 2.98E+02	9.43E+02		++	. . . . .
	510.84	I.D. . . . .	. . . .			. . . . .
	583.14	5.18E+02 +- 3.61E+01	8.34E+01		++	. . . . .
	860.37	3.88E+02 +- 1.72E+02	5.50E+02		+	. . . . .
	2614.66	4.08E+02 +- 4.07E+01	7.23E+01		++	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration	MDA	Flags	Notes	MDC
	ENERGY E	(keV)					
Bi-214	Average:	x	4.82E+02 +- 2.42E+01	. . . . .	*	
	609.31		4.85E+02 +- 2.81E+01	6.28E+01	+		
	768.36		5.42E+02 +- 1.84E+02	5.82E+02	+		
	1120.29		4.27E+02 +- 8.05E+01	2.36E+02	+		
	1238.11		4.44E+02 +- 1.91E+02	6.12E+02	+		
	1729.59		5.70E+02 +- 2.45E+02	7.63E+02	+		
	1764.49		4.87E+02 +- 6.86E+01	1.63E+02	+		
Bi-212	727.17		4.14E+02 +- 8.02E+01	2.37E+02	+		
K-40	1460.81		1.06E+04 +- 2.85E+02	2.51E+02	+		
Am-241	59.54	N-1.38E+01 +- 5.84E+01	1.97E+02L		x	LHROI	
Co-57	122.06	N 8.29E+00 +- 7.55E+00	2.51E+01		x		
Ce-144	133.54	N-5.14E+01 +- 5.98E+01	2.05E+02		x		
Ce-141	145.44	N-1.92E+01 +- 4.44E+01	1.51E+02		x		
Se-75	264.65	N-2.18E+01 +- 1.28E+01	4.53E+01L		x	lbase	
Cr-51	320.08	N 3.27E+01 +- 2.88E+02	9.82E+02		x		
I-131	364.48	N-2.49E+02 +- 1.59E+03	5.50E+03		x		
Sb-125	427.89	N-1.02E+00 +- 2.27E+01	7.80E+01		x		
Ag-108m	433.93	N-1.10E+01 +- 6.81E+00	2.44E+01		x		
Be-7	477.59	N-9.21E+01 +- 1.35E+02	4.75E+02		x		
La-140	487.03	N-2.09E+01 +- 3.88E+02	1.35E+03		x		
Ru-103	497.08	N-9.68E-01 +- 1.76E+01	6.16E+01		x		
Ba-140	537.32	N 5.30E+02 +- 7.22E+02	2.45E+03		x		
Cs-134	604.70	N 4.67E+01 +- 2.89E+01	9.52E+01P		x	PIC	
Ru-106	621.84	N 2.52E+01 +- 7.68E+01	2.64E+02		x		
Cs-137	661.65	N 5.38E+00 +- 8.12E+00	2.76E+01		x	Y.	
Zr-95	724.18	N-6.91E+03 +- 3.00E+03	9.88E+03P		x	PIC	
Nb-95	765.79	N 4.66E+01 +- 3.72E+01	1.24E+02P		x	PIC	
Co-58	810.76	N-1.65E+01 +- 1.19E+01	4.39E+01		x		
Mn-54	834.83	N 9.17E+00 +- 8.58E+00	2.88E+01		x		
Ag-110m	884.67	N 9.06E-01 +- 1.01E+01	3.56E+01		x		
Fe-59	1099.22	N 1.54E+01 +- 3.51E+01	1.22E+02		x		
Zn-65	1115.52	N-6.02E+01 +- 3.80E+01	1.33E+02P		x	PIC	
Co-60	1332.49	N-7.40E+00 +- 7.02E+00	2.63E+01		x	Y.	
Sb-124	1691.02	N 1.43E+01 +- 2.53E+01	8.95E+01		x		

MEASURED TOTAL: 1.43E+04 +- 7.38E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.09	95.22	49	41	66	671	1.24	Deleted
4	84.00	126.78	25	28	46	445	0.78	Deleted
6	92.86	140.14	39	45	74	804	0.81	Deleted
7	104.44	157.63	-38	44	72	774	1.07	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
35	59.54	89.87	-10N	42	70	450	1.24	NET< CL LHRoi
36	122.06	184.22	33N	30	49	435	1.29	NET< CL
37	133.54	201.54	-26N	30	50	470	1.30	NET< CL
38	145.44	219.50	-13N	30	50	448	1.31	NET< CL
39	264.65	399.41	-36N	21	36	240	1.39	NET< CL LBase
40	320.08	483.06	2N	21	34	194	1.43	NET< CL
41	364.48	550.07	-3N	18	30	153	1.46	NET< CL
42	427.89	645.76	-1N	19	31	160	1.50	NET< CL
43	433.93	654.88	-29N	18	30	158	1.51	NET< CL
44	477.59	720.77	-12N	17	28	137	1.53	NET< CL
45	487.03	735.02	-1N	15	25	111	1.54	NET< CL
46	497.08	750.18	-1N	14	22	100	1.55	NET< CL
47	537.32	810.91	11N	15	24	111	1.57	NET< CL
48	604.70	912.60	100N	62	101	210	1.62	NET< CL PIC
49	621.84	938.47	5N	15	25	114	1.63	NET< CL
50	661.65	998.55	10N	15	24	109	1.66	NET< CL
51	724.18	1092.91	-3149N	1366	2250	173	1.70	NET< CL PIC
52	765.79	1155.71	27N	21	34	135	1.73	NET< CL PIC
53	810.76	1223.58	-17N	12	21	83	1.76	NET< CL
54	834.83	1259.90	15N	14	22	91	1.77	NET< CL
55	884.67	1335.12	1N	11	18	62	1.81	NET< CL
56	1099.22	1658.91	5N	12	19	62	1.95	NET< CL
57	1115.52	1683.51	-40N	25	42	166	1.96	NET< CL PIC
58	1332.49	2010.95	-10N	9	16	50	2.10	NET< CL
59	1691.02	2552.03	4N	7	11	22	2.34	NET< CL

L5186-07 analyzed by emm1461 on 04/11/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/07/2003 12:00:00 | Counting Start: 04/11/2003 14:31:54
Sampling Stop: 02/07/2003 12:00:00 | Decay Time. 1.51E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 9775 Sec
Sample Size 6.63E-01 kg | Real Time 9785 Sec
Collection Efficiency 1.0000 | Spectrum File 1016008.spc

Detector #: 8

Energy(keV)= -0.01 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5186-07.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	5.46E+02	2.14E+01	< 4.57E+01	2.21E+01	1.00E+00	MEAS +	YES
Ra-226	9.32E+02	2.48E+02	< 7.93E+02	3.88E+02	1.00E+00	MEAS +	YES
AcTh-228	4.72E+02	3.06E+01	< 9.88E+01	4.66E+01	1.00E+00	MEAS +	YES
Pb-214	4.65E+02	2.28E+01	< 7.15E+01	3.47E+01	1.00E+00	MEAS +	YES
Tl-208	4.72E+02	2.66E+01	< 7.22E+01	3.19E+01	1.00E+00	MEAS +	YES
Bi-214	4.82E+02	2.42E+01	< 6.28E+01	3.01E+01	1.00E+00	MEAS +	YES
Bi-212	4.14E+02	8.02E+01	< 2.37E+02	1.13E+02	1.00E+00	MEAS +	YES
K-40	1.06E+04	2.85E+02	< 2.52E+02	1.16E+02	1.00E+00	MEAS +	YES
Am-241	-1.38E+01	5.84E+01	< 1.97E+02	9.66E+01	1.00E+00	NET	YES
Co-57	8.29E+00	7.55E+00	< 2.50E+01	1.22E+01	8.51E-01	NET	YES
Ce-144	-5.14E+01	5.98E+01	< 2.05E+02	9.97E+01	8.57E-01	NET	YES
Ce-141	-1.92E+01	4.44E+01	< 1.51E+02	7.35E+01	2.60E-01	NET	YES
Se-75	-2.18E+01	1.28E+01	< 4.53E+01	2.18E+01	6.94E-01	NET	YES
Cr-51	3.27E+01	2.88E+02	< 9.82E+02	4.72E+02	2.06E-01	NET	YES
I-131	-2.49E+02	1.59E+03	< 5.50E+03	2.63E+03	4.32E-03	NET	YES
Sb-125	-1.02E+00	2.27E+01	< 7.80E+01	3.73E+01	9.58E-01	NET	YES
Ag-108m	-1.10E+01	6.81E+00	< 2.44E+01	1.17E+01	9.99E-01	NET	YES
Be-7	-9.21E+01	1.35E+02	< 4.75E+02	2.27E+02	4.41E-01	NET	YES
La-140	-2.09E+01	3.88E+02	< 1.35E+03	6.39E+02	3.26E-02	NET	YES
Ru-103	-9.68E-01	1.76E+01	< 6.16E+01	2.90E+01	3.29E-01	NET	YES
Ba-140	5.30E+02	7.22E+02	< 2.45E+03	1.16E+03	3.26E-02	NET	YES
Cs-134	4.67E+01	2.89E+01	< 9.52E+01	4.70E+01	9.43E-01	NET	YES
Ru-106	2.51E+01	7.68E+01	< 2.64E+02	1.25E+02	8.88E-01	NET	YES
Cs-137	5.38E+00	8.12E+00	< 2.76E+01	1.31E+01	9.96E-01	NET	YES
Zr-95	-6.91E+03	3.00E+03	< 9.88E+03	4.94E+03	5.05E-01	NET	YES
Nb-95	4.66E+01	3.72E+01	< 1.24E+02	5.98E+01	2.87E-01	NET	YES
Co-58	-1.65E+01	1.19E+01	< 4.39E+01	2.06E+01	5.39E-01	NET	YES
Mn-54	9.17E+00	8.58E+00	< 2.88E+01	1.36E+01	8.69E-01	NET	YES
Ag-110m	9.06E-01	1.01E+01	< 3.56E+01	1.66E+01	8.39E-01	NET	YES
Fe-59	1.54E+01	3.51E+01	< 1.22E+02	5.67E+01	3.75E-01	NET	YES
Zn-65	-6.02E+01	3.80E+01	< 1.33E+02	6.44E+01	8.36E-01	NET	YES
Co-60	-7.40E+00	7.02E+00	< 2.63E+01	1.22E+01	9.78E-01	NET	YES
Sb-124	1.43E+01	2.53E+01	< 8.95E+01	3.99E+01	4.83E-01	NET	YES

L5186-07 analyzed by emm1461 on 04/11/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-08 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-095
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-06-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____
Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 666.0 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/10/03 1737 Det No.: 6 Spectrum No.: 1017306
Counted by: [Signature]
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5186-08	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2600-095	Matrix	: SO01 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 02/06/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	666		
Sample Weight-Dry	g			
Aliquot Weight	g	666		
FINAL WEIGHT	kg	.666		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5186-08 analyzed by emm1461 on 04/11/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

 LSN: L5186-08 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1017306

 Sampling Start: 02/06/2003 12:00:00 ✓ Counting Start: 04/11/2003 17:37:06
 Sampling Stop: 02/06/2003 12:00:00 ✓ Decay Time. 1.54E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 10000 Sec
 Sample Size 6.66E-001 kg | Real Time 10010 Sec
 Collection Efficiency 1.0000 | Spc. File 1017306.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Energy(keV)= 0.12 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003
 FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.29	95.48	155	39	61	628	1.50	
2	74.96	113.11	246	35	51	530	1.13	a
3	77.16	116.44	418	37	51	530	1.02	b
4	87.34	131.83	114	32	49	483	1.09	a
5	92.74	139.99	431	40	56	580	1.29	b
6	99.05	149.52	31	26	42	387	0.95	c NET< CL
7	129.55	195.63	48	34	56	526	0.70	NET< CL
8	143.91	217.32	28	34	56	533	0.54	NET< CL
9	163.47	246.89	46	36	57	523	1.35	NET< CL
10	185.87	280.74	285	35	51	439	1.27	
11	198.17	299.34	38	34	55	472	1.36	NET< CL
12	205.70	310.72	25	17	27	175	0.58	a NET< CL
13	209.44	316.37	111	28	44	350	1.33	b
14	238.62	360.47	995	40	39	287	1.24	a
15	241.68	365.09	204	30	44	335	1.54	b
16	270.23	408.24	99	25	38	251	2.04	Wide Pk
17	277.77	419.64	24	25	40	271	0.65	NET< CL
18	295.19	445.98	265	24	29	172	1.05	a
19	300.10	453.40	34	14	20	103	0.70	b
20	328.18	495.84	0	26	42	284	0.00	NET< CL
21	338.14	510.89	225	27	37	212	1.45	
22	351.90	531.68	537	31	35	189	1.57	
23	409.13	618.19	35	27	43	232	0.84	NET< CL
24	462.80	699.31	85	21	30	135	2.38	Wide Pk
25	510.79	771.84	360	28	33	159	2.32	Wide Pk
26	583.22	881.31	340	26	29	126	1.44	
27	609.36	920.82	384	27	30	136	1.38	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	727.11	1098.80	74	16	22	86	1.76	a
29	728.30	1100.60	18	9	13	43	0.81	b
30	795.58	1202.29	5	16	26	114	0.24	NET< CL
31	859.96	1299.58	26	9	11	32	0.88	a
32	861.31	1301.64	28	10	13	39	1.06	b
33	911.19	1377.02	253	21	23	85	1.74	
34	968.95	1464.33	97	19	27	120	1.29	
35	1120.17	1692.88	100	19	26	100	2.89	Wide Pk
36	1377.51	2081.84	18	11	17	47	1.20	
37	1460.82	2207.75	1514	40	17	44	2.11	
38	1729.32	2613.58	28	8	9	14	1.57	
39	1764.74	2667.11	83	12	12	22	2.95	
40	2103.83	3179.62	24	8	10	16	3.17	
41	2614.72	3951.80	153	13	8	11	2.55	

L5186-08 analyzed by emml461 on 04/11/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.29	155	39	61	38	39	64	NET<CL
2	74.96	246	35	51	225	35	52	
3	77.16	418	37	51	393	37	52	
5	92.74	431	40	56	157	40	63	
6	99.05	31	26	42	17	26	42	NET<CL
8	143.91	28	34	56	-8	35	57	NET<CL
9	163.47	46	36	57	32	36	58	NET<CL
10	185.87	285	35	51	111	36	56	
11	198.17	38	34	55	29	34	55	NET<CL
12	205.70	25	17	27	22	17	28	NET<CL
14	238.62	995	40	39	942	40	42	
15	241.68	204	30	44	184	31	45	
16	270.23	99	25	38	94	26	39	
17	277.77	24	25	40	23	25	40	NET<CL
18	295.19	265	24	29	230	24	31	
21	338.14	225	27	37	217	27	37	
22	351.90	537	31	35	474	31	37	
25	510.79	360	28	33	131	28	42	
26	583.22	340	26	29	325	26	30	
27	609.36	384	27	30	336	27	33	
28	727.11	74	16	22	70	16	22	
30	795.58	5	16	26	2	16	27	NET<CL
33	911.19	253	21	23	242	21	24	
34	968.95	97	19	27	96	19	27	
35	1120.17	101	19	26	94	19	27	
36	1377.51	18	11	17	17	11	17	NET<CL
37	1460.82	1514	40	17	1493	40	18	
38	1729.32	28	8	9	24	8	10	
39	1764.74	83	12	12	73	12	13	
40	2103.83	24	8	10	22	8	10	
41	2614.72	153	13	8	137	13	11	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.96	225	Pb-212	170	5 of 6	100.00	1.50	
			Pb-214	75	5 of 7	98.65	0.99	
			Tl-208	18	5 of 9	94.86	0.95	
3	77.16	87	Pb-214	136	5 of 7	98.65	0.99	Split
44	77.16	306	Pb-212	306	5 of 6	100.00	1.50	AutoAdd
4	87.34	114	Pb-212	173	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
5	92.74	78	Th-234	. . . . .	1 of 2	58.74	0.59	Split
43	92.74	79	AcTh-228	79	7 of 36	69.70	1.20	AutoAdd
10	185.87	111	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
13	209.44	111	AcTh-228	100	7 of 36	74.20	1.24	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
14	238.62	942	Pb-212	984	5 of 6	100.00	1.50	
15	241.68	184	Pb-214	114	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
16	270.23	94	AcTh-228	70	7 of 36	74.20	1.24	
18	295.19	230	Pb-214	283	5 of 7	100.00	1.50	
19	300.10	34	Pb-212	64	5 of 6	100.00	1.50	
21	338.14	217	AcTh-228	188	7 of 36	74.20	1.24	
22	351.90	474	Pb-214	432	5 of 7	100.00	1.50	
24	462.80	85	AcTh-228	60	7 of 36	74.20	1.24	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
25	510.79	43	Annul	. . . . .	1 of 1	100.00	1.50	Split
42	510.79	88	Tl-208	88	5 of 9	97.02	1.47	AutoAdd
26	583.22	325	Tl-208	316	5 of 9	97.02	1.47	
27	609.36	336	Bi-214	451	4 of 33	79.98	1.30	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
28	727.11	70	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Bi-212	. . . . .	1 of 13	100.00	1.00	Matched
29	728.30	18	Bi-212	. . . . .	1 of 13	100.00	1.50	
			Te-129m	. . . . .	1 of 2	18.72	0.69	
31	859.96	26	Tl-208	37	5 of 9	100.00	1.50	
32	861.31	28	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Tl-208	37	5 of 9	100.00	1.50	Matched
33	911.19	242	AcTh-228	245	7 of 36	76.96	1.27	
34	968.95	96	AcTh-228	151	7 of 36	87.10	1.37	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
35	1120.17	94	Bi-214	77	4 of 33	75.96	1.26	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
37	1460.82	1493	K-40	. . . . .	1 of 1	100.00	1.50	
38	1729.32	24	Bi-214	11	4 of 33	70.00	1.20	
39	1764.74	73	Bi-214	58	4 of 33	75.96	1.26	
40	2103.83	22	2615SEsc	. . . . .	0 of 0	. . .	0.50	
41	2614.72	137	Tl-208	140	5 of 9	97.02	1.47	

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5186-08

Sample ID: SOIL/SEDI Duratek Inc

Code: 1017306

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Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 17:37:06
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. . . . . 1.54e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 10000 Sec
Sample Size . . . . . 6.66e-001 kg | Real Time . . . . . 10010 Sec
Collection Efficiency . . . . 1.0000 | Spectrum File . . . . . 1017306.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[8.71E-03*En^-3.34E+00 + 1.54E+02*En^6.70E-01] 02/06/1998

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Library File: . . . . . SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: . . . . . L5186-08.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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              N
      ENERGY E   Concentration
Nuclide  (keV)   (pCi/kg )      MDA   Flags   Notes   MDC
-----
Pb-212  Average:x 5.07E+02 +- 2.13E+01 . . . . . * . . . . .
          74.81    I.D. . . . . . . . . . . . . . . .
          77.12    I.D. . . . . . . . . . . . . . . .
          87.30    I.D. . . . . . . . . . . . . . . .
          238.63  5.15E+02 +- 2.17E+01 4.69E+01 +* . . . . .
          300.09  2.77E+02 +- 1.13E+02 3.60E+02 + . . . . .
Pb-214  Average:x 3.85E+02 +- 2.07E+01 . . . . . * . . . . .
          77.11    I.D. . . . . . . . . . . . . . . .
          241.98  6.04E+02 +- 1.01E+02 3.06E+02 +* . . . . .
          295.21  3.34E+02 +- 3.52E+01 9.46E+01 +* . . . . .
          351.92  3.98E+02 +- 2.64E+01 6.50E+01 +* . . . . .
Th-234   92.59    3.28E+02 +- 2.94E+02 9.71E+02 + . . . . .
Ra-226   186.22  7.21E+02 +- 2.30E+02 7.41E+02 +* . . . . .
AcTh-228 Average:x 5.09E+02 +- 3.17E+01 . . . . . * . . . . .
          209.28  5.69E+02 +- 1.46E+02 4.61E+02 +* . . . . .
          270.23  6.91E+02 +- 1.88E+02 5.91E+02 +* . . . . .
          338.32  5.80E+02 +- 7.20E+01 2.06E+02 +* . . . . .
          463.00  7.23E+02 +- 1.75E+02 5.37E+02 +* . . . . .
          911.07  5.13E+02 +- 4.49E+01 1.06E+02 +* . . . . .
          969.11  3.55E+02 +- 7.11E+01 2.11E+02 +* . . . . .
          93.35    I.D. . . . . . . . . . . . . . . .
Annul    511.00  1.93E+01 +- 2.19E+01 7.27E+01 + . . . . .
Tl-208  Average:x 4.55E+02 +- 2.76E+01 . . . . . * . . . . .
          583.14  4.68E+02 +- 3.71E+01 9.09E+01 +* . . . . .
          860.37  3.29E+02 +- 1.08E+02 3.20E+02 +* . . . . .
          2614.66 4.57E+02 +- 4.46E+01 8.04E+01 +* . . . . .
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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	510.84	I.D.				
Bi-214	Average:x	3.49E+02 +- 2.35E+01		*		
	609.31	3.26E+02 +- 2.63E+01	6.64E+01	++		
	1120.29	4.22E+02 +- 8.43E+01	2.50E+02	++		
	1729.59	7.36E+02 +- 2.41E+02	7.04E+02	++		
	1764.49	4.24E+02 +- 6.82E+01	1.70E+02	++		
Bi-212	727.17	7.61E+01 +- 3.87E+01	1.25E+02	+		
K-40	1460.81	1.13E+04 +- 3.04E+02	3.00E+02	++		
Am-241	59.54 N	7.59E+01 +- 4.02E+01	1.32E+021	x	lbase	
Co-57	122.06 N	-1.77E-01 +- 7.03E+00	2.39E+01	x		
Ce-144	133.54 N	-8.94E+01 +- 5.43E+01	1.90E+02	x		
Ce-141	145.44 N	7.48E+01 +- 4.21E+01	1.38E+02	x		
Se-75	264.65 N	-7.57E+00 +- 1.37E+01	4.74E+011	x	lbase	
Cr-51	320.08 N	-4.03E+02 +- 2.90E+02	1.03E+03	x		
I-131	364.48 N	8.03E+02 +- 1.69E+03	5.76E+03	x		
Sb-125	427.89 N	-1.01E+01 +- 1.94E+01	6.82E+01	x		
Ag-108m	433.93 N	0.00E+00 +- 6.00E+00	2.08E+01	x		
Be-7	477.59 N	6.75E+01 +- 1.17E+02	4.00E+02	x		
La-140	487.03 N	-1.11E+02 +- 4.01E+02	1.41E+03	x		
Ru-103	497.08 N	-1.23E+01 +- 2.09E+01	7.38E+01	x		
Ba-140	537.32 N	4.22E+02 +- 8.04E+02	2.74E+03	x		
Cs-134	604.70 N	3.08E+00 +- 7.59E+00	2.60E+011	x	lbase	
Ru-106	621.84 N	5.25E+00 +- 7.39E+01	2.57E+02	x		
Cs-137	661.65 N	1.35E+01 +- 7.58E+00	2.48E+01	x	Y.	
Zr-95	724.18 N	-1.09E+02 +- 4.53E+01	1.72E+02L	x	LHROI	
Nb-95	765.79 N	-1.08E+01 +- 2.54E+01	9.00E+01	x		
Co-58	810.76 N	8.22E+00 +- 1.32E+01	4.50E+01	x		
Mn-54	834.83 N	-1.15E+01 +- 8.63E+00	3.15E+01	x		
Ag-110m	884.67 N	-1.90E+00 +- 9.87E+00	3.53E+01	x		
Fe-59	1099.22 N	1.88E+01 +- 4.07E+01	1.40E+02	x		
Zn-65	1115.52 N	3.86E+01 +- 3.92E+01	1.31E+02P	x	PIC	
Co-60	1332.49 N	-1.17E+01 +- 7.33E+00	2.82E+01	x	Y.	
Sb-124	1691.02 N	-3.81E+00 +- 2.19E+01	8.34E+01	x		

MEASURED TOTAL: 1.46E+04 +- 1.01E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.29	95.48	38	39	64	628	1.50	Deleted
6	99.05	149.52	17	26	42	387	0.95	Deleted
7	129.55	195.63	48	34	56	526	0.70	Deleted
8	143.91	217.32	-8	35	57	533	0.54	Deleted
9	163.47	246.89	32	36	58	523	1.35	Deleted
11	198.17	299.34	29	34	55	472	1.36	Deleted
12	205.70	310.72	22	17	28	175	0.58	Deleted
17	277.77	419.64	23	25	40	271	0.65	Deleted
20	328.18	495.84	0	26	42	284	0.00	Deleted
23	409.13	618.19	35	27	43	232	0.84	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	727.11	1098.80	70	16	22	86	1.76	Unknown
30	795.58	1202.29	2	16	27	114	0.24	Deleted
32	861.31	1301.64	28	10	13	39	1.06	Unknown
36	1377.51	2081.84	17	11	17	47	1.20	Deleted
40	2103.83	3179.62	22	8	10	16	3.17	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
45	59.54	89.81	51N	27	43	370	1.13	LBase
46	122.06	184.30	-1N	26	44	382	1.12	NET< CL
47	133.54	201.65	-43N	26	44	395	1.13	NET< CL
48	145.44	219.64	47N	27	42	362	1.13	
49	264.65	399.82	-12N	22	36	243	1.21	NET< CL
								LBase
50	320.08	483.59	-27N	19	33	202	1.25	NET< CL
51	364.48	550.70	8N	17	27	138	1.29	NET< CL
52	427.89	646.54	-8N	15	26	121	1.35	NET< CL
53	433.93	655.67	0N	15	25	113	1.36	NET< CL
54	477.59	721.66	8N	14	22	92	1.40	NET< CL
55	487.03	735.93	-4N	14	24	107	1.40	NET< CL
56	497.08	751.12	-9N	15	26	112	1.41	NET< CL
57	537.32	811.94	8N	15	24	99	1.45	NET< CL
58	604.70	913.78	6N	16	25	110	1.51	NET< CL
								LBase
59	621.84	939.69	1N	14	23	91	1.53	NET< CL
60	661.65	999.86	24N	14	21	85	1.57	
61	724.18	1094.37	-47N	20	36	119	1.62	NET< CL
								LHRoi
62	765.79	1157.26	-6N	14	23	89	1.66	NET< CL
63	810.76	1225.23	8N	13	21	78	1.70	NET< CL
64	834.83	1261.61	-18N	13	23	100	1.72	NET< CL
65	884.67	1336.94	-2N	10	17	55	1.76	NET< CL
66	1099.22	1661.22	6N	13	21	73	1.92	NET< CL
67	1115.52	1685.85	24N	25	40	146	1.93	NET< CL
								PIC
68	1332.49	2013.79	-15N	9	17	52	2.08	NET< CL
69	1691.02	2555.68	-1N	6	10	17	2.26	NET< CL

L5186-08 analyzed by emm1461 on 04/11/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 17:37:06
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 10000 Sec
Sample Size 6.66E-01 kg | Real Time 10010 Sec
Collection Efficiency 1.0000 | Spectrum File 1017306.spc

Detector #: 6

Energy(keV)= 0.12 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[8.71e-03*En^-3.34e+00 + 1.54e+02*En^ 6.70e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5186-08.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
=====	=====	=====	=====	=====	=====	=====	=====
Pb-212	5.07E+02	2.14E+01	< 4.69E+01	2.27E+01	1.00E+00	MEAS +	YES
Pb-214	3.85E+02	2.07E+01	< 6.50E+01	3.14E+01	1.00E+00	MEAS +	YES
Th-234	3.28E+02	2.94E+02	< 9.71E+02	4.80E+02	1.00E+00	MEAS +	YES
Ra-226	7.21E+02	2.30E+02	< 7.41E+02	3.62E+02	1.00E+00	MEAS +	YES
AcTh-228	5.09E+02	3.17E+01	< 1.06E+02	5.01E+01	1.00E+00	MEAS +	YES
Annil	1.93E+01	2.19E+01	< 7.27E+01	3.58E+01	8.85E-01	MEAS +	YES
Tl-208	4.55E+02	2.76E+01	< 8.04E+01	3.57E+01	1.00E+00	MEAS +	YES
Bi-214	3.49E+02	2.35E+01	< 6.64E+01	3.19E+01	1.00E+00	MEAS +	YES
Bi-212	7.61E+01	3.87E+01	< 1.25E+02	5.66E+01	1.00E+00	MEAS +	YES
K-40	1.13E+04	3.04E+02	< 3.00E+02	1.40E+02	1.00E+00	MEAS +	YES
Am-241	7.59E+01	4.02E+01	< 1.32E+02	6.37E+01	1.00E+00	NET	YES
Co-57	-1.77E-01	7.03E+00	< 2.39E+01	1.16E+01	8.48E-01	NET	YES
Ce-144	-8.94E+01	5.43E+01	< 1.90E+02	9.21E+01	8.55E-01	NET	YES
Ce-141	7.48E+01	4.21E+01	< 1.38E+02	6.70E+01	2.54E-01	NET	YES
Se-75	-7.57E+00	1.37E+01	< 4.75E+01	2.29E+01	6.89E-01	NET	YES
Cr-51	-4.03E+02	2.90E+02	< 1.03E+03	4.93E+02	2.00E-01	NET	YES
I-131	8.03E+02	1.69E+03	< 5.76E+03	2.74E+03	3.92E-03	NET	YES
Sb-125	-1.01E+01	1.94E+01	< 6.82E+01	3.24E+01	9.57E-01	NET	YES
Ag-108m	0.00E+00	6.00E+00	< 2.08E+01	9.87E+00	9.99E-01	NET	YES
Be-7	6.75E+01	1.17E+02	< 4.00E+02	1.88E+02	4.34E-01	NET	YES
La-140	-1.11E+02	4.01E+02	< 1.41E+03	6.66E+02	3.07E-02	NET	YES
Ru-103	-1.23E+01	2.09E+01	< 7.38E+01	3.50E+01	3.22E-01	NET	YES
Ba-140	4.22E+02	8.04E+02	< 2.74E+03	1.30E+03	3.07E-02	NET	YES
Cs-134	3.08E+00	7.59E+00	< 2.60E+01	1.23E+01	9.43E-01	NET	YES
Ru-106	5.25E+00	7.39E+01	< 2.57E+02	1.21E+02	8.86E-01	NET	YES
Cs-137	1.35E+01	7.58E+00	< 2.48E+01	1.16E+01	9.96E-01	NET	YES
Zr-95	-1.09E+02	4.53E+01	< 1.72E+02	8.31E+01	4.99E-01	NET	YES
Nb-95	-1.09E+01	2.54E+01	< 8.99E+01	4.25E+01	2.81E-01	NET	YES
Co-58	8.22E+00	1.31E+01	< 4.50E+01	2.11E+01	5.33E-01	NET	YES
Mn-54	-1.15E+01	8.64E+00	< 3.15E+01	1.49E+01	8.67E-01	NET	YES
Ag-110m	-1.90E+00	9.87E+00	< 3.53E+01	1.64E+01	8.37E-01	NET	YES
Fe-59	1.88E+01	4.07E+01	< 1.40E+02	6.57E+01	3.68E-01	NET	YES
Zn-65	3.85E+01	3.92E+01	< 1.31E+02	6.32E+01	8.33E-01	NET	YES

L5186-08 analyzed by emm1461 on 04/11/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	-1.16E+01	7.33E+00	< 2.82E+01	1.30E+01	9.77E-01	NET	YES
Sb-124	-3.81E+00	2.19E+01	< 8.34E+01	3.65E+01	4.77E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-09

Count by Date: _____
(if required)

Client: Duratek Inc

Delay Date: _____
(if required)

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMS-2600-099

Collect Start Date/Time: _____

Collect Stop Date/Time: 02-06-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 674.5 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/16/03 1431

Det No.: 5

Spectrum No.: 1016005

Counted by: [Signature]

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5186-09	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2600-099	Matrix	: SO01 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 02/06/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	674.5		
Sample Weight-Dry	g			
Aliquot Weight	g	674.5		
FINAL WEIGHT	kg	.6745		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5186-09 analyzed by emml461 on 04/11/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5186-09

Sample ID: SOIL/SEDI Duratek Inc

Code: 1016005

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 14:31:07
Sampling Stop: 02/06/2003 12:00:00 | Decay Time: 1.54E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 9704 Sec
Sample Size 6.74E-001 kg | Real Time 9714 Sec
Collection Efficiency 1.0000 | Spc. File 1016005.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Energy(keV) = -0.13 + 0.661*Ch + -2.03E-07*Ch^2 + 7.32E-11*Ch^3 04/11/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.88	95.28	10	34	55	525	0.26	NET< CL
2	74.76	113.25	188	31	45	414	1.05	a
3	77.07	116.75	300	33	45	414	1.18	b
4	83.89	127.06	52	30	48	433	1.24	a HiResid
5	87.21	132.07	108	31	48	433	1.20	b HiResid
6	92.66	140.32	230	36	54	505	1.49	c HiResid
7	185.91	281.36	149	31	47	371	1.34	
8	209.07	316.38	56	27	42	303	1.53	
9	231.62	350.48	6	29	48	369	0.18	NET< CL
10	238.54	360.95	741	35	37	251	1.36	a
11	241.53	365.46	129	28	41	293	1.59	b
12	295.06	446.43	223	24	31	181	1.25	a
13	299.97	453.87	55	20	31	181	1.21	b
14	308.73	467.11	20	20	31	181	1.33	c NET< CL
15	338.28	511.80	114	27	40	238	1.07	
16	351.82	532.28	452	31	38	213	1.40	
17	462.66	699.94	61	22	33	145	1.92	
18	510.79	772.75	316	26	31	137	2.22	Wide Pk
19	582.95	881.88	266	23	26	100	1.97	
20	609.17	921.56	326	24	27	110	1.61	
21	727.85	1101.07	86	18	26	102	3.44	Wide Pk
22	767.85	1161.57	47	19	30	127	1.59	
23	911.23	1378.45	141	18	23	89	1.54	
24	968.92	1465.69	108	18	25	90	1.99	
25	1120.57	1695.06	116	19	26	94	2.14	
26	1378.01	2084.35	31	10	13	33	1.65	
27	1460.55	2209.13	1796	43	13	27	2.04	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	1587.57	2401.14	12	7	11	22	0.95	
29	1764.20	2668.09	72	11	10	18	1.83	
30	2614.65	3952.01	122	12	6	6	2.47	

L5186-09 analyzed by emml461 on 04/11/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.88	10	34	55	-10	34	56	NET<CL
2	74.76	188	31	45	170	31	46	
3	77.07	300	33	45	275	33	46	
4	83.89	52	30	48	34	31	49	NET<CL
5	87.21	108	31	48	94	31	49	
6	92.66	230	36	54	154	37	57	
7	185.91	149	31	47	96	31	49	
10	238.54	741	35	37	701	35	39	
11	241.53	129	28	41	111	28	42	
12	295.06	223	24	31	189	24	33	
15	338.28	115	27	40	109	27	41	
16	351.82	452	31	38	389	32	40	
17	462.66	61	22	33	59	22	34	
18	510.79	316	26	31	98	26	40	
19	582.95	267	23	26	252	23	27	
20	609.17	327	25	27	281	25	30	
21	727.85	86	18	26	84	19	27	
22	767.85	47	19	30	42	20	30	
23	911.23	141	18	23	129	19	24	
24	968.92	108	18	25	101	18	25	
25	1120.57	116	19	26	105	19	27	
26	1378.01	31	10	13	30	10	14	
27	1460.55	1796	43	13	1777	43	15	
29	1764.20	72	11	10	61	11	12	
30	2614.65	122	12	6	107	12	9	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0Minimum Score 0.65 | Decay Correction. ON

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.76	170	Pb-212	122	5 of 6	100.00	1.50	
			Tl-208	7	5 of 9	90.39	0.90	
			Pb-214	57	5 of 7	100.00	1.00	
			Tl-208	13	5 of 9	90.39	0.90	
3	77.07	52	Pb-214	104	5 of 7	100.00	1.00	Split
33	77.07	222	Pb-212	222	5 of 6	100.00	1.50	AutoAdd
5	87.21	94	Pb-212	127	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	92.66	154	AcTh-228	46	7 of 36	69.61	1.20	
			Th-234	. . . . .	1 of 2	58.74	0.59	LowScore
7	185.91	96	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
8	209.07	56	AcTh-228	61	7 of 36	86.67	1.37	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
10	238.54	701	Pb-212	828	5 of 6	100.00	1.50	
11	241.53	111	Pb-214	94	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
12	295.06	189	Pb-214	227	5 of 7	100.00	1.50	
13	299.97	55	Pb-212	48	5 of 6	100.00	1.50	
15	338.28	109	AcTh-228	118	7 of 36	83.43	1.33	
16	351.82	389	Pb-214	341	5 of 7	100.00	1.50	
17	462.66	59	AcTh-228	36	7 of 36	75.35	1.25	
			Sb-125	. . . . .	1 of 8	13.67	0.64	LowScore
18	510.79	28	Annil	. . . . .	1 of 1	100.00	1.50	Split
32	510.79	70	Tl-208	70	5 of 9	91.63	1.42	AutoAdd
19	582.95	252	Tl-208	253	5 of 9	91.63	1.42	
20	609.17	281	Bi-214	412	5 of 33	94.55	1.45	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1121SEsc	. . . . .	0 of 0	. . . .	0.65	
21	727.85	84	Bi-212	. . . . .	1 of 13	81.10	0.81	
			Te-129m	. . . . .	1 of 2	18.72	0.19	LowScore
22	767.85	14	Pa-234	. . . . .	1 of 2	26.32	0.76	Split
31	767.85	29	Bi-214	29	5 of 33	79.29	1.29	AutoAdd
23	911.23	129	AcTh-228	169	7 of 36	89.71	1.40	
24	968.92	101	AcTh-228	81	7 of 36	78.66	1.29	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
25	1120.57	105	Bi-214	65	5 of 33	79.29	1.29	
26	1378.01	30	Bi-214	16	5 of 33	76.44	1.26	
27	1460.55	1777	K-40	. . . . .	1 of 1	100.00	1.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
28	1587.57	12	AcTh-228	13	7 of 36	86.67	1.37	
29	1764.20	61	Bi-214	51	5 of 33	84.19	1.34	
30	2614.65	107	Tl-208	112	5 of 9	91.63	1.42	

L5186-09 analyzed by emm1461 on 04/11/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5186-09

Sample ID: SOIL/SEDI Duratek Inc

Code: 1016005

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 14:31:07
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54e+003 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 9704 Sec
Sample Size 6.74e-001 kg | Real Time 9714 Sec
Collection Efficiency 1.0000 | Spectrum File 1016005.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46E-03*En^-3.56E+00 + 1.55E+02*En^6.66E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: L5186-09.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	3.93E+02 +- 1.97E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	3.92E+02 +- 1.98E+01	4.48E+01		++	. . . . .
	300.09	4.65E+02 +- 1.72E+02	5.51E+02		+	. . . . .
Pb-214	Average:x	3.18E+02 +- 2.11E+01	. . . .		*	. . . . .
	77.11	I.D.	. . . .			. . . . .
	241.98	3.74E+02 +- 9.34E+01	2.93E+02		++	. . . . .
	295.21	2.81E+02 +- 3.62E+01	1.02E+02		++	. . . . .
	351.92	3.35E+02 +- 2.71E+01	7.18E+01		++	. . . . .
AcTh-228	Average:x	3.07E+02 +- 2.98E+01	. . . .		*	. . . . .
	93.35	I.D.	. . . .			. . . . .
	209.28	2.92E+02 +- 1.40E+02	4.57E+02		+	. . . . .
	338.32	2.98E+02 +- 7.30E+01	2.28E+02		++	. . . . .
	463.00	5.15E+02 +- 1.90E+02	6.07E+02		+	. . . . .
	911.07	2.78E+02 +- 4.02E+01	1.11E+02		++	. . . . .
	969.11	3.82E+02 +- 6.88E+01	1.99E+02		++	. . . . .
	1588.00	2.85E+02 +- 1.83E+02	6.00E+02		+	. . . . .
Ra-226	186.22	6.39E+02 +- 2.06E+02	6.61E+02		++	. . . . .
Annul	511.00	1.30E+01 +- 2.13E+01	7.08E+01		+	. . . . .
Tl-208	Average:x	3.67E+02 +- 2.56E+01	. . . .		*	. . . . .
	583.14	3.71E+02 +- 3.37E+01	8.38E+01		++	. . . . .
	2614.66	3.61E+02 +- 3.95E+01	7.02E+01		++	. . . . .
	510.84	I.D.	. . . .			. . . . .
Bi-214	Average:x	3.05E+02 +- 2.19E+01	. . . .		*	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
	609.31	2.79E+02 +- 2.45E+01	6.18E+01		+		
	768.36	3.05E+02 +- 2.96E+02	9.83E+02		+		
	1120.29	4.77E+02 +- 8.73E+01	2.55E+02		+		
	1377.67	5.69E+02 +- 1.91E+02	5.79E+02		+		
	1764.49	3.61E+02 +- 6.28E+01	1.56E+02		+		
Bi-212	727.17	3.65E+02 +- 8.12E+01	2.44E+02		+		
Pa-234	766.40	2.46E+03 +- 6.07E+03	2.03E+04		+		
K-40	1460.81	1.37E+04 +- 3.32E+02	2.53E+02		+		
Am-241	59.54	N-5.76E+01 +- 4.23E+01	1.48E+02		x		
Co-57	122.06	N-5.58E+00 +- 6.55E+00	2.27E+01		x		
Ce-144	133.54	N-2.97E+01 +- 5.20E+01	1.79E+02		x		
Ce-141	145.44	N 5.58E+01 +- 4.45E+01	1.47E+02		x		
Se-75	264.65	N 6.45E-01 +- 1.32E+01	4.50E+01		x		
Cr-51	320.08	N-6.09E+01 +- 2.70E+02	9.34E+02		x		
I-131	364.48	N 1.02E+03 +- 1.61E+03	5.45E+03		x		
Sb-125	427.89	N-3.11E+01 +- 1.96E+01	7.14E+01		x		
Ag-108m	433.93	N 5.38E+00 +- 6.88E+00	2.32E+01		x		
Be-7	477.59	N-8.91E+01 +- 1.28E+02	4.56E+02		x		
La-140	487.03	N 2.20E+02 +- 4.20E+02	1.43E+03		x		
Ru-103	497.08	N 4.89E+00 +- 2.16E+01	7.42E+01		x		
Ba-140	537.32	N 9.20E+02 +- 8.05E+02	2.69E+03		x		
Cs-134	604.70	N 1.08E+00 +- 7.49E+00	2.59E+011		x	lbase	
Ru-106	621.84	N 1.97E+01 +- 7.10E+01	2.46E+02		x		
Cs-137	661.65	N 7.15E-02 +- 7.80E+00	2.72E+01		x		Y.
Zr-95	724.18	N-9.21E+01 +- 4.32E+01	1.64E+02L		x	LHROI	
Nb-95	765.79	N 2.44E+01 +- 4.00E+01	1.35E+02P		x	PIC	
Co-58	810.76	N 1.47E+01 +- 1.18E+01	3.93E+01		x		
Mn-54	834.83	N 1.11E+01 +- 8.29E+00	2.76E+01		x		
Ag-110m	884.67	N 1.45E+01 +- 1.17E+01	3.92E+01		x		
Fe-59	1099.22	N 6.11E+00 +- 4.33E+01	1.51E+02		x		
Zn-65	1115.52	N 1.08E+01 +- 4.38E+01	1.48E+02P		x	PIC	
Co-60	1332.49	N-9.02E+00 +- 7.27E+00	2.76E+01		x		Y.
Sb-124	1691.02	N 1.55E+01 +- 2.05E+01	7.28E+01		x		

MEASURED TOTAL: 1.88E+04 +- 6.83E+03 pCi/kg

0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.88	95.28	-10	34	56	525	0.26	Deleted
4	83.89	127.06	34	31	49	433	1.24	Deleted
9	231.62	350.48	6	29	48	369	0.18	Deleted
14	308.73	467.11	20	20	31	181	1.33	Deleted

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 NET/MDA PEAK RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
34	59.54	90.23	-34N	25	42	356	1.13	NET< CL
35	122.06	184.78	-21N	24	40	328	1.18	NET< CL
36	133.54	202.15	-14N	24	41	335	1.19	NET< CL
37	145.44	220.14	35N	28	44	355	1.20	NET< CL
38	264.65	400.45	1N	20	34	208	1.28	NET< CL
39	320.09	484.29	-4N	18	29	159	1.32	NET< CL
40	364.49	551.45	10N	16	25	120	1.36	NET< CL
41	427.91	647.38	-24N	15	26	127	1.40	NET< CL
42	433.95	656.51	13N	17	27	125	1.41	NET< CL
43	477.62	722.56	-10N	15	25	107	1.44	NET< CL
44	487.06	736.85	8N	15	24	99	1.44	NET< CL
45	497.11	752.05	4N	15	25	109	1.45	NET< CL
46	537.36	812.93	17N	15	23	92	1.48	NET< CL
47	604.76	914.88	2N	15	25	104	1.52	NET< CL
								LBase
48	621.90	940.81	4N	13	22	79	1.54	NET< CL
49	661.59	1000.85	0N	14	22	99	1.56	NET< CL
50	724.14	1095.46	-39N	18	33	103	1.61	NET< CL
								LHRoi
51	765.77	1158.43	13N	21	34	144	1.63	NET< CL
								PIC
52	810.76	1226.48	14N	11	17	56	1.66	NET< CL
53	834.85	1262.91	17N	13	20	72	1.68	NET< CL
54	884.71	1338.34	15N	12	19	66	1.71	NET< CL
55	1099.16	1662.68	2N	13	22	82	1.86	NET< CL
56	1115.48	1687.35	7N	27	44	188	1.87	NET< CL
								PIC
57	1332.43	2015.42	-11N	9	16	50	2.01	NET< CL
58	1691.06	2557.55	4N	5	8	12	2.25	NET< CL

c:\seeker\Results\L5186-09.RES Analysis Results Saved.

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 14:31:07
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. . . . . 1.54E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 9704 Sec
Sample Size . . . . . 6.74E-01 kg | Real Time . . . . . 9714 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1016005.spc
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Detector #: 5

Energy(keV) = -0.13 + 0.661*Ch + -2.03E-07*Ch^2 + -2.03E-07*Ch^3 04/11/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File: . . . WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5186-09.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	3.93E+02	1.97E+01	< 4.48E+01	2.16E+01	1.00E+00	MEAS +	YES
Pb-214	3.18E+02	2.11E+01	< 7.18E+01	3.48E+01	1.00E+00	MEAS +	YES
AcTh-228	3.07E+02	2.98E+01	< 1.10E+02	5.23E+01	1.00E+00	MEAS +	YES
Ra-226	6.39E+02	2.06E+02	< 6.61E+02	3.22E+02	1.00E+00	MEAS +	YES
Annil	1.31E+01	2.13E+01	< 7.08E+01	3.48E+01	8.85E-01	MEAS +	YES
Tl-208	3.67E+02	2.56E+01	< 7.02E+01	3.05E+01	1.00E+00	MEAS +	YES
Bi-214	3.05E+02	2.19E+01	< 6.18E+01	2.96E+01	1.00E+00	MEAS +	YES
Bi-212	3.65E+02	8.12E+01	< 2.44E+02	1.16E+02	1.00E+00	MEAS +	YES
Pa-234	2.46E+03	6.07E+02	< 2.03E+04	9.92E+03	1.00E+00	MEAS +	YES
K-40	1.37E+04	3.32E+03	< 2.53E+02	1.16E+02	1.00E+00	MEAS +	YES
Am-241	-5.76E+01	4.23E+01	< 1.48E+02	7.15E+01	1.00E+00	NET	YES
Co-57	-5.58E+00	6.55E+00	< 2.27E+01	1.10E+01	8.49E-01	NET	YES
Ce-144	-2.97E+01	5.20E+01	< 1.79E+02	8.66E+01	8.55E-01	NET	YES
Ce-141	5.58E+01	4.45E+01	< 1.48E+02	7.16E+01	2.55E-01	NET	YES
Se-75	6.45E-01	1.32E+01	< 4.50E+01	2.16E+01	6.90E-01	NET	YES
Cr-51	-6.09E+01	2.70E+02	< 9.34E+02	4.46E+02	2.01E-01	NET	YES
I-131	1.02E+03	1.61E+03	< 5.45E+03	2.59E+03	3.97E-03	NET	YES
Sb-125	-3.11E+01	1.96E+01	< 7.14E+01	3.39E+01	9.57E-01	NET	YES
Ag-108m	5.38E+00	6.88E+00	< 2.32E+01	1.11E+01	9.99E-01	NET	YES
Be-7	-8.91E+01	1.28E+02	< 4.56E+02	2.16E+02	4.35E-01	NET	YES
La-140	2.20E+02	4.20E+02	< 1.43E+03	6.78E+02	3.09E-02	NET	YES
Ru-103	4.89E+00	2.16E+01	< 7.42E+01	3.52E+01	3.23E-01	NET	YES
Ba-140	9.20E+02	8.05E+02	< 2.69E+03	1.27E+03	3.09E-02	NET	YES
Cs-134	1.08E+00	7.49E+00	< 2.59E+01	1.23E+01	9.43E-01	NET	YES
Ru-106	1.97E+01	7.10E+01	< 2.46E+02	1.16E+02	8.86E-01	NET	YES
Cs-137	7.15E-02	7.80E+00	< 2.72E+01	1.28E+01	9.96E-01	NET	YES
Zr-95	-9.21E+01	4.32E+01	< 1.64E+02	7.88E+01	4.99E-01	NET	YES
Nb-95	2.44E+01	4.00E+01	< 1.35E+02	6.48E+01	2.81E-01	NET	YES
Co-58	1.47E+01	1.18E+01	< 3.93E+01	1.82E+01	5.34E-01	NET	YES
Mn-54	1.11E+01	8.29E+00	< 2.75E+01	1.29E+01	8.68E-01	NET	YES
Ag-110m	1.45E+01	1.18E+01	< 3.92E+01	1.83E+01	8.37E-01	NET	YES
Fe-59	6.11E+00	4.33E+01	< 1.50E+02	7.08E+01	3.69E-01	NET	YES
Zn-65	1.08E+01	4.38E+01	< 1.48E+02	7.18E+01	8.34E-01	NET	YES

L5186-09 analyzed by emml461 on 04/11/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	-9.02E+00	7.27E+00	< 2.76E+01	1.27E+01	9.77E-01	NET	YES
Sb-124	1.55E+01	2.05E+01	< 7.28E+01	3.12E+01	4.78E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-10 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-107
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-06-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 139.6 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/10/03 1735 Det No.: 2 Spectrum No.: 1017302
Counted by: Ph
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5186-10
Client Id : BMS-2600-107
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/06/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	139.6		
Sample Weight-Dry	g			
Aliquot Weight	g	139.6		
FINAL WEIGHT	kg	.1396		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-10

Sample ID: SOIL/SEDI Duratek Inc

Code: 1017302

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 17:35:03
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.54E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 200000 Sec
 Sample Size 1.40E-001 kg | Real Time 200055 Sec
 Collection Efficiency 1.0000 | Spc. File 1017302.spc

Detector #: 2 (Canberra sn 9923043 det# 2)
 Energy(keV)= 1.30 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003
 FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.66	94.38	1594	123	191	6200	1.23	
2	73.55	109.35	331	80	129	3663	0.81	a
3	75.23	111.89	3239	108	151	4578	1.11	b
4	77.50	115.33	4488	113	151	4578	1.00	c
5	84.66	126.16	908	90	139	3894	1.11	a HiResid
6	87.48	130.43	1470	93	139	3894	1.17	b HiResid
7	90.04	134.30	780	77	119	3115	0.92	c HiResid
8	93.16	139.03	4237	117	159	4673	1.32	d HiResid
9	99.69	148.91	7	59	97	2336	0.73	e NET< CL HiResid
10	105.70	158.00	9	59	97	2336	0.56	f NET< CL HiResid
11	110.50	165.27	35	72	119	3115	0.80	g NET< CL HiResid
12	129.44	193.93	460	101	162	4478	1.07	
13	140.14	210.13	225	76	123	3049	1.11	a
14	144.23	216.32	493	78	123	3049	1.07	b
15	154.42	231.74	11	85	140	3636	0.12	NET< CL
16	163.51	245.50	99	84	136	3441	0.69	NET< CL
17	186.30	279.99	2471	103	149	3764	1.18	
18	197.74	297.31	282	71	113	2584	1.08	a
19	199.13	299.40	251	51	79	1550	0.59	b
20	209.67	315.36	538	100	160	4076	1.04	
21	239.01	359.77	7209	105	102	2082	1.13	a
22	241.97	364.24	1573	81	116	2499	1.40	b
23	253.00	380.94	-31	75	124	2618	0.41	NET< CL
24	270.66	407.67	467	77	121	2490	1.41	
25	277.82	418.50	200	75	121	2490	0.96	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
26	288.84	435.18	100	70	114	2219	2.30	NET< CL Wide Pk
27	295.57	445.36	2474	73	88	1563	1.17	a
28	300.34	452.59	449	65	101	1876	1.25	b
29	328.43	495.11	248	76	122	2353	1.05	
30	338.77	510.75	1440	74	105	1888	1.22	
31	352.31	531.25	3994	93	112	2000	1.33	
32	375.08	565.70	88	66	108	1848	2.28	NET< CL Wide Pk
33	409.39	617.62	245	64	101	1627	1.34	
34	426.57	643.63	63	54	87	1303	0.99	NET< CL
35	438.94	662.35	46	54	88	1321	1.05	NET< CL
36	463.23	699.11	388	54	83	1172	1.19	
37	511.27	771.83	4081	93	111	1702	2.47	Wide Pk
38	558.72	843.63	159	43	68	856	1.29	a
39	562.87	849.91	60	42	68	856	1.33	b NET< CL
40	570.03	860.76	85	48	77	1007	1.03	
41	583.56	881.24	2216	73	92	1262	1.48	
42	597.91	902.95	132	68	110	1568	2.62	Wide Pk
43	609.69	920.78	3079	80	94	1308	1.46	
44	652.57	985.68	16	41	68	782	0.36	NET< CL
45	662.15	1000.17	214	54	85	1078	1.32	
46	693.81	1048.09	91	58	94	1220	1.10	NET< CL
47	727.67	1099.34	440	50	74	946	1.51	
48	768.34	1160.89	228	51	81	1065	1.53	
49	782.39	1182.15	70	31	50	518	1.32	a
50	786.25	1188.00	126	39	61	691	1.75	b
51	795.41	1201.86	264	38	57	634	1.48	a
52	803.31	1213.82	158	33	51	544	1.28	b
53	836.52	1264.08	2	43	71	879	0.06	NET< CL
54	861.17	1301.38	266	49	76	908	1.61	
55	911.66	1377.79	1592	57	68	754	1.66	
56	934.69	1412.65	97	39	63	686	1.10	
57	943.27	1425.64	49	35	56	582	1.75	a NET< CL
58	949.85	1435.61	49	22	34	291	0.85	b
59	965.06	1458.63	348	38	55	567	1.74	a
60	969.43	1465.23	892	43	50	496	1.59	b
61	1001.88	1514.35	150	47	75	830	1.92	
62	1064.12	1608.54	45	47	76	861	2.78	NET< CL Wide Pk
63	1079.12	1631.25	42	40	65	688	1.01	NET< CL
64	1120.92	1694.50	574	50	72	810	1.86	
65	1209.43	1828.47	2	41	68	756	0.04	NET< CL
66	1238.78	1872.89	174	43	67	734	1.41	
67	1280.59	1936.17	30	35	57	540	0.58	NET< CL
68	1378.29	2084.04	136	33	50	424	1.64	
69	1401.63	2119.35	37	19	30	209	1.27	a
70	1408.28	2129.42	73	22	33	244	1.56	b
71	1461.31	2209.68	7290	90	46	359	2.04	
72	1496.24	2262.54	54	25	40	278	1.61	
73	1509.95	2283.30	58	28	44	326	1.33	
74	1588.65	2402.40	138	21	28	173	1.60	a
75	1593.15	2409.22	93	26	39	272	2.37	b

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
76	1620.97	2451.32	71	21	32	194	2.16	a
77	1631.01	2466.52	72	19	27	155	1.71	b
78	1730.11	2616.50	92	26	40	251	2.59	
79	1765.07	2669.42	486	32	39	253	2.11	
80	1846.85	2793.19	100	26	39	238	4.73	Wide Pk
81	2103.84	3182.13	124	23	33	189	3.76	Wide Pk
82	2205.02	3335.27	101	25	38	238	2.24	
83	2614.97	3955.71	933	35	28	124	2.72	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.66	1594	123	191	474	154	251	
3	75.23	3239	108	151	2406	133	204	
4	77.50	4488	114	151	3503	126	183	
5	84.66	908	90	139	582	108	174	
6	87.48	1470	93	139	876	117	186	
8	93.16	4237	117	159	1381	144	230	
11	110.50	35	72	119	-101	105	174	NET<CL
13	140.14	225	76	123	109	90	148	NET<CL
14	144.23	493	78	123	169	98	159	
16	163.51	99	84	136	-10	121	199	NET<CL
17	186.30	2471	103	149	1275	139	220	
18	197.74	282	71	113	27	90	149	NET<CL
19	199.13	251	51	79	93	65	105	NET<CL
21	239.01	7209	105	102	6241	120	149	
22	241.97	1573	81	116	914	98	154	
27	295.57	2474	73	88	1215	106	164	
30	338.77	1440	74	105	1296	93	140	
31	352.31	3994	93	112	1870	118	181	
36	463.23	388	54	83	285	80	129	
37	511.27	4081	93	111	353	123	199	
38	558.72	159	43	68	22	61	100	NET<CL
40	570.03	85	48	77	35	69	113	NET<CL
41	583.56	2216	73	92	1845	87	125	
43	609.69	3079	80	94	1516	101	153	
47	727.67	440	50	74	379	60	93	
48	768.34	228	51	81	44	66	108	NET<CL
52	803.31	158	33	51	43	42	69	NET<CL
55	911.66	1592	57	68	1342	70	98	
56	934.69	97	39	63	46	52	84	NET<CL
60	969.43	892	43	50	859	53	73	
61	1001.88	151	47	75	19	60	99	NET<CL
64	1120.92	574	50	72	240	61	97	
66	1238.78	174	43	67	31	53	87	NET<CL
68	1378.29	136	33	50	44	44	72	NET<CL
71	1461.31	7290	90	46	6894	96	78	
78	1730.11	92	26	40	71	33	53	
79	1765.07	486	32	39	243	42	64	
82	2205.02	102	25	38	50	32	51	NET<CL
83	2614.97	933	35	28	681	42	54	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: ENVA.LIB (Environmental Library (Kocher 1981))

 Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	63.66	474	Th-234	618	2 of 2	100.00	1.50	
2	73.55	331	Tl-208	98	8 of 9	99.30	1.49	
3	75.23	2406	Pb-212	1677	5 of 6	99.30	0.99	
			Pb-214	583	6 of 7	98.66	0.99	
			Tl-208	172	8 of 9	99.30	0.99	
4	77.50	3503	Pb-212	2928	5 of 6	99.30	0.99	
			Pb-214	851	6 of 7	98.66	0.99	
5	84.66	582	Tl-208	88	8 of 9	99.30	0.99	
6	87.48	876	Cd-109	. . . . .	1 of 1	100.00	1.50	
			Pb-212	1466	5 of 6	100.00	1.00	
7	90.04	780	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	93.16	1381	Th-234	1059	2 of 2	100.00	1.50	
			AcTh-228	700	16 of 36	89.15	0.89	
12	129.44	460	AcTh-228	584	16 of 36	93.38	1.43	
14	144.23	169	U-235	169	2 of 3	100.00	1.50	
17	186.30	517	Ra-226	. . . . .	1 of 1	100.00	1.50	Split
85	186.30	759	U-235	759	2 of 3	93.21	1.43	AutoAdd
20	209.67	538	AcTh-228	716	16 of 36	93.38	1.43	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
21	239.01	6241	Pb-212	7449	5 of 6	100.00	1.00	
22	241.97	914	Pb-214	1098	6 of 7	100.00	1.50	
24	270.66	467	AcTh-228	480	16 of 36	92.44	1.42	
25	277.82	200	Tl-208	274	8 of 9	100.00	1.50	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
27	295.57	1215	Pb-214	2018	6 of 7	100.00	1.00	
28	300.34	449	Pb-212	401	5 of 6	99.30	1.49	
29	328.43	248	AcTh-228	370	16 of 36	97.34	1.47	
			Bi-212	8	4 of 13	82.79	0.83	
30	338.77	1296	AcTh-228	1272	16 of 36	92.44	1.42	
31	352.31	1870	Pb-214	3407	6 of 7	100.00	1.00	
33	409.39	245	AcTh-228	205	16 of 36	91.62	1.42	
36	463.23	285	AcTh-228	386	16 of 36	93.38	1.43	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
37	511.27	353	Tl-208	539	8 of 9	100.00	1.50	
			Annul	. . . . .	1 of 1	100.00	1.50	
41	583.56	1845	Tl-208	1916	8 of 9	100.00	1.50	
42	597.91	133	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
43	609.69	1516	Bi-214	1677	8 of 33	79.15	1.29	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1121SEsc	. . . . .	0 of 0	. . . . .	0.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
45	662.15	215	Cs-137	. . . . .	1 of 1	100.00	1.50	
47	727.67	379	Bi-212	544	4 of 13	100.00	1.50	
49	782.39	70	AcTh-228	30	16 of 36	88.27	1.38	
50	786.25	63	Pb-214	53	6 of 7	98.66	1.49	Split
84	786.25	63	Bi-212	63	4 of 13	100.00	1.50	AutoAdd
51	795.41	264	AcTh-228	260	16 of 36	92.44	1.42	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
54	861.17	267	Tl-208	201	8 of 9	100.00	1.50	
55	911.66	1342	AcTh-228	1433	16 of 36	92.44	1.42	
58	949.85	49	1461SEsc	. . . . .	0 of 0	. . .	0.50	
59	965.06	348	AcTh-228	247	16 of 36	90.81	1.41	
60	969.43	859	AcTh-228	784	16 of 36	92.44	1.42	
64	1120.92	240	Bi-214	316	8 of 33	79.15	1.29	
69	1401.63	37	Bi-214	24	8 of 33	76.99	1.27	
70	1408.28	73	Bi-214	42	8 of 33	76.99	1.27	
71	1461.31	6894	K-40	. . . . .	1 of 1	100.00	1.50	
72	1496.24	54	AcTh-228	34	16 of 36	90.22	1.40	
73	1509.95	58	Bi-214	36	8 of 33	76.99	1.27	
74	1588.65	138	AcTh-228	112	16 of 36	91.62	1.42	
75	1593.15	93	2615DEsc	. . . . .	0 of 0	. . .	0.50	
			2104SEsc	. . . . .	0 of 0	. . .	0.50	
76	1620.97	71	Bi-212	49	4 of 13	100.00	1.50	
77	1631.01	72	AcTh-228	59	16 of 36	91.62	1.42	
78	1730.11	71	Bi-214	43	8 of 33	76.99	1.27	
79	1765.07	243	Bi-214	222	8 of 33	79.15	1.29	
80	1846.85	100	Bi-214	28	8 of 33	72.26	1.22	
81	2103.84	124	2615SEsc	. . . . .	0 of 0	. . .	0.50	
83	2614.97	681	Tl-208	650	8 of 9	100.00	1.50	

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
U-235	911.07	6.06E+02 +- 3.15E+01	8.95E+01	+	+	.	.
	964.60	8.78E+02 +- 9.70E+01	2.86E+02	+	+	.	.
	969.11	6.80E+02 +- 4.20E+01	1.17E+02	+	+	.	.
	1495.80	1.00E+03 +- 4.71E+02	1.53E+03	+	+	.	.
	1588.00	7.71E+02 +- 1.16E+02	3.31E+02	+	+	.	.
	1630.40	7.74E+02 +- 2.02E+02	6.20E+02	+	+	.	.
	Average:x	5.10E+01 +- 2.17E+01	.	.	.	.	.
	143.76	5.10E+01 +- 2.94E+01	9.66E+01	+	+	.	.
	185.72	5.10E+01 +- 3.22E+01	1.06E+02	+	+	.	.
	186.22	5.73E+02 +- 5.53E+02	1.82E+03	+	+	.	.
Ra-226	186.22	5.73E+02 +- 5.53E+02	1.82E+03	+	+	.	.
Pb-214	Average:x	3.17E+02 +- 1.49E+01	.	.	.	.	.
	241.98	5.33E+02 +- 5.72E+01	1.81E+02	+	+	.	.
	295.21	3.21E+02 +- 2.80E+01	8.77E+01	+	+	.	.
	351.92	2.93E+02 +- 1.85E+01	5.71E+01	+	+	.	.
	785.91	6.40E+02 +- 6.84E+02	2.26E+03	+	+	.	.
Bi-214	Average:x	3.03E+02 +- 1.75E+01	.	.	.	.	.
	609.31	2.96E+02 +- 1.97E+01	6.03E+01	+	+	.	.
	1120.29	2.35E+02 +- 5.95E+01	1.92E+02	+	+	.	.
	1401.50	4.75E+02 +- 2.45E+02	8.00E+02	+	+	.	.
	1407.98	5.20E+02 +- 1.57E+02	4.97E+02	+	+	.	.
	1509.23	4.88E+02 +- 2.36E+02	7.69E+02	+	+	.	.
	1729.59	5.01E+02 +- 2.36E+02	7.72E+02	+	+	.	.
	1764.49	3.28E+02 +- 5.64E+01	1.76E+02	+	+	.	.
	1847.42	1.06E+03 +- 2.74E+02	8.61E+02	+	+	.	.
	661.65	2.44E+01 +- 6.15E+00	1.98E+01	+	+	.	.
Cs-137	661.65	2.44E+01 +- 6.15E+00	1.98E+01	+	+	.	.
Bi-212	Average:x	3.53E+02 +- 4.93E+01	.	.	.	.	.
	727.17	3.35E+02 +- 5.27E+01	1.66E+02	+	+	.	.
	785.46	3.53E+02 +- 3.13E+02	1.04E+03	+	+	.	.
	1620.62	5.12E+02 +- 1.55E+02	4.89E+02	+	+	.	.
K-40	1460.81	1.18E+04 +- 1.64E+02	2.74E+02	+	+	.	.
Am-241	59.54 N	3.72E+01 +- 1.34E+01	4.39E+011	x	lbase	.	.
Co-57	122.06 N	9.73E-01 +- 3.19E+00	1.06E+01	x		.	.
Ce-144	133.54 N	4.73E+01 +- 2.54E+01	8.34E+01r	x	rbase	.	.
Ce-141	145.44 N	8.47E+01 +- 3.85E+01	1.26E+02P	x	PIC	.	.
Se-75	264.65 N	4.90E+00 +- 7.42E+00	2.49E+01	x		.	.
Cr-51	320.08 N	1.04E+02 +- 1.66E+02	5.56E+02	x		.	.
I-131	364.48 N	4.54E+02 +- 1.10E+03	3.67E+03	x		.	.
Sb-125	427.89 N	1.58E+01 +- 1.17E+01	3.86E+01	x		.	.
Ag-108m	433.93 N	3.07E+00 +- 3.66E+00	1.24E+01	x		.	.
Be-7	477.59 N	3.33E+00 +- 7.42E+01	2.49E+02	x		.	.
Ru-103	497.08 N	2.18E+00 +- 1.19E+01	3.99E+01	x		.	.
Ru-106	621.84 N	4.90E+01 +- 4.75E+01	1.61E+02	x		.	.
Zr-95	756.72 N	1.35E+01 +- 1.45E+01	4.82E+01	x		.	.
Nb-95	765.79 N	5.19E+01 +- 2.36E+01	8.15E+01L	x	LHROI	.	.
Cs-134	795.84 N	1.03E+00 +- 5.76E+00	1.93E+01P	x	PIC	.	.
Co-58	810.76 N	1.76E+00 +- 7.41E+00	2.49E+01	x		.	.
Mn-54	834.83 N	2.83E+00 +- 5.28E+00	1.76E+01	x		.	.
Ag-110m	884.67 N	1.17E+01 +- 7.21E+00	2.37E+01	x		.	.
Fe-59	1099.22 N	1.35E+01 +- 2.32E+01	7.76E+01	x		.	.
Zn-65	1115.52 N	6.64E+00 +- 1.21E+01	4.06E+011	x	lbase	.	.
Co-60	1332.49 N	8.48E-01 +- 4.95E+00	1.67E+01	x	Y.	.	.
Ba-140	1596.49 N	5.01E+02 +- 1.98E+02	7.19E+02R	x	RHROI	.	.
La-140	1596.49 N	5.76E+02 +- 2.28E+02	8.26E+02R	x	RHROI	.	.

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	N Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Sb-124	1691.02	N 3.57E+00 +- 1.81E+01	6.16E+01		x

MEASURED TOTAL: 1.60E+04 +- 9.55E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

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UNKNOWN,SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	90.04	134.30	780	77	119	3115	0.92	Unknown
9	99.69	148.91	7	59	97	2337	0.73	Deleted
10	105.70	158.00	9	59	97	2337	0.56	Deleted
11	110.50	165.27	-101	105	174	3115	0.80	Deleted
13	140.14	210.13	109	90	148	3049	1.11	Deleted
15	154.42	231.74	11	85	140	3636	0.12	Deleted
16	163.51	245.50	-10	121	199	3441	0.69	Deleted
18	197.74	297.31	27	90	149	2584	1.08	Deleted
19	199.13	299.40	93	65	105	1551	0.59	Deleted
23	253.00	380.94	-31	75	124	2618	0.41	Deleted
26	288.84	435.18	100	70	114	2219	2.30	Deleted
32	375.08	565.70	88	66	108	1848	2.28	Deleted
34	426.57	643.63	63	54	87	1303	0.99	Deleted
35	438.94	662.35	46	54	88	1321	1.05	Deleted
38	558.72	843.63	22	61	100	856	1.29	Deleted
39	562.87	849.91	60	42	68	856	1.33	Deleted
40	570.03	860.76	35	69	113	1007	1.03	Deleted
42	597.91	902.95	133	68	110	1568	2.62	Unknown
44	652.57	985.68	16	41	68	782	0.36	Deleted
46	693.81	1048.09	91	58	94	1220	1.10	Deleted
48	768.34	1160.89	44	66	108	1065	1.53	Deleted
52	803.31	1213.82	43	42	69	544	1.28	Deleted
53	836.52	1264.08	2	43	71	879	0.06	Deleted
56	934.69	1412.65	46	52	84	686	1.10	Deleted
57	943.27	1425.64	49	35	56	582	1.75	Deleted
58	949.85	1435.61	49	22	34	291	0.85	1461SEsc
61	1001.88	1514.35	19	60	99	830	1.92	Deleted
62	1064.12	1608.54	45	47	76	861	2.78	Deleted
63	1079.12	1631.25	42	40	65	688	1.01	Deleted
65	1209.43	1828.47	2	41	68	756	0.04	Deleted
66	1238.78	1872.89	31	53	87	734	1.41	Deleted
67	1280.59	1936.17	30	35	57	540	0.58	Deleted
68	1378.29	2084.04	44	44	72	424	1.64	Deleted

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-11 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-164
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-07-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 6321 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/11/03 11:03 Det No.: 5 Spectrum No.: 101405
Counted by: [Signature]
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : LS186-11
Client Id : BMS-2600-164
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/07/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	632.1		
Sample Weight-Dry	g			
Aliquot Weight	g	632.1		
FINAL WEIGHT	kg	.6321		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-11 ✓

Sample ID: SOIL/SEDI Duratek Inc

 Sampling Start: 02/07/2003 12:00:00 | Counting Start: 04/11/2003 11:02:31
 Sampling Stop: 02/07/2003 12:00:00 | Decay Time. 1.51E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 10430 Sec
 Sample Size 6.32E-001 kg | Real Time 10441 Sec
 Collection Efficiency 1.0000 | Spc. File 1014105.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Energy(keV)= -0.13 + 0.661*Ch + -2.03E-07*Ch^2 + 7.32E-11*Ch^3 04/11/2003
 FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	51.76	78.47	-6839	465	777	7700	318.50	NET< CL Wide Pk
2	63.36	96.01	66	41	66	746	0.69	
3	74.76	113.25	390	42	61	684	1.35	a
4	76.97	116.60	575	40	53	570	1.13	b
5	84.32	127.71	104	39	61	643	1.53	a
6	87.10	131.91	281	41	61	643	1.60	b
7	89.80	136.00	154	32	48	459	1.01	c
8	92.80	140.53	375	49	75	826	1.91	d Wide Pk
9	99.13	150.11	62	30	48	459	1.07	e
10	128.75	194.90	80	38	61	639	0.96	
11	143.39	217.05	4	33	54	544	0.11	NET< CL
12	185.88	281.31	279	41	62	601	1.35	
13	209.17	316.53	80	33	53	477	1.06	
14	238.51	360.91	1437	45	41	317	1.27	a
15	241.47	365.38	320	33	47	370	1.42	b
16	269.85	408.31	81	31	48	369	1.11	
17	277.06	419.21	54	30	47	355	1.07	
18	295.08	446.47	429	30	36	243	1.26	a
19	299.93	453.80	76	21	32	202	1.10	b
20	328.03	496.30	52	25	39	262	0.77	
21	337.94	511.29	208	32	47	332	1.16	
22	351.79	532.24	804	39	44	286	1.37	
23	409.59	619.66	9	22	36	207	0.29	NET< CL
24	462.44	699.60	101	25	37	193	2.03	Wide Pk
25	510.71	772.62	431	30	35	170	2.23	Wide Pk
26	557.71	843.71	4	20	33	162	0.21	NET< CL
27	583.02	881.99	505	29	30	129	1.73	

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	609.20	921.59	606	32	33	162	1.59	
29	727.06	1099.87	78	19	28	126	1.37	
30	768.12	1161.99	44	18	28	131	1.83	
31	793.61	1200.53	27	9	12	34	0.83	a
32	794.96	1202.58	44	10	12	34	0.94	b
33	860.02	1300.99	53	18	28	109	1.98	
34	911.00	1378.10	330	24	26	109	1.81	
35	933.60	1412.28	38	16	25	95	2.06	
36	964.67	1459.27	61	14	18	67	1.49	a
37	968.84	1465.58	203	17	17	58	1.38	b
38	1119.92	1694.07	140	22	31	132	1.71	
39	1238.16	1872.88	15	16	26	109	0.59	NET< CL
40	1377.86	2084.11	29	11	15	43	1.15	
41	1460.60	2209.21	1404	39	15	35	2.06	
42	1729.39	2615.48	15	8	11	19	1.44	
43	1764.31	2668.25	136	13	11	20	2.51	
44	2203.80	3332.08	41	10	12	21	2.62	
45	2614.72	3952.11	212	15	8	9	2.61	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File:. EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	51.76	-6839	465	777	-5516	468	779	NET<CL
2	63.36	67	41	66	45	41	67	NET<CL
3	74.76	390	42	61	370	42	61	
4	76.97	575	40	53	547	40	54	
5	84.32	104	39	61	85	39	62	
6	87.10	281	41	61	267	41	62	
8	92.80	375	49	75	294	50	76	
11	143.39	4	33	54	-7	33	55	NET<CL
12	185.88	279	41	62	222	41	63	
14	238.51	1437	46	41	1394	46	43	
15	241.47	320	33	47	301	34	47	
16	269.85	81	31	48	76	31	49	
18	295.08	429	30	36	393	30	38	
21	337.94	209	32	47	203	32	48	
22	351.79	805	39	44	737	39	46	
24	462.44	101	25	37	99	25	38	
25	510.71	431	30	35	196	30	44	
26	557.71	4	20	33	-1	20	34	NET<CL
27	583.02	505	29	30	489	29	31	
28	609.20	606	32	33	557	32	35	
29	727.06	78	19	28	75	19	28	
30	768.12	44	18	28	39	19	29	
34	911.00	330	24	26	317	24	27	
35	933.60	38	16	25	34	16	25	
37	968.84	203	17	17	196	17	17	
38	1119.92	140	22	31	128	22	31	
39	1238.16	15	16	26	10	16	26	NET<CL
40	1377.86	29	11	15	28	11	16	
41	1460.60	1404	39	15	1384	39	17	
43	1764.31	136	13	11	124	14	13	
44	2203.80	41	10	12	37	10	12	
45	2614.72	212	15	8	196	15	10	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. 2.00 | Decay Limit (Half-lives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.76	370	Pb-212	250	5 of 6	100.00	1.50	
			Tl-208	14	8 of 9	99.30	0.99	
			Pb-214	116	5 of 7	98.65	0.99	
			Tl-208	25	8 of 9	99.30	0.99	
4	76.97	547	Pb-212	445	5 of 6	100.00	1.50	
			Pb-214	202	5 of 7	98.65	0.99	
5	84.32	85	Tl-208	14	8 of 9	99.30	1.49	
6	87.10	15	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
48	87.10	252	Pb-212	252	5 of 6	100.00	1.50	AutoAdd
7	89.80	155	Cd-109	. . . . .	1 of 1	100.00	1.50	
8	92.80	200	Th-234	. . . . .	1 of 2	58.74	0.59	Split
47	92.80	94	AcTh-228	94	12 of 36	82.32	0.82	AutoAdd
9	99.13	62	AcTh-228	31	12 of 36	85.22	1.35	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
			1120DEsc	. . . . .	0 of 0	. . . . .	0.50	
10	128.75	80	AcTh-228	96	12 of 36	92.19	1.42	
12	185.88	222	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
13	209.17	80	AcTh-228	129	12 of 36	96.19	1.46	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
14	238.51	1394	Pb-212	1711	5 of 6	100.00	1.50	
15	241.47	301	Pb-214	183	5 of 7	100.00	1.00	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
16	269.85	76	AcTh-228	90	12 of 36	92.19	1.42	
17	277.06	54	Tl-208	62	8 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
18	295.08	393	Pb-214	447	5 of 7	100.00	1.50	
19	299.93	76	Pb-212	96	5 of 6	100.00	1.50	
20	328.03	52	AcTh-228	71	12 of 36	92.19	1.42	
			Bi-212	1	2 of 13	59.32	1.09	
			La-140	11808	2 of 15	23.26	0.23	LowScore
21	337.94	203	AcTh-228	252	12 of 36	92.19	1.42	
22	351.79	737	Pb-214	1177	5 of 7	100.00	1.00	
24	462.44	99	AcTh-228	72	12 of 36	89.08	1.39	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
25	510.71	64	Annul	. . . . .	1 of 1	100.00	1.50	Split
46	510.71	132	Tl-208	132	8 of 9	100.00	1.50	AutoAdd
27	583.02	489	Tl-208	473	8 of 9	100.00	1.50	
28	609.20	557	Bi-214	648	8 of 33	88.44	1.38	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
			Ru-103		1 of 2	5.92	0.06	LowScore
			1120SEsc		0 of 0	. . .	0.50	
29	727.06	75	Bi-212	2762	2 of 13	100.00	1.50	
30	768.12	39	Bi-214	54	8 of 33	94.26	1.44	
			Pa-234		1 of 2	26.32	0.76	
31	793.61	27	AcTh-228	56	12 of 36	100.00	1.00	
32	794.96	44	Unknown . . . . .		. . . . .	. . . . .	. . . . .
			AcTh-228	56	12 of 36	92.19	1.42	Matched
			Cs-134		1 of 9	46.67	0.47	LowScore
33	860.02	53	Tl-208	55	8 of 9	100.00	1.50	
34	911.00	317	AcTh-228	295	12 of 36	90.68	1.41	
35	933.60	34	Bi-214	30	8 of 33	87.21	1.37	
36	964.67	61	AcTh-228	55	12 of 36	90.68	1.41	
37	968.84	196	AcTh-228	168	12 of 36	90.68	1.41	
			Sb-124		1 of 13	1.04	0.01	LowScore
38	1119.92	128	Bi-214	126	8 of 33	88.44	1.38	
40	1377.86	28	Bi-214	30	8 of 33	88.44	1.38	
41	1460.60	1384	K-40		1 of 1	100.00	1.50	
42	1729.39	15	Bi-214	19	8 of 33	94.26	1.44	
43	1764.31	124	Bi-214	94	8 of 33	87.21	1.37	
44	2203.80	37	Bi-214	26	8 of 33	84.87	1.35	
45	2614.72	196	Tl-208	219	8 of 9	100.00	1.50	

SEEKER F I N A L A C T I V I T Y R E P O R T Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5186-11

Sample ID: SOIL/SEDI Duratek Inc

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Sampling Start: 02/07/2003 12:00:00 | Counting Start: 04/11/2003 11:02:31
Sampling Stop: 02/07/2003 12:00:00 | Decay Time. . . . . 1.51e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 10430 Sec
Sample Size . . . . . 6.32e-001 kg | Real Time . . . . . 10441 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1014105.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[5.46E-03*En^-3.56E+00 + 1.55E+02*En^6.66E-01] 02/06/1998
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Library File: . . . . . SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: . . . . . L5186-11.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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N
ENERGY E Concentration
Nuclide (keV) (pCi/kg ) MDA Flags Notes MDC
-----
Pb-212 Average:x 7.73E+02 +- 2.51E+01 . . . . * . . . . .
74.81 I.D. . . . . . . . . . .
77.12 I.D. . . . . . . . . . .
87.30 I.D. . . . . . . . . . .
238.63 7.76E+02 +- 2.54E+01 4.96E+01 +* . . . . .
300.09 6.38E+02 +- 1.78E+02 5.55E+02 +* . . . . .
Tl-208 Average:x 6.92E+02 +- 3.22E+01 . . . . * . . . . .
84.90 I.D. . . . . . . . . . .
277.35 6.06E+02 +- 3.31E+02 1.09E+03 + . . . . .
510.84 I.D. . . . . . . . . . .
583.14 7.16E+02 +- 4.23E+01 9.35E+01 +* . . . . .
860.37 6.80E+02 +- 2.36E+02 7.47E+02 + . . . . .
2614.66 6.58E+02 +- 5.15E+01 7.83E+01 +* . . . . .
Cd-109 88.03 I.D. . . . . . . . . . .
Th-234 92.59 8.72E+02 +- 3.75E+02 1.23E+03 + . . . . .
AcTh-228 Average:x 6.31E+02 +- 3.22E+01 . . . . * . . . . .
99.45 1.31E+03 +- 6.37E+02 2.08E+03 + . . . . .
129.08 5.54E+02 +- 2.66E+02 8.71E+02 + . . . . .
209.28 4.17E+02 +- 1.74E+02 5.66E+02 + . . . . .
270.23 5.65E+02 +- 2.30E+02 7.47E+02 + . . . . .
327.64 4.87E+02 +- 2.36E+02 7.68E+02 + . . . . .
338.32 5.51E+02 +- 8.76E+01 2.66E+02 +* . . . . .
463.00 8.52E+02 +- 2.15E+02 6.74E+02 +* . . . . .
794.70 3.15E+02 +- 1.04E+02 3.08E+02 +* . . . . .
911.07 6.81E+02 +- 5.24E+01 1.23E+02 +* . . . . .
964.60 7.21E+02 +- 1.62E+02 4.72E+02 +* . . . . .
969.11 7.32E+02 +- 6.54E+01 1.39E+02 +* . . . . .
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MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
	93.35	I.D.	. . . . .	. . . . .	
Ra-226	186.22	1.46E+03 +- 2.71E+02	8.50E+02		+		
Pb-214	Average:x	6.33E+02 +- 2.61E+01	. . . . .		*	
	241.98	1.00E+03 +- 1.12E+02	3.26E+02		+		
	295.21	5.80E+02 +- 4.49E+01	1.16E+02		+		
	351.92	6.29E+02 +- 3.34E+01	8.14E+01		+		
Annul	511.00	2.92E+01 +- 2.40E+01	7.93E+01		+		
Bi-214	Average:x	5.72E+02 +- 2.70E+01	. . . . .		*	
	609.31	5.49E+02 +- 3.15E+01	7.25E+01		+		
	768.36	4.08E+02 +- 1.96E+02	6.36E+02		+		
	934.06	6.42E+02 +- 3.08E+02	9.98E+02		+		
	1120.29	5.82E+02 +- 1.00E+02	2.95E+02		+		
	1377.67	5.25E+02 +- 2.07E+02	6.47E+02		+		
	1729.59	4.55E+02 +- 2.32E+02	7.41E+02		+		
	1764.49	7.26E+02 +- 7.91E+01	1.63E+02		+		
	2204.22	7.89E+02 +- 2.07E+02	5.86E+02		+		
Bi-212	727.17	3.26E+02 +- 8.32E+01	2.56E+02		+		
K-40	1460.81	1.06E+04 +- 2.95E+02	2.77E+02		+		
Am-241	59.54	N-2.28E+01 +- 5.09E+01	1.73E+02		x		
Co-57	122.06	N-6.73E-01 +- 7.75E+00	2.62E+01		x		
Ce-144	133.54	N 5.61E+01 +- 6.19E+01	2.06E+02r		x	rbase	
Ce-141	145.44	N 1.45E+02 +- 5.08E+01	1.64E+02		x		
Se-75	264.65	N-1.46E+01 +- 1.55E+01	5.38E+01l		x	lbase	
Cr-51	320.08	N 4.40E+01 +- 2.91E+02	9.94E+02		x		
I-131	364.48	N 9.14E+01 +- 1.71E+03	5.86E+03		x		
Sb-125	427.89	N 3.85E+00 +- 2.11E+01	7.27E+01		x		
Ag-108m	433.93	N 6.76E-02 +- 7.03E+00	2.42E+01		x		
Be-7	477.59	N-1.14E+02 +- 1.49E+02	5.24E+02		x		
La-140	487.03	N-4.85E+02 +- 4.60E+02	1.63E+03		x		
Ru-103	497.08	N-1.88E+01 +- 2.36E+01	8.31E+01		x		
Ba-140	537.32	N-3.40E+01 +- 7.86E+02	2.73E+03		x		
Cs-134	604.70	N 1.97E+00 +- 7.97E+00	2.74E+01l		x	lbase	
Ru-106	621.84	N 1.35E+02 +- 7.22E+01	2.35E+02		x		
Cs-137	661.65	N 7.39E+00 +- 8.73E+00	2.95E+01		x		Y.
Zr-95	724.18	N-6.22E+03 +- 3.09E+03	1.02E+04P		x	PIC	
Nb-95	765.79	N-1.37E+00 +- 4.04E+01	1.38E+02P		x	PIC	
Co-58	810.76	N-1.85E+01 +- 1.39E+01	5.06E+01		x		
Mn-54	834.83	N 5.17E+00 +- 9.10E+00	3.11E+01		x		
Ag-110m	884.67	N 1.25E+01 +- 1.15E+01	3.86E+01		x		
Fe-59	1099.22	N-2.23E+01 +- 4.32E+01	1.53E+02		x		
Zn-65	1115.52	N 3.67E+01 +- 4.38E+01	1.46E+02P		x	PIC	
Co-60	1332.49	N-2.43E+00 +- 7.76E+00	2.81E+01		x		Y.
Sb-124	1691.02	N-2.28E+01 +- 2.34E+01	9.30E+01		x		

MEASURED TOTAL: 1.66E+04 +- 1.19E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	51.76	78.47	-5516	468	779	7700	318.50	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	63.36	96.01	45	41	67	746	0.69	Deleted
11	143.39	217.05	-7	33	55	544	0.11	Deleted
23	409.59	619.66	9	22	36	207	0.29	Deleted
26	557.71	843.71	-1	20	34	162	0.21	Deleted
32	794.96	1202.58	44	10	12	34	0.94	Unknown
39	1238.16	1872.88	10	16	26	109	0.59	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
49	59.54	90.23	-14N	30	50	503	1.13	NET< CL
50	122.06	184.78	-3N	29	47	453	1.18	NET< CL
51	133.54	202.15	27N	29	48	458	1.19	NET< CL RBase
52	145.44	220.14	93N	33	51	483	1.20	
53	264.65	400.45	-23N	24	41	309	1.28	NET< CL LBase
54	320.09	484.29	3N	20	32	195	1.32	NET< CL
55	364.49	551.45	1N	19	31	174	1.36	NET< CL
56	427.91	647.38	3N	16	27	134	1.40	NET< CL
57	433.95	656.51	0N	17	29	139	1.41	NET< CL
58	477.62	722.56	-14N	18	30	151	1.44	NET< CL
59	487.06	736.85	-19N	18	30	151	1.44	NET< CL
60	497.11	752.05	-14N	17	29	146	1.45	NET< CL
61	537.36	812.93	-1N	15	25	110	1.48	NET< CL
62	604.76	914.88	4N	16	26	119	1.52	NET< CL LBase
63	621.90	940.81	26N	14	21	74	1.54	
64	661.59	1000.85	13N	15	25	119	1.56	NET< CL
65	724.14	1095.46	-2688N	1335	2198	167	1.61	NET< CL PIC
66	765.77	1158.43	-1N	22	36	159	1.63	NET< CL PIC
67	810.76	1226.48	-18N	13	23	100	1.66	NET< CL
68	834.85	1262.91	8N	14	23	95	1.68	NET< CL
69	884.71	1338.34	13N	12	19	65	1.71	NET< CL
70	1099.16	1662.68	-7N	14	23	90	1.86	NET< CL
71	1115.48	1687.35	23N	27	44	171	1.87	NET< CL PIC
72	1332.43	2015.42	-3N	10	17	53	2.01	NET< CL
73	1691.06	2557.55	-6N	6	11	22	2.25	NET< CL

c:\seeker\Results\L5186-11.RES Analysis Results Saved.

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/07/2003 12:00:00 | Counting Start: 04/11/2003 11:02:31
Sampling Stop: 02/07/2003 12:00:00 | Decay Time. 1.51E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 10430 Sec
Sample Size 6.32E-01 kg | Real Time 10441 Sec
Collection Efficiency 1.0000 | Spectrum File 1014105.spc

Detector #: 5

Energy(keV) = -0.13 + 0.661*Ch + -2.03E-07*Ch^2 + -2.03E-07*Ch^3 04/11/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5186-11.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	7.73E+02	2.51E+01	< 4.96E+01	2.40E+01	9.99E-01	MEAS +	YES
Tl-208	6.92E+02	3.22E+01	< 7.82E+01	3.46E+01	1.00E+00	MEAS +	YES
Th-234	8.72E+02	3.75E+02	< 1.23E+03	6.09E+02	9.99E-01	MEAS +	YES
AcTh-228	6.31E+02	3.22E+01	< 1.23E+02	5.88E+01	1.00E+00	MEAS +	YES
Ra-226	1.46E+03	2.71E+02	< 8.50E+02	4.16E+02	1.00E+00	MEAS +	YES
Pb-214	6.33E+02	2.61E+01	< 8.14E+01	3.96E+01	9.99E-01	MEAS +	YES
Annil	2.92E+01	2.40E+01	< 7.93E+01	3.90E+01	8.87E-01	MEAS +	YES
Bi-214	5.72E+02	2.70E+01	< 7.25E+01	3.49E+01	9.99E-01	MEAS +	YES
Bi-212	3.26E+02	8.32E+01	< 2.56E+02	1.22E+02	1.00E+00	MEAS +	YES
K-40	1.06E+04	2.95E+02	< 2.77E+02	1.28E+02	1.00E+00	MEAS +	YES
Am-241	-2.28E+01	5.09E+01	< 1.73E+02	8.43E+01	1.00E+00	NET	YES
Co-57	-6.73E-01	7.74E+00	< 2.62E+01	1.28E+01	8.51E-01	NET	YES
Ce-144	5.61E+01	6.19E+01	< 2.06E+02	1.00E+02	8.58E-01	NET	YES
Ce-141	1.45E+02	5.08E+01	< 1.64E+02	7.98E+01	2.61E-01	NET	YES
Se-75	-1.46E+01	1.55E+01	< 5.38E+01	2.60E+01	6.95E-01	NET	YES
Cr-51	4.40E+01	2.91E+02	< 9.94E+02	4.77E+02	2.07E-01	NET	YES
I-131	9.14E+01	1.71E+03	< 5.86E+03	2.80E+03	4.37E-03	NET	YES
Sb-125	3.85E+00	2.11E+01	< 7.27E+01	3.46E+01	9.58E-01	NET	YES
Ag-108m	6.76E-02	7.03E+00	< 2.42E+01	1.16E+01	9.99E-01	NET	YES
Be-7	-1.14E+02	1.49E+02	< 5.24E+02	2.50E+02	4.42E-01	NET	YES
La-140	-4.85E+02	4.60E+02	< 1.63E+03	7.79E+02	3.29E-02	NET	YES
Ru-103	-1.88E+01	2.36E+01	< 8.31E+01	3.97E+01	3.30E-01	NET	YES
Ba-140	-3.40E+01	7.86E+02	< 2.73E+03	1.29E+03	3.29E-02	NET	YES
Cs-134	1.97E+00	7.97E+00	< 2.74E+01	1.30E+01	9.44E-01	NET	YES
Ru-106	1.35E+02	7.22E+01	< 2.35E+02	1.10E+02	8.88E-01	NET	YES
Cs-137	7.39E+00	8.73E+00	< 2.95E+01	1.40E+01	9.96E-01	NET	YES
Zr-95	-6.22E+03	3.09E+03	< 1.02E+04	5.09E+03	5.06E-01	NET	YES
Nb-95	-1.37E+00	4.04E+01	< 1.38E+02	6.66E+01	2.88E-01	NET	YES
Co-58	-1.85E+01	1.39E+01	< 5.06E+01	2.39E+01	5.40E-01	NET	YES
Mn-54	5.17E+00	9.10E+00	< 3.11E+01	1.47E+01	8.70E-01	NET	YES
Ag-110m	1.25E+01	1.15E+01	< 3.86E+01	1.80E+01	8.40E-01	NET	YES
Fe-59	-2.23E+01	4.32E+01	< 1.53E+02	7.23E+01	3.76E-01	NET	YES
Zn-65	3.67E+01	4.38E+01	< 1.46E+02	7.09E+01	8.36E-01	NET	YES
Co-60	-2.43E+00	7.76E+00	< 2.81E+01	1.30E+01	9.78E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	-2.28E+01	2.34E+01	< 9.30E+01	4.14E+01	4.84E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-12 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-170
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-10-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____
Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 586.5 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/10/03 Det No.: 6 Spectrum No.: 1014106
Counted by: g
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5186-12
Client Id : BMS-2600-170
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/10/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	586.5		
Sample Weight-Dry	g			
Aliquot Weight	g	586.5		
FINAL WEIGHT	kg	.5865		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-12

Sample ID: SOIL/SEDI Duratek Inc

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 Sampling Start: 02/10/2003 12:00:00 | Counting Start: 04/11/2003 11:03:04
 Sampling Stop: 02/10/2003 12:00:00 | Decay Time. 1.44E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 10544 Sec
 Sample Size 5.86E-001 kg | Real Time 10555 Sec
 Collection Efficiency 1.0000 | Spc. File 1014106.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV)= 0.12 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.22	95.37	130	50	80	1008	0.94	
2	74.90	113.02	443	42	60	723	1.06	a
3	77.08	116.31	669	45	60	723	0.99	b
4	84.11	126.94	112	35	55	610	1.08	a
5	87.22	131.64	275	42	63	732	1.29	b
6	89.98	135.81	190	36	55	610	1.17	c
7	92.82	140.11	510	44	63	732	1.34	d
8	112.55	169.93	-1	36	59	648	0.03	NET< CL
9	129.16	195.04	58	36	58	632	0.70	NET< CL
10	144.03	217.51	19	38	63	673	0.42	NET< CL
11	185.96	280.88	392	40	58	575	1.23	
12	209.39	316.29	198	38	59	548	1.50	
13	238.67	360.55	1604	48	44	354	1.20	a
14	241.58	364.95	350	38	55	472	1.70	b Wide Pk
15	269.81	407.62	88	31	49	385	0.97	
16	277.25	418.86	72	27	43	312	1.62	
17	295.20	445.99	495	31	36	245	1.28	a
18	299.94	453.15	83	21	32	204	1.05	b
19	328.55	496.39	91	29	45	324	1.59	
20	338.26	511.07	323	29	38	251	1.27	
21	351.91	531.71	814	37	38	235	1.51	
22	409.63	618.95	65	28	44	265	1.11	
23	463.00	699.61	106	24	36	190	2.00	Wide Pk
24	510.92	772.04	444	29	34	166	2.02	Wide Pk
25	558.67	844.22	17	17	28	123	0.72	NET< CL
26	583.21	881.29	517	30	31	152	1.49	
27	609.24	920.64	684	32	31	142	1.64	
28	661.66	999.87	67	19	28	143	1.22	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
29	727.25	1099.00	128	21	29	138	1.26	
30	767.77	1160.25	45	22	35	186	1.59	
31	795.16	1201.65	35	17	27	119	0.78	
32	860.45	1300.33	45	17	26	109	2.52	Wide Pk
33	911.28	1377.16	384	25	26	104	1.80	
34	964.56	1457.69	118	19	26	102	2.36	a
35	969.16	1464.64	236	19	18	65	1.54	b
36	1120.43	1693.28	144	20	27	106	2.28	
37	1238.08	1871.09	51	19	29	139	1.42	
38	1378.10	2082.72	11	11	18	59	0.62	NET< CL
39	1460.85	2207.79	1647	42	16	43	2.23	
40	1729.49	2613.83	31	8	9	12	3.82	Wide Pk
41	1764.46	2666.69	98	13	14	30	1.86	
42	2614.60	3951.61	243	16	8	10	3.65	Wide Pk

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.22	130	50	80	6	50	82	NET<CL
2	74.90	443	42	60	421	42	61	
3	77.08	669	45	60	643	45	61	
4	84.11	112	35	55	101	35	56	
7	92.82	510	44	63	221	45	69	
8	112.55	-1	36	59	-20	36	60	NET<CL
10	144.03	19	38	63	-19	39	64	NET<CL
11	185.96	392	40	58	208	41	63	
13	238.67	1604	48	44	1547	48	46	
14	241.58	350	38	55	329	38	55	
15	269.81	88	31	49	83	32	50	
16	277.25	72	27	43	70	27	43	
17	295.20	495	31	36	458	32	38	
20	338.26	323	29	38	315	30	39	
21	351.91	814	37	38	749	37	41	
24	510.92	445	29	34	203	30	43	
25	558.67	17	17	28	10	18	28	NET<CL
26	583.21	517	30	31	501	30	32	
27	609.24	685	32	31	634	32	34	
29	727.25	129	21	29	124	21	29	
31	795.16	35	17	27	31	18	27	
33	911.28	384	25	26	371	25	27	
35	969.16	236	19	18	235	19	18	
36	1120.43	144	20	27	137	20	27	
37	1238.08	51	19	29	45	19	30	
38	1378.10	11	11	18	9	11	18	NET<CL
39	1460.85	1647	42	16	1625	42	18	
40	1729.49	31	8	9	28	8	9	
41	1764.46	98	13	14	88	13	15	
42	2614.60	243	16	8	227	16	10	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG

2	74.90	421	Pb-212	294	5 of 6	100.00	1.50	
			Pb-214	130	5 of 7	98.65	0.99	
			Tl-208	29	7 of 9	98.43	0.98	
3	77.08	643	Pb-212	520	5 of 6	100.00	1.50	
			Pb-214	226	5 of 7	98.65	0.99	
4	84.11	101	Tl-208	16	7 of 9	98.43	1.48	
5	87.22	275	Pb-212	288	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	89.98	190	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
7	92.82	92	Th-234	. . . . .	1 of 2	58.74	0.59	Split
45	92.82	129	AcTh-228	129	11 of 36	82.09	1.32	AutoAdd
11	185.96	208	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
12	209.39	198	AcTh-228	162	11 of 36	86.48	1.36	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
13	238.67	1547	Pb-212	1866	5 of 6	100.00	1.50	
14	241.58	329	Pb-214	195	5 of 7	100.00	1.00	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
15	269.81	83	AcTh-228	115	11 of 36	91.40	1.41	
16	277.25	70	Tl-208	67	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
17	295.20	458	Pb-214	451	5 of 7	100.00	1.50	
18	299.94	83	Pb-212	107	5 of 6	100.00	1.50	
19	328.55	91	AcTh-228	90	11 of 36	88.28	1.38	
			Bi-212	2	2 of 13	59.32	0.59	
			La-140	12936	2 of 15	23.26	0.23	LowScore
20	338.26	315	AcTh-228	313	11 of 36	88.28	1.38	
21	351.91	749	Pb-214	1289	5 of 7	100.00	1.00	
22	409.63	65	AcTh-228	52	11 of 36	85.16	1.35	
23	463.00	106	AcTh-228	98	11 of 36	87.39	1.37	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
24	510.92	61	Annil	. . . . .	1 of 1	100.00	1.50	Split
44	510.92	142	Tl-208	142	7 of 9	100.00	1.50	AutoAdd
26	583.21	501	Tl-208	540	7 of 9	100.00	1.50	
27	609.24	55	1120SEsc	. . . . .	0 of 0	. . . . .	0.50	Split
43	609.24	579	Bi-214	579	6 of 33	81.52	1.32	AutoAdd
28	661.66	67	Cs-137	. . . . .	1 of 1	100.00	1.50	
29	727.25	124	Bi-212	4868	2 of 13	81.27	0.81	
30	767.77	45	Bi-214	58	6 of 33	86.37	1.36	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
31	795.16	31	AcTh-228	73	11 of 36	96.87	1.47	
			Cs-134		1 of 9	46.67	0.97	
32	860.45	45	Tl-208	59	7 of 9	100.00	1.50	
33	911.28	371	AcTh-228	410	11 of 36	88.28	1.38	
34	964.56	118	AcTh-228	70	11 of 36	82.09	1.32	
35	969.16	235	AcTh-228	224	11 of 36	88.28	1.38	
			Sb-124		1 of 13	1.04	0.01	LowScore
36	1120.43	137	Bi-214	134	6 of 33	81.52	1.32	
37	1238.08	45	Bi-214	50	6 of 33	84.37	1.34	
39	1460.85	1625	K-40		1 of 1	100.00	1.50	
40	1729.49	28	Bi-214	20	6 of 33	80.69	1.31	
41	1764.46	88	Bi-214	106	6 of 33	86.37	1.36	
42	2614.60	227	Tl-208	223	7 of 9	100.00	1.50	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-12

Sample ID: SOIL/SEDI Duratek Inc

 Sampling Start: 02/10/2003 12:00:00 | Counting Start: 04/11/2003 11:03:04
 Sampling Stop: 02/10/2003 12:00:00 | Decay Time. 1.44e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 10544 Sec
 Sample Size 5.86e-001 kg | Real Time 10555 Sec
 Collection Efficiency 1.0000 | Spectrum File 1014106.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[8.71E-03*En^-3.34E+00 + 1.54E+02*En^6.70E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5186-12.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						

Pb-212	Average:x	9.07E+02 +- 2.80E+01	*		
	74.81	I.D.	
	77.12	I.D.	
	87.30	I.D.	
	238.63	9.11E+02 +- 2.84E+01	5.55E+01	+*		
	300.09	7.39E+02 +- 1.90E+02	5.89E+02	+*		
Tl-208	Average:x	7.86E+02 +- 3.55E+01	*		
	84.90	I.D.	
	277.35	8.22E+02 +- 3.24E+02	1.05E+03	+		
	510.84	I.D.	
	583.14	7.76E+02 +- 4.59E+01	1.03E+02	+*		
	860.37	6.14E+02 +- 2.31E+02	7.35E+02	+		
	2614.66	8.11E+02 +- 5.85E+01	8.47E+01	+*		
Th-234	92.59	4.17E+02 +- 3.52E+02	1.16E+03	+		
Ra-226	186.22	1.45E+03 +- 2.85E+02	8.96E+02	+*		
AcTh-228	Average:x	8.90E+02 +- 3.70E+01	*		
	209.28	1.09E+03 +- 2.12E+02	6.64E+02	+*		
	270.23	6.50E+02 +- 2.49E+02	8.06E+02	+		
	327.64	9.10E+02 +- 2.91E+02	9.32E+02	+*		
	338.32	9.03E+02 +- 8.48E+01	2.31E+02	+*		
	409.51	1.13E+03 +- 4.83E+02	1.57E+03	+		
	463.00	9.64E+02 +- 2.20E+02	6.81E+02	+*		
	794.70	3.94E+02 +- 2.20E+02	7.19E+02	+		
	911.07	8.47E+02 +- 5.75E+01	1.28E+02	+*		
	964.60	1.49E+03 +- 2.39E+02	6.80E+02	+*		
	969.11	9.34E+02 +- 7.54E+01	1.57E+02	+*		
	93.35	I.D.	
=====							

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E (keV)		(pCi/kg)				
Pb-214	Average:x	7.08E+02	+-	2.72E+01	. . . . .	*	
	241.98	1.17E+03	+-	1.35E+02	4.02E+02	++		
	295.21	7.16E+02	+-	4.94E+01	1.24E+02	++		
	351.92	6.77E+02	+-	3.35E+01	7.69E+01	++		
Annil	511.00	2.93E+01	+-	2.50E+01	8.27E+01	+		
Cs-137	661.65	4.04E+01	+-	1.13E+01	3.52E+01	++		
Bi-212	727.17	5.73E+02	+-	9.69E+01	2.83E+02	++		
Bi-214	Average:x	6.06E+02	+-	4.56E+01	. . . . .	*	
	768.36	5.09E+02	+-	2.47E+02	8.06E+02	+		
	1120.29	6.60E+02	+-	9.80E+01	2.77E+02	++		
	1238.11	5.94E+02	+-	2.54E+02	8.17E+02	+		
	1729.59	9.05E+02	+-	2.55E+02	7.08E+02	++		
	1764.49	5.50E+02	+-	8.12E+01	2.02E+02	++		
	609.31	6.06E+02	+-	7.49E+01	2.35E+02	++		
K-40	1460.81	1.32E+04	+-	3.41E+02	3.21E+02	++		
Am-241	59.54	N 1.79E+01	+-	5.14E+01	1.73E+02	x	lbase	
Co-57	122.06	N 1.14E+01	+-	8.30E+00	2.74E+01	x		
Ce-144	133.54	N-6.61E+01	+-	6.74E+01	2.31E+02	x		
Ce-141	145.44	N 7.59E+01	+-	4.76E+01	1.57E+02	x		
Se-75	264.65	N 3.98E+00	+-	1.61E+01	5.47E+01	x	lbase	
Cr-51	320.08	N-1.88E+02	+-	3.19E+02	1.10E+03	x		
I-131	364.48	N-1.42E+03	+-	1.43E+03	5.02E+03	x		
Sb-125	427.89	N 1.22E+01	+-	2.39E+01	8.11E+01	x		
Ag-108m	433.93	N-1.03E+01	+-	7.06E+00	2.54E+01	x		
Be-7	477.59	N 6.88E+01	+-	1.41E+02	4.80E+02	x		
La-140	487.03	N 2.37E+02	+-	3.75E+02	1.27E+03	x		
Ru-103	497.08	N-3.07E+01	+-	2.38E+01	8.49E+01	x		
Ba-140	537.32	N 7.67E+00	+-	7.36E+02	2.54E+03	x		
Cs-134	604.70	N-7.21E+00	+-	8.83E+00	3.12E+01	x	lbase	
Ru-106	621.84	N-4.02E+01	+-	8.65E+01	3.04E+02	x		
Zr-95	724.18	N-1.13E+04	+-	3.71E+03	1.22E+04	x#	PIC	
Nb-95	765.79	N-2.95E+01	+-	4.51E+01	1.56E+02	x	PIC	
Co-58	810.76	N-2.02E+01	+-	1.49E+01	5.42E+01	x		
Mn-54	834.83	N 8.88E+00	+-	9.82E+00	3.31E+01	x		
Ag-110m	884.67	N-2.02E+00	+-	1.33E+01	4.66E+01	x		
Fe-59	1099.22	N-4.04E-01	+-	4.26E+01	1.49E+02	x		
Zn-65	1115.52	N-2.62E+01	+-	4.94E+01	1.68E+02	x	PIC	
Co-60	1332.49	N-2.51E+00	+-	8.80E+00	3.16E+01	x		Y.
Sb-124	1691.02	N 0.00E+00	+-	2.59E+01	9.58E+01	x		

MEASURED TOTAL: 1.96E+04 +- 1.28E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.22	95.37	6	50	82	1008	0.94	Deleted
6	89.98	135.81	190	36	55	610	1.17	Unknown
8	112.55	169.93	-20	36	60	648	0.03	Deleted
9	129.16	195.04	58	36	58	632	0.70	Deleted
10	144.03	217.51	-19	39	64	673	0.42	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	558.67	844.22	10	18	28	123	0.72	Deleted
27	609.24	920.64	55	79	129	143	1.64	1120SEsc
38	1378.10	2082.72	9	11	18	59	0.62	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
46	59.54	89.81	11N	32	53	556	1.13	NET< CL LBase
47	122.06	184.30	40N	29	47	446	1.12	NET< CL
48	133.54	201.65	-30N	30	51	521	1.13	NET< CL
49	145.44	219.64	49N	31	49	484	1.13	NET< CL
50	264.65	399.82	6N	24	40	294	1.21	NET< CL LBase
51	320.08	483.59	-13N	22	37	251	1.25	NET< CL
52	364.48	550.70	-19N	19	32	192	1.29	NET< CL
53	427.89	646.54	9N	18	28	150	1.35	NET< CL
54	433.93	655.67	-24N	16	28	147	1.36	NET< CL
55	477.59	721.66	8N	16	27	130	1.40	NET< CL
56	487.03	735.93	10N	16	26	121	1.40	NET< CL
57	497.08	751.12	-23N	17	30	151	1.41	NET< CL
58	537.32	811.94	0N	16	26	118	1.45	NET< CL
59	604.70	913.78	-14N	17	29	139	1.51	NET< CL LBase
60	621.84	939.69	-7N	15	26	113	1.53	NET< CL
61	724.18	1094.37	-4744N	1557	2564	201	1.62	NET< CL PIC
62	765.79	1157.26	-16N	24	41	205	1.66	NET< CL PIC
63	810.76	1225.23	-19N	14	24	108	1.70	NET< CL
64	834.83	1261.61	13N	14	23	97	1.72	NET< CL
65	884.67	1336.94	-2N	13	22	87	1.76	NET< CL
66	1099.22	1661.22	-0N	13	22	82	1.92	NET< CL
67	1115.52	1685.85	-15N	29	48	204	1.93	NET< CL PIC
68	1332.49	2013.79	-3N	11	18	57	2.08	NET< CL
69	1691.02	2555.68	0N	7	11	22	2.26	NET< CL

c:\seeker\Results\L5186-12.RES Analysis Results Saved.

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/10/2003 12:00:00 | Counting Start: 04/11/2003 11:03:04
Sampling Stop: 02/10/2003 12:00:00 | Decay Time. 1.44E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 10544 Sec
Sample Size 5.86E-01 kg | Real Time 10555 Sec
Collection Efficiency 1.0000 | Spectrum File 1014106.spc

Detector #: 6

Energy(keV)= 0.12 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[8.71e-03*En^-3.34e+00 + 1.54e+02*En^ 6.70e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5186-12.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	9.07E+02	2.80E+01	< 5.55E+01	2.69E+01	1.00E+00	MEAS +	YES
Tl-208	7.86E+02	3.55E+01	< 8.48E+01	3.75E+01	1.00E+00	MEAS +	YES
Th-234	4.17E+02	3.52E+02	< 1.16E+03	5.75E+02	9.99E-01	MEAS +	YES
Ra-226	1.46E+03	2.85E+02	< 8.96E+02	4.39E+02	1.00E+00	MEAS +	YES
AcTh-228	8.90E+02	3.70E+01	< 1.28E+02	6.10E+01	1.00E+00	MEAS +	YES
Pb-214	7.08E+02	2.72E+01	< 7.69E+01	3.72E+01	9.99E-01	MEAS +	YES
Annil	2.93E+01	2.50E+01	< 8.27E+01	4.07E+01	8.92E-01	MEAS +	YES
Cs-137	4.04E+01	1.13E+01	< 3.52E+01	1.68E+01	9.96E-01	MEAS +	YES
Bi-212	5.73E+02	9.69E+01	< 2.83E+02	1.35E+02	1.00E+00	MEAS +	YES
Bi-214	6.06E+02	4.56E+01	< 2.02E+02	9.24E+01	9.99E-01	MEAS +	YES
K-40	1.32E+04	3.41E+02	< 3.21E+02	1.50E+02	1.00E+00	MEAS +	YES
Am-241	1.79E+01	5.14E+01	< 1.73E+02	8.41E+01	1.00E+00	NET	YES
Co-57	1.14E+01	8.30E+00	< 2.74E+01	1.33E+01	8.58E-01	NET	YES
Ce-144	-6.61E+01	6.74E+01	< 2.31E+02	1.13E+02	8.64E-01	NET	YES
Ce-141	7.59E+01	4.76E+01	< 1.57E+02	7.62E+01	2.78E-01	NET	YES
Se-75	3.98E+00	1.61E+01	< 5.47E+01	2.64E+01	7.07E-01	NET	YES
Cr-51	-1.88E+02	3.19E+02	< 1.10E+03	5.32E+02	2.23E-01	NET	YES
I-131	-1.42E+03	1.43E+03	< 5.02E+03	2.41E+03	5.67E-03	NET	YES
Sb-125	1.22E+01	2.39E+01	< 8.11E+01	3.87E+01	9.60E-01	NET	YES
Ag-108m	-1.03E+01	7.06E+00	< 2.54E+01	1.21E+01	9.99E-01	NET	YES
Be-7	6.88E+01	1.41E+02	< 4.80E+02	2.28E+02	4.59E-01	NET	YES
La-140	2.36E+02	3.76E+02	< 1.28E+03	6.05E+02	3.87E-02	NET	YES
Ru-103	-3.08E+01	2.38E+01	< 8.49E+01	4.06E+01	3.47E-01	NET	YES
Ba-140	7.67E+00	7.36E+02	< 2.54E+03	1.21E+03	3.87E-02	NET	YES
Cs-134	-7.21E+00	8.83E+00	< 3.12E+01	1.49E+01	9.46E-01	NET	YES
Ru-106	-4.02E+01	8.65E+01	< 3.04E+02	1.44E+02	8.93E-01	NET	YES
Zr-95	-1.13E+04	3.71E+03	< 1.22E+04	6.10E+03	5.22E-01	NET	YES
Nb-95	-2.95E+01	4.51E+01	< 1.56E+02	7.56E+01	3.05E-01	NET	YES
Co-58	-2.02E+01	1.49E+01	< 5.42E+01	2.56E+01	5.56E-01	NET	YES
Mn-54	8.88E+00	9.82E+00	< 3.31E+01	1.56E+01	8.75E-01	NET	YES
Ag-110m	-2.02E+00	1.33E+01	< 4.66E+01	2.19E+01	8.47E-01	NET	YES
Fe-59	-4.04E-01	4.27E+01	< 1.49E+02	7.02E+01	3.94E-01	NET	YES
Zn-65	-2.62E+01	4.94E+01	< 1.68E+02	8.19E+01	8.44E-01	NET	YES
Co-60	-2.51E+00	8.80E+00	< 3.16E+01	1.47E+01	9.79E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	0.00E+00	2.59E+01	< 9.58E+01	4.26E+01	5.01E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-13 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-241
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-13-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____
Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 714.1 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/11/03 1312 Det No.: 2 Spectrum No.: 1015402

Counted by: En

Recount Date/Time: 4/11/03 1737 Det No.: 5 Spectrum No.: 1017305

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5186-13	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2600-241	Matrix	: S001 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 02/13/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	714.1		
Sample Weight-Dry	g			
Aliquot Weight	g	714.1		
FINAL WEIGHT	kg	.7141		
Container			WT5S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5186-13 analyzed by emml461 on 04/11/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5186-13

not steel

Sample ID: SOIL/SEDI Duratek Inc

Code: 1015402

Sampling Start: 02/13/2003 12:00:00 | Counting Start: 04/11/2003 13:11:42
Sampling Stop: 02/13/2003 12:00:00 | Decay Time: 1.37E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 10000 Sec
Sample Size 7.14E-001 kg | Real Time 10004 Sec
Collection Efficiency 1.0000 | Spc. File 1015402.spc

Detector #: 2 (Canberra sn 9923043 det# 2)

Energy(keV)= 0.74 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.85	94.00	108	40	64	688	0.95	
2	74.61	111.80	292	36	52	538	1.10	a
3	76.91	115.27	446	38	52	538	1.07	b
4	87.01	130.56	131	24	35	304	0.65	a
5	89.55	134.41	78	27	43	406	0.78	b
6	92.67	139.12	230	34	50	508	1.18	c
7	121.90	183.37	458	44	63	636	1.19	
8	128.82	193.83	16	38	62	609	0.31	NET< CL
9	153.45	231.11	37	32	52	454	0.89	NET< CL
10	185.70	279.92	184	38	59	514	1.01	
11	208.63	314.61	43	17	26	163	0.63	a
12	209.85	316.46	44	17	26	163	0.60	b
13	238.47	359.78	862	38	39	274	1.23	a
14	241.51	364.38	185	30	43	320	1.41	b
15	270.03	407.54	36	27	43	292	1.15	NET< CL
16	277.05	418.17	-7	23	39	253	0.31	NET< CL
17	294.94	445.24	306	25	29	151	1.38	a
18	299.68	452.42	77	23	36	201	1.71	b
19	338.11	510.58	124	24	35	197	1.38	
20	351.73	531.18	462	29	31	163	1.25	
21	462.29	698.51	38	10	13	44	0.69	a
22	463.52	700.37	25	11	16	59	0.76	b
23	510.81	771.93	264	25	31	142	2.15	Wide Pk
24	583.04	881.25	280	23	27	106	1.54	
25	609.20	920.83	395	26	27	108	1.56	
26	661.51	1000.00	102	19	26	104	1.68	
27	727.01	1099.13	66	15	21	79	1.85	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	768.21	1161.48	14	14	22	88	0.72	NET< CL
29	795.34	1202.54	39	16	24	80	1.54	
30	860.48	1301.13	24	14	22	84	0.90	
31	911.11	1377.74	152	18	22	74	1.67	
32	968.96	1465.30	79	18	25	110	1.04	NET< CL
33	1120.28	1694.30	69	16	22	79	1.30	
34	1172.53	1773.38	28	16	24	87	1.80	
35	1332.17	2014.97	30	12	17	44	1.95	
36	1377.67	2083.82	22	10	14	31	1.17	
37	1407.59	2129.12	6	8	13	30	0.42	
38	1460.82	2209.67	967	32	11	19	1.88	
39	1728.84	2615.29	22	7	9	13	1.24	
40	1764.40	2669.11	69	10	10	16	1.99	
41	2614.37	3955.45	108	11	5	4	2.33	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.85	108	40	64	52	40	65	NET<CL
2	74.61	292	36	52	250	36	53	
3	76.91	446	38	52	397	38	53	
4	87.01	131	24	35	101	24	37	
6	92.67	230	34	50	87	34	54	
10	185.70	184	38	59	124	39	61	
13	238.47	862	38	39	813	38	40	
14	241.51	185	30	43	152	30	45	
17	294.94	306	25	29	243	25	32	
19	338.11	124	24	35	116	24	36	
20	351.73	462	29	31	355	29	36	
21	462.29	38	10	13	33	11	15	
23	510.81	264	25	31	77	25	39	
24	583.04	281	23	27	262	24	28	
25	609.20	395	26	27	317	26	31	
27	727.01	66	15	21	63	15	22	
28	768.21	14	14	22	5	14	23	NET<CL
31	911.11	152	18	22	139	18	23	
32	968.96	79	18	25	77	18	25	
33	1120.28	69	16	22	53	16	23	
36	1377.67	22	10	14	17	10	15	
38	1460.82	967	32	11	947	32	13	
39	1728.84	22	7	9	21	7	9	
40	1764.40	69	10	10	57	10	11	
41	2614.37	108	11	5	95	11	8	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.61	250	Pb-212	192	5 of 6	100.00	1.50	
			Tl-208	11	6 of 9	95.73	0.96	
			Pb-214	83	5 of 7	98.65	0.99	
			Tl-208	19	6 of 9	95.73	0.96	
3	76.91	397	Pb-212	335	5 of 6	100.00	1.50	
			Tl-208	19	6 of 9	95.73	0.96	
			Pb-214	148	5 of 7	98.65	0.99	
4	87.01	101	Cd-109	. . . . .	1 of 1	100.00	1.50	
			Pb-212	183	5 of 6	100.00	1.00	
5	89.55	78	Cd-109	. . . . .	1 of 1	100.00	1.50	
6	92.67	32	Th-234	. . . . .	1 of 2	100.00	1.50	Split
44	92.67	55	AcTh-228	55	7 of 36	76.51	1.27	AutoAdd
7	121.90	458	Co-57	. . . . .	1 of 4	88.97	0.89	
			Se-75	. . . . .	1 of 5	9.69	0.10	LowScore
10	185.70	124	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
11	208.63	43	AcTh-228	62	7 of 36	100.00	1.50	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
12	209.85	44	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			AcTh-228	62	7 of 36	100.00	1.50	Matched
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
13	238.47	813	Pb-212	823	5 of 6	100.00	1.50	
14	241.51	152	Pb-214	98	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
17	294.94	243	Pb-214	216	5 of 7	100.00	1.50	
18	299.68	77	Pb-212	53	5 of 6	100.00	1.50	
19	338.11	116	AcTh-228	110	7 of 36	88.32	1.38	
20	351.73	355	Pb-214	435	5 of 7	100.00	1.50	
21	462.29	33	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
22	463.52	25	AcTh-228	. . . . .	0 of 0	. . . . .	. . . . .
			AcTh-228	35	7 of 36	100.00	1.50	
23	510.81	6	Annil	. . . . .	1 of 1	100.00	1.50	Split
43	510.81	71	Tl-208	71	6 of 9	97.05	1.47	AutoAdd
24	583.04	262	Tl-208	242	6 of 9	97.05	1.47	
25	609.20	317	Bi-214	332	5 of 33	84.08	1.34	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
26	661.51	102	Cs-137	. . . . .	1 of 1	100.00	1.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
27	727.01	63	Bi-212	. . . . .	1 of 13	81.10	0.81	
29	795.34	15	Cs-134	. . . . .	1 of 9	46.67	0.97	Split
42	795.34	24	AcTh-228	24	7 of 36	76.51	1.27	AutoAdd
30	860.48	24	Tl-208	28	6 of 9	100.00	1.50	
31	911.11	139	AcTh-228	129	7 of 36	88.32	1.38	
32	968.96	77	AcTh-228	76	7 of 36	88.32	1.38	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
33	1120.28	53	Bi-214	68	5 of 33	89.37	1.39	
34	1172.53	28	Co-60	32	2 of 2	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.67	
35	1332.17	30	Co-60	26	2 of 2	100.00	1.50	
36	1377.67	17	Bi-214	16	5 of 33	79.86	1.30	
38	1460.82	947	K-40	. . . . .	1 of 1	100.00	1.50	
39	1728.84	21	Bi-214	10	5 of 33	75.66	1.26	
40	1764.40	57	Bi-214	49	5 of 33	79.86	1.30	
41	2614.37	95	Tl-208	103	6 of 9	100.00	1.50	

L5186-13 analyzed by emml461 on 04/11/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-13

Sample ID: SOIL/SEDI Duratek Inc

Code: 1015402

 Sampling Start: 02/13/2003 12:00:00 | Counting Start: 04/11/2003 13:11:42
 Sampling Stop: 02/13/2003 12:00:00 | Decay Time. 1.37e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 10000 Sec
 Sample Size 7.14e-001 kg | Real Time 10004 Sec
 Collection Efficiency 1.0000 | Spectrum File 1015402.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 2 (Canberra sn 9923043 det# 2)
 Efficiency File: WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[1.15E-02*En^-3.19E+00 + 2.16E+02*En^7.29E-01] 02/06/1998

 Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5186-13.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	5.35E+02 +- 2.45E+01	. . . .		*	. . . . .
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	238.63	5.33E+02 +- 2.47E+01	5.48E+01	++		. . . . .
	300.09	7.74E+02 +- 2.35E+02	7.43E+02	++		. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	1.37E+02 +- 2.54E+02	8.44E+02	+		. . . . .
Co-57	122.06	1.32E+02 +- 1.27E+01	3.72E+01	++		. . . . .
Ra-226	186.22	9.42E+02 +- 2.94E+02	9.47E+02	++		. . . . .
AcTh-228	Average:x	3.58E+02 +- 3.40E+01	. . . .		*	. . . . .
	209.28	2.63E+02 +- 1.03E+02	3.30E+02	+		. . . . .
	338.32	3.81E+02 +- 7.95E+01	2.43E+02	++		. . . . .
	463.00	2.67E+02 +- 1.17E+02	3.74E+02	+		. . . . .
	794.70	3.64E+02 +- 3.37E+02	1.12E+03	+		. . . . .
	911.07	3.84E+02 +- 5.03E+01	1.34E+02	++		. . . . .
	969.11	3.71E+02 +- 8.56E+01	2.58E+02	++		. . . . .
	93.35	I.D.	. . . .			. . . . .
Pb-214	Average:x	3.95E+02 +- 2.41E+01	. . . .		*	. . . . .
	241.98	5.98E+02 +- 1.17E+02	3.62E+02	++		. . . . .
	295.21	4.28E+02 +- 4.40E+01	1.18E+02	++		. . . . .
	351.92	3.67E+02 +- 2.97E+01	7.66E+01	++		. . . . .
Annil	511.00	3.28E+00 +- 2.46E+01	8.24E+01	+		. . . . .
Tl-208	Average:x	4.61E+02 +- 3.23E+01	. . . .		*	. . . . .
	583.14	4.78E+02 +- 4.29E+01	1.07E+02	++		. . . . .
	860.37	3.87E+02 +- 2.33E+02	7.66E+02	+		. . . . .
	2614.66	4.40E+02 +- 5.02E+01	8.56E+01	++		. . . . .

MEASURED or MDA CONCENTRATIONS

	N	Concentration					
Nuclide	ENERGY E (keV)	(pCi/kg)	MDA	Flags	Notes	MDC	
<hr/>							
	510.84	I.D.	. . . . .			
Bi-214	Average:x	3.95E+02 +- 2.80E+01	. . . . .		*	
	609.31	3.91E+02 +- 3.20E+01	8.01E+01		++		
	1120.29	3.10E+02 +- 9.31E+01	2.88E+02		++		
	1377.67	4.33E+02 +- 2.46E+02	8.03E+02		+		
	1729.59	8.61E+02 +- 2.99E+02	8.77E+02		+		
	1764.49	4.49E+02 +- 8.06E+01	2.00E+02		++		
Cs-137	661.65	7.26E+01 +- 1.36E+01	3.98E+01		++		
Bi-212	727.17	3.48E+02 +- 8.45E+01	2.53E+02		++		
Cs-134	Average:x	1.75E+01 +- 1.95E+01	. . . . .			
	795.84	1.30E+01 +- 2.34E+01	7.87E+01		+		
	604.70 N	2.78E+01 +- 3.52E+01	1.17E+02P		x	PIC	
Co-60	Average:x	2.88E+01 +- 9.36E+00	. . . . .		*	
	1173.22	2.63E+01 +- 1.47E+01	4.81E+01		+		
	1332.49	3.04E+01 +- 1.21E+01	3.82E+01		+		
K-40	1460.81	9.58E+03 +- 3.22E+02	2.95E+02		++		
Am-241	59.54 N	5.65E+01 +- 3.64E+01	1.20E+021		x	lbase	
Ce-144	133.54 N	5.43E+01 +- 6.08E+01	2.10E+02		x		
Ce-141	145.44 N	3.09E+01 +- 3.99E+01	1.37E+02		x		
Se-75	264.65 N	5.11E+00 +- 1.46E+01	4.95E+01		x		
Cr-51	320.08 N	3.81E+02 +- 2.69E+02	9.62E+02		x		
I-131	364.48 N	7.99E+02 +- 1.07E+03	3.78E+03		x		
Sb-125	427.89 N	2.82E+01 +- 2.14E+01	7.78E+01		x		
Ag-108m	433.93 N	1.99E+00 +- 7.13E+00	2.50E+01		x		
Be-7	477.59 N	1.35E+02 +- 1.33E+02	4.46E+02		x		
La-140	487.03 N	1.65E+02 +- 2.83E+02	9.72E+02		x		
Ru-103	497.08 N	3.03E+01 +- 1.93E+01	6.34E+01		x		
Ba-140	537.32 N	5.75E+02 +- 6.29E+02	2.12E+03		x		
Ru-106	621.84 N	1.27E+02 +- 8.09E+01	2.66E+02		x		
Zr-95	724.18 N	3.57E+01 +- 5.11E+01	1.82E+02L		x	LHROI	
Nb-95	765.79 N	3.40E+01 +- 2.57E+01	9.46E+01		x		
Co-58	810.76 N	2.46E+01 +- 1.24E+01	4.79E+01		x		
Mn-54	834.83 N	1.55E+01 +- 9.82E+00	3.66E+01		x		
Ag-110m	884.67 N	2.30E+01 +- 1.26E+01	4.10E+01		x		
Fe-59	1099.22 N	1.51E+01 +- 3.77E+01	1.32E+02		x		
Zn-65	1115.52 N	6.40E+01 +- 4.42E+01	1.46E+02P		x	PIC	
Sb-124	1691.02 N	4.73E+00 +- 2.37E+01	9.22E+01		x		

MEASURED TOTAL: 1.34E+04 +- 1.18E+03 pCi/kg

0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.85	94.00	52	40	65	688	0.95	Deleted
8	128.82	193.83	16	38	62	609	0.31	Deleted
9	153.45	231.11	37	32	52	454	0.89	Deleted
12	209.85	316.46	44	17	26	163	0.60	Unknown
15	270.03	407.54	36	27	43	292	1.15	Deleted
16	277.05	418.17	-7	23	39	253	0.31	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
21	462.29	698.51	33	11	15	44	0.69	Unknown
28	768.21	1161.48	5	14	23	88	0.72	Deleted
37	1407.59	2129.12	6	8	13	30	0.42	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
45	59.54	88.99	44N	29	46	422	1.08	NET< CL LBase
46	133.54	200.98	-24N	27	44	397	1.14	NET< CL
47	145.44	218.99	-20N	26	43	361	1.15	NET< CL
48	264.65	399.40	7N	20	33	196	1.23	NET< CL
49	320.08	483.29	-25N	18	30	169	1.27	NET< CL
50	364.48	550.48	-12N	16	27	135	1.30	NET< CL
51	427.89	646.44	-18N	14	23	102	1.35	NET< CL
52	433.93	655.59	-4N	14	24	105	1.35	NET< CL
53	477.59	721.66	14N	14	22	88	1.38	NET< CL
54	487.03	735.95	7N	12	19	69	1.39	NET< CL
55	497.08	751.16	20N	13	20	71	1.39	
56	537.32	812.05	13N	14	22	81	1.42	NET< CL
57	604.70	914.03	45N	57	94	203	1.47	NET< CL PIC
58	621.84	939.97	19N	12	19	61	1.48	
59	724.18	1094.85	-13N	19	32	93	1.55	NET< CL LHRoi
60	765.79	1157.82	-16N	12	21	89	1.58	NET< CL
61	810.76	1225.88	-20N	10	18	64	1.61	NET< CL
62	834.83	1262.30	-19N	12	21	82	1.62	NET< CL
63	884.67	1337.73	19N	10	16	45	1.66	
64	1099.22	1662.43	4N	10	16	48	1.80	NET< CL
65	1115.52	1687.10	31N	22	34	108	1.82	NET< CL PIC
66	1691.02	2558.05	-1N	5	8	13	2.21	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 02/13/2003 12:00:00 | Counting Start: 04/11/2003 13:11:42
Sampling Stop: 02/13/2003 12:00:00 | Decay Time. . . . . 1.37E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 10000 Sec
Sample Size . . . . . 7.14E-01 kg | Real Time . . . . . 10004 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1015402.spc
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Detector #: 2

Energy(keV)= 0.74 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 6.55E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[1.15e-02*En^-3.19e+00 + 2.16e+02*En^ 7.29e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5186-13.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	5.35E+02	2.45E+01	< 5.48E+01	2.65E+01	1.00E+00	MEAS +	YES
Th-234	1.37E+02	2.54E+02	< 8.44E+02	4.16E+02	1.00E+00	MEAS +	YES
Co-57	1.32E+02	1.27E+01	< 3.72E+01	1.82E+01	8.64E-01	MEAS +	YES
Ra-226	9.42E+02	2.94E+02	< 9.47E+02	4.63E+02	1.00E+00	MEAS +	YES
AcTh-228	3.58E+02	3.40E+01	< 1.34E+02	6.31E+01	1.00E+00	MEAS +	YES
Pb-214	3.95E+02	2.41E+01	< 7.66E+01	3.69E+01	1.00E+00	MEAS +	YES
Annul	3.28E+00	2.46E+01	< 8.24E+01	4.04E+01	8.97E-01	MEAS +	YES
Tl-208	4.61E+02	3.23E+01	< 8.56E+01	3.65E+01	1.00E+00	MEAS +	YES
Bi-214	3.95E+02	2.80E+01	< 8.01E+01	3.84E+01	1.00E+00	MEAS +	YES
Cs-137	7.26E+01	1.36E+01	< 3.98E+01	1.89E+01	9.96E-01	MEAS +	YES
Bi-212	3.48E+02	8.45E+01	< 2.53E+02	1.19E+02	1.00E+00	MEAS +	YES
Cs-134	1.75E+01	1.95E+01	< 7.87E+01	3.82E+01	9.49E-01	MEAS +	YES
Co-60	2.88E+01	9.36E+00	< 3.82E+01	1.77E+01	9.80E-01	MEAS +	YES
K-40	9.58E+03	3.22E+02	< 2.95E+02	1.34E+02	1.00E+00	MEAS +	YES
Am-241	5.65E+01	3.64E+01	< 1.20E+02	5.83E+01	1.00E+00	NET	YES
Ce-144	-5.43E+01	6.08E+01	< 2.10E+02	1.02E+02	8.70E-01	NET	YES
Ce-141	-3.09E+01	3.99E+01	< 1.37E+02	6.66E+01	2.96E-01	NET	YES
Se-75	5.11E+00	1.46E+01	< 4.95E+01	2.38E+01	7.19E-01	NET	YES
Cr-51	-3.80E+02	2.69E+02	< 9.62E+02	4.60E+02	2.40E-01	NET	YES
I-131	-7.99E+02	1.07E+03	< 3.78E+03	1.80E+03	7.28E-03	NET	YES
Sb-125	-2.82E+01	2.14E+01	< 7.78E+01	3.68E+01	9.62E-01	NET	YES
Ag-108m	-1.99E+00	7.13E+00	< 2.50E+01	1.18E+01	9.99E-01	NET	YES
Be-7	1.35E+02	1.33E+02	< 4.46E+02	2.10E+02	4.77E-01	NET	YES
La-140	1.65E+02	2.83E+02	< 9.72E+02	4.54E+02	4.53E-02	NET	YES
Ru-103	3.03E+01	1.92E+01	< 6.34E+01	2.96E+01	3.66E-01	NET	YES
Ba-140	5.75E+02	6.29E+02	< 2.12E+03	1.00E+03	4.53E-02	NET	YES
Ru-106	1.27E+02	8.09E+01	< 2.66E+02	1.24E+02	8.98E-01	NET	YES
Zr-95	-3.58E+01	5.12E+01	< 1.82E+02	8.72E+01	5.39E-01	NET	YES
Nb-95	-3.40E+01	2.57E+01	< 9.46E+01	4.45E+01	3.23E-01	NET	YES
Co-58	-2.46E+01	1.24E+01	< 4.79E+01	2.23E+01	5.72E-01	NET	YES
Mn-54	-1.55E+01	9.82E+00	< 3.66E+01	1.72E+01	8.81E-01	NET	YES
Ag-110m	2.30E+01	1.26E+01	< 4.10E+01	1.89E+01	8.54E-01	NET	YES
Fe-59	1.51E+01	3.77E+01	< 1.32E+02	6.08E+01	4.12E-01	NET	YES

L5186-13 analyzed by emm1461 on 04/11/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Zn-65	6.40E+01	4.42E+01	< 1.46E+02	7.03E+01	8.50E-01	NET	YES
Sb-124	-4.73E+00	2.37E+01	< 9.22E+01	3.97E+01	5.18E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-13

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Sample ID: SOIL/SEDI Duratek Inc

Code: 1017305

 Sampling Start: 02/13/2003 12:00:00 | Counting Start: 04/11/2003 17:36:41
 Sampling Stop: 02/13/2003 12:00:00 | Decay Time: 1.37E+003 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time: 20000 Sec
 Sample Size: 7.14E-001 kg | Real Time: 20018 Sec
 Collection Efficiency: 1.0000 | Spc. File: 1017305.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Energy(keV) = $-0.13 + 0.661 \cdot \text{Ch} + -2.03\text{E-}07 \cdot \text{Ch}^2 + 7.32\text{E-}11 \cdot \text{Ch}^3$ 04/11/2003
 FWHM(keV) = $1.06 + 0.004 \cdot \text{En} + 6.14\text{E-}04 \cdot \text{En}^2 + 0.00\text{E+}00 \cdot \text{En}^3$ 02/28/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.01	95.48	78	38	60	810	0.83	a
2	66.66	101.00	10	30	50	608	0.57	b NET< CL
3	74.67	113.12	591	62	93	1484	1.62	a Wide Pk
4	77.02	116.67	775	52	73	1060	1.07	b
5	87.10	131.91	212	46	72	1044	1.02	a
6	89.78	135.97	137	39	61	835	0.80	b
7	92.79	140.52	424	66	103	1671	1.67	c Wide Pk
8	99.85	151.19	69	42	67	916	1.10	a
9	105.41	159.61	55	30	47	550	0.59	b
10	122.01	184.71	933	64	93	1379	1.34	
11	136.66	206.86	95	51	83	1162	1.28	
12	144.24	218.33	62	48	79	1054	1.24	NET< CL
13	154.43	233.74	41	53	87	1203	0.66	NET< CL
14	185.87	281.28	368	53	82	1052	1.28	
15	209.15	316.49	177	48	76	912	1.72	
16	238.55	360.96	2041	57	57	608	1.27	a
17	241.44	365.34	377	44	64	709	1.47	b
18	269.98	408.50	105	37	59	586	1.10	
19	277.28	419.55	36	35	57	556	0.72	NET< CL
20	287.39	434.83	-15	41	68	675	0.78	NET< CL
21	295.11	446.51	587	36	43	368	1.19	a
22	299.93	453.80	133	32	49	441	1.27	b
23	327.57	495.61	95	36	56	501	0.97	
24	338.17	511.64	445	38	52	427	1.44	
25	351.83	532.30	1058	49	59	519	1.38	
26	409.08	618.89	15	34	55	449	0.63	NET< CL
27	462.72	700.03	136	31	47	321	1.65	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	501.20	758.24	13	16	25	143	0.91	a NET< CL
29	505.01	764.00	7	13	21	108	0.73	b NET< CL
30	510.70	772.61	776	43	55	394	2.36	c Wide Pk
31	523.81	792.44	-39	22	38	244	1.55	NET< CL
32	570.05	862.38	36	27	43	268	1.53	NET< CL
33	583.06	882.05	686	37	42	260	1.67	
34	609.21	921.61	923	40	42	255	1.62	
35	661.63	1000.91	258	28	38	252	1.67	
36	727.28	1100.20	194	27	38	227	1.87	
37	767.69	1161.32	64	25	39	256	2.31	Wide Pk
38	794.31	1201.60	120	25	37	200	1.77	
39	835.14	1263.36	-13	19	32	193	1.58	NET< CL
40	859.97	1300.92	85	23	35	188	1.15	
41	911.06	1378.19	471	30	35	190	2.14	
42	933.88	1412.70	63	20	30	151	2.06	
43	950.09	1437.22	10	22	35	191	0.32	NET< CL
44	964.49	1458.99	81	18	26	136	1.43	a
45	968.83	1465.56	291	25	29	155	1.64	b
46	1119.47	1693.39	104	17	22	106	1.21	a
47	1120.92	1695.59	71	15	20	88	1.10	b
48	1172.96	1774.28	74	22	34	182	1.47	
49	1237.93	1872.53	117	28	42	247	3.20	Wide Pk
50	1332.38	2015.35	93	17	23	90	2.07	
51	1377.61	2083.74	45	14	20	73	2.10	
52	1407.70	2129.22	7	14	23	87	0.68	NET< CL
53	1460.57	2209.16	2943	56	19	60	2.09	
54	1508.28	2281.29	32	13	19	59	1.98	
55	1587.89	2401.63	27	13	19	69	2.09	
56	1729.66	2615.89	38	11	15	40	1.53	
57	1764.40	2668.38	156	16	17	43	2.02	
58	1847.58	2794.08	48	11	14	32	2.33	
59	2103.61	3180.80	45	10	13	29	4.01	Wide Pk
60	2204.28	3332.80	38	10	14	34	2.29	
61	2614.84	3952.29	322	19	10	15	3.12	

L5186-13 analyzed by emm1461 on 04/11/2003

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.01	78	38	60	36	38	62	NET<CL
3	74.67	591	62	93	554	62	94	
4	77.02	775	52	73	722	53	74	
5	87.10	212	46	72	184	47	73	
7	92.79	424	66	103	269	66	105	
12	144.24	62	48	79	40	49	80	NET<CL
14	185.87	368	53	82	259	54	84	
16	238.55	2042	57	57	1959	57	60	
17	241.44	377	44	64	340	44	66	
18	269.98	105	37	59	96	38	60	
21	295.11	587	36	43	517	36	46	
24	338.17	445	38	52	435	38	53	
25	351.83	1058	49	59	929	49	63	
27	462.72	136	31	47	132	31	47	
30	510.70	776	43	55	326	44	67	
32	570.05	37	27	43	24	27	44	NET<CL
33	583.06	687	37	42	656	37	44	
34	609.21	923	40	42	829	40	46	
36	727.28	194	27	38	189	27	39	
37	767.69	64	25	40	54	26	40	
41	911.06	471	30	35	445	31	37	
42	933.88	63	20	30	55	20	31	
45	968.83	291	25	29	278	25	30	
46	1119.47	104	17	22	81	17	24	
49	1237.93	117	28	42	107	28	43	
51	1377.61	45	14	20	43	14	21	
53	1460.57	2943	56	19	2904	56	23	
57	1764.40	156	16	17	133	16	19	
60	2204.28	38	10	14	31	11	15	
61	2614.84	322	19	10	292	19	14	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0Minimum Score 0.50 | Decay Correction. ON
-----LIBRARY SEARCH RESULTS
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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.67	554	Pb-212	350	5 of 6	100.00	1.00	
			Tl-208	20	6 of 9	95.73	0.96	
			Pb-214	146	5 of 7	98.65	0.99	
			Tl-208	35	6 of 9	95.73	0.96	
4	77.02	722	Pb-212	616	5 of 6	100.00	1.50	
			Pb-214	263	5 of 7	98.65	0.99	
5	87.10	184	Cd-109	. . . . .	1 of 1	100.00	1.50	
			Pb-212	347	5 of 6	100.00	1.00	
6	89.78	137	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	92.79	117	Th-234	. . . . .	1 of 2	58.74	0.59	Split
63	92.79	152	AcTh-228	152	13 of 36	86.65	1.37	AutoAdd
8	99.85	69	AcTh-228	48	13 of 36	89.11	1.39	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
9	105.41	55	AcTh-228	78	13 of 36	93.04	1.43	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
10	122.01	933	Co-57	763	2 of 4	100.00	1.50	
			Se-75	27	2 of 5	44.05	0.44	LowScore
11	136.66	95	Co-57	. . . . .	2 of 4	100.00	1.50	
			Se-75	3331	2 of 5	55.93	0.56	
14	185.87	259	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
15	209.14	177	AcTh-228	196	13 of 36	93.04	1.43	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
16	238.55	1959	Pb-212	2413	5 of 6	100.00	1.50	
17	241.44	340	Pb-214	234	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
18	269.98	96	AcTh-228	138	13 of 36	93.04	1.43	
21	295.11	517	Pb-214	555	5 of 7	100.00	1.50	
22	299.93	133	Pb-212	132	5 of 6	100.00	1.50	
23	327.57	95	AcTh-228	108	13 of 36	93.04	1.43	
			Bi-212	4	2 of 13	59.32	1.09	
			La-140	13360	2 of 15	23.26	0.23	LowScore
24	338.17	435	AcTh-228	364	13 of 36	91.40	1.41	
25	351.83	929	Pb-214	945	5 of 7	100.00	1.50	
27	462.72	132	AcTh-228	118	13 of 36	91.40	1.41	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
30	510.70	140	Annul	. . . . .	1 of 1	100.00	1.50	Split
62	510.70	186	Tl-208	186	6 of 9	97.05	0.97	AutoAdd

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
33	583.06	656	Tl-208	706	6 of 9	97.05	1.47	
34	609.21	829	Bi-214	552	11 of 33	97.74	0.98	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
35	661.63	258	Cs-137	. . . . .	1 of 1	100.00	1.50	
36	727.28	189	Bi-212	5077	2 of 13	71.65	1.22	
			1238SEsc	. . . . .	0 of 0	. . .	0.50	
37	767.69	54	Bi-214	78	11 of 33	100.00	1.50	
			Nb-95	. . . . .	1 of 1	100.00	1.50	
			Pa-234	. . . . .	1 of 2	26.32	0.76	
38	794.31	121	AcTh-228	86	13 of 36	89.11	1.39	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
40	859.97	85	Tl-208	77	6 of 9	97.05	1.47	
41	911.06	445	AcTh-228	496	13 of 36	93.04	1.43	
42	933.88	55	Bi-214	44	11 of 33	95.40	1.45	
44	964.49	81	AcTh-228	86	13 of 36	93.04	1.43	
45	968.83	278	AcTh-228	271	13 of 36	91.40	1.41	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
46	1119.47	81	Unknown	. . . . .	. . . . .	. . .	. . .
			Bi-214	182	11 of 33	100.00	1.00	Matched
47	1120.92	71	Bi-214	182	11 of 33	100.00	1.00	
48	1172.96	75	Co-60	101	2 of 2	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.17	LowScore
49	1237.93	107	Bi-214	66	11 of 33	90.78	1.41	
50	1332.38	93	Co-60	68	2 of 2	100.00	1.50	
51	1377.61	43	Bi-214	43	11 of 33	97.74	1.48	
53	1460.57	2904	K-40	. . . . .	1 of 1	100.00	1.50	
54	1508.28	32	Bi-214	22	11 of 33	92.86	1.43	
55	1587.89	27	AcTh-228	42	13 of 36	93.04	1.43	
56	1729.66	38	Bi-214	27	11 of 33	94.24	1.44	
57	1764.40	133	Bi-214	142	11 of 33	97.74	1.48	
58	1847.58	48	Bi-214	18	11 of 33	88.13	1.38	
59	2103.61	45	2615SEsc	. . . . .	0 of 0	. . .	0.50	
60	2204.28	31	Bi-214	38	11 of 33	97.74	1.48	
61	2614.84	292	Tl-208	298	6 of 9	97.05	1.47	

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5186-13

Sample ID: SOIL/SEDI Duratek Inc

Code: 1017305

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Sampling Start:    02/13/2003 12:00:00 | Counting Start:    04/11/2003 17:36:41
Sampling Stop:     02/13/2003 12:00:00 | Decay Time. . . . . 1.37e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 20000 Sec
Sample Size . . . . . 7.14e-001 kg | Real Time . . . . . 20018 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1017305.spc
Type I | Type I & II
Cr. Level Confidence Interval:    95 % | Det. Limit Confidence Interval:    95 %
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Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[5.46E-03*En^-3.56E+00 + 1.55E+02*En^6.66E-01] 02/06/1998
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Library File: . . . . . SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: . . . . . L5186-13.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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              N
      ENERGY E   Concentration
Nuclide   (keV)   (pCi/kg      )   MDA   Flags   Notes   MDC
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Pb-212   Average:x 5.03E+02 +- 1.46E+01   . . . .   *   . . . . .
          74.81     I.D.   . . . .   . . . .   . . . . .
          77.12     I.D.   . . . .   . . . .   . . . . .
          238.63    5.03E+02 +- 1.48E+01    3.17E+01   +*   . . . . .
          300.09    5.15E+02 +- 1.23E+02    3.89E+02   +*   . . . . .
Cd-109    88.03     I.D.   . . . .   . . . .   . . . . .
Th-234    92.59     2.36E+02 +- 2.31E+02    7.63E+02   +   . . . . .
AcTh-228  Average:x 4.69E+02 +- 1.99E+01   . . . .   *   . . . . .
          99.45     6.74E+02 +- 4.09E+02    1.35E+03   +   . . . . .
          105.00    I.D.   . . . .   . . . .   . . . . .
          209.28    4.26E+02 +- 1.16E+02    3.72E+02   +*   . . . . .
          270.23    3.30E+02 +- 1.30E+02    4.22E+02   +   . . . . .
          327.64    4.13E+02 +- 1.55E+02    5.03E+02   +   . . . . .
          338.32    5.44E+02 +- 4.79E+01    1.36E+02   +*   . . . . .
          463.00    5.27E+02 +- 1.24E+02    3.88E+02   +*   . . . . .
          794.70    6.58E+02 +- 1.36E+02    4.16E+02   +*   . . . . .
          911.07    4.42E+02 +- 3.04E+01    7.52E+01   +*   . . . . .
          964.60    4.46E+02 +- 1.00E+02    3.03E+02   +*   . . . . .
          969.11    4.80E+02 +- 4.26E+01    1.08E+02   +*   . . . . .
          1588.00   3.07E+02 +- 1.46E+02    4.70E+02   +   . . . . .
          93.35     I.D.   . . . .   . . . .   . . . . .
Co-57     Average:x 1.14E+02 +- 7.80E+00   . . . .   *   . . . . .
          122.06    1.14E+02 +- 7.89E+00    2.32E+01   +*   . . . . .
          136.48    9.35E+01 +- 5.03E+01    1.65E+02   +   . . . . .
Ra-226    186.22    7.88E+02 +- 1.63E+02    5.20E+02   +*   . . . . .
Pb-214    Average:x 3.68E+02 +- 1.48E+01   . . . .   *   . . . . .
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MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY	E					
	(keV)						
Annil Tl-208	241.98		5.24E+02 +- 6.80E+01	2.08E+02		++	. . . . .
	295.21		3.52E+02 +- 2.46E+01	6.45E+01		++	. . . . .
	351.92		3.66E+02 +- 1.93E+01	5.07E+01		++	. . . . .
	511.00		2.92E+01 +- 1.61E+01	5.31E+01		+	. . . . .
	Average:x		4.48E+02 +- 1.88E+01	. . . . .		*	. . . . .
	583.14		4.43E+02 +- 2.49E+01	6.08E+01		++	. . . . .
	860.37		5.00E+02 +- 1.36E+02	4.27E+02		++	. . . . .
	2614.66		4.52E+02 +- 2.95E+01	4.69E+01		++	. . . . .
Bi-214	510.84		I.D.	. . . . .			. . . . .
	Average:x		3.30E+02 +- 1.42E+01	. . . . .		*	. . . . .
	609.31		3.77E+02 +- 1.82E+01	4.27E+01		++	. . . . .
	768.36		2.63E+02 +- 1.25E+02	4.08E+02		+	. . . . .
	934.06		4.78E+02 +- 1.77E+02	5.66E+02		+	. . . . .
	1120.29		1.49E+02 +- 3.06E+01	8.80E+01		++	. . . . .
	1238.11		6.09E+02 +- 1.58E+02	4.99E+02		++	. . . . .
	1377.67		3.75E+02 +- 1.27E+02	3.95E+02		+	. . . . .
	1509.23		5.58E+02 +- 2.20E+02	6.96E+02		+	. . . . .
	1729.59		5.45E+02 +- 1.59E+02	4.74E+02		++	. . . . .
	1764.49		3.61E+02 +- 4.42E+01	1.10E+02		++	. . . . .
	1847.42		1.01E+03 +- 2.36E+02	6.67E+02		++	. . . . .
	2204.22		3.05E+02 +- 1.06E+02	3.25E+02		+	. . . . .
	661.65		6.76E+01 +- 7.39E+00	2.07E+01		++	. . . . .
Cs-137	661.65		6.76E+01 +- 7.39E+00	2.07E+01		++	. . . . .
Bi-212	727.17		3.79E+02 +- 5.49E+01	1.62E+02		++	. . . . .
Co-60	Average:x		3.01E+01 +- 4.71E+00	. . . . .		*	. . . . .
	1173.22		2.48E+01 +- 7.47E+00	2.36E+01		++	. . . . .
	1332.49		3.36E+01 +- 6.08E+00	1.74E+01		++	. . . . .
K-40	1460.81		1.03E+04 +- 1.96E+02	1.69E+02		++	. . . . .
Am-241	59.54	N	4.04E+01 +- 3.05E+01	1.01E+021		x lbase	. . . . .
Ce-144	133.54	N	6.70E+00 +- 6.00E+01	2.00E+02L		x LHROI	. . . . .
Ce-141	145.44	N	5.49E+01 +- 2.76E+01	9.04E+01		x	. . . . .
Se-75	264.65	N	1.99E+00 +- 8.81E+00	2.99E+01		x	. . . . .
Cr-51	320.08	N	1.18E+01 +- 1.60E+02	5.41E+02		x	. . . . .
I-131	364.48	N	7.76E+01 +- 6.35E+02	2.16E+03		x	. . . . .
Sb-125	427.89	N	3.54E+00 +- 1.31E+01	4.49E+01		x	. . . . .
Ag-108m	433.93	N	8.73E-01 +- 4.63E+00	1.58E+01		x	. . . . .
Be-7	477.59	N	1.59E+02 +- 8.81E+01	3.10E+02		x	. . . . .
La-140	487.03	N	3.34E+02 +- 2.02E+02	6.65E+02		x	. . . . .
Ru-103	497.08	N	4.92E+00 +- 1.31E+01	4.49E+01		x	. . . . .
Ba-140	537.32	N	2.37E+02 +- 3.86E+02	1.33E+03		x	. . . . .
Cs-134	604.70	N	5.39E+00 +- 5.16E+00	1.80E+011		x lbase	. . . . .
Ru-106	621.84	N	2.51E+01 +- 4.56E+01	1.55E+02		x	. . . . .
Zr-95	724.18	N	4.95E+03 +- 1.92E+03	6.31E+03P		x PIC	. . . . .
Nb-95	765.79	N	2.21E+01 +- 2.35E+01	8.07E+01P		x PIC	. . . . .
Co-58	810.76	N	1.80E+00 +- 8.08E+00	2.76E+01		x	. . . . .
Mn-54	834.83	N	1.18E+00 +- 5.59E+00	1.91E+01		x	. . . . .
Ag-110m	884.67	N	3.92E+00 +- 7.63E+00	2.67E+01		x	. . . . .
Fe-59	1099.22	N	8.07E+00 +- 2.33E+01	8.10E+01		x	. . . . .
Zn-65	1115.52	N	1.28E+00 +- 1.98E+01	6.72E+01L		x LHROI	. . . . .
Sb-124	1691.02	N	6.56E+00 +- 1.27E+01	4.76E+01		x	. . . . .

MEASURED TOTAL: 1.40E+04 +- 7.64E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.01	95.48	36	38	62	810	0.83	Deleted
2	66.66	101.00	10	30	50	608	0.57	Deleted
12	144.24	218.33	40	49	80	1054	1.24	Deleted
13	154.43	233.74	41	53	87	1203	0.66	Deleted
19	277.28	419.55	36	35	57	557	0.72	Deleted
20	287.39	434.83	-15	41	68	675	0.78	Deleted
26	409.08	618.89	16	34	55	449	0.63	Deleted
28	501.20	758.24	13	16	25	143	0.91	Deleted
29	505.01	764.00	7	13	21	108	0.73	Deleted
31	523.81	792.44	-39	22	38	244	1.55	Deleted
32	570.05	862.38	24	27	44	269	1.53	Deleted
39	835.14	1263.36	-13	19	32	193	1.58	Deleted
43	950.09	1437.22	10	22	35	191	0.32	Deleted
46	1119.47	1693.39	81	17	24	106	1.21	Unknown
52	1407.70	2129.22	7	14	23	87	0.68	Deleted
59	2103.61	3180.80	45	10	13	29	4.01	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
64	59.54	90.23	52N	39	63	804	1.13	NET< CL LBase
65	133.54	202.15	7N	63	103	977	1.19	NET< CL LHRoi
66	145.44	220.14	86N	43	69	892	1.20	
67	264.65	400.45	-7N	31	51	484	1.28	NET< CL
68	320.09	484.29	-2N	27	45	369	1.32	NET< CL
69	364.49	551.45	3N	25	40	300	1.36	NET< CL
70	427.91	647.38	-6N	22	37	248	1.40	NET< CL
71	433.95	656.51	-5N	25	41	285	1.41	NET< CL
72	477.62	722.56	-44N	24	42	294	1.44	NET< CL
73	487.06	736.85	38N	23	36	221	1.44	
74	497.11	752.05	-9N	23	38	250	1.45	NET< CL
75	537.36	812.93	-14N	22	37	236	1.48	NET< CL
76	604.76	914.88	-24N	23	38	251	1.52	NET< CL LBase
77	621.90	940.81	10N	19	31	159	1.54	NET< CL
78	724.14	1095.46	-4928N	1907	3139	336	1.61	NET< CL PIC
79	765.77	1158.43	-29N	31	52	340	1.63	NET< CL PIC
80	810.76	1226.48	4N	18	29	160	1.66	NET< CL
81	834.85	1262.91	4N	19	31	178	1.68	NET< CL
82	884.71	1338.34	-9N	18	29	158	1.71	NET< CL
83	1099.16	1662.68	-6N	17	29	144	1.86	NET< CL
84	1115.48	1687.35	-2N	27	45	164	1.87	NET< CL LHRoi
85	1691.06	2557.55	-4N	8	13	32	2.25	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 02/13/2003 12:00:00 | Counting Start: 04/11/2003 17:36:41
Sampling Stop: 02/13/2003 12:00:00 | Decay Time. . . . . 1.37E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 20000 Sec
Sample Size . . . . . 7.14E-01 kg | Real Time . . . . . 20018 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1017305.spc
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Detector #: 5

Energy(keV)= -0.13 + 0.661*Ch + -2.03E-07*Ch^2 + -2.03E-07*Ch^3 04/11/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File: . . . WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5186-13.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	5.03E+02	1.46E+01	< 3.17E+01	1.55E+01	1.00E+00	MEAS +	YES
Th-234	2.36E+02	2.31E+02	< 7.63E+02	3.79E+02	1.00E+00	MEAS +	YES
AcTh-228	4.69E+02	1.99E+01	< 7.52E+01	3.63E+01	1.00E+00	MEAS +	YES
Co-57	1.14E+02	7.80E+00	< 2.32E+01	1.14E+01	8.63E-01	MEAS +	YES
Ra-226	7.88E+02	1.63E+02	< 5.20E+02	2.56E+02	1.00E+00	MEAS +	YES
Pb-214	3.68E+02	1.48E+01	< 5.07E+01	2.48E+01	1.00E+00	MEAS +	YES
Annil	2.92E+01	1.61E+01	< 5.31E+01	2.62E+01	8.97E-01	MEAS +	YES
Tl-208	4.48E+02	1.89E+01	< 4.70E+01	2.14E+01	1.00E+00	MEAS +	YES
Bi-214	3.30E+02	1.42E+01	< 4.27E+01	2.07E+01	1.00E+00	MEAS +	YES
Cs-137	6.77E+01	7.39E+00	< 2.07E+01	9.98E+00	9.96E-01	MEAS +	YES
Bi-212	3.79E+02	5.49E+01	< 1.62E+02	7.81E+01	1.00E+00	MEAS +	YES
Co-60	3.01E+01	4.71E+00	< 1.74E+01	8.19E+00	9.80E-01	MEAS +	YES
K-40	1.02E+04	1.96E+02	< 1.68E+02	7.95E+01	1.00E+00	MEAS +	YES
Am-241	4.04E+01	3.05E+01	< 1.01E+02	4.93E+01	1.00E+00	NET	YES
Ce-144	6.70E+00	6.00E+01	< 2.00E+02	9.85E+01	8.69E-01	NET	YES
Ce-141	5.49E+01	2.76E+01	< 9.04E+01	4.43E+01	2.94E-01	NET	YES
Se-75	-1.99E+00	8.81E+00	< 2.99E+01	1.46E+01	7.18E-01	NET	YES
Cr-51	-1.18E+01	1.60E+02	< 5.42E+02	2.63E+02	2.38E-01	NET	YES
I-131	7.76E+01	6.36E+02	< 2.16E+03	1.04E+03	7.13E-03	NET	YES
Sb-125	-3.54E+00	1.31E+01	< 4.49E+01	2.16E+01	9.61E-01	NET	YES
Ag-108m	-8.73E-01	4.63E+00	< 1.58E+01	7.64E+00	9.99E-01	NET	YES
Be-7	-1.59E+02	8.81E+01	< 3.10E+02	1.50E+02	4.75E-01	NET	YES
La-140	3.34E+02	2.02E+02	< 6.65E+02	3.20E+02	4.47E-02	NET	YES
Ru-103	-4.92E+00	1.31E+01	< 4.50E+01	2.17E+01	3.64E-01	NET	YES
Ba-140	-2.37E+02	3.86E+02	< 1.34E+03	6.44E+02	4.47E-02	NET	YES
Cs-134	-5.39E+00	5.16E+00	< 1.80E+01	8.68E+00	9.49E-01	NET	YES
Ru-106	2.51E+01	4.56E+01	< 1.54E+02	7.40E+01	8.98E-01	NET	YES
Zr-95	-4.95E+03	1.92E+03	< 6.32E+03	3.16E+03	5.38E-01	NET	YES
Nb-95	-2.21E+01	2.35E+01	< 8.07E+01	3.93E+01	3.22E-01	NET	YES
Co-58	1.80E+00	8.08E+00	< 2.76E+01	1.32E+01	5.70E-01	NET	YES
Mn-54	1.18E+00	5.59E+00	< 1.91E+01	9.15E+00	8.81E-01	NET	YES
Ag-110m	-3.92E+00	7.63E+00	< 2.67E+01	1.27E+01	8.53E-01	NET	YES
Fe-59	-8.06E+00	2.33E+01	< 8.10E+01	3.87E+01	4.10E-01	NET	YES

L5186-13 analyzed by emm1461 on 04/11/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Zn-65	-1.28E+00	1.98E+01	< 6.72E+01	3.26E+01	8.50E-01	NET	YES
Sb-124	-6.56E+00	1.27E+01	< 4.76E+01	2.16E+01	5.17E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-14
Client: Duratek Inc
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-259
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-06-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

Count by Date: _____
(if required)
Delay Date: _____
(if required)

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 752.3 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 04/10/03 1059

Det No.: 3

Spectrum No.: 1014103

Counted by: gh

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5186-14	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2600-259	Matrix	: S001 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 02/06/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	752.3		
Sample Weight-Dry	g			
Aliquot Weight	g	752.3		
FINAL WEIGHT	kg	.7523		
Container			WT5S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-14 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1014103

 Sampling Start: 02/06/2003 12:00:00 ✓ | Counting Start: 04/11/2003 10:58:43
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.53E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 11069 Sec
 Sample Size 7.52E-001 kg | Real Time 11074 Sec
 Collection Efficiency 1.0000 | Spc. File 1014103.spc

Detector #: 3 (Canberra sn 10923049 det#3)
 Energy(keV)= 0.42 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003
 FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 0.00E+00*En^3 02/18/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.21	94.93	13	27	43	379	0.30	NET< CL
2	74.68	112.26	200	34	51	486	1.20	a
3	76.94	115.68	244	25	31	243	0.68	b
4	80.46	121.00	15	15	24	162	0.46	c NET< CL
5	87.09	131.02	86	27	41	346	1.09	a
6	89.82	135.15	47	23	35	277	0.88	b
7	92.58	139.32	187	32	47	415	1.28	c
8	127.83	192.61	1	26	44	350	0.03	NET< CL
9	185.72	280.14	106	22	33	213	1.14	
10	238.41	359.80	532	28	27	142	1.11	a
11	241.28	364.14	118	25	38	227	1.78	b Wide Pk
12	269.85	407.32	14	18	28	150	0.43	NET< CL
13	294.91	445.21	170	22	29	144	1.49	a
14	299.83	452.65	34	20	32	164	1.76	b Wide Pk
15	338.20	510.65	70	21	31	151	1.03	
16	351.69	531.05	297	24	27	125	1.28	
17	462.71	698.88	21	15	23	89	0.69	NET< CL
18	510.46	771.08	141	22	31	132	2.08	a Wide Pk
19	511.91	773.27	30	11	15	53	0.76	b
20	583.21	881.05	175	18	19	54	1.53	
21	609.11	920.22	192	21	25	94	1.42	
22	661.78	999.85	18	13	21	74	0.70	NET< CL
23	727.10	1098.58	15	13	20	65	0.71	NET< CL
24	911.00	1376.61	68	15	20	65	1.34	
25	934.02	1411.41	19	12	19	56	1.06	NET< CL
26	968.91	1464.16	56	14	19	58	1.58	
27	1120.10	1692.72	20	13	20	70	1.13	
28	1237.83	1870.70	16	15	23	84	0.97	NET< CL

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
29	1460.78	2207.76	1024	33	10	18	2.08	
30	1764.59	2667.05	42	8	6	6	2.46	
31	2614.46	3951.88	56	8	3	2	2.89	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY03.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.21	13	27	43	-35	27	45	NET<CL
2	74.68	200	34	51	167	34	52	
3	76.94	244	25	31	205	25	33	
5	87.09	86	27	41	64	27	42	
7	92.58	187	32	47	88	32	50	
9	185.72	106	22	33	55	23	35	
10	238.41	532	28	27	490	28	29	
11	241.28	118	25	38	101	26	39	
13	294.91	170	22	29	138	22	31	
15	338.20	70	21	31	60	21	32	
16	351.69	297	24	27	245	24	30	
17	462.71	21	15	23	21	15	23	NET<CL
18	510.46	141	22	31	-2	22	37	NET<CL
20	583.21	175	18	19	161	18	20	
21	609.11	193	21	25	151	21	28	
23	727.10	15	13	20	13	13	21	NET<CL
24	911.00	68	15	20	60	15	21	
25	934.02	19	12	19	18	12	19	NET<CL
26	968.91	57	14	19	54	14	19	
27	1120.10	20	13	20	12	13	21	NET<CL
28	1237.83	16	15	23	14	15	23	NET<CL
29	1460.78	1024	33	10	1012	33	12	
30	1764.59	42	8	6	35	8	8	
31	2614.46	56	8	3	46	8	6	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.68	167	Pb-212	123	5 of	6	100.00	1.50
			Tl-208	8	5 of	9	90.39	0.90
			Pb-214	61	5 of	7	100.00	1.00
			Tl-208	13	5 of	9	90.39	0.90
3	76.94	205	Pb-212	220	5 of	6	100.00	1.50
			Tl-208	13	5 of	9	90.39	0.90
			Pb-214	106	5 of	7	100.00	1.00
5	87.09	64	Pb-212	112	5 of	6	100.00	1.50
			Cd-109	. . . . .	1 of	1	100.00	1.50
6	89.82	47	Cd-109	. . . . .	1 of	1	100.00	1.50
7	92.58	54	Th-234	. . . . .	1 of	2	58.74	1.09 Split
32	92.58	34	AcTh-228	34	4 of	36	61.35	1.11 AutoAdd
9	185.72	55	U-235	. . . . .	1 of	3	100.00	1.50
			Ra-226	. . . . .	1 of	1	100.00	1.50
10	238.41	490	Pb-212	450	5 of	6	100.00	1.50
11	241.28	101	Pb-214	68	5 of	7	100.00	1.50
			La-140	. . . . .	1 of	15	0.40	0.00 LowScore
13	294.91	138	Pb-214	174	5 of	7	100.00	1.50
14	299.83	34	Pb-212	31	5 of	6	100.00	1.50
15	338.20	60	AcTh-228	68	4 of	36	93.08	1.43
16	351.69	245	Pb-214	327	5 of	7	100.00	1.50
19	511.91	30	Tl-208	43	5 of	9	100.00	1.50
			Annul	. . . . .	1 of	1	100.00	1.50
20	583.21	161	Tl-208	127	5 of	9	94.42	1.44
21	609.11	151	Bi-214	246	2 of	33	80.44	1.30
			Ru-103	. . . . .	1 of	2	5.92	0.06 LowScore
24	911.00	60	AcTh-228	85	4 of	36	93.08	1.43
26	968.91	54	AcTh-228	37	4 of	36	72.02	1.22
			Sb-124	. . . . .	1 of	13	1.04	0.01 LowScore
29	1460.78	1012	K-40	. . . . .	1 of	1	100.00	1.50
30	1764.59	35	Bi-214	21	2 of	33	65.85	1.16
31	2614.46	46	Tl-208	52	5 of	9	100.00	1.50

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-14

Sample ID: SOIL/SEDI Duratek Inc

Code: 1014103

 Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 10:58:43
 Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.53e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 11069 Sec
 Sample Size 7.52e-001 kg | Real Time 11074 Sec
 Collection Efficiency 1.0000 | Spectrum File 1014103.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Canberra sn 10923049 det#3)
 Efficiency File: WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[3.20E-02*En^-2.77E+00 + 2.47E+02*En^8.30E-01] 04/30/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5186-14.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

		N					
	ENERGY	E	Concentration				
Nuclide	(keV)	(pCi/kg)	MDA	Flags	Notes	MDC

Pb-212	Average:x	2.75E+02	+- 1.58E+01	. . . .		*	. . . . .
	74.81	I.D.	. . . .	. . . .			. . . . .
	77.12	I.D.	. . . .	. . . .			. . . . .
	87.30	I.D.	. . . .	. . . .			. . . . .
	238.63	2.75E+02	+- 1.58E+01	3.39E+01	+	*	. . . . .
	300.09	3.01E+02	+- 1.79E+02	5.87E+02	+		. . . . .
Cd-109	88.03	I.D.	. . . .	. . . .			. . . . .
Th-234	92.59	1.87E+02	+- 1.93E+02	6.40E+02	+		. . . . .
U-235	185.72	2.11E+01	+- 8.76E+00	2.83E+01	+		. . . . .
Pb-214	Average:x	2.25E+02	+- 1.80E+01	. . . .		*	. . . . .
	241.98	3.41E+02	+- 8.61E+01	2.70E+02	+	*	. . . . .
	295.21	2.12E+02	+- 3.39E+01	9.87E+01	+	*	. . . . .
	351.92	2.23E+02	+- 2.19E+01	5.70E+01	+	*	. . . . .
AcTh-228	Average:x	1.83E+02	+- 2.93E+01	. . . .		*	. . . . .
	338.32	1.73E+02	+- 5.98E+01	1.90E+02	+		. . . . .
	911.07	1.60E+02	+- 3.94E+01	1.18E+02	+	*	. . . . .
	969.11	2.55E+02	+- 6.45E+01	1.92E+02	+	*	. . . . .
	93.35	I.D.	. . . .	. . . .			. . . . .
Tl-208	Average:x	2.57E+02	+- 2.37E+01	. . . .		*	. . . . .
	510.84	I.D.	. . . .	. . . .			. . . . .
	583.14	2.73E+02	+- 3.01E+01	7.39E+01	+	*	. . . . .
	2614.66	2.29E+02	+- 3.86E+01	7.51E+01	+	*	. . . . .
Bi-214	Average:x	1.88E+02	+- 2.24E+01	. . . .		*	. . . . .
	609.31	1.73E+02	+- 2.40E+01	6.69E+01	+	*	. . . . .
	1764.49	2.83E+02	+- 6.18E+01	1.50E+02	+	*	. . . . .
K-40	1460.81	1.04E+04	+- 3.36E+02	2.75E+02	+	*	. . . . .
Am-241	59.54 N	1.25E+00	+- 1.98E+01	6.75E+01	x		. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
Co-57	122.06	N-6.04E+00	+-	4.46E+00	1.59E+01		x	. . . . .
Ce-144	133.54	N 1.48E+01	+-	3.70E+01	1.26E+02		x	. . . . .
Ce-141	145.44	N-3.08E+01	+-	3.26E+01	1.14E+02		x	. . . . .
Ra-226	186.22	N 1.11E+03	+-	2.39E+02	7.01E+02R		x*	RHROI
Se-75	264.65	N 6.21E+00	+-	9.81E+00	3.34E+01		x	. . . . .
Cr-51	320.08	N 1.58E+01	+-	2.04E+02	7.12E+02		x	. . . . .
I-131	364.48	N 1.62E+03	+-	1.40E+03	4.70E+03		x	. . . . .
Sb-125	427.89	N-2.83E+00	+-	1.94E+01	6.80E+01		x	. . . . .
Ag-108m	433.93	N-5.37E+00	+-	5.52E+00	2.01E+01		x	. . . . .
Be-7	477.59	N-4.79E+01	+-	1.15E+02	4.12E+02		x	. . . . .
La-140	487.03	N 6.23E+01	+-	3.71E+02	1.30E+03		x	. . . . .
Ru-103	497.08	N 4.68E+00	+-	1.92E+01	6.66E+01		x	. . . . .
Ba-140	537.32	N 6.15E+01	+-	6.54E+02	2.31E+03		x	. . . . .
Cs-134	604.70	N-3.06E+01	+-	3.42E+01	1.15E+02P		x	PIC
Ru-106	621.84	N 1.87E+01	+-	5.87E+01	2.07E+02		x	. . . . .
Cs-137	661.65	N 2.35E+01	+-	7.86E+00	2.41E+01		x	Y.
Zr-95	724.18	N-7.53E+01	+-	3.47E+01	1.31E+02		x	. . . . .
Nb-95	765.79	N-7.22E+00	+-	2.80E+01	9.94E+01		x	. . . . .
Co-58	810.76	N-5.28E+00	+-	1.20E+01	4.38E+01		x	. . . . .
Mn-54	834.83	N 3.31E+00	+-	7.65E+00	2.68E+01		x	. . . . .
Ag-110m	884.67	N 1.79E+00	+-	1.11E+01	3.94E+01		x	. . . . .
Fe-59	1099.22	N 7.88E+01	+-	3.91E+01	1.25E+02		x	. . . . .
Zn-65	1115.52	N-6.63E+01	+-	2.23E+01	8.86E+01		x	. . . . .
Co-60	1332.49	N-3.51E+00	+-	8.14E+00	3.03E+01		x	Y.
Sb-124	1691.02	N-2.11E+01	+-	2.36E+01	9.94E+01		x	. . . . .

MEASURED TOTAL: 1.29E+04 +- 8.86E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.21	94.93	-35	27	45	379	0.30	Deleted
4	80.46	121.00	15	15	24	162	0.46	Deleted
8	127.83	192.61	1	26	44	350	0.03	Deleted
12	269.85	407.32	14	18	28	150	0.43	Deleted
17	462.71	698.88	21	15	23	89	0.69	Deleted
18	510.46	771.08	-2	22	37	132	2.08	Deleted
22	661.78	999.85	18	13	21	74	0.70	Deleted
23	727.10	1098.58	13	13	21	65	0.71	Deleted
25	934.02	1411.41	18	12	19	56	1.06	Deleted
27	1120.10	1692.72	12	13	21	70	1.13	Deleted
28	1237.83	1870.70	14	15	23	84	0.97	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
33	59.54	89.38	1N	21	35	267	0.90	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
34	122.06	183.90	-25N	18	31	220	0.95	NET< CL
35	133.54	201.25	8N	19	31	215	0.96	NET< CL
36	145.44	219.24	-21N	22	37	267	0.97	NET< CL
37	186.22	280.89	174N	37	53	264	1.01	RHRoi
38	264.65	399.46	10N	15	24	118	1.07	NET< CL
39	320.08	483.26	1N	13	21	90	1.12	NET< CL
40	364.48	550.38	15N	13	21	86	1.16	NET< CL
41	427.89	646.25	-2N	14	23	95	1.21	NET< CL
42	433.93	655.38	-12N	12	21	82	1.21	NET< CL
43	477.59	721.38	-5N	12	20	75	1.25	NET< CL
44	487.03	735.65	2N	12	19	70	1.26	NET< CL
45	497.08	750.85	3N	12	20	74	1.26	NET< CL
46	537.32	811.68	1N	11	17	56	1.30	NET< CL
47	604.70	913.55	-53N	60	99	140	1.35	NET< CL PIC
48	621.84	939.46	3N	9	15	43	1.37	NET< CL
49	661.65	999.64	35N	12	17	51	1.40	
50	724.18	1094.17	-27N	12	22	83	1.45	NET< CL
51	765.79	1157.08	-3N	12	20	71	1.48	NET< CL
52	810.76	1225.07	-4N	9	16	43	1.52	NET< CL
53	834.83	1261.45	4N	10	15	41	1.54	NET< CL
54	884.67	1336.80	2N	9	15	46	1.58	NET< CL
55	1099.22	1661.16	19N	9	14	35	1.75	
56	1115.52	1685.80	-32N	11	20	74	1.77	NET< CL
57	1332.49	2013.81	-3N	8	13	30	1.94	NET< CL
58	1691.02	2555.84	-4N	4	8	12	2.23	NET< CL

c:\seeker\Results\L5186-14.RES Analysis Results Saved.

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/11/2003 10:58:43
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.53E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 11069 Sec
Sample Size 7.52E-01 kg | Real Time 11074 Sec
Collection Efficiency 1.0000 | Spectrum File 1014103.spc

Detector #: 3

Energy(keV)= 0.42 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 7.91E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[3.20e-02*En^-2.77e+00 + 2.47e+02*En^ 8.30e-01] 04/30/1998

Library File: SOILA.LIB LSF File: L5186-14.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	2.75E+02	1.58E+01	< 3.39E+01	1.62E+01	9.99E-01	MEAS +	YES
Th-234	1.87E+02	1.93E+02	< 6.40E+02	3.15E+02	9.99E-01	MEAS +	YES
U-235	2.11E+01	8.76E+00	< 2.83E+01	1.36E+01	1.00E+00	MEAS +	YES
Pb-214	2.25E+02	1.80E+01	< 5.70E+01	2.73E+01	9.99E-01	MEAS +	YES
AcTh-228	1.83E+02	2.93E+01	< 1.18E+02	5.52E+01	1.00E+00	MEAS +	YES
Tl-208	2.56E+02	2.37E+01	< 7.39E+01	3.08E+01	1.00E+00	MEAS +	YES
Bi-214	1.88E+02	2.24E+01	< 6.69E+01	3.19E+01	9.99E-01	MEAS +	YES
K-40	1.04E+04	3.36E+02	< 2.75E+02	1.24E+02	1.00E+00	MEAS +	YES
Am-241	1.25E+00	1.98E+01	< 6.75E+01	3.25E+01	1.00E+00	NET	YES
Co-57	-6.04E+00	4.46E+00	< 1.59E+01	7.61E+00	8.49E-01	NET	YES
Ce-144	1.48E+01	3.70E+01	< 1.26E+02	6.02E+01	8.55E-01	NET	YES
Ce-141	-3.08E+01	3.26E+01	< 1.14E+02	5.48E+01	2.55E-01	NET	YES
Ra-226	1.11E+03	2.40E+02	< 7.01E+02	3.42E+02	1.00E+00	NET	YES
Se-75	6.21E+00	9.81E+00	< 3.33E+01	1.58E+01	6.91E-01	NET	YES
Cr-51	1.58E+01	2.04E+02	< 7.12E+02	3.35E+02	2.02E-01	NET	YES
I-131	1.62E+03	1.40E+03	< 4.70E+03	2.21E+03	4.01E-03	NET	YES
Sb-125	-2.83E+00	1.94E+01	< 6.80E+01	3.21E+01	9.57E-01	NET	YES
Ag-108m	-5.37E+00	5.52E+00	< 2.01E+01	9.43E+00	9.99E-01	NET	YES
Be-7	-4.78E+01	1.15E+02	< 4.12E+02	1.93E+02	4.36E-01	NET	YES
La-140	6.23E+01	3.71E+02	< 1.30E+03	6.06E+02	3.12E-02	NET	YES
Ru-103	4.68E+00	1.92E+01	< 6.66E+01	3.12E+01	3.24E-01	NET	YES
Ba-140	6.15E+01	6.54E+02	< 2.31E+03	1.07E+03	3.12E-02	NET	YES
Cs-134	-3.05E+01	3.42E+01	< 1.15E+02	5.67E+01	9.43E-01	NET	YES
Ru-106	1.87E+01	5.87E+01	< 2.07E+02	9.49E+01	8.87E-01	NET	YES
Cs-137	2.35E+01	7.86E+00	< 2.41E+01	1.11E+01	9.96E-01	NET	YES
Zr-95	-7.53E+01	3.47E+01	< 1.31E+02	6.18E+01	5.00E-01	NET	YES
Nb-95	-7.22E+00	2.80E+01	< 9.94E+01	4.66E+01	2.82E-01	NET	YES
Co-58	-5.28E+00	1.20E+01	< 4.38E+01	2.02E+01	5.34E-01	NET	YES
Mn-54	3.31E+00	7.65E+00	< 2.68E+01	1.23E+01	8.68E-01	NET	YES
Ag-110m	1.79E+00	1.11E+01	< 3.94E+01	1.81E+01	8.37E-01	NET	YES
Fe-59	7.88E+01	3.91E+01	< 1.25E+02	5.70E+01	3.70E-01	NET	YES
Zn-65	-6.63E+01	2.23E+01	< 8.86E+01	4.15E+01	8.34E-01	NET	YES
Co-60	-3.51E+00	8.14E+00	< 3.03E+01	1.38E+01	9.77E-01	NET	YES
Sb-124	-2.11E+01	2.36E+01	< 9.94E+01	4.26E+01	4.79E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
=====							

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-15 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-278
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-13-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 731.1 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/11/03 1058 Det No.: 2 Spectrum No.: 1014102
Counted by: gh
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5186-15	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2600-278	Matrix	: SO01 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 02/13/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	731.1		
Sample Weight-Dry	g			
Aliquot Weight	g	731.1		
FINAL WEIGHT	kg	.7311		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5186-15 analyzed by emm1461 on 04/11/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-15 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1014102

 Sampling Start: 02/13/2003 12:00:00 | Counting Start: 04/11/2003 10:58:17
 Sampling Stop: 02/13/2003 12:00:00 | Decay Time: 1.37E+003 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time 6000 Sec
 Sample Size 7.31E-001 kg | Real Time 6002 Sec
 Collection Efficiency 1.0000 | Spc. File 1014102.spc

Detector #: 2 (Canberra sn 9923043 det# 2)

Energy(keV)= 0.74 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.60 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.89	94.07	35	23	36	246	0.70	NET< CL
2	74.78	112.06	99	23	35	243	0.98	a
3	76.92	115.30	158	22	30	195	0.93	b
4	92.62	139.06	78	27	43	310	1.06	
5	185.85	280.14	39	24	38	233	0.64	
6	238.42	359.70	271	27	35	210	1.03	
7	295.07	445.44	71	19	28	125	1.12	
8	314.17	474.34	29	14	22	83	1.19	
9	338.08	510.52	75	17	24	89	1.42	
10	351.71	531.16	174	19	23	83	1.38	
11	510.90	772.07	120	17	22	69	1.85	
12	582.84	880.95	96	15	19	56	1.42	
13	609.16	920.77	148	16	17	42	1.43	
14	661.52	1000.02	312	20	16	38	1.60	
15	911.00	1377.57	62	11	14	30	1.60	
16	1460.72	2209.52	198	15	9	13	1.76	
17	1764.43	2669.15	25	6	7	7	1.48	
18	2614.60	3955.79	49	8	7	8	3.58	

L5186-15 analyzed by emml461 on 04/11/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.89	35	23	36	1	23	38	NET<CL
2	74.78	99	23	35	74	23	36	
3	76.92	158	22	30	128	22	31	
4	92.62	78	27	43	-8	28	45	NET<CL
5	185.85	39	24	38	3	24	40	NET<CL
6	238.42	271	27	35	242	27	36	
7	295.07	71	19	28	33	19	30	
9	338.08	75	17	24	70	17	24	
10	351.71	174	19	23	111	19	27	
11	510.90	120	17	22	8	17	28	NET<CL
12	582.84	96	15	19	84	15	20	
13	609.16	148	16	17	101	16	21	
15	911.00	62	11	14	55	11	14	
16	1460.72	198	15	9	186	15	11	
17	1764.43	25	6	7	18	7	8	
18	2614.60	49	8	7	41	8	8	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.45 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.78	74	Pb-214	21	4 of 7	90.71	1.41	
			Tl-208	4	4 of 9	81.13	1.31	
			Pb-212	61	3 of 6	90.16	1.40	
			Tl-208	7	4 of 9	81.13	1.31	
3	76.92	128	Pb-212	104	3 of 6	90.16	1.40	
			Tl-208	7	4 of 9	81.13	0.81	
			Pb-214	39	4 of 7	90.71	0.91	
6	238.42	242	Pb-212	306	3 of 6	90.16	1.40	
7	295.07	33	Pb-214	69	4 of 7	100.00	1.50	
8	314.17	29	Unknown					
			Np-239		0 of 0		0.00	Decay
9	338.08	70	AcTh-228	46	2 of 36	45.62	0.96	
10	351.71	111	Pb-214	80	4 of 7	100.00	1.50	
12	582.84	84	Tl-208	111	4 of 9	89.76	1.40	
13	609.16	101	Bi-214	113	2 of 33	76.37	1.26	
			Ru-103		1 of 2	5.92	0.06	LowScore
14	661.52	312	Cs-137		1 of 1	100.00	1.50	
15	911.00	55	AcTh-228	83	2 of 36	64.84	1.15	
16	1460.72	186	K-40		1 of 1	100.00	1.50	
17	1764.43	18	Bi-214	16	2 of 33	76.37	1.26	
18	2614.60	41	Tl-208	35	4 of 9	84.75	1.35	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-15

Sample ID: SOIL/SEDI Duratek Inc

Code: 1014102

 Sampling Start: 02/13/2003 12:00:00 | Counting Start: 04/11/2003 10:58:17
 Sampling Stop: 02/13/2003 12:00:00 | Decay Time. 1.37e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 6000 Sec
 Sample Size 7.31e-001 kg | Real Time 6002 Sec
 Collection Efficiency 1.0000 | Spectrum File 1014102.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 2 (Canberra sn 9923043 det# 2)
 Efficiency File: WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[1.15E-02*En^-3.19E+00 + 2.16E+02*En^7.29E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5186-15.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
Pb-214	Average:x	1.62E+02 +- 2.79E+01	. . . .		*	. . . . .
	74.81	I.D.	. . . .			. . . . .
	295.21	9.44E+01 +- 5.50E+01	1.81E+02		+	. . . . .
	351.92	1.86E+02 +- 3.24E+01	9.38E+01		++	. . . . .
Pb-212	238.63	2.58E+02 +- 2.88E+01	6.92E+01		++	. . . . .
	77.12	I.D.	. . . .			. . . . .
AcTh-228	Average:x	2.77E+02 +- 4.47E+01	. . . .		*	. . . . .
	338.32	3.75E+02 +- 9.01E+01	2.72E+02		++	. . . . .
	911.07	2.45E+02 +- 5.15E+01	1.42E+02		++	. . . . .
Tl-208	Average:x	2.72E+02 +- 3.68E+01	. . . .		*	. . . . .
	583.14	2.51E+02 +- 4.58E+01	1.29E+02		++	. . . . .
	2614.66	3.11E+02 +- 6.20E+01	1.48E+02		++	. . . . .
Bi-214	Average:x	2.06E+02 +- 3.00E+01	. . . .		*	. . . . .
	609.31	2.03E+02 +- 3.21E+01	8.77E+01		++	. . . . .
	1764.49	2.26E+02 +- 8.31E+01	2.43E+02		+	. . . . .
Cs-137	661.65	3.63E+02 +- 2.34E+01	4.02E+01		++	. . . . .
K-40	1460.81	3.06E+03 +- 2.49E+02	3.96E+02		++	. . . . .
Am-241	59.54 N	3.97E+01 +- 3.93E+01	1.32E+02		x	. . . . .
Co-57	122.06 N	1.12E+01 +- 8.21E+00	2.72E+01		x	. . . . .
Ce-144	133.54 N	1.99E+01 +- 6.09E+01	2.13E+02		x	. . . . .
Ce-141	145.44 N	5.99E+00 +- 4.19E+01	1.45E+02		x	. . . . .
Ra-226	186.22 N	7.13E+02 +- 2.18E+02	6.81E+02		x*	. . . . .
Se-75	264.65 N	1.19E+01 +- 1.58E+01	5.36E+01		x	. . . . .
Cr-51	320.08 N	4.94E+01 +- 2.92E+02	1.04E+03r		x	rbase	
I-131	364.48 N	3.22E+02 +- 1.30E+03	4.61E+03		x	. . . . .
Sb-125	427.89 N	4.08E+01 +- 2.42E+01	9.33E+01		x	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY	E	(pCi/kg)				
	(keV)							
Ag-108m	433.93	N	4.85E+00	+ - 8.33E+00	2.88E+01		x	. . . . .
Be-7	477.59	N	6.26E+01	+ - 1.55E+02	5.42E+02		x	. . . . .
La-140	487.03	N	3.80E+02	+ - 3.40E+02	1.15E+03		x	. . . . .
Ru-103	497.08	N	7.37E+00	+ - 2.24E+01	7.90E+01		x	. . . . .
Ba-140	537.32	N	1.39E+03	+ - 6.11E+02	2.47E+03		x	. . . . .
Cs-134	604.70	N	7.20E+00	+ - 4.68E+01	1.57E+02P		x	PIC
Ru-106	621.84	N	3.04E+01	+ - 9.00E+01	3.31E+02		x	. . . . .
Zr-95	724.18	N	4.58E+01	+ - 3.61E+01	1.40E+02		x	. . . . .
Nb-95	765.79	N	3.62E+01	+ - 2.33E+01	9.42E+01		x	. . . . .
Co-58	810.76	N	1.51E+00	+ - 1.22E+01	4.52E+01		x	. . . . .
Mn-54	834.83	N	1.06E+01	+ - 9.75E+00	3.80E+01		x	. . . . .
Ag-110m	884.67	N	3.94E+00	+ - 1.24E+01	4.52E+01		x	. . . . .
Fe-59	1099.22	N	3.06E+01	+ - 3.52E+01	1.23E+02		x	. . . . .
Zn-65	1115.52	N	1.00E+01	+ - 2.44E+01	9.14E+01		x	. . . . .
Co-60	1332.49	N	1.13E+01	+ - 9.29E+00	3.15E+01		x	Y.
Sb-124	1691.02	N	1.54E+01	+ - 2.43E+01	9.24E+01		x	. . . . .

MEASURED TOTAL: 5.31E+03 +- 6.58E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.89	94.07	1	23	38	246	0.70	Deleted
4	92.62	139.06	-8	28	45	310	1.06	Deleted
5	185.85	280.14	3	24	40	233	0.64	Deleted
8	314.17	474.34	29	14	22	83	1.19	Unknown
11	510.90	772.07	8	17	28	69	1.85	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
19	59.54	88.99	19N	19	30	186	1.08	NET< CL
20	122.06	183.60	24N	18	28	155	1.13	NET< CL
21	133.54	200.98	-5N	16	27	148	1.14	NET< CL
22	145.44	218.99	-2N	17	28	147	1.15	NET< CL
23	186.22	280.70	58N	18	26	138	1.18	
24	264.65	399.40	10N	13	21	83	1.23	NET< CL
25	320.08	483.29	-2N	12	20	71	1.27	NET< CL
								RBase
26	364.48	550.48	-3N	12	20	75	1.30	NET< CL
27	427.89	646.44	-16N	9	17	53	1.35	NET< CL
28	433.93	655.59	6N	10	16	50	1.35	NET< CL
29	477.59	721.66	4N	10	16	47	1.38	NET< CL
30	487.03	735.95	10N	9	14	35	1.39	NET< CL
31	497.08	751.16	3N	9	15	40	1.39	NET< CL
32	537.32	812.05	-19N	8	15	40	1.42	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
33	604.70	914.03	-7N	47	77	108	1.47	NET< CL PIC
34	621.84	939.97	-3N	8	14	34	1.48	NET< CL
35	724.18	1094.85	-10N	8	14	40	1.55	NET< CL
36	765.79	1157.82	-11N	7	13	27	1.58	NET< CL
37	810.76	1225.88	1N	6	10	19	1.61	NET< CL
38	834.83	1262.30	-8N	7	13	31	1.62	NET< CL
39	884.67	1337.73	2N	6	10	19	1.66	NET< CL
40	1099.22	1662.43	5N	6	9	14	1.80	NET< CL
41	1115.52	1687.10	-3N	7	12	28	1.82	NET< CL
42	1332.49	2015.46	7N	6	8	11	1.96	NET< CL
43	1691.02	2558.05	2N	3	5	4	2.21	NET< CL

L5186-15 analyzed by emm1461 on 04/11/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/13/2003 12:00:00 | Counting Start: 04/11/2003 10:58:17
Sampling Stop: 02/13/2003 12:00:00 | Decay Time. 1.37E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 6000 Sec
Sample Size 7.31E-01 kg | Real Time 6002 Sec
Collection Efficiency 1.0000 | Spectrum File 1014102.spc

Detector #: 2

Energy(keV)= 0.74 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 6.55E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[1.15e-02*En^-3.19e+00 + 2.16e+02*En^ 7.29e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5186-15.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-214	1.62E+02	2.79E+01	< 9.38E+01	4.46E+01	1.00E+00	MEAS +	YES
Pb-212	2.58E+02	2.88E+01	< 6.92E+01	3.32E+01	1.00E+00	MEAS +	YES
AcTh-228	2.77E+02	4.47E+01	< 1.42E+02	6.47E+01	1.00E+00	MEAS +	YES
Tl-208	2.72E+02	3.68E+01	< 1.29E+02	6.03E+01	1.00E+00	MEAS +	YES
Bi-214	2.06E+02	3.00E+01	< 8.77E+01	4.11E+01	1.00E+00	MEAS +	YES
Cs-137	3.62E+02	2.34E+01	< 4.02E+01	1.85E+01	9.96E-01	MEAS +	YES
K-40	3.06E+03	2.49E+02	< 3.96E+02	1.76E+02	1.00E+00	MEAS +	YES
Am-241	3.98E+01	3.93E+01	< 1.32E+02	6.30E+01	1.00E+00	NET	YES
Co-57	1.12E+01	8.21E+00	< 2.72E+01	1.30E+01	8.64E-01	NET	YES
Ce-144	-1.99E+01	6.09E+01	< 2.12E+02	1.01E+02	8.70E-01	NET	YES
Ce-141	-5.99E+00	4.19E+01	< 1.45E+02	6.92E+01	2.97E-01	NET	YES
Ra-226	7.13E+02	2.18E+02	< 6.81E+02	3.24E+02	1.00E+00	NET	YES
Se-75	1.19E+01	1.58E+01	< 5.35E+01	2.52E+01	7.19E-01	NET	YES
Cr-51	-4.94E+01	2.92E+02	< 1.04E+03	4.84E+02	2.40E-01	NET	YES
I-131	-3.22E+02	1.30E+03	< 4.61E+03	2.16E+03	7.35E-03	NET	YES
Sb-125	-4.08E+01	2.42E+01	< 9.33E+01	4.32E+01	9.62E-01	NET	YES
Ag-108m	4.85E+00	8.33E+00	< 2.88E+01	1.33E+01	9.99E-01	NET	YES
Be-7	6.26E+01	1.55E+02	< 5.42E+02	2.50E+02	4.78E-01	NET	YES
La-140	3.80E+02	3.40E+02	< 1.15E+03	5.24E+02	4.56E-02	NET	YES
Ru-103	7.37E+00	2.24E+01	< 7.90E+01	3.62E+01	3.66E-01	NET	YES
Ba-140	-1.39E+03	6.11E+02	< 2.47E+03	1.14E+03	4.56E-02	NET	YES
Cs-134	-7.20E+00	4.68E+01	< 1.57E+02	7.71E+01	9.49E-01	NET	YES
Ru-106	-3.04E+01	9.00E+01	< 3.31E+02	1.51E+02	8.98E-01	NET	YES
Zr-95	-4.58E+01	3.61E+01	< 1.40E+02	6.39E+01	5.40E-01	NET	YES
Nb-95	-3.62E+01	2.33E+01	< 9.42E+01	4.25E+01	3.24E-01	NET	YES
Co-58	1.51E+00	1.22E+01	< 4.52E+01	1.99E+01	5.72E-01	NET	YES
Mn-54	-1.06E+01	9.75E+00	< 3.80E+01	1.72E+01	8.81E-01	NET	YES
Ag-110m	3.94E+00	1.24E+01	< 4.52E+01	2.00E+01	8.54E-01	NET	YES
Fe-59	3.06E+01	3.52E+01	< 1.23E+02	5.33E+01	4.13E-01	NET	YES
Zn-65	-1.00E+01	2.44E+01	< 9.14E+01	4.12E+01	8.51E-01	NET	YES
Co-60	1.13E+01	9.29E+00	< 3.15E+01	1.35E+01	9.80E-01	NET	YES
Sb-124	1.54E+01	2.43E+01	< 9.24E+01	3.58E+01	5.19E-01	NET	YES

L5186-15 analyzed by emml461 on 04/11/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5186-16 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2600-338
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-05-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____
Work Group ID: 5123

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 182.4 g

Filter/Smear Data

Volume: _____
Units: _____
Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/11/03 1736 Det No.: 4 Spectrum No.: 1017369
Counted by: WJ
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5186-16
Client Id : BMS-2600-338
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/05/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	182.4		
Sample Weight-Dry	g			
Aliquot Weight	g	182.4		
FINAL WEIGHT	kg	.1824		
Container			WT5S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5186-16

Sample ID: SOIL/SEDI Duratek Inc

Code: 1017304

 Sampling Start: 02/05/2003 12:00:00 | Counting Start: 04/11/2003 17:36:01
 Sampling Stop: 02/05/2003 12:00:00 | Decay Time. 1.57E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 200000 Sec
 Sample Size 1.82E-001 kg | Real Time 200055 Sec
 Collection Efficiency 1.0000 | Spc. File 1017304.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.40 + 0.661*Ch + 5.71E-08*Ch^2 + 0.00E+00*Ch^3 04/11/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.32	95.14	1454	116	180	5996	0.88	
2	74.89	112.64	4867	120	161	5234	1.11	a HiResid
3	77.13	116.02	6968	118	137	4187	0.88	b HiResid
4	84.40	127.01	1123	93	142	4087	1.14	a HiResid
5	87.23	131.30	2824	102	142	4087	1.15	b HiResid
6	89.92	135.37	1735	96	142	4087	1.08	c HiResid
7	92.92	139.91	4339	129	183	5721	1.43	d HiResid
								Wide Pk
8	99.36	149.65	429	93	150	4145	1.21	a
9	105.40	158.77	424	93	150	4145	1.19	b
10	108.63	163.65	171	57	92	2072	0.62	c
11	110.10	165.89	263	70	112	2763	0.95	d
12	112.00	168.75	28	68	112	2763	0.87	e NET< CL
13	112.61	169.68	138	44	71	1382	0.54	f
14	128.95	194.38	864	116	184	5364	1.48	Wide Pk
15	139.99	211.08	149	67	109	2615	0.96	a
16	144.04	217.21	312	68	109	2615	0.84	b
17	153.43	231.40	188	131	214	6348	0.75	NET< CL
18	163.44	246.53	-62	106	174	4820	0.75	NET< CL
19	185.99	280.63	2517	112	165	4316	1.49	
20	197.59	298.18	472	102	164	4269	1.99	Wide Pk
21	205.22	309.71	97	49	79	1534	0.56	a
22	209.33	315.92	953	66	96	2045	0.93	b
23	238.62	360.21	11008	121	101	2041	1.09	a
24	241.51	364.58	2174	91	129	2857	1.54	b
25	270.16	407.91	796	76	117	2328	1.31	
26	277.64	419.21	239	81	130	2695	0.76	
27	288.75	436.02	16	68	111	2099	0.16	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	295.18	445.73	2934	75	85	1452	1.14	a
29	300.09	453.15	572	57	85	1452	1.09	b
30	327.94	495.27	426	68	107	1940	1.08	
31	338.31	510.95	2134	78	104	1844	1.16	
32	351.94	531.55	4623	96	110	1933	1.42	
33	397.19	599.96	36	56	91	1422	0.40	NET< CL
34	409.45	618.51	216	56	88	1334	0.88	
35	463.04	699.54	533	59	89	1267	1.42	
36	498.76	753.54	25	46	75	954	0.48	NET< CL
37	510.90	771.90	3686	84	94	1316	2.40	Wide Pk
38	558.50	843.86	64	35	56	632	1.09	a
39	562.16	849.40	66	25	39	380	0.71	b
40	569.54	860.56	80	30	48	506	0.88	c
41	583.14	881.11	3316	78	86	1090	1.36	
42	597.64	903.04	68	53	86	1098	3.52	NET< CL Wide Pk
43	609.27	920.63	3314	79	89	1169	1.52	
44	631.91	954.85	85	65	106	1315	2.31	NET< CL Wide Pk
45	665.13	1005.07	64	37	59	636	1.23	a
46	670.47	1013.15	29	36	59	636	1.28	b NET< CL
47	694.17	1048.98	100	51	82	990	1.78	
48	727.23	1098.97	665	51	72	771	1.50	
49	741.93	1121.19	58	47	77	817	1.50	NET< CL
50	756.06	1142.55	59	47	77	818	1.17	NET< CL
51	768.20	1160.90	341	37	53	559	1.51	a
52	772.61	1167.58	152	44	70	799	2.21	b Wide Pk
53	785.71	1187.38	129	37	58	614	1.58	
54	794.94	1201.33	351	33	45	429	1.39	a
55	802.89	1213.36	128	27	40	358	1.08	b
56	805.94	1217.97	56	25	40	358	0.99	c
57	835.80	1263.11	125	30	45	433	1.39	a
58	839.80	1269.15	106	39	61	649	2.05	b
59	846.83	1279.78	40	22	34	288	0.92	c
60	860.83	1300.95	352	44	66	683	1.56	
61	904.17	1366.47	98	24	35	285	1.16	a
62	911.16	1377.04	2120	55	50	456	1.67	b
63	934.07	1411.67	178	42	65	620	1.58	
64	964.55	1457.75	428	41	59	535	2.38	a Wide Pk
65	968.91	1464.34	1294	46	46	389	1.68	b
66	1001.37	1513.42	86	32	51	446	1.16	
67	1078.71	1630.33	75	31	48	407	1.95	
68	1095.47	1655.67	46	30	47	390	1.24	NET< CL
69	1120.30	1693.19	657	42	54	476	1.92	
70	1154.45	1744.83	48	37	59	522	1.94	NET< CL
71	1238.20	1871.43	222	37	55	470	2.03	
72	1377.73	2082.35	152	32	48	374	1.65	
73	1401.69	2118.55	52	21	33	218	1.64	a
74	1407.90	2127.95	72	22	33	218	1.76	b
75	1460.80	2207.92	1931	51	42	298	2.01	
76	1495.29	2260.04	6	25	40	288	0.29	NET< CL
77	1509.27	2281.17	75	27	41	288	1.56	
78	1588.01	2400.19	104	22	32	204	1.73	a

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
79	1592.70	2407.28	115	20	29	178	1.45	b
80	1620.75	2449.68	89	19	27	153	1.73	a
81	1630.66	2464.65	87	19	27	153	1.71	b
82	1729.92	2614.69	103	24	35	210	1.63	
83	1764.64	2667.16	583	32	35	196	2.38	
84	1847.53	2792.45	72	26	40	232	1.91	
85	2103.80	3179.77	147	25	36	216	2.64	
86	2203.41	3330.31	120	22	32	172	3.13	
87	2614.66	3951.78	1155	38	26	109	2.62	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.32	1454	116	180	484	129	209	
2	74.89	4867	120	161	4323	132	188	
3	77.13	6968	118	137	6301	130	170	
4	84.40	1123	93	142	664	121	194	
5	87.23	2824	102	142	2544	112	165	
6	89.92	1735	96	142	1550	107	163	
7	92.93	4339	129	183	2114	150	235	
8	99.36	429	93	150	341	101	163	
11	110.10	263	70	112	29	93	152	NET<CL
12	112.00	28	68	112	-96	96	158	NET<CL
16	144.04	312	68	109	126	95	156	NET<CL
18	163.44	-62	106	174	-268	120	199	NET<CL
19	185.99	2517	112	165	1534	132	208	
20	197.59	472	102	164	218	131	213	
22	209.33	953	66	96	894	85	131	
23	238.62	11008	121	101	10181	132	139	
24	241.51	2174	91	129	1834	102	153	
28	295.18	2934	75	85	2426	93	130	
31	338.31	2135	78	104	1997	94	136	
32	351.94	4623	96	110	3683	112	154	
35	463.04	533	59	89	491	72	113	
37	510.90	3687	84	94	760	109	174	
38	558.50	64	35	56	-27	51	84	NET<CL
41	583.14	3317	78	86	3057	88	112	
43	609.27	3315	79	89	2647	93	128	
53	785.71	129	37	58	90	49	79	
55	802.89	128	27	40	93	40	65	
62	911.16	2120	55	50	1977	60	66	
65	968.91	1294	46	46	1249	53	65	
66	1001.37	87	32	51	27	43	71	NET<CL
69	1120.30	657	42	54	521	51	76	
70	1154.45	48	37	59	30	43	70	NET<CL
71	1238.20	222	37	55	192	46	72	
72	1377.73	152	32	48	125	40	64	
75	1460.80	1931	51	42	1720	57	63	
83	1764.64	583	32	35	481	38	51	
85	2103.80	147	25	36	129	30	46	
87	2614.66	1155	38	26	959	42	48	

SEEKER L I B R A R Y S E A R C H R E S U L T S Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	63.32	484	Th-234	457	2 of 2	100.00	1.50	
2	74.89	4323	Pb-214	1684	6 of 7	98.66	1.49	
			Pb-212	2903	5 of 6	99.30	0.99	
			Tl-208	312	7 of 9	98.43	0.98	
3	77.13	6301	Pb-212	5055	5 of 6	99.30	0.99	
			Pb-214	1952	6 of 7	98.66	0.99	
4	84.40	664	Tl-208	158	7 of 9	98.43	0.98	
6	89.92	1550	Unknown					
7	92.93	989	Th-234	1046	2 of 2	100.00	1.00	Split
88	92.93	1125	AcTh-228	1125	20 of 36	93.56	0.94	AutoAdd
8	99.36	341	AcTh-228	339	20 of 36	97.21	1.47	
			Np-239		0 of 0		0.00	Decay
9	105.40	424	AcTh-228	535	20 of 36	98.14	1.48	
			Np-239		0 of 0		0.00	Decay
10	108.63	171	Unknown					
			La-140		1 of 15	0.18	0.00	LowScore
13	112.61	138	Unknown					
14	128.95	864	AcTh-228	919	20 of 36	97.21	1.47	
15	139.99	149	Unknown					
			Mo-99		0 of 0		0.00	Decay
19	185.99	1534	Ra-226		1 of 1	100.00	1.50	
			U-235		1 of 3	78.03	0.78	
20	197.59	218	Unknown					
21	205.22	97	Unknown					
22	209.33	894	AcTh-228	1105	20 of 36	97.21	1.47	
			Np-239		0 of 0		0.00	Decay
23	238.62	10181	Pb-212	12641	5 of 6	99.30	0.99	
24	241.51	1834	Pb-214	1683	6 of 7	98.66	1.49	
			La-140	256	2 of 15	0.58	0.01	LowScore
25	270.16	797	AcTh-228	727	20 of 36	97.21	1.47	
26	277.64	239	Tl-208	462	7 of 9	100.00	1.50	
			Np-239		0 of 0		0.00	Decay
28	295.18	2426	Pb-214	3990	6 of 7	98.66	0.99	
29	300.09	572	Pb-212	652	5 of 6	99.30	1.49	
30	327.94	426	AcTh-228	555	20 of 36	98.14	1.48	
			Bi-212	15	5 of 13	87.52	0.88	
			La-140		3 of 15	23.42	0.23	LowScore
31	338.31	1997	AcTh-228	1899	20 of 36	97.21	1.47	
32	351.94	3683	Pb-214	6663	6 of 7	98.66	0.99	
34	409.45	217	AcTh-228	305	20 of 36	98.14	1.48	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
35	463.04	491	AcTh-228	566	20 of 36	97.21	1.47	
			Sb-125		1 of 8	12.32	0.12	LowScore
37	510.90	760	Tl-208	869	7 of 9	100.00	1.50	
			Annil		1 of 1	100.00	1.50	
39	562.16	66	AcTh-228	102	20 of 36	99.13	1.49	
40	569.54	80	Cs-134	86	3 of 9	52.89	1.03	
41	583.14	3057	Tl-208	2988	7 of 9	99.12	1.49	
43	609.27	2647	Bi-214	3223	16 of 33	97.30	0.97	
			1120SEsc		0 of 0	. . .	0.50	
45	665.13	64	Bi-214	88	16 of 33	98.54	1.49	
47	694.17	100	Unknown . . . . .		. . . . .	. . .	. . .
48	727.23	665	Bi-212	770	5 of 13	100.00	1.50	
			1238SEsc		0 of 0	. . .	0.50	
51	768.20	341	Bi-214	247	16 of 33	94.19	1.44	
52	772.61	152	AcTh-228	127	20 of 36	95.43	1.45	
			TeI-132		0 of 0	. . .	0.00	Decay
53	785.71	90	Bi-212	106	5 of 13	100.00	1.50	
			Pb-214		6 of 7	98.66	1.49	
54	794.94	351	AcTh-228	370	20 of 36	97.21	1.47	
			Cs-134	384	3 of 9	52.89	1.03	
55	802.89	93	Cs-134	35	3 of 9	50.83	1.01	
56	805.94	56	Bi-214	58	16 of 33	97.30	1.47	
57	835.80	125	AcTh-228	134	20 of 36	97.21	1.47	MANUAL
			Mn-54		1 of 1	100.00	1.50	DELETED
58	839.80	106	AcTh-228	72	20 of 36	94.50	1.44	
59	846.83	40	Unknown . . . . .		. . . . .	. . .	. . .
60	860.83	352	Tl-208	316	7 of 9	99.12	1.49	
61	904.17	98	Bi-214	5	16 of 33	90.59	0.91	
62	911.16	1977	AcTh-228	1968	20 of 36	97.21	1.47	
63	934.07	178	Bi-214	134	16 of 33	94.19	1.44	
64	964.55	428	AcTh-228	350	20 of 36	95.43	1.45	
65	968.91	1249	AcTh-228	1095	20 of 36	96.67	1.47	
			Sb-124		1 of 13	1.04	0.01	LowScore
67	1078.71	75	Bi-212	38	5 of 13	96.44	1.46	
69	1120.30	521	Bi-214	541	16 of 33	97.30	1.47	
71	1238.20	192	Bi-214	194	16 of 33	97.30	1.47	
72	1377.73	125	Bi-214	122	16 of 33	96.03	1.46	
73	1401.69	52	Bi-214	41	16 of 33	94.19	1.44	
74	1407.90	72	Bi-214	73	16 of 33	97.30	1.47	
75	1460.80	1720	K-40		1 of 1	100.00	1.50	
77	1509.27	75	Bi-214	61	16 of 33	95.11	1.45	
78	1588.01	104	AcTh-228	154	20 of 36	98.14	1.48	
79	1592.70	115	2615DEsc		0 of 0	. . .	0.50	
			2104SEsc		0 of 0	. . .	0.50	
80	1620.75	89	Bi-212	77	5 of 13	100.00	1.50	
81	1630.66	87	AcTh-228	80	20 of 36	97.21	1.47	
82	1729.92	103	Bi-214	72	16 of 33	94.19	1.44	
83	1764.64	481	Bi-214	371	16 of 33	94.19	1.44	
84	1847.53	72	Bi-214	48	16 of 33	94.19	1.44	
85	2103.80	129	2615SEsc		0 of 0	. . .	0.50	
86	2203.41	120	Bi-214	98	16 of 33	95.11	1.45	
87	2614.66	959	Tl-208	975	7 of 9	99.12	1.49	
89	87.23	2234	Pb-212	2234	5 of 6	99.30	1.49	AutoAdd

Environmental Gamma Isotopic Analysis

LSN: L5186-16

Sample ID: SOIL/SEDI Duratek Inc

Code: 1017304

Sampling Start:	02/05/2003 12:00:00	Counting Start:	04/11/2003 17:36:01
Sampling Stop:	02/05/2003 12:00:00	Decay Time.	1.57e+003 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	200000 Sec
Sample Size	1.82e-001 kg	Real Time	200055 Sec
Collection Efficiency	1.0000	Spectrum File	.1017304.spc
Type I		Type I & II	
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Canberra sn 10923050 det#4)

Efficiency File: WT1SS004.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

$$\text{Eff.} = 1 / [2.12\text{E-}02 * \text{En}^{-2.69\text{E}+00} + 1.61\text{E}+02 * \text{En}^{8.72\text{E-}01}] \quad 02/09/1998$$

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File:L5186-16.LSF (SOIL/SEDI: Duratek Inc)

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E (keV)		(pCi/kg)				
Th-234	Average:x	4.59E+02	+ -	8.61E+01	. . . . .		*	. . . . .
	63.29	4.73E+02	+ -	1.26E+02	4.11E+02		+*	. . . . .
	92.59	4.47E+02	+ -	1.18E+02	3.86E+02		+*	. . . . .
Pb-214	Average:x	5.15E+02	+ -	1.14E+01	. . . . .		*	. . . . .
	74.81	I.D.		. . . . .	. . . . .			. . . . .
	241.98	8.65E+02	+ -	4.82E+01	1.45E+02		+*	. . . . .
	295.21	5.25E+02	+ -	2.02E+01	5.71E+01		+*	. . . . .
	351.92	4.78E+02	+ -	1.45E+01	4.03E+01		+*	. . . . .
Pb-212	Average:x	7.95E+02	+ -	1.02E+01	. . . . .		*	. . . . .
	77.12	I.D.		. . . . .	. . . . .			. . . . .
	87.30	I.D.		. . . . .	. . . . .			. . . . .
	238.63	7.97E+02	+ -	1.03E+01	2.20E+01		+*	. . . . .
	300.09	7.07E+02	+ -	7.03E+01	2.13E+02		+*	. . . . .
Tl-208	Average:x	7.45E+02	+ -	1.76E+01	. . . . .		*	. . . . .
	84.90	I.D.		. . . . .	. . . . .			. . . . .
	277.35	3.87E+02	+ -	1.31E+02	4.26E+02		+	. . . . .
	510.84	I.D.		. . . . .	. . . . .			. . . . .
	583.14	7.54E+02	+ -	2.16E+01	5.58E+01		+*	. . . . .
	860.37	8.21E+02	+ -	1.04E+02	3.16E+02		+*	. . . . .
AcTh-228	2614.66	7.39E+02	+ -	3.26E+01	7.54E+01		+*	. . . . .
	Average:x	7.85E+02	+ -	1.49E+01	. . . . .		*	. . . . .
	99.45	7.86E+02	+ -	2.32E+02	7.57E+02		+*	. . . . .
	105.00	I.D.		. . . . .	. . . . .			. . . . .
	129.08	7.37E+02	+ -	9.87E+01	3.16E+02		+*	. . . . .
	209.28	6.41E+02	+ -	6.10E+01	1.90E+02		+*	. . . . .
	270.23	8.55E+02	+ -	8.20E+01	2.54E+02		+*	. . . . .
	327.64	6.04E+02	+ -	9.65E+01	3.06E+02		+*	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY	E					
	(keV)						
	338.32		8.17E+02 +- 3.86E+01	1.13E+02		++	. . . . .
	409.51		5.58E+02 +- 1.44E+02	4.63E+02		++	. . . . .
	463.00		6.81E+02 +- 1.00E+02	3.18E+02		++	. . . . .
	562.30		5.04E+02 +- 1.94E+02	6.24E+02		+	. . . . .
	772.17		9.36E+02 +- 2.71E+02	8.74E+02		++	. . . . .
	794.70		7.45E+02 +- 7.04E+01	1.97E+02		++	. . . . .
	835.50		7.26E+02 +- 1.73E+02	5.44E+02		++	. . . . .
	840.00		1.15E+03 +- 4.20E+02	1.36E+03		+	. . . . .
	911.07		7.85E+02 +- 2.37E+01	5.32E+01		++	. . . . .
	964.60		9.52E+02 +- 9.16E+01	2.67E+02		++	. . . . .
	969.11		8.74E+02 +- 3.72E+01	9.34E+01		++	. . . . .
	1588.00		5.30E+02 +- 1.11E+02	3.35E+02		++	. . . . .
	1630.40		8.52E+02 +- 1.87E+02	5.63E+02		++	. . . . .
	93.35		I.D.	. . . . .			. . . . .
Ra-226	186.22		1.36E+03 +- 1.17E+02	3.70E+02		++	. . . . .
Cs-134	Average:x		3.16E+00 +- 3.70E+00	. . . . .			. . . . .
	569.31		4.03E+01 +- 1.53E+01	4.94E+01		+	. . . . .
	604.70	N	1.68E-01 +- 3.82E+00	1.28E+011	WMDL ✓	x lbase	. . . . .
	801.93		1.12E+02 +- 4.85E+01	1.58E+02		+	. . . . .
Bi-214	Average:x		4.70E+02 +- 1.32E+01	. . . . .		*	. . . . .
	609.31		4.43E+02 +- 1.56E+01	4.32E+01		++	. . . . .
	665.45		3.40E+02 +- 1.95E+02	6.40E+02		+	. . . . .
	768.36		6.41E+02 +- 7.01E+01	2.05E+02		++	. . . . .
	806.17		4.46E+02 +- 2.03E+02	6.59E+02		+	. . . . .
	904.25		1.01E+04 +- 2.44E+03	7.58E+03		++	. . . . .
	934.06		6.22E+02 +- 1.45E+02	4.63E+02		++	. . . . .
	1120.29		4.54E+02 +- 4.48E+01	1.35E+02		++	. . . . .
	1238.11		4.64E+02 +- 1.12E+02	3.57E+02		++	. . . . .
	1377.67		4.79E+02 +- 1.54E+02	4.99E+02		++	. . . . .
	1401.50		6.02E+02 +- 2.42E+02	7.81E+02		+	. . . . .
	1407.98		4.62E+02 +- 1.39E+02	4.38E+02		++	. . . . .
	1509.23		5.77E+02 +- 2.05E+02	6.58E+02		+	. . . . .
	1729.59		6.67E+02 +- 1.54E+02	4.76E+02		++	. . . . .
	1764.49		5.96E+02 +- 4.73E+01	1.31E+02		++	. . . . .
	1847.42		6.97E+02 +- 2.49E+02	8.00E+02		+	. . . . .
	2204.22		5.70E+02 +- 1.06E+02	3.16E+02		++	. . . . .
Bi-212	Average:x		5.19E+02 +- 3.67E+01	. . . . .		*	. . . . .
	727.17		5.09E+02 +- 3.90E+01	1.13E+02		++	. . . . .
	785.46		4.43E+02 +- 2.41E+02	7.91E+02		+	. . . . .
	1078.62		1.00E+03 +- 4.11E+02	1.33E+03		+	. . . . .
	1620.62		5.91E+02 +- 1.26E+02	3.79E+02		++	. . . . .
K-40	1460.81		2.68E+03 +- 8.81E+01	2.02E+02		++	. . . . .
Am-241	59.54	N	7.11E+01 +- 1.03E+01	3.29E+011		x* lbase	. . . . .
Co-57	122.06	N	1.79E+00 +- 2.56E+00	8.47E+00		x	. . . . .
Ce-144	133.54	N	1.61E+01 +- 2.05E+01	6.79E+01r		x rbase	. . . . .
Ce-141	145.44	N	5.32E+01 +- 2.71E+01	9.11E+01R		x RHROI	. . . . .
Se-75	264.65	N	3.81E+00 +- 5.17E+00	1.71E+01		x	. . . . .
Cr-51	320.08	N	7.15E+01 +- 1.33E+02	4.47E+02		x	. . . . .
I-131	364.48	N	3.74E+02 +- 9.63E+02	3.23E+03		x	. . . . .
Sb-125	427.89	N	4.07E-01 +- 9.37E+00	3.14E+01		x	. . . . .
Ag-108m	433.93	N	2.83E+00 +- 2.92E+00	9.88E+00		x	. . . . .
Be-7	477.59	N	2.14E+01 +- 6.02E+01	2.01E+02		x	. . . . .
La-140	487.03	N	4.60E+01 +- 2.14E+02	7.18E+02		x	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
		E						
Ru-103	497.08	N	1.17E+00	+ - 9.56E+00	3.20E+01		x	. . . . .
Ba-140	537.32	N	4.66E+02	+ - 3.93E+02	1.34E+03		x	. . . . .
Ru-106	621.84	N	1.78E+01	+ - 3.71E+01	1.25E+02		x	. . . . .
Cs-137	661.65	N	6.51E-02	+ - 6.03E+00	2.01E+01P		x	PIC Y.
Zr-95	724.18	N	5.86E+01	+ - 6.57E+01	2.18E+02P		x	PIC
Nb-95	765.79	N	4.04E+01	+ - 1.65E+01	5.39E+01P		x	PIC
Co-58	810.76	N	5.31E+00	+ - 5.63E+00	1.87E+01r		x	rbase
Mn-54	834.83	N	2.52E+00	+ - 4.21E+00	1.43E+01P		x	PIC
Ag-110m	884.67	N	4.97E+00	+ - 5.48E+00	1.83E+01		x	. . . . .
Fe-59	1099.22	N	3.28E+01	+ - 1.74E+01	6.10E+01		x	. . . . .
Zn-65	1115.52	N	4.53E+01	+ - 1.82E+01	5.94E+01P		x	PIC
Co-60	1332.49	N	2.04E+00	+ - 3.98E+00	1.34E+01		x	Y.
Sb-124	1691.02	N	2.65E+01	+ - 1.58E+01	5.18E+01		x	. . . . .

MEASURED TOTAL: 8.39E+03 + - 4.09E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
5	87.23	131.30	310	295	484	4087	1.15	Deleted
6	89.92	135.37	1550	107	163	4087	1.08	Unknown
10	108.63	163.65	171	57	92	2073	0.62	Unknown
11	110.10	165.89	29	93	152	2763	0.95	Deleted
12	112.00	168.75	-96	96	158	2763	0.87	Deleted
13	112.61	169.68	138	44	71	1382	0.54	Unknown
15	139.99	211.08	149	67	109	2615	0.96	Unknown
16	144.04	217.21	126	95	156	2615	0.84	Deleted
17	153.43	231.40	188	131	214	6348	0.75	Deleted
18	163.44	246.53	-268	120	199	4820	0.75	Deleted
20	197.59	298.18	218	131	213	4269	1.99	Unknown
21	205.22	309.71	97	49	79	1534	0.56	Unknown
27	288.75	436.02	16	68	111	2099	0.16	Deleted
33	397.19	599.96	36	56	91	1422	0.40	Deleted
36	498.76	753.54	25	46	75	954	0.48	Deleted
38	558.49	843.86	-27	51	84	633	1.09	Deleted
42	597.64	903.04	68	53	86	1098	3.52	Deleted
44	631.91	954.85	85	65	106	1315	2.31	Deleted
46	670.47	1013.15	29	36	59	636	1.28	Deleted
47	694.17	1048.98	100	51	82	990	1.78	Unknown
49	741.93	1121.19	58	47	77	817	1.50	Deleted
50	756.06	1142.55	59	47	77	818	1.17	Deleted
59	846.83	1279.78	40	22	34	289	0.92	Unknown
66	1001.37	1513.42	27	43	71	446	1.16	Deleted
68	1095.47	1655.67	46	30	47	390	1.24	Deleted
70	1154.45	1744.83	30	43	70	522	1.94	Deleted
76	1495.29	2260.04	6	25	40	288	0.29	Deleted
79	1592.70	2407.28	115	20	29	179	1.45	2615DEsc
85	2103.80	3179.77	129	30	46	216	2.64	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
90	59.54	89.43	618N	89	141	4029	0.98	LBase
91	122.06	183.96	55N	78	128	3324	1.04	NET< CL
92	133.54	201.32	61N	78	128	3292	1.05	NET< CL
								RBase
93	145.44	219.32	-250N	127	213	4176	1.06	NET< CL
								RHRoi
94	264.65	399.57	41N	55	91	1654	1.17	NET< CL
95	320.08	483.38	-30N	56	93	1583	1.21	NET< CL
96	364.48	550.51	-20N	52	85	1338	1.25	NET< CL
97	427.89	646.39	2N	46	76	1059	1.30	NET< CL
98	433.93	655.52	-44N	45	76	1054	1.30	NET< CL
99	477.59	721.53	15N	42	69	886	1.34	NET< CL
100	487.03	735.81	9N	42	69	877	1.34	NET< CL
101	497.08	751.00	5N	41	67	826	1.35	NET< CL
102	537.32	811.84	-46N	39	65	774	1.38	NET< CL
103	604.70	913.71	2N	46	75	959	1.43	NET< CL
								LBase
104	621.84	939.63	-20N	41	67	774	1.44	NET< CL
105	661.65	999.82	1N	61	101	1224	1.47	NET< CL
								PIC
106	724.18	1094.35	-139N	155	256	1157	1.52	NET< CL
								PIC
107	765.79	1157.26	115N	47	75	798	1.55	PIC
108	810.76	1225.25	28N	29	48	446	1.58	NET< CL
								RBase
109	834.83	1261.64	-21N	36	59	575	1.60	NET< CL
								PIC
110	884.67	1336.99	28N	31	50	463	1.64	NET< CL
111	1099.22	1661.33	-51N	27	46	392	1.79	NET< CL
112	1115.52	1685.97	145N	58	94	786	1.80	PIC
113	1332.49	2013.96	13N	25	41	297	1.95	NET< CL
114	1691.02	2555.89	32N	19	30	166	2.20	

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/05/2003 12:00:00 | Counting Start: 04/11/2003 17:36:01
Sampling Stop: 02/05/2003 12:00:00 | Decay Time. 1.57E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 200000 Sec
Sample Size 1.82E-01 kg | Real Time 200055 Sec
Collection Efficiency 1.0000 | Spectrum File 1017304.spc

Detector #: 4

Energy(keV)= 0.40 + 0.661*Ch + 5.71E-08*Ch^2 + 5.71E-08*Ch^3 04/11/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS004.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[2.12e-02*En^-2.69e+00 + 1.61e+02*En^ 8.72e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5186-16.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	4.59E+02	8.61E+01	< 3.86E+02	1.92E+02	1.00E+00	MEAS +	YES
Pb-214	5.15E+02	1.14E+01	< 4.03E+01	2.00E+01	1.00E+00	MEAS +	YES
Pb-212	7.95E+02	1.02E+01	< 2.20E+01	1.09E+01	1.00E+00	MEAS +	YES
Tl-208	7.45E+02	1.76E+01	< 5.58E+01	2.76E+01	1.00E+00	MEAS +	YES
AcTh-228	7.85E+02	1.49E+01	< 5.32E+01	2.60E+01	1.00E+00	MEAS +	YES
Ra-226	1.36E+03	1.17E+02	< 3.70E+02	1.84E+02	1.00E+00	MEAS +	YES
Cs-134	3.16E+00	3.70E+00	< 1.28E+01	6.29E+00	9.41E-01	MEAS +	YES
Bi-214	4.70E+02	1.32E+01	< 4.32E+01	2.14E+01	1.00E+00	MEAS +	YES
Bi-212	5.19E+02	3.67E+01	< 1.13E+02	5.53E+01	1.00E+00	MEAS +	YES
K-40	2.68E+03	8.81E+01	< 2.02E+02	9.87E+01	1.00E+00	MEAS +	YES
Am-241	7.11E+01	1.03E+01	< 3.28E+01	1.63E+01	1.00E+00	NET	YES
Co-57	1.79E+00	2.56E+00	< 8.47E+00	4.19E+00	8.44E-01	NET	YES
Ce-144	1.61E+01	2.05E+01	< 6.79E+01	3.36E+01	8.51E-01	NET	YES
Ce-141	-5.32E+01	2.71E+01	< 9.11E+01	4.52E+01	2.43E-01	NET	YES
Se-75	3.81E+00	5.17E+00	< 1.71E+01	8.45E+00	6.81E-01	NET	YES
Cr-51	-7.15E+01	1.33E+02	< 4.47E+02	2.20E+02	1.90E-01	NET	YES
I-131	-3.74E+02	9.62E+02	< 3.23E+03	1.59E+03	3.28E-03	NET	YES
Sb-125	4.07E-01	9.37E+00	< 3.14E+01	1.54E+01	9.56E-01	NET	YES
Ag-108m	-2.83E+00	2.92E+00	< 9.88E+00	4.86E+00	9.99E-01	NET	YES
Be-7	2.14E+01	6.02E+01	< 2.01E+02	9.86E+01	4.23E-01	NET	YES
La-140	4.60E+01	2.14E+02	< 7.18E+02	3.52E+02	2.74E-02	NET	YES
Ru-103	1.17E+00	9.56E+00	< 3.20E+01	1.57E+01	3.11E-01	NET	YES
Ba-140	-4.66E+02	3.93E+02	< 1.34E+03	6.56E+02	2.74E-02	NET	YES
Ru-106	-1.78E+01	3.71E+01	< 1.25E+02	6.14E+01	8.82E-01	NET	YES
Cs-137	6.51E-02	6.03E+00	< 2.01E+01	9.91E+00	9.96E-01	NET	YES
Zr-95	-5.86E+01	6.57E+01	< 2.18E+02	1.08E+02	4.87E-01	NET	YES
Nb-95	4.05E+01	1.65E+01	< 5.39E+01	2.65E+01	2.69E-01	NET	YES
Co-58	5.31E+00	5.63E+00	< 1.87E+01	9.11E+00	5.22E-01	NET	YES
Mn-54	-2.53E+00	4.21E+00	< 1.43E+01	6.98E+00	8.63E-01	NET	YES
Ag-110m	4.97E+00	5.48E+00	< 1.82E+01	8.89E+00	8.32E-01	NET	YES
Fe-59	-3.28E+01	1.74E+01	< 6.10E+01	2.96E+01	3.57E-01	NET	YES
Zn-65	4.53E+01	1.82E+01	< 5.94E+01	2.93E+01	8.28E-01	NET	YES
Co-60	2.04E+00	3.98E+00	< 1.34E+01	6.49E+00	9.76E-01	NET	YES
Sb-124	2.65E+01	1.58E+01	< 5.18E+01	2.48E+01	4.66E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
=====							

PERFORMED BY: _____

REVIEWED BY: _____

An AREVA and Siemens Company

DURATEK, INC. DATA PACKETS

Samples
L5185-01 - L5185-18



FRAMATOME ANP

ENVIRONMENTAL LABORATORY
29 Research Drive
Westborough, MA 01581-3913
(508) 898-9970 Fax (508) 836-9815


1 of 2

Name/Address of Client Representative:

(Person(s) who should receive the results)

Phone: Fax:

Working Days (**SPECIFY NUMBER**)[illegible]

Chain of Custody		Field Treatment/Comments	SPECIFY METHOD	ELAB ACCEPTANCE STAMP
Relinquished By:	Date:	Butch # 1	(Internal Lab Use ONLY)	
Collected By:	Phone Number:		RA-226 (A)	
Received By: <i>On</i>	Date: <i>3/12/03</i>		RADIUM_EPA	
ELAB Comments:	<i>L5185</i>		RA-228 (PROC. 1300)	
			RA-228_EPA (PROC. 1311)	
		I-131LL (BETA/GAMMA)		
		I-131LL (GAS PROPORTIONAL)		
		OTHER		

2072

Name/Address of Client Representative:

(Person(s) who should receive the results) _____

2/25/2003

REMP □

Non-REMP □

Phone: Fax:

☐ **Standard**

☐ Rush (**COST MULTIPLIER MAY APPLY**)
Working Days (**SPECIFY NUMBER**)

Radiological Analyses (Check All That Apply)Quarterly
Composit

Chain of Custody

Field Treatment/Comments

SPECIFY METHOD

ELAB ACCEPTANCE STAMPDate:Phone Number:Date: 3/13/13

Batch #1

(Internal Lab Use ONLY)

RA-226 (A)RADIUMA_EPARA-228 (PROC. 1300)RA-228_EPA (PROC. 1311)I-131LL (BETA/GAMMA)I-131LL (GAS PROPORTIONAL)OTHER

FRAMATOME
ACCEPTED

APR 04 2003

MONITORING

Client: Duratek, Inc
Project: Bristol-Myers Squibb

Duratek Purchase Order # 15313

Samples Collected by
Betty & Doug Kjos, Don Schumaker

CHAIN OF CUSTODY RECORD

BMS-003

Batch # 1
Duratek, Inc.
628 Gallaher Road
Kingston, Tn. 37763

Project Manager: Paul Ely
(732) 519-3341-BMS Office
(865) 376-8243-Duratek Office
(865) 414-1973-cell

Page 1 of 2

Sample ID	date	Sample turnaround time	matrix	preservative	number of containers	Gamma-spec									Remarks
BMS-2700-003	1/28/03	Std	S	N/A	1	X									Soil Sample
BMS-2700-005	1/28/03	Std	S	N/A	1	X									Soil Sample
BMS-2700-009	1/28/03	Std	S	N/A	1	X									Soil Sample
BMS-2700-013	1/28/03	Std	S	N/A	1	X									Soil Sample
BMS-2700-038	1/28/03	Std	S	N/A	1	X									Soil Sample
BMS-2700-040	1/28/03	Std	S	N/A	1	X									Soil Sample
BMS-2700-058	1/28/03	Std	S	N/A	1	X									Soil Sample
BMS-2700-060	1/28/03	Std	S	N/A	1	X									Soil Sample
BMS-2700-090	2/25/03	Std	S	N/A	1	X									Soil Sample
BMS-2700-094	2/6/03	Std	S	N/A	1	X									Soil Sample
BMS-2700-101	2/6/03	Std	S	N/A	1	X									Soil Sample
Relinquished by: <i>W.R. Hays</i>	Date: <i>3/13/03</i>	Time: <i>1000</i>	Received by:	Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Remarks:					

Matrix codes: s-Soil, m-Misc Solid, V-Vegetation, L-Sludge, W-Water, G-Ground Water, D-Drinking Water, Z-Waste Water, M-Misc Liquid, F-Filter or Smear



FRAMATOME ANP

Framatome ANP

Login Chain of Custody Report (In01)

Apr. 04, 2003

03:30 PM

Login Number: L5185

Account: 00435

Duratek Inc

Project: OTHER ENVIRON-DUR Duratek Other Environmental

Page: 1 of 2

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due Date	Start Date Comments	Volume
L5185-01	BMS-2700-003	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-02	BMS-2700-005	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-03	BMS-2700-009	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-04	BMS-2700-013	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-05	BMS-2700-038	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-06	BMS-2700-040	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-07	BMS-2700-058	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-08	BMS-2700-060	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-09	BMS-2700-090	25-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-10	BMS-2700-094	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-11	BMS-2700-101	06-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-12	BMS-2700-112	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-13	BMS-2700-140	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-14	BMS-2700-144	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-15	BMS-2700-145	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5185-16	BMS-2700-164	28-JAN-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				

Signature :

Debra Riordan

Date :

4-4-03



Framatome ANP

Login Chain of Custody Report (In01)

Apr. 04, 2003

03:30 PM

Login Number: L5185

Account: 00435 Duratek Inc

Project: OTHER ENVIRON-DUR Duratek Other Environmental

Page: 2 of 2

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due Date	Start Date Comments	Volume
L5185-17	BMS-SM-391	21-FEB-03 12:00	13-MAR-03			
Soil	S GAMMA SPECTROME Hold:		WT1S			
L5185-18	BMS-SC-141	23-DEC-02 12:00	13-MAR-03			
Smear	S GAMMA SPECTROME Hold:					

Signature :

Dale Rardon

Date :

4-4-03

April 10, 2003

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903
ATT: Paul Ely

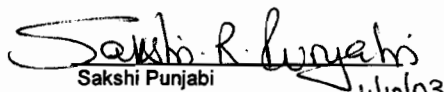
Dear Paul Ely :

Framatome-ANP Environmental Laboratory received the samples listed below from your company on 13-MAR-03. Please verify that the data and requested analyses are correct. Analysis reports will be submitted when the requested analyses have been completed and the results approved.

<u>Media</u>	<u>Client ID</u>	<u>Site</u>	<u>Reference Date</u>	<u>Lab Sample #</u>	<u>Analysis Requested</u>
Soil	BMS-2700-003		28-JAN-03 12:00	L5185-01	GAMMA SPECTROMETRY
Soil	BMS-2700-005		28-JAN-03 12:00	L5185-02	GAMMA SPECTROMETRY
Soil	BMS-2700-009		28-JAN-03 12:00	L5185-03	GAMMA SPECTROMETRY
Soil	BMS-2700-013		28-JAN-03 12:00	L5185-04	GAMMA SPECTROMETRY
Soil	BMS-2700-038		28-JAN-03 12:00	L5185-05	GAMMA SPECTROMETRY
Soil	BMS-2700-040		28-JAN-03 12:00	L5185-06	GAMMA SPECTROMETRY
Soil	BMS-2700-058		28-JAN-03 12:00	L5185-07	GAMMA SPECTROMETRY
Soil	BMS-2700-060		28-JAN-03 12:00	L5185-08	GAMMA SPECTROMETRY
Soil	BMS-2700-090		25-FEB-03 12:00	L5185-09	GAMMA SPECTROMETRY
Soil	BMS-2700-094		06-FEB-03 12:00	L5185-10	GAMMA SPECTROMETRY
Soil	BMS-2700-101		06-FEB-03 12:00	L5185-11	GAMMA SPECTROMETRY
Soil	BMS-2700-112		28-JAN-03 12:00	L5185-12	GAMMA SPECTROMETRY
Soil	BMS-2700-140		28-JAN-03 12:00	L5185-13	GAMMA SPECTROMETRY
Soil	BMS-2700-144		28-JAN-03 12:00	L5185-14	GAMMA SPECTROMETRY
Soil	BMS-2700-145		28-JAN-03 12:00	L5185-15	GAMMA SPECTROMETRY
Soil	BMS-2700-164		28-JAN-03 12:00	L5185-16	GAMMA SPECTROMETRY
Soil	BMS-SM-391		21-FEB-03 12:00	L5185-17	GAMMA SPECTROMETRY
Smear	BMS-SC-141		23-DEC-02 12:00	L5185-18	GAMMA SPECTROMETRY

If you have any questions regarding these samples, please contact me at (508)898-9970, ext. 2557 or email:
Sakshi.Punjabi@Framatome-anp.com.

Sincerely,


Sakshi Punjabi
Sample Receipt Technician 4/10/03

Notes:

c:

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-01 Client ID BMS-2700-003
Reference Date 01/28/03 Analysis Date 04/08/03

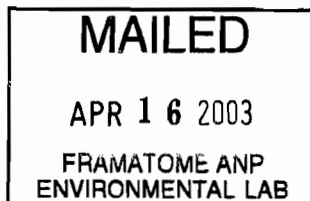
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	4.21E-01 +/- 4.0E-02	4.5E-02	1.3E-01		bc
Ag-108m	2.8E-03 +/- 7.9E-03	7.9E-03	2.7E-02		
Ag-110m	-9E-03 +/- 1.4E-02	1.4E-02	5.4E-02		
Ba-140	6E-01 +/- 1.5E+00	1.5E+00	5.1E+00		
Be-7	-2.9E-01 +/- 1.7E-01	1.7E-01	6.3E-01		
Ce-141	5.8E-02 +/- 5.7E-02	5.7E-02	1.9E-01		
Ce-144	-3.3E-02 +/- 6.6E-02	6.6E-02	2.3E-01		
Co-57	1.08E-02 +/- 8.5E-03	8.5E-03	2.8E-02		
Co-58	-4E-03 +/- 1.6E-02	1.6E-02	5.9E-02		
Co-60	0E+00 +/- 9.1E-03	9.1E-03	3.4E-02	3.8E-02	
Cr-51	-1.5E-01 +/- 4.1E-01	4.1E-01	1.5E+00		
Cs-134	4E-03 +/- 9.0E-03	9.0E-03	3.1E-02		
Cs-137	-9E-03 +/- 1.0E-02	1.0E-02	3.8E-02	1.1E+00	
Fe-59	7.2E-02 +/- 5.1E-02	5.1E-02	1.7E-01		
I-131	-3E-01 +/- 3.6E+00	3.6E+00	1.3E+01		
K-40	1.027E+01 +/- 4.0E-01	6.5E-01	3.8E-01		bc
La-140	1.08E+00 +/- 6.7E-01	6.7E-01	2.2E+00		
Mn-54	8E-03 +/- 1.1E-02	1.1E-02	3.8E-02		
Nb-95	-7.9E-02 +/- 3.7E-02	3.7E-02	1.4E-01		
Ru-103	-8E-03 +/- 2.5E-02	2.5E-02	9.1E-02		
Ru-106	-6.2E-02 +/- 9.9E-02	9.9E-02	3.6E-01		
Sb-124	1.6E-02 +/- 3.1E-02	3.1E-02	1.2E-01		
Sb-125	-4E-03 +/- 2.4E-02	2.4E-02	8.6E-02		
Se-75	-1.2E-02 +/- 1.6E-02	1.6E-02	5.8E-02		
Zn-65	-3.6E-02 +/- 2.8E-02	2.9E-02	1.1E-01		
Zr-95	-5.9E-02 +/- 6.3E-02	6.3E-02	2.3E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-02 Client ID BMS-2700-005
Reference Date 01/28/03 Analysis Date 04/08/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.68E-01	+/- 4.3E-02	4.7E-02	1.5E-01		bc
Ag-108m	1.09E-02	+/- 7.0E-03	7.1E-03	2.3E-02		
Ag-110m	-2E-03	+/- 1.2E-02	1.2E-02	4.7E-02		
Ba-140	0E+00	+/- 1.3E+00	1.3E+00	4.6E+00		
Be-7	-1E-01	+/- 1.7E-01	1.7E-01	6.3E-01		
Ce-141	-1.5E-02	+/- 5.3E-02	5.3E-02	1.8E-01		
Ce-144	4.6E-02	+/- 5.6E-02	5.6E-02	1.9E-01		
Co-57	-4.4E-03	+/- 6.8E-03	6.8E-03	2.4E-02		
Co-58	-3.4E-02	+/- 1.6E-02	1.6E-02	6.8E-02		
Co-60	1.85E-02	+/- 8.5E-03	8.5E-03	2.5E-02	3.8E-02	
Cr-51	-3.4E-01	+/- 3.1E-01	3.1E-01	1.2E+00		
Cs-134	-9.7E-03	+/- 8.4E-03	8.4E-03	3.3E-02		
Cs-137	0E+00	+/- 8.9E-03	8.9E-03	3.3E-02	1.1E+00	
Fe-59	3.4E-02	+/- 4.5E-02	4.5E-02	1.6E-01		
I-131	1.1E+00	+/- 3.2E+00	3.2E+00	1.1E+01		
K-40	4.77E+00	+/- 3.2E-01	4.0E-01	3.5E-01		bc
La-140	8E-02	+/- 6.6E-01	6.6E-01	2.4E+00		
Mn-54	9E-03	+/- 1.1E-02	1.1E-02	3.8E-02		
Nb-95	-1.22E-01	+/- 4.1E-02	4.1E-02	1.7E-01		
Ru-103	2.3E-02	+/- 2.7E-02	2.7E-02	9.4E-02		
Ru-106	1.2E-02	+/- 7.5E-02	7.5E-02	2.8E-01		
Sb-124	1.1E-02	+/- 3.2E-02	3.2E-02	1.3E-01		
Sb-125	2.4E-02	+/- 2.4E-02	2.4E-02	8.1E-02		
Se-75	-4E-03	+/- 1.6E-02	1.6E-02	5.5E-02		
Zn-65	4.7E-02	+/- 5.1E-02	5.1E-02	1.7E-01		
Zr-95	-6.3E-02	+/- 6.4E-02	6.5E-02	2.4E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

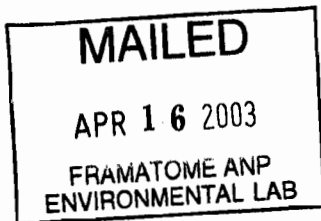
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-03 Client ID BMS-2700-009
Reference Date 01/28/03 Analysis Date 04/08/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	2.34E-01 +/- 2.4E-02	2.7E-02	9.1E-02		bc
Ag-108m	-4.9E-03 +/- 5.4E-03	5.4E-03	1.9E-02		
Ag-110m	-2E-03 +/- 1.2E-02	1.2E-02	4.1E-02		
Ba-140	1.8E-01 +/- 9.1E-01	9.1E-01	3.1E+00		
Be-7	2E-02 +/- 1.2E-01	1.2E-01	4.0E-01		
Ce-141	7.2E-02 +/- 3.5E-02	3.5E-02	1.1E-01		
Ce-144	-2.8E-02 +/- 4.1E-02	4.1E-02	1.4E-01		
Co-57	-9.1E-03 +/- 5.0E-03	5.1E-03	1.8E-02		
Co-58	-8E-03 +/- 1.2E-02	1.2E-02	4.3E-02		
Co-60	1.24E-02 +/- 7.7E-03	7.7E-03	2.5E-02	3.8E-02	
Cr-51	1.8E-01 +/- 2.6E-01	2.6E-01	8.8E-01		
Cs-134	-8E-04 +/- 6.4E-03	6.4E-03	2.2E-02		
Cs-137	4.8E-03 +/- 6.8E-03	6.8E-03	2.3E-02	1.1E+00	
Fe-59	-8.7E-02 +/- 4.4E-02	4.4E-02	1.6E-01		
I-131	3E+00 +/- 2.4E+00	2.4E+00	7.8E+00		
K-40	1.722E+01 +/- 3.5E-01	9.3E-01	2.3E-01		bc
La-140	4.2E-01 +/- 4.8E-01	4.8E-01	1.6E+00		
Mn-54	-7.3E-03 +/- 7.6E-03	7.6E-03	2.7E-02		
Nb-95	1.4E-02 +/- 2.4E-02	2.4E-02	8.2E-02		
Ru-103	2E-02 +/- 1.9E-02	1.9E-02	6.3E-02		
Ru-106	-8.4E-02 +/- 7.1E-02	7.1E-02	2.5E-01		
Sb-124	-7E-03 +/- 1.9E-02	1.9E-02	7.6E-02		
Sb-125	-1.7E-02 +/- 1.7E-02	1.7E-02	6.0E-02		
Se-75	7.2E-03 +/- 9.8E-03	9.8E-03	3.3E-02		
Zn-65	1E-02 +/- 2.0E-02	2.0E-02	6.8E-02		
Zr-95	-9.3E-02 +/- 3.5E-02	3.5E-02	1.3E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager

MAILED

APR 16 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/09/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-04 Client ID BMS-2700-013
Reference Date 01/28/03 Analysis Date 04/08/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	2.32E-01 +/- 3.4E-02	3.6E-02	1.1E-01		bc
Ag-108m	-4.9E-03 +/- 7.0E-03	7.1E-03	2.6E-02		
Ag-110m	-6E-03 +/- 1.4E-02	1.4E-02	5.1E-02		
Ba-140	-4E-01 +/- 1.2E+00	1.2E+00	4.4E+00		
Be-7	2.3E-01 +/- 1.6E-01	1.6E-01	5.2E-01		
Ce-141	-4.7E-02 +/- 6.0E-02	6.0E-02	2.1E-01		
Ce-144	8.2E-02 +/- 6.0E-02	6.0E-02	2.0E-01		
Co-57	-3.5E-03 +/- 8.2E-03	8.2E-03	2.9E-02		
Co-58	-1.3E-02 +/- 1.3E-02	1.3E-02	5.2E-02		
Co-60	-4.5E-03 +/- 6.7E-03	6.7E-03	2.8E-02	3.8E-02	
Cr-51	1.8E-01 +/- 3.1E-01	3.1E-01	1.1E+00		
Cs-134	-7.7E-03 +/- 8.9E-03	8.9E-03	3.3E-02		
Cs-137	6.5E-03 +/- 8.4E-03	8.4E-03	2.9E-02	1.1E+00	
Fe-59	3.8E-02 +/- 4.5E-02	4.5E-02	1.6E-01		
I-131	2E+00 +/- 3.2E+00	3.2E+00	1.1E+01		
K-40	2.13E+00 +/- 2.1E-01	2.3E-01	3.6E-01		bc
La-140	7.7E-01 +/- 6.6E-01	6.7E-01	2.2E+00		
Mn-54	-1.3E-02 +/- 1.0E-02	1.0E-02	4.0E-02		
Nb-95	-6.1E-02 +/- 3.4E-02	3.4E-02	1.3E-01		
Ru-103	-4.1E-02 +/- 2.6E-02	2.6E-02	1.0E-01		
Ru-106	-7.4E-02 +/- 8.9E-02	8.9E-02	3.4E-01		
Sb-124	0E+00 +/- 3.1E-02	3.1E-02	1.2E-01		
Sb-125	1.8E-02 +/- 2.3E-02	2.3E-02	8.0E-02		
Se-75	1.9E-02 +/- 1.6E-02	1.6E-02	5.4E-02		
Zn-65	4.2E-02 +/- 4.1E-02	4.1E-02	1.4E-01		
Zr-95	5.6E-02 +/- 5.8E-02	5.8E-02	1.9E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

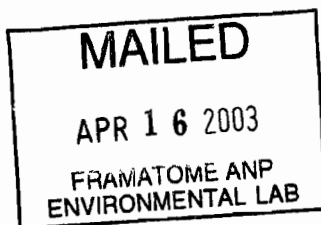
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/09/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-05 Client ID BMS-2700-038
Reference Date 01/28/03 Analysis Date 04/08/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.35E-01 +/- 4.0E-02	4.3E-02	1.2E-01		bc
Ag-108m	9.6E-03 +/- 7.4E-03	7.4E-03	2.5E-02		
Ag-110m	0E+00 +/- 1.2E-02	1.2E-02	4.6E-02		
Ba-140	-5E-01 +/- 1.3E+00	1.3E+00	4.7E+00		
Be-7	1.4E-01 +/- 1.5E-01	1.5E-01	5.3E-01		
Ce-141	-2.9E-02 +/- 5.9E-02	5.9E-02	2.1E-01		
Ce-144	-1.3E-01 +/- 6.8E-02	6.8E-02	2.5E-01		
Co-57	3.4E-03 +/- 8.8E-03	8.8E-03	3.0E-02		
Co-58	-2.9E-02 +/- 1.3E-02	1.3E-02	5.7E-02		
Co-60	5.1E-03 +/- 8.2E-03	8.2E-03	3.0E-02	3.8E-02	
Cr-51	1.5E-01 +/- 3.7E-01	3.7E-01	1.3E+00		
Cs-134	1.9E-02 +/- 3.7E-02	3.7E-02	1.3E-01		
Cs-137	2.3E-03 +/- 8.9E-03	8.9E-03	3.2E-02	1.1E+00	
Fe-59	2.8E-02 +/- 4.2E-02	4.2E-02	1.5E-01		
I-131	-1.8E+00 +/- 3.5E+00	3.5E+00	1.3E+01		
K-40	1.69E+00 +/- 1.9E-01	2.1E-01	3.7E-01		bc
La-140	1E+00 +/- 6.3E-01	6.3E-01	2.1E+00		
Mn-54	1.4E-03 +/- 9.5E-03	9.5E-03	3.5E-02		
Nb-95	-3.7E-02 +/- 3.5E-02	3.5E-02	1.3E-01		
Ru-103	3.8E-02 +/- 2.7E-02	2.7E-02	9.0E-02		
Ru-106	-6E-02 +/- 1.0E-01	1.0E-01	3.8E-01		
Sb-124	-1.8E-02 +/- 3.6E-02	3.6E-02	1.5E-01		
Sb-125	-1.4E-02 +/- 2.3E-02	2.3E-02	8.5E-02		
Se-75	7E-03 +/- 1.6E-02	1.6E-02	5.7E-02		
Zn-65	3.4E-02 +/- 4.8E-02	4.8E-02	1.6E-01		
Zr-95	-1.57E-01 +/- 6.2E-02	6.2E-02	2.6E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

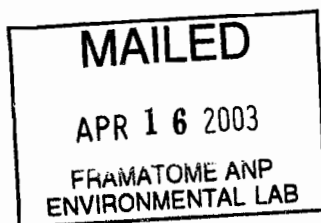
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/09/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-06 Client ID BMS-2700-040
Reference Date 01/28/03 Analysis Date 04/08/03

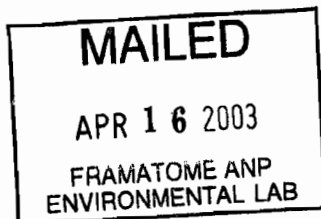
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	2.73E-01 +/- 3.8E-02	4.1E-02	8.4E-02		bc
Ag-108m	-3E-04 +/- 8.0E-03	8.0E-03	2.9E-02		
Ag-110m	-2E-03 +/- 1.2E-02	1.2E-02	4.8E-02		
Ba-140	1.2E+00 +/- 1.1E+00	1.1E+00	3.9E+00		
Be-7	0E+00 +/- 1.7E-01	1.7E-01	6.2E-01		
Ce-141	-3.6E-02 +/- 6.0E-02	6.0E-02	2.1E-01		
Ce-144	-6.2E-02 +/- 6.8E-02	6.8E-02	2.5E-01		
Co-57	1.77E-02 +/- 9.0E-03	9.0E-03	2.9E-02		
Co-58	-3.2E-02 +/- 1.4E-02	1.4E-02	6.3E-02		
Co-60	-5.7E-03 +/- 7.4E-03	7.4E-03	3.2E-02	3.8E-02	
Cr-51	-1.6E-01 +/- 3.5E-01	3.5E-01	1.3E+00		
Cs-134	-8E-03 +/- 4.1E-02	4.1E-02	1.4E-01		
Cs-137	-4.1E-03 +/- 8.4E-03	8.4E-03	3.2E-02	1.1E+00	
Fe-59	1.3E-02 +/- 4.7E-02	4.7E-02	1.7E-01		
I-131	-6E-01 +/- 3.3E+00	3.3E+00	1.2E+01		
K-40	1.41E+00 +/- 1.9E-01	2.1E-01	4.1E-01		bc
La-140	-1.6E-01 +/- 6.9E-01	6.9E-01	2.5E+00		
Mn-54	-1.6E-03 +/- 7.3E-03	7.3E-03	2.9E-02		
Nb-95	2.3E-02 +/- 3.3E-02	3.3E-02	1.2E-01		
Ru-103	-9E-03 +/- 2.5E-02	2.5E-02	9.5E-02		
Ru-106	9.1E-02 +/- 8.8E-02	8.8E-02	3.0E-01		
Sb-124	3.6E-02 +/- 3.6E-02	3.6E-02	1.3E-01		
Sb-125	-1.4E-02 +/- 2.5E-02	2.5E-02	9.2E-02		
Se-75	2.6E-02 +/- 1.5E-02	1.5E-02	5.0E-02		
Zn-65	-3.4E-02 +/- 2.5E-02	2.5E-02	1.0E-01		
Zr-95	1.2E-02 +/- 4.6E-02	4.6E-02	1.7E-01		

- Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-07 Client ID BMS-2700-058
Reference Date 01/28/03 Analysis Date 04/08/03

Product GAMMA SPECTROMETRY
Matrix Soil

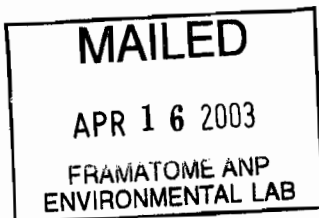
Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	2.98E-01 +/- 3.9E-02	4.1E-02	1.2E-01		bc
Ag-108m	-1.58E-02 +/- 7.2E-03	7.2E-03	2.9E-02		
Ag-110m	-1E-02 +/- 1.3E-02	1.3E-02	5.0E-02		
Ba-140	5E-01 +/- 1.1E+00	1.1E+00	4.1E+00		
Be-7	3E-02 +/- 1.5E-01	1.5E-01	5.5E-01		
Ce-141	-6.3E-02 +/- 6.2E-02	6.2E-02	2.2E-01		
Ce-144	-5.1E-02 +/- 7.4E-02	7.4E-02	2.6E-01		
Co-57	-3.3E-03 +/- 9.4E-03	9.4E-03	3.3E-02		
Co-58	2E-02 +/- 1.6E-02	1.6E-02	5.4E-02		
Co-60	-9.5E-03 +/- 7.7E-03	7.7E-03	3.3E-02	3.8E-02	
Cr-51	-6.7E-01 +/- 4.3E-01	4.3E-01	1.6E+00		
Cs-134	-2.9E-02 +/- 3.5E-02	3.5E-02	1.2E-01		
Cs-137	-1.14E-02 +/- 9.4E-03	9.4E-03	3.6E-02	1.1E+00	
Fe-59	0E+00 +/- 5.4E-02	5.4E-02	2.0E-01		
I-131	-4.3E+00 +/- 3.7E+00	3.7E+00	1.4E+01		
K-40	5.88E+00 +/- 3.2E-01	4.3E-01	3.7E-01		bc
La-140	-4.3E-01 +/- 7.5E-01	7.5E-01	2.8E+00		
Mn-54	-1.3E-03 +/- 8.9E-03	8.9E-03	3.3E-02		
Nb-95	3.1E-02 +/- 3.3E-02	3.3E-02	1.2E-01		
Ru-103	2.2E-02 +/- 2.4E-02	2.4E-02	8.4E-02		
Ru-106	5.4E-02 +/- 8.5E-02	8.5E-02	3.0E-01		
Sb-124	-2E-03 +/- 2.1E-02	2.1E-02	9.4E-02		
Sb-125	-1E-02 +/- 2.6E-02	2.6E-02	9.4E-02		
Se-75	1.6E-02 +/- 1.7E-02	1.7E-02	5.7E-02		
Zn-65	4.5E-02 +/- 4.0E-02	4.0E-02	1.3E-01		
Zr-95	-4.5E-02 +/- 4.8E-02	4.8E-02	1.8E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-08 Client ID BMS-2700-060
Reference Date 01/28/03 Analysis Date 04/08/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	1.94E-01	+/- 3.0E-02	3.1E-02	1.2E-01		bc
Ag-108m	-2.3E-03	+/- 6.3E-03	6.3E-03	2.3E-02		
Ag-110m	-1.8E-02	+/- 1.0E-02	1.0E-02	4.1E-02		
Ba-140	1E-01	+/- 1.2E+00	1.2E+00	4.3E+00		
Be-7	-3E-02	+/- 1.3E-01	1.3E-01	4.6E-01		
Ce-141	2.2E-02	+/- 4.7E-02	4.7E-02	1.6E-01		
Ce-144	8.3E-02	+/- 5.5E-02	5.5E-02	1.8E-01		
Co-57	-1.75E-02	+/- 6.3E-03	6.4E-03	2.3E-02		
Co-58	-2.2E-02	+/- 1.1E-02	1.1E-02	4.6E-02		
Co-60	1.26E-02	+/- 7.8E-03	7.9E-03	2.6E-02	3.8E-02	
Cr-51	2E-02	+/- 3.2E-01	3.2E-01	1.1E+00		
Cs-134	6.3E-03	+/- 7.5E-03	7.5E-03	2.6E-02		
Cs-137	1.51E-02	+/- 8.1E-03	8.2E-03	2.6E-02	1.1E+00	
Fe-59	-5E-03	+/- 4.0E-02	4.0E-02	1.5E-01		
I-131	-2.2E+00	+/- 3.0E+00	3.0E+00	1.1E+01		
K-40	5.78E+00	+/- 2.7E-01	4.0E-01	2.9E-01		bc
La-140	-5.6E-01	+/- 4.8E-01	4.8E-01	7.0E+00		
Mn-54	-1.09E-02	+/- 8.9E-03	8.9E-03	3.4E-02		
Nb-95	-2.8E-02	+/- 2.6E-02	2.6E-02	9.9E-02		
Ru-103	-3.4E-02	+/- 2.2E-02	2.2E-02	8.3E-02		
Ru-106	-1.3E-02	+/- 7.9E-02	7.9E-02	2.8E-01		
Sb-124	2.6E-02	+/- 2.2E-02	2.2E-02	7.8E-02		
Sb-125	1.8E-02	+/- 1.8E-02	1.8E-02	6.8E-02		
Se-75	0E+00	+/- 1.3E-02	1.3E-02	4.6E-02		
Zn-65	1.3E-02	+/- 3.7E-02	3.7E-02	1.3E-01		
Zr-95	-7.5E-02	+/- 3.4E-02	3.4E-02	1.3E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

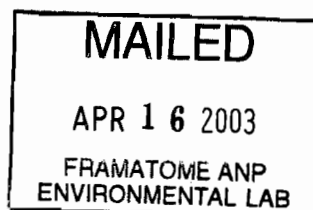
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-09 Client ID BMS-2700-090
Reference Date 02/25/03 Analysis Date 04/08/03

Product GAMMA SPECTROMETRY
Matrix Soil

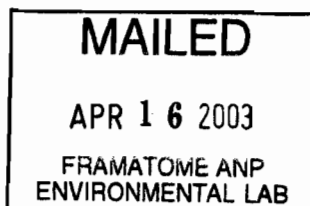
Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	2.6E-01	+/- 3.1E-02	3.4E-02	1.2E-01		bc
Ag-108m	-2.6E-03	+/- 6.7E-03	6.7E-03	2.4E-02		
Ag-110m	-1.51E-02	+/- 9.9E-03	1.0E-02	3.9E-02		
Ba-140	-9E-02	+/- 2.2E-01	2.2E-01	7.9E-01		
Be-7	-1.9E-01	+/- 1.0E-01	1.0E-01	3.8E-01		
Ce-141	3.4E-02	+/- 2.4E-02	2.4E-02	7.9E-02		
Ce-144	2.1E-02	+/- 4.0E-02	4.0E-02	1.4E-01		
Co-57	1.8E-03	+/- 5.2E-03	5.2E-03	1.8E-02		
Co-58	-1.6E-02	+/- 1.2E-02	1.2E-02	4.4E-02		
Co-60	-4E-03	+/- 7.7E-03	7.7E-03	3.0E-02	3.8E-02	
Cr-51	-1.3E-01	+/- 1.4E-01	1.4E-01	5.2E-01		
Cs-134	-1.69E-02	+/- 6.7E-03	6.7E-03	2.6E-02		
Cs-137	2.54E-01	+/- 1.7E-02	2.1E-02	3.3E-02	1.1E+00	bc
Fe-59	3.4E-02	+/- 3.4E-02	3.4E-02	1.2E-01		
I-131	3.2E-01	+/- 2.1E-01	2.1E-01	7.1E-01		
K-40	1.115E+01	+/- 3.7E-01	6.7E-01	3.0E-01		bc
La-140	1E-02	+/- 1.2E-01	1.2E-01	4.4E-01		
Mn-54	-5.1E-03	+/- 8.0E-03	8.0E-03	2.9E-02		
Nb-95	-3.2E-02	+/- 1.8E-02	1.8E-02	7.0E-02		
Ru-103	-4E-03	+/- 1.3E-02	1.3E-02	4.6E-02		
Ru-106	9E-02	+/- 7.0E-02	7.0E-02	2.3E-01		
Sb-124	-9E-03	+/- 1.8E-02	1.8E-02	7.5E-02		
Sb-125	-6E-03	+/- 2.0E-02	2.0E-02	7.3E-02		
Se-75	-4E-03	+/- 1.1E-02	1.1E-02	3.8E-02		
Zn-65	3.8E-02	+/- 4.0E-02	4.0E-02	1.3E-01		
Zr-95	-4.1E-02	+/- 4.0E-02	4.0E-02	1.5E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-10 Client ID BMS-2700-094
Reference Date 02/06/03 Analysis Date 04/08/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	2.62E-01 +/- 4.2E-02	4.4E-02	1.3E-01		bc
Ag-108m	2.2E-03 +/- 7.5E-03	7.5E-03	2.6E-02		
Ag-110m	7E-03 +/- 1.5E-02	1.5E-02	5.2E-02		
Ba-140	2.8E-01 +/- 7.2E-01	7.2E-01	2.6E+00		
Be-7	3E-02 +/- 1.6E-01	1.6E-01	5.5E-01		
Ce-141	6.4E-02 +/- 5.0E-02	5.0E-02	1.7E-01		
Ce-144	-4.3E-02 +/- 6.3E-02	6.3E-02	2.2E-01		
Co-57	9.9E-03 +/- 8.2E-03	8.2E-03	2.7E-02		
Co-58	-7E-03 +/- 1.5E-02	1.5E-02	5.5E-02		
Co-60	9E-04 +/- 9.6E-03	9.6E-03	3.5E-02	3.8E-02	
Cr-51	-2.8E-01 +/- 3.1E-01	3.1E-01	1.1E+00		
Cs-134	-4.3E-03 +/- 8.9E-03	8.9E-03	3.2E-02		
Cs-137	2.32E-02 +/- 8.5E-03	8.5E-03	2.5E-02	1.1E+00	
Fe-59	-4.7E-02 +/- 4.9E-02	4.9E-02	1.8E-01		
I-131	-1.1E+00 +/- 1.4E+00	1.4E+00	5.3E+00		
K-40	9.22E+00 +/- 3.7E-01	5.9E-01	3.1E-01		bc
La-140	-2.8E-01 +/- 4.8E-01	4.8E-01	1.7E+00		
Mn-54	-1.41E-02 +/- 9.4E-03	9.4E-03	3.7E-02		
Nb-95	-3E-03 +/- 3.2E-02	3.2E-02	1.1E-01		
Ru-103	2E-02 +/- 2.5E-02	2.5E-02	8.5E-02		
Ru-106	8.4E-02 +/- 8.3E-02	8.3E-02	2.8E-01		
Sb-124	-2.7E-02 +/- 2.5E-02	2.5E-02	1.1E-01		
Sb-125	-1.4E-02 +/- 2.1E-02	2.1E-02	7.8E-02		
Se-75	1.3E-02 +/- 1.6E-02	1.6E-02	5.3E-02		
Zn-65	5.7E-02 +/- 4.7E-02	4.7E-02	1.6E-01		
Zr-95	-3.2E-02 +/- 3.6E-02	3.6E-02	1.3E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager

MAILED

APR 16 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-11 Client ID BMS-2700-101
Reference Date 02/06/03 Analysis Date 04/08/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	2.41E-01	+/- 3.7E-02	3.9E-02	1.4E-01		bc
Ag-108m	8.9E-03	+/- 7.8E-03	7.8E-03	2.6E-02		
Ag-110m	4E-02	+/- 1.6E-02	1.6E-02	5.1E-02		
Ba-140	-8.1E-01	+/- 8.4E-01	8.4E-01	3.1E+00		
Be-7	6E-02	+/- 1.5E-01	1.5E-01	5.2E-01		
Ce-141	3.6E-02	+/- 4.7E-02	4.7E-02	1.6E-01		
Ce-144	1.12E-01	+/- 6.4E-02	6.4E-02	2.1E-01		
Co-57	7E-03	+/- 8.3E-03	8.3E-03	2.8E-02		
Co-58	-2.4E-02	+/- 1.6E-02	1.6E-02	6.0E-02		
Co-60	-7.9E-03	+/- 9.9E-03	9.9E-03	3.8E-02	3.8E-02	
Cr-51	-7E-02	+/- 3.2E-01	3.2E-01	1.1E+00		
Cs-134	1.24E-02	+/- 9.1E-03	9.1E-03	3.0E-02		
Cs-137	-3.8E-03	+/- 9.6E-03	9.6E-03	3.5E-02	1.1E+00	
Fe-59	3.7E-02	+/- 5.7E-02	5.7E-02	2.0E-01		
I-131	3E-01	+/- 1.5E+00	1.5E+00	5.4E+00		
K-40	1.615E+01	+/- 4.7E-01	9.3E-01	3.5E-01		bc
La-140	-3.2E-01	+/- 3.9E-01	3.9E-01	1.5E+00		
Mn-54	-1.7E-02	+/- 1.1E-02	1.1E-02	4.1E-02		
Nb-95	-1.7E-02	+/- 3.3E-02	3.3E-02	1.2E-01		
Ru-103	1.2E-02	+/- 2.4E-02	2.4E-02	8.3E-02		
Ru-106	6.2E-02	+/- 9.5E-02	9.5E-02	3.3E-01		
Sb-124	6E-03	+/- 2.7E-02	2.7E-02	1.0E-01		
Sb-125	-1.1E-02	+/- 2.3E-02	2.3E-02	8.5E-02		
Se-75	7E-03	+/- 1.7E-02	1.7E-02	5.7E-02		
Zn-65	-4.1E-02	+/- 3.2E-02	3.2E-02	1.2E-01		
Zr-95	-4.1E-02	+/- 3.8E-02	3.8E-02	1.4E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

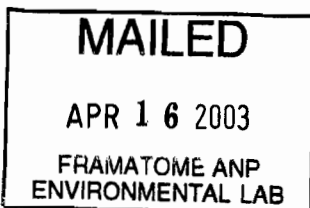
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-12 Client ID BMS-2700-112
Reference Date 01/28/03 Analysis Date 04/08/03

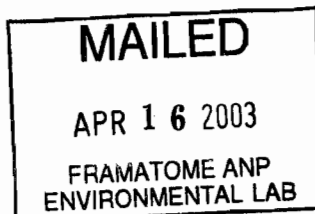
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.5E-01	+/- 3.4E-02	3.8E-02	1.1E-01		bc
Ag-108m	-4E-03	+/- 6.4E-03	6.4E-03	2.3E-02		
Ag-110m	1.1E-02	+/- 1.2E-02	1.2E-02	4.1E-02		
Ba-140	8E-01	+/- 1.2E+00	1.2E+00	4.2E+00		
Be-7	-1E-01	+/- 1.6E-01	1.6E-01	5.6E-01		
Ce-141	8.7E-02	+/- 5.6E-02	5.7E-02	1.9E-01		
Ce-144	-1.54E-01	+/- 6.0E-02	6.1E-02	2.2E-01		
Co-57	-2.8E-03	+/- 7.6E-03	7.6E-03	2.6E-02		
Co-58	-4E-03	+/- 1.4E-02	1.4E-02	5.0E-02		
Co-60	-1.45E-02	+/- 8.4E-03	8.4E-03	3.3E-02	3.8E-02	
Cr-51	7E-02	+/- 3.6E-01	3.6E-01	1.2E+00		
Cs-134	-4E-03	+/- 7.6E-03	7.6E-03	2.9E-02		
Cs-137	2.4E-03	+/- 7.5E-03	7.5E-03	2.6E-02	1.1E+00	
Fe-59	-3E-02	+/- 4.5E-02	4.5E-02	1.7E-01		
I-131	2E-01	+/- 2.9E+00	2.9E+00	1.0E+01		
K-40	1.176E+01	+/- 3.4E-01	6.8E-01	2.7E-01		bc
La-140	-3.5E-01	+/- 6.5E-01	6.5E-01	2.3E+00		
Mn-54	-1.06E-02	+/- 8.7E-03	8.7E-03	3.2E-02		
Nb-95	-2.2E-02	+/- 3.1E-02	3.1E-02	1.1E-01		
Ru-103	4E-02	+/- 2.5E-02	2.5E-02	8.3E-02		
Ru-106	-8E-03	+/- 7.8E-02	7.8E-02	2.8E-01		
Sb-124	2E-02	+/- 2.2E-02	2.2E-02	7.7E-02		
Sb-125	-1.1E-02	+/- 1.9E-02	1.9E-02	7.0E-02		
Se-75	2.5E-02	+/- 1.5E-02	1.5E-02	4.9E-02		
Zn-65	-1.3E-02	+/- 4.4E-02	4.4E-02	1.5E-01		
Zr-95	-5.9E-02	+/- 4.7E-02	4.7E-02	1.8E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-13 Client ID BMS-2700-140
Reference Date 01/28/03 Analysis Date 04/08/03

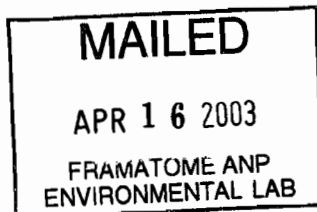
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	4.43E-01 +/- 3.0E-02	3.7E-02	9.7E-02		bc
Ag-108m	9E-04 +/- 5.5E-03	5.5E-03	1.9E-02		
Ag-110m	1.99E-02 +/- 9.9E-03	9.9E-03	3.2E-02		
Ba-140	2E-01 +/- 1.0E+00	1.0E+00	3.5E+00		
Be-7	-1E-01 +/- 1.1E-01	1.1E-01	4.0E-01		
Ce-141	2.3E-02 +/- 3.4E-02	3.4E-02	1.1E-01		
Ce-144	-5E-03 +/- 5.3E-02	5.3E-02	1.8E-01		
Co-57	-1.6E-02 +/- 7.1E-03	7.2E-03	2.5E-02		
Co-58	-3.2E-02 +/- 1.2E-02	1.2E-02	4.8E-02		
Co-60	9E-04 +/- 5.7E-03	5.7E-03	2.1E-02	3.8E-02	
Cr-51	2.2E-01 +/- 3.1E-01	3.1E-01	1.1E+00		
Cs-134	3.3E-03 +/- 7.1E-03	7.1E-03	2.4E-02		
Cs-137	3.7E-03 +/- 7.0E-03	7.0E-03	2.4E-02	1.1E+00	
Fe-59	-3.4E-02 +/- 3.5E-02	3.5E-02	1.3E-01		
I-131	8E-01 +/- 2.7E+00	2.7E+00	9.3E+00		
K-40	4.8E+00 +/- 2.1E-01	3.2E-01	2.4E-01		bc
La-140	-5.7E-01 +/- 4.7E-01	4.7E-01	1.8E+00		
Mn-54	4.5E-03 +/- 7.2E-03	7.2E-03	2.5E-02		
Nb-95	-2.9E-02 +/- 2.9E-02	2.9E-02	1.1E-01		
Ru-103	-1E-03 +/- 2.2E-02	2.2E-02	7.6E-02		
Ru-106	2.7E-02 +/- 7.4E-02	7.4E-02	2.6E-01		
Sb-124	5E-03 +/- 2.2E-02	2.2E-02	8.5E-02		
Sb-125	1E-03 +/- 1.8E-02	1.8E-02	6.2E-02		
Se-75	-2E-02 +/- 1.3E-02	1.3E-02	4.7E-02		
Zn-65	1.2E-02 +/- 3.5E-02	3.5E-02	1.2E-01		
Zr-95	-6.1E+00 +/- 2.7E+00	2.7E+00	8.9E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-14 Client ID BMS-2700-144
Reference Date 01/28/03 Analysis Date 04/08/03

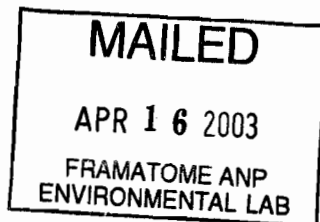
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	5.26E-01	+/- 2.8E-02	3.8E-02	9.2E-02		bc
Ag-108m	1.21E-02	+/- 5.9E-03	6.0E-03	1.9E-02		
Ag-110m	-7.3E-03	+/- 8.4E-03	8.5E-03	3.2E-02		
Ba-140	-5E-01	+/- 9.9E-01	9.9E-01	3.6E+00		
Be-7	-1.7E-01	+/- 1.4E-01	1.4E-01	5.0E-01		
Ce-141	3.7E-02	+/- 5.2E-02	5.2E-02	1.7E-01		
Ce-144	5.2E-02	+/- 6.0E-02	6.0E-02	2.0E-01		
Co-57	-8E-03	+/- 1.1E-02	1.1E-02	3.7E-02		
Co-58	8E-03	+/- 1.2E-02	1.2E-02	4.0E-02		
Co-60	-1.35E-02	+/- 6.1E-03	6.1E-03	2.5E-02	3.8E-02	
Cr-51	-1.9E-01	+/- 3.5E-01	3.5E-01	1.2E+00		
Cs-134	3.2E-02	+/- 2.6E-02	2.6E-02	8.5E-02		
Cs-137	6.1E-03	+/- 7.5E-03	7.5E-03	2.6E-02	1.1E+00	
Fe-59	0E+00	+/- 3.3E-02	3.3E-02	1.2E-01		
I-131	7E-01	+/- 3.0E+00	3.0E+00	1.0E+01		
K-40	3.08E+00	+/- 1.7E-01	2.3E-01	2.4E-01		bc
La-140	-1.9E-01	+/- 5.7E-01	5.7E-01	2.0E+00		
Mn-54	-3.5E-03	+/- 7.4E-03	7.4E-03	2.7E-02		
Nb-95	-7E-03	+/- 4.3E-02	4.3E-02	1.5E-01		
Ru-103	-6E-02	+/- 2.2E-02	2.2E-02	8.3E-02		
Ru-106	5.2E-02	+/- 6.6E-02	6.6E-02	2.2E-01		
Sb-124	-3.8E-02	+/- 2.3E-02	2.3E-02	1.0E-01		
Sb-125	1.7E-02	+/- 2.0E-02	2.0E-02	6.8E-02		
Se-75	3.1E-02	+/- 1.3E-02	1.3E-02	4.3E-02		
Zn-65	-4.4E-02	+/- 3.1E-02	3.1E-02	1.1E-01		
Zr-95	-5E-02	+/- 1.5E-01	1.5E-01	5.0E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-15 Client ID BMS-2700-145
Reference Date 01/28/03 Analysis Date 04/09/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.6E-01 +/- 3.9E-02	4.3E-02	1.4E-01		bc
Ag-108m	3.4E-03 +/- 7.7E-03	7.7E-03	2.7E-02		
Ag-110m	2E-03 +/- 1.4E-02	1.4E-02	5.2E-02		
Ba-140	-2E-01 +/- 1.5E+00	1.5E+00	5.4E+00		
Be-7	1E-01 +/- 1.7E-01	1.7E-01	5.8E-01		
Ce-141	0E+00 +/- 6.7E-02	6.7E-02	2.3E-01		
Ce-144	-1.03E-01 +/- 7.6E-02	7.7E-02	2.7E-01		
Co-57	1.07E-02 +/- 9.7E-03	9.7E-03	3.2E-02		
Co-58	-7E-03 +/- 1.7E-02	1.7E-02	6.3E-02		
Co-60	1.7E-03 +/- 8.4E-03	8.4E-03	3.1E-02	3.8E-02	
Cr-51	-3E-01 +/- 4.3E-01	4.3E-01	1.6E+00		
Cs-134	-1E-02 +/- 4.0E-02	4.0E-02	1.4E-01		
Cs-137	2.7E-03 +/- 9.2E-03	9.2E-03	3.3E-02	1.1E+00	
Fe-59	-1.8E-02 +/- 5.0E-02	5.0E-02	1.9E-01		
I-131	-3.4E+00 +/- 4.1E+00	4.1E+00	1.5E+01		
K-40	3.69E+00 +/- 2.6E-01	3.2E-01	3.5E-01		bc
La-140	-4.3E-01 +/- 7.5E-01	7.5E-01	2.8E+00		
Mn-54	-1.82E-02 +/- 9.6E-03	9.6E-03	3.9E-02		
Nb-95	3.2E-02 +/- 4.2E-02	4.2E-02	1.4E-01		
Ru-103	-7.5E-02 +/- 3.2E-02	3.2E-02	1.3E-01		
Ru-106	-3.4E-02 +/- 9.7E-02	9.7E-02	3.6E-01		
Sb-124	-1.8E-02 +/- 2.8E-02	2.8E-02	1.2E-01		
Sb-125	5E-03 +/- 2.6E-02	2.6E-02	9.1E-02		
Se-75	2.4E-02 +/- 1.8E-02	1.8E-02	5.9E-02		
Zn-65	-5.2E-02 +/- 5.3E-02	5.3E-02	1.9E-01		
Zr-95	-7.5E-02 +/- 7.0E-02	7.0E-02	2.6E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

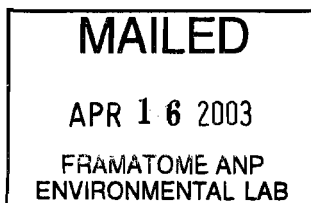
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/15/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/10/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-16 Client ID BMS-2700-164
Reference Date 01/28/03 Analysis Date 04/09/03

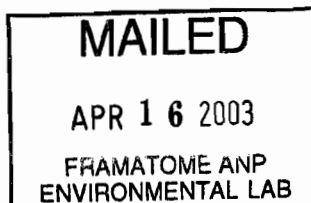
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.01E-01	+/- 3.7E-02	4.0E-02	1.1E-01		bc
Ag-108m	4E-04	+/- 8.0E-03	8.0E-03	2.9E-02		
Ag-110m	2.9E-02	+/- 1.4E-02	1.4E-02	5.7E-02		
Ba-140	1.9E+00	+/- 1.1E+00	1.1E+00	4.5E+00		
Be-7	1.3E-01	+/- 1.8E-01	1.9E-01	6.4E-01		
Ce-141	3.1E-02	+/- 6.1E-02	6.1E-02	2.1E-01		
Ce-144	8.5E-02	+/- 7.1E-02	7.1E-02	2.5E-01		
Co-57	2.48E-02	+/- 8.8E-03	8.9E-03	3.3E-02		
Co-58	2E-03	+/- 1.6E-02	1.6E-02	5.7E-02		
Co-60	4.7E-03	+/- 8.7E-03	8.7E-03	3.4E-02	3.8E-02	
Cr-51	2.6E-01	+/- 4.5E-01	4.5E-01	1.5E+00		
Cs-134	1.1E-02	+/- 3.4E-02	3.4E-02	1.2E-01		
Cs-137	7.9E-03	+/- 9.6E-03	9.6E-03	3.3E-02	1.1E+00	
Fe-59	4.1E-02	+/- 5.0E-02	5.0E-02	1.7E-01		
I-131	2.3E+00	+/- 3.5E+00	3.5E+00	1.2E+01		
K-40	6.97E+00	+/- 3.3E-01	4.8E-01	3.0E-01		bc
La-140	1.1E-01	+/- 7.5E-01	7.5E-01	2.7E+00		
Mn-54	1.3E-03	+/- 8.8E-03	8.8E-03	3.3E-02		
Nb-95	4E-03	+/- 3.5E-02	3.5E-02	1.3E-01		
Ru-103	1.2E-02	+/- 2.5E-02	2.5E-02	9.0E-02		
Ru-106	0E+00	+/- 9.6E-02	9.6E-02	3.5E-01		
Sb-124	2.2E-02	+/- 3.0E-02	3.0E-02	1.3E-01		
Sb-125	3.7E-02	+/- 2.6E-02	2.6E-02	8.6E-02		
Se-75	1.6E-02	+/- 1.6E-02	1.6E-02	5.7E-02		
Zn-65	2E-03	+/- 4.7E-02	4.7E-02	1.6E-01		
Zr-95	2E-02	+/- 6.0E-02	6.0E-02	2.1E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 4/15/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/04/03
Receipt Date 03/13/03

Duratek Inc

Lab. Sample No. L5185-17 Client ID BMS-SM-391
Reference Date 02/21/03 Analysis Date 04/04/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	6.9E-01 +/- 1.0E-01	1.1E-01	3.9E-01		bc
Ag-108m	2.6E-02 +/- 2.5E-02	2.5E-02	8.5E-02		
Ag-110m	2E-02 +/- 3.1E-02	3.1E-02	1.1E-01		
Ba-140	6.9E-01 +/- 7.1E-01	7.1E-01	2.4E+00		
Be-7	-1.1E-01 +/- 3.8E-01	3.8E-01	1.3E+00		
Ce-141	-2E-02 +/- 7.5E-02	7.5E-02	2.6E-01		
Ce-144	1E-02 +/- 1.5E-01	1.5E-01	5.1E-01		
Co-57	1.1E-02 +/- 1.8E-02	1.8E-02	6.3E-02		
Co-58	-4E-03 +/- 3.2E-02	3.2E-02	1.2E-01		
Co-60	9.59E-01 +/- 4.5E-02	6.6E-02	9.3E-02	3.8E-02	abc
Cr-51	4.3E-01 +/- 5.8E-01	5.8E-01	2.0E+00		
Cs-134	-3.8E-02 +/- 9.4E-02	9.4E-02	3.2E-01		
Cs-137	3.87E+00 +/- 1.0E-01	2.2E-01	1.1E-01	1.1E+00	bc
Fe-59	4E-03 +/- 8.8E-02	8.8E-02	3.2E-01		
I-131	1.9E-01 +/- 9.3E-01	9.3E-01	3.2E+00		
K-40	1.018E+01 +/- 6.4E-01	8.2E-01	8.0E-01		bc
La-140	3E-01 +/- 4.6E-01	4.6E-01	1.6E+00		
Mn-54	-6E-03 +/- 2.4E-02	2.4E-02	8.8E-02		
Nb-95	1.8E-02 +/- 5.0E-02	5.0E-02	1.8E-01		
Ru-103	-3.9E-02 +/- 4.6E-02	4.6E-02	1.7E-01		
Ru-106	4.7E-01 +/- 2.3E-01	2.3E-01	7.2E-01		
Sb-124	-6E-03 +/- 4.2E-02	4.2E-02	1.8E-01		
Sb-125	-1E-02 +/- 8.1E-02	8.1E-02	2.8E-01		
Se-75	1.6E-02 +/- 3.6E-02	3.6E-02	1.2E-01		
Zn-65	4.3E-02 +/- 6.2E-02	6.2E-02	2.2E-01		
Zr-95	-2E-02 +/- 1.0E-01	1.0E-01	3.6E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

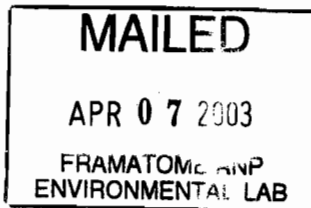
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/4/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/07/03
Receipt Date 03/13/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5185-18 Client ID BMS-SC-141
Reference Date 12/23/02 Analysis Date 04/04/03

Product GAMMA SPECTROMETRY
Matrix Smear

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/sample)		TPU 1 Sigma (pCi/sample)	Measured MDC (pCi/sample)	Required MDC (pCi/sample)	Flags
AcTh-228	-2.4E+00	+/- 3.9E+00	3.9E+00	1.5E+01		
Ag-108m	-1.87E+00	+/- 8.8E-01	8.8E-01	3.5E+00		
Ag-110m	-1.4E+00	+/- 2.1E+00	2.1E+00	8.2E+00		
Ba-133	1.57E+01	+/- 1.9E+00	2.0E+00	6.8E+00		bc
Ba-140	-1.12E+03	+/- 3.8E+02	3.8E+02	1.8E+03		
Be-7	4E+00	+/- 3.0E+01	3.0E+01	1.1E+02		
Ce-141	-1.6E+01	+/- 1.0E+01	1.0E+01	3.8E+01		
Ce-144	6.5E+00	+/- 6.0E+00	6.0E+00	2.0E+01		
Co-57	2.1E+00	+/- 1.1E+00	1.1E+00	3.4E+00		c
Co-58	-2.4E+00	+/- 2.7E+00	2.7E+00	1.1E+01		
Co-60	1E-01	+/- 1.7E+00	1.7E+00	6.5E+00		
Cr-51	-7E+01	+/- 1.4E+02	1.4E+02	4.8E+02		
Cs-134	-6E-01	+/- 1.2E+00	1.2E+00	4.7E+00		
Cs-137	9E-01	+/- 1.3E+00	1.3E+00	4.7E+00		
Fe-59	6E+00	+/- 1.1E+01	1.1E+01	4.0E+01		
I-131	6E+02	+/- 7.6E+03	7.6E+03	2.7E+04		
K-40	-1.8E+01	+/- 1.4E+01	1.4E+01	6.0E+01		
La-140	-1.29E+03	+/- 4.3E+02	4.4E+02	2.1E+03		
Mn-54	5.3E+00	+/- 1.8E+00	1.8E+00	5.3E+00		c
Na-22	4.06E+01	+/- 4.0E+00	4.5E+00	7.4E+00		bc
Nb-95	-2.8E+00	+/- 7.2E+00	7.2E+00	2.8E+01		
Ru-103	-7.9E+00	+/- 6.3E+00	6.3E+00	2.4E+01		
Ru-106	-2E+00	+/- 1.3E+01	1.3E+01	4.8E+01		
Sb-124	-2.4E+00	+/- 5.5E+00	5.5E+00	2.6E+01		
Sb-125	2E+00	+/- 2.7E+00	2.7E+00	9.3E+00		
Se-75	3.7E+00	+/- 2.6E+00	2.7E+00	8.8E+00		
Sr-85	6.07E+02	+/- 1.5E+01	3.4E+01	1.2E+01		bc
Y-88	7.27E+01	+/- 4.7E+00	5.9E+00	8.1E+00		bc
Zn-65	-1.9E+00	+/- 3.4E+00	3.4E+00	1.4E+01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/7/03

J.M. Raimondi
Sample Control Manager

MAILED

APR 08 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-01 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-003
Collect Start Date/Time: _____
Collect Stop Date/Time: 01-28-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG 5111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 836.9 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/10/03 1310 Det No.: 2 Spectrum No.: 0915202
Counted by: W
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5185-01	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2700-003	Matrix	: SO01 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 01/28/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	836.9		
Sample Weight-Dry	g			
Aliquot Weight	g	836.9		
FINAL WEIGHT	kg	.8369		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-01

Sample ID: None

Code: 0985202

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:40:04
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.68E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 6000 Sec
 Sample Size 8.37E-001 kg | Real Time 6003 Sec
 Collection Efficiency 1.0000 | Spc. File 0985202.spc

Detector #: 2 (Canberra sn 9923043 det# 2)

Energy(keV)= 0.85 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

 =====

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.33	94.57	76	36	58	496	1.13	
2	74.71	111.79	142	27	39	308	1.07	a
3	76.89	115.09	233	28	39	308	1.03	b
4	87.01	130.41	66	18	26	171	0.56	a
5	89.65	134.40	44	17	26	171	0.60	b
6	92.71	139.03	125	25	38	285	1.12	c
7	115.50	173.53	27	30	49	357	1.03	NET< CL
8	129.02	193.99	52	24	37	255	1.01	
9	143.73	216.25	-15	23	38	261	0.48	NET< CL
10	185.83	279.98	149	26	37	216	1.42	
11	238.50	359.70	460	26	24	121	1.07	a
12	241.51	364.25	101	23	35	193	1.71	b Wide Pk
13	269.94	407.28	45	17	26	119	1.21	
14	295.06	445.30	139	22	31	148	1.30	
15	327.98	495.13	7	15	24	109	0.18	NET< CL
16	338.15	510.52	98	19	27	113	1.66	
17	351.84	531.25	260	22	25	96	1.29	
18	510.28	771.05	106	18	24	82	1.92	a
19	511.73	773.24	63	16	24	82	1.86	b
20	583.04	881.18	154	17	20	60	1.40	
21	609.25	920.84	180	19	22	69	1.41	
22	726.92	1098.95	24	11	16	46	1.46	
23	860.69	1301.41	19	11	17	44	1.18	
24	911.11	1377.73	114	14	14	34	1.67	
25	968.76	1464.99	55	13	17	50	1.49	
26	1460.80	2209.71	725	28	10	18	2.28	
27	1764.44	2669.30	32	8	8	12	1.32	
28	2614.37	3955.70	65	8	3	1	2.52	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.33	76	36	58	42	36	59	NET<CL
2	74.71	142	27	39	117	27	40	
3	76.89	233	28	39	203	28	40	
4	87.01	66	18	26	48	18	27	
6	92.71	125	25	38	40	26	41	NET<CL
9	143.73	-15	23	38	-25	23	38	NET<CL
10	185.83	149	26	37	113	26	38	
11	238.50	460	26	24	431	26	26	
12	241.51	101	23	35	81	24	36	
14	295.06	139	22	31	101	22	32	
16	338.15	98	19	27	93	19	27	
17	351.84	260	22	25	196	22	28	
18	510.28	106	18	24	-6	18	30	NET<CL
20	583.04	154	17	20	143	17	21	
21	609.25	180	19	22	133	19	25	
22	726.92	24	11	16	22	11	16	
24	911.11	114	14	14	107	14	15	
25	968.76	55	13	17	54	13	18	
26	1460.80	725	28	10	713	28	12	
27	1764.44	32	8	8	25	8	10	
28	2614.37	65	8	3	57	8	5	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halfives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.71	117	Pb-214	43	5 of 7	100.00	1.50	
			Tl-208	6	6 of 9	95.73	0.96	
			Pb-212	100	4 of 6	95.97	1.46	
			Tl-208	11	6 of 9	95.73	0.96	
3	76.89	203	Pb-212	175	4 of 6	95.97	1.46	
			Tl-208	11	6 of 9	95.73	0.96	
			Pb-214	78	5 of 7	100.00	1.00	
4	87.01	48	Pb-212	95	4 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
5	89.65	44	Cd-109	. . . . .	1 of 1	100.00	1.50	
8	129.02	52	AcTh-228	38	5 of 36	66.75	1.17	
10	185.83	113	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
11	238.50	431	Pb-212	400	4 of 6	95.97	1.46	
12	241.51	81	Pb-214	52	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
13	269.94	45	AcTh-228	33	5 of 36	66.75	1.17	
14	295.06	101	Pb-214	124	5 of 7	100.00	1.50	
16	338.15	93	AcTh-228	90	5 of 36	72.46	1.22	
17	351.84	196	Pb-214	220	5 of 7	100.00	1.50	
19	511.73	23	Annul	. . . . .	1 of 1	100.00	1.50	Split
29	511.73	41	Tl-208	41	6 of 9	97.05	1.47	AutoAdd
20	583.04	143	Tl-208	154	6 of 9	100.00	1.50	
21	609.25	133	Bi-214	157	2 of 33	75.57	1.26	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
22	726.92	22	Bi-212	. . . . .	1 of 13	100.00	1.50	
23	860.69	19	Tl-208	16	6 of 9	100.00	1.50	
24	911.11	107	AcTh-228	108	5 of 36	72.46	1.22	
25	968.76	54	AcTh-228	63	5 of 36	75.55	1.26	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
26	1460.80	713	K-40	. . . . .	1 of 1	100.00	1.50	
27	1764.44	25	Bi-214	21	2 of 33	69.57	1.20	
28	2614.37	57	Tl-208	60	6 of 9	100.00	1.50	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-01

Sample ID: None

Code: 0985202

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Sampling Start:      01/28/2003 12:00:00 | Counting Start:      04/08/2003 13:40:04
Sampling Stop:       01/28/2003 12:00:00 | Decay Time. . . . . 1.68e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 6000 Sec
Sample Size . . . . . 8.37e-001 kg | Real Time . . . . . 6003 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 0985202.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 2 (Canberra sn 9923043 det# 2)
Efficiency File: WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[1.15E-02*En^-3.19E+00 + 2.16E+02*En^7.29E-01] 02/06/1998
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Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

MEASURED or MDA CONCENTRATIONS

N		Concentration				
Nuclide	ENERGY E (keV)	(pCi/kg	)	MDA	Flags	Notes
Pb-214	Average:x	2.87E+02	+ - 2.74E+01	. . . .		*
	74.81	I.D.	. . . .	. . . .
	241.98	4.56E+02	+ - 1.32E+02	4.16E+02		+
	295.21	2.54E+02	+ - 5.54E+01	1.69E+02		+
Pb-212	351.92	2.88E+02	+ - 3.24E+01	8.64E+01		+
	238.63	4.02E+02	+ - 2.44E+01	7.75E+01		+
	77.12	I.D.	. . . .	. . . .
Cd-109	87.30	I.D.	. . . .	. . . .
	88.03	I.D.	. . . .	. . . .
AcTh-228	Average:x	4.21E+02	+ - 4.00E+01	. . . .		*
	129.08	5.65E+02	+ - 2.58E+02	8.37E+02		+
	270.23	5.66E+02	+ - 2.19E+02	6.98E+02		+
	338.32	4.34E+02	+ - 8.89E+01	2.65E+02		+
	911.07	4.20E+02	+ - 5.44E+01	1.30E+02		+
	969.11	3.71E+02	+ - 8.90E+01	2.60E+02		+
Ra-226	186.22	1.22E+03	+ - 2.78E+02	8.63E+02		+
Annul	511.00	1.85E+01	+ - 2.34E+01	7.81E+01		+
Tl-208	Average:x	3.74E+02	+ - 3.45E+01	. . . .		*
	583.14	3.72E+02	+ - 4.55E+01	1.16E+02		+
	860.37	4.43E+02	+ - 2.59E+02	8.47E+02		+
	2614.66	3.75E+02	+ - 5.41E+01	8.88E+01		+
Bi-214	510.84	I.D.	. . . .	. . . .
	Average:x	2.39E+02	+ - 3.08E+01	. . . .		*
	609.31	2.33E+02	+ - 3.31E+01	9.08E+01		+
Bi-212	1764.49	2.76E+02	+ - 8.57E+01	2.45E+02		+
	727.17	1.74E+02	+ - 8.47E+01	2.72E+02		+
K-40	1460.81	1.03E+04	+ - 3.98E+02	3.82E+02		+
Am-241	59.54 N	7.79E+01	+ - 3.79E+01	1.23E+021		x lbase

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E	Concentration (pCi/kg)	MDA	Flags	Notes
Co-57	122.06	N	1.08E+01 +- 8.51E+00	2.83E+01		x
Ce-144	133.54	N	3.25E+01 +- 6.63E+01	2.30E+02r		x rbase
Ce-141	145.44	N	5.79E+01 +- 5.70E+01	1.90E+02		x
Se-75	264.65	N	1.23E+01 +- 1.63E+01	5.81E+01l		x lbase
Cr-51	320.08	N	1.50E+02 +- 4.14E+02	1.46E+03		x
I-131	364.48	N	2.90E+02 +- 3.59E+03	1.26E+04		x
Sb-125	427.89	N	4.49E+00 +- 2.42E+01	8.64E+01		x
Ag-108m	433.93	N	2.83E+00 +- 7.87E+00	2.74E+01		x
Be-7	477.59	N	2.92E+02 +- 1.65E+02	6.33E+02		x
La-140	487.03	N	1.08E+03 +- 6.69E+02	2.20E+03		x
Ru-103	497.08	N	8.11E+00 +- 2.49E+01	9.08E+01		x
Ba-140	537.32	N	5.73E+02 +- 1.45E+03	5.05E+03		x
Cs-134	604.70	N	3.97E+00 +- 8.96E+00	3.12E+01l		x lbase
Ru-106	621.84	N	6.24E+01 +- 9.94E+01	3.63E+02		x
Cs-137	661.65	N	9.33E+00 +- 1.02E+01	3.77E+01		x
Zr-95	724.18	N	5.85E+01 +- 6.27E+01	2.32E+02L		x LHROI
Nb-95	765.79	N	7.89E+01 +- 3.68E+01	1.44E+02		x
Co-58	810.76	N	3.75E+00 +- 1.62E+01	5.93E+01		x
Mn-54	834.83	N	8.36E+00 +- 1.11E+01	3.84E+01		x
Ag-110m	884.67	N	8.91E+00 +- 1.44E+01	5.39E+01		x
Fe-59	1099.22	N	7.22E+01 +- 5.13E+01	1.70E+02		x
Zn-65	1115.52	N	3.64E+01 +- 2.85E+01	1.08E+02		x
Co-60	1332.49	N	0.00E+00 +- 9.11E+00	3.40E+01		x
Sb-124	1691.02	N	1.56E+01 +- 3.13E+01	1.17E+02		x

MEASURED TOTAL: 1.34E+04 +- 9.42E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.33	94.57	42	36	59	497	1.13	Deleted
6	92.71	139.03	40	26	41	285	1.12	Deleted
7	115.50	173.53	27	30	49	357	1.03	Deleted
9	143.73	216.25	-25	23	38	261	0.48	Deleted
15	327.98	495.13	7	15	24	109	0.18	Deleted
18	510.28	771.05	-6	18	30	83	1.92	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
30	59.54	88.83	43N	21	33	215	1.08	LBase
31	122.06	183.46	26N	20	32	208	1.13	NET< CL
32	133.54	200.83	-10N	20	33	217	1.14	NET< CL
								RBase
33	145.44	218.85	20N	20	31	200	1.15	NET< CL
34	264.65	399.28	-11N	15	25	112	1.23	NET< CL
								LBase

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
35	320.08	483.17	-5N	14	23	98	1.27	NET< CL
36	364.48	550.37	-1N	12	20	77	1.30	NET< CL
37	427.89	646.35	-2N	11	18	59	1.35	NET< CL
38	433.93	655.49	4N	11	18	60	1.35	NET< CL
39	477.59	721.57	-18N	10	18	61	1.38	NET< CL
40	487.03	735.86	16N	10	15	41	1.39	
41	497.08	751.07	-3N	9	15	44	1.39	NET< CL
42	537.32	811.98	4N	11	18	54	1.42	NET< CL
43	604.70	913.96	5N	10	16	46	1.47	NET< CL
								LBase
44	621.84	939.90	-7N	10	18	53	1.48	NET< CL
45	661.65	1000.16	-9N	10	17	50	1.51	NET< CL
46	724.18	1094.80	-13N	14	24	55	1.55	NET< CL
								LHRoi
47	765.79	1157.78	-21N	10	17	56	1.58	NET< CL
48	810.76	1225.84	-2N	8	13	36	1.61	NET< CL
49	834.83	1262.27	7N	9	15	40	1.63	NET< CL
50	884.67	1337.71	-5N	8	14	35	1.66	NET< CL
51	1099.22	1662.44	11N	8	12	25	1.80	NET< CL
52	1115.52	1687.11	-12N	9	16	50	1.82	NET< CL
53	1332.49	2015.51	0N	6	10	18	1.96	NET< CL
54	1691.02	2558.16	2N	4	6	7	2.21	NET< CL

c:\seeker\Results\L5185-01.RES Analysis Results Saved.

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : None

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:40:04
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.68E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 6000 Sec
Sample Size 8.37E-01 kg | Real Time 6003 Sec
Collection Efficiency 1.0000 | Spectrum File 0985202.spc

Detector #: 2

Energy(keV)= 0.85 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 6.55E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[1.15e-02*En^-3.19e+00 + 2.16e+02*En^ 7.29e-01] 02/06/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-214	2.87E+02	2.74E+01	< 8.64E+01	4.12E+01	1.00E+00	MEAS +
Pb-212	4.02E+02	2.44E+01	< 7.75E+01	3.75E+01	1.00E+00	MEAS +
AcTh-228	4.21E+02	4.00E+01	< 1.30E+02	5.96E+01	1.00E+00	MEAS +
Ra-226	1.22E+03	2.78E+02	< 8.63E+02	4.17E+02	1.00E+00	MEAS +
Annil	1.85E+01	2.34E+01	< 7.81E+01	3.79E+01	8.76E-01	MEAS +
Tl-208	3.74E+02	3.45E+01	< 8.88E+01	3.55E+01	1.00E+00	MEAS +
Bi-214	2.39E+02	3.08E+01	< 9.08E+01	4.30E+01	1.00E+00	MEAS +
Bi-212	1.74E+02	8.47E+01	< 2.72E+02	1.25E+02	1.00E+00	MEAS +
K-40	1.03E+04	3.98E+02	< 3.82E+02	1.72E+02	1.00E+00	MEAS +
Am-241	7.79E+01	3.79E+01	< 1.23E+02	5.92E+01	1.00E+00	NET
Co-57	1.08E+01	8.51E+00	< 2.83E+01	1.36E+01	8.36E-01	NET
Ce-144	-3.25E+01	6.62E+01	< 2.30E+02	1.10E+02	8.43E-01	NET
Ce-141	5.80E+01	5.70E+01	< 1.90E+02	9.13E+01	2.24E-01	NET
Se-75	-1.23E+01	1.63E+01	< 5.81E+01	2.76E+01	6.67E-01	NET
Cr-51	-1.50E+02	4.14E+02	< 1.46E+03	6.90E+02	1.73E-01	NET
I-131	-2.90E+02	3.59E+03	< 1.26E+04	5.92E+03	2.37E-03	NET
Sb-125	-4.49E+00	2.42E+01	< 8.64E+01	4.02E+01	9.53E-01	NET
Ag-108m	2.83E+00	7.87E+00	< 2.74E+01	1.27E+01	9.99E-01	NET
Be-7	-2.92E+02	1.65E+02	< 6.33E+02	2.94E+02	4.03E-01	NET
La-140	1.08E+03	6.69E+02	< 2.20E+03	1.01E+03	2.24E-02	NET
Ru-103	-8.11E+00	2.49E+01	< 9.08E+01	4.17E+01	2.91E-01	NET
Ba-140	5.74E+02	1.45E+03	< 5.05E+03	2.35E+03	2.24E-02	NET
Cs-134	3.97E+00	8.96E+00	< 3.12E+01	1.44E+01	9.38E-01	NET
Ru-106	-6.24E+01	9.94E+01	< 3.63E+02	1.68E+02	8.76E-01	NET
Cs-137	-9.33E+00	1.01E+01	< 3.77E+01	1.75E+01	9.96E-01	NET
Zr-95	-5.85E+01	6.27E+01	< 2.32E+02	1.10E+02	4.68E-01	NET
Nb-95	-7.89E+01	3.68E+01	< 1.44E+02	6.69E+01	2.50E-01	NET
Co-58	-3.75E+00	1.62E+01	< 5.93E+01	2.70E+01	5.03E-01	NET
Mn-54	8.35E+00	1.11E+01	< 3.83E+01	1.76E+01	8.56E-01	NET
Ag-110m	-8.91E+00	1.44E+01	< 5.39E+01	2.45E+01	8.23E-01	NET
Fe-59	7.22E+01	5.13E+01	< 1.70E+02	7.63E+01	3.37E-01	NET
Zn-65	-3.64E+01	2.85E+01	< 1.08E+02	4.99E+01	8.20E-01	NET
Co-60	0.00E+00	9.11E+00	< 3.40E+01	1.50E+01	9.75E-01	NET
Sb-124	1.56E+01	3.13E+01	< 1.17E+02	4.81E+01	4.46E-01	NET

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-02 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-005
Collect Start Date/Time: _____
Collect Stop Date/Time: 01-28-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG 5111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 743.8 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/8/03 01341 Det No.: 3 Spectrum No.: 0985253
Counted by: 83
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5185-02
Client Id : BMS-2700-005
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 01/28/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	743.8		
Sample Weight-Dry	g			
Aliquot Weight	g	743.8		
FINAL WEIGHT	kg	.7438		
Container			WATS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-02 analyzed by emml461 on 04/08/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-02 ✓

Sample ID: NONE

Code: 0985203

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:41:04
Sampling Stop: 01/28/2003 12:00:00 | Decay Time: 1.68E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 6000 Sec
Sample Size 7.44E-001 kg | Real Time 6003 Sec
Collection Efficiency 1.0000 | Spc. File 0985203.spc

Detector #: 3 (Canberra sn 10923049 det#3)

Energy(keV)= 0.64 + 0.661*Ch +-1.68E-07*Ch^2 + 4.51E-11*Ch^3 04/08/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.21	94.61	10	25	41	310	0.23	NET< CL
2	74.92	112.31	152	23	32	227	0.97	a
3	77.04	115.50	255	25	32	227	0.91	b
4	83.82	125.76	23	18	28	176	0.92	a NET< CL
5	87.20	130.88	80	19	28	176	0.94	b
6	89.71	134.66	58	21	33	220	1.16	c
7	92.97	139.60	129	28	42	308	1.43	d Wide Pk
8	105.32	158.27	23	24	38	250	0.84	NET< CL
9	129.43	194.73	42	20	31	190	1.10	
10	185.68	279.78	81	21	31	180	1.08	
11	209.58	315.91	15	20	32	173	0.44	NET< CL
12	238.59	359.79	516	26	20	80	1.11	a
13	241.66	364.43	121	19	26	112	1.49	b Wide Pk
14	295.09	445.23	145	16	18	68	1.04	a
15	299.99	452.63	28	9	13	40	0.55	b
16	338.13	510.30	75	16	23	91	1.14	
17	351.92	531.16	212	19	20	68	1.20	
18	462.87	698.94	30	15	22	70	1.23	
19	510.98	771.70	117	16	19	59	2.18	Wide Pk
20	583.11	880.78	167	16	15	33	1.66	
21	609.19	920.21	164	16	17	40	1.38	
22	727.18	1098.66	22	10	15	30	0.91	
23	911.17	1376.92	80	12	13	32	1.62	
24	968.79	1464.07	36	11	14	36	1.12	
25	1120.37	1693.30	43	10	12	23	1.91	
26	1460.57	2207.74	255	16	7	7	1.94	
27	1764.11	2666.68	24	6	7	7	1.57	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	2614.61	3951.77	58	8	4	3	2.03	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY03.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.21	10	25	41	-16	25	42	NET<CL
2	74.92	152	23	32	134	23	33	
3	77.04	255	25	32	234	25	33	
4	83.82	23	18	28	8	18	29	NET<CL
5	87.20	80	19	28	69	19	29	
7	92.97	129	28	42	75	28	44	
10	185.68	81	21	31	53	21	33	
11	209.58	15	20	32	13	20	32	NET<CL
12	238.59	516	26	20	493	26	22	
13	241.66	121	19	26	112	19	26	
14	295.09	145	16	18	128	16	20	
16	338.13	75	17	23	69	17	24	
17	351.92	212	19	20	184	19	22	
18	462.87	30	15	22	30	15	23	
19	510.98	117	16	19	40	16	24	
20	583.11	167	16	15	160	16	16	
21	609.19	164	16	17	141	16	18	
23	911.17	80	12	13	75	12	14	
24	968.79	36	11	14	35	11	15	
25	1120.37	43	10	12	38	10	13	
26	1460.57	255	16	7	248	16	8	
27	1764.11	24	6	7	20	6	7	
28	2614.61	58	8	4	53	8	6	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.92	134	Pb-212	125	5 of 6	100.00	1.50	
			Pb-214	50	5 of 7	100.00	1.00	
			Tl-208	14	4 of 9	89.51	0.90	
3	77.04	234	Pb-212	217	5 of 6	100.00	1.50	
			Pb-214	88	5 of 7	100.00	1.00	
5	87.20	69	Pb-212	114	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	89.71	58	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
7	92.97	38	Th-234	. . . . .	1 of 2	58.74	1.09	Split
29	92.97	37	AcTh-228	37	6 of 36	68.82	1.19	AutoAdd
9	129.43	42	AcTh-228	32	6 of 36	80.78	1.31	
10	185.68	53	U-235	. . . . .	1 of 3	100.00	1.50	
			Ra-226	. . . . .	1 of 1	100.00	1.50	
12	238.59	493	Pb-212	463	5 of 6	100.00	1.50	
13	241.66	112	Pb-214	53	5 of 7	100.00	1.00	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
14	295.09	128	Pb-214	119	5 of 7	100.00	1.50	
15	299.99	28	Pb-212	31	5 of 6	100.00	1.50	
16	338.13	69	AcTh-228	70	6 of 36	80.78	1.31	
17	351.92	184	Pb-214	263	5 of 7	100.00	1.50	
18	462.87	30	AcTh-228	21	6 of 36	74.61	1.25	
			Sb-125	. . . . .	1 of 8	13.67	0.64	LowScore
19	510.98	40	Annil	. . . . .	1 of 1	100.00	1.50	
			Tl-208	45	4 of 9	91.56	1.42	
20	583.11	160	Tl-208	154	4 of 9	91.56	1.42	
21	609.19	141	Bi-214	165	3 of 33	88.51	1.39	
22	727.18	22	Bi-212	. . . . .	1 of 13	100.00	1.50	
23	911.17	75	AcTh-228	76	6 of 36	80.78	1.31	
24	968.79	35	AcTh-228	45	6 of 36	85.57	1.36	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
25	1120.37	38	Bi-214	28	3 of 33	77.60	1.28	
26	1460.57	248	K-40	. . . . .	1 of 1	100.00	1.50	
27	1764.11	20	Bi-214	21	3 of 33	88.51	1.39	
28	2614.61	53	Tl-208	54	4 of 9	91.56	1.42	

L5185-02 analyzed by emml461 on 04/08/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-02

Sample ID: NONE

Code: 0985203

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:41:04
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.68e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 6000 Sec
 Sample Size 7.44e-001 kg | Real Time 6003 Sec
 Collection Efficiency 1.0000 | Spectrum File 0985203.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Canberra sn 10923049 det#3)
 Efficiency File: WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[3.20E-02*En^-2.77E+00 + 2.47E+02*En^8.30E-01] 04/30/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
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MEASURED or MDA CONCENTRATIONS

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Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes
	ENERGY E (keV)					
Pb-212	Average:x	5.13E+02 +- 2.65E+01		*	
	74.81	I.D.			
	77.12	I.D.			
	87.30	I.D.			
	238.63	5.15E+02 +- 2.69E+01	4.78E+01		++	
	300.09	4.58E+02 +- 1.53E+02	4.62E+02		+	
Th-234	92.59	2.47E+02 +- 3.17E+02	1.05E+03		+	
AcTh-228	Average:x	3.68E+02 +- 4.28E+01		*	
	129.08	4.95E+02 +- 2.33E+02	7.56E+02		+	
	338.32	3.73E+02 +- 8.91E+01	2.68E+02		++	
	463.00	5.34E+02 +- 2.65E+02	8.60E+02		+	
	911.07	3.75E+02 +- 6.06E+01	1.53E+02		++	
	969.11	3.05E+02 +- 9.33E+01	2.79E+02		++	
	93.35	I.D.			
U-235	185.72	3.85E+01 +- 1.53E+01	4.91E+01		+	
Pb-214	Average:x	3.47E+02 +- 2.60E+01		*	
	241.98	7.01E+02 +- 1.20E+02	3.46E+02		++	
	295.21	3.66E+02 +- 4.70E+01	1.20E+02		++	
	351.92	3.12E+02 +- 3.23E+01	7.90E+01		++	
Annul	511.00	3.90E+01 +- 1.57E+01	5.03E+01		+	
Tl-208	Average:x	5.01E+02 +- 4.16E+01		*	
	583.14	5.04E+02 +- 5.01E+01	1.08E+02		++	
	2614.66	4.94E+02 +- 7.47E+01	1.29E+02		++	
Bi-214	Average:x	3.12E+02 +- 3.14E+01		*	
	609.31	3.02E+02 +- 3.50E+01	8.48E+01		++	
	1120.29	4.16E+02 +- 1.08E+02	3.08E+02		++	
	1764.49	3.05E+02 +- 9.58E+01	2.63E+02		++	

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes
Bi-212	727.17	2.14E+02 +- 9.83E+01	3.13E+02		+
K-40	1460.81	4.76E+03 +- 3.16E+02	3.53E+02		+
Am-241	59.54	N-3.49E+00 +- 2.91E+01	1.01E+02		x
Co-57	122.06	N-4.42E+00 +- 6.76E+00	2.40E+01		x
Ce-144	133.54	N 4.63E+01 +- 5.64E+01	1.90E+02r		x rbase
Ce-141	145.44	N-1.47E+01 +- 5.30E+01	1.84E+02		x
Ra-226	186.22	N 8.82E+02 +- 3.78E+02	1.18E+03R		x RHROI
Se-75	264.65	N-3.79E+00 +- 1.56E+01	5.53E+01		x
Cr-51	320.08	N-3.44E+02 +- 3.11E+02	1.18E+03		x
I-131	364.48	N 1.12E+03 +- 3.18E+03	1.12E+04		x
Sb-125	427.89	N 2.39E+01 +- 2.39E+01	8.12E+01		x
Ag-108m	433.93	N 1.09E+01 +- 7.03E+00	2.32E+01		x
Be-7	477.59	N-9.66E+01 +- 1.72E+02	6.35E+02		x
La-140	487.03	N 8.08E+01 +- 6.61E+02	2.38E+03		x
Ru-103	497.08	N 2.27E+01 +- 2.73E+01	9.40E+01		x
Ba-140	537.32	N 0.00E+00 +- 1.28E+03	4.63E+03		x
Cs-134	604.70	N-9.69E+00 +- 8.41E+00	3.26E+01l		x lbase
Ru-106	621.84	N 1.17E+01 +- 7.52E+01	2.76E+02		x
Cs-137	661.65	N 0.00E+00 +- 8.86E+00	3.25E+01		x
Zr-95	724.18	N-6.34E+01 +- 6.45E+01	2.45E+02L		x LHROI
Nb-95	765.79	N-1.22E+02 +- 4.10E+01	1.70E+02		x
Co-58	810.76	N-3.43E+01 +- 1.63E+01	6.84E+01		x
Mn-54	834.83	N 8.77E+00 +- 1.10E+01	3.84E+01		x
Ag-110m	884.67	N-1.69E+00 +- 1.21E+01	4.65E+01		x
Fe-59	1099.22	N 3.40E+01 +- 4.50E+01	1.60E+02		x
Zn-65	1115.52	N 4.71E+01 +- 5.11E+01	1.73E+02P		x PIC
Co-60	1332.49	N 1.85E+01 +- 8.49E+00	2.51E+01		x
Sb-124	1691.02	N 1.06E+01 +- 3.17E+01	1.27E+02		x

MEASURED TOTAL: 7.34E+03 +- 9.31E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.21	94.61	-16	25	42	310	0.23	Deleted
4	83.82	125.76	8	18	29	176	0.92	Deleted
6	89.71	134.66	58	21	33	220	1.16	Unknown
8	105.32	158.27	23	24	38	250	0.84	Deleted
11	209.58	315.91	13	20	32	173	0.44	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
30	59.54	89.05	-2N	17	28	168	0.90	NET< CL
31	122.06	183.58	-10N	15	25	137	0.95	NET< CL
32	133.54	200.94	13N	15	25	135	0.96	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
33	145.44	218.93	-5N	17	28	157	0.97	RBase NET< CL
34	186.22	280.60	74N	32	48	214	1.01	RHRoi
35	264.65	399.19	-3N	12	21	85	1.07	NET< CL
36	320.09	483.02	-10N	9	16	50	1.12	NET< CL
37	364.49	550.16	3N	9	15	47	1.16	NET< CL
38	427.90	646.06	9N	9	14	36	1.21	NET< CL
39	433.94	655.19	13N	8	13	29	1.21	
40	477.61	721.22	-5N	9	15	42	1.25	NET< CL
41	487.05	735.50	1N	8	13	33	1.26	NET< CL
42	497.10	750.70	7N	8	13	32	1.26	NET< CL
43	537.34	811.56	0N	8	13	32	1.30	NET< CL
44	604.73	913.48	-9N	8	14	35	1.35	NET< CL
45	621.88	939.41	1N	6	10	20	1.37	LBase NET< CL
46	661.70	999.62	0N	7	12	25	1.40	NET< CL
47	724.24	1094.21	-11N	12	21	33	1.45	NET< CL
48	765.73	1156.96	-26N	9	16	46	1.48	LHRoi NET< CL
49	810.71	1224.99	-14N	6	12	26	1.52	NET< CL
50	834.79	1261.40	6N	7	11	22	1.54	NET< CL
51	884.65	1336.80	-1N	5	9	16	1.58	NET< CL
52	1099.16	1661.23	4N	5	8	12	1.75	NET< CL
53	1115.47	1685.89	12N	13	21	38	1.77	NET< CL
54	1332.46	2014.03	10N	4	5	5	1.94	PIC
55	1690.98	2556.12	1N	3	5	4	2.23	NET< CL

L5185-02 analyzed by emml461 on 04/08/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:41:04
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.68E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 6000 Sec
Sample Size 7.44E-01 kg | Real Time 6003 Sec
Collection Efficiency 1.0000 | Spectrum File 0985203.spc

Detector #: 3

Energy(keV)= 0.64 + 0.661*Ch + -1.68E-07*Ch^2 + -1.68E-07*Ch^3 04/08/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 7.91E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[3.20e-02*En^-2.77e+00 + 2.47e+02*En^ 8.30e-01] 04/30/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-212	5.13E+02	2.65E+01	< 4.78E+01	2.25E+01	1.00E+00	MEAS +
Th-234	2.47E+02	3.17E+02	< 1.05E+03	5.18E+02	1.00E+00	MEAS +
AcTh-228	3.68E+02	4.28E+01	< 1.53E+02	6.98E+01	1.00E+00	MEAS +
U-235	3.85E+01	1.53E+01	< 4.90E+01	2.35E+01	1.00E+00	MEAS +
Pb-214	3.47E+02	2.60E+01	< 7.90E+01	3.72E+01	1.00E+00	MEAS +
Annil	3.90E+01	1.58E+01	< 5.03E+01	2.38E+01	8.76E-01	MEAS +
Tl-208	5.01E+02	4.16E+01	< 1.08E+02	4.98E+01	1.00E+00	MEAS +
Bi-214	3.12E+02	3.14E+01	< 8.48E+01	3.95E+01	1.00E+00	MEAS +
Bi-212	2.14E+02	9.83E+01	< 3.13E+02	1.43E+02	1.00E+00	MEAS +
K-40	4.76E+03	3.16E+02	< 3.53E+02	1.51E+02	1.00E+00	MEAS +
Am-241	-3.49E+00	2.91E+01	< 1.01E+02	4.81E+01	1.00E+00	NET
Co-57	-4.42E+00	6.76E+00	< 2.40E+01	1.14E+01	8.36E-01	NET
Ce-144	4.63E+01	5.64E+01	< 1.90E+02	9.03E+01	8.43E-01	NET
Ce-141	-1.47E+01	5.30E+01	< 1.84E+02	8.80E+01	2.24E-01	NET
Ra-226	8.82E+02	3.78E+02	< 1.18E+03	5.74E+02	1.00E+00	NET
Se-75	-3.79E+00	1.56E+01	< 5.53E+01	2.60E+01	6.67E-01	NET
Cr-51	-3.44E+02	3.11E+02	< 1.18E+03	5.42E+02	1.73E-01	NET
I-131	1.12E+03	3.18E+03	< 1.12E+04	5.13E+03	2.37E-03	NET
Sb-125	2.39E+01	2.39E+01	< 8.12E+01	3.70E+01	9.53E-01	NET
Ag-108m	1.09E+01	7.03E+00	< 2.32E+01	1.05E+01	9.99E-01	NET
Be-7	-9.66E+01	1.72E+02	< 6.35E+02	2.91E+02	4.03E-01	NET
La-140	8.08E+01	6.61E+02	< 2.38E+03	1.08E+03	2.24E-02	NET
Ru-103	2.27E+01	2.73E+01	< 9.40E+01	4.26E+01	2.91E-01	NET
Ba-140	0.00E+00	1.28E+03	< 4.63E+03	2.10E+03	2.24E-02	NET
Cs-134	-9.69E+00	8.41E+00	< 3.26E+01	1.48E+01	9.38E-01	NET
Ru-106	1.17E+01	7.52E+01	< 2.76E+02	1.22E+02	8.76E-01	NET
Cs-137	0.00E+00	8.86E+00	< 3.25E+01	1.46E+01	9.96E-01	NET
Zr-95	-6.34E+01	6.45E+01	< 2.45E+02	1.15E+02	4.68E-01	NET
Nb-95	-1.22E+02	4.10E+01	< 1.70E+02	7.84E+01	2.50E-01	NET
Co-58	-3.43E+01	1.63E+01	< 6.84E+01	3.08E+01	5.03E-01	NET
Mn-54	8.77E+00	1.10E+01	< 3.84E+01	1.71E+01	8.56E-01	NET
Ag-110m	-1.70E+00	1.21E+01	< 4.65E+01	2.02E+01	8.23E-01	NET
Fe-59	3.40E+01	4.50E+01	< 1.60E+02	6.85E+01	3.37E-01	NET

L5185-02 analyzed by emm1461 on 04/08/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Zn-65	4.71E+01	5.11E+01	< 1.73E+02	8.10E+01	8.20E-01	NET
Co-60	1.85E+01	8.49E+00	< 2.51E+01	9.90E+00	9.75E-01	NET
Sb-124	1.06E+01	3.17E+01	< 1.27E+02	4.92E+01	4.46E-01	NET

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-03
Client: Duratek Inc
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-009
Collect Start Date/Time: _____
Collect Stop Date/Time: 01-28-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

Count by Date: _____
(if required)
Delay Date: _____
(if required)

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 654.6 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/30/03 1722

Det No.: 4

Spectrum No.: 0986809

Counted by: EL

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5185-03	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2700-009	Matrix	: SO01 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 01/28/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	654.6		
Sample Weight-Dry	g			
Aliquot Weight	g	654.6		
FINAL WEIGHT	kg	.6546		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-03 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986804

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:21:42
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 20000 Sec
 Sample Size 6.55E-001 kg | Real Time 20005 Sec
 Collection Efficiency 1.0000 | Spc. File 0986804.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.80 + 0.662*Ch + -1.39E-07*Ch^2 + 3.67E-11*Ch^3 04/09/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.79	80.10	-8174	492	822	8715	846.22	NET< CL Wide Pk
2	59.88	89.31	61	39	62	720	1.20	a NET< CL
3	63.71	95.10	106	25	38	360	0.65	b
4	75.18	112.44	265	39	58	675	1.00	a
5	77.51	115.96	451	37	49	540	0.92	b
6	84.92	127.15	169	52	84	1034	1.94	a Wide Pk
7	87.70	131.37	180	35	53	574	1.09	b
8	90.38	135.42	120	25	37	344	0.54	c
9	93.22	139.71	344	41	61	689	1.25	d
10	105.50	158.26	-22	36	60	670	0.76	NET< CL
11	123.74	185.84	-19	34	56	585	0.41	NET< CL
12	144.11	216.64	-17	30	50	497	0.55	NET< CL
13	154.60	232.50	35	25	40	350	0.90	a NET< CL
14	159.56	240.00	10	16	25	175	0.54	b NET< CL
15	186.29	280.40	142	40	63	629	0.84	
16	209.66	315.73	79	30	46	396	1.10	
17	238.95	360.02	776	36	39	303	0.98	a
18	242.10	364.78	175	30	44	364	1.38	b
19	270.63	407.91	51	28	44	331	1.18	
20	295.61	445.67	202	24	32	207	1.05	a
21	300.20	452.61	37	15	22	124	0.65	b
22	338.82	510.99	139	27	40	274	0.90	
23	352.31	531.39	388	31	39	247	1.42	
24	463.54	699.57	45	20	31	159	1.17	
25	511.42	771.96	338	29	37	200	2.53	Wide Pk
26	583.73	881.28	290	26	33	160	1.35	
27	609.69	920.54	318	26	32	151	1.72	

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	727.62	1098.84	21	20	32	155	0.67	NET< CL
29	767.93	1159.79	-3	16	27	134	0.26	NET< CL
30	911.50	1376.87	173	19	23	93	1.54	
31	969.27	1464.21	33	17	27	132	0.70	
32	1120.98	1693.60	81	20	29	136	2.24	
33	1227.89	1855.23	3	20	33	180	0.16	NET< CL
34	1461.16	2207.90	2598	52	13	30	2.09	
35	1764.64	2666.67	39	10	13	27	1.88	
36	2615.23	3951.82	108	11	8	10	2.37	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
3	63.71	106	25	38	9	26	43	NET<CL
4	75.18	265	39	58	210	39	60	
5	77.51	451	37	49	384	37	52	
6	84.92	169	52	84	123	53	85	
7	87.70	180	35	53	152	35	55	
8	90.38	120	25	37	102	26	39	
9	93.22	344	42	61	122	42	67	
12	144.11	-17	30	50	-35	31	51	NET<CL
15	186.29	142	40	63	43	41	66	NET<CL
16	209.66	79	30	46	73	30	47	
17	238.95	776	36	39	693	37	42	
18	242.10	175	30	44	141	30	46	
20	295.61	202	24	32	151	25	35	
22	338.82	139	27	40	125	28	41	
23	352.31	388	31	39	294	32	44	
24	463.54	45	20	31	41	20	31	
25	511.42	338	29	37	45	30	48	NET<CL
26	583.73	290	26	33	264	27	35	
27	609.69	319	26	32	252	27	36	
30	911.50	173	19	23	158	19	24	
31	969.27	33	17	27	29	17	27	
32	1120.98	81	20	29	67	20	30	
34	1461.16	2598	52	13	2577	52	16	
35	1764.64	39	10	13	29	10	15	
36	2615.23	108	11	8	88	12	11	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
4	75.18	210	Pb-212	171	5 of 6	100.00	1.50	
			Pb-214	67	5 of 7	100.00	1.00	
			Tl-208	22	4 of 9	80.91	0.81	
5	77.51	80	Pb-214	120	5 of 7	100.00	1.00	Split
38	77.51	305	Pb-212	305	5 of 6	100.00	1.50	AutoAdd
6	84.92	123	Tl-208	11	4 of 9	80.91	1.31	
7	87.70	152	Pb-212	163	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
8	90.38	102	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
9	93.22	59	Th-234	. . . . .	1 of 2	100.00	1.50	Split
37	93.22	63	AcTh-228	63	7 of 36	74.20	1.24	AutoAdd
16	209.66	73	AcTh-228	67	7 of 36	83.55	1.34	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
17	238.95	693	Pb-212	816	5 of 6	100.00	1.50	
18	242.10	141	Pb-214	75	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
19	270.63	51	AcTh-228	45	7 of 36	83.55	1.34	
20	295.61	151	Pb-214	184	5 of 7	100.00	1.50	
21	300.20	37	Pb-212	47	5 of 6	100.00	1.50	
22	338.82	125	AcTh-228	120	7 of 36	87.10	1.37	
23	352.31	294	Pb-214	319	5 of 7	100.00	1.50	
24	463.54	41	AcTh-228	36	7 of 36	83.55	1.34	
			Sb-125	. . . . .	1 of 8	13.67	0.64	LowScore
26	583.73	264	Tl-208	247	4 of 9	82.21	1.32	
27	609.69	252	Bi-214	244	3 of 33	93.94	1.44	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
30	911.50	158	AcTh-228	113	7 of 36	83.55	1.34	
31	969.27	29	AcTh-228	89	7 of 36	100.00	1.00	
32	1120.98	67	Bi-214	49	3 of 33	84.53	1.35	
34	1461.16	2577	K-40	. . . . .	1 of 1	100.00	1.50	
35	1764.64	29	Bi-214	38	3 of 33	100.00	1.50	
36	2615.23	88	Tl-208	95	4 of 9	82.21	1.32	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-03

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986804

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:21:42
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 20000 Sec
 Sample Size 6.55e-001 kg | Real Time 20005 Sec
 Collection Efficiency 1.0000 | Spectrum File 0986804.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 4 (Canberra sn 10923050 det#4)
 Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
 Eff.=1/[1.58E-02*En^-3.09E+00 + 2.56E+02*En^7.93E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5185-03.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	N		Concentration	MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
Pb-212	Average:	x	2.67E+02 +- 1.41E+01	. . . .	*	. . . . .
	74.81		I.D. . . . .	. . . .		. . . . .
	77.12		I.D. . . . .	. . . .		. . . . .
	87.30		I.D. . . . .	. . . .		. . . . .
	238.63		2.68E+02 +- 1.42E+01	3.38E+01	++	. . . . .
	300.09		2.23E+02 +- 8.96E+01	2.85E+02	+	. . . . .
Pb-214	Average:	x	1.82E+02 +- 1.53E+01	. . . .	*	. . . . .
	77.11		I.D. . . . .	. . . .		. . . . .
	241.98		3.28E+02 +- 7.06E+01	2.20E+02	++	. . . . .
	295.21		1.59E+02 +- 2.60E+01	7.72E+01	++	. . . . .
	351.92		1.83E+02 +- 1.96E+01	5.60E+01	++	. . . . .
Tl-208	Average:	x	2.91E+02 +- 2.33E+01	. . . .	*	. . . . .
	84.90		I.D. . . . .	. . . .		. . . . .
	583.14		3.00E+02 +- 3.02E+01	8.19E+01	++	. . . . .
	2614.66		2.79E+02 +- 3.66E+01	7.89E+01	++	. . . . .
Th-234	92.59		1.43E+02 +- 1.78E+02	5.88E+02	+	. . . . .
Ra-226	186.22	N	1.92E+02 +- 1.80E+02	5.98E+02	x	. . . . .
AcTh-228	Average:	x	2.33E+02 +- 2.41E+01	. . . .	*	. . . . .
	209.28		2.60E+02 +- 1.07E+02	3.47E+02	+	. . . . .
	270.23		2.66E+02 +- 1.45E+02	4.77E+02	+	. . . . .
	338.32		2.46E+02 +- 5.43E+01	1.68E+02	++	. . . . .
	463.00		2.68E+02 +- 1.31E+02	4.28E+02	+	. . . . .
	911.07		2.80E+02 +- 3.43E+01	9.07E+01	++	. . . . .
	969.11		8.84E+01 +- 5.41E+01	1.78E+02	+	. . . . .
	93.35		I.D. . . . .	. . . .		. . . . .
Bi-214	Average:	x	1.93E+02 +- 1.87E+01	. . . .	*	. . . . .
	609.31		1.94E+02 +- 2.07E+01	5.70E+01	++	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E		(pCi/kg)				
	(keV)							
	1120.29		2.57E+02 +- 7.62E+01		2.39E+02	++	.	.
	1764.49		1.53E+02 +- 5.43E+01		1.67E+02	+	.	.
K-40	1460.81		1.72E+04 +- 3.45E+02		2.26E+02	++	.	.
Am-241	59.54	N	1.63E+01 +- 2.38E+01		7.93E+01	x	.	.
Co-57	122.06	N-9.12E+00 +- 5.03E+00			1.75E+01	x	.	.
Ce-144	133.54	N-2.78E+01 +- 4.10E+01			1.40E+02	x	.	.
Ce-141	145.44	N 7.18E+01 +- 3.51E+01			1.14E+02	x	.	.
Se-75	264.65	N 7.17E+00 +- 9.81E+00			3.30E+01	x	.	.
Cr-51	320.08	N 1.78E+02 +- 2.62E+02			8.81E+02	x	.	.
I-131	364.48	N 3.02E+03 +- 2.36E+03			7.82E+03	x	.	.
Sb-125	427.89	N-1.74E+01 +- 1.70E+01			6.01E+01	x	.	.
Ag-108m	433.93	N-4.86E+00 +- 5.37E+00			1.89E+01	x	.	.
Be-7	477.59	N 2.11E+01 +- 1.15E+02			3.96E+02	x	.	.
La-140	487.03	N 4.15E+02 +- 4.82E+02			1.62E+03	x	.	.
Ru-103	497.08	N 2.00E+01 +- 1.90E+01			6.35E+01	x	.	.
Ba-140	537.32	N 1.75E+02 +- 9.07E+02			3.12E+03	x	.	.
Cs-134	604.70	N-7.75E-01 +- 6.38E+00			2.21E+011	x	lbase	.
Ru-106	621.84	N-8.37E+01 +- 7.08E+01			2.52E+02	x	.	.
Cs-137	661.65	N 4.79E+00 +- 6.79E+00			2.30E+01	x	Y.	.
Zr-95	724.18	N-9.28E+01 +- 3.51E+01			1.29E+02	x	.	.
Nb-95	765.79	N 1.40E+01 +- 2.39E+01			8.17E+01	x	.	.
Co-58	810.76	N-7.73E+00 +- 1.20E+01			4.29E+01	x	.	.
Mn-54	834.83	N-7.29E+00 +- 7.59E+00			2.73E+01	x	.	.
Ag-110m	884.67	N-1.60E+00 +- 1.17E+01			4.10E+01	x	.	.
Fe-59	1099.22	N-8.71E+01 +- 4.38E+01			1.62E+02	x	.	.
Zn-65	1115.52	N 9.70E+00 +- 1.98E+01			6.79E+011	x	lbase	.
Co-60	1332.49	N 1.24E+01 +- 7.70E+00			2.53E+01	x	Y.	.
Sb-124	1691.02	N-7.35E+00 +- 1.94E+01			7.61E+01	x	.	.

MEASURED TOTAL: 1.85E+04 +- 6.18E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.79	80.10	-8174	492	822	8715	846.22	Deleted
2	59.88	89.31	61	39	62	720	1.20	Deleted
3	63.71	95.10	9	26	43	360	0.65	Deleted
8	90.38	135.42	102	26	39	345	0.54	Unknown
10	105.50	158.26	-22	36	60	670	0.76	Deleted
11	123.74	185.84	-19	34	56	585	0.41	Deleted
12	144.11	216.64	-35	31	51	497	0.55	Deleted
13	154.60	232.50	35	25	40	350	0.90	Deleted
14	159.56	240.00	10	16	25	175	0.54	Deleted
25	511.42	771.96	45	30	48	200	2.53	Deleted
28	727.62	1098.84	22	20	32	155	0.67	Deleted
29	767.93	1159.79	-3	16	27	134	0.26	Deleted
33	1227.89	1855.23	3	20	33	180	0.16	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	186.29	280.40	43N	41	66	629	0.84	NET< CL
39	59.54	88.79	23N	33	54	589	0.98	NET< CL
40	122.06	183.30	-54N	30	50	507	1.04	NET< CL
41	133.54	200.66	-21N	30	50	508	1.05	NET< CL
42	145.44	218.65	61N	30	47	450	1.06	
43	264.65	398.87	15N	21	34	232	1.17	NET< CL
44	320.08	482.67	14N	21	33	205	1.21	NET< CL
45	364.49	549.80	24N	19	30	163	1.25	NET< CL
46	427.90	645.68	-18N	18	30	164	1.30	NET< CL
47	433.94	654.81	-16N	18	30	164	1.30	NET< CL
48	477.60	720.83	3N	16	27	133	1.34	NET< CL
49	487.04	735.10	14N	16	26	125	1.34	NET< CL
50	497.10	750.30	17N	16	26	121	1.35	NET< CL
51	537.34	811.14	3N	16	25	119	1.38	NET< CL
52	604.73	913.03	-2N	16	27	126	1.43	NET< CL
								LBase
53	621.87	938.95	-20N	17	29	139	1.44	NET< CL
54	661.69	999.15	11N	15	24	100	1.47	NET< CL
55	724.23	1093.71	-46N	18	31	163	1.52	NET< CL
56	765.85	1156.64	8N	14	22	99	1.55	NET< CL
57	810.70	1224.45	-9N	13	23	101	1.58	NET< CL
58	834.77	1260.85	-14N	14	24	115	1.60	NET< CL
59	884.63	1336.23	-2N	15	24	108	1.64	NET< CL
60	1099.26	1660.75	-29N	15	26	121	1.79	NET< CL
61	1115.56	1685.41	7N	14	23	99	1.80	NET< CL
								LBase
62	1332.53	2013.44	18N	11	17	52	1.95	
63	1690.97	2555.31	-2N	5	9	15	2.20	NET< CL

 S E E K E R A N A L Y S I S S U M M A R Y
 Environmental Laboratory
 Environmental Gamma Isotopic Analysis

 Sample ID : SOIL/SEDI Duratek Inc

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:21:42
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69E+03 Hrs
 Buildup Time. 0.00E+00 Hrs | Live Time 20000 Sec
 Sample Size 6.55E-01 kg | Real Time 20005 Sec
 Collection Efficiency 1.0000 | Spectrum File 0986804.spc

Detector #: 4
 Energy(keV)= 0.80 + 0.662*Ch + -1.39E-07*Ch^2 + -1.39E-07*Ch^3 04/09/2003
 FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003
 Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
 Eff.=1/[1.58e-02*En^-3.09e+00 + 2.56e+02*En^ 7.93e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5185-03.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	2.67E+02	1.41E+01	< 3.38E+01	1.64E+01	1.00E+00	MEAS +	YES
Pb-214	1.82E+02	1.53E+01	< 5.60E+01	2.71E+01	1.00E+00	MEAS +	YES
Tl-208	2.91E+02	2.33E+01	< 7.89E+01	3.52E+01	1.00E+00	MEAS +	YES
Th-234	1.42E+02	1.78E+02	< 5.88E+02	2.91E+02	1.00E+00	MEAS +	YES
Ra-226	1.92E+02	1.80E+02	< 5.98E+02	2.93E+02	1.00E+00	NET	YES
AcTh-228	2.34E+02	2.41E+01	< 9.07E+01	4.30E+01	1.00E+00	MEAS +	YES
Bi-214	1.93E+02	1.87E+01	< 5.70E+01	2.75E+01	1.00E+00	MEAS +	YES
K-40	1.72E+04	3.45E+02	< 2.26E+02	1.04E+02	1.00E+00	MEAS +	YES
Am-241	1.63E+01	2.38E+01	< 7.93E+01	3.87E+01	1.00E+00	NET	YES
Co-57	-9.12E+00	5.03E+00	< 1.75E+01	8.52E+00	8.35E-01	NET	YES
Ce-144	-2.78E+01	4.10E+01	< 1.40E+02	6.81E+01	8.42E-01	NET	YES
Ce-141	7.18E+01	3.50E+01	< 1.14E+02	5.56E+01	2.23E-01	NET	YES
Se-75	7.17E+00	9.81E+00	< 3.30E+01	1.59E+01	6.66E-01	NET	YES
Cr-51	1.78E+02	2.62E+02	< 8.82E+02	4.24E+02	1.72E-01	NET	YES
I-131	3.02E+03	2.36E+03	< 7.82E+03	3.74E+03	2.33E-03	NET	YES
Sb-125	-1.74E+01	1.70E+01	< 6.02E+01	2.88E+01	9.53E-01	NET	YES
Ag-108m	-4.86E+00	5.37E+00	< 1.89E+01	9.05E+00	9.99E-01	NET	YES
Be-7	2.11E+01	1.15E+02	< 3.96E+02	1.89E+02	4.02E-01	NET	YES
La-140	4.15E+02	4.82E+02	< 1.62E+03	7.71E+02	2.21E-02	NET	YES
Ru-103	2.00E+01	1.90E+01	< 6.35E+01	3.01E+01	2.90E-01	NET	YES
Ba-140	1.75E+02	9.07E+02	< 3.12E+03	1.48E+03	2.21E-02	NET	YES
Cs-134	-7.75E-01	6.38E+00	< 2.21E+01	1.05E+01	9.37E-01	NET	YES
Ru-106	-8.38E+01	7.08E+01	< 2.52E+02	1.20E+02	8.76E-01	NET	YES
Cs-137	4.79E+00	6.78E+00	< 2.30E+01	1.09E+01	9.96E-01	NET	YES
Zr-95	-9.28E+01	3.51E+01	< 1.29E+02	6.20E+01	4.67E-01	NET	YES
Nb-95	1.40E+01	2.39E+01	< 8.17E+01	3.85E+01	2.49E-01	NET	YES
Co-58	-7.72E+00	1.20E+01	< 4.29E+01	2.02E+01	5.02E-01	NET	YES
Mn-54	-7.29E+00	7.59E+00	< 2.73E+01	1.29E+01	8.56E-01	NET	YES
Ag-110m	-1.61E+00	1.17E+01	< 4.10E+01	1.94E+01	8.23E-01	NET	YES
Fe-59	-8.71E+01	4.38E+01	< 1.62E+02	7.68E+01	3.36E-01	NET	YES
Zn-65	9.70E+00	1.98E+01	< 6.79E+01	3.21E+01	8.19E-01	NET	YES
Co-60	1.24E+01	7.70E+00	< 2.53E+01	1.17E+01	9.75E-01	NET	YES
Sb-124	-7.35E+00	1.94E+01	< 7.61E+01	3.31E+01	4.45E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
=====							

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-04 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-013
Collect Start Date/Time: _____
Collect Stop Date/Time: 01-28-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 742.0 g

Filter/Smear Data

Volume: _____
Units: _____

Work Group ID: WG5111

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/10/03 1343 Det No.: 5 Spectrum No.: 0985205
Counted by: g
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5185-04	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2700-013	Matrix	: SO01 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 01/28/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	742		
Sample Weight-Dry	g			
Aliquot Weight	g	742		
FINAL WEIGHT	kg	.742		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-04 analyzed by emml461 on 04/08/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-04 ✓

Sample ID: NONE

Code: 0985205

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:42:57
Sampling Stop: 01/28/2003 12:00:00 | Decay Time: 1.68E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 4397 Sec
Sample Size 7.42E-001 kg | Real Time 4401 Sec
Collection Efficiency 1.0000 | Spc. File 0985205.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Energy(keV)= -0.04 + 0.662*Ch +-2.11E-07*Ch^2 + 7.83E-11*Ch^3 04/08/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	65.82	99.50	1	19	31	177	0.05	NET< CL
2	74.84	113.13	84	17	23	117	0.88	a
3	77.05	116.47	137	20	27	147	1.09	b
4	86.88	131.32	54	22	35	204	1.13	
5	186.47	281.80	49	25	39	200	1.22	
6	209.26	316.25	34	18	28	127	1.25	
7	238.64	360.64	270	20	20	81	1.15	a
8	241.77	365.37	74	19	29	129	1.65	b
9	277.32	419.08	54	15	22	74	1.52	
10	295.17	446.07	65	18	26	111	1.18	
11	338.55	511.61	65	17	24	78	1.59	
12	351.91	531.81	180	20	24	82	1.42	
13	510.81	771.95	120	17	21	64	2.26	Wide Pk
14	583.26	881.43	92	14	17	47	1.22	
15	609.35	920.87	138	15	17	40	2.06	
16	727.36	1099.21	17	9	13	32	1.34	
17	911.34	1377.25	54	10	11	21	1.79	
18	969.05	1464.45	31	9	12	27	1.28	
19	1120.21	1692.86	40	10	12	23	1.93	
20	1460.99	2207.66	146	13	9	13	1.97	
21	2615.44	3949.26	47	7	4	3	1.98	

L5185-04 analyzed by emm1461 on 04/08/2003

SEEKER. BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	74.84	84	17	23	75	17	24	
3	77.05	137	20	27	126	20	28	
4	86.88	54	22	35	48	22	35	
5	186.47	49	25	39	25	25	40	NET<CL
7	238.64	270	20	20	251	20	21	
8	241.77	74	19	29	66	19	29	
10	295.17	65	18	26	50	18	27	
11	338.55	65	17	24	62	17	24	
12	351.91	181	20	24	152	20	25	
13	510.81	120	17	21	21	17	27	NET<CL
14	583.26	92	14	17	86	14	18	
15	609.35	138	15	17	117	16	18	
16	727.36	17	9	13	16	9	13	
17	911.34	54	10	11	48	10	12	
18	969.05	31	9	12	28	9	13	
19	1120.21	40	10	12	35	10	13	
20	1460.99	146	13	9	138	13	10	
21	2615.44	47	7	4	41	7	6	

L5185-04 analyzed by emml461 on 04/08/2003

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG

2	74.84	75	Pb-212	44	4 of 6	95.97	1.46	
			Pb-214	22	5 of 7	100.00	1.00	
			Tl-208	5	5 of 9	83.82	0.84	
3	77.05	44	Pb-214	39	5 of 7	100.00	1.00	Split
22	77.05	82	Pb-212	82	4 of 6	95.97	1.46	AutoAdd
4	86.88	48	Pb-212	47	4 of 6	100.00	1.50	
			Tl-208	3	5 of 9	83.82	1.34	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	209.26	34	AcTh-228	22	4 of 36	74.60	1.25	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
7	238.64	251	Pb-212	389	4 of 6	100.00	1.50	
8	241.77	66	Pb-214	34	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
9	277.32	54	Tl-208	12	5 of 9	85.17	1.35	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
10	295.17	50	Pb-214	98	5 of 7	100.00	1.50	
11	338.55	62	AcTh-228	39	4 of 36	77.29	1.27	
12	351.91	152	Pb-214	137	5 of 7	100.00	1.50	
14	583.26	86	Tl-208	100	5 of 9	90.06	1.40	
15	609.35	117	Bi-214	159	2 of 33	69.68	1.20	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
16	727.36	16	Bi-212	. . . . .	1 of 13	100.00	1.50	
17	911.34	48	AcTh-228	62	4 of 36	100.00	1.50	
18	969.05	28	AcTh-228	31	4 of 36	100.00	1.50	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
19	1120.21	35	Bi-214	25	2 of 33	61.25	1.11	
20	1460.99	138	K-40	. . . . .	1 of 1	100.00	1.50	
21	2615.44	41	Tl-208	40	5 of 9	85.17	1.35	

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-04

Sample ID: NONE

Code: 0985205

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:42:57
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time 1.68e+003 Hrs
 Buildup Time 0.00e+000 Hrs | Live Time 4397 Sec
 Sample Size 7.42e-001 kg | Real Time 4401 Sec
 Collection Efficiency 1.0000 | Spectrum File 0985205.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.46E-03*En^-3.56E+00 + 1.55E+02*En^6.66E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: \$ERROR\$.LSF (No LSF File Available)
 =====

MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	238.63	2.82E+02 +- 2.30E+01	5.60E+01		+	
	74.81	I.D.				
	77.12	I.D.				
	87.30	I.D.				
Pb-214	Average:x	2.40E+02 +- 2.80E+01			*	
	77.11	I.D.				
	241.98	4.47E+02 +- 1.31E+02	4.10E+02		+	
	295.21	1.49E+02 +- 5.37E+01	1.71E+02		+	
	351.92	2.62E+02 +- 3.39E+01	9.18E+01		+	
Ra-226	186.22 N	3.36E+02 +- 3.31E+02	1.10E+03		x	
AcTh-228	Average:x	2.32E+02 +- 3.38E+01			*	
	209.28	3.62E+02 +- 1.92E+02	6.25E+02		+	
	338.32	3.42E+02 +- 9.09E+01	2.78E+02		+	
	911.07	2.08E+02 +- 4.34E+01	1.15E+02		+	
	969.11	2.12E+02 +- 7.12E+01	2.14E+02		+	
Tl-208	Average:x	2.71E+02 +- 3.20E+01			*	
	277.35	1.21E+03 +- 3.47E+02	1.07E+03		+	
	583.14	2.54E+02 +- 4.21E+01	1.13E+02		+	
	2614.66	2.76E+02 +- 4.98E+01	9.94E+01		+	
Bi-214	Average:x	2.41E+02 +- 2.92E+01			*	
	609.31	2.32E+02 +- 3.08E+01	7.82E+01		+	
	1120.29	3.16E+02 +- 8.95E+01	2.60E+02		+	
Bi-212	727.17	1.39E+02 +- 7.95E+01	2.58E+02		+	
K-40	1460.81	2.13E+03 +- 2.06E+02	3.61E+02		+	
Am-241	59.54 N	2.05E+01 +- 4.89E+01	1.72E+02		x	
Co-57	122.06 N	3.51E+00 +- 8.22E+00	2.89E+01		x	

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Ce-144	133.54	N	8.22E+01	+- 6.01E+01	1.99E+02		x	. . . . .
Ce-141	145.44	N	4.65E+01	+- 6.02E+01	2.13E+02		x	. . . . .
Se-75	264.65	N	1.88E+01	+- 1.62E+01	5.43E+01		x	. . . . .
Cr-51	320.08	N	1.77E+02	+- 3.15E+02	1.10E+03		x	. . . . .
I-131	364.48	N	2.04E+03	+- 3.19E+03	1.10E+04		x	. . . . .
Sb-125	427.89	N	1.83E+01	+- 2.32E+01	7.99E+01		x	. . . . .
Ag-108m	433.93	N	4.92E+00	+- 7.05E+00	2.63E+01		x	. . . . .
Be-7	477.59	N	2.27E+02	+- 1.57E+02	5.19E+02		x	. . . . .
La-140	487.03	N	7.65E+02	+- 6.65E+02	2.25E+03		x	. . . . .
Ru-103	497.08	N	4.14E+01	+- 2.56E+01	1.00E+02		x	. . . . .
Ba-140	537.32	N	3.53E+02	+- 1.20E+03	4.45E+03		x	. . . . .
Cs-134	604.70	N	7.68E+00	+- 8.87E+00	3.33E+011		x lbase	. . . . .
Ru-106	621.84	N	7.43E+01	+- 8.87E+01	3.36E+02		x	. . . . .
Cs-137	661.65	N	6.46E+00	+- 8.38E+00	2.92E+01		x	. . . . .
Zr-95	724.18	N	5.56E+01	+- 5.76E+01	1.86E+02L		x LHROI	. . . . .
Nb-95	765.79	N	6.09E+01	+- 3.35E+01	1.34E+02		x	. . . . .
Co-58	810.76	N	1.34E+01	+- 1.30E+01	5.24E+01		x	. . . . .
Mn-54	834.83	N	1.33E+01	+- 1.01E+01	3.96E+01		x	. . . . .
Ag-110m	884.67	N	5.93E+00	+- 1.35E+01	5.13E+01		x	. . . . .
Fe-59	1099.22	N	3.77E+01	+- 4.46E+01	1.56E+02		x	. . . . .
Zn-65	1115.52	N	4.17E+01	+- 4.13E+01	1.39E+02P		x PIC	. . . . .
Co-60	1332.49	N	4.45E+00	+- 6.70E+00	2.80E+00		x	. . . . .
Sb-124	1691.02	N	0.00E+00	+- 3.11E+01	1.25E+02		x	. . . . .

MEASURED TOTAL: 3.53E+03 +- 4.31E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	65.82	99.50	1	19	31	177	0.05	Deleted
13	510.81	771.95	21	17	27	65	2.26	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
5	186.47	281.80	25N	25	40	200	1.22	NET< CL
23	59.54	90.01	-6N	14	24	115	1.13	NET< CL
24	122.06	184.48	-6N	15	25	123	1.18	NET< CL
25	133.54	201.83	19N	14	22	95	1.19	NET< CL
26	145.44	219.81	-13N	16	28	138	1.20	NET< CL
27	264.66	399.95	14N	12	19	66	1.29	NET< CL
28	320.09	483.72	5N	9	14	37	1.33	NET< CL
29	364.49	550.83	6N	9	15	41	1.36	NET< CL
30	427.91	646.67	7N	9	14	36	1.40	NET< CL
31	433.95	655.80	-6N	9	15	40	1.41	NET< CL
32	477.62	721.79	12N	8	13	27	1.44	NET< CL

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NET/MDA PEAK RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
33	487.06	736.06	10N	9	13	29	1.44	NET< CL
34	497.11	751.25	-13N	8	15	37	1.45	NET< CL
35	537.36	812.07	-2N	8	13	30	1.48	NET< CL
36	604.76	913.93	-8N	9	15	40	1.52	NET< CL
								LBase
37	621.91	939.84	-7N	8	14	34	1.54	NET< CL
38	661.60	999.83	6N	7	11	25	1.56	NET< CL
39	724.15	1094.36	11N	11	17	27	1.61	NET< CL
								LHRoi
40	765.78	1157.27	-14N	8	14	36	1.63	NET< CL
41	810.77	1225.27	-6N	6	10	20	1.66	NET< CL
42	834.86	1261.66	-10N	8	14	34	1.68	NET< CL
43	884.72	1337.03	-3N	7	12	25	1.71	NET< CL
44	1099.18	1661.09	5N	6	10	16	1.86	NET< CL
45	1115.50	1685.74	13N	12	20	34	1.87	NET< CL
								PIC
46	1332.47	2013.54	-3N	4	7	11	2.01	NET< CL
47	1691.00	2555.01	0N	4	6	7	2.25	NET< CL

c:\seeker\Results\L5185-04.RES Analysis Results Saved.

L5185-04 analyzed by emml461 on 04/08/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:42:57
Sampling Stop: 01/28/2003 12:00:00 | Decay Time 1.68E+03 Hrs
Buildup Time 0.00E+00 Hrs | Live Time 4397 Sec
Sample Size 7.42E-01 kg | Real Time 4401 Sec
Collection Efficiency 1.0000 | Spectrum File0985205.spc

Detector #: 5

Energy(keV)= -0.04 + 0.662*Ch + -2.11E-07*Ch^2 + -2.11E-07*Ch^3 04/08/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: \$ERROR\$.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
=====	=====	=====	=====	=====	=====	=====	=====
Pb-212	2.82E+02	2.30E+01	< 5.60E+01	2.65E+01	1.00E+00	MEAS +	YES
Pb-214	2.40E+02	2.80E+01	< 9.18E+01	4.36E+01	1.00E+00	MEAS +	YES
Ra-226	3.36E+02	3.31E+02	< 1.10E+03	5.33E+02	1.00E+00	NET	YES
AcTh-228	2.32E+02	3.38E+01	< 1.15E+02	5.16E+01	1.00E+00	MEAS +	YES
Tl-208	2.71E+02	3.20E+01	< 9.94E+01	4.05E+01	1.00E+00	MEAS +	YES
Bi-214	2.41E+02	2.92E+01	< 7.82E+01	3.64E+01	1.00E+00	MEAS +	YES
Bi-212	1.39E+02	7.95E+01	< 2.58E+02	1.17E+02	1.00E+00	MEAS +	YES
K-40	2.13E+03	2.06E+02	< 3.61E+02	1.59E+02	1.00E+00	MEAS +	YES
Am-241	-2.05E+01	4.89E+01	< 1.72E+02	8.16E+01	1.00E+00	NET	YES
Co-57	-3.51E+00	8.22E+00	< 2.89E+01	1.37E+01	8.36E-01	NET	YES
Ce-144	8.22E+01	6.01E+01	< 1.99E+02	9.39E+01	8.43E-01	NET	YES
Ce-141	-4.65E+01	6.02E+01	< 2.13E+02	1.01E+02	2.24E-01	NET	YES
Se-75	1.88E+01	1.62E+01	< 5.42E+01	2.53E+01	6.67E-01	NET	YES
Cr-51	1.77E+02	3.15E+02	< 1.10E+03	5.01E+02	1.73E-01	NET	YES
I-131	2.04E+03	3.19E+03	< 1.10E+04	5.06E+03	2.38E-03	NET	YES
Sb-125	1.83E+01	2.32E+01	< 7.99E+01	3.64E+01	9.53E-01	NET	YES
Ag-108m	-4.92E+00	7.05E+00	< 2.63E+01	1.21E+01	9.99E-01	NET	YES
Be-7	2.27E+02	1.57E+02	< 5.19E+02	2.34E+02	4.03E-01	NET	YES
La-140	7.65E+02	6.65E+02	< 2.24E+03	1.02E+03	2.24E-02	NET	YES
Ru-103	-4.15E+01	2.55E+01	< 1.00E+02	4.60E+01	2.91E-01	NET	YES
Ba-140	-3.53E+02	1.20E+03	< 4.45E+03	2.02E+03	2.24E-02	NET	YES
Cs-134	-7.68E+00	8.87E+00	< 3.33E+01	1.53E+01	9.38E-01	NET	YES
Ru-106	-7.43E+01	8.87E+01	< 3.36E+02	1.53E+02	8.76E-01	NET	YES
Cs-137	6.46E+00	8.38E+00	< 2.92E+01	1.30E+01	9.96E-01	NET	YES
Zr-95	5.56E+01	5.76E+01	< 1.86E+02	8.64E+01	4.68E-01	NET	YES
Nb-95	-6.09E+01	3.35E+01	< 1.34E+02	6.12E+01	2.50E-01	NET	YES
Co-58	-1.34E+01	1.30E+01	< 5.23E+01	2.32E+01	5.03E-01	NET	YES
Mn-54	-1.33E+01	1.01E+01	< 3.96E+01	1.80E+01	8.56E-01	NET	YES
Ag-110m	-5.93E+00	1.36E+01	< 5.13E+01	2.30E+01	8.23E-01	NET	YES
Fe-59	3.77E+01	4.46E+01	< 1.56E+02	6.83E+01	3.37E-01	NET	YES
Zn-65	4.17E+01	4.13E+01	< 1.39E+02	6.52E+01	8.20E-01	NET	YES
Co-60	-4.45E+00	6.70E+00	< 2.80E+01	1.19E+01	9.75E-01	NET	YES
Sb-124	0.00E+00	3.11E+01	< 1.25E+02	5.12E+01	4.46E-01	NET	YES

L5185-04 analyzed by emm1461 on 04/08/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-05 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-038
Collect Start Date/Time: _____
Collect Stop Date/Time: 01-28-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 785.1 g

Filter/Smear Data

Volume: _____
Units: _____

Work Group ID: WG511 Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/8/03 1344 Det No.: 6 Spectrum No.: 0985306
Counted by: B
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5185-05
Client Id : BMS-2700-038
Site :

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 01/28/03 12:00

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	785.1		
Sample Weight-Dry	g			
Aliquot Weight	g	785.1		
FINAL WEIGHT	kg	.7851		
Container			WATS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-05

Sample ID: NONE

Code: 0985306

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:43:53
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.68E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 3876 Sec
 Sample Size 7.85E-001 kg | Real Time 3879 Sec
 Collection Efficiency 1.0000 | Spc. File 0985306.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV)= -0.02 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.90	95.09	20	25	40	252	0.58	NET< CL
2	74.57	112.72	98	16	20	99	0.72	a
3	76.99	116.38	140	21	29	165	1.10	b
4	92.49	139.80	93	24	36	217	1.09	
5	128.91	194.82	14	20	32	180	0.44	NET< CL
6	185.77	280.76	116	21	30	147	1.51	
7	238.49	360.42	242	24	31	164	1.27	
8	270.40	408.64	16	12	19	70	0.81	NET< CL
9	295.12	445.99	106	17	22	80	1.21	
10	338.23	511.13	81	15	20	69	1.43	
11	351.80	531.64	160	19	22	79	1.55	
12	510.55	771.52	103	15	18	49	2.08	Wide Pk
13	583.23	881.35	121	14	15	33	1.82	
14	609.30	920.74	152	16	18	43	1.66	
15	726.67	1098.10	34	9	11	20	1.53	
16	860.50	1300.33	18	9	14	30	1.07	
17	911.44	1377.30	73	11	11	21	1.62	
18	969.06	1464.37	33	11	16	41	1.59	
19	1120.79	1693.65	36	10	12	22	2.28	
20	1460.90	2207.59	110	12	8	12	2.44	
21	1764.55	2666.42	31	7	6	5	2.91	
22	2615.34	3952.04	48	8	5	4	2.79	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.90	20	25	40	-26	25	42	NET<CL
2	74.57	98	16	20	90	16	21	
3	76.99	140	21	29	130	21	29	
4	92.49	93	24	36	-13	24	40	NET<CL
6	185.77	116	21	30	49	22	33	
7	238.49	242	24	31	221	24	32	
8	270.40	16	12	19	14	13	20	NET<CL
9	295.12	107	17	22	93	17	23	
10	338.23	81	15	20	78	15	20	
11	351.80	160	19	22	136	19	24	
12	510.55	103	15	18	14	15	24	NET<CL
13	583.23	121	14	15	115	14	16	
14	609.30	152	16	18	133	16	19	
15	726.67	34	9	11	32	9	11	
17	911.44	73	11	11	68	11	12	
18	969.06	33	11	16	32	11	16	
19	1120.79	37	10	12	34	10	13	
20	1460.90	110	12	8	102	12	10	
21	1764.55	31	7	6	27	7	7	
22	2615.34	48	8	5	42	8	6	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.57	90	Pb-212	41	3 of 6	86.53	1.37	
			Tl-208	3	5 of 9	86.47	0.86	
			Pb-214	24	4 of 7	90.71	0.91	
			Tl-208	6	5 of 9	86.47	0.86	
3	76.99	50	Pb-214	42	4 of 7	90.71	0.91	Split
23	76.99	80	Pb-212	80	3 of 6	86.53	1.37	AutoAdd
6	185.77	49	U-235	. . . . .	1 of 3	100.00	1.50	
			Ra-226	. . . . .	1 of 1	100.00	1.50	
7	238.49	221	Pb-212	426	3 of 6	90.16	0.90	
9	295.12	93	Pb-214	79	4 of 7	90.71	1.41	
10	338.23	78	AcTh-228	52	3 of 36	64.99	1.15	
11	351.80	136	Pb-214	200	4 of 7	100.00	1.50	
13	583.23	115	Tl-208	100	5 of 9	90.33	1.40	
14	609.30	133	Bi-214	160	3 of 33	79.37	1.29	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
15	726.67	32	Bi-212	. . . . .	1 of 13	100.00	1.00	
16	860.50	18	Tl-208	12	5 of 9	87.66	1.38	
17	911.44	68	AcTh-228	78	3 of 36	76.62	1.27	
18	969.06	32	AcTh-228	44	3 of 36	86.09	1.36	
			Sb-124	. . . . .	1 of 13	1.04	0.51	
19	1120.79	34	Bi-214	30	3 of 33	79.37	1.29	
20	1460.90	102	K-40	. . . . .	1 of 1	100.00	1.50	
21	1764.55	27	Bi-214	23	3 of 33	79.37	1.29	
22	2615.34	42	Tl-208	50	5 of 9	90.33	1.40	

Environmental Gamma Isotopic Analysis

LSN: L5185-05

Code: 0985306

Sampling Start:	01/28/2003 12:00:00	Counting Start:	04/08/2003 13:43:53
Sampling Stop:	01/28/2003 12:00:00	Decay Time	1.68e+003 Hrs
Buildup Time	0.00e+000 Hrs	Live Time	3876 Sec
Sample Size	7.85e-001 kg	Real Time	3879 Sec
Collection Efficiency	1.0000	Spectrum File . . . . .	.0985306.spc
Type I		Type I & II	
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[8.71E-03*En^-3.34E+00 + 1.54E+02*En^6.70E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	E	Concentration (pCi/kg)	MDA	Flags	Notes
Pb-212	238.63		2.64E+02 +- 2.93E+01	5.28E+01		+
	74.81		I.D. . . . .	. . . . .	
	77.12		I.D. . . . .	. . . . .	
Pb-214	Average:x		2.63E+02 +- 2.87E+01	. . . . .		*
	77.11		I.D. . . . .	. . . . .	
	295.21		2.94E+02 +- 5.33E+01	1.52E+02		+
	351.92		2.50E+02 +- 3.41E+01	9.23E+01		+
U-235	185.72		4.21E+01 +- 1.85E+01	6.00E+01		+
AcTh-228	Average:x		3.35E+02 +- 3.98E+01	. . . . .		*
	338.32		4.57E+02 +- 8.89E+01	2.54E+02		+
	911.07		3.18E+02 +- 5.11E+01	1.24E+02		+
	969.11		2.62E+02 +- 9.08E+01	2.79E+02		+
Tl-208	Average:x		3.44E+02 +- 3.46E+01	. . . . .		*
	583.14		3.63E+02 +- 4.51E+01	1.07E+02		+
	860.37		4.91E+02 +- 2.62E+02	8.46E+02		+
	2614.66		3.08E+02 +- 5.50E+01	1.12E+02		+
Bi-214	Average:x		2.96E+02 +- 3.04E+01	. . . . .		*
	609.31		2.82E+02 +- 3.48E+01	8.70E+01		+
	1120.29		3.33E+02 +- 9.44E+01	2.74E+02		+
	1764.49		3.44E+02 +- 8.31E+01	2.01E+02		+
Bi-212	727.17		3.02E+02 +- 8.26E+01	2.33E+02		+
K-40	1460.81		1.69E+03 +- 1.94E+02	3.67E+02		+
Am-241	59.54	N	7.65E+01 +- 5.39E+01	1.94E+02		x
Co-57	122.06	N	3.45E+00 +- 8.85E+00	3.03E+01		x
Ce-144	133.54	N	1.30E+02 +- 6.81E+01	2.51E+02		x
Ce-141	145.44	N	2.92E+01 +- 5.85E+01	2.06E+02		x
Ra-226	186.22	N	1.51E+03 +- 2.38E+02	6.58E+02		x*
Se-75	264.65	N	7.14E+00 +- 1.63E+01	5.66E+01		x

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E		Concentration		MDA	Flags	Notes
	(keV)	N	(pCi/kg)			
Cr-51	320.08	N	1.51E+02	+ - 3.74E+02	1.31E+03		x
I-131	364.48	N	1.81E+03	+ - 3.53E+03	1.29E+04		x
Sb-125	427.89	N	1.39E+01	+ - 2.28E+01	8.52E+01		x
Ag-108m	433.93	N	9.61E+00	+ - 7.36E+00	2.46E+01		x
Be-7	477.59	N	1.39E+02	+ - 1.53E+02	5.26E+02		x
La-140	487.03	N	9.96E+02	+ - 6.32E+02	2.08E+03		x
Ru-103	497.08	N	3.76E+01	+ - 2.71E+01	9.03E+01		x
Ba-140	537.32	N	5.11E+02	+ - 1.25E+03	4.66E+03		x
Cs-134	604.70	N	1.87E+01	+ - 3.75E+01	1.25E+02P		x PIC
Ru-106	621.84	N	6.19E+01	+ - 1.01E+02	3.75E+02		x
Cs-137	661.65	N	2.30E+00	+ - 8.91E+00	3.21E+01		x
Zr-95	724.18	N	1.56E+02	+ - 6.15E+01	2.58E+02L		x LHROI
Nb-95	765.79	N	3.68E+01	+ - 3.49E+01	1.35E+02		x
Co-58	810.76	N	2.86E+01	+ - 1.30E+01	5.72E+01		x
Mn-54	834.83	N	1.42E+00	+ - 9.52E+00	3.48E+01		x
Ag-110m	884.67	N	0.00E+00	+ - 1.23E+01	4.62E+01		x
Fe-59	1099.22	N	2.78E+01	+ - 4.20E+01	1.50E+02		x
Zn-65	1115.52	N	3.44E+01	+ - 4.78E+01	1.62E+02P		x PIC
Co-60	1332.49	N	5.11E+00	+ - 8.17E+00	2.97E+01		x
Sb-124	1691.02	N	1.78E+01	+ - 3.56E+01	1.48E+02		x

MEASURED TOTAL: 5.04E+03 +- 6.96E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.90	95.09	-26	25	42	252	0.58	Deleted
4	92.49	139.80	-13	24	40	217	1.09	Deleted
5	128.91	194.82	14	20	32	180	0.44	Deleted
8	270.40	408.64	14	13	20	70	0.81	Deleted
12	510.55	771.52	14	15	24	49	2.08	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	59.54	90.01	-24N	17	28	163	1.13	NET< CL
25	122.06	184.48	6N	15	24	119	1.12	NET< CL
26	133.54	201.83	-28N	15	26	134	1.13	NET< CL
27	145.44	219.81	-7N	15	25	118	1.13	NET< CL
28	186.22	281.43	106N	17	22	96	1.15	
29	264.65	399.95	5N	11	18	63	1.21	NET< CL
30	320.08	483.70	4N	10	16	47	1.25	NET< CL
31	364.48	550.80	-5N	10	16	50	1.29	NET< CL
32	427.89	646.62	-5N	8	14	36	1.35	NET< CL
33	433.93	655.74	11N	8	13	30	1.36	NET< CL
34	477.59	721.72	7N	8	12	26	1.40	NET< CL
35	487.03	735.98	12N	8	11	23	1.40	

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NET/MDA PEAK RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
36	497.08	751.17	11N	8	12	26	1.41	NET< CL
37	537.32	811.97	-3N	8	13	29	1.45	NET< CL
38	604.70	913.79	17N	35	57	51	1.51	NET< CL
								PIC
39	621.84	939.69	-5N	9	15	37	1.53	NET< CL
40	661.65	999.85	2N	7	12	27	1.57	NET< CL
41	724.18	1094.33	-29N	11	23	47	1.62	NET< CL
								LHRoi
42	765.79	1157.21	-8N	8	13	31	1.66	NET< CL
43	810.76	1225.16	-12N	5	11	21	1.70	NET< CL
44	834.83	1261.54	1N	7	11	22	1.72	NET< CL
45	884.67	1336.85	0N	6	10	17	1.76	NET< CL
46	1099.22	1661.05	4N	5	8	12	1.92	NET< CL
47	1115.52	1685.68	10N	13	22	38	1.93	NET< CL
								PIC
48	1332.49	2013.54	3N	5	7	10	2.08	NET< CL
49	1691.02	2555.31	-2N	4	7	9	2.26	NET< CL

c:\seeker\Results\L5185-05.RES Analysis Results Saved.

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:43:53
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.68E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 3876 Sec
Sample Size 7.85E-01 kg | Real Time 3879 Sec
Collection Efficiency 1.0000 | Spectrum File 0985306.spc

Detector #: 6

Energy(keV)= -0.02 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[8.71e-03*En^-3.34e+00 + 1.54e+02*En^ 6.70e-01] 02/06/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-212	2.64E+02	2.93E+01	< 5.28E+01	2.48E+01	1.00E+00	MEAS +
Pb-214	2.63E+02	2.87E+01	< 9.23E+01	4.37E+01	1.00E+00	MEAS +
U-235	4.21E+01	1.85E+01	< 6.00E+01	2.88E+01	1.00E+00	MEAS +
AcTh-228	3.35E+02	3.98E+01	< 1.24E+02	5.55E+01	1.00E+00	MEAS +
Tl-208	3.44E+02	3.46E+01	< 1.07E+02	4.60E+01	1.00E+00	MEAS +
Bi-214	2.96E+02	3.04E+01	< 8.70E+01	4.06E+01	1.00E+00	MEAS +
Bi-212	3.02E+02	8.26E+01	< 2.33E+02	1.04E+02	1.00E+00	MEAS +
K-40	1.68E+03	1.94E+02	< 3.67E+02	1.61E+02	1.00E+00	MEAS +
Am-241	-7.65E+01	5.39E+01	< 1.94E+02	9.24E+01	1.00E+00	NET
Co-57	3.45E+00	8.85E+00	< 3.03E+01	1.44E+01	8.36E-01	NET
Ce-144	-1.30E+02	6.81E+01	< 2.51E+02	1.19E+02	8.43E-01	NET
Ce-141	-2.92E+01	5.85E+01	< 2.06E+02	9.79E+01	2.24E-01	NET
Ra-226	1.51E+03	2.38E+02	< 6.58E+02	3.10E+02	1.00E+00	NET
Se-75	7.14E+00	1.63E+01	< 5.66E+01	2.64E+01	6.67E-01	NET
Cr-51	1.51E+02	3.74E+02	< 1.31E+03	6.02E+02	1.73E-01	NET
I-131	-1.81E+03	3.53E+03	< 1.29E+04	5.96E+03	2.38E-03	NET
Sb-125	-1.39E+01	2.28E+01	< 8.52E+01	3.88E+01	9.53E-01	NET
Ag-108m	9.61E+00	7.36E+00	< 2.46E+01	1.11E+01	9.99E-01	NET
Be-7	1.39E+02	1.53E+02	< 5.26E+02	2.36E+02	4.03E-01	NET
La-140	9.96E+02	6.32E+02	< 2.08E+03	9.26E+02	2.24E-02	NET
Ru-103	3.76E+01	2.71E+01	< 9.03E+01	4.07E+01	2.91E-01	NET
Ba-140	-5.11E+02	1.25E+03	< 4.66E+03	2.11E+03	2.24E-02	NET
Cs-134	1.87E+01	3.75E+01	< 1.25E+02	6.12E+01	9.38E-01	NET
Ru-106	-6.19E+01	1.01E+02	< 3.75E+02	1.72E+02	8.76E-01	NET
Cs-137	2.30E+00	8.91E+00	< 3.21E+01	1.44E+01	9.96E-01	NET
Zr-95	-1.56E+02	6.15E+01	< 2.58E+02	1.22E+02	4.68E-01	NET
Nb-95	-3.68E+01	3.49E+01	< 1.35E+02	6.12E+01	2.50E-01	NET
Co-58	-2.85E+01	1.30E+01	< 5.72E+01	2.54E+01	5.03E-01	NET
Mn-54	1.42E+00	9.52E+00	< 3.48E+01	1.55E+01	8.56E-01	NET
Ag-110m	0.00E+00	1.23E+01	< 4.62E+01	2.03E+01	8.23E-01	NET
Fe-59	2.78E+01	4.20E+01	< 1.50E+02	6.47E+01	3.37E-01	NET
Zn-65	3.44E+01	4.78E+01	< 1.62E+02	7.64E+01	8.20E-01	NET
Co-60	5.11E+00	8.17E+00	< 2.97E+01	1.25E+01	9.75E-01	NET
Sb-124	-1.78E+01	3.56E+01	< 1.48E+02	6.22E+01	4.46E-01	NET

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-06 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-040
Collect Start Date/Time: _____
Collect Stop Date/Time: 01-28-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 782.4 g

Filter/Smear Data

Volume: _____
Units: _____

Work Group ID: WG 5111 Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/8/03 1315 Det No.: 8 Spectrum No.: 6985308
Counted by: 87
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5185-06
Client Id : BMS-2700-040
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 01/28/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	782.4		
Sample Weight-Dry	g			
Aliquot Weight	g	782.4		
FINAL WEIGHT	kg	.7824		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-06 analyzed by emml461 on 04/08/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-06 ✓

Sample ID: NONE

Code: 0985308

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:44:37
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.68E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 3232 Sec
Sample Size 7.82E-001 kg | Real Time 3235 Sec
Collection Efficiency 1.0000 | Spc. File 0985308.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Energy(keV)= 0.08 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.09	95.10	19	15	24	110	0.56	NET< CL
2	77.04	116.14	51	21	32	173	1.03	
3	87.11	131.34	34	11	15	56	0.63	a
4	92.32	139.21	105	21	31	151	1.82	b Wide Pk
5	185.83	280.34	35	16	24	93	1.42	
6	238.31	359.54	164	22	29	124	1.43	
7	294.92	444.97	41	15	22	79	1.10	
8	338.20	510.30	11	13	20	63	0.59	NET< CL
9	351.82	530.85	86	15	19	56	1.46	
10	510.43	770.24	96	14	16	40	3.28	Wide Pk
11	582.88	879.58	82	11	12	22	1.89	
12	609.22	919.34	77	12	13	29	1.45	
13	911.12	1374.98	56	8	6	6	1.64	
14	969.57	1463.18	30	9	12	21	1.54	
15	1460.69	2204.39	84	11	9	11	1.78	
16	1763.83	2661.91	18	5	5	4	1.67	
17	2614.16	3945.26	38	6	3	1	2.14	

L5185-06 analyzed by emml461 on 04/08/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.09	19	15	24	4	15	25	NET<CL
2	77.04	51	21	32	42	21	32	
3	87.11	34	11	15	28	11	16	
4	92.32	105	21	31	69	21	32	
5	185.83	35	16	24	16	16	25	NET<CL
6	238.31	165	22	29	150	22	30	
7	294.92	41	15	22	27	15	23	
8	338.20	11	13	20	8	13	20	NET<CL
9	351.82	87	15	19	66	15	21	
10	510.43	96	14	16	15	14	22	NET<CL
11	582.88	82	11	12	77	12	12	
12	609.22	77	12	13	59	12	15	
13	911.12	57	8	6	53	8	7	
14	969.57	30	9	12	28	9	12	
15	1460.69	84	11	9	77	11	10	
16	1763.83	18	5	5	14	5	6	
17	2614.16	38	6	3	33	6	5	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.55 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	77.04	42	Pb-212	52	3 of 6	100.00	1.50	
			Pb-214	19	3 of 7	89.93	1.40	
3	87.11	0	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
19	87.11	27	Pb-212	27	3 of 6	100.00	1.50	AutoAdd
4	92.32	51	Th-234	. . . . .	1 of 2	58.74	0.59	Split
18	92.32	18	AcTh-228	18	3 of 36	47.43	0.97	AutoAdd
6	238.31	150	Pb-212	135	3 of 6	100.00	1.50	
7	294.92	27	Pb-214	40	3 of 7	100.00	1.50	
9	351.82	66	Pb-214	59	3 of 7	100.00	1.50	
11	582.88	77	Tl-208	74	2 of 9	84.37	1.34	
12	609.22	59	Bi-214	85	2 of 33	80.44	1.30	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
13	911.12	53	AcTh-228	58	3 of 36	62.73	1.13	
14	969.57	28	AcTh-228	32	3 of 36	75.16	1.25	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
15	1460.69	77	K-40	. . . . .	1 of 1	100.00	1.50	
16	1763.83	14	Bi-214	10	2 of 33	80.44	1.30	
17	2614.16	33	Tl-208	34	2 of 9	84.37	1.34	

L5185-06 analyzed by emm1461 on 04/08/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-06

Sample ID: NONE

Code: 0985308

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:44:37
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.68e+003 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 3232 Sec
Sample Size 7.82e-001 kg | Real Time 3235 Sec
Collection Efficiency 1.0000 | Spectrum File 0985308.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes
Pb-212	238.63	2.03E+02 +- 2.96E+01	9.12E+01		+
	77.12	I.D. . . . .	. . . . .	
	87.30	I.D. . . . .	. . . . .	
Cd-109	88.03	I.D. . . . .	. . . . .	
Th-234	92.59	5.14E+02 +- 3.72E+02	1.23E+03		+
Ra-226	186.22	2.50E+02 +- 2.56E+02	8.59E+02		x
Pb-214	Average:x	1.28E+02 +- 2.71E+01	. . . . .		*
	295.21	9.82E+01 +- 5.41E+01	1.77E+02		+
	351.92	1.37E+02 +- 3.13E+01	9.23E+01		+
Tl-208	Average:x	2.71E+02 +- 3.21E+01	. . . . .		*
	583.14	2.75E+02 +- 4.10E+01	9.68E+01		+
	2614.66	2.64E+02 +- 5.18E+01	9.90E+01		+
Bi-214	Average:x	1.49E+02 +- 2.67E+01	. . . . .		*
	609.31	1.41E+02 +- 2.86E+01	7.87E+01		+
	1764.49	2.03E+02 +- 7.38E+01	2.05E+02		+
AcTh-228	Average:x	2.73E+02 +- 3.85E+01	. . . . .		*
	911.07	2.79E+02 +- 4.35E+01	8.36E+01		+
	969.11	2.53E+02 +- 8.23E+01	2.45E+02		+
	93.35	I.D. . . . .	. . . . .	
K-40	1460.81	1.41E+03 +- 1.94E+02	4.06E+02		+
Am-241	59.54	1.10E+02 +- 4.98E+01	1.86E+02		x
Co-57	122.06	1.77E+01 +- 8.96E+00	2.90E+01		x
Ce-144	133.54	6.18E+01 +- 6.80E+01	2.45E+02		x
Ce-141	145.44	3.64E+01 +- 6.00E+01	2.13E+02		x
Se-75	264.65	2.59E+01 +- 1.52E+01	4.95E+01		x
Cr-51	320.08	1.57E+02 +- 3.50E+02	1.30E+03		x
I-131	364.48	6.14E+02 +- 3.35E+03	1.22E+04		x

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	N		Concentration (pCi/kg)	MDA	Flags	Notes
Sb-125	427.89	N	-1.36E+01	+ 2.46E+01	9.22E+01		x
Ag-108m	433.93	N	-3.29E-01	+ 7.98E+00	2.90E+01		x
Be-7	477.59	N	3.74E+00	+ 1.72E+02	6.24E+02		x
La-140	487.03	N	-1.56E+02	+ 6.87E+02	2.55E+03		x
Ru-103	497.08	N	-8.88E+00	+ 2.51E+01	9.50E+01		x
Ba-140	537.32	N	1.18E+03	+ 1.14E+03	3.92E+03		x
Cs-134	604.70	N	-8.37E+00	+ 4.13E+01	1.40E+02P		x PIC
Ru-106	621.84	N	9.14E+01	+ 8.76E+01	3.00E+02		x
Cs-137	661.65	N	-4.14E+00	+ 8.39E+00	3.24E+01		x
Zr-95	724.18	N	1.21E+01	+ 4.62E+01	1.66E+02		x
Nb-95	765.79	N	2.31E+01	+ 3.34E+01	1.18E+02		x
Co-58	810.76	N	-3.20E+01	+ 1.41E+01	6.28E+01		x
Mn-54	834.83	N	-1.59E+00	+ 7.29E+00	2.89E+01		x
Ag-110m	884.67	N	-2.37E+00	+ 1.23E+01	4.76E+01		x
Fe-59	1099.22	N	1.29E+01	+ 4.71E+01	1.74E+02		x
Zn-65	1115.52	N	-3.37E+01	+ 2.48E+01	1.01E+02		x
Co-60	1332.49	N	-5.70E+00	+ 7.36E+00	3.17E+01		x
Sb-124	1691.02	N	3.57E+01	+ 3.55E+01	1.26E+02		x

MEASURED TOTAL: 2.95E+03 +- 7.21E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.09	95.10	4	15	25	110	0.56	Deleted
8	338.20	510.30	8	13	20	63	0.59	Deleted
10	510.43	770.24	15	14	22	40	3.28	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
5	185.83	280.34	16N	16	25	93	1.42	NET< CL
20	59.54	89.74	-31N	14	25	114	1.24	NET< CL
21	122.06	184.09	27N	14	21	80	1.29	
22	133.54	201.42	-12N	13	22	93	1.30	NET< CL
23	145.44	219.38	-8N	14	23	95	1.31	NET< CL
24	264.65	399.30	16N	9	14	36	1.39	
25	320.08	482.95	-4N	8	14	33	1.43	NET< CL
26	364.48	549.96	-2N	8	14	32	1.46	NET< CL
27	427.89	645.66	-4N	8	13	30	1.50	NET< CL
28	433.93	654.78	-0N	8	13	30	1.51	NET< CL
29	477.59	720.67	0N	8	13	27	1.53	NET< CL
30	487.03	734.92	-2N	7	12	26	1.54	NET< CL
31	497.08	750.09	-2N	7	11	25	1.55	NET< CL
32	537.32	810.82	7N	6	9	18	1.57	NET< CL
33	604.70	912.51	-7N	34	57	50	1.62	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
								PIC
34	621.84	938.38	7N	7	10	19	1.63	NET< CL
35	661.65	998.46	-3N	6	10	20	1.66	NET< CL
36	724.18	1092.83	2N	8	12	28	1.70	NET< CL
37	765.79	1155.63	4N	6	10	18	1.73	NET< CL
38	810.76	1223.50	-12N	5	10	20	1.76	NET< CL
39	834.83	1259.83	-1N	5	8	11	1.77	NET< CL
40	884.67	1335.05	-1N	5	9	14	1.81	NET< CL
41	1099.22	1658.85	2N	5	9	14	1.95	NET< CL
42	1115.52	1683.45	-9N	6	11	23	1.96	NET< CL
43	1332.49	2010.91	-3N	4	7	9	2.10	NET< CL
44	1691.02	2552.02	4N	4	5	4	2.34	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

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Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 13:44:37
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. . . . . 1.68E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 3232 Sec
Sample Size . . . . . 7.82E-01 kg | Real Time . . . . . 3235 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . .0985308.spc
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Detector #: 8

Energy(keV)= 0.08 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-212	2.03E+02	2.96E+01	< 9.12E+01	4.38E+01	1.00E+00	MEAS +
Th-234	5.14E+02	3.72E+02	< 1.23E+03	6.01E+02	9.98E-01	MEAS +
Ra-226	2.50E+02	2.56E+02	< 8.59E+02	4.08E+02	1.00E+00	NET
Pb-214	1.28E+02	2.71E+01	< 9.23E+01	4.33E+01	9.98E-01	MEAS +
Tl-208	2.71E+02	3.21E+01	< 9.68E+01	3.86E+01	1.00E+00	MEAS +
Bi-214	1.49E+02	2.67E+01	< 7.87E+01	3.61E+01	9.98E-01	MEAS +
AcTh-228	2.73E+02	3.85E+01	< 8.36E+01	3.47E+01	1.00E+00	MEAS +
K-40	1.41E+03	1.94E+02	< 4.06E+02	1.78E+02	1.00E+00	MEAS +
Am-241	-1.10E+02	4.98E+01	< 1.86E+02	8.81E+01	1.00E+00	NET
Co-57	1.77E+01	8.96E+00	< 2.90E+01	1.36E+01	8.36E-01	NET
Ce-144	-6.18E+01	6.79E+01	< 2.45E+02	1.16E+02	8.43E-01	NET
Ce-141	-3.64E+01	6.00E+01	< 2.14E+02	1.01E+02	2.24E-01	NET
Se-75	2.59E+01	1.52E+01	< 4.95E+01	2.26E+01	6.67E-01	NET
Cr-51	-1.57E+02	3.50E+02	< 1.30E+03	5.91E+02	1.73E-01	NET
I-131	-6.14E+02	3.34E+03	< 1.22E+04	5.56E+03	2.38E-03	NET
Sb-125	-1.36E+01	2.46E+01	< 9.22E+01	4.19E+01	9.53E-01	NET
Ag-108m	-3.29E-01	7.98E+00	< 2.90E+01	1.31E+01	9.99E-01	NET
Be-7	3.74E+00	1.72E+02	< 6.24E+02	2.82E+02	4.03E-01	NET
La-140	-1.56E+02	6.87E+02	< 2.55E+03	1.15E+03	2.24E-02	NET
Ru-103	-8.88E+00	2.51E+01	< 9.50E+01	4.24E+01	2.91E-01	NET
Ba-140	1.18E+03	1.14E+03	< 3.92E+03	1.71E+03	2.24E-02	NET
Cs-134	-8.37E+00	4.13E+01	< 1.40E+02	6.82E+01	9.38E-01	NET
Ru-106	9.14E+01	8.76E+01	< 3.00E+02	1.32E+02	8.76E-01	NET
Cs-137	-4.14E+00	8.39E+00	< 3.24E+01	1.44E+01	9.96E-01	NET
Zr-95	1.21E+01	4.62E+01	< 1.66E+02	7.46E+01	4.68E-01	NET
Nb-95	2.31E+01	3.34E+01	< 1.18E+02	5.20E+01	2.50E-01	NET
Co-58	-3.20E+01	1.41E+01	< 6.28E+01	2.78E+01	5.04E-01	NET
Mn-54	-1.59E+00	7.29E+00	< 2.89E+01	1.23E+01	8.56E-01	NET
Ag-110m	-2.37E+00	1.23E+01	< 4.76E+01	2.06E+01	8.23E-01	NET
Fe-59	1.29E+01	4.71E+01	< 1.74E+02	7.56E+01	3.37E-01	NET
Zn-65	-3.37E+01	2.48E+01	< 1.01E+02	4.51E+01	8.20E-01	NET
Co-60	-5.70E+00	7.36E+00	< 3.17E+01	1.33E+01	9.75E-01	NET
Sb-124	3.57E+01	3.55E+01	< 1.26E+02	4.96E+01	4.46E-01	NET

L5185-06 analyzed by emml461 on 04/08/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
=====						

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-07 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-058
Collect Start Date/Time: _____
Collect Stop Date/Time: 01-28-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG 5111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 762.1 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/10/03 @ 1450 Det No.: 8 Spectrum No.: 0985708
Counted by: 97
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5185-07
Client Id : BMS-2700-058
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 01/28/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	762.1		
Sample Weight-Dry	g			
Aliquot Weight	g	762.1		
FINAL WEIGHT	kg	.7621		
Container			WATS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-07 analyzed by emml461 on 04/08/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-07

Sample ID: SOIL/SEDI Duratek Inc

Code: 0985708

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 14:49:51
Sampling Stop: 01/28/2003 12:00:00 | Decay Time: 1.68E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 4000 Sec
Sample Size 7.62E-001 kg | Real Time 4003 Sec
Collection Efficiency 1.0000 | Spc. File 0985708.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Energy(keV)= 0.08 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.55	95.79	23	26	42	255	0.83	NET< CL
2	74.48	112.28	96	20	28	158	1.19 a	
3	76.84	115.85	101	20	28	158	1.19 b	
4	86.94	131.09	12	21	34	214	0.32	NET< CL
5	92.79	139.93	73	23	36	216	1.68	
6	186.31	281.07	32	22	35	177	1.39	NET< CL
7	209.03	315.36	8	17	27	125	0.42	NET< CL
8	238.49	359.82	302	21	19	74	1.15 a	
9	241.22	363.93	86	19	27	119	1.82 b	
10	295.09	445.23	87	17	24	91	1.17	
11	338.29	510.43	67	16	23	75	1.69	
12	351.83	530.87	152	18	22	74	1.32	
13	510.73	770.69	103	16	19	61	2.29	Wide Pk
14	582.97	879.71	131	15	16	40	1.59	
15	609.24	919.36	143	16	17	49	1.51	
16	911.23	1375.13	80	12	13	25	1.63	
17	968.97	1462.28	26	11	15	37	1.69	
18	1120.42	1690.84	44	9	11	16	3.63	Wide Pk
19	1460.80	2204.56	393	21	10	16	2.17	
20	1764.59	2663.05	30	7	7	7	1.63	
21	2614.58	3945.88	61	9	6	7	2.17	

L5185-07 analyzed by emm1461 on 04/08/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File:. EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.55	23	26	42	5	26	42	NET<CL
2	74.48	96	20	28	89	20	28	
3	76.84	101	20	28	90	20	29	
4	86.94	12	21	34	4	21	35	NET<CL
5	92.79	73	23	36	29	23	37	NET<CL
6	186.31	32	22	35	8	22	36	NET<CL
8	238.49	302	21	19	284	21	21	
9	241.22	86	19	27	78	19	28	
10	295.09	87	17	24	70	17	25	
11	338.29	67	16	23	63	16	23	
12	351.83	153	18	22	127	18	24	
13	510.73	103	16	19	2	16	26	NET<CL
14	582.97	131	15	16	126	15	17	
15	609.24	143	16	17	121	16	19	
16	911.23	80	12	13	77	12	13	
17	968.97	26	11	15	23	11	16	
18	1120.42	45	9	11	41	9	11	
19	1460.80	393	21	10	384	21	11	
20	1764.59	30	7	7	25	7	8	
21	2614.58	61	9	6	55	9	8	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.48	89	Pb-212	55	3 of 6	86.53	1.37	
			Tl-208	4	4 of 9	81.13	0.81	
			Pb-214	25	5 of 7	100.00	1.00	
			Tl-208	7	4 of 9	81.13	0.81	
3	76.84	90	Pb-214	41	5 of 7	100.00	1.50	
			Tl-208	7	4 of 9	81.13	0.81	
			Pb-212	101	3 of 6	90.16	1.40	
8	238.49	284	Pb-212	307	3 of 6	90.16	1.40	
9	241.22	78	Pb-214	34	5 of 7	100.00	1.50	
			La-140		1 of 15	0.40	0.00	LowScore
10	295.09	70	Pb-214	86	5 of 7	100.00	1.50	
11	338.29	63	AcTh-228	52	3 of 36	76.62	1.27	
12	351.83	127	Pb-214	186	5 of 7	100.00	1.50	
14	582.97	126	Tl-208	126	4 of 9	84.75	1.35	
15	609.24	121	Bi-214	168	3 of 33	100.00	1.50	
			Ru-103		1 of 2	5.92	0.06	LowScore
16	911.23	77	AcTh-228	59	3 of 36	76.62	1.27	
17	968.97	23	AcTh-228	45	3 of 36	100.00	1.50	
			Sb-124		1 of 13	1.04	0.51	
18	1120.42	41	Bi-214	27	3 of 33	74.63	1.25	
19	1460.80	384	K-40		1 of 1	100.00	1.50	
20	1764.59	25	Bi-214	22	3 of 33	83.70	1.34	
21	2614.58	55	Tl-208	55	4 of 9	84.75	1.35	

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-07

Sample ID: SOIL/SEDI Duratek Inc

Code: 0985708

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Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 14:49:51
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. . . . . 1.68e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 4000 Sec
Sample Size . . . . . 7.62e-001 kg | Real Time . . . . . 4003 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 0985708.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File: L5185-07.LSF (SOIL/SEDI: Duratek Inc)

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MEASURED or MDA CONCENTRATIONS

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              N
      ENERGY E   Concentration
Nuclide   (keV)   (pCi/kg      )   MDA   Flags   Notes   MDC
-----
Pb-212    238.63   3.20E+02 +- 2.36E+01  6.70E+01   +*       . . . . .
          74.81    I.D.      . . . . .      . . . . .
Pb-214    Average:x 2.30E+02 +- 2.65E+01  . . . . .      *       . . . . .
          77.11    I.D.      . . . . .      . . . . .
          241.98   5.25E+02 +- 1.29E+02  3.95E+02   +*       . . . . .
          295.21   2.09E+02 +- 5.18E+01  1.57E+02   +*       . . . . .
          351.92   2.19E+02 +- 3.17E+01  8.71E+01   +*       . . . . .
AcTh-228  Average:x 2.98E+02 +- 3.87E+01  . . . . .      *       . . . . .
          338.32   3.47E+02 +- 8.77E+01  2.65E+02   +*       . . . . .
          911.07   3.31E+02 +- 5.10E+01  1.25E+02   +*       . . . . .
          969.11   1.75E+02 +- 8.03E+01  2.56E+02   +       . . . . .
Tl-208    Average:x 3.71E+02 +- 3.54E+01  . . . . .      *       . . . . .
          583.14   3.71E+02 +- 4.44E+01  1.05E+02   +*       . . . . .
          2614.66  3.70E+02 +- 5.88E+01  1.21E+02   +*       . . . . .
Bi-214    Average:x 2.61E+02 +- 2.78E+01  . . . . .      *       . . . . .
          609.31   2.40E+02 +- 3.17E+01  8.09E+01   +*       . . . . .
          1120.29  3.73E+02 +- 8.44E+01  2.26E+02   +*       . . . . .
          1764.49  2.98E+02 +- 8.04E+01  2.11E+02   +*       . . . . .
K-40      1460.81   5.88E+03 +- 3.17E+02  3.74E+02   +*       . . . . .
Am-241     59.54 N-1.09E+02 +- 5.50E+01  1.98E+02    x       . . . . .
Co-57     122.06 N-3.26E+00 +- 9.38E+00  3.27E+01    x       . . . . .
Ce-144    133.54 N-5.13E+01 +- 7.43E+01  2.61E+02    x       . . . . .
Ce-141    145.44 N-6.31E+01 +- 6.22E+01  2.20E+02    x       . . . . .
Ra-226    186.22 N 8.25E+02 +- 2.20E+02  6.71E+02   x*       . . . . .
Se-75     264.65 N 1.61E+01 +- 1.68E+01  5.66E+01    x       . . . . .
Cr-51     320.08 N-6.74E+02 +- 4.31E+02  1.60E+03    x       . . . . .

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MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
I-131	364.48	N-4.26E+03 +- 3.68E+03	1.37E+04		x		
Sb-125	427.89	N-9.99E+00 +- 2.60E+01	9.43E+01		x		
Ag-108m	433.93	N-1.58E+01 +- 7.17E+00	2.86E+01		x		
Be-7	477.59	N 3.11E+01 +- 1.53E+02	5.48E+02		x		
La-140	487.03	N-4.28E+02 +- 7.51E+02	2.75E+03		x		
Ru-103	497.08	N 2.21E+01 +- 2.43E+01	8.35E+01		x		
Ba-140	537.32	N 4.73E+02 +- 1.14E+03	4.07E+03		x		
Cs-134	604.70	N-2.90E+01 +- 3.54E+01	1.21E+02P		x	PIC	
Ru-106	621.84	N 5.42E+01 +- 8.46E+01	2.96E+02		x		
Cs-137	661.65	N-1.14E+01 +- 9.43E+00	3.63E+01		x	Y.	
Zr-95	724.18	N-4.53E+01 +- 4.80E+01	1.79E+02		x		
Nb-95	765.79	N 3.05E+01 +- 3.35E+01	1.15E+02		x		
Co-58	810.76	N 1.99E+01 +- 1.61E+01	5.43E+01		x		
Mn-54	834.83	N-1.32E+00 +- 8.85E+00	3.30E+01		x		
Ag-110m	884.67	N-9.82E+00 +- 1.29E+01	5.01E+01		x		
Fe-59	1099.22	N 0.00E+00 +- 5.39E+01	1.97E+02		x		
Zn-65	1115.52	N 4.45E+01 +- 3.98E+01	1.33E+02P		x	PIC	
Co-60	1332.49	N-9.46E+00 +- 7.72E+00	3.27E+01		x	Y.	
Sb-124	1691.02	N-2.47E+00 +- 2.12E+01	9.35E+01		x		

MEASURED TOTAL: 8.19E+03 +- 6.88E+02 pCi/kg

0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.55	95.79	5	26	42	255	0.83	Deleted
4	86.94	131.09	4	21	35	214	0.32	Deleted
5	92.79	139.93	29	23	37	216	1.68	Deleted
6	186.31	281.07	8	22	36	177	1.39	Deleted
7	209.03	315.36	8	17	27	125	0.42	Deleted
13	510.73	770.69	2	16	26	61	2.29	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
22	59.54	89.74	-37N	19	32	193	1.24	NET< CL
23	122.06	184.09	-6N	17	29	152	1.29	NET< CL
24	133.54	201.42	-12N	17	29	157	1.30	NET< CL
25	145.44	219.38	-17N	17	29	151	1.31	NET< CL
26	186.22	280.93	62N	16	24	105	1.33	
27	264.65	399.30	12N	12	20	72	1.39	NET< CL
28	320.08	482.95	-19N	12	21	77	1.43	NET< CL
29	364.48	549.96	-13N	11	19	60	1.46	NET< CL
30	427.89	645.66	-4N	10	17	48	1.50	NET< CL
31	433.93	654.78	-19N	9	16	44	1.51	NET< CL
32	477.59	720.67	2N	8	13	30	1.53	NET< CL

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 NET/MDA PEAK RESULTS
 =====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
33	487.03	734.92	-6N	10	16	46	1.54	NET< CL
34	497.08	750.09	7N	8	12	29	1.55	NET< CL
35	537.32	810.82	3N	8	12	29	1.57	NET< CL
36	604.70	912.51	-29N	35	59	86	1.62	NET< CL PIC
37	621.84	938.38	5N	8	12	28	1.63	NET< CL
38	661.65	998.46	-10N	8	15	39	1.66	NET< CL
39	724.18	1092.83	-9N	10	16	50	1.70	NET< CL
40	765.79	1155.63	7N	8	12	26	1.73	NET< CL
41	810.76	1223.50	9N	7	11	22	1.76	NET< CL
42	834.83	1259.83	-1N	7	11	23	1.77	NET< CL
43	884.67	1335.05	-5N	7	11	24	1.81	NET< CL
44	1099.22	1658.85	0N	8	12	27	1.95	NET< CL
45	1115.52	1683.45	14N	12	19	29	1.96	NET< CL PIC
46	1332.49	2010.91	-6N	5	9	15	2.10	NET< CL
47	1691.02	2552.02	-0N	3	4	3	2.34	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 14:49:51
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. . . . . 1.68E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 4000 Sec
Sample Size . . . . . 7.62E-01 kg | Real Time . . . . . 4003 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 0985708.spc
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Detector #: 8

Energy(keV)= 0.08 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5185-07.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	3.20E+02	2.36E+01	< 6.70E+01	3.20E+01	1.00E+00	MEAS +	YES
Pb-214	2.30E+02	2.65E+01	< 8.71E+01	4.12E+01	9.99E-01	MEAS +	YES
AcTh-228	2.98E+02	3.87E+01	< 1.25E+02	5.64E+01	1.00E+00	MEAS +	YES
Tl-208	3.71E+02	3.54E+01	< 1.06E+02	4.87E+01	1.00E+00	MEAS +	YES
Bi-214	2.61E+02	2.78E+01	< 8.09E+01	3.78E+01	9.99E-01	MEAS +	YES
K-40	5.88E+03	3.17E+02	< 3.74E+02	1.66E+02	1.00E+00	MEAS +	YES
Am-241	-1.09E+02	5.50E+01	< 1.98E+02	9.51E+01	1.00E+00	NET	YES
Co-57	-3.26E+00	9.38E+00	< 3.27E+01	1.56E+01	8.36E-01	NET	YES
Ce-144	-5.13E+01	7.43E+01	< 2.61E+02	1.25E+02	8.43E-01	NET	YES
Ce-141	-6.31E+01	6.22E+01	< 2.20E+02	1.05E+02	2.24E-01	NET	YES
Ra-226	8.25E+02	2.20E+02	< 6.71E+02	3.17E+02	1.00E+00	NET	YES
Se-75	1.61E+01	1.68E+01	< 5.66E+01	2.65E+01	6.66E-01	NET	YES
Cr-51	-6.74E+02	4.31E+02	< 1.60E+03	7.54E+02	1.73E-01	NET	YES
I-131	-4.26E+03	3.68E+03	< 1.37E+04	6.37E+03	2.37E-03	NET	YES
Sb-125	-9.98E+00	2.60E+01	< 9.43E+01	4.36E+01	9.53E-01	NET	YES
Ag-108m	-1.58E+01	7.17E+00	< 2.86E+01	1.32E+01	9.99E-01	NET	YES
Be-7	3.11E+01	1.53E+02	< 5.48E+02	2.49E+02	4.03E-01	NET	YES
La-140	-4.28E+02	7.51E+02	< 2.75E+03	1.27E+03	2.24E-02	NET	YES
Ru-103	2.21E+01	2.43E+01	< 8.35E+01	3.76E+01	2.91E-01	NET	YES
Ba-140	4.73E+02	1.14E+03	< 4.07E+03	1.83E+03	2.24E-02	NET	YES
Cs-134	-2.90E+01	3.54E+01	< 1.20E+02	5.89E+01	9.38E-01	NET	YES
Ru-106	5.42E+01	8.46E+01	< 2.96E+02	1.33E+02	8.76E-01	NET	YES
Cs-137	-1.14E+01	9.43E+00	< 3.63E+01	1.66E+01	9.96E-01	NET	YES
Zr-95	-4.53E+01	4.80E+01	< 1.79E+02	8.27E+01	4.68E-01	NET	YES
Nb-95	3.05E+01	3.35E+01	< 1.15E+02	5.17E+01	2.50E-01	NET	YES
Co-58	1.99E+01	1.61E+01	< 5.43E+01	2.42E+01	5.03E-01	NET	YES
Mn-54	-1.32E+00	8.85E+00	< 3.30E+01	1.47E+01	8.56E-01	NET	YES
Ag-110m	-9.82E+00	1.29E+01	< 5.01E+01	2.24E+01	8.23E-01	NET	YES
Fe-59	0.00E+00	5.39E+01	< 1.97E+02	8.87E+01	3.36E-01	NET	YES
Zn-65	4.45E+01	3.98E+01	< 1.34E+02	6.23E+01	8.20E-01	NET	YES
Co-60	-9.46E+00	7.72E+00	< 3.27E+01	1.42E+01	9.75E-01	NET	YES
Sb-124	-2.47E+00	2.12E+01	< 9.35E+01	3.56E+01	4.46E-01	NET	YES

L5185-07 analyzed by emm1461 on 04/08/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-08
Client: Duratek Inc
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-060
Collect Start Date/Time: _____
Collect Stop Date/Time: 01-28-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

Count by Date: _____
(if required)
Delay Date: _____
(if required)

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG 5111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 843.8 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R 8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/8/03 1721 Det No.: 2 Spectrum No.: 0986802
Counted by: EN
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5185-08
Client Id : BMS-2700-060
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 01/28/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	843.8		
Sample Weight-Dry	g			
Aliquot Weight	g	843.8		
FINAL WEIGHT	kg	.8438		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-08 analyzed by emml461 on 04/08/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-08

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986802

Sampling Start: 01/28/2003 12:00:00 ✓ Counting Start: 04/08/2003 17:20:44
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69E+003 Hrs
Buildup Time. 0.00E+000 Hrs ✓ Live Time 7200 Sec
Sample Size 8.44E-001 kg ✓ Real Time 7203 Sec
Collection Efficiency 1.0000 | Spc. File 0986802.spc

Detector #: 2 (Canberra sn 9923043 det# 2)

Energy(keV)= 0.85 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.10	94.21	53	25	40	298	1.13	
2	74.85	112.00	122	25	38	288	1.12	a
3	76.96	115.20	189	24	32	230	0.91	b
4	86.97	130.35	44	17	26	164	0.56	a
5	89.68	134.45	28	17	26	164	0.58	b
6	92.79	139.16	108	28	42	329	1.22	c
7	185.90	280.08	93	23	35	205	1.18	
8	209.01	315.06	5	22	37	231	0.17	NET< CL
9	233.27	351.78	17	11	17	74	0.61	a NET< CL
10	238.51	359.72	432	26	25	122	1.07	b
11	241.74	364.60	71	21	32	172	1.42	c
12	277.02	418.00	-18	17	29	139	0.99	NET< CL
13	295.04	445.27	64	15	20	84	1.00	a
14	300.25	453.16	35	14	20	84	1.11	b
15	338.26	510.69	47	19	28	127	0.67	
16	351.83	531.23	197	20	23	89	1.18	
17	462.47	698.69	19	7	10	22	0.71	a
18	463.59	700.39	14	7	10	22	0.69	b
19	511.06	772.23	160	19	23	72	2.63	Wide Pk
20	582.85	880.88	97	16	21	71	1.22	
21	609.12	920.64	162	18	20	58	1.40	
22	640.30	967.84	6	10	16	43	0.46	NET< CL
23	726.91	1098.93	8	10	16	46	0.68	NET< CL
24	794.82	1201.71	32	10	14	32	2.08	
25	860.73	1301.47	29	10	14	29	1.74	
26	911.22	1377.90	70	13	16	40	1.55	
27	968.99	1465.33	30	12	18	52	0.97	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	1119.60	1693.29	43	12	16	36	2.65	Wide Pk
29	1460.81	2209.73	500	23	8	12	2.01	
30	1764.14	2668.83	35	8	8	9	2.31	
31	2614.37	3955.70	49	8	7	8	3.20	

L5185-08 analyzed by emml461 on 04/08/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.10	53	25	40	13	26	42	NET<CL
2	74.85	122	25	38	92	26	39	
3	76.96	189	24	32	153	24	34	
4	86.97	44	17	26	22	17	27	NET<CL
6	92.79	108	28	42	5	28	46	NET<CL
7	185.90	93	23	35	50	23	37	
10	238.51	432	26	25	397	26	27	
11	241.74	71	21	32	48	21	33	
13	295.04	64	15	20	19	15	24	NET<CL
15	338.26	47	19	28	42	19	29	
16	351.83	197	20	23	121	20	27	
17	462.47	19	7	10	16	8	11	
19	511.06	160	19	23	26	19	30	NET<CL
20	582.85	97	16	21	84	16	22	
21	609.12	162	18	20	105	18	24	
23	726.91	8	10	16	6	10	16	NET<CL
26	911.22	70	13	16	61	13	17	
27	968.99	31	12	18	29	12	18	
28	1119.60	43	12	16	31	12	17	
29	1460.81	500	23	8	486	23	11	
30	1764.14	35	8	8	26	8	9	
31	2614.37	49	8	7	40	8	9	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.85	92	Pb-212	94	4 of 6	90.56	1.41	
			Pb-214	26	4 of 7	76.18	1.26	
			Tl-208	7	4 of 9	85.60	0.86	
3	76.96	153	Pb-212	167	4 of 6	90.56	1.41	
			Tl-208	7	4 of 9	85.60	0.86	
			Pb-214	50	4 of 7	76.18	0.76	
5	89.68	28	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	185.90	50	U-235	. . . . .	1 of 3	100.00	1.50	
			Ra-226	. . . . .	1 of 1	100.00	1.50	
10	238.51	397	Pb-212	378	4 of 6	90.56	1.41	
11	241.74	14	La-140	. . . . .	1 of 15	0.40	0.50	Split
32	241.74	34	Pb-214	34	4 of 7	76.18	1.26	AutoAdd
14	300.25	35	Pb-212	26	4 of 6	90.56	1.41	
15	338.26	42	AcTh-228	52	5 of 36	100.00	1.50	
16	351.83	121	Pb-214	333	4 of 7	76.18	0.76	
17	462.47	16	Sb-125	. . . . .	1 of 8	18.01	0.68	
			Sb-125	. . . . .	1 of 8	18.01	0.68	
18	463.59	14	AcTh-228	. . . . .	0 of 0	. . . . .	. . . . .
			AcTh-228	16	5 of 36	100.00	1.50	
20	582.85	84	Tl-208	109	4 of 9	90.24	1.40	
21	609.12	105	Bi-214	159	3 of 33	100.00	1.50	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
24	794.82	33	AcTh-228	10	5 of 36	67.05	1.17	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
25	860.73	29	Tl-208	10	4 of 9	87.55	1.38	
26	911.22	61	AcTh-228	59	5 of 36	100.00	1.50	
27	968.99	29	AcTh-228	36	5 of 36	100.00	1.50	
			Sb-124	. . . . .	1 of 13	1.04	0.51	
28	1119.60	31	Bi-214	24	3 of 33	93.87	1.44	
29	1460.81	486	K-40	. . . . .	1 of 1	100.00	1.50	
30	1764.14	26	Bi-214	17	3 of 33	88.51	1.39	
31	2614.37	40	Tl-208	36	4 of 9	90.24	1.40	

L5185-08 analyzed by emml461 on 04/08/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-08

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986802

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:20:44
Sampling Stop: 01/28/2003 12:00:00 | Decay Time: 1.69e+003 Hrs
Buildup Time: 0.00e+000 Hrs | Live Time 7200 Sec
Sample Size 8.44e-001 kg | Real Time 7203 Sec
Collection Efficiency 1.0000 | Spectrum File 0986802.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 2 (Canberra sn 9923043 det# 2)
Efficiency File: WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[1.15E-02*En^-3.19E+00 + 2.16E+02*En^7.29E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: L5185-08.LSF (SOIL/SEDI: Duratek Inc)
=====

MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	3.07E+02 +- 1.96E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	238.63	3.06E+02 +- 1.98E+01	4.32E+01		+	. . . . .
	300.09	4.09E+02 +- 1.62E+02	5.14E+02		+	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
U-235	185.72	2.69E+01 +- 1.27E+01	4.14E+01		+	. . . . .
La-140	487.03	N-5.64E+02 +- 4.78E+02	6.97E+03		x	. . . . .
	241.97	I.D.	. . . .			. . . . .
AcTh-228	Average:x	1.94E+02 +- 2.96E+01	. . . .		*	. . . . .
	338.32	1.63E+02 +- 7.19E+01	2.32E+02		+	. . . . .
	463.00	1.73E+02 +- 8.62E+01	2.74E+02		+	. . . . .
	794.70	5.78E+02 +- 1.83E+02	5.48E+02		+	. . . . .
	911.07	1.99E+02 +- 4.15E+01	1.17E+02		+	. . . . .
	969.11	1.67E+02 +- 6.97E+01	2.21E+02		+	. . . . .
Pb-214	Average:x	1.47E+02 +- 2.38E+01	. . . .		*	. . . . .
	351.92	1.46E+02 +- 2.41E+01	6.95E+01		+	. . . . .
	241.98	1.57E+02 +- 1.40E+02	4.66E+02		+	. . . . .
Sb-125	Average:x	1.82E+01 +- 1.75E+01	. . . .			. . . . .
	463.38	8.67E+01 +- 4.20E+01	1.34E+02			. . . . .
	427.89 N	3.72E+00 +- 1.93E+01	6.80E+01		x	. . . . .
Tl-208	Average:x	2.03E+02 +- 2.74E+01	. . . .		*	. . . . .
	583.14	1.81E+02 +- 3.51E+01	1.01E+02		+	. . . . .
	860.37	5.63E+02 +- 1.91E+02	5.79E+02		+
	2614.66	2.17E+02 +- 4.50E+01	1.10E+02		+
Bi-214	Average:x	1.67E+02 +- 2.31E+01		*

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MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E (keV)		(pCi/kg)				
	609.31		1.53E+02 +- 2.56E+01		7.26E+01	+		
	1120.29		2.16E+02 +- 8.16E+01		2.55E+02	+		
	1764.49		2.42E+02 +- 7.05E+01		1.97E+02	+		
K-40	1460.81		5.78E+03 +- 2.73E+02		2.86E+02	+		
Am-241	59.54	N	4.07E+01 +- 3.05E+01		1.01E+021	x	lbase	
Co-57	122.06	N	1.75E+01 +- 6.31E+00		2.32E+01	x		
Ce-144	133.54	N	8.26E+01 +- 5.52E+01		1.82E+02	x		
Ce-141	145.44	N	2.20E+01 +- 4.69E+01		1.59E+02	x		
Ra-226	186.22	N	8.14E+02 +- 1.71E+02		5.12E+02	x*		
Se-75	264.65	N	0.00E+00 +- 1.31E+01		4.56E+01	x		
Cr-51	320.08	N	2.49E+01 +- 3.23E+02		1.13E+03	x		
I-131	364.48	N	2.19E+03 +- 2.99E+03		1.08E+04	x		
Ag-108m	433.93	N	2.34E+00 +- 6.34E+00		2.28E+01	x		
Be-7	477.59	N	2.68E+01 +- 1.29E+02		4.64E+02	x		
Ru-103	497.08	N	3.36E+01 +- 2.19E+01		8.34E+01	x		
Ba-140	537.32	N	1.29E+02 +- 1.21E+03		4.26E+03	x		
Cs-134	604.70	N	6.32E+00 +- 7.47E+00		2.55E+011	x	lbase	
Ru-106	621.84	N	1.32E+01 +- 7.91E+01		2.84E+02	x		
Cs-137	661.65	N	1.51E+01 +- 8.15E+00		2.64E+01	x	Y.	
Zr-95	724.18	N	7.50E+01 +- 3.40E+01		1.35E+02	x		
Nb-95	765.79	N	2.75E+01 +- 2.58E+01		9.91E+01	x		
Co-58	810.76	N	2.23E+01 +- 1.12E+01		4.63E+01	x		
Mn-54	834.83	N	1.09E+01 +- 8.88E+00		3.38E+01	x		
Ag-110m	884.67	N	1.77E+01 +- 1.00E+01		4.09E+01	x		
Fe-59	1099.22	N	5.44E+00 +- 4.03E+01		1.49E+02	x		
Zn-65	1115.52	N	1.28E+01 +- 3.72E+01		1.28E+02P	x	PIC	
Co-60	1332.49	N	1.26E+01 +- 7.84E+00		2.56E+01	x	Y.	
Sb-124	1691.02	N	2.59E+01 +- 2.24E+01		7.78E+01	x		

MEASURED TOTAL: 7.66E+03 +- 5.98E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.10	94.21	13	26	42	298	1.13	Deleted
4	86.97	130.35	22	17	27	165	0.56	Deleted
6	92.79	139.16	5	28	46	329	1.22	Deleted
8	209.01	315.06	5	22	37	231	0.17	Deleted
9	233.27	351.78	17	11	17	74	0.61	Deleted
12	277.02	418.00	-18	17	29	139	0.99	Deleted
13	295.04	445.27	19	15	24	84	1.00	Deleted
19	511.06	772.23	26	19	30	72	2.63	Deleted
22	640.30	967.84	6	10	16	43	0.46	Deleted
23	726.91	1098.93	6	10	16	46	0.68	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
33	59.54	88.83	27N	20	32	211	1.08	NET< CL LBase
34	122.06	183.46	-50N	18	32	205	1.13	NET< CL
35	133.54	200.83	30N	20	31	198	1.14	NET< CL
36	145.44	218.85	9N	20	32	194	1.15	NET< CL
37	186.22	280.57	91N	19	27	150	1.18	
38	264.65	399.28	0N	14	23	100	1.23	NET< CL
39	320.08	483.17	1N	13	21	84	1.27	NET< CL
40	364.48	550.37	-9N	12	21	80	1.30	NET< CL
41	427.89	646.35	2N	10	17	53	1.35	NET< CL
42	433.93	655.49	-4N	11	18	61	1.35	NET< CL
43	477.59	721.57	-2N	10	16	47	1.38	NET< CL
44	487.03	735.86	-10N	8	15	41	1.39	NET< CL
45	497.08	751.07	-15N	10	17	55	1.39	NET< CL
46	537.32	811.98	1N	11	18	55	1.42	NET< CL
47	604.70	913.96	9N	10	16	44	1.47	NET< CL LBase
48	621.84	939.90	-2N	10	17	47	1.48	NET< CL
49	661.65	1000.16	18N	10	14	35	1.51	
50	724.18	1094.80	-20N	9	17	55	1.55	NET< CL
51	765.79	1157.78	-9N	8	14	35	1.58	NET< CL
52	810.76	1225.84	-14N	7	13	32	1.61	NET< CL
53	834.83	1262.27	-11N	9	16	46	1.63	NET< CL
54	884.67	1337.71	-12N	7	13	29	1.66	NET< CL
55	1099.22	1662.44	-1N	7	12	28	1.80	NET< CL
56	1115.52	1687.11	5N	15	24	57	1.82	NET< CL PIC
57	1332.49	2015.51	10N	6	9	15	1.96	
58	1691.02	2558.16	4N	3	5	4	2.21	NET< CL

L5185-08 analyzed by emml461 on 04/08/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:20:44
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 7200 Sec
Sample Size 8.44E-01 kg | Real Time 7203 Sec
Collection Efficiency 1.0000 | Spectrum File 0986802.spc

Detector #: 2

Energy(keV)= 0.85 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 6.55E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[1.15e-02*En^-3.19e+00 + 2.16e+02*En^ 7.29e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5185-08.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	3.07E+02	1.96E+01	< 4.32E+01	2.06E+01	1.00E+00	MEAS +	YES
U-235	2.69E+01	1.27E+01	< 4.14E+01	2.00E+01	1.00E+00	MEAS +	YES
La-140	-5.64E+02	4.78E+02	< 6.97E+03	3.41E+03	2.22E-02	NET	YES
AcTh-228	1.94E+02	2.96E+01	< 1.17E+02	5.39E+01	9.96E-01	MEAS +	YES
Pb-214	1.47E+02	2.38E+01	< 6.94E+01	3.31E+01	1.00E+00	MEAS +	YES
Sb-125	1.82E+01	1.75E+01	< 6.79E+01	3.15E+01	9.53E-01	MEAS +	YES
Tl-208	2.02E+02	2.74E+01	< 1.01E+02	4.77E+01	9.96E-01	MEAS +	YES
Bi-214	1.67E+02	2.31E+01	< 7.26E+01	3.43E+01	1.00E+00	MEAS +	YES
K-40	5.78E+03	2.73E+02	< 2.86E+02	1.27E+02	1.00E+00	MEAS +	YES
Am-241	4.07E+01	3.05E+01	< 1.01E+02	4.84E+01	1.00E+00	NET	YES
Co-57	-1.75E+01	6.31E+00	< 2.32E+01	1.11E+01	8.36E-01	NET	YES
Ce-144	8.26E+01	5.52E+01	< 1.82E+02	8.73E+01	8.43E-01	NET	YES
Ce-141	2.20E+01	4.69E+01	< 1.59E+02	7.62E+01	2.23E-01	NET	YES
Ra-226	8.14E+02	1.71E+02	< 5.12E+02	2.44E+02	1.00E+00	NET	YES
Se-75	0.00E+00	1.31E+01	< 4.56E+01	2.15E+01	6.66E-01	NET	YES
Cr-51	2.49E+01	3.23E+02	< 1.13E+03	5.30E+02	1.72E-01	NET	YES
I-131	-2.19E+03	2.99E+03	< 1.08E+04	5.06E+03	2.34E-03	NET	YES
Ag-108m	-2.34E+00	6.34E+00	< 2.28E+01	1.06E+01	9.99E-01	NET	YES
Be-7	-2.68E+01	1.29E+02	< 4.64E+02	2.14E+02	4.02E-01	NET	YES
Ru-103	-3.36E+01	2.19E+01	< 8.34E+01	3.87E+01	2.90E-01	NET	YES
Ba-140	1.29E+02	1.21E+03	< 4.26E+03	1.98E+03	2.22E-02	NET	YES
Cs-134	6.32E+00	7.47E+00	< 2.55E+01	1.18E+01	9.37E-01	NET	YES
Ru-106	-1.32E+01	7.91E+01	< 2.84E+02	1.31E+02	8.76E-01	NET	YES
Cs-137	1.51E+01	8.15E+00	< 2.64E+01	1.21E+01	9.96E-01	NET	YES
Zr-95	-7.50E+01	3.40E+01	< 1.35E+02	6.23E+01	4.67E-01	NET	YES
Nb-95	-2.75E+01	2.59E+01	< 9.91E+01	4.52E+01	2.49E-01	NET	YES
Co-58	-2.23E+01	1.12E+01	< 4.63E+01	2.09E+01	5.03E-01	NET	YES
Mn-54	-1.09E+01	8.88E+00	< 3.38E+01	1.56E+01	8.56E-01	NET	YES
Ag-110m	-1.77E+01	1.00E+01	< 4.09E+01	1.85E+01	8.23E-01	NET	YES
Fe-59	-5.44E+00	4.03E+01	< 1.49E+02	6.69E+01	3.36E-01	NET	YES
Zn-65	1.28E+01	3.72E+01	< 1.28E+02	6.05E+01	8.19E-01	NET	YES
Co-60	1.26E+01	7.84E+00	< 2.56E+01	1.12E+01	9.75E-01	NET	YES
Sb-124	2.59E+01	2.24E+01	< 7.78E+01	3.01E+01	4.45E-01	NET	YES

L5185-08 analyzed by emml461 on 04/08/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-09 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-090
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-25-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WC25111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 801.2 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R 8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/8/03 01721 Det No.: 3 Spectrum No.: 0986803
Counted by: gh
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s) : Co-60,38;Cs-137,1100;

Sample Id : L5185-09
Client Id : BMS-2700-090
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/25/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	801.2		
Sample Weight-Dry	g			
Aliquot Weight	g	801.2		
FINAL WEIGHT	kg	.8012		
Container			WATS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-09 analyzed by emml461 on 04/08/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-09

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986803

Sampling Start: 02/25/2003 12:00:00 | Counting Start: 04/08/2003 17:21:15
Sampling Stop: 02/25/2003 12:00:00 | Decay Time: 1.01E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 9000 Sec
Sample Size 8.01E-001 kg | Real Time 9004 Sec
Collection Efficiency 1.0000 | Spc. File 0986803.spc

Detector #: 3 (Canberra sn 10923049 det#3)

Energy(keV)= 0.64 + 0.661*Ch +-1.68E-07*Ch^2 + 4.51E-11*Ch^3 04/08/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.31	94.76	77	30	48	421	1.23	
2	74.78	112.10	195	27	38	312	0.94	a
3	77.05	115.52	322	23	24	156	0.54	b
4	87.16	130.81	14	31	50	466	0.40	NET< CL
5	92.75	139.27	158	32	48	431	1.29	
6	105.39	158.38	14	24	39	302	0.44	NET< CL
7	185.97	280.22	106	24	35	230	0.95	
8	209.52	315.83	61	24	38	245	1.42	
9	238.55	359.72	507	29	29	168	1.02	a
10	241.55	364.26	97	25	37	234	1.55	b Wide Pk
11	270.42	407.92	35	21	33	191	1.09	
12	294.94	444.99	170	21	28	133	1.49	a
13	299.96	452.59	36	11	15	57	0.73	b
14	327.83	494.73	27	20	32	164	0.78	NET< CL
15	338.21	510.43	91	20	28	135	1.14	
16	351.94	531.19	286	24	27	126	1.26	
17	510.79	771.40	168	19	23	85	2.78	Wide Pk
18	582.42	879.73	54	10	10	27	0.75	a
19	583.50	881.37	97	13	15	44	0.98	b
20	609.16	920.18	232	20	21	63	1.35	
21	661.54	999.40	328	22	20	58	1.55	
22	726.83	1098.13	22	13	19	56	0.84	
23	911.00	1376.67	95	14	17	46	1.67	
24	969.17	1464.64	36	13	19	62	1.24	
25	1120.50	1693.49	37	13	20	64	1.70	
26	1378.06	2082.99	8	10	15	32	0.55	NET< CL
27	1460.65	2207.87	948	31	10	18	1.96	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	1764.90	2667.86	35	8	8	10	1.53	
29	2614.81	3952.07	59	9	8	9	2.36	

L5185-09 analyzed by emml461 on 04/08/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY03.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.31	77	30	48	38	30	49	NET<CL
2	74.78	195	27	38	168	27	39	
3	77.05	322	23	24	291	23	26	
4	87.16	14	31	50	-3	31	51	NET<CL
5	92.75	158	32	48	77	32	51	
7	185.97	106	24	35	64	24	37	
8	209.52	61	24	38	58	24	38	
9	238.55	507	29	29	473	29	31	
10	241.55	97	25	37	83	25	38	
12	294.94	170	21	28	145	22	29	
15	338.21	91	20	28	82	20	29	
16	351.94	286	24	27	244	24	29	
17	510.79	168	19	23	51	19	30	
18	582.42	54	10	10	43	10	12	
20	609.16	232	20	21	198	20	23	
22	726.83	22	13	19	20	13	20	
23	911.00	95	14	17	88	14	17	
24	969.17	36	13	19	34	13	19	
25	1120.50	37	13	20	31	14	20	
27	1460.65	948	31	10	939	31	11	
28	1764.90	35	8	8	30	8	9	
29	2614.81	59	9	8	51	9	9	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. 2.00 | Decay Limit (Halflives) 8.0Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.78	168	Pb-212	124	4 of 6	90.56	1.41	
			Tl-208	6	5 of 9	90.39	0.90	
			Pb-214	60	5 of 7	100.00	1.00	
			Tl-208	10	5 of 9	90.39	0.90	
3	77.05	70	Pb-214	106	5 of 7	100.00	1.00	Split
32	77.05	221	Pb-212	221	4 of 6	90.56	1.41	AutoAdd
5	92.75	35	Th-234	. . . . .	1 of 2	100.00	1.50	Split
31	92.75	42	AcTh-228	42	6 of 36	71.01	1.21	AutoAdd
7	185.97	64	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.50	
8	209.52	58	AcTh-228	44	6 of 36	78.41	1.28	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
9	238.55	473	Pb-212	637	4 of 6	90.56	0.91	
10	241.55	83	Pb-214	66	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
11	270.42	35	AcTh-228	30	6 of 36	81.75	1.32	
12	294.94	145	Pb-214	147	5 of 7	100.00	1.50	
13	299.96	36	Pb-212	33	4 of 6	90.56	1.41	
15	338.21	82	AcTh-228	79	6 of 36	81.75	1.32	
16	351.94	244	Pb-214	462	5 of 7	100.00	1.50	
17	510.79	21	Annil	. . . . .	1 of 1	100.00	1.50	Split
30	510.79	31	Tl-208	31	5 of 9	91.63	1.42	AutoAdd
18	582.42	43	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Tl-208	154	5 of 9	100.00	1.00	Matched
19	583.50	97	Tl-208	154	5 of 9	100.00	1.50	
20	609.16	198	Bi-214	189	3 of 33	88.51	1.39	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
21	661.54	328	Cs-137	. . . . .	1 of 1	100.00	1.50	
22	726.83	20	Bi-212	. . . . .	1 of 13	100.00	1.50	
23	911.00	88	AcTh-228	84	6 of 36	81.75	1.32	
24	969.17	34	AcTh-228	52	6 of 36	100.00	1.50	
			Sb-124	. . . . .	1 of 13	1.04	0.51	
25	1120.50	31	Bi-214	39	3 of 33	100.00	1.50	
27	1460.65	939	K-40	. . . . .	1 of 1	100.00	1.50	
28	1764.90	30	Bi-214	28	3 of 33	84.53	1.35	
29	2614.81	51	Tl-208	34	5 of 9	94.42	1.44	

L5185-09 analyzed by emm1461 on 04/08/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-09

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986803

Sampling Start: 02/25/2003 12:00:00 | Counting Start: 04/08/2003 17:21:15
Sampling Stop: 02/25/2003 12:00:00 | Decay Time: 1.01e+003 Hrs
Buildup Time: 0.00e+000 Hrs | Live Time 9000 Sec
Sample Size 8.01e-001 kg | Real Time 9004 Sec
Collection Efficiency 1.0000 | Spectrum File 0986803.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Canberra sn 10923049 det#3)

Efficiency File: WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[3.20E-02*En^-2.77E+00 + 2.47E+02*En^8.30E-01] 04/30/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File: L5185-09.LSF (SOIL/SEDI: Duratek Inc)

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MEASURED or MDA CONCENTRATIONS

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N

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	3.06E+02 +- 1.82E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	238.63	3.04E+02 +- 1.84E+01	4.11E+01		++	. . . . .
	300.09	3.66E+02 +- 1.11E+02	3.33E+02		++	. . . . .
Pb-214	Average:x	2.59E+02 +- 2.04E+01	. . . .		*	. . . . .
	77.11	I.D.	. . . .			. . . . .
	241.98	3.22E+02 +- 9.58E+01	3.04E+02		++	. . . . .
	295.21	2.55E+02 +- 3.81E+01	1.09E+02		++	. . . . .
	351.92	2.56E+02 +- 2.50E+01	6.48E+01		++	. . . . .
Th-234	92.59	1.40E+02 +- 2.23E+02	7.40E+02		+	. . . . .
Ra-226	186.22	4.75E+02 +- 1.77E+02	5.69E+02		+	. . . . .
AcTh-228	Average:x	2.60E+02 +- 3.11E+01	. . . .		*	. . . . .
	209.28	3.46E+02 +- 1.45E+02	4.70E+02		+	. . . . .
	270.23	3.05E+02 +- 1.86E+02	6.12E+02		+	. . . . .
	338.32	2.73E+02 +- 6.55E+01	2.01E+02		++	. . . . .
	911.07	2.72E+02 +- 4.37E+01	1.16E+02		++	. . . . .
	969.11	1.86E+02 +- 7.05E+01	2.22E+02		+	. . . . .
	93.35	I.D.	. . . .			. . . . .
Annil	511.00	1.18E+01 +- 1.94E+01	6.49E+01		+	. . . . .
Tl-208	Average:x	2.10E+02 +- 2.32E+01	. . . .		*	. . . . .
	583.14	1.89E+02 +- 2.60E+01	6.31E+01		++	. . . . .
	2614.66	2.93E+02 +- 5.16E+01	1.19E+02		++	. . . . .
	510.84	I.D.	. . . .			. . . . .
Bi-214	Average:x	2.60E+02 +- 2.39E+01	. . . .		*	. . . . .
	609.31	2.62E+02 +- 2.63E+01	6.46E+01		++	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	1120.29	2.06E+02 +- 9.08E+01	2.91E+02		+	. . . . .
	1764.49	2.79E+02 +- 7.24E+01	1.94E+02		+	. . . . .
Cs-137	661.65	2.54E+02 +- 1.69E+01	3.29E+01		+	. . . . .
Bi-212	727.17	1.22E+02 +- 7.67E+01	2.52E+02		+	. . . . .
K-40	1460.81	1.11E+04 +- 3.73E+02	3.02E+02		+	. . . . .
Am-241	59.54	N 1.62E+01 +- 2.23E+01	7.49E+011		x lbase	. . . . .
Co-57	122.06	N 1.85E+00 +- 5.17E+00	1.76E+01		x	. . . . .
Ce-144	133.54	N 2.11E+01 +- 4.01E+01	1.36E+02		x	. . . . .
Ce-141	145.44	N 3.38E+01 +- 2.38E+01	7.87E+01		x	. . . . .
Se-75	264.65	N-4.00E+00 +- 1.07E+01	3.75E+01		x	. . . . .
Cr-51	320.08	N-1.26E+02 +- 1.43E+02	5.15E+02		x	. . . . .
I-131	364.48	N 3.22E+02 +- 2.14E+02	7.05E+02		x	. . . . .
Sb-125	427.89	N-6.44E+00 +- 2.05E+01	7.26E+01		x	. . . . .
Ag-108m	433.93	N-2.58E+00 +- 6.71E+00	2.38E+01		x	. . . . .
Be-7	477.59	N-1.92E+02 +- 1.00E+02	3.78E+02		x	. . . . .
La-140	487.03	N 1.11E+01 +- 1.24E+02	4.35E+02		x	. . . . .
Ru-103	497.08	N-3.68E+00 +- 1.29E+01	4.64E+01		x	. . . . .
Ba-140	537.32	N-8.75E+01 +- 2.17E+02	7.86E+02		x	. . . . .
Cs-134	604.70	N-1.69E+01 +- 6.69E+00	2.63E+011		x lbase	. . . . .
Ru-106	621.84	N 8.97E+01 +- 7.00E+01	2.34E+02		x	. . . . .
Zr-95	724.18	N-4.10E+01 +- 4.03E+01	1.48E+02L		x LHROI	. . . . .
Nb-95	765.79	N-3.23E+01 +- 1.84E+01	6.99E+01		x	. . . . .
Co-58	810.76	N-1.58E+01 +- 1.17E+01	4.43E+01		x	. . . . .
Mn-54	834.83	N-5.11E+00 +- 7.96E+00	2.95E+01		x	. . . . .
Ag-110m	884.67	N-1.50E+01 +- 9.94E+00	3.93E+01		x	. . . . .
Fe-59	1099.22	N 3.41E+01 +- 3.41E+01	1.16E+02		x	. . . . .
Zn-65	1115.52	N 3.76E+01 +- 3.96E+01	1.33E+02P		x PIC	. . . . .
Co-60	1332.49	N-4.02E+00 +- 7.73E+00	2.97E+01		x Y.	. . . . .
Sb-124	1691.02	N-9.50E+00 +- 1.78E+01	7.54E+01		x	. . . . .

MEASURED TOTAL: 1.34E+04 +- 1.00E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.31	94.76	38	30	49	421	1.23	Deleted
4	87.16	130.81	-3	31	51	466	0.40	Deleted
6	105.39	158.38	14	24	39	303	0.44	Deleted
14	327.83	494.73	27	20	32	164	0.78	Deleted
18	582.42	879.73	43	10	12	27	0.75	Unknown
26	1378.06	2082.99	8	10	15	33	0.55	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
33	59.54	89.05	15N	21	33	246	0.90	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
34	122.06	183.58	7N	20	32	226	0.95	LBase NET< CL
35	133.54	200.94	10N	19	31	210	0.96	NET< CL
36	145.44	218.93	31N	22	35	243	0.97	NET< CL
37	264.65	399.19	-6N	16	27	145	1.07	NET< CL
38	320.09	483.02	-12N	13	23	106	1.12	NET< CL
39	364.49	550.16	17N	11	17	60	1.16	NET< CL
40	427.90	646.06	-4N	13	21	83	1.21	NET< CL
41	433.94	655.19	-5N	13	22	87	1.21	NET< CL
42	477.61	721.22	-23N	12	21	84	1.25	NET< CL
43	487.05	735.50	1N	11	18	62	1.26	NET< CL
44	497.10	750.70	-3N	11	18	57	1.26	NET< CL
45	537.34	811.56	-4N	10	17	51	1.30	NET< CL
46	604.73	913.48	-26N	10	19	66	1.35	NET< CL
47	621.88	939.41	13N	10	16	45	1.37	LBase NET< CL
48	724.24	1094.21	-16N	16	28	60	1.45	NET< CL
49	765.73	1156.96	-19N	11	19	62	1.48	LHRoi NET< CL
50	810.71	1224.99	-13N	10	17	51	1.52	NET< CL
51	834.79	1261.40	-6N	9	15	41	1.54	NET< CL
52	884.65	1336.80	-12N	8	14	38	1.58	NET< CL
53	1099.16	1661.23	10N	10	16	45	1.75	NET< CL
54	1115.47	1685.89	17N	18	28	80	1.77	NET< CL
55	1332.46	2014.03	-3N	6	11	21	1.94	PIC NET< CL
56	1690.98	2556.12	-2N	4	7	8	2.23	NET< CL

L5185-09 analyzed by emml461 on 04/08/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/25/2003 12:00:00 | Counting Start: 04/08/2003 17:21:15
Sampling Stop: 02/25/2003 12:00:00 | Decay Time: 1.01E+03 Hrs
Buildup Time: 0.00E+00 Hrs | Live Time 9000 Sec
Sample Size 8.01E-01 kg | Real Time 9004 Sec
Collection Efficiency 1.0000 | Spectrum File 0986803.spc

Detector #: 3

Energy(keV)= 0.64 + 0.661*Ch + -1.68E-07*Ch^2 + -1.68E-07*Ch^3 04/08/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 7.91E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[3.20e-02*En^-2.77e+00 + 2.47e+02*En^ 8.30e-01] 04/30/1998

Library File: SOILA.LIB LSF File: L5185-09.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
=====	=====	=====	=====	=====	=====	=====	=====
Pb-212	3.06E+02	1.82E+01	< 4.12E+01	1.97E+01	1.00E+00	MEAS +	YES
Pb-214	2.59E+02	2.04E+01	< 6.48E+01	3.10E+01	1.00E+00	MEAS +	YES
Th-234	1.40E+02	2.23E+02	< 7.40E+02	3.64E+02	1.00E+00	MEAS +	YES
Ra-226	4.75E+02	1.77E+02	< 5.69E+02	2.74E+02	1.00E+00	MEAS +	YES
AcTh-228	2.60E+02	3.11E+01	< 1.16E+02	5.38E+01	1.00E+00	MEAS +	YES
Annil	1.18E+01	1.94E+01	< 6.49E+01	3.17E+01	9.23E-01	MEAS +	YES
Tl-208	2.10E+02	2.32E+01	< 6.31E+01	2.89E+01	1.00E+00	MEAS +	YES
Bi-214	2.60E+02	2.39E+01	< 6.46E+01	3.05E+01	1.00E+00	MEAS +	YES
Cs-137	2.54E+02	1.69E+01	< 3.29E+01	1.54E+01	9.97E-01	MEAS +	YES
Bi-212	1.22E+02	7.67E+01	< 2.52E+02	1.18E+02	1.00E+00	MEAS +	YES
K-40	1.12E+04	3.73E+02	< 3.02E+02	1.35E+02	1.00E+00	MEAS +	YES
Am-241	1.62E+01	2.23E+01	< 7.49E+01	3.60E+01	1.00E+00	NET	YES
Co-57	1.85E+00	5.17E+00	< 1.76E+01	8.42E+00	8.97E-01	NET	YES
Ce-144	2.11E+01	4.01E+01	< 1.36E+02	6.51E+01	9.02E-01	NET	YES
Ce-141	3.38E+01	2.38E+01	< 7.87E+01	3.79E+01	4.06E-01	NET	YES
Se-75	-4.00E+00	1.07E+01	< 3.75E+01	1.79E+01	7.83E-01	NET	YES
Cr-51	-1.26E+02	1.43E+02	< 5.15E+02	2.43E+02	3.47E-01	NET	YES
I-131	3.22E+02	2.14E+02	< 7.05E+02	3.27E+02	2.61E-02	NET	YES
Sb-125	-6.44E+00	2.05E+01	< 7.26E+01	3.41E+01	9.71E-01	NET	YES
Ag-108m	-2.58E+00	6.71E+00	< 2.38E+01	1.12E+01	9.99E-01	NET	YES
Be-7	-1.92E+02	1.00E+02	< 3.78E+02	1.78E+02	5.78E-01	NET	YES
La-140	1.11E+01	1.24E+02	< 4.35E+02	2.03E+02	1.01E-01	NET	YES
Ru-103	-3.68E+00	1.29E+01	< 4.64E+01	2.16E+01	4.75E-01	NET	YES
Ba-140	-8.75E+01	2.16E+02	< 7.86E+02	3.63E+02	1.01E-01	NET	YES
Cs-134	-1.69E+01	6.69E+00	< 2.63E+01	1.23E+01	9.62E-01	NET	YES
Ru-106	8.97E+01	7.00E+01	< 2.34E+02	1.08E+02	9.24E-01	NET	YES
Zr-95	-4.10E+01	4.03E+01	< 1.48E+02	7.05E+01	6.33E-01	NET	YES
Nb-95	-3.23E+01	1.84E+01	< 6.99E+01	3.26E+01	4.34E-01	NET	YES
Co-58	-1.58E+01	1.17E+01	< 4.43E+01	2.05E+01	6.61E-01	NET	YES
Mn-54	-5.11E+00	7.96E+00	< 2.95E+01	1.35E+01	9.11E-01	NET	YES
Ag-110m	-1.51E+01	9.94E+00	< 3.93E+01	1.79E+01	8.89E-01	NET	YES
Fe-59	3.42E+01	3.42E+01	< 1.16E+02	5.33E+01	5.19E-01	NET	YES
Zn-65	3.76E+01	3.96E+01	< 1.33E+02	6.33E+01	8.87E-01	NET	YES

L5185-09 analyzed by emml461 on 04/08/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	-4.02E+00	7.73E+00	< 2.97E+01	1.32E+01	9.85E-01	NET	YES
Sb-124	-9.50E+00	1.78E+01	< 7.54E+01	3.12E+01	6.15E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-10 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-094
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-06-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG 5111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 1.031 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/8/03 1505 Det No.: 5 Spectrum No.: 0985805
Counted by: W
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5185-10	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2700-094	Matrix	: S001 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 02/06/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	603.1		
Sample Weight-Dry	g			
Aliquot Weight	g	603.1		
FINAL WEIGHT	kg	.6031		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-10 analyzed by emml461 on 04/08/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-10

Sample ID: SOIL/SEDI Duratek Inc

Code: 0985805

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/08/2003 15:04:56
Sampling Stop: 02/06/2003 12:00:00 | Decay Time: 1.47E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 6000 Sec
Sample Size 6.03E-001 kg | Real Time 6004 Sec
Collection Efficiency 1.0000 | Spc. File 0985805.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Energy(keV)= -0.04 + 0.662*Ch + -2.11E-07*Ch^2 + 7.83E-11*Ch^3 04/08/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.94	113.28	78	18	26	145	0.84	a
2	77.18	116.66	118	24	34	218	1.34	b
3	87.15	131.73	14	22	36	241	0.46	NET< CL
4	92.89	140.40	52	24	38	242	0.91	
5	129.71	196.05	4	21	34	192	0.17	NET< CL
6	185.96	281.03	55	21	32	174	1.22	
7	208.87	315.65	16	20	33	171	0.55	NET< CL
8	238.61	360.59	306	28	35	197	1.44	
9	271.29	409.98	20	17	28	121	1.24	NET< CL
10	295.18	446.08	77	18	25	106	1.26	
11	338.15	511.02	66	17	25	96	1.69	
12	351.88	531.77	168	20	25	92	1.40	
13	510.31	771.20	54	13	17	53	1.30	a
14	511.36	772.78	85	17	23	80	2.05	b
15	583.06	881.13	96	15	19	52	1.46	
16	609.47	921.05	151	16	18	48	1.72	
17	911.09	1376.87	71	12	15	36	2.16	
18	969.29	1464.81	14	11	17	50	1.30	NET< CL
19	1120.26	1692.93	43	11	15	36	1.72	
20	1460.90	2207.53	673	26	8	11	2.20	
21	2615.13	3948.79	30	6	5	4	2.76	

L5185-10 analyzed by emm1461 on 04/08/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.94	78	18	26	67	18	26	
2	77.18	118	24	34	102	24	35	
3	87.15	14	22	36	6	22	37	NET<CL
4	92.89	52	24	38	5	24	39	NET<CL
6	185.96	55	21	32	23	21	33	NET<CL
8	238.61	306	28	35	281	28	36	
9	271.29	20	17	28	17	18	28	NET<CL
10	295.18	77	18	25	56	18	26	
11	338.15	66	17	25	63	18	26	
12	351.88	169	20	25	130	20	27	
13	510.31	54	13	17	-81	13	26	NET<CL
15	583.06	97	15	19	87	15	20	
16	609.47	151	16	18	123	17	20	
17	911.09	71	12	15	63	12	16	
18	969.29	15	11	17	10	11	17	NET<CL
19	1120.26	43	11	15	36	11	16	
20	1460.90	673	26	8	662	26	10	
21	2615.13	30	6	5	21	6	7	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	74.94	67	Pb-214	19	4 of 7	90.71	1.41	
			Pb-212	49	3 of 6	86.53	1.37	
			Tl-208	4	4 of 9	89.51	0.90	
2	77.18	11	Pb-214	36	4 of 7	90.71	1.41	Split
23	77.18	90	Pb-212	90	3 of 6	90.16	1.40	AutoAdd
8	238.61	281	Pb-212	343	3 of 6	90.16	1.40	
10	295.18	56	Pb-214	87	4 of 7	100.00	1.50	
11	338.15	63	AcTh-228	50	2 of 36	51.79	1.02	
12	351.88	130	Pb-214	145	4 of 7	100.00	1.50	
14	511.36	66	Annil	1 of 1	1 of 1	100.00	1.50	Split
22	511.36	19	Tl-208	19	4 of 9	91.56	0.92	AutoAdd
15	583.06	87	Tl-208	48	4 of 9	100.00	1.50	
16	609.47	123	Bi-214	165	2 of 33	79.53	1.30	
			Ru-103	1 of 2	1 of 2	5.92	0.06	LowScore
17	911.09	63	AcTh-228	79	2 of 36	65.06	1.15	
19	1120.26	36	Bi-214	27	2 of 33	67.23	1.17	
20	1460.90	662	K-40	1 of 1	1 of 1	100.00	1.50	
21	2615.13	21	Tl-208	38	4 of 9	100.00	1.50	

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-10

Sample ID: SOIL/SEDI Duratek Inc

Code: 0985805

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Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/08/2003 15:04:56
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. . . . . 1.47e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 6000 Sec
Sample Size . . . . . 6.03e-001 kg | Real Time . . . . . 6004 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 0985805.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46E-03*En^-3.56E+00 + 1.55E+02*En^6.66E-01] 02/06/1998

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Library File: . . . . . SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: . . . . . L5185-10.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-214	Average:x	1.86E+02 +- 2.60E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.11	I.D.	. . . .			. . . . .
	295.21	1.51E+02 +- 4.73E+01	1.48E+02		++	. . . . .
	351.92	2.02E+02 +- 3.11E+01	8.83E+01		++	. . . . .
Ra-226	186.22 N	2.71E+02 +- 2.51E+02	8.36E+02		x	. . . . .
Pb-212	238.63	2.84E+02 +- 2.81E+01	7.65E+01		++	. . . . .
	77.12	I.D.	. . . .			. . . . .
AcTh-228	Average:x	2.62E+02 +- 4.24E+01	. . . .		*	. . . . .
	338.32	3.10E+02 +- 8.68E+01	2.68E+02		++	. . . . .
	911.07	2.46E+02 +- 4.86E+01	1.34E+02		++	. . . . .
Annil	511.00	5.50E+01 +- 2.43E+01	7.91E+01		+	. . . . .
Tl-208	Average:x	1.78E+02 +- 2.79E+01	. . . .		*	. . . . .
	583.14	2.33E+02 +- 4.05E+01	1.12E+02		++	. . . . .
	2614.66	1.28E+02 +- 3.86E+01	1.04E+02		++	. . . . .
	510.84	I.D.	. . . .			. . . . .
Bi-214	Average:x	2.27E+02 +- 2.83E+01	. . . .		*	. . . . .
	609.31	2.20E+02 +- 2.97E+01	7.75E+01		++	. . . . .
	1120.29	2.95E+02 +- 9.23E+01	2.79E+02		++	. . . . .
K-40	1460.81	9.22E+03 +- 3.68E+02	3.14E+02		++	. . . . .
Am-241	59.54 N	2.67E+01 +- 5.16E+01	1.75E+02		x	. . . . .
Co-57	122.06 N	9.93E+00 +- 8.17E+00	2.72E+01		x	. . . . .
Ce-144	133.54 N	4.26E+01 +- 6.28E+01	2.21E+02		x	. . . . .
Ce-141	145.44 N	6.44E+01 +- 5.03E+01	1.67E+02		x	. . . . .
Se-75	264.65 N	1.26E+01 +- 1.55E+01	5.26E+01		x	. . . . .
Cr-51	320.08 N	2.81E+02 +- 3.07E+02	1.12E+03		x	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
I-131	364.48	N-1.14E+03 +- 1.43E+03	5.28E+03		x		
Sb-125	427.89	N-1.40E+01 +- 2.09E+01	7.76E+01		x		
Ag-108m	433.93	N 2.22E+00 +- 7.50E+00	2.63E+01		x		
Be-7	477.59	N 2.75E+01 +- 1.58E+02	5.55E+02		x		
La-140	487.03	N-2.81E+02 +- 4.78E+02	1.73E+03		x		
Ru-103	497.08	N 2.04E+01 +- 2.48E+01	8.47E+01		x		
Ba-140	537.32	N 2.80E+02 +- 7.24E+02	2.55E+03		x		
Cs-134	604.70	N-4.33E+00 +- 8.91E+00	3.24E+011		x	lbase	
Ru-106	621.84	N 8.36E+01 +- 8.32E+01	2.83E+02		x		
Cs-137	661.65	N 2.32E+01 +- 8.45E+00	2.55E+01		x	Y.	
Zr-95	724.18	N-3.20E+01 +- 3.56E+01	1.34E+02		x		
Nb-95	765.79	N-3.11E+00 +- 3.18E+01	1.14E+02		x		
Co-58	810.76	N-7.36E+00 +- 1.47E+01	5.49E+01		x		
Mn-54	834.83	N-1.41E+01 +- 9.39E+00	3.68E+01		x		
Ag-110m	884.67	N 6.95E+00 +- 1.47E+01	5.18E+01		x		
Fe-59	1099.22	N-4.71E+01 +- 4.88E+01	1.85E+02		x		
Zn-65	1115.52	N 5.69E+01 +- 4.68E+01	1.56E+02P		x	PIC	
Co-60	1332.49	N 8.58E-01 +- 9.60E+00	3.52E+01		x	Y.	
Sb-124	1691.02	N-2.71E+01 +- 2.53E+01	1.13E+02		x		

MEASURED TOTAL: 1.04E+04 +- 5.45E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
3	87.15	131.73	6	22	37	241	0.46	Deleted
4	92.89	140.40	5	24	39	242	0.91	Deleted
5	129.71	196.05	5	21	34	193	0.17	Deleted
7	208.87	315.65	16	20	33	171	0.55	Deleted
9	271.29	409.98	17	18	28	121	1.24	Deleted
13	510.31	771.20	-81	13	26	53	1.30	Deleted
18	969.29	1464.81	10	11	17	50	1.30	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
6	185.96	281.03	23N	21	33	174	1.22	NET< CL
24	59.54	90.01	9N	17	27	148	1.13	NET< CL
25	122.06	184.48	20N	17	27	142	1.18	NET< CL
26	133.54	201.83	-11N	16	28	154	1.19	NET< CL
27	145.44	219.81	24N	18	29	153	1.20	NET< CL
28	264.66	399.95	11N	14	22	86	1.29	NET< CL
29	320.09	483.72	-11N	12	21	78	1.33	NET< CL
30	364.49	550.83	-8N	10	17	55	1.36	NET< CL
31	427.91	646.67	-6N	9	15	43	1.40	NET< CL
32	433.95	655.80	3N	10	16	50	1.41	NET< CL

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 NET/MDA PEAK RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
33	477.62	721.79	2N	11	17	50	1.44	NET< CL
34	487.06	736.06	-7N	11	19	60	1.44	NET< CL
35	497.11	751.25	9N	10	16	46	1.45	NET< CL
36	537.36	812.07	3N	9	14	33	1.48	NET< CL
37	604.76	913.93	-5N	10	17	48	1.52	NET< CL
								LBase
38	621.91	939.84	9N	9	13	30	1.54	NET< CL
39	661.60	999.83	22N	8	11	24	1.56	
40	724.15	1094.36	-8N	9	15	44	1.61	NET< CL
41	765.78	1157.27	-1N	10	16	46	1.63	NET< CL
42	810.77	1225.27	-4N	8	14	34	1.66	NET< CL
43	834.86	1261.66	-12N	8	14	38	1.68	NET< CL
44	884.72	1337.03	4N	8	14	34	1.71	NET< CL
45	1099.18	1661.09	-8N	9	15	39	1.86	NET< CL
46	1115.50	1685.74	20N	16	25	64	1.87	NET< CL
								PIC
47	1332.47	2013.54	1N	7	11	23	2.01	NET< CL
48	1691.00	2555.01	-4N	4	7	9	2.25	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/08/2003 15:04:56
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. . . . . 1.47E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 6000 Sec
Sample Size . . . . . 6.03E-01 kg | Real Time . . . . . 6004 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . .0985805.spc
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Detector #: 5

Energy(keV)= -0.04 + 0.662*Ch + -2.11E-07*Ch^2 + -2.11E-07*Ch^3 04/08/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5185-10.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-214	1.86E+02	2.60E+01	< 8.83E+01	4.20E+01	1.00E+00	MEAS +	YES
Ra-226	2.71E+02	2.51E+02	< 8.36E+02	4.02E+02	1.00E+00	NET	YES
Pb-212	2.84E+02	2.81E+01	< 7.65E+01	3.69E+01	1.00E+00	MEAS +	YES
AcTh-228	2.62E+02	4.24E+01	< 1.34E+02	6.15E+01	1.00E+00	MEAS +	YES
Annil	5.50E+01	2.43E+01	< 7.91E+01	3.85E+01	8.90E-01	MEAS +	YES
Tl-208	1.78E+02	2.79E+01	< 1.04E+02	4.38E+01	1.00E+00	MEAS +	YES
Bi-214	2.27E+02	2.83E+01	< 7.75E+01	3.63E+01	1.00E+00	MEAS +	YES
K-40	9.22E+03	3.68E+02	< 3.14E+02	1.38E+02	1.00E+00	MEAS +	YES
Am-241	2.67E+01	5.16E+01	< 1.75E+02	8.35E+01	1.00E+00	NET	YES
Co-57	9.93E+00	8.17E+00	< 2.72E+01	1.29E+01	8.55E-01	NET	YES
Ce-144	-4.26E+01	6.28E+01	< 2.21E+02	1.06E+02	8.62E-01	NET	YES
Ce-141	6.44E+01	5.03E+01	< 1.67E+02	7.99E+01	2.71E-01	NET	YES
Se-75	1.26E+01	1.55E+01	< 5.26E+01	2.47E+01	7.02E-01	NET	YES
Cr-51	-2.81E+02	3.07E+02	< 1.12E+03	5.25E+02	2.16E-01	NET	YES
I-131	-1.14E+03	1.43E+03	< 5.28E+03	2.45E+03	5.13E-03	NET	YES
Sb-125	-1.40E+01	2.09E+01	< 7.76E+01	3.57E+01	9.59E-01	NET	YES
Ag-108m	2.22E+00	7.50E+00	< 2.63E+01	1.21E+01	9.99E-01	NET	YES
Be-7	2.75E+01	1.58E+02	< 5.55E+02	2.57E+02	4.52E-01	NET	YES
La-140	-2.81E+02	4.78E+02	< 1.73E+03	8.07E+02	3.64E-02	NET	YES
Ru-103	2.04E+01	2.48E+01	< 8.47E+01	3.91E+01	3.41E-01	NET	YES
Ba-140	2.80E+02	7.24E+02	< 2.56E+03	1.16E+03	3.64E-02	NET	YES
Cs-134	-4.33E+00	8.91E+00	< 3.24E+01	1.50E+01	9.45E-01	NET	YES
Ru-106	8.36E+01	8.32E+01	< 2.83E+02	1.29E+02	8.91E-01	NET	YES
Cs-137	2.32E+01	8.45E+00	< 2.55E+01	1.13E+01	9.96E-01	NET	YES
Zr-95	-3.20E+01	3.56E+01	< 1.34E+02	6.16E+01	5.16E-01	NET	YES
Nb-95	-3.11E+00	3.18E+01	< 1.14E+02	5.25E+01	2.99E-01	NET	YES
Co-58	-7.36E+00	1.47E+01	< 5.49E+01	2.50E+01	5.49E-01	NET	YES
Mn-54	-1.41E+01	9.39E+00	< 3.68E+01	1.68E+01	8.73E-01	NET	YES
Ag-110m	6.95E+00	1.48E+01	< 5.18E+01	2.36E+01	8.44E-01	NET	YES
Fe-59	-4.71E+01	4.88E+01	< 1.85E+02	8.47E+01	3.87E-01	NET	YES
Zn-65	5.69E+01	4.68E+01	< 1.56E+02	7.40E+01	8.41E-01	NET	YES
Co-60	8.58E-01	9.60E+00	< 3.52E+01	1.57E+01	9.78E-01	NET	YES
Sb-124	-2.70E+01	2.53E+01	< 1.13E+02	4.72E+01	4.95E-01	NET	YES

L5185-10 analyzed by emm1461 on 04/08/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-11 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-101
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-06-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG5111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 758.7 650.8 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/8/03 15:05 Det No.: 6 Spectrum No.: 0985806
Counted by: gh
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5185-11	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2700-101	Matrix	: SO01 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 02/06/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	650.8		
Sample Weight-Dry	g			
Aliquot Weight	g	650.8		
FINAL WEIGHT	kg	.6508		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-11 analyzed by emm1461 on 04/08/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory

Environmental Gamma Isotopic Analysis

LSN: L5185-11

Sample ID: SOIL/SEDI Duratek Inc

Code: 0985806

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/08/2003 15:05:28
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.47E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 6000 Sec
Sample Size 6.51E-001 kg | Real Time 6004 Sec
Collection Efficiency 1.0000 | Spc. File 0985806.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV)= -0.02 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.86	95.02	51	31	49	377	0.80	
2	74.57	112.72	106	29	45	342	1.44	a
3	77.03	116.44	127	19	24	146	0.60	b
4	87.18	131.78	25	16	25	152	0.60	a NET< CL
5	92.65	140.04	202	26	35	253	1.16	b
6	143.71	217.19	16	24	38	250	0.42	NET< CL
7	185.71	280.67	173	26	37	213	1.24	
8	238.46	360.37	371	25	27	136	1.25	a
9	241.50	364.97	74	19	27	136	1.24	b
10	294.98	445.78	85	19	27	121	1.56	
11	327.36	494.71	16	16	26	116	0.52	NET< CL
12	338.29	511.23	42	17	26	112	0.93	
13	351.77	531.60	171	19	23	87	1.31	
14	510.49	771.44	132	18	23	75	1.96	a
15	511.88	773.53	33	8	10	25	0.72	b
16	583.15	881.23	119	17	22	69	1.36	
17	609.34	920.79	161	19	23	78	1.56	
18	911.34	1377.14	87	14	17	47	1.66	
19	969.14	1464.49	32	12	17	53	0.98	
20	1460.96	2207.67	1265	36	11	18	2.10	
21	2614.20	3950.32	30	6	4	3	1.70	a
22	2615.92	3952.92	22	5	3	2	1.35	b

L5185-11 analyzed by emm1461 on 04/08/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.86	51	31	49	-20	31	51	NET<CL
2	74.57	106	29	45	94	29	45	
3	77.03	127	19	24	112	19	25	
5	92.65	202	26	35	37	26	42	NET<CL
6	143.71	16	24	38	-5	24	39	NET<CL
7	185.71	173	26	37	68	26	41	
8	238.46	371	25	27	339	25	29	
9	241.50	74	19	27	62	19	28	
10	294.98	85	19	27	64	19	28	
12	338.29	42	17	26	37	17	26	
13	351.77	171	19	23	134	19	26	
14	510.49	132	18	23	-5	18	30	NET<CL
16	583.15	119	17	22	110	17	22	
17	609.34	161	19	23	132	19	25	
18	911.34	87	14	17	80	14	18	
19	969.14	32	12	17	31	12	17	
20	1460.96	1265	36	11	1252	36	12	
21	2614.20	30	6	4	21	6	6	

L5185-11 analyzed by emml461 on 04/08/2003

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.57	94	Pb-214	22	5 of 7	100.00	1.50	
			Tl-208	2	5 of 9	90.39	0.90	
			Pb-212	63	3 of 6	86.53	1.37	
			Tl-208	4	5 of 9	90.39	0.90	
3	77.03	112	Pb-212	114	3 of 6	90.16	1.40	
			Pb-214	41	5 of 7	100.00	1.00	
7	185.71	68	U-235	. . . . .	1 of 3	100.00	1.50	
			Ra-226	. . . . .	1 of 1	100.00	1.50	
8	238.46	339	Pb-212	358	3 of 6	90.16	1.40	
9	241.50	62	Pb-214	34	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
10	294.98	64	Pb-214	84	5 of 7	100.00	1.50	
12	338.29	37	AcTh-228	57	3 of 36	100.00	1.50	
13	351.77	134	Pb-214	185	5 of 7	100.00	1.50	
15	511.88	12	Annil	. . . . .	1 of 1	100.00	1.50	Split
23	511.88	20	Tl-208	20	5 of 9	100.00	1.50	AutoAdd
16	583.15	110	Tl-208	60	5 of 9	100.00	1.50	
17	609.34	132	Bi-214	. . . . .	1 of 33	59.97	0.60	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
18	911.34	80	AcTh-228	51	3 of 36	86.36	1.36	
19	969.14	31	AcTh-228	40	3 of 36	100.00	1.50	
			Sb-124	. . . . .	1 of 13	1.04	0.51	
20	1460.96	1252	K-40	. . . . .	1 of 1	100.00	1.50	
21	2614.20	21	Tl-208	49	5 of 9	100.00	1.00	
22	2615.92	22	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Tl-208	49	5 of 9	100.00	1.00	Matched

L5185-11 analyzed by emml461 on 04/08/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-11

Sample ID: SOIL/SEDI Duratek Inc

Code: 0985806

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/08/2003 15:05:28
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.47e+003 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 6000 Sec
Sample Size 6.51e-001 kg | Real Time 6004 Sec
Collection Efficiency 1.0000 | Spectrum File 0985806.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[8.71E-03*En^-3.34E+00 + 1.54E+02*En^6.70E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: L5185-11.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-214	Average:x	1.91E+02 +- 2.32E+01		*
	74.81	I.D.	. . . .			. . . . .
	241.98	3.50E+02 +- 1.05E+02	3.27E+02		+	. . . . .
	295.21	1.57E+02 +- 4.64E+01	1.45E+02		+	. . . . .
	351.92	1.92E+02 +- 2.78E+01	7.74E+01		+	. . . . .
Pb-212	238.63	3.17E+02 +- 2.37E+01	4.99E+01		+	. . . . .
	77.12	I.D.	. . . .			. . . . .
U-235	185.72	4.58E+01 +- 1.75E+01	5.64E+01		+	. . . . .
AcTh-228	Average:x	2.40E+02 +- 3.70E+01	. . . .		*	. . . . .
	338.32	1.70E+02 +- 7.72E+01	2.49E+02		+	. . . . .
	911.07	2.91E+02 +- 5.12E+01	1.40E+02		+	. . . . .
	969.11	1.98E+02 +- 7.43E+01	2.32E+02		+	. . . . .
Annul	511.00	9.49E+00 +- 1.13E+01	3.82E+01		+	. . . . .
Tl-208	Average:x	1.77E+02 +- 2.65E+01	. . . .		*	. . . . .
	583.14	2.70E+02 +- 4.22E+01	1.16E+02		+	. . . . .
	2614.66	1.17E+02 +- 3.40E+01	8.88E+01		+	. . . . .
	510.84	I.D.	. . . .			. . . . .
Bi-214	609.31	2.19E+02 +- 3.14E+01	8.65E+01		+	. . . . .
K-40	1460.81	1.62E+04 +- 4.67E+02	3.52E+02		+	. . . . .
Am-241	59.54	N-1.65E+02 +- 5.25E+01	1.92E+02		x#	. . . . .
Co-57	122.06	N 7.05E+00 +- 8.33E+00	2.80E+01		x	. . . . .
Ce-144	133.54	N 1.11E+02 +- 6.41E+01	2.10E+02		x	. . . . .
Ce-141	145.44	N 3.62E+01 +- 4.70E+01	1.58E+02		x	. . . . .
Ra-226	186.22	N 1.96E+03 +- 2.27E+02	5.99E+02		x*	. . . . .
Se-75	264.65	N 7.39E+00 +- 1.67E+01	5.69E+01		x	. . . . .
Cr-51	320.08	N-7.06E+01 +- 3.16E+02	1.11E+03		x	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	N Concentration (pCi/kg)	MDA	Flags	Notes	MDC
I-131	364.48	N 2.61E+02 +- 1.54E+03	5.37E+03		x	. . . . .
Sb-125	427.89	N-1.08E+01 +- 2.35E+01	8.47E+01		x	. . . . .
Ag-108m	433.93	N 8.85E+00 +- 7.79E+00	2.62E+01		x	. . . . .
Be-7	477.59	N 5.53E+01 +- 1.50E+02	5.23E+02		x	. . . . .
La-140	487.03	N-3.19E+02 +- 3.95E+02	1.46E+03		x	. . . . .
Ru-103	497.08	N 1.21E+01 +- 2.41E+01	8.35E+01		x	. . . . .
Ba-140	537.32	N-8.14E+02 +- 8.44E+02	3.11E+03		x	. . . . .
Cs-134	604.70	N 1.24E+01 +- 9.10E+00	3.03E+011		x lbase	. . . . .
Ru-106	621.84	N 6.23E+01 +- 9.47E+01	3.26E+02		x	. . . . .
Cs-137	661.65	N-3.82E+00 +- 9.60E+00	3.48E+01		x	Y.
Zr-95	724.18	N-4.10E+01 +- 3.77E+01	1.41E+02		x	. . . . .
Nb-95	765.79	N-1.70E+01 +- 3.29E+01	1.19E+02		x	. . . . .
Co-58	810.76	N-2.38E+01 +- 1.56E+01	5.99E+01		x	. . . . .
Mn-54	834.83	N-1.73E+01 +- 1.08E+01	4.13E+01		x	. . . . .
Ag-110m	884.67	N 4.01E+01 +- 1.63E+01	5.10E+01		x	. . . . .
Fe-59	1099.22	N 3.71E+01 +- 5.69E+01	1.96E+02		x	. . . . .
Zn-65	1115.52	N-4.14E+01 +- 3.24E+01	1.19E+02		x	. . . . .
Co-60	1332.49	N-7.94E+00 +- 9.90E+00	3.79E+01		x	Y.
Sb-124	1691.02	N 6.27E+00 +- 2.73E+01	1.04E+02		x	. . . . .

MEASURED TOTAL: 1.93E+04 +- 8.64E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.86	95.02	-20	31	51	377	0.80	Deleted
4	87.18	131.78	25	16	25	152	0.60	Deleted
5	92.65	140.04	37	26	42	253	1.16	Deleted
6	143.71	217.19	-5	24	39	250	0.42	Deleted
11	327.36	494.71	16	16	26	116	0.52	Deleted
14	510.49	771.44	-5	18	30	75	1.96	Deleted
22	2615.92	3952.92	22	5	3	3	1.35	Unknown

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	59.54	90.01	-65N	21	37	269	1.13	NET< CL
25	122.06	184.48	16N	19	30	178	1.12	NET< CL
26	133.54	201.83	32N	18	28	163	1.13	
27	145.44	219.81	14N	19	30	182	1.13	NET< CL
28	186.22	281.43	177N	21	26	133	1.15	
29	264.65	399.95	7N	16	26	121	1.21	NET< CL
30	320.08	483.70	-3N	13	22	92	1.25	NET< CL
31	364.48	550.80	2N	12	19	68	1.29	NET< CL
32	427.89	646.62	-5N	11	18	62	1.35	NET< CL
33	433.93	655.74	13N	11	18	59	1.36	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
34	477.59	721.72	4N	11	18	57	1.40	NET< CL
35	487.03	735.98	-8N	10	17	53	1.40	NET< CL
36	497.08	751.17	6N	11	18	53	1.41	NET< CL
37	537.32	811.97	-11N	11	19	60	1.45	NET< CL
38	604.70	913.79	15N	11	17	49	1.51	NET< CL
								LBase
39	621.84	939.69	7N	11	17	49	1.53	NET< CL
40	661.65	999.85	-4N	10	17	56	1.57	NET< CL
41	724.18	1094.33	-11N	10	17	58	1.62	NET< CL
42	765.79	1157.21	-6N	11	18	60	1.66	NET< CL
43	810.76	1225.16	-14N	9	16	49	1.70	NET< CL
44	834.83	1261.54	-16N	10	18	58	1.72	NET< CL
45	884.67	1336.85	25N	10	15	39	1.76	
46	1099.22	1661.05	7N	11	17	53	1.92	NET< CL
47	1115.52	1685.68	-15N	12	21	75	1.93	NET< CL
48	1332.49	2013.54	-6N	7	13	31	2.08	NET< CL
49	1691.02	2555.31	1N	4	7	9	2.26	NET< CL

L5185-11 analyzed by emml461 on 04/08/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 02/06/2003 12:00:00 | Counting Start: 04/08/2003 15:05:28
Sampling Stop: 02/06/2003 12:00:00 | Decay Time. 1.47E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 6000 Sec
Sample Size 6.51E-01 kg | Real Time 6004 Sec
Collection Efficiency 1.0000 | Spectrum File 0985806.spc

Detector #: 6

Energy(keV)= -0.02 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[8.71e-03*En^-3.34e+00 + 1.54e+02*En^ 6.70e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5185-11.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-214	1.91E+02	2.32E+01	< 7.74E+01	3.68E+01	1.00E+00	MEAS +	YES
Pb-212	3.16E+02	2.37E+01	< 4.99E+01	2.37E+01	1.00E+00	MEAS +	YES
U-235	4.58E+01	1.75E+01	< 5.64E+01	2.73E+01	1.00E+00	MEAS +	YES
AcTh-228	2.40E+02	3.70E+01	< 1.40E+02	6.50E+01	1.00E+00	MEAS +	YES
Annil	9.49E+00	1.13E+01	< 3.82E+01	1.81E+01	8.90E-01	MEAS +	YES
Tl-208	1.77E+02	2.65E+01	< 8.88E+01	3.67E+01	1.00E+00	MEAS +	YES
Bi-214	2.19E+02	3.14E+01	< 8.66E+01	4.10E+01	1.00E+00	MEAS +	YES
K-40	1.62E+04	4.67E+02	< 3.52E+02	1.58E+02	1.00E+00	MEAS +	YES
Am-241	-1.65E+02	5.25E+01	< 1.92E+02	9.27E+01	1.00E+00	NET	YES
Co-57	7.05E+00	8.33E+00	< 2.80E+01	1.34E+01	8.55E-01	NET	YES
Ce-144	1.12E+02	6.41E+01	< 2.10E+02	1.00E+02	8.62E-01	NET	YES
Ce-141	3.62E+01	4.70E+01	< 1.58E+02	7.57E+01	2.71E-01	NET	YES
Ra-226	1.96E+03	2.27E+02	< 5.99E+02	2.85E+02	1.00E+00	NET	YES
Se-75	7.39E+00	1.67E+01	< 5.69E+01	2.70E+01	7.02E-01	NET	YES
Cr-51	-7.06E+01	3.16E+02	< 1.11E+03	5.25E+02	2.16E-01	NET	YES
I-131	2.61E+02	1.54E+03	< 5.37E+03	2.51E+03	5.13E-03	NET	YES
Sb-125	-1.08E+01	2.35E+01	< 8.47E+01	3.95E+01	9.59E-01	NET	YES
Ag-108m	8.85E+00	7.79E+00	< 2.62E+01	1.22E+01	9.99E-01	NET	YES
Be-7	5.53E+01	1.50E+02	< 5.23E+02	2.43E+02	4.52E-01	NET	YES
La-140	-3.19E+02	3.94E+02	< 1.46E+03	6.75E+02	3.64E-02	NET	YES
Ru-103	1.21E+01	2.41E+01	< 8.34E+01	3.87E+01	3.41E-01	NET	YES
Ba-140	-8.14E+02	8.44E+02	< 3.11E+03	1.45E+03	3.64E-02	NET	YES
Cs-134	1.24E+01	9.10E+00	< 3.03E+01	1.40E+01	9.45E-01	NET	YES
Ru-106	6.23E+01	9.47E+01	< 3.26E+02	1.51E+02	8.91E-01	NET	YES
Cs-137	-3.82E+00	9.60E+00	< 3.48E+01	1.61E+01	9.96E-01	NET	YES
Zr-95	-4.10E+01	3.77E+01	< 1.41E+02	6.53E+01	5.16E-01	NET	YES
Nb-95	-1.70E+01	3.29E+01	< 1.19E+02	5.54E+01	2.99E-01	NET	YES
Co-58	-2.38E+01	1.56E+01	< 5.99E+01	2.77E+01	5.49E-01	NET	YES
Mn-54	-1.74E+01	1.08E+01	< 4.13E+01	1.92E+01	8.73E-01	NET	YES
Ag-110m	4.01E+01	1.63E+01	< 5.10E+01	2.33E+01	8.44E-01	NET	YES
Fe-59	3.71E+01	5.69E+01	< 1.96E+02	9.08E+01	3.87E-01	NET	YES
Zn-65	-4.14E+01	3.24E+01	< 1.19E+02	5.61E+01	8.41E-01	NET	YES
Co-60	-7.94E+00	9.90E+00	< 3.79E+01	1.71E+01	9.78E-01	NET	YES

L5185-11 analyzed by emm1461 on 04/08/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	6.27E+00	2.73E+01	< 1.04E+02	4.37E+01	4.95E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-12
Client: Duratek Inc
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-112
Collect Start Date/Time: _____
Collect Stop Date/Time: 01-28-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

Count by Date: _____
(if required)
Delay Date: _____
(if required)

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5711

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 775.5 758.7 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/8/03 01722

Det No.: 5

Spectrum No.: 0986805

Counted by: eh

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5185-12
Client Id : BMS-2700-112
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 01/28/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	758.7		
Sample Weight-Dry	g			
Aliquot Weight	g	758.7		
FINAL WEIGHT	kg	.7587		
Container			WATS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-12 analyzed by emml461 on 04/08/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-12 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986805

 Sampling Start: 01/28/2003 12:00:00 ✓ Counting Start: 04/08/2003 17:22:15
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 7000 Sec
 Sample Size 7.59E-001 kg | Real Time 7007 Sec
 Collection Efficiency 1.0000 | Spc. File 0986805.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Energy(keV)= -0.04 + 0.662*Ch + -2.11E-07*Ch^2 + 7.83E-11*Ch^3 04/08/2003
 FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.37	95.79	2	27	44	351	0.05	NET< CL
2	74.96	113.31	143	28	41	338	1.03	a
3	76.97	116.35	257	33	47	405	1.22	b
4	87.21	131.83	3	31	50	465	0.08	NET< CL
5	92.94	140.48	81	30	48	419	0.87	
6	185.88	280.91	105	28	42	306	1.30	
7	209.32	316.34	89	31	49	348	1.31	
8	238.64	360.64	522	31	35	226	1.20	a
9	241.67	365.22	100	28	44	301	1.74	b
10	270.45	408.71	35	23	36	208	1.29	NET< CL
11	295.21	446.13	172	26	38	212	1.54	
12	338.46	511.49	68	23	34	188	0.93	
13	351.92	531.83	338	27	33	158	1.41	
14	509.72	770.31	52	12	17	55	1.18	a
15	511.40	772.84	185	22	28	110	2.21	b Wide Pk
16	583.17	881.31	210	20	23	87	1.54	
17	609.29	920.78	274	22	24	82	1.53	
18	727.35	1099.20	38	13	19	65	1.41	
19	794.82	1201.16	26	14	22	76	1.80	
20	911.24	1377.09	168	17	18	52	1.66	
21	968.93	1464.27	59	16	23	89	1.24	
22	1120.01	1692.56	59	15	20	65	1.60	
23	1460.93	2207.58	1252	36	11	20	2.29	
24	1764.93	2666.61	61	10	11	18	2.26	
25	2204.49	3329.86	21	6	7	8	1.75	
26	2615.23	3948.95	107	11	4	3	1.81	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.37	2	27	44	-12	27	44	NET<CL
2	74.96	143	28	41	130	28	41	
3	76.97	257	33	47	238	33	48	
4	87.21	3	31	50	-7	31	51	NET<CL
5	92.94	81	30	48	27	30	49	NET<CL
6	185.88	105	28	42	67	28	44	
8	238.64	522	31	35	493	31	36	
9	241.67	100	28	44	87	28	44	
10	270.45	35	23	36	32	23	37	NET<CL
11	295.21	173	26	38	148	27	39	
12	338.46	68	23	34	64	23	35	
13	351.92	339	27	33	293	27	35	
14	509.72	52	12	17	-105	13	27	NET<CL
16	583.17	210	20	23	200	20	24	
17	609.29	275	22	24	242	22	26	
18	727.35	38	13	19	36	13	20	
20	911.24	168	17	18	158	17	19	
21	968.93	59	16	23	55	16	24	
22	1120.01	59	15	20	51	15	21	
23	1460.93	1253	36	11	1239	36	13	
24	1764.93	61	10	11	53	10	12	
25	2204.49	21	6	7	18	6	8	
26	2615.23	107	11	4	97	11	7	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.96	130	Pb-212	90	3 of 6	86.53	1.37	
			Pb-214	45	5 of 7	100.00	1.00	
			Tl-208	11	4 of 9	89.51	0.90	
3	76.97	238	Pb-212	158	3 of 6	86.53	1.37	
			Tl-208	11	4 of 9	89.51	0.90	
			Pb-214	83	5 of 7	100.00	1.00	
6	185.88	67	U-235	. . . . .	1 of 3	100.00	1.50	
			Ra-226	. . . . .	1 of 1	100.00	1.50	
7	209.32	89	AcTh-228	53	5 of 36	67.05	1.17	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
8	238.64	493	Pb-212	752	3 of 6	86.53	1.37	
9	241.67	87	Pb-214	75	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
11	295.21	148	Pb-214	178	5 of 7	100.00	1.50	
12	338.46	64	AcTh-228	114	5 of 36	100.00	1.50	
13	351.92	293	Pb-214	299	5 of 7	100.00	1.50	
15	511.40	126	Annil	. . . . .	1 of 1	100.00	1.50	Split
28	511.40	58	Tl-208	58	4 of 9	91.56	0.92	AutoAdd
16	583.17	200	Tl-208	221	4 of 9	94.37	1.44	
17	609.29	242	Bi-214	291	4 of 33	84.49	1.34	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
18	727.35	36	Bi-212	. . . . .	1 of 13	100.00	1.50	
19	794.82	2	Cs-134	. . . . .	1 of 9	46.67	0.97	Split
27	794.82	24	AcTh-228	24	5 of 36	75.50	1.25	AutoAdd
20	911.24	158	AcTh-228	99	5 of 36	71.18	1.21	
21	968.93	55	AcTh-228	81	5 of 36	100.00	1.50	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
22	1120.01	51	Bi-214	55	4 of 33	84.49	1.34	
23	1460.93	1239	K-40	. . . . .	1 of 1	100.00	1.50	
24	1764.93	53	Bi-214	41	4 of 33	79.44	1.29	
25	2204.49	18	Bi-214	11	4 of 33	74.54	1.25	
26	2615.23	97	Tl-208	87	4 of 9	94.37	1.44	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-12

Sample ID: SOIL/SEDI Duratek Inc Code: 0986805

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:22:15
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 7000 Sec
 Sample Size 7.59e-001 kg | Real Time 7007 Sec
 Collection Efficiency 1.0000 | Spectrum File 0986805.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.46E-03*En^-3.56E+00 + 1.55E+02*En^6.66E-01] 02/06/1998

 Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5185-12.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS

		N								
		ENERGY E	Concentration							
Nuclide	(keV)	(pCi/kg	)	MDA	Flags	Notes	MDC		

Pb-212	238.63	3.41E+02	+- 2.16E+01	5.92E+01		+	*		
	74.81	I.D.	. . . . .	. . . . .				. . . . .
	77.12	I.D.	. . . . .	. . . . .				. . . . .
U-235	185.72	3.34E+01	+- 1.38E+01	4.47E+01		+			
AcTh-228	Average:x	3.50E+02	+- 3.37E+01	. . . . .		*		. . . . .
	209.28	5.75E+02	+- 2.00E+02	6.44E+02		+			
	338.32	2.16E+02	+- 7.58E+01	2.42E+02		+			
	794.70	3.50E+02	+- 2.99E+02	9.94E+02		+			
	911.07	4.21E+02	+- 4.51E+01	1.07E+02		+	*		
	969.11	2.52E+02	+- 7.46E+01	2.31E+02		+	*		
Pb-214	Average:x	3.03E+02	+- 2.42E+01	. . . . .		*		. . . . .
	241.98	3.62E+02	+- 1.18E+02	3.77E+02		+	*		
	295.21	2.72E+02	+- 4.87E+01	1.47E+02		+	*		
	351.92	3.11E+02	+- 2.88E+01	7.63E+01		+	*		
Annul	511.00	7.27E+01	+- 2.19E+01	7.05E+01		+	*		
Tl-208	Average:x	3.78E+02	+- 2.84E+01	. . . . .		*		. . . . .
	583.14	3.62E+02	+- 3.69E+01	9.25E+01		+	*		
	2614.66	4.01E+02	+- 4.45E+01	6.95E+01		+	*		
	510.84	I.D.	. . . . .	. . . . .				. . . . .
Bi-214	Average:x	3.08E+02	+- 2.40E+01	. . . . .		*		. . . . .
	609.31	2.96E+02	+- 2.70E+01	6.62E+01		+	*		
	1120.29	2.89E+02	+- 8.24E+01	2.52E+02		+	*		
	1764.49	3.86E+02	+- 7.47E+01	1.93E+02		+	*		
	2204.22	4.84E+02	+- 1.68E+02	4.77E+02		+			
Bi-212	727.17	1.93E+02	+- 7.18E+01	2.26E+02		+			
Cs-134	Average:x	4.02E+00	+- 7.58E+00	. . . . .				. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
	795.84	2.10E+00	+-	2.11E+01	7.15E+01		(+) Ac	. . . . .
	604.70	N-4.93E+00	+-	8.12E+00	2.90E+01	✓	x lbase	. . . . .
K-40	1460.81	1.18E+04	+-	3.42E+02	2.67E+02		+	. . . . .
Am-241	59.54	N 1.75E+00	+-	4.53E+01	1.55E+02		x	. . . . .
Co-57	122.06	N-2.78E+00	+-	7.57E+00	2.60E+01		x	. . . . .
Ce-144	133.54	N-1.54E+02	+-	6.00E+01	2.16E+02		x	. . . . .
Ce-141	145.44	N 8.71E+01	+-	5.64E+01	1.86E+02		x	. . . . .
Ra-226	186.22	N-1.63E+02	+-	2.97E+02	1.01E+03	L	x LHROI	. . . . .
Se-75	264.65	N 2.47E+01	+-	1.49E+01	4.88E+01		x	. . . . .
Cr-51	320.08	N 6.55E+01	+-	3.56E+02	1.22E+03		x	. . . . .
I-131	364.48	N 2.12E+02	+-	2.94E+03	1.02E+04		x	. . . . .
Sb-125	427.89	N-1.12E+01	+-	1.94E+01	6.98E+01		x	. . . . .
Ag-108m	433.93	N-4.03E+00	+-	6.45E+00	2.31E+01		x	. . . . .
Be-7	477.59	N-1.02E+02	+-	1.57E+02	5.59E+02		x	. . . . .
La-140	487.03	N-3.54E+02	+-	6.47E+02	2.30E+03		x	. . . . .
Ru-103	497.08	N 4.02E+01	+-	2.52E+01	8.28E+01		x	. . . . .
Ba-140	537.32	N 8.44E+02	+-	1.24E+03	4.24E+03		x	. . . . .
Ru-106	621.84	N-7.80E+00	+-	7.85E+01	2.77E+02		x	. . . . .
Cs-137	661.65	N 2.38E+00	+-	7.51E+00	2.63E+01		x	Y.
Zr-95	724.18	N-5.91E+01	+-	4.72E+01	1.76E+02	L	x LHROI	. . . . .
Nb-95	765.79	N-2.24E+01	+-	3.13E+01	1.13E+02		x	. . . . .
Co-58	810.76	N-4.11E+00	+-	1.39E+01	5.01E+01		x	. . . . .
Mn-54	834.83	N-1.06E+01	+-	8.67E+00	3.23E+01		x	. . . . .
Ag-110m	884.67	N 1.09E+01	+-	1.21E+01	4.12E+01		x	. . . . .
Fe-59	1099.22	N-3.04E+01	+-	4.54E+01	1.66E+02		x	. . . . .
Zn-65	1115.52	N-1.27E+01	+-	4.45E+01	1.53E+02	P	x PIC	. . . . .
Co-60	1332.49	N-1.45E+01	+-	8.41E+00	3.30E+01		x	Y.
Sb-124	1691.02	N 2.05E+01	+-	2.17E+01	7.68E+01		x	. . . . .

MEASURED TOTAL: 1.37E+04 +- 5.82E+02 pCi/kg

0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.37	95.79	-12	27	44	351	0.05	Deleted
4	87.21	131.83	-7	31	51	465	0.08	Deleted
5	92.94	140.48	27	30	49	419	0.87	Deleted
10	270.45	408.71	32	23	37	208	1.29	Deleted
14	509.72	770.31	-105	13	27	55	1.18	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
29	59.54	90.01	1N	22	36	254	1.13	NET< CL
30	122.06	184.48	-8N	22	37	274	1.18	NET< CL
31	133.54	201.83	-58N	23	39	310	1.19	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
32	145.44	219.81	39N	25	40	286	1.20	NET< CL
33	186.22	281.43	-20N	36	61	340	1.23	NET< CL LHRoi
34	264.66	399.95	30N	18	28	148	1.29	
35	320.09	483.72	3N	16	27	131	1.33	NET< CL
36	364.49	550.83	1N	14	23	96	1.36	NET< CL
37	427.91	646.67	-7N	12	20	77	1.40	NET< CL
38	433.95	655.80	-8N	13	22	86	1.41	NET< CL
39	477.62	721.79	-9N	14	23	90	1.44	NET< CL
40	487.06	736.06	-7N	13	22	86	1.44	NET< CL
41	497.11	751.25	21N	13	20	70	1.45	
42	537.36	812.07	9N	13	21	77	1.48	NET< CL
43	604.76	913.93	-8N	13	22	84	1.52	NET< CL LBase
44	621.91	939.84	-1N	12	19	64	1.54	NET< CL
45	661.60	999.83	3N	11	17	59	1.56	NET< CL
46	724.15	1094.36	-19N	15	27	67	1.61	NET< CL LHRoi
47	765.78	1157.27	-8N	12	20	71	1.63	NET< CL
48	810.77	1225.27	-3N	10	17	53	1.66	NET< CL
49	834.86	1261.66	-13N	11	18	63	1.68	NET< CL
50	884.72	1337.03	9N	10	16	45	1.71	NET< CL
51	1099.18	1661.09	-7N	10	17	53	1.86	NET< CL
52	1115.50	1685.74	-6N	22	36	121	1.87	NET< CL PIC
53	1332.47	2013.54	-15N	9	16	47	2.01	NET< CL
54	1691.00	2555.01	4N	4	6	7	2.25	NET< CL

L5185-12 analyzed by emml461 on 04/08/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:22:15
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 7000 Sec
Sample Size 7.59E-01 kg | Real Time 7007 Sec
Collection Efficiency 1.0000 | Spectrum File 0986805.spc

Detector #: 5

Energy(keV)= -0.04 + 0.662*Ch + -2.11E-07*Ch^2 + -2.11E-07*Ch^3 04/08/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5185-12.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	3.41E+02	2.16E+01	< 5.92E+01	2.86E+01	9.99E-01	MEAS +	YES
U-235	3.34E+01	1.38E+01	< 4.47E+01	2.17E+01	1.00E+00	MEAS +	YES
AcTh-228	3.50E+02	3.37E+01	< 1.07E+02	4.98E+01	1.00E+00	MEAS +	YES
Pb-214	3.03E+02	2.42E+01	< 7.63E+01	3.67E+01	9.99E-01	MEAS +	YES
Ann1l	7.27E+01	2.19E+01	< 7.05E+01	3.45E+01	8.75E-01	MEAS +	YES
Tl-208	3.78E+02	2.84E+01	< 6.95E+01	2.91E+01	1.00E+00	MEAS +	YES
Bi-214	3.08E+02	2.40E+01	< 6.62E+01	3.14E+01	9.99E-01	MEAS +	YES
Bi-212	1.93E+02	7.18E+01	< 2.26E+02	1.06E+02	1.00E+00	MEAS +	YES
Cs-134	-4.02E+00	7.58E+00	< 2.90E+01	1.37E+01	9.37E-01	MEAS +	YES
K-40	1.18E+04	3.42E+02	< 2.67E+02	1.21E+02	1.00E+00	MEAS +	YES
Am-241	1.75E+00	4.53E+01	< 1.55E+02	7.45E+01	1.00E+00	NET	YES
Co-57	-2.78E+00	7.57E+00	< 2.60E+01	1.26E+01	8.36E-01	NET	YES
Ce-144	-1.54E+02	6.00E+01	< 2.16E+02	1.04E+02	8.43E-01	NET	YES
Ce-141	8.71E+01	5.64E+01	< 1.86E+02	8.99E+01	2.23E-01	NET	YES
Ra-226	-1.64E+02	2.97E+02	< 1.01E+03	4.96E+02	1.00E+00	NET	YES
Se-75	2.47E+01	1.49E+01	< 4.88E+01	2.33E+01	6.66E-01	NET	YES
Cr-51	6.55E+01	3.56E+02	< 1.22E+03	5.82E+02	1.72E-01	NET	YES
I-131	2.12E+02	2.94E+03	< 1.02E+04	4.83E+03	2.34E-03	NET	YES
Sb-125	-1.12E+01	1.94E+01	< 6.98E+01	3.27E+01	9.53E-01	NET	YES
Ag-108m	-4.03E+00	6.45E+00	< 2.31E+01	1.09E+01	9.99E-01	NET	YES
Be-7	-1.02E+02	1.57E+02	< 5.59E+02	2.64E+02	4.02E-01	NET	YES
La-140	-3.54E+02	6.46E+02	< 2.30E+03	1.08E+03	2.22E-02	NET	YES
Ru-103	4.02E+01	2.52E+01	< 8.28E+01	3.88E+01	2.90E-01	NET	YES
Ba-140	8.44E+02	1.24E+03	< 4.24E+03	1.99E+03	2.22E-02	NET	YES
Ru-106	-7.80E+00	7.85E+01	< 2.77E+02	1.30E+02	8.76E-01	NET	YES
Cs-137	2.38E+00	7.51E+00	< 2.62E+01	1.22E+01	9.96E-01	NET	YES
Zr-95	-5.91E+01	4.72E+01	< 1.76E+02	8.37E+01	4.67E-01	NET	YES
Nb-95	-2.24E+01	3.13E+01	< 1.13E+02	5.30E+01	2.49E-01	NET	YES
Co-58	-4.11E+00	1.39E+01	< 5.01E+01	2.32E+01	5.03E-01	NET	YES
Mn-54	-1.06E+01	8.67E+00	< 3.23E+01	1.51E+01	8.56E-01	NET	YES
Ag-110m	1.09E+01	1.21E+01	< 4.12E+01	1.90E+01	8.23E-01	NET	YES
Fe-59	-3.04E+01	4.54E+01	< 1.66E+02	7.70E+01	3.36E-01	NET	YES
Zn-65	-1.27E+01	4.45E+01	< 1.53E+02	7.37E+01	8.19E-01	NET	YES

L5185-12 analyzed by emm1461 on 04/08/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	-1.45E+01	8.41E+00	< 3.30E+01	1.52E+01	9.75E-01	NET	YES
Sb-124	2.05E+01	2.17E+01	< 7.68E+01	3.15E+01	4.45E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-13

Count by Date: _____
(if required)

Client: Duratek Inc

Delay Date: _____
(if required)

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMS-2700-140

Collect Start Date/Time: _____

Collect Stop Date/Time: 01-28-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: W65711

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 762.1755 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/10/03 1723

Det No.: 6

Spectrum No.: 0986806

Counted by: en

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5185-13
Client Id : BMS-2700-140
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 01/28/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	775.5		
Sample Weight-Dry	g			
Aliquot Weight	g	775.5		
FINAL WEIGHT	kg	.7755		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-13 analyzed by emm1461 on 04/08/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-13

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986806

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:22:45
Sampling Stop: 01/28/2003 12:00:00 | Decay Time: 1.69E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 7500 Sec
Sample Size 7.75E-001 kg | Real Time 7507 Sec
Collection Efficiency 1.0000 | Spc. File 0986806.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV)= -0.02 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.21	95.55	84	33	52	458	1.00	
2	74.70	112.92	143	29	43	376	1.07	a
3	76.97	116.35	247	27	37	301	0.83	b
4	87.04	131.57	93	20	29	202	0.68	a
5	90.00	136.03	57	22	35	269	0.95	b
6	92.67	140.07	272	33	47	403	1.24	c
7	143.93	217.53	38	16	25	148	0.57	a
8	148.68	224.71	31	19	30	198	0.89	b
9	160.19	242.10	-16	27	44	332	0.57	NET< CL
10	185.73	280.70	240	31	44	304	1.64	Wide Pk
11	209.24	316.22	36	26	41	285	0.47	NET< CL
12	238.52	360.46	629	31	30	180	1.15	a
13	241.52	364.99	108	21	30	180	1.16	b
14	269.89	407.86	45	21	33	181	0.96	
15	295.05	445.88	181	23	31	167	1.22	
16	327.81	495.38	40	18	28	130	1.28	
17	338.22	511.11	142	20	27	120	1.36	
18	351.71	531.49	385	27	29	136	1.60	
19	463.09	699.81	83	17	24	82	2.09	Wide Pk
20	510.91	772.07	226	22	26	102	2.24	Wide Pk
21	583.08	881.13	252	22	25	90	1.55	
22	609.21	920.60	292	23	25	92	1.40	
23	727.50	1099.35	47	14	20	65	1.57	
24	795.02	1201.37	30	14	21	68	1.82	
25	859.85	1299.35	26	14	22	74	1.45	
26	911.29	1377.08	204	18	18	50	1.72	
27	933.74	1411.00	12	12	19	54	0.95	NET< CL

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	969.02	1464.31	88	16	22	77	2.45	
29	1120.29	1692.89	81	14	18	44	2.57	
30	1460.91	2207.59	570	25	11	19	2.18	
31	1764.78	2666.78	50	9	10	16	1.77	
32	2615.06	3951.62	93	10	6	6	3.11	

L5185-13 analyzed by emml461 on 04/08/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.21	85	33	52	-4	33	54	NET<CL
2	74.70	143	29	43	127	29	44	
3	76.97	247	27	37	228	27	38	
6	92.67	272	33	47	66	33	53	
7	143.93	38	16	25	11	16	26	NET<CL
10	185.73	240	31	44	109	31	48	
12	238.52	629	31	30	589	31	32	
13	241.52	108	21	30	93	21	31	
14	269.89	45	21	33	42	21	33	
15	295.05	181	23	31	155	23	33	
17	338.22	142	20	27	136	20	27	
18	351.71	385	27	29	338	27	32	
20	510.91	226	22	26	54	22	34	
21	583.08	252	22	25	241	22	25	
22	609.21	292	23	25	256	23	27	
23	727.50	47	14	20	44	14	20	
24	795.02	31	14	21	28	14	22	
26	911.29	204	18	18	195	18	19	
27	933.74	12	12	19	11	12	19	NET<CL
28	969.02	88	16	22	87	17	22	
29	1120.29	81	14	18	76	14	18	
30	1460.91	570	25	11	554	25	13	
31	1764.78	50	9	10	43	9	11	
32	2615.06	93	10	6	82	10	8	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0Minimum Score 0.50 | Decay Correction. ON

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.70	127	Pb-214	53	5 of 7	100.00	1.50	
			Tl-208	7	6 of 9	95.73	0.96	
			Pb-212	111	4 of 6	95.97	1.46	
			Tl-208	12	6 of 9	95.73	0.96	
3	76.97	228	Pb-212	194	4 of 6	95.97	1.46	
			Pb-214	97	5 of 7	100.00	1.00	
4	87.04	93	Cd-109	. . . . .	1 of 1	100.00	1.50	
			Pb-212	108	4 of 6	95.97	1.46	
5	90.00	57	Cd-109	. . . . .	1 of 1	100.00	1.50	
6	92.67	6	Th-234	. . . . .	1 of 2	100.00	1.50	Split
33	92.67	60	AcTh-228	60	8 of 36	79.04	1.29	AutoAdd
8	148.68	31	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
10	185.73	109	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
12	238.52	589	Pb-212	637	4 of 6	95.97	1.46	
13	241.52	93	Pb-214	83	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
14	269.89	42	AcTh-228	53	8 of 36	87.51	1.38	
15	295.05	155	Pb-214	202	5 of 7	100.00	1.50	
16	327.81	41	AcTh-228	42	8 of 36	79.04	1.29	
			Bi-212	1	2 of 13	59.32	1.09	
			La-140	3651	2 of 15	23.26	0.23	LowScore
17	338.22	136	AcTh-228	149	8 of 36	79.04	1.29	
18	351.71	338	Pb-214	306	5 of 7	100.00	1.50	
19	463.09	83	AcTh-228	44	8 of 36	76.34	1.26	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
20	510.91	54	Tl-208	61	6 of 9	100.00	1.50	
			Annil	. . . . .	1 of 1	100.00	1.50	
21	583.08	241	Tl-208	190	6 of 9	97.05	1.47	
22	609.21	256	Bi-214	298	3 of 33	74.63	1.25	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
23	727.50	44	Bi-212	2167	2 of 13	100.00	1.50	
24	795.02	28	AcTh-228	33	8 of 36	82.51	1.33	
			Cs-134	. . . . .	1 of 9	46.67	0.97	
25	859.85	26	Tl-208	25	6 of 9	97.05	1.47	
26	911.29	195	AcTh-228	173	8 of 36	79.04	1.29	
28	969.02	87	AcTh-228	109	8 of 36	82.51	1.33	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
29	1120.29	76	Bi-214	56	3 of 33	71.46	1.21	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
30	1460.91	554	K-40	. . . . .	1 of 1	100.00	1.50	
31	1764.78	43	Bi-214	45	3 of 33	74.63	1.25	
32	2615.06	82	Tl-208	103	6 of 9	100.00	1.50	

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-13

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986806

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:22:45
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 7500 Sec
 Sample Size 7.75e-001 kg | Real Time 7507 Sec
 Collection Efficiency 1.0000 | Spectrum File 0986806.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[8.71E-03*En^-3.34E+00 + 1.54E+02*En^6.70E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5185-13.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-214	Average:x	3.08E+02 +- 2.07E+01		*
	74.81	I.D.	. . . .			. . . . .
	241.98	3.50E+02 +- 7.92E+01	2.42E+02		++	. . . . .
	295.21	2.57E+02 +- 3.90E+01	1.13E+02		++	. . . . .
	351.92	3.25E+02 +- 2.56E+01	6.36E+01		++	. . . . .
Pb-212	238.63	3.70E+02 +- 1.95E+01	4.91E+01		++	. . . . .
	77.12	I.D.	. . . .			. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	2.72E+01 +- 2.77E+02	9.23E+02		+	. . . . .
Ce-141	145.44	2.25E+01 +- 3.35E+01	1.14E+02		x	. . . . .
Ra-226	186.22	8.13E+02 +- 2.31E+02	7.34E+02		++	. . . . .
AcTh-228	Average:x	4.43E+02 +- 2.99E+01	. . . .		*	. . . . .
	270.23	3.48E+02 +- 1.76E+02	5.75E+02		+	. . . . .
	327.64	4.31E+02 +- 1.91E+02	6.15E+02		+	. . . . .
	338.32	4.15E+02 +- 6.15E+01	1.73E+02		++	. . . . .
	463.00	8.09E+02 +- 1.68E+02	4.98E+02		++	. . . . .
	794.70	3.70E+02 +- 1.89E+02	6.14E+02		+	. . . . .
	911.07	4.73E+02 +- 4.36E+01	9.68E+01		++	. . . . .
	969.11	3.68E+02 +- 6.97E+01	2.00E+02		++	. . . . .
	93.35	I.D.	. . . .			. . . . .
Tl-208	Average:x	3.57E+02 +- 2.64E+01	. . . .		*	. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	3.96E+02 +- 3.61E+01	8.84E+01		++	. . . . .
	860.37	3.68E+02 +- 2.09E+02	6.83E+02		+
	2614.66	3.10E+02 +- 3.93E+01	7.31E+01		++
Bi-214	Average:x	2.95E+02 +- 2.24E+01		*

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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E		Concentration		MDA	Flags	Notes	MDC
	(keV)	(pCi/kg)	(pCi/kg)	(pCi/kg)				
	609.31	2.84E+02	+- 2.55E+01	6.32E+01		+		
	1120.29	3.92E+02	+- 7.22E+01	2.00E+02		+		
	1764.49	2.88E+02	+- 6.15E+01	1.60E+02		+		
Bi-212	727.17	2.16E+02	+- 6.85E+01	2.12E+02		+		
K-40	1460.81	4.80E+03	+- 2.15E+02	2.44E+02		+		
Am-241	59.54	N 8.52E+00	+- 6.33E+01	2.12E+02L		x	LHROI	
Co-57	122.06	N-1.60E+01	+- 7.11E+00	2.53E+01		x		
Ce-144	133.54	N-4.83E+00	+- 5.27E+01	1.80E+02		x		
Se-75	264.65	N-2.02E+01	+- 1.32E+01	4.74E+011		x	lbase	
Cr-51	320.08	N 2.18E+02	+- 3.13E+02	1.06E+03		x		
I-131	364.48	N 7.69E+02	+- 2.71E+03	9.33E+03		x		
Sb-125	427.89	N 1.45E+00	+- 1.78E+01	6.22E+01		x		
Ag-108m	433.93	N 9.14E-01	+- 5.49E+00	1.92E+01		x		
Be-7	477.59	N-1.04E+02	+- 1.10E+02	4.05E+02		x		
La-140	487.03	N-5.70E+02	+- 4.70E+02	1.75E+03		x		
Ru-103	497.08	N-5.80E-01	+- 2.18E+01	7.64E+01		x		
Ba-140	537.32	N 2.42E+02	+- 1.02E+03	3.54E+03		x		
Cs-134	604.70	N 3.27E+00	+- 7.08E+00	2.44E+011		x	lbase	
Ru-106	621.84	N 2.73E+01	+- 7.41E+01	2.56E+02		x		
Cs-137	661.65	N 3.69E+00	+- 7.05E+00	2.44E+01		x		Y.
Zr-95	724.18	N-6.07E+03	+- 2.71E+03	8.94E+03P		x	PIC	
Nb-95	765.79	N-2.86E+01	+- 2.92E+01	1.06E+02		x		
Co-58	810.76	N-3.24E+01	+- 1.20E+01	4.79E+01		x		
Mn-54	834.83	N 4.46E+00	+- 7.20E+00	2.49E+01		x		
Ag-110m	884.67	N 1.99E+01	+- 9.89E+00	3.16E+01		x		
Fe-59	1099.22	N-3.37E+01	+- 3.49E+01	1.32E+02		x		
Zn-65	1115.52	N 1.25E+01	+- 3.50E+01	1.19E+02P		x	PIC	
Co-60	1332.49	N 8.91E-01	+- 5.71E+00	2.10E+01		x		Y.
Sb-124	1691.02	N 4.67E+00	+- 2.24E+01	8.47E+01		x		

MEASURED TOTAL: 7.63E+03 +- 9.09E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.21	95.55	-4	33	54	459	1.00	Deleted
8	148.68	224.71	31	19	30	198	0.89	Unknown
9	160.19	242.10	-17	27	44	333	0.57	Deleted
11	209.24	316.22	36	26	41	285	0.47	Deleted
27	933.74	1411.00	11	12	19	54	0.95	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	143.93	217.53	11N	16	26	149	0.57	a NET< CL
34	59.54	90.01	5N	37	61	343	1.13	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
35	122.06	184.48	-52N	23	40	317	1.12	LHRoi NET< CL
36	133.54	201.83	-2N	22	36	260	1.13	NET< CL
37	264.65	399.95	-27N	18	30	170	1.21	NET< CL
38	320.08	483.70	11N	16	25	119	1.25	LBase NET< CL
39	364.48	550.80	4N	14	23	97	1.29	NET< CL
40	427.89	646.62	1N	12	20	74	1.35	NET< CL
41	433.93	655.74	2N	12	20	71	1.36	NET< CL
42	477.59	721.72	-10N	10	18	60	1.40	NET< CL
43	487.03	735.98	-13N	11	19	64	1.40	NET< CL
44	497.08	751.17	-0N	13	21	72	1.41	NET< CL
45	537.32	811.97	3N	12	19	64	1.45	NET< CL
46	604.70	913.79	6N	13	20	71	1.51	NET< CL
47	621.84	939.69	5N	12	20	67	1.53	LBase NET< CL
48	661.65	999.85	6N	11	18	61	1.57	NET< CL
49	724.18	1094.33	-2145N	959	1579	114	1.62	NET< CL
50	765.79	1157.21	-12N	12	21	75	1.66	PIC NET< CL
51	810.76	1225.16	-26N	10	18	59	1.70	NET< CL
52	834.83	1261.54	6N	10	15	44	1.72	NET< CL
53	884.67	1336.85	18N	9	13	31	1.76	
54	1099.22	1661.05	-8N	9	15	39	1.92	NET< CL
55	1115.52	1685.68	7N	19	31	81	1.93	NET< CL
56	1332.49	2013.54	1N	6	10	20	2.08	PIC NET< CL
57	1691.02	2555.31	1N	5	8	11	2.26	NET< CL

L5185-13 analyzed by emml461 on 04/08/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:22:45
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 7500 Sec
Sample Size 7.75E-01 kg | Real Time 7507 Sec
Collection Efficiency 1.0000 | Spectrum File 0986806.spc

Detector #: 6

Energy(keV)= -0.02 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[8.71e-03*En^-3.34e+00 + 1.54e+02*En^ 6.70e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5185-13.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-214	3.08E+02	2.07E+01	< 6.35E+01	3.05E+01	9.99E-01	MEAS +	YES
Pb-212	3.70E+02	1.95E+01	< 4.90E+01	2.37E+01	9.98E-01	MEAS +	YES
Th-234	2.72E+01	2.77E+02	< 9.23E+02	4.55E+02	9.99E-01	MEAS +	YES
Ce-141	2.25E+01	3.35E+01	< 1.14E+02	5.41E+01	2.23E-01	NET	YES
Ra-226	8.13E+02	2.31E+02	< 7.34E+02	3.57E+02	1.00E+00	MEAS +	YES
AcTh-228	4.43E+02	2.99E+01	< 9.68E+01	4.51E+01	1.00E+00	MEAS +	YES
Tl-208	3.57E+02	2.64E+01	< 7.31E+01	3.14E+01	1.00E+00	MEAS +	YES
Bi-214	2.95E+02	2.24E+01	< 6.32E+01	3.01E+01	9.99E-01	MEAS +	YES
Bi-212	2.16E+02	6.85E+01	< 2.12E+02	9.92E+01	1.00E+00	MEAS +	YES
K-40	4.80E+03	2.15E+02	< 2.44E+02	1.10E+02	1.00E+00	MEAS +	YES
Am-241	8.52E+00	6.33E+01	< 2.12E+02	1.04E+02	1.00E+00	NET	YES
Co-57	-1.60E+01	7.11E+00	< 2.54E+01	1.23E+01	8.36E-01	NET	YES
Ce-144	-4.83E+00	5.27E+01	< 1.80E+02	8.68E+01	8.43E-01	NET	YES
Se-75	-2.02E+01	1.32E+01	< 4.74E+01	2.27E+01	6.66E-01	NET	YES
Cr-51	2.18E+02	3.13E+02	< 1.06E+03	5.03E+02	1.72E-01	NET	YES
I-131	7.69E+02	2.71E+03	< 9.34E+03	4.41E+03	2.34E-03	NET	YES
Sb-125	1.46E+00	1.78E+01	< 6.22E+01	2.91E+01	9.53E-01	NET	YES
Ag-108m	9.14E-01	5.49E+00	< 1.92E+01	8.96E+00	9.99E-01	NET	YES
Be-7	-1.04E+02	1.10E+02	< 4.05E+02	1.88E+02	4.02E-01	NET	YES
La-140	-5.70E+02	4.70E+02	< 1.75E+03	8.16E+02	2.22E-02	NET	YES
Ru-103	-5.80E-01	2.18E+01	< 7.64E+01	3.58E+01	2.90E-01	NET	YES
Ba-140	2.42E+02	1.02E+03	< 3.54E+03	1.65E+03	2.22E-02	NET	YES
Cs-134	3.27E+00	7.08E+00	< 2.44E+01	1.14E+01	9.37E-01	NET	YES
Ru-106	2.74E+01	7.41E+01	< 2.56E+02	1.20E+02	8.76E-01	NET	YES
Cs-137	3.69E+00	7.05E+00	< 2.44E+01	1.13E+01	9.96E-01	NET	YES
Zr-95	-6.07E+03	2.71E+03	< 8.94E+03	4.47E+03	4.67E-01	NET	YES
Nb-95	-2.86E+01	2.92E+01	< 1.06E+02	4.99E+01	2.49E-01	NET	YES
Co-58	-3.24E+01	1.20E+01	< 4.79E+01	2.23E+01	5.03E-01	NET	YES
Mn-54	4.46E+00	7.20E+00	< 2.49E+01	1.15E+01	8.56E-01	NET	YES
Ag-110m	1.99E+01	9.89E+00	< 3.16E+01	1.43E+01	8.23E-01	NET	YES
Fe-59	-3.37E+01	3.49E+01	< 1.32E+02	6.06E+01	3.36E-01	NET	YES
Zn-65	1.25E+01	3.50E+01	< 1.19E+02	5.70E+01	8.19E-01	NET	YES
Co-60	8.91E-01	5.71E+00	< 2.10E+01	9.27E+00	9.75E-01	NET	YES

L5185-13 analyzed by emm1461 on 04/08/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	4.67E+00	2.24E+01	< 8.47E+01	3.60E+01	4.45E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-14

Count by Date: _____
(if required)

Client: Duratek Inc

Delay Date: _____
(if required)

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMS-2700-144

Collect Start Date/Time: _____

Collect Stop Date/Time: 01-28-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 7621 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/8/03 1723

Det No.: 8

Spectrum No.: 0986 80K

Counted by: 84

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : LS185-14
Client Id : BMS-2700-144
Site :

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 01/28/03 12:00

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	762.1		
Sample Weight-Dry	g			
Aliquot Weight	g	762.1		
FINAL WEIGHT	kg	.7621		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-14 analyzed by emml461 on 04/09/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-14 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986808

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:23:16
Sampling Stop: 01/28/2003 12:00:00 | Decay Time: 1.69E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 7500 Sec
Sample Size 7.62E-001 kg | Real Time 7507 Sec
Collection Efficiency 1.0000 | Spc. File 0986808.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
Energy(keV)= 0.40 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003
FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.74	94.10	84	34	54	494	1.84	Wide Pk
2	75.03	112.64	241	31	45	407	1.14	a
3	77.20	115.93	422	34	45	407	1.07	b
4	87.22	131.05	92	24	37	297	0.94	a
5	92.86	139.56	220	40	61	593	1.84	b Wide Pk
6	105.25	158.27	28	37	60	538	0.86	NET< CL
7	123.58	185.94	54	24	37	277	1.13	a
8	128.96	194.05	64	27	42	332	1.29	b
9	186.01	280.18	147	34	53	408	1.33	
10	208.99	314.85	67	32	51	390	1.45	
11	238.75	359.78	999	37	32	189	1.36	a
12	241.62	364.10	199	28	40	252	1.66	b
13	270.04	407.00	75	22	33	189	1.47	a
14	277.85	418.80	45	26	41	243	2.02	b Wide Pk
15	295.29	445.12	247	22	25	130	1.13	a
16	300.27	452.64	30	12	18	78	0.71	b
17	328.12	494.68	7	24	39	222	0.20	NET< CL
18	338.30	510.04	190	26	36	194	1.42	
19	352.08	530.84	466	29	32	155	1.34	
20	463.07	698.38	54	17	26	99	1.45	
21	511.05	770.80	286	22	24	100	2.07	
22	583.40	880.01	365	24	23	86	1.47	
23	609.33	919.16	387	25	25	106	1.50	
24	727.45	1097.46	88	16	21	69	2.13	
25	767.13	1157.34	13	8	11	32	0.86	a
26	768.74	1159.78	22	9	13	39	1.17	b
27	794.69	1198.94	54	14	19	60	2.78	Wide Pk

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	860.80	1298.74	38	13	19	58	1.81	
29	911.39	1375.11	238	19	18	51	1.57	
30	965.48	1456.75	35	9	10	23	1.34	a
31	969.12	1462.25	138	14	12	27	1.52	b
32	1120.33	1690.49	84	12	14	30	2.47	
33	1460.85	2204.50	394	21	11	20	2.39	
34	1621.05	2446.31	12	7	11	16	1.46	
35	1764.30	2662.54	68	10	10	14	2.49	
36	2614.49	3945.88	148	13	6	6	3.46	

L5185-14 analyzed by emml461 on 04/09/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.74	84	34	54	49	34	55	NET<CL
2	75.03	241	31	45	227	31	45	
3	77.20	422	34	45	401	34	46	
4	87.22	92	24	37	77	25	38	
5	92.86	220	40	61	136	40	63	
9	186.01	147	34	53	103	34	54	
11	238.75	999	37	32	964	37	34	
12	241.62	199	28	40	183	28	41	
15	295.29	247	22	25	215	22	27	
17	328.12	7	24	39	8	24	39	NET<CL
18	338.30	191	26	36	183	26	37	
19	352.08	466	29	32	418	29	34	
20	463.07	54	17	26	53	17	26	
21	511.05	286	22	24	97	23	33	
22	583.40	365	24	23	355	24	24	
23	609.33	387	25	25	344	25	28	
25	767.13	13	8	11	9	8	12	NET<CL
26	768.74	22	9	13	18	9	14	
29	911.39	238	19	18	231	19	19	
31	969.12	138	14	12	133	14	12	
32	1120.33	84	12	14	77	13	15	
33	1460.85	394	21	11	377	21	13	
35	1764.30	68	10	10	59	10	11	
36	2614.49	148	13	6	137	13	8	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	75.03	227	Pb-212	184	5 of 6	100.00	1.50	
			Pb-214	71	5 of 7	98.65	0.99	
			Tl-208	20	6 of 9	97.77	0.98	
3	77.20	70	Pb-214	129	5 of 7	98.65	0.99	Split
39	77.20	332	Pb-212	332	5 of 6	100.00	1.50	AutoAdd
4	87.22	77	Cd-109	. . . . .	1 of 1	100.00	1.50	
			Pb-212	183	5 of 6	100.00	1.00	
5	92.86	59	Th-234	. . . . .	1 of 2	58.74	0.59	Split
38	92.86	78	AcTh-228	78	10 of 36	82.68	1.33	AutoAdd
7	123.58	54	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	128.96	64	AcTh-228	72	10 of 36	88.73	1.39	
9	186.01	103	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
10	208.99	67	AcTh-228	95	10 of 36	92.63	1.43	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
11	238.75	964	Pb-212	1033	5 of 6	100.00	1.50	
12	241.62	183	Pb-214	102	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
13	270.04	75	AcTh-228	66	10 of 36	85.71	1.36	
14	277.85	45	Tl-208	44	6 of 9	100.00	1.50	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
15	295.29	215	Pb-214	253	5 of 7	100.00	1.50	
16	300.27	30	Pb-212	66	5 of 6	100.00	1.50	
18	338.30	183	AcTh-228	182	10 of 36	88.73	1.39	
19	352.08	418	Pb-214	409	5 of 7	100.00	1.50	
20	463.07	53	AcTh-228	57	10 of 36	88.73	1.39	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
21	511.05	2	Annil	. . . . .	1 of 1	100.00	1.50	Split
37	511.05	94	Tl-208	94	6 of 9	100.00	1.50	AutoAdd
22	583.40	355	Tl-208	317	6 of 9	100.00	1.50	
23	609.33	344	Bi-214	329	4 of 33	79.50	1.29	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
24	727.45	88	Bi-212	84	2 of 13	100.00	1.50	
26	768.74	18	Bi-214	32	4 of 33	84.55	1.35	
27	794.69	54	AcTh-228	42	10 of 36	85.71	1.36	
28	860.80	39	Tl-208	39	6 of 9	100.00	1.50	
29	911.39	231	AcTh-228	231	10 of 36	88.73	1.39	
30	965.48	35	AcTh-228	42	10 of 36	90.77	1.41	
31	969.12	133	AcTh-228	133	10 of 36	88.73	1.39	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
32	1120.33	77	Bi-214	74	4 of 33	79.50	1.29	
33	1460.85	377	K-40	. . . . .	1 of 1	100.00	1.50	
34	1621.05	12	Bi-212	12	2 of 13	100.00	1.50	
35	1764.30	59	Bi-214	57	4 of 33	79.50	1.29	
36	2614.49	137	Tl-208	156	6 of 9	100.00	1.50	

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-14

Sample ID: SOIL/SEDI Duratek Inc

Code: 0986808

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:23:16
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 7500 Sec
 Sample Size 7.62e-001 kg | Real Time 7507 Sec
 Collection Efficiency 1.0000 | Spectrum File 0986808.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5185-14.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	5.68E+02 +- 2.19E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	238.63	5.80E+02 +- 2.24E+01	4.21E+01		+*	. . . . .
	300.09	2.71E+02 +- 1.10E+02	3.47E+02		+	. . . . .
Pb-214	Average:x	3.81E+02 +- 2.10E+01	. . . .		*	. . . . .
	77.11	I.D.	. . . .			. . . . .
	241.98	6.62E+02 +- 1.02E+02	3.03E+02		+*	. . . . .
	295.21	3.42E+02 +- 3.53E+01	9.14E+01		+*	. . . . .
	351.92	3.85E+02 +- 2.69E+01	6.59E+01		+*	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	2.60E+02 +- 3.09E+02	1.02E+03		+	. . . . .
AcTh-228	Average:x	5.26E+02 +- 2.81E+01	. . . .		*	. . . . .
	129.08	4.69E+02 +- 1.99E+02	6.45E+02		+	. . . . .
	209.28	3.76E+02 +- 1.81E+02	5.92E+02		+	. . . . .
	270.23	6.00E+02 +- 1.76E+02	5.54E+02		+*	. . . . .
	338.32	5.35E+02 +- 7.60E+01	2.21E+02		+*	. . . . .
	463.00	4.92E+02 +- 1.62E+02	5.08E+02		+*	. . . . .
	794.70	6.83E+02 +- 1.74E+02	5.17E+02		+*	. . . . .
	911.07	5.31E+02 +- 4.36E+01	9.23E+01		+*	. . . . .
	964.60	4.47E+02 +- 1.10E+02	3.01E+02		+*	. . . . .
	969.11	5.32E+02 +- 5.50E+01	1.10E+02		+*	. . . . .
	93.35	I.D.	. . . .			. . . . .
Ra-226	186.22	7.29E+02 +- 2.43E+02	7.84E+02		+	. . . . .
Tl-208	Average:x	5.29E+02 +- 2.83E+01	. . . .		*	. . . . .
	277.35	5.40E+02 +- 3.06E+02	1.01E+03		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
	510.84	I.D.	. . . . .	. . . . .	
	583.14	5.57E+02 +- 3.72E+01	7.85E+01		++	. . . . .
	860.37	5.27E+02 +- 1.77E+02	5.49E+02		+	. . . . .
	2614.66	4.88E+02 +- 4.54E+01	6.92E+01		++	. . . . .
Annul	511.00	1.14E+00 +- 1.97E+01	6.60E+01		+	. . . . .
Bi-214	Average:x	3.60E+02 +- 2.22E+01	. . . . .		*	. . . . .
	609.31	3.65E+02 +- 2.66E+01	6.19E+01		++	. . . . .
	768.36	2.02E+02 +- 1.06E+02	3.42E+02		+	. . . . .
	1120.29	3.75E+02 +- 6.08E+01	1.56E+02		++	. . . . .
	1764.49	3.71E+02 +- 6.33E+01	1.52E+02		++	. . . . .
Bi-212	Average:x	4.08E+02 +- 7.06E+01	. . . . .		*	. . . . .
	727.17	4.10E+02 +- 7.37E+01	2.08E+02		++	. . . . .
	1620.62	3.89E+02 +- 2.45E+02	8.06E+02		+	. . . . .
K-40	1460.81	3.08E+03 +- 1.71E+02	2.36E+02		++	. . . . .
Am-241	59.54 N	4.24E+01 +- 5.89E+01	1.94E+02L		x	LHROI	. . . . .
Co-57	122.06 N	7.54E+00 +- 1.07E+01	3.67E+01L		x	LHROI	. . . . .
Ce-144	133.54 N	5.24E+01 +- 5.97E+01	1.99E+02r		x	rbase	. . . . .
Ce-141	145.44 N	3.70E+01 +- 5.23E+01	1.75E+02		x		. . . . .
Se-75	264.65 N	3.08E+01 +- 1.33E+01	4.27E+01l		x	lbase	. . . . .
Cr-51	320.08 N	1.87E+02 +- 3.48E+02	1.21E+03		x		. . . . .
I-131	364.48 N	7.05E+02 +- 2.99E+03	1.03E+04		x		. . . . .
Sb-125	427.89 N	1.69E+01 +- 2.00E+01	6.75E+01		x		. . . . .
Ag-108m	433.93 N	1.21E+01 +- 5.93E+00	1.92E+01		x		. . . . .
Be-7	477.59 N	1.66E+02 +- 1.38E+02	4.99E+02		x		. . . . .
La-140	487.03 N	1.88E+02 +- 5.69E+02	2.01E+03		x		. . . . .
Ru-103	497.08 N	6.04E+01 +- 2.16E+01	8.27E+01		x		. . . . .
Ba-140	537.32 N	4.98E+02 +- 9.94E+02	3.56E+03		x		. . . . .
Cs-134	604.70 N	3.17E+01 +- 2.58E+01	8.53E+01P		x	PIC	. . . . .
Ru-106	621.84 N	5.20E+01 +- 6.57E+01	2.24E+02		x		. . . . .
Cs-137	661.65 N	6.10E+00 +- 7.52E+00	2.56E+01		x		Y.
Zr-95	724.18 N	4.94E+01 +- 1.51E+02	5.05E+02P		x	PIC	. . . . .
Nb-95	765.79 N	6.86E+00 +- 4.33E+01	1.50E+02R		x	RHROI	. . . . .
Co-58	810.76 N	8.28E+00 +- 1.16E+01	4.01E+01		x		. . . . .
Mn-54	834.83 N	3.52E+00 +- 7.42E+00	2.69E+01		x		. . . . .
Ag-110m	884.67 N	7.33E+00 +- 8.45E+00	3.21E+01		x		. . . . .
Fe-59	1099.22 N	0.00E+00 +- 3.33E+01	1.20E+02		x		. . . . .
Zn-65	1115.52 N	4.44E+01 +- 3.13E+01	1.12E+02P		x	PIC	. . . . .
Co-60	1332.49 N	1.35E+01 +- 6.06E+00	2.51E+01		x		Y.
Sb-124	1691.02 N	3.78E+01 +- 2.34E+01	9.98E+01		x		. . . . .

MEASURED TOTAL: 6.84E+03 +- 9.35E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.74	94.10	49	34	55	494	1.84	Deleted
6	105.25	158.27	28	37	60	539	0.86	Deleted
7	123.58	185.94	54	24	37	277	1.13	Unknown
17	328.12	494.68	8	24	39	222	0.20	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	767.13	1157.34	9	8	12	32	0.86	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
40	59.54	89.27	27N	38	61	339	1.24	NET< CL LHRoi
41	122.06	183.64	-26N	37	62	354	1.29	NET< CL LHRoi
42	133.54	200.97	23N	26	42	331	1.30	NET< CL RBase
43	145.44	218.93	19N	27	44	350	1.31	NET< CL
44	264.65	398.87	43N	19	28	150	1.39	LBase
45	320.08	482.54	-10N	18	31	160	1.43	NET< CL
46	364.48	549.56	4N	16	27	120	1.46	NET< CL
47	427.89	645.28	12N	14	23	90	1.50	NET< CL
48	433.93	654.40	28N	14	21	72	1.50	
49	477.59	720.30	-17N	14	24	96	1.53	NET< CL
50	487.03	734.55	-5N	14	23	88	1.54	NET< CL
51	497.08	749.72	-36N	13	24	109	1.55	NET< CL
52	537.32	810.46	-6N	12	21	83	1.57	NET< CL
53	604.70	912.17	59N	48	79	166	1.62	NET< CL PIC
54	621.84	938.04	9N	11	18	60	1.63	NET< CL
55	661.65	998.13	10N	12	20	71	1.66	NET< CL
56	724.18	1092.52	-18N	56	93	107	1.70	NET< CL PIC
57	765.79	1155.33	-3N	19	31	91	1.73	NET< CL RHRoi
58	810.76	1223.21	7N	10	16	45	1.76	NET< CL
59	834.83	1259.54	-5N	11	18	58	1.77	NET< CL
60	884.67	1334.77	-7N	8	14	36	1.81	NET< CL
61	1099.22	1658.63	0N	9	14	36	1.95	NET< CL
62	1115.52	1683.23	-25N	18	30	79	1.96	NET< CL PIC
63	1332.49	2010.74	-16N	7	14	34	2.10	NET< CL
64	1691.02	2551.93	-9N	5	10	18	2.34	NET< CL

L5185-14 analyzed by emml461 on 04/09/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/08/2003 17:23:16
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.69E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 7500 Sec
Sample Size 7.62E-01 kg | Real Time 7507 Sec
Collection Efficiency 1.0000 | Spectrum File 0986808.spc

Detector #: 8

Energy(keV)= 0.40 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5185-14.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	5.68E+02	2.19E+01	< 4.21E+01	2.02E+01	9.98E-01	MEAS +	YES
Pb-214	3.81E+02	2.10E+01	< 6.59E+01	3.17E+01	9.99E-01	MEAS +	YES
Th-234	2.60E+02	3.09E+02	< 1.02E+03	5.05E+02	9.99E-01	MEAS +	YES
AcTh-228	5.26E+02	2.81E+01	< 9.23E+01	4.30E+01	1.00E+00	MEAS +	YES
Ra-226	7.29E+02	2.44E+02	< 7.84E+02	3.83E+02	1.00E+00	MEAS +	YES
Tl-208	5.29E+02	2.83E+01	< 6.92E+01	2.98E+01	1.00E+00	MEAS +	YES
Annil	1.14E+00	1.97E+01	< 6.60E+01	3.23E+01	8.75E-01	MEAS +	YES
Bi-214	3.60E+02	2.22E+01	< 6.19E+01	2.95E+01	9.99E-01	MEAS +	YES
Bi-212	4.08E+02	7.06E+01	< 2.08E+02	9.77E+01	1.00E+00	MEAS +	YES
K-40	3.08E+03	1.71E+02	< 2.36E+02	1.07E+02	1.00E+00	MEAS +	YES
Am-241	4.24E+01	5.89E+01	< 1.94E+02	9.50E+01	1.00E+00	NET	YES
Co-57	-7.54E+00	1.07E+01	< 3.67E+01	1.80E+01	8.36E-01	NET	YES
Ce-144	5.24E+01	5.97E+01	< 1.99E+02	9.65E+01	8.43E-01	NET	YES
Ce-141	3.70E+01	5.23E+01	< 1.75E+02	8.48E+01	2.23E-01	NET	YES
Se-75	3.08E+01	1.33E+01	< 4.27E+01	2.04E+01	6.66E-01	NET	YES
Cr-51	-1.87E+02	3.48E+02	< 1.21E+03	5.81E+02	1.72E-01	NET	YES
I-131	7.05E+02	2.99E+03	< 1.03E+04	4.88E+03	2.34E-03	NET	YES
Sb-125	1.69E+01	2.00E+01	< 6.75E+01	3.19E+01	9.53E-01	NET	YES
Ag-108m	1.21E+01	5.93E+00	< 1.92E+01	8.99E+00	9.99E-01	NET	YES
Be-7	-1.66E+02	1.38E+02	< 4.99E+02	2.36E+02	4.02E-01	NET	YES
La-140	-1.88E+02	5.68E+02	< 2.01E+03	9.46E+02	2.22E-02	NET	YES
Ru-103	-6.03E+01	2.15E+01	< 8.27E+01	3.91E+01	2.90E-01	NET	YES
Ba-140	-4.98E+02	9.94E+02	< 3.56E+03	1.67E+03	2.22E-02	NET	YES
Cs-134	3.17E+01	2.58E+01	< 8.53E+01	4.19E+01	9.37E-01	NET	YES
Ru-106	5.20E+01	6.57E+01	< 2.24E+02	1.04E+02	8.76E-01	NET	YES
Cs-137	6.10E+00	7.52E+00	< 2.56E+01	1.20E+01	9.96E-01	NET	YES
Zr-95	-4.94E+01	1.51E+02	< 5.04E+02	2.49E+02	4.67E-01	NET	YES
Nb-95	-6.86E+00	4.33E+01	< 1.50E+02	7.18E+01	2.49E-01	NET	YES
Co-58	8.28E+00	1.16E+01	< 4.01E+01	1.85E+01	5.03E-01	NET	YES
Mn-54	-3.52E+00	7.42E+00	< 2.69E+01	1.25E+01	8.56E-01	NET	YES
Ag-110m	-7.33E+00	8.45E+00	< 3.21E+01	1.46E+01	8.23E-01	NET	YES
Fe-59	0.00E+00	3.33E+01	< 1.20E+02	5.48E+01	3.36E-01	NET	YES
Zn-65	-4.44E+01	3.13E+01	< 1.12E+02	5.35E+01	8.19E-01	NET	YES

L5185-14 analyzed by emm1461 on 04/09/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	-1.34E+01	6.06E+00	< 2.51E+01	1.14E+01	9.75E-01	NET	YES
Sb-124	-3.78E+01	2.34E+01	< 9.98E+01	4.40E+01	4.45E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-15

Count by Date: _____
(if required)

Client: Duratek Inc

Delay Date: _____
(if required)

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMS-2700-145

Collect Start Date/Time: _____

Collect Stop Date/Time: 01-28-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 774.8 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/9/03 1006

Det No.: 6

Spectrum No.: 0993706

Counted by: 87

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5185-15
Client Id : BMS-2700-145
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 01/28/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	774.8		
Sample Weight-Dry	g			
Aliquot Weight	g	774.8		
FINAL WEIGHT	kg	.7748		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-15 analyzed by emm1461 on 04/09/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-15 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 0993706

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/09/2003 10:05:56
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.70E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 4000 Sec
Sample Size 7.75E-001 kg | Real Time 4003 Sec
Collection Efficiency 1.0000 | Spc. File 0993706.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV)= -0.04 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/09/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.71	112.96	83	25	38	263	1.20	a
2	76.85	116.18	122	23	33	219	1.01	b
3	92.45	139.76	150	27	39	262	1.84	Wide Pk
4	185.77	280.77	116	22	32	157	1.93	Wide Pk
5	208.70	315.42	27	19	31	161	0.89	NET< CL
6	238.34	360.20	331	27	34	195	1.22	
7	269.61	407.45	60	17	24	92	1.90	Wide Pk
8	294.82	445.56	104	17	22	86	1.30	
9	338.09	510.94	90	15	20	65	1.25	
10	351.61	531.36	190	19	22	73	1.53	
11	462.33	698.66	12	12	19	59	0.65	NET< CL
12	510.44	771.36	136	18	23	75	2.04	Wide Pk
13	582.71	880.56	151	16	16	39	1.48	
14	608.95	920.22	178	17	17	44	1.94	
15	726.71	1098.15	36	11	15	36	1.35	
16	910.82	1376.36	84	12	13	28	1.93	
17	967.80	1462.46	27	9	12	28	1.71	a
18	969.30	1464.73	24	7	9	18	1.17	b
19	1120.10	1692.59	44	11	14	26	2.49	
20	1460.57	2207.06	236	16	8	10	1.95	
21	1764.57	2666.42	36	7	7	7	3.01	
22	2613.70	3949.50	59	8	4	2	3.71	Wide Pk

L5185-15 analyzed by emm1461 on 04/09/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.71	83	25	38	75	25	38	
2	76.85	122	23	33	112	23	33	
3	92.45	150	27	39	40	27	43	NET<CL
4	185.77	116	22	32	46	22	35	
6	238.34	331	27	34	310	27	35	
7	269.61	60	17	24	58	17	24	
8	294.82	104	17	22	90	17	23	
9	338.09	90	15	20	87	15	20	
10	351.61	190	19	22	165	19	23	
12	510.44	136	18	23	44	18	28	
13	582.71	151	16	16	145	16	17	
14	608.95	179	17	17	159	17	19	
15	726.71	36	11	15	34	11	15	
16	910.82	85	12	13	80	12	13	
17	967.80	27	9	12	27	9	12	
19	1120.10	44	11	14	41	11	14	
20	1460.57	236	16	8	227	16	9	
21	1764.57	36	7	7	32	7	7	
22	2613.70	59	8	4	52	8	6	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	74.71	75	Pb-214	28	4 of 7	90.71	1.41	
			Tl-208	4	5 of 9	90.39	1.40	
			Pb-212	58	3 of 6	86.53	1.37	
			Tl-208	8	5 of 9	90.39	1.40	
2	76.85	112	Pb-214	49	4 of 7	90.71	1.41	
			Tl-208	8	5 of 9	90.39	0.90	
			Pb-212	104	3 of 6	86.53	1.37	
4	185.77	46	U-235	. . . . .	1 of 3	100.00	1.50	
			Ra-226	. . . . .	1 of 1	100.00	1.50	
6	238.34	310	Pb-212	352	3 of 6	90.16	1.40	
7	269.61	58	AcTh-228	22	4 of 36	60.36	1.10	
8	294.82	90	Pb-214	105	4 of 7	100.00	1.50	
9	338.09	87	AcTh-228	57	4 of 36	67.85	1.18	
10	351.61	165	Pb-214	191	4 of 7	90.71	1.41	
12	510.44	6	Annil	. . . . .	1 of 1	100.00	1.50	Split
23	510.44	38	Tl-208	38	5 of 9	91.63	1.42	AutoAdd
13	582.71	145	Tl-208	127	5 of 9	94.42	1.44	
14	608.95	159	Bi-214	191	3 of 33	82.87	1.33	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
15	726.71	34	Bi-212	. . . . .	1 of 13	100.00	1.00	
16	910.82	80	AcTh-228	78	4 of 36	81.57	1.32	
17	967.80	27	AcTh-228	53	4 of 36	100.00	1.50	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
18	969.30	24	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
			AcTh-228	53	4 of 36	100.00	1.00	Matched
19	1120.10	41	Bi-214	35	3 of 33	76.83	1.27	
20	1460.57	227	K-40	. . . . .	1 of 1	100.00	1.50	
21	1764.57	32	Bi-214	27	3 of 33	76.83	1.27	
22	2613.70	52	Tl-208	64	5 of 9	94.42	1.44	

L5185-15 analyzed by emm1461 on 04/09/2003

SEEKER F I N A L A C T I V I T Y R E P O R T Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-15

Sample ID: SOIL/SEDI Duratek Inc

Code: 0993706

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/09/2003 10:05:56
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.70e+003 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 4000 Sec
Sample Size 7.75e-001 kg | Real Time 4003 Sec
Collection Efficiency 1.0000 | Spectrum File 0993706.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[8.71E-03*En^-3.34E+00 + 1.54E+02*En^6.70E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: L5185-15.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	N		Concentration	MDA	Flags	Notes	MDC
	ENERGY E	(keV)					
Pb-214	Average:x	2.92E+02	+ - 2.87E+01		*
	74.81	I.D.	. . . .	. . . .			. . . . .
	77.11	I.D.	. . . .	. . . .			. . . . .
	295.21	2.81E+02	+ - 5.20E+01	1.49E+02	+*		. . . . .
	351.92	2.97E+02	+ - 3.44E+01	8.85E+01	+*		. . . . .
U-235	185.72	3.89E+01	+ - 1.87E+01	6.07E+01	+		. . . . .
Pb-212	238.63	3.64E+02	+ - 3.23E+01	8.48E+01	+*		. . . . .
AcTh-228	Average:x	3.59E+02	+ - 3.89E+01	. . . .		*	. . . . .
	270.23	9.14E+02	+ - 2.62E+02	8.08E+02	+*		. . . . .
	338.32	4.97E+02	+ - 8.75E+01	2.43E+02	+*		. . . . .
	911.07	3.65E+02	+ - 5.53E+01	1.35E+02	+*		. . . . .
	969.11	2.13E+02	+ - 7.26E+01	2.18E+02	+		. . . . .
Annul	511.00	6.12E+00	+ - 3.15E+01	1.06E+02	+		. . . . .
Tl-208	Average:x	4.18E+02	+ - 3.72E+01	. . . .		*	. . . . .
	583.14	4.49E+02	+ - 4.90E+01	1.13E+02	+*		. . . . .
	2614.66	3.75E+02	+ - 5.72E+01	9.93E+01	+*		. . . . .
	510.84	I.D.	. . . .	. . . .			. . . . .
Bi-214	Average:x	3.47E+02	+ - 3.14E+01	. . . .		*	. . . . .
	609.31	3.33E+02	+ - 3.55E+01	8.39E+01	+*		. . . . .
	1120.29	4.00E+02	+ - 1.02E+02	2.93E+02	+*		. . . . .
	1764.49	3.99E+02	+ - 8.99E+01	2.17E+02	+*		. . . . .
Bi-212	727.17	3.15E+02	+ - 1.00E+02	3.03E+02	+*		. . . . .
K-40	1460.81	3.69E+03	+ - 2.62E+02	3.51E+02	+*		. . . . .
Am-241	59.54	N-9.16E+01	+ - 5.74E+01	2.06E+02	x		. . . . .
Co-57	122.06	N 1.07E+01	+ - 9.69E+00	3.24E+01	x		. . . . .
Ce-144	133.54	N-1.03E+02	+ - 7.64E+01	2.74E+02	x		. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
Ce-141	145.44	N-2.45E-01	+-	6.71E+01	2.32E+02		x	. . . . .
Ra-226	186.22	N 1.64E+03	+-	2.40E+02	6.51E+02		x*	. . . . .
Se-75	264.65	N 2.39E+01	+-	1.79E+01	5.94E+011		x	lbase
Cr-51	320.08	N-3.03E+02	+-	4.28E+02	1.55E+03		x	. . . . .
I-131	364.48	N-3.44E+03	+-	4.10E+03	1.51E+04		x	. . . . .
Sb-125	427.89	N 5.46E+00	+-	2.56E+01	9.07E+01		x	. . . . .
Ag-108m	433.93	N 3.43E+00	+-	7.67E+00	2.69E+01		x	. . . . .
Be-7	477.59	N 9.89E+01	+-	1.67E+02	5.82E+02		x	. . . . .
La-140	487.03	N-4.27E+02	+-	7.49E+02	2.77E+03		x	. . . . .
Ru-103	497.08	N-7.49E+01	+-	3.20E+01	1.26E+02		x	. . . . .
Ba-140	537.32	N-2.21E+02	+-	1.48E+03	5.36E+03		x	. . . . .
Cs-134	604.70	N-9.68E+00	+-	4.03E+01	1.36E+02P		x	PIC
Ru-106	621.84	N-3.43E+01	+-	9.74E+01	3.58E+02		x	. . . . .
Cs-137	661.65	N 2.71E+00	+-	9.18E+00	3.29E+01		x	Y.
Zr-95	724.18	N-7.49E+01	+-	7.01E+01	2.63E+02L		x	LHROI
Nb-95	765.79	N 3.15E+01	+-	4.17E+01	1.44E+02		x	. . . . .
Co-58	810.76	N-7.07E+00	+-	1.68E+01	6.33E+01		x	. . . . .
Mn-54	834.83	N-1.81E+01	+-	9.57E+00	3.93E+01		x	. . . . .
Ag-110m	884.67	N 2.08E+00	+-	1.43E+01	5.20E+01		x	. . . . .
Fe-59	1099.22	N-1.81E+01	+-	5.01E+01	1.90E+02		x	. . . . .
Zn-65	1115.52	N-5.19E+01	+-	5.32E+01	1.90E+02P		x	PIC
Co-60	1332.49	N 1.67E+00	+-	8.37E+00	3.15E+01		x	Y.
Sb-124	1691.02	N-1.77E+01	+-	2.79E+01	1.25E+02		x	. . . . .

MEASURED TOTAL: 7.47E+03 +- 8.21E+02 pCi/kg

0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
3	92.45	139.76	40	27	43	263	1.84	Deleted
5	208.70	315.42	27	19	31	161	0.89	Deleted
11	462.32	698.66	12	12	19	59	0.65	Deleted
18	969.30	1464.73	24	7	9	18	1.17	Unknown

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	59.54	90.03	-29N	18	31	192	1.13	NET< CL
25	122.06	184.50	18N	17	27	142	1.12	NET< CL
26	133.54	201.85	-23N	17	29	167	1.13	NET< CL
27	145.44	219.83	-0N	17	28	152	1.13	NET< CL
28	186.22	281.45	118N	17	22	98	1.15	
29	264.65	399.96	17N	13	20	72	1.21	NET< CL
								LBase
30	320.08	483.72	-8N	11	19	68	1.25	NET< CL
31	364.48	550.81	-9N	11	18	62	1.29	NET< CL

=====
 NET/MDA PEAK RESULTS
 =====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
32	427.89	646.63	2N	9	15	43	1.35	NET< CL
33	433.93	655.75	4N	9	14	38	1.36	NET< CL
34	477.59	721.73	5N	8	13	33	1.40	NET< CL
35	487.03	735.99	-5N	9	15	41	1.40	NET< CL
36	497.08	751.18	-23N	10	18	54	1.41	NET< CL
37	537.32	811.98	-1N	9	15	37	1.45	NET< CL
38	604.70	913.80	-9N	38	63	70	1.51	NET< CL PIC
39	621.84	939.69	-3N	9	14	35	1.53	NET< CL
40	661.65	999.85	2N	8	12	30	1.57	NET< CL
41	724.18	1094.34	-14N	13	23	50	1.62	NET< CL LHRoi
42	765.79	1157.21	7N	9	14	36	1.66	NET< CL
43	810.76	1225.16	-3N	7	12	27	1.70	NET< CL
44	834.83	1261.53	-13N	7	13	30	1.72	NET< CL
45	884.67	1336.84	1N	7	11	23	1.76	NET< CL
46	1099.22	1661.04	-2N	7	11	21	1.92	NET< CL
47	1115.52	1685.67	-15N	15	26	59	1.93	NET< CL PIC
48	1332.49	2013.52	1N	5	8	12	2.08	NET< CL
49	1691.02	2555.28	-2N	3	6	6	2.26	NET< CL

L5185-15 analyzed by emml461 on 04/09/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/09/2003 10:05:56
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.70E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 4000 Sec
Sample Size 7.75E-01 kg | Real Time 4003 Sec
Collection Efficiency 1.0000 | Spectrum File 0993706.spc

Detector #: 6

Energy(keV)= -0.04 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/09/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[8.71e-03*En^-3.34e+00 + 1.54e+02*En^ 6.70e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5185-15.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-214	2.92E+02	2.87E+01	< 8.85E+01	4.18E+01	9.99E-01	MEAS +	YES
U-235	3.89E+01	1.87E+01	< 6.07E+01	2.92E+01	1.00E+00	MEAS +	YES
Pb-212	3.64E+02	3.23E+01	< 8.48E+01	4.08E+01	1.00E+00	MEAS +	YES
AcTh-228	3.60E+02	3.89E+01	< 1.35E+02	6.14E+01	1.00E+00	MEAS +	YES
Annil	6.12E+00	3.15E+01	< 1.06E+02	5.17E+01	8.74E-01	MEAS +	YES
Tl-208	4.18E+02	3.72E+01	< 9.93E+01	4.00E+01	1.00E+00	MEAS +	YES
Bi-214	3.47E+02	3.14E+01	< 8.39E+01	3.91E+01	9.99E-01	MEAS +	YES
Bi-212	3.15E+02	1.00E+02	< 3.02E+02	1.39E+02	1.00E+00	MEAS +	YES
K-40	3.69E+03	2.62E+02	< 3.51E+02	1.53E+02	1.00E+00	MEAS +	YES
Am-241	-9.17E+01	5.74E+01	< 2.06E+02	9.86E+01	1.00E+00	NET	YES
Co-57	1.07E+01	9.69E+00	< 3.24E+01	1.54E+01	8.34E-01	NET	YES
Ce-144	-1.03E+02	7.64E+01	< 2.74E+02	1.31E+02	8.41E-01	NET	YES
Ce-141	-2.45E-01	6.72E+01	< 2.32E+02	1.10E+02	2.20E-01	NET	YES
Ra-226	1.64E+03	2.40E+02	< 6.51E+02	3.07E+02	1.00E+00	NET	YES
Se-75	2.39E+01	1.79E+01	< 5.94E+01	2.78E+01	6.63E-01	NET	YES
Cr-51	-3.03E+02	4.28E+02	< 1.55E+03	7.26E+02	1.69E-01	NET	YES
I-131	-3.44E+03	4.10E+03	< 1.50E+04	7.01E+03	2.21E-03	NET	YES
Sb-125	5.46E+00	2.56E+01	< 9.07E+01	4.17E+01	9.53E-01	NET	YES
Ag-108m	3.43E+00	7.67E+00	< 2.69E+01	1.23E+01	9.99E-01	NET	YES
Be-7	9.89E+01	1.67E+02	< 5.82E+02	2.64E+02	3.98E-01	NET	YES
La-140	-4.26E+02	7.48E+02	< 2.77E+03	1.27E+03	2.14E-02	NET	YES
Ru-103	-7.49E+01	3.20E+01	< 1.26E+02	5.86E+01	2.87E-01	NET	YES
Ba-140	-2.21E+02	1.48E+03	< 5.36E+03	2.46E+03	2.14E-02	NET	YES
Cs-134	-9.68E+00	4.03E+01	< 1.36E+02	6.65E+01	9.37E-01	NET	YES
Ru-106	-3.43E+01	9.74E+01	< 3.58E+02	1.64E+02	8.75E-01	NET	YES
Cs-137	2.71E+00	9.18E+00	< 3.28E+01	1.48E+01	9.96E-01	NET	YES
Zr-95	-7.49E+01	7.01E+01	< 2.63E+02	1.24E+02	4.64E-01	NET	YES
Nb-95	3.15E+01	4.17E+01	< 1.44E+02	6.57E+01	2.46E-01	NET	YES
Co-58	-7.07E+00	1.68E+01	< 6.33E+01	2.85E+01	4.99E-01	NET	YES
Mn-54	-1.81E+01	9.57E+00	< 3.93E+01	1.78E+01	8.54E-01	NET	YES
Ag-110m	2.08E+00	1.42E+01	< 5.20E+01	2.32E+01	8.21E-01	NET	YES
Fe-59	-1.81E+01	5.01E+01	< 1.90E+02	8.47E+01	3.32E-01	NET	YES
Zn-65	-5.19E+01	5.32E+01	< 1.90E+02	9.03E+01	8.18E-01	NET	YES

L5185-15 analyzed by emm1461 on 04/09/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	1.67E+00	8.36E+00	< 3.15E+01	1.35E+01	9.75E-01	NET	YES
Sb-124	-1.77E+01	2.79E+01	< 1.25E+02	5.03E+01	4.42E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-16 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-2700-164
Collect Start Date/Time: _____
Collect Stop Date/Time: 01-28-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5111

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 768.8 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R8842

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/9/03 1006 Det No.: 8 Spectrum No.: 0993706
Counted by: ES
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5185-16	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-2700-164	Matrix	: S001 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 01/28/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	768.8		
Sample Weight-Dry	g			
Aliquot Weight	g	768.8		
FINAL WEIGHT	kg	.7688		
Container			WAT5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-16 analyzed by emml461 on 04/09/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-16

Sample ID: SOIL/SEDI Duratek Inc Code: 0993708

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/09/2003 10:06:26
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time. 1.70E+003 Hrs
 Buildup Time. 0.00E+000 Hrs / Live Time 4000 Sec
 Sample Size 7.69E-001 kg | Real Time 4003 Sec
 Collection Efficiency 1.0000 | Spc. File 0993708.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Energy(keV)= 0.40 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003
 FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003
 Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.87	112.41	115	22	32	191	1.30	a
2	77.19	115.91	109	20	28	159	1.02	b
3	92.88	139.59	71	23	35	211	1.03	
4	186.07	280.27	49	21	32	164	1.49	
5	208.86	314.67	38	21	32	154	1.12	
6	238.71	359.72	283	25	31	153	1.38	
7	295.34	445.20	97	17	23	87	1.19	
8	338.21	509.91	37	16	25	93	1.30	
9	351.87	530.52	144	17	21	69	1.51	
10	511.03	770.77	138	16	17	46	2.18	
11	583.10	879.57	113	15	17	49	1.35	
12	609.24	919.02	130	15	16	40	1.50	
13	727.31	1097.24	19	10	14	34	2.28	
14	911.31	1374.98	83	11	11	19	1.60	
15	968.84	1461.82	41	10	14	30	1.60	
16	1120.42	1690.63	29	10	14	34	1.44	
17	1460.72	2204.30	468	22	7	8	2.30	
18	1764.56	2662.93	33	7	6	5	2.14	
19	2614.48	3945.86	33	7	5	4	3.04	

L5185-16 analyzed by emm1461 on 04/09/2003

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.87	115	22	32	108	22	32	
2	77.19	109	20	28	98	20	29	
3	92.88	71	23	35	26	23	37	NET<CL
4	186.07	49	21	32	25	21	33	NET<CL
6	238.71	283	25	31	264	25	32	
7	295.34	97	17	23	80	17	24	
8	338.21	37	16	25	33	16	25	
9	351.87	144	17	21	118	18	23	
10	511.03	138	16	17	37	16	24	
11	583.10	113	15	17	108	15	18	
12	609.24	130	15	16	107	15	18	
14	911.31	83	11	11	79	11	12	
15	968.84	41	10	14	38	10	14	
16	1120.42	29	10	14	26	10	15	
17	1460.72	468	22	7	459	22	9	
18	1764.56	33	7	6	28	7	7	
19	2614.48	33	7	5	27	7	7	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	74.87	108	Pb-212	52	3 of 6	86.53	1.37	
			Pb-214	21	4 of 7	89.49	0.89	
			Tl-208	5	4 of 9	89.51	0.90	
2	77.19	1	Pb-214	38	4 of 7	90.71	1.41	Split
21	77.19	96	Pb-212	96	3 of 6	90.16	1.40	AutoAdd
5	208.86	38	AcTh-228	29	4 of 36	75.69	1.26	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
6	238.71	264	Pb-212	336	3 of 6	90.16	1.40	
7	295.34	80	Pb-214	76	4 of 7	100.00	1.50	
8	338.21	33	AcTh-228	60	4 of 36	100.00	1.50	
9	351.87	118	Pb-214	170	4 of 7	100.00	1.50	
10	511.03	13	Annil	. . . . .	1 of 1	100.00	1.50	Split
20	511.03	24	Tl-208	24	4 of 9	94.37	1.44	AutoAdd
11	583.10	108	Tl-208	66	4 of 9	94.37	1.44	
12	609.24	107	Bi-214	146	3 of 33	93.94	1.44	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
13	727.31	19	Bi-212	. . . . .	1 of 13	100.00	1.50	
14	911.31	79	AcTh-228	59	4 of 36	82.67	1.33	
15	968.84	38	AcTh-228	41	4 of 36	86.98	1.37	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
16	1120.42	26	Bi-214	25	3 of 33	93.94	1.44	
17	1460.72	459	K-40	. . . . .	1 of 1	100.00	1.50	
18	1764.56	28	Bi-214	18	3 of 33	75.35	1.25	
19	2614.48	27	Tl-208	48	4 of 9	100.00	1.50	

L5185-16 analyzed by emm1461 on 04/09/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-16

Sample ID: SOIL/SEDI Duratek Inc

Code: 0993708

 Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/09/2003 10:06:26
 Sampling Stop: 01/28/2003 12:00:00 | Decay Time: 1.70e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 4000 Sec
 Sample Size 7.69e-001 kg | Real Time 4003 Sec
 Collection Efficiency 1.0000 | Spectrum File 0993708.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5185-16.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS
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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	238.63	2.95E+02 +- 2.83E+01	7.55E+01		++
	74.81	I.D. . . . .	. . . . .			. . . . .
	77.12	I.D. . . . .	. . . . .			. . . . .
Pb-214	Average:x	2.11E+02 +- 2.59E+01	. . . . .		*	. . . . .
	77.11	I.D. . . . .	. . . . .			. . . . .
	295.21	2.37E+02 +- 5.14E+01	1.53E+02		++	. . . . .
	351.92	2.02E+02 +- 3.00E+01	8.19E+01		++	. . . . .
Ra-226	186.22 N	3.35E+02 +- 2.75E+02	9.13E+02		x	. . . . .
AcTh-228	Average:x	3.01E+02 +- 3.69E+01	. . . . .		*	. . . . .
	209.28	3.93E+02 +- 2.16E+02	7.05E+02		+	. . . . .
	338.32	1.81E+02 +- 8.95E+01	2.90E+02		+	. . . . .
	911.07	3.38E+02 +- 4.86E+01	1.11E+02		++	. . . . .
	969.11	2.86E+02 +- 7.76E+01	2.26E+02		++	. . . . .
Annul	511.00	1.23E+01 +- 2.53E+01	8.50E+01		+	. . . . .
Tl-208	Average:x	2.47E+02 +- 3.08E+01	. . . . .		*	. . . . .
	583.14	3.16E+02 +- 4.37E+01	1.11E+02		++	. . . . .
	2614.66	1.79E+02 +- 4.33E+01	1.04E+02		++	. . . . .
	510.84	I.D. . . . .	. . . . .			. . . . .
Bi-214	Average:x	2.26E+02 +- 2.63E+01	. . . . .		*	. . . . .
	609.31	2.11E+02 +- 2.93E+01	7.45E+01		++	. . . . .
	1120.29	2.32E+02 +- 9.26E+01	2.89E+02		+	. . . . .
	1764.49	3.28E+02 +- 7.80E+01	1.88E+02		++	. . . . .
Bi-212	727.17	1.67E+02 +- 8.27E+01	2.65E+02		+	. . . . .
K-40	1460.81	6.97E+03 +- 3.35E+02	3.02E+02		++	. . . . .
Am-241	59.54 N	2.92E+01 +- 4.70E+01	1.66E+02		x	. . . . .
Co-57	122.06 N	2.48E+01 +- 8.81E+00	3.28E+01		x	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	N Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Ce-144	133.54	N-8.49E+01 +- 7.13E+01	2.54E+02		x	. . . . .
Ce-141	145.44	N-3.06E+01 +- 6.13E+01	2.15E+02		x	. . . . .
Se-75	264.65	N-1.60E+01 +- 1.57E+01	5.75E+01		x	. . . . .
Cr-51	320.08	N 2.63E+02 +- 4.45E+02	1.53E+03		x	. . . . .
I-131	364.48	N 2.30E+03 +- 3.48E+03	1.20E+04		x	. . . . .
Sb-125	427.89	N 3.70E+01 +- 2.59E+01	8.58E+01		x	. . . . .
Ag-108m	433.93	N-4.06E-01 +- 8.03E+00	2.87E+01		x	. . . . .
Be-7	477.59	N 1.31E+02 +- 1.85E+02	6.37E+02		x	. . . . .
La-140	487.03	N 1.07E+02 +- 7.53E+02	2.68E+03		x	. . . . .
Ru-103	497.08	N 1.17E+01 +- 2.54E+01	8.95E+01		x	. . . . .
Ba-140	537.32	N-1.92E+03 +- 1.11E+03	4.49E+03		x	. . . . .
Cs-134	604.70	N-1.07E+01 +- 3.45E+01	1.17E+02P		x	PIC
Ru-106	621.84	N 0.00E+00 +- 9.62E+01	3.46E+02		x	. . . . .
Cs-137	661.65	N 7.94E+00 +- 9.55E+00	3.29E+01		x	Y.
Zr-95	724.18	N 2.01E+01 +- 6.04E+01	2.07E+02L		x	LHROI
Nb-95	765.79	N-3.73E+00 +- 3.53E+01	1.29E+02		x	. . . . .
Co-58	810.76	N 2.21E+00 +- 1.58E+01	5.75E+01		x	. . . . .
Mn-54	834.83	N-1.31E+00 +- 8.79E+00	3.28E+01		x	. . . . .
Ag-110m	884.67	N-2.93E+01 +- 1.39E+01	5.74E+01		x	. . . . .
Fe-59	1099.22	N 4.11E+01 +- 4.99E+01	1.74E+02		x	. . . . .
Zn-65	1115.52	N 2.28E+00 +- 4.71E+01	1.63E+02P		x	PIC
Co-60	1332.49	N-4.69E+00 +- 8.70E+00	3.42E+01		x	Y.
Sb-124	1691.02	N-2.22E+01 +- 3.02E+01	1.31E+02		x	. . . . .

MEASURED TOTAL: 8.43E+03 +- 5.91E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
3	92.88	139.59	26	23	37	211	1.03	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
4	186.07	280.27	25N	21	33	164	1.49	NET< CL
22	59.54	89.27	-10N	16	27	135	1.24	NET< CL
23	122.06	183.64	-46N	16	29	156	1.29	NET< CL
24	133.54	200.97	-20N	17	29	151	1.30	NET< CL
25	145.44	218.93	-8N	17	28	140	1.31	NET< CL
26	264.65	398.87	-12N	12	20	75	1.39	NET< CL
27	320.08	482.54	7N	12	20	68	1.43	NET< CL
28	364.48	549.56	6N	10	15	40	1.46	NET< CL
29	427.89	645.28	14N	10	15	40	1.50	NET< CL
30	433.93	654.40	-1N	10	16	46	1.50	NET< CL
31	477.59	720.30	7N	10	16	42	1.53	NET< CL
32	487.03	734.55	1N	9	15	40	1.54	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
33	497.08	749.72	4N	8	13	33	1.55	NET< CL
34	537.32	810.46	-12N	7	13	33	1.57	NET< CL
35	604.70	912.17	-11N	35	57	54	1.62	NET< CL
								PIC
36	621.84	938.04	0N	9	15	40	1.63	NET< CL
37	661.65	998.13	7N	8	13	32	1.66	NET< CL
38	724.18	1092.52	4N	12	19	34	1.70	NET< CL
								LHRoi
39	765.79	1155.33	-1N	8	14	33	1.73	NET< CL
40	810.76	1223.21	1N	7	12	25	1.76	NET< CL
41	834.83	1259.54	-1N	7	11	23	1.77	NET< CL
42	884.67	1334.77	-15N	7	13	33	1.81	NET< CL
43	1099.22	1658.63	6N	7	11	20	1.95	NET< CL
44	1115.52	1683.23	1N	14	24	55	1.96	NET< CL
								PIC
45	1332.49	2010.74	-3N	6	10	17	2.10	NET< CL
46	1691.02	2551.93	-3N	4	7	8	2.34	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 01/28/2003 12:00:00 | Counting Start: 04/09/2003 10:06:26
Sampling Stop: 01/28/2003 12:00:00 | Decay Time. . . . . 1.70E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 4000 Sec
Sample Size . . . . . 7.69E-01 kg | Real Time . . . . . 4003 Sec
Collection Efficiency . . . . 1.0000 | Spectrum File . . . . . 0993708.spc
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Detector #: 8

Energy(keV)= 0.40 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/08/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5185-16.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	2.95E+02	2.83E+01	< 7.55E+01	3.62E+01	1.00E+00	MEAS +	YES
Pb-214	2.11E+02	2.59E+01	< 8.19E+01	3.87E+01	9.99E-01	MEAS +	YES
Ra-226	3.35E+02	2.75E+02	< 9.14E+02	4.39E+02	1.00E+00	NET	YES
AcTh-228	3.01E+02	3.69E+01	< 1.11E+02	4.98E+01	1.00E+00	MEAS +	YES
Annil	1.23E+01	2.53E+01	< 8.50E+01	4.13E+01	8.74E-01	MEAS +	YES
Tl-208	2.47E+02	3.08E+01	< 1.04E+02	4.31E+01	1.00E+00	MEAS +	YES
Bi-214	2.26E+02	2.63E+01	< 7.45E+01	3.46E+01	9.99E-01	MEAS +	YES
Bi-212	1.67E+02	8.27E+01	< 2.65E+02	1.21E+02	1.00E+00	MEAS +	YES
K-40	6.97E+03	3.35E+02	< 3.02E+02	1.30E+02	1.00E+00	MEAS +	YES
Am-241	-2.92E+01	4.70E+01	< 1.66E+02	7.88E+01	1.00E+00	NET	YES
Co-57	-2.48E+01	8.81E+00	< 3.28E+01	1.57E+01	8.34E-01	NET	YES
Ce-144	-8.49E+01	7.13E+01	< 2.54E+02	1.21E+02	8.41E-01	NET	YES
Ce-141	-3.06E+01	6.13E+01	< 2.14E+02	1.02E+02	2.20E-01	NET	YES
Se-75	-1.60E+01	1.57E+01	< 5.75E+01	2.69E+01	6.63E-01	NET	YES
Cr-51	2.63E+02	4.45E+02	< 1.53E+03	7.14E+02	1.69E-01	NET	YES
I-131	2.30E+03	3.48E+03	< 1.20E+04	5.53E+03	2.21E-03	NET	YES
Sb-125	3.70E+01	2.59E+01	< 8.58E+01	3.94E+01	9.53E-01	NET	YES
Ag-108m	-4.06E-01	8.03E+00	< 2.87E+01	1.32E+01	9.99E-01	NET	YES
Be-7	1.31E+02	1.85E+02	< 6.37E+02	2.93E+02	3.98E-01	NET	YES
La-140	1.07E+02	7.53E+02	< 2.68E+03	1.23E+03	2.14E-02	NET	YES
Ru-103	1.17E+01	2.54E+01	< 8.95E+01	4.05E+01	2.87E-01	NET	YES
Ba-140	-1.92E+03	1.11E+03	< 4.49E+03	2.03E+03	2.14E-02	NET	YES
Cs-134	-1.07E+01	3.45E+01	< 1.17E+02	5.70E+01	9.37E-01	NET	YES
Ru-106	0.00E+00	9.62E+01	< 3.46E+02	1.58E+02	8.75E-01	NET	YES
Cs-137	7.94E+00	9.55E+00	< 3.29E+01	1.49E+01	9.96E-01	NET	YES
Zr-95	2.01E+01	6.03E+01	< 2.07E+02	9.65E+01	4.64E-01	NET	YES
Nb-95	-3.73E+00	3.53E+01	< 1.29E+02	5.85E+01	2.46E-01	NET	YES
Co-58	2.21E+00	1.58E+01	< 5.75E+01	2.57E+01	4.99E-01	NET	YES
Mn-54	-1.31E+00	8.79E+00	< 3.28E+01	1.46E+01	8.54E-01	NET	YES
Ag-110m	-2.93E+01	1.39E+01	< 5.74E+01	2.61E+01	8.21E-01	NET	YES
Fe-59	4.11E+01	4.99E+01	< 1.74E+02	7.71E+01	3.32E-01	NET	YES
Zn-65	2.28E+00	4.71E+01	< 1.63E+02	7.73E+01	8.18E-01	NET	YES
Co-60	-4.69E+00	8.70E+00	< 3.42E+01	1.50E+01	9.75E-01	NET	YES

L5185-16 analyzed by emm1461 on 04/09/2003
Activity Units: pCi/kg
Nuclide Activity Uncertainty MDA CL ACT DECAY FLAG SEN MET
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Sb-124	-2.22E+01	3.02E+01	< 1.31E+02	5.45E+01	4.42E-01	NET	YES
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-17 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-SM-391
Collect Start Date/Time: _____
Collect Stop Date/Time: 02-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG 5088

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 238.5 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: B8805

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/10/03 1235 Det No.: 8 Spectrum No.: 0945208
Counted by: EL
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,.038;Cs-137,1.1;

Sample Id : L5185-17
Client Id : BMS-SM-391
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 02/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	238.5		
Sample Weight-Dry	g			
Aliquot Weight	g	238.5		
FINAL WEIGHT	kg	.2385		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5185-17 analyzed by emml461 on 04/04/2003

SEEKER, G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5185-17

Sample ID: NONE

Code: 0945208

Sampling Start: 02/21/2003 12:00:00 | Counting Start: 04/04/2003 12:34:51
Sampling Stop: 02/21/2003 12:00:00 | Decay Time: 1.01E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 3657 Sec
Sample Size 2.38E-001 kg | Real Time 3658 Sec
Collection Efficiency 1.0000 | Spc. File 0945208.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Energy(keV)= 0.17 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/04/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.83	112.67	87	18	26	148	0.87	a
2	76.91	115.80	121	21	30	185	1.09	b
3	92.77	139.74	60	27	42	279	1.94	Wide Pk
4	185.91	280.30	104	26	38	219	2.26	Wide Pk
5	238.43	359.56	213	29	41	267	1.10	
6	294.86	444.71	122	23	33	155	1.84	
7	338.85	511.11	73	21	32	147	1.86	
8	351.79	530.63	156	21	28	127	1.49	
9	510.52	770.16	105	17	23	91	1.56	
10	583.09	879.68	86	17	24	84	1.31	
11	609.05	918.85	131	16	19	63	1.36	
12	661.58	998.13	1545	41	21	70	1.69	
13	726.87	1096.66	17	10	14	35	1.17	
14	911.14	1374.74	86	14	18	50	2.36	
15	969.07	1462.16	25	12	18	55	2.25	
16	1173.22	1770.24	291	19	15	36	1.85	
17	1332.56	2010.70	262	18	11	21	2.32	
18	1460.81	2204.24	291	18	9	12	2.45	
19	1764.48	2662.52	30	6	4	3	2.14	
20	2614.51	3945.28	36	7	4	3	2.55	

L5185-17 analyzed by emml461 on 04/04/2003

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File:. EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.83	87	18	26	80	18	26	
2	76.91	121	21	30	111	21	31	
3	92.77	60	27	42	20	27	43	NET<CL
4	185.91	104	26	38	82	26	39	
5	238.43	213	29	41	197	29	42	
6	294.86	122	23	33	106	23	34	
7	338.85	73	21	32	70	21	32	
8	351.79	156	21	28	133	21	29	
9	510.52	105	17	23	13	17	28	NET<CL
10	583.09	86	17	24	81	17	24	
11	609.05	131	16	19	110	16	21	
14	911.14	87	15	18	83	15	19	
15	969.07	25	12	18	23	12	18	
18	1460.81	291	18	9	283	18	10	
19	1764.48	30	6	4	26	6	5	
20	2614.51	36	7	4	31	7	6	

L5185-17 analyzed by emml461 on 04/04/2003

SEEKER. LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	74.83	80	Pb-214	28	4 of 7	90.71	1.41	
			Pb-212	43	3 of 6	90.16	1.40	
			Tl-208	6	3 of 9	80.26	0.80	
2	76.91	29	Pb-214	54	4 of 7	90.71	1.41	Split
21	76.91	82	Pb-212	82	3 of 6	90.16	1.40	AutoAdd
4	185.91	82	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
5	238.43	197	Pb-212	316	3 of 6	90.16	1.40	
6	294.86	106	Pb-214	96	4 of 7	90.71	1.41	
7	338.85	70	AcTh-228	59	3 of 36	81.55	1.32	
8	351.79	133	Pb-214	242	4 of 7	100.00	1.50	
10	583.09	81	Tl-208	79	3 of 9	89.66	1.40	
11	609.05	110	Bi-214	168	2 of 33	80.44	1.30	
12	661.58	1545	Cs-137	. . . . .	1 of 1	100.00	1.50	
			1173SEsc	. . . . .	0 of 0	. . . .	0.50	
13	726.87	17	Bi-212	. . . . .	1 of 13	100.00	1.50	
14	911.14	83	AcTh-228	57	3 of 36	81.55	1.32	
15	969.07	23	AcTh-228	47	3 of 36	100.00	1.50	
			Sb-124	. . . . .	1 of 13	1.05	0.51	
16	1173.22	291	Co-60	288	2 of 2	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.17	LowScore
17	1332.56	262	Co-60	265	2 of 2	100.00	1.50	
18	1460.81	283	K-40	. . . . .	1 of 1	100.00	1.50	
19	1764.48	26	Bi-214	17	2 of 33	66.66	1.17	
20	2614.51	31	Tl-208	31	3 of 9	89.66	1.40	

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-17

Sample ID: NONE

Code: 0945208

 Sampling Start: 02/21/2003 12:00:00 | Counting Start: 04/04/2003 12:34:51
 Sampling Stop: 02/21/2003 12:00:00 | Decay Time: 1.01e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 3657 Sec
 Sample Size 2.38e-001 kg | Real Time 3658 Sec
 Collection Efficiency 1.0000 | Spectrum File 0945208.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Efficiency File: WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[7.49E-03*En^-3.10E+00 + 9.34E+01*En^7.45E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File: \$ERROR\$.LSF (No LSF File Available)

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-214	Average:x	5.16E+02 +- 6.72E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.11	I.D.	. . . .			. . . . .
	295.21	6.50E+02 +- 1.42E+02	4.35E+02		+	. . . . .
	351.92	4.78E+02 +- 7.64E+01	2.21E+02		+	. . . . .
Ra-226	186.22	2.18E+03 +- 6.78E+02	2.16E+03		+	. . . . .
Pb-212	238.63	4.47E+02 +- 6.58E+01	1.96E+02		+	. . . . .
	77.12	I.D.	. . . .			. . . . .
AcTh-228	Average:x	6.94E+02 +- 1.04E+02	. . . .		*	. . . . .
	338.32	7.92E+02 +- 2.39E+02	7.53E+02		+	. . . . .
	911.07	8.10E+02 +- 1.42E+02	3.89E+02		+	. . . . .
	969.11	3.85E+02 +- 2.03E+02	6.60E+02		+	. . . . .
Tl-208	Average:x	5.14E+02 +- 7.75E+01	. . . .		*	. . . . .
	583.14	5.21E+02 +- 1.10E+02	3.27E+02		+	. . . . .
	2614.66	5.08E+02 +- 1.09E+02	2.38E+02		+	. . . . .
Bi-214	Average:x	5.13E+02 +- 6.52E+01	. . . .		*	. . . . .
	609.31	4.77E+02 +- 7.05E+01	1.89E+02		+	. . . . .
	1764.49	7.27E+02 +- 1.71E+02	3.83E+02		+	. . . . .
Cs-137	661.65	3.87E+03 +- 1.03E+02	1.10E+02		+	. . . . .
Bi-212	727.17	3.31E+02 +- 1.85E+02	6.00E+02		+	. . . . .
Co-60	Average:x	9.59E+02 +- 4.52E+01	. . . .		*	. . . . .
	1173.22	9.64E+02 +- 6.37E+01	1.06E+02		+	. . . . .
	1332.49	9.55E+02 +- 6.41E+01	9.27E+01		+	. . . . .
K-40	1460.81	1.02E+04 +- 6.42E+02	8.02E+02		+	. . . . .
Am-241	59.54	N-1.35E+02 +- 1.00E+02	3.54E+02		x	. . . . .
Co-57	122.06	N 1.09E+01 +- 1.85E+01	6.25E+01		x	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
Ce-144	133.54	N	7.83E+00	+ - 1.48E+02	5.09E+02		x	. . . . .
Ce-141	145.44	N	1.97E+01	+ - 7.51E+01	2.60E+02		x	. . . . .
Se-75	264.65	N	1.63E+01	+ - 3.56E+01	1.22E+02		x	. . . . .
Cr-51	320.08	N	4.29E+02	+ - 5.82E+02	1.97E+03		x	. . . . .
I-131	364.48	N	1.90E+02	+ - 9.28E+02	3.20E+03		x	. . . . .
Sb-125	427.89	N	9.91E+00	+ - 8.08E+01	2.81E+02		x	. . . . .
Ag-108m	433.93	N	2.57E+01	+ - 2.54E+01	8.53E+01		x	. . . . .
Be-7	477.59	N	1.06E+02	+ - 3.82E+02	1.34E+03		x	. . . . .
La-140	487.03	N	2.97E+02	+ - 4.56E+02	1.56E+03		x	. . . . .
Ru-103	497.08	N	3.85E+01	+ - 4.59E+01	1.68E+02		x	. . . . .
Ba-140	537.32	N	6.94E+02	+ - 7.06E+02	2.40E+03		x	. . . . .
Cs-134	604.70	N	3.82E+01	+ - 9.43E+01	3.17E+02P		x	PIC
Ru-106	621.84	N	4.71E+02	+ - 2.26E+02	7.21E+02		x	. . . . .
Zr-95	724.18	N	2.46E+01	+ - 1.01E+02	3.60E+02L		x	LHROI
Nb-95	765.79	N	1.80E+01	+ - 4.98E+01	1.75E+02		x	. . . . .
Co-58	810.76	N	3.76E+00	+ - 3.17E+01	1.15E+02		x	. . . . .
Mn-54	834.83	N	5.56E+00	+ - 2.42E+01	8.83E+01		x	. . . . .
Ag-110m	884.67	N	2.05E+01	+ - 3.14E+01	1.10E+02		x	. . . . .
Fe-59	1099.22	N	3.96E+00	+ - 8.82E+01	3.18E+02		x	. . . . .
Zn-65	1115.52	N	4.27E+01	+ - 6.25E+01	2.16E+02		x	. . . . .
Sb-124	1691.02	N	5.67E+00	+ - 4.22E+01	1.80E+02		x	. . . . .

MEASURED TOTAL: 2.02E+04 +- 2.03E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
3	92.77	139.74	20	27	43	279	1.94	Deleted
9	510.52	770.16	13	17	28	91	1.56	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
22	59.54	89.59	-27N	20	34	214	1.24	NET< CL
23	122.06	183.94	11N	19	30	169	1.29	NET< CL
24	133.54	201.27	1N	19	31	179	1.30	NET< CL
25	145.44	219.23	-5N	19	32	184	1.31	NET< CL
26	264.65	399.12	7N	15	25	114	1.39	NET< CL
27	320.08	482.77	12N	16	26	113	1.43	NET< CL
28	364.48	549.78	3N	15	24	98	1.46	NET< CL
29	427.89	645.47	-2N	15	25	104	1.50	NET< CL
30	433.93	654.58	15N	15	23	92	1.51	NET< CL
31	477.59	720.47	-4N	14	23	90	1.53	NET< CL
32	487.03	734.72	8N	13	20	69	1.54	NET< CL
33	497.08	749.88	-10N	11	19	74	1.55	NET< CL
34	537.32	810.61	10N	10	15	47	1.57	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
35	604.70	912.29	-18N	44	73	94	1.62	NET< CL PIC
36	621.84	938.16	21N	10	15	40	1.63	
37	724.18	1092.60	-3N	12	21	39	1.70	NET< CL LHRoi
38	765.79	1155.39	3N	9	15	39	1.73	NET< CL
39	810.76	1223.26	-1N	8	14	36	1.76	NET< CL
40	834.83	1259.58	-2N	9	15	39	1.77	NET< CL
41	884.67	1334.79	5N	8	12	27	1.81	NET< CL
42	1099.22	1658.57	0N	8	14	33	1.95	NET< CL
43	1115.52	1683.17	6N	9	14	35	1.96	NET< CL
44	1691.02	2551.65	-0N	3	5	4	2.34	NET< CL

c:\seeker\Results\L5185-17.RES Analysis Results Saved.

L5185-17 analyzed by emml461 on 04/04/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 02/21/2003 12:00:00 | Counting Start: 04/04/2003 12:34:51
Sampling Stop: 02/21/2003 12:00:00 | Decay Time. 1.01E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 3657 Sec
Sample Size 2.38E-01 kg | Real Time 3658 Sec
Collection Efficiency 1.0000 | Spectrum File 0945208.spc

Detector #: 8

Energy(keV)= 0.17 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/04/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[7.49e-03*En^-3.10e+00 + 9.34e+01*En^ 7.45e-01] 02/06/1998

Library File: SOILA.LIB LSF File: \$ERROR\$.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-214	5.16E+02	6.72E+01	< 2.21E+02	1.06E+02	1.00E+00	MEAS +	YES
Ra-226	2.18E+03	6.78E+02	< 2.16E+03	1.04E+03	1.00E+00	MEAS +	YES
Pb-212	4.47E+02	6.58E+01	< 1.96E+02	9.47E+01	1.00E+00	MEAS +	YES
AcTh-228	6.94E+02	1.04E+02	< 3.89E+02	1.81E+02	1.00E+00	MEAS +	YES
Tl-208	5.14E+02	7.75E+01	< 2.38E+02	9.66E+01	1.00E+00	MEAS +	YES
Bi-214	5.14E+02	6.52E+01	< 1.89E+02	8.88E+01	1.00E+00	MEAS +	YES
Cs-137	3.87E+03	1.04E+02	< 1.10E+02	5.18E+01	9.97E-01	MEAS +	YES
Bi-212	3.31E+02	1.85E+02	< 6.00E+02	2.74E+02	1.00E+00	MEAS +	YES
Co-60	9.59E+02	4.52E+01	< 9.27E+01	4.14E+01	9.85E-01	MEAS +	YES
K-40	1.02E+04	6.42E+02	< 8.02E+02	3.52E+02	1.00E+00	MEAS +	YES
Am-241	-1.35E+02	1.00E+02	< 3.54E+02	1.70E+02	1.00E+00	NET	YES
Co-57	1.09E+01	1.85E+01	< 6.25E+01	2.99E+01	8.98E-01	NET	YES
Ce-144	7.83E+00	1.48E+02	< 5.09E+02	2.44E+02	9.03E-01	NET	YES
Ce-141	-1.97E+01	7.51E+01	< 2.60E+02	1.24E+02	4.08E-01	NET	YES
Se-75	1.63E+01	3.56E+01	< 1.22E+02	5.77E+01	7.84E-01	NET	YES
Cr-51	4.30E+02	5.82E+02	< 1.97E+03	9.35E+02	3.49E-01	NET	YES
I-131	1.90E+02	9.28E+02	< 3.20E+03	1.52E+03	2.67E-02	NET	YES
Sb-125	-9.91E+00	8.08E+01	< 2.82E+02	1.33E+02	9.72E-01	NET	YES
Ag-108m	2.57E+01	2.54E+01	< 8.52E+01	4.03E+01	9.99E-01	NET	YES
Be-7	-1.06E+02	3.82E+02	< 1.34E+03	6.35E+02	5.80E-01	NET	YES
La-140	2.97E+02	4.56E+02	< 1.56E+03	7.30E+02	1.02E-01	NET	YES
Ru-103	-3.85E+01	4.59E+01	< 1.68E+02	7.83E+01	4.77E-01	NET	YES
Ba-140	6.94E+02	7.06E+02	< 2.40E+03	1.10E+03	1.02E-01	NET	YES
Cs-134	-3.82E+01	9.43E+01	< 3.17E+02	1.56E+02	9.62E-01	NET	YES
Ru-106	4.72E+02	2.26E+02	< 7.21E+02	3.30E+02	9.24E-01	NET	YES
Zr-95	-2.46E+01	1.01E+02	< 3.60E+02	1.69E+02	6.34E-01	NET	YES
Nb-95	1.80E+01	4.98E+01	< 1.75E+02	8.03E+01	4.36E-01	NET	YES
Co-58	-3.76E+00	3.17E+01	< 1.15E+02	5.25E+01	6.63E-01	NET	YES
Mn-54	-5.56E+00	2.42E+01	< 8.83E+01	4.04E+01	9.11E-01	NET	YES
Ag-110m	2.05E+01	3.14E+01	< 1.10E+02	4.95E+01	8.90E-01	NET	YES
Fe-59	3.96E+00	8.82E+01	< 3.18E+02	1.45E+02	5.21E-01	NET	YES
Zn-65	4.27E+01	6.25E+01	< 2.16E+02	9.88E+01	8.88E-01	NET	YES
Sb-124	-5.67E+00	4.22E+01	< 1.80E+02	7.09E+01	6.16E-01	NET	YES

L5185-17 analyzed by emm1461 on 04/04/2003
Activity Units: pCi/kg
Nuclide, Activity Uncertainty MDA CL ACT DECAY FLAG SEN MET
=====

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5185-18 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Smear
Sample Description: BMS-SC-141
Collect Start Date/Time: _____
Collect Stop Date/Time: 12-23-02 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): _____

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____
Work Group ID: WG5088

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 04/03/03 12:34 Det No.: 2 Spectrum No.: 0945202
Counted by: ES
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s):

Sample Id : L5185-18
Client Id : BMS-SC-141
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 12/23/02 12:00

Product : GAMMA SPECTROMETRY
Matrix : SM01 Smear

Parameter	Units	Numvalue	Textvalue	Datevalue
=====				
FINAL WEIGHT	sample	1		
Container				
LIBRARY			MCDERMOTT.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-18

Sample ID: NONE

Code: 0945202

 Sampling Start: 12/23/2002 12:00:00 | Counting Start: 04/04/2003 12:33:55
 Sampling Stop: 12/23/2002 12:00:00 | Decay Time. 2.45E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 5096 Sec
 Sample Size 1.00E+000 sample | Real Time 5097 Sec
 Collection Efficiency 1.0000 | Spc. File 0945202.spc

Detector #: 2 (Canberra sn 9923043 det# 2)
 Energy(keV)= 1.09 + 0.661*Ch + -1.57E-07*Ch^2 + 4.05E-11*Ch^3 04/04/2003
 FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.35	88.17	12	15	25	135	0.81	a NET< CL
2	63.20	94.00	11	13	20	102	0.54	b NET< CL
3	80.83	120.67	109	27	41	268	0.90	
4	92.64	138.55	26	25	40	253	0.71	NET< CL
5	121.88	182.80	40	20	31	169	1.31	
6	186.16	280.08	50	22	34	188	1.69	Wide Pk
7	238.19	358.83	22	18	28	134	1.38	NET< CL
8	276.19	416.35	-1	17	27	128	0.07	NET< CL
9	302.71	456.48	76	20	30	147	1.55	
10	317.72	479.20	20	17	26	119	0.89	NET< CL
11	356.06	537.23	124	19	25	106	1.22	
12	511.14	771.96	693	33	33	121	2.98	a Wide Pk
13	513.96	776.22	1835	44	17	52	1.34	b
14	834.49	1261.42	24	8	10	18	1.29	
15	898.00	1357.56	166	14	9	12	2.02	
16	1274.44	1927.36	136	13	11	18	2.38	
17	1836.02	2777.26	110	11	5	4	1.81	



 SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File:. EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	63.20	11	13	20	-18	13	22	NET<CL
4	92.64	26	25	40	-47	25	43	NET<CL
6	186.16	50	22	34	20	22	36	NET<CL
7	238.19	22	18	28	-3	18	29	NET<CL
12	511.14	693	33	33	598	33	.37	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: DURATEK.LIB (Environmental Library (Kocher 1981))

 Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.70 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	80.83	109	Ba-133	148	3 of 5	100.00	1.50	
			Ce-144	. . . . .	1 of 2	12.90	0.13	LowScore
			I-131	. . . . .	0 of 0	. . .	0.00	Decay
5	121.88	40	Co-57	. . . . .	1 of 4	100.00	1.50	
			Se-75	. . . . .	1 of 5	10.38	0.60	LowScore
9	302.71	76	Ba-133	40	3 of 5	87.66	1.38	
11	356.06	124	Ba-133	116	3 of 5	100.00	1.50	
12	511.14	598	Annil	. . . . .	1 of 1	100.00	1.50	
			Tl-208	. . . . .	1 of 9	9.26	0.09	LowScore
13	513.96	1835	Sr-85	. . . . .	1 of 1	100.00	1.50	
14	834.49	24	Mn-54	. . . . .	1 of 1	100.00	1.50	
15	898.00	166	Y-88	214	2 of 3	99.69	1.50	
16	1274.44	136	Na-22	. . . . .	1 of 1	100.00	1.50	
17	1836.02	110	Y-88	85	2 of 3	99.69	1.50	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5185-18

Sample ID: NONE

Code: 0945202

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Sampling Start:      12/23/2002 12:00:00 | Counting Start:      04/04/2003 12:33:55
Sampling Stop:       12/23/2002 12:00:00 | Decay Time. . . . . 2.45e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 5096 Sec
Sample Size . . . . . 1.00e+000 sample | Real Time . . . . . 5097 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 0945202.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 2 (Canberra sn 9923043 det# 2)
Efficiency File: ARS1S002.EFF (47 mm Glass Fiber Filter in Petri Dish)
Eff.=1/[2.31E-02*En^-2.05E+00 + 4.08E+01*En^1.02E+00] 10/15/1994
-----
Library File: . . . . . DURATEK.LIB (Environmental Library (Kocher 1981))
LSF File: . . . . . $ERROR$.LSF (No LSF File Available )
=====
  
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MEASURED or MDA CONCENTRATIONS

		N						
	ENERGY E		Concentration					
Nuclide	(keV)		(pCi/sample)	MDA	Flags	Notes	MDC

Ba-133	Average:x		1.57E+01	+ - 1.87E+00	. . . . .		*	. . . . .
	81.00		1.27E+01	+ - 3.17E+00	9.93E+00		+	. . . . .
	302.84		2.86E+01	+ - 7.66E+00	2.38E+01		+	. . . . .
	356.01		1.61E+01	+ - 2.44E+00	6.83E+00		+	. . . . .
Co-57	122.06		2.08E+00	+ - 1.05E+00	3.44E+00		+	. . . . .
Ra-226	186.22	N	2.55E+01	+ - 2.90E+01	9.71E+01		x	. . . . .
Annul	511.00		7.96E+01	+ - 4.41E+00	1.02E+01		+	. . . . .
Sr-85	513.99		6.06E+02	+ - 1.46E+01	1.20E+01		+	. . . . .
Mn-54	834.83		5.31E+00	+ - 1.79E+00	5.28E+00		+	. . . . .
Y-88	Average:x		7.27E+01	+ - 4.69E+00	. . . . .		*	. . . . .
	898.02		6.68E+01	+ - 5.61E+00	8.13E+00		+	. . . . .
	1836.01		8.65E+01	+ - 8.57E+00	9.87E+00		+	. . . . .
Na-22	1274.54		4.06E+01	+ - 4.02E+00	7.40E+00		+	. . . . .
Am-241	59.54	N	1.96E+00	+ - 2.48E+00	8.36E+00		x	. . . . .
Ce-144	133.54	N	6.51E+00	+ - 5.99E+00	2.01E+01		x	. . . . .
Ce-141	145.44	N	1.58E+01	+ - 1.05E+01	3.78E+01		x	. . . . .
Se-75	264.65	N	3.65E+00	+ - 2.64E+00	8.76E+00		x	. . . . .
Cr-51	320.08	N	7.21E+01	+ - 1.35E+02	4.78E+02		x	. . . . .
I-131	364.48	N	6.37E+02	+ - 7.62E+03	2.67E+04		x	. . . . .
Sb-125	427.89	N	2.01E+00	+ - 2.68E+00	9.31E+00		x	. . . . .
Ag-108m	433.93	N	1.87E+00	+ - 8.79E-01	3.51E+00		x	. . . . .
Be-7	477.59	N	3.69E+00	+ - 3.02E+01	1.09E+02		x	. . . . .
Ru-103	497.08	N	7.95E+00	+ - 6.26E+00	2.40E+01		x	. . . . .
Ru-106	621.84	N	1.93E+00	+ - 1.30E+01	4.77E+01		x	. . . . .
Cs-137	661.65	N	8.69E-01	+ - 1.34E+00	4.68E+00		x	. . . . .
Zr-95	756.72	N	3.78E+00	+ - 5.02E+00	2.00E+01		x	. . . . .
Nb-95	765.79	N	2.80E+00	+ - 7.23E+00	2.79E+01		x	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/sample)				
Cs-134	795.84	N-5.79E-01	+-	1.18E+00	4.65E+00		x	. . . . .
Co-58	810.76	N-2.45E+00	+-	2.73E+00	1.09E+01		x	. . . . .
Ag-110m	884.67	N-1.40E+00	+-	2.10E+00	8.22E+00		x	. . . . .
AcTh-228	911.07	N-2.40E+00	+-	3.90E+00	1.54E+01		x	. . . . .
Fe-59	1099.22	N 6.17E+00	+-	1.11E+01	4.01E+01		x	. . . . .
Zn-65	1115.52	N-1.91E+00	+-	3.43E+00	1.36E+01		x	. . . . .
Co-60	1332.49	N 7.52E-02	+-	1.75E+00	6.54E+00		x	. . . . .
K-40	1460.81	N-1.82E+01	+-	1.40E+01	6.00E+01		x	. . . . .
Ba-140	1596.49	N-1.12E+03	+-	3.76E+02	1.80E+03		x	. . . . .
La-140	1596.49	N-1.29E+03	+-	4.32E+02	2.07E+03		x	. . . . .
Sb-124	1691.02	N-2.44E+00	+-	5.46E+00	2.63E+01		x	. . . . .

MEASURED TOTAL: 8.22E+02 +- 3.24E+01 pCi/sample 0.00E+00
NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.35	88.17	12	15	25	135	0.81	Deleted
2	63.20	94.00	-18	13	22	102	0.54	Deleted
4	92.64	138.55	-47	25	43	253	0.71	Deleted
7	238.19	358.83	-3	18	29	134	1.38	Deleted
8	276.19	416.35	-1	17	27	128	0.07	Deleted
10	317.72	479.20	20	17	26	119	0.89	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
6	186.16	280.08	20N	22	36	188	1.69	NET< CL
18	59.54	88.46	14N	17	28	153	1.08	NET< CL
19	133.54	200.45	16N	14	23	103	1.14	NET< CL
20	145.44	218.46	-24N	16	27	147	1.15	NET< CL
21	264.65	398.88	21N	15	24	105	1.23	NET< CL
22	320.08	482.78	-8N	15	25	117	1.27	NET< CL
23	364.49	549.98	1N	12	20	71	1.30	NET< CL
24	427.90	645.97	6N	8	13	29	1.35	NET< CL
25	433.94	655.11	-18N	8	16	45	1.35	NET< CL
26	477.61	721.20	1N	8	13	33	1.38	NET< CL
27	497.10	750.71	-11N	9	15	43	1.39	NET< CL
28	621.87	939.58	-1N	8	13	29	1.48	NET< CL
29	661.69	999.85	5N	8	13	27	1.51	NET< CL
30	756.78	1143.79	-4N	6	10	19	1.57	NET< CL
31	765.85	1157.52	-2N	6	10	19	1.58	NET< CL
32	795.78	1202.82	-3N	5	9	17	1.60	NET< CL
33	810.70	1225.41	-5N	6	10	20	1.61	NET< CL
34	884.63	1337.32	-4N	6	10	20	1.66	NET< CL
35	911.04	1377.30	-3N	5	10	13	1.68	NET< CL
36	1099.27	1662.23	3N	5	8	13	1.81	NET< CL

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NET/MDA PEAK RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
37	1115.58	1686.91	-3N	5	9	16	1.82	NET< CL
38	1332.43	2015.13	0N	6	10	16	1.96	NET< CL
39	1460.85	2209.51	-6N	5	9	9	2.05	NET< CL
40	1596.53	2414.86	-14N	5	10	18	2.14	NET< CL
41	1596.53	2414.86	-14N	5	10	18	2.14	NET< CL
42	1691.04	2557.88	-1N	2	4	3	2.21	NET< CL

c:\seeker\Results\L5185-18.RES Analysis Results Saved.

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 12/23/2002 12:00:00 | Counting Start: 04/04/2003 12:33:55
Sampling Stop: 12/23/2002 12:00:00 | Decay Time. 2.45E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 5096 Sec
Sample Size 1.00E+00 sample | Real Time 5097 Sec
Collection Efficiency 1.0000 | Spectrum File 0945202.spc

Detector #: 2

Energy(keV)= 1.09 + 0.661*Ch + -1.57E-07*Ch^2 + -1.57E-07*Ch^3 04/04/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 6.55E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:ARS1S002.EFF (47 mm Glass Fiber Filter in Petri Dish)
Eff.=1/[2.31e-02*En^-2.05e+00 + 4.08e+01*En^ 1.02e+00] 10/15/1994

Library File: DURATEK.LIB LSF File: \$ERROR\$.LSF

Activity Units: pCi/sample

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Ba-133	1.56E+01	1.88E+00	< 6.83E+00	3.24E+00	9.82E-01	MEAS +	YES
Co-57	2.08E+00	1.05E+00	< 3.44E+00	1.65E+00	7.70E-01	MEAS +	YES
Ra-226	2.55E+01	2.90E+01	< 9.71E+01	4.68E+01	1.00E+00	NET	YES
Annil	7.96E+01	4.41E+00	< 1.02E+01	4.91E+00	8.24E-01	MEAS +	YES
Sr-85	6.06E+02	1.46E+01	< 1.20E+01	5.55E+00	3.36E-01	MEAS +	YES
Mn-54	5.31E+00	1.79E+00	< 5.28E+00	2.33E+00	7.98E-01	MEAS +	YES
Y-88	7.27E+01	4.70E+00	< 8.13E+00	3.52E+00	5.15E-01	MEAS +	YES
Na-22	4.06E+01	4.02E+00	< 7.40E+00	3.30E+00	9.28E-01	MEAS +	YES
Am-241	1.96E+00	2.48E+00	< 8.36E+00	3.98E+00	1.00E+00	NET	YES
Ce-144	6.51E+00	5.99E+00	< 2.01E+01	9.47E+00	7.80E-01	NET	YES
Ce-141	-1.58E+01	1.04E+01	< 3.78E+01	1.80E+01	1.13E-01	NET	YES
Se-75	3.65E+00	2.64E+00	< 8.76E+00	4.15E+00	5.54E-01	NET	YES
Cr-51	-7.21E+01	1.36E+02	< 4.78E+02	2.27E+02	7.79E-02	NET	YES
I-131	6.37E+02	7.62E+03	< 2.67E+04	1.25E+04	1.51E-04	NET	YES
Sb-125	2.01E+00	2.68E+00	< 9.31E+00	4.20E+00	9.33E-01	NET	YES
Ag-108m	-1.87E+00	8.79E-01	< 3.52E+00	1.62E+00	9.98E-01	NET	YES
Be-7	3.69E+00	3.02E+01	< 1.09E+02	4.93E+01	2.66E-01	NET	YES
Ru-103	-7.95E+00	6.26E+00	< 2.40E+01	1.10E+01	1.66E-01	NET	YES
Ru-106	-1.93E+00	1.30E+01	< 4.77E+01	2.16E+01	8.25E-01	NET	YES
Cs-137	8.69E-01	1.34E+00	< 4.68E+00	2.11E+00	9.94E-01	NET	YES
Zr-95	-3.78E+00	5.02E+00	< 2.00E+01	8.80E+00	3.31E-01	NET	YES
Nb-95	-2.80E+00	7.23E+00	< 2.79E+01	1.23E+01	1.33E-01	NET	YES
Cs-134	-5.80E-01	1.18E+00	< 4.65E+00	2.03E+00	9.10E-01	NET	YES
Co-58	-2.45E+00	2.73E+00	< 1.09E+01	4.83E+00	3.68E-01	NET	YES
Ag-110m	-1.40E+00	2.10E+00	< 8.22E+00	3.63E+00	7.53E-01	NET	YES
AcTh-228	-2.40E+00	3.90E+00	< 1.54E+01	6.76E+00	1.00E+00	NET	YES
Fe-59	6.18E+00	1.11E+01	< 4.01E+01	1.73E+01	2.05E-01	NET	YES
Zn-65	-1.91E+00	3.43E+00	< 1.36E+01	5.93E+00	7.49E-01	NET	YES
Co-60	7.52E-02	1.75E+00	< 6.54E+00	2.86E+00	9.64E-01	NET	YES
K-40	-1.82E+01	1.39E+01	< 6.00E+01	2.60E+01	9.99E-01	NET	YES
Ba-140	-1.12E+03	3.76E+02	< 1.80E+03	7.90E+02	3.97E-03	NET	YES
La-140	-1.29E+03	4.32E+02	< 2.07E+03	9.09E+02	3.97E-03	NET	YES
Sb-124	-2.44E+00	5.46E+00	< 2.63E+01	9.85E+00	3.09E-01	NET	YES

Activity Units: pCi/sample
Nuclide Activity Uncertainty MDA CL ACT DECAY FLAG SEN MET
=====

PERFORMED BY: _____

REVIEWED BY: _____

An AREVA and Siemens Company

DURATEK, INC. DATA PACKETS

Samples
L5187-01 - L5187-17



FRAMATOME ANP

ENVIRONMENTAL LABORATORY
29 Research Drive
Westborough, MA 01581-3913
(508) 898-9970 Fax (508) 836-9815

Client: Duratek, Inc
Project: Bristol Myers Squibb

Duratek Purchase Order # 15313

Samples Collected by
Betty Kjos & Doug Kjos, Duratek

Batch #2

CHAIN OF CUSTODY RECORD

Duratek, Inc.
628 Gallaher Road
Kingston, Tn. 37763

Project Manager: Paul Ely
(732)-519-3341-office
(865)-414-1973-cell

Page 1 of 2

Sample ID	date	Turn around time (days)	matrix	preservative	number of containers	Gamma Spec	TCLP								Remarks
BMS-A0300-1	3-21-03	S	S	N/A	1	X									
BMS-A0300-2	3-21-03	S	S	N/A	1	X									
BMS-A0300-3	3-21-03	S	S	N/A	1	X									
BMS-A0300-4	3-21-03	S	S	N/A	1	X									
BMS-A0300-5	3-21-03	S	S	N/A	1	X									
BMS-A0300-6	3-21-03	S	S	N/A	1	X									
BMS-A0300-7	3-21-03	S	S	N/A	1	X									
BMS-A0300-8	3-21-03	S	S	N/A	1	X									
BMS-A0300-9	3-21-03	S	5	1/4	1	X									

Relinquished by: <i>[Signature]</i>	Date: 3/21/03	Time: 1000	Received by:	Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Remarks:	

Matrix codes: s-Soil, m-Misc Solid, V-Vegetation, L-Sludge, W-Water, G-Ground Water, D-Drinking Water, Z-Waste Water, M-Misc Liquid, F-Filter

Client: Duratek, Inc
Project: Bristol Myers Squibb

Duratek Purchase Order # 15313

Samples Collected by
Betty Kjos & Doug Kjos, Duratek

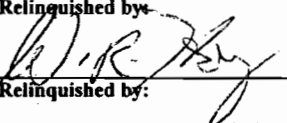
Batch 3
CHAIN OF CUSTODY RECORD

Duratek, Inc.
628 Gallaher Road
Kingston, Tn. 37763

Project Manager: Paul Ely
(732)-519-3341-office
(865)-414-1973-cell

Page 2 of 2

Sample ID	date	Turn around time (days)	matrix	preservative	number of containers	Gamma Spec	TCLP									Remarks
BMS-A0300-10	3-21-03	S	S	N/A	1	X										
BMS-A0300-11	3-21-03	S	S	N/A	1	X										
BMS-A0300-12	3-21-03	S	S	N/A	1	X										
BMS-A0300-13	3-21-03	S	S	N/A	1	X										
BMS-A0300-14	3-21-03	S	S	N/A	1	X										
BMS-A0300-15	3-21-03	S	S	N/A	1	X										
BMS-A0300-16	3-21-03	S	S	N/A	1	X										
BMS-A0300-17	3-21-03	S	S	N/A	1	X										

Relinquished by: 	Date: 3/21/03	Time: 1000	Received by:	Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Remarks:	

Matrix codes: s-Soil, m-Misc Solid, V-Vegetation, L-Sludge, W-Water, G-Ground Water, D-Drinking Water, Z-Waste Water, M-Misc Liquid, F-Filter



Framatome ANP

Login Chain of Custody Report (In01)

Apr. 04, 2003

03:30 PM

Login Number: L5187

Account: 00435

Duratek Inc

Project: OTHER ENVIRON-DUR Duratek Other Environmental

Page: 1 of 2

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due Date	Start Date Comments	Volume
L5187-01	BMS-AO300-1	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-02	BMS-AO300-2	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-03	BMS-AO300-3	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-04	BMS-AO300-4	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-05	BMS-AO300-5	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-06	BMS-AO300-6	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-07	BMS-AO300-7	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-08	BMS-AO300-8	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-09	BMS-AO300-9	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-10	BMS-AO300-10	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-11	BMS-AO300-11	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-12	BMS-AO300-12	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-13	BMS-AO300-13	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-14	BMS-AO300-14	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-15	BMS-AO300-15	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				
L5187-16	BMS-AO300-16	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME	Hold:				

Signature :

Dale Keardon

Date :

4-4-03



Framatome ANP

Login Chain of Custody Report (In01)

Apr. 04, 2003

03:30 PM

Login Number: L5187

Account: 00435 Duratek Inc

Project: OTHER ENVIRON-DUR Duratek Other Environmental Page: 2 of 2

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due Date	Start Date Comments	Volume
L5187-17	BMS-AO300-17	21-MAR-03 12:00	21-MAR-03			
Soil	S GAMMA SPECTROME Hold:					

Signature : Dale Reardon
Date : 4-4-03

April 10, 2003

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

ATT: Paul Ely

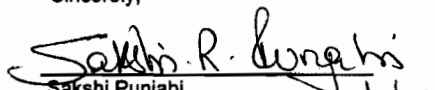
Dear Paul Ely :

Framatome-ANP Environmental Laboratory received the samples listed below from your company on 21-MAR-03. Please verify that the data and requested analyses are correct. Analysis reports will be submitted when the requested analyses have been completed and the results approved.

<u>Media</u>	<u>Client ID</u>	<u>Site</u>	<u>Reference Date</u>	<u>Lab Sample #</u>	<u>Analysis Requested</u>
Soil	BMS-AO300-1		21-MAR-03 12:00	L5187-01	GAMMA SPECTROMETRY
Soil	BMS-AO300-2		21-MAR-03 12:00	L5187-02	GAMMA SPECTROMETRY
Soil	BMS-AO300-3		21-MAR-03 12:00	L5187-03	GAMMA SPECTROMETRY
Soil	BMS-AO300-4		21-MAR-03 12:00	L5187-04	GAMMA SPECTROMETRY
Soil	BMS-AO300-5		21-MAR-03 12:00	L5187-05	GAMMA SPECTROMETRY
Soil	BMS-AO300-6		21-MAR-03 12:00	L5187-06	GAMMA SPECTROMETRY
Soil	BMS-AO300-7		21-MAR-03 12:00	L5187-07	GAMMA SPECTROMETRY
Soil	BMS-AO300-8		21-MAR-03 12:00	L5187-08	GAMMA SPECTROMETRY
Soil	BMS-AO300-9		21-MAR-03 12:00	L5187-09	GAMMA SPECTROMETRY
Soil	BMS-AO300-10		21-MAR-03 12:00	L5187-10	GAMMA SPECTROMETRY
Soil	BMS-AO300-11		21-MAR-03 12:00	L5187-11	GAMMA SPECTROMETRY
Soil	BMS-AO300-12		21-MAR-03 12:00	L5187-12	GAMMA SPECTROMETRY
Soil	BMS-AO300-13		21-MAR-03 12:00	L5187-13	GAMMA SPECTROMETRY
Soil	BMS-AO300-14		21-MAR-03 12:00	L5187-14	GAMMA SPECTROMETRY
Soil	BMS-AO300-15		21-MAR-03 12:00	L5187-15	GAMMA SPECTROMETRY
Soil	BMS-AO300-16		21-MAR-03 12:00	L5187-16	GAMMA SPECTROMETRY
Soil	BMS-AO300-17		21-MAR-03 12:00	L5187-17	GAMMA SPECTROMETRY

If you have any questions regarding these samples, please contact me at (508)898-9970, ext. 2557 or email:
Sakshi.Punjabi@Framatome-anp.com.

Sincerely,


Sakshi Punjabi
Sample Receipt Technician 4/10/03

Notes:

c:

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/23/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-01 Client ID BMS-AO300-1
Reference Date 03/21/03 Analysis Date 04/23/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	5.8E-01 +/- 3.8E-02	4.8E-02	1.5E-01		bc
Ag-108m	5E-04 +/- 8.0E-03	8.0E-03	2.8E-02		
Ag-110m	-6E-03 +/- 1.5E-02	1.5E-02	5.4E-02		
Ba-140	2.1E-01 +/- 1.6E-01	1.6E-01	5.3E-01		
Be-7	-1.1E-01 +/- 1.0E-01	1.0E-01	3.8E-01		
Ce-141	2.5E-02 +/- 2.4E-02	2.4E-02	7.8E-02		
Ce-144	1.12E-01 +/- 5.8E-02	5.9E-02	1.9E-01		
Co-57	-1.71E-02 +/- 7.1E-03	7.2E-03	2.5E-02		
Co-58	-5E-03 +/- 1.2E-02	1.2E-02	4.4E-02		
Co-60	7.2E-03 +/- 9.8E-03	9.9E-03	3.4E-02	3.8E-02	
Cr-51	-8E-02 +/- 1.6E-01	1.6E-01	5.4E-01		
Cs-134	7.1E-03 +/- 9.7E-03	9.7E-03	3.3E-02		
Cs-137	2E-03 +/- 1.1E-02	1.1E-02	3.7E-02	1.1E+00	
Fe-59	0E+00 +/- 3.2E-02	3.2E-02	1.1E-01		
I-131	8E-02 +/- 1.4E-01	1.4E-01	4.9E-01		
K-40	1.551E+01 +/- 4.3E-01	8.9E-01	3.3E-01		bc
La-140	-2E-02 +/- 9.1E-02	9.1E-02	3.2E-01		
Mn-54	-1.48E-02 +/- 9.0E-03	9.0E-03	3.4E-02		
Nb-95	-3.6E-02 +/- 1.7E-02	1.8E-02	6.6E-02		
Ru-103	-1.1E-02 +/- 1.3E-02	1.3E-02	4.8E-02		
Ru-106	7.4E-02 +/- 9.5E-02	9.5E-02	3.2E-01		
Sb-124	6.5E-02 +/- 2.2E-02	2.2E-02	6.1E-02		
Sb-125	-1.4E-02 +/- 2.5E-02	2.5E-02	8.9E-02		
Se-75	-1.4E-02 +/- 1.2E-02	1.2E-02	4.2E-02		
Zn-65	2.1E-02 +/- 4.8E-02	4.8E-02	1.6E-01		
Zr-95	-9.9E-02 +/- 4.7E-02	4.7E-02	1.8E-01		

- Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

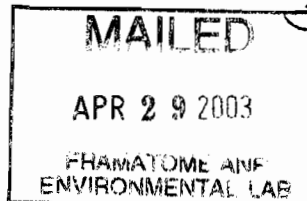
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/24/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-02 Client ID BMS-AO300-2
Reference Date 03/21/03 Analysis Date 04/23/03

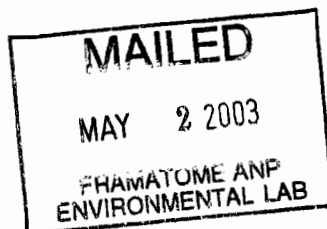
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	2.82E-01 +/- 2.3E-02	2.7E-02	8.3E-02		bc
Ag-108m	3.1E-03 +/- 5.2E-03	5.2E-03	1.8E-02		
Ag-110m	3.3E-03 +/- 8.6E-03	8.6E-03	3.0E-02		
Ba-140	6E-02 +/- 1.2E-01	1.2E-01	4.0E-01		
Be-7	1.6E-02 +/- 6.9E-02	6.9E-02	2.4E-01		
Ce-141	1.8E-02 +/- 1.9E-02	1.9E-02	6.2E-02		
Ce-144	0E+00 +/- 3.9E-02	3.9E-02	1.3E-01		
Co-57	3.5E-03 +/- 5.1E-03	5.1E-03	1.7E-02		
Co-58	-4E-03 +/- 7.7E-03	7.7E-03	2.7E-02		
Co-60	-6.7E-03 +/- 5.8E-03	5.8E-03	2.2E-02	3.8E-02	
Cr-51	-8.8E-02 +/- 9.9E-02	9.9E-02	3.5E-01		
Cs-134	-8.6E-03 +/- 5.7E-03	5.7E-03	2.0E-02		
Cs-137	-2.5E-03 +/- 6.1E-03	6.1E-03	2.1E-02	1.1E+00	
Fe-59	-7E-03 +/- 2.0E-02	2.0E-02	7.0E-02		
I-131	1E-02 +/- 9.6E-02	9.6E-02	3.3E-01		
K-40	1.139E+01 +/- 2.6E-01	6.3E-01	2.3E-01		bc
La-140	-3.8E-02 +/- 6.4E-02	6.4E-02	2.5E-01		
Mn-54	6.3E-03 +/- 6.4E-03	6.4E-03	2.2E-02		
Nb-95	-4E-03 +/- 1.1E-02	1.1E-02	4.0E-02		
Ru-103	-2E-04 +/- 9.7E-03	9.7E-03	3.4E-02		
Ru-106	-6.4E-02 +/- 5.4E-02	5.5E-02	2.0E-01		
Sb-124	-8E-03 +/- 1.2E-02	1.2E-02	4.8E-02		
Sb-125	1.5E-02 +/- 1.5E-02	1.5E-02	5.1E-02		
Se-75	-7.6E-03 +/- 8.8E-03	8.8E-03	3.0E-02		
Zn-65	2.5E-02 +/- 2.9E-02	2.9E-02	9.7E-02		
Zr-95	-1.56E+00 +/- 8.7E-01	8.7E-01	2.9E+00		

- Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/2/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/23/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-03 Client ID BMS-AO300-3 Product GAMMA SPECTROMETRY
Reference Date 03/21/03 Analysis Date 04/23/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	4.23E-01 +/- 2.8E-02	3.5E-02	9.9E-02		bc
Ag-108m	4.6E-03 +/- 5.4E-03	5.4E-03	1.8E-02		
Ag-110m	-7.8E-03 +/- 9.7E-03	9.7E-03	3.5E-02		
Ba-140	-1E-02 +/- 1.3E-01	1.3E-01	4.6E-01		
Be-7	3.2E-02 +/- 7.4E-02	7.4E-02	2.5E-01		
Ce-141	-1.9E-02 +/- 1.9E-02	1.9E-02	6.7E-02		
Ce-144	4.8E-02 +/- 4.6E-02	4.6E-02	1.5E-01		
Co-57	1.19E-02 +/- 6.0E-03	6.0E-03	2.0E-02		
Co-58	1.24E-02 +/- 8.7E-03	8.7E-03	2.9E-02		
Co-60	6.9E-03 +/- 6.6E-03	6.6E-03	2.2E-02	3.8E-02	
Cr-51	-8E-02 +/- 1.1E-01	1.1E-01	3.9E-01		
Cs-134	-5E-03 +/- 6.7E-03	6.8E-03	2.4E-02		
Cs-137	1.58E-02 +/- 6.4E-03	6.4E-03	2.0E-02	1.1E+00	c
Fe-59	4E-03 +/- 2.3E-02	2.3E-02	7.9E-02		
I-131	-7E-02 +/- 1.0E-01	1.0E-01	3.7E-01		
K-40	1.289E+01 +/- 2.9E-01	7.1E-01	2.5E-01		bc
La-140	-2.5E-02 +/- 6.7E-02	6.7E-02	2.3E-01		
Mn-54	-9.3E-03 +/- 7.3E-03	7.3E-03	2.6E-02		
Nb-95	1.5E-02 +/- 1.9E-02	1.9E-02	6.5E-02		
Ru-103	1.9E-02 +/- 1.0E-02	1.0E-02	3.4E-02		
Ru-106	-1.17E-01 +/- 6.3E-02	6.3E-02	2.3E-01		
Sb-124	1.5E-02 +/- 1.4E-02	1.4E-02	4.8E-02		
Sb-125	2.9E-02 +/- 1.8E-02	1.8E-02	5.8E-02		
Se-75	-9E-03 +/- 1.0E-02	1.0E-02	3.6E-02		
Zn-65	3.3E-02 +/- 3.3E-02	3.3E-02	1.1E-01		
Zr-95	-5.9E-02 +/- 3.1E-02	3.1E-02	1.1E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

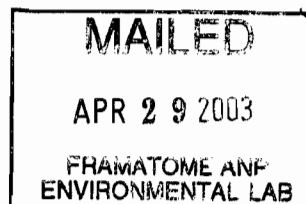
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 4/24/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/23/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-04 Client ID BMS-AO300-4
Reference Date 03/21/03 Analysis Date 04/23/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.21E-01 +/- 2.4E-02	2.9E-02	8.3E-02		bc
Ag-108m	-6.4E-03 +/- 5.3E-03	5.4E-03	1.9E-02		
Ag-110m	4.8E-03 +/- 8.7E-03	8.7E-03	3.0E-02		
Ba-140	1.2E-01 +/- 1.1E-01	1.1E-01	3.6E-01		
Be-7	-1.07E-01 +/- 6.5E-02	6.6E-02	2.4E-01		
Ce-141	5E-03 +/- 1.7E-02	1.7E-02	5.8E-02		
Ce-144	1.3E-02 +/- 8.3E-02	8.3E-02	2.8E-01		
Co-57	6.4E-03 +/- 5.3E-03	5.3E-03	1.8E-02		
Co-58	1E-03 +/- 7.1E-03	7.1E-03	2.5E-02		
Co-60	-4.8E-03 +/- 6.3E-03	6.3E-03	2.3E-02	3.8E-02	
Cr-51	7E-02 +/- 1.0E-01	1.0E-01	3.5E-01		
Cs-134	-1.3E-02 +/- 2.3E-02	2.3E-02	7.7E-02		
Cs-137	8.2E-03 +/- 6.4E-03	6.5E-03	2.1E-02	1.1E+00	
Fe-59	-2.8E-02 +/- 2.1E-02	2.1E-02	7.6E-02		
I-131	-3.6E-02 +/- 9.8E-02	9.8E-02	3.4E-01		
K-40	1.116E+01 +/- 2.5E-01	6.1E-01	2.1E-01		bc
La-140	-1.4E-02 +/- 6.1E-02	6.1E-02	2.1E-01		
Mn-54	-5E-03 +/- 6.0E-03	6.0E-03	2.1E-02		
Nb-95	1E-03 +/- 1.1E-02	1.1E-02	3.8E-02		
Ru-103	-1.2E-03 +/- 8.1E-03	8.1E-03	2.8E-02		
Ru-106	-3.1E-02 +/- 5.4E-02	5.4E-02	1.9E-01		
Sb-124	0E+00 +/- 1.2E-02	1.2E-02	4.5E-02		
Sb-125	6E-03 +/- 1.7E-02	1.7E-02	5.8E-02		
Se-75	-1.47E-02 +/- 8.7E-03	8.7E-03	3.1E-02		
Zn-65	5E-02 +/- 2.9E-02	2.9E-02	9.6E-02		
Zr-95	-2.1E-02 +/- 2.4E-02	2.4E-02	8.4E-02		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

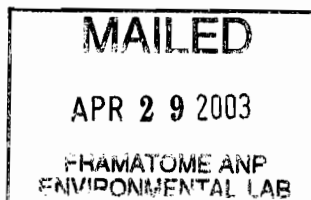
Reporting Level Ratio:

c:

Approved by

Jm Raimondi 4/24/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/06/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-05 Client ID BMS-AO300-5
Reference Date 03/21/03 Analysis Date 05/02/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.96E-01 +/- 1.4E-02	2.4E-02	5.1E-02		bc
Ag-108m	-3.3E-03 +/- 3.8E-03	3.8E-03	1.3E-02		
Ag-110m	-7.6E-03 +/- 5.0E-03	5.0E-03	1.7E-02		
Ba-140	-1.4E-01 +/- 1.4E-01	1.4E-01	4.9E-01		
Be-7	-1.1E-02 +/- 5.9E-02	5.9E-02	2.0E-01		
Ce-141	0E+00 +/- 1.8E-02	1.8E-02	6.1E-02		
Ce-144	-3.3E-02 +/- 2.8E-02	2.8E-02	9.6E-02		
Co-57	1.09E-02 +/- 3.7E-03	3.7E-03	1.2E-02		
Co-58	-3.9E-03 +/- 4.9E-03	4.9E-03	1.7E-02		
Co-60	3.28E-02 +/- 3.9E-03	4.3E-03	1.5E-02	3.8E-02	bc
Cr-51	9E-02 +/- 9.5E-02	9.5E-02	3.2E-01		
Cs-134	-2.2E-03 +/- 4.0E-03	4.0E-03	1.4E-02		
Cs-137	1.431E+00 +/- 1.5E-02	7.3E-02	1.5E-02	1.1E+00	bc
Fe-59	-9E-03 +/- 1.3E-02	1.3E-02	4.6E-02		
I-131	1.4E-01 +/- 1.6E-01	1.6E-01	5.2E-01		
K-40	9.85E+00 +/- 1.4E-01	5.1E-01	1.4E-01		bc
La-140	2.1E-02 +/- 7.2E-02	7.2E-02	2.4E-01		
Mn-54	3.8E-03 +/- 3.9E-03	3.9E-03	1.3E-02		
Nb-95	6E-03 +/- 1.1E-02	1.1E-02	3.8E-02		
Ru-103	5.5E-03 +/- 8.4E-03	8.5E-03	2.8E-02		
Ru-106	-5E-02 +/- 3.9E-02	3.9E-02	1.3E-01		
Sb-124	-8.1E-03 +/- 7.9E-03	7.9E-03	2.9E-02		
Sb-125	1E-02 +/- 1.3E-02	1.3E-02	4.2E-02		
Se-75	-2E-02 +/- 6.8E-03	6.8E-03	2.3E-02		
Zn-65	1.3E-02 +/- 1.8E-02	1.8E-02	5.9E-02		
Zr-95	-4E-02 +/- 4.7E-02	4.7E-02	1.6E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/12/03

J.M. Raimondi
Sample Control Manager

MAILED

MAY 13 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-06 Client ID BMS-AO300-6
Reference Date 03/21/03 Analysis Date 04/23/03

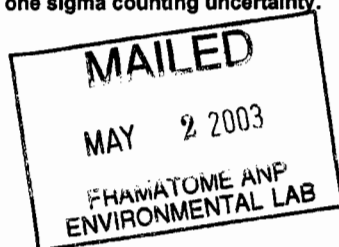
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	5.61E-01 +/- 2.7E-02	3.9E-02	8.6E-02		bc
Ag-108m	-1.5E-03 +/- 6.1E-03	6.1E-03	2.1E-02		
Ag-110m	3E-03 +/- 1.0E-02	1.0E-02	3.6E-02		
Ba-140	0E+00 +/- 1.3E-01	1.3E-01	4.6E-01		
Be-7	-1.7E-02 +/- 8.4E-02	8.4E-02	2.9E-01		
Ce-141	2.9E-02 +/- 1.8E-02	1.8E-02	6.0E-02		
Ce-144	-7E-03 +/- 4.3E-02	4.3E-02	1.4E-01		
Co-57	-7.7E-03 +/- 5.4E-03	5.4E-03	1.8E-02		
Co-58	1.9E-03 +/- 8.6E-03	8.6E-03	3.0E-02		
Co-60	1.72E-01 +/- 1.0E-02	1.3E-02	3.0E-02	3.8E-02	bc
Cr-51	1.5E-01 +/- 1.2E-01	1.2E-01	4.1E-01		
Cs-134	-6.5E-03 +/- 7.4E-03	7.4E-03	2.6E-02		
Cs-137	3.68E-01 +/- 1.5E-02	2.4E-02	3.1E-02	1.1E+00	bc
Fe-59	5.2E-02 +/- 2.4E-02	2.4E-02	7.8E-02		
I-131	0E+00 +/- 1.1E-01	1.1E-01	3.9E-01		
K-40	1.164E+01 +/- 2.9E-01	6.5E-01	2.9E-01		bc
La-140	-3.8E-02 +/- 7.1E-02	7.1E-02	2.5E-01		
Mn-54	6.6E-03 +/- 7.1E-03	7.1E-03	2.4E-02		
Nb-95	1.4E-02 +/- 1.4E-02	1.4E-02	4.6E-02		
Ru-103	-2.2E-02 +/- 1.1E-02	1.1E-02	4.0E-02		
Ru-106	-9.7E-02 +/- 6.8E-02	6.8E-02	2.4E-01		
Sb-124	1.6E-02 +/- 1.4E-02	1.4E-02	4.9E-02		
Sb-125	-1.8E-02 +/- 1.9E-02	1.9E-02	6.7E-02		
Se-75	-1.13E-02 +/- 9.0E-03	9.0E-03	3.1E-02		
Zn-65	6E-02 +/- 3.6E-02	3.6E-02	1.2E-01		
Zr-95	-6E-02 +/- 2.0E-01	2.0E-01	6.6E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/2/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-07 Client ID BMS-AO300-7
Reference Date 03/21/03 Analysis Date 04/21/03

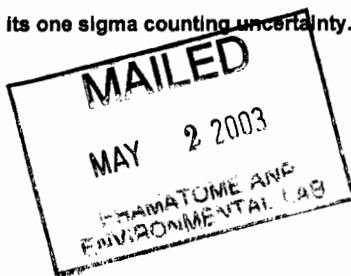
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	7.08E-01 +/- 2.6E-02	4.4E-02	9.7E-02		bc
Ag-108m	5E-03 +/- 5.7E-03	5.7E-03	1.9E-02		
Ag-110m	1.3E-03 +/- 8.9E-03	8.9E-03	3.0E-02		
Ba-140	-1.3E-01 +/- 1.1E-01	1.1E-01	3.9E-01		
Be-7	-4.9E-02 +/- 7.5E-02	7.5E-02	2.6E-01		
Ce-141	2.8E-02 +/- 1.6E-02	1.7E-02	5.4E-02		
Ce-144	2.3E-02 +/- 3.4E-02	3.4E-02	1.1E-01		
Co-57	7E-04 +/- 4.3E-03	4.3E-03	1.4E-02		
Co-58	-1.1E-03 +/- 8.4E-03	8.4E-03	2.9E-02		
Co-60	9.9E-03 +/- 7.9E-03	7.9E-03	2.6E-02	3.8E-02	
Cr-51	9.1E-02 +/- 9.3E-02	9.3E-02	3.1E-01		
Cs-134	-5.4E-03 +/- 5.6E-03	5.7E-03	2.0E-02		
Cs-137	3.87E-01 +/- 1.5E-02	2.4E-02	3.1E-02	1.1E+00	bc
Fe-59	-1.5E-02 +/- 2.2E-02	2.2E-02	7.8E-02		
I-131	3.1E-02 +/- 7.7E-02	7.7E-02	2.6E-01		
K-40	1.47E+01 +/- 2.8E-01	7.9E-01	2.6E-01		bc
La-140	-3.3E-02 +/- 6.1E-02	6.1E-02	2.1E-01		
Mn-54	1.19E-02 +/- 7.0E-03	7.0E-03	2.3E-02		
Nb-95	-2.1E-02 +/- 1.3E-02	1.3E-02	4.7E-02		
Ru-103	-5.5E-03 +/- 9.6E-03	9.6E-03	3.3E-02		
Ru-106	-2.3E-02 +/- 5.8E-02	5.8E-02	2.0E-01		
Sb-124	-5E-03 +/- 1.4E-02	1.4E-02	5.3E-02		
Sb-125	-2E-03 +/- 1.8E-02	1.8E-02	6.0E-02		
Se-75	-4E-04 +/- 8.4E-03	8.4E-03	2.8E-02		
Zn-65	4.4E-02 +/- 3.4E-02	3.5E-02	1.1E-01		
Zr-95	-7E-02 +/- 1.2E-01	1.2E-01	4.0E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J. M. Raimondi 5/2/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-08 Client ID BMS-AO300-8
Reference Date 03/21/03 Analysis Date 04/21/03

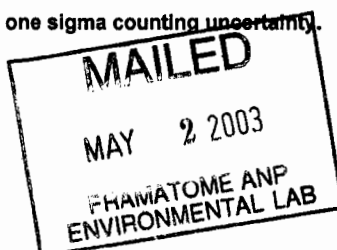
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.03E-01	+/- 2.6E-02	3.0E-02	1.0E-01		bc
Ag-108m	5.2E-03	+/- 5.1E-03	5.1E-03	1.7E-02		
Ag-110m	-1.38E-02	+/- 9.7E-03	9.8E-03	3.6E-02		
Ba-140	-6E-02	+/- 1.0E-01	1.0E-01	3.6E-01		
Be-7	-1.3E-02	+/- 6.7E-02	6.7E-02	2.3E-01		
Ce-141	2.1E-02	+/- 1.5E-02	1.5E-02	5.0E-02		
Ce-144	-1E-02	+/- 3.7E-02	3.7E-02	1.3E-01		
Co-57	-4.9E-03	+/- 4.5E-03	4.5E-03	1.6E-02		
Co-58	4.2E-03	+/- 7.5E-03	7.5E-03	2.6E-02		
Co-60	4.9E-03	+/- 7.3E-03	7.4E-03	2.5E-02	3.8E-02	
Cr-51	-4.3E-02	+/- 9.7E-02	9.7E-02	3.4E-01		
Cs-134	0E+00	+/- 2.5E-02	2.5E-02	8.3E-02		
Cs-137	1.8E-02	+/- 8.4E-03	8.4E-03	2.7E-02	1.1E+00	c
Fe-59	1.3E-02	+/- 2.2E-02	2.2E-02	7.6E-02		
I-131	-5.2E-02	+/- 8.1E-02	8.1E-02	2.8E-01		
K-40	1.265E+01	+/- 3.0E-01	7.0E-01	2.6E-01		bc
La-140	6.4E-02	+/- 5.7E-02	5.7E-02	1.9E-01		
Mn-54	-5.2E-03	+/- 6.7E-03	6.7E-03	2.4E-02		
Nb-95	-9E-03	+/- 1.1E-02	1.1E-02	4.0E-02		
Ru-103	3E-03	+/- 8.5E-03	8.5E-03	2.9E-02		
Ru-106	-3E-03	+/- 5.9E-02	5.9E-02	2.1E-01		
Sb-124	1.7E-02	+/- 1.3E-02	1.3E-02	4.5E-02		
Sb-125	-1.2E-02	+/- 1.6E-02	1.6E-02	5.7E-02		
Se-75	2.6E-03	+/- 7.5E-03	7.5E-03	2.5E-02		
Zn-65	2.8E-02	+/- 3.5E-02	3.5E-02	1.2E-01		
Zr-95	1.8E-02	+/- 3.0E-02	3.0E-02	1.0E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/2/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-09 Client ID BMS-AO300-9
Reference Date 03/21/03 Analysis Date 04/23/03

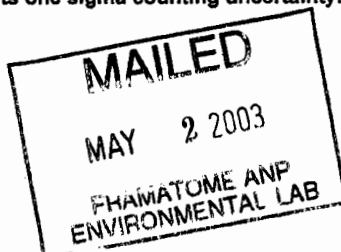
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.65E-01 +/- 2.0E-02	2.7E-02	7.9E-02		bc
Ag-108m	5.3E-03 +/- 4.2E-03	4.2E-03	1.4E-02		
Ag-110m	-5.5E-03 +/- 7.2E-03	7.2E-03	2.6E-02		
Ba-140	2E-02 +/- 1.0E-01	1.0E-01	3.5E-01		
Be-7	6E-03 +/- 6.4E-02	6.4E-02	2.2E-01		
Ce-141	1.8E-02 +/- 1.7E-02	1.7E-02	5.5E-02		
Ce-144	-3.2E-02 +/- 3.5E-02	3.5E-02	1.2E-01		
Co-57	4.9E-03 +/- 4.6E-03	4.6E-03	1.5E-02		
Co-58	2.8E-03 +/- 6.6E-03	6.6E-03	2.3E-02		
Co-60	6.04E-02 +/- 5.7E-03	6.4E-03	1.8E-02	3.8E-02	bc
Cr-51	6.9E-02 +/- 9.0E-02	9.0E-02	3.0E-01		
Cs-134	-2E-03 +/- 5.3E-03	5.3E-03	1.8E-02		
Cs-137	7.27E-02 +/- 7.3E-03	8.2E-03	1.9E-02	1.1E+00	bc
Fe-59	-1.1E-02 +/- 1.8E-02	1.8E-02	6.4E-02		
I-131	5.5E-02 +/- 8.1E-02	8.1E-02	2.7E-01		
K-40	1.108E+01 +/- 2.2E-01	5.9E-01	1.8E-01		bc
La-140	-9E-03 +/- 6.0E-02	6.0E-02	2.1E-01		
Mn-54	7.9E-03 +/- 5.4E-03	5.4E-03	1.8E-02		
Nb-95	-1.3E-02 +/- 1.5E-02	1.5E-02	5.1E-02		
Ru-103	9.2E-03 +/- 8.4E-03	8.4E-03	2.8E-02		
Ru-106	4.1E-02 +/- 4.6E-02	4.6E-02	1.5E-01		
Sb-124	-1.5E-02 +/- 1.0E-02	1.0E-02	4.0E-02		
Sb-125	1.5E-02 +/- 1.3E-02	1.3E-02	4.2E-02		
Se-75	-1.12E-02 +/- 7.8E-03	7.8E-03	2.7E-02		
Zn-65	-3.4E-02 +/- 2.5E-02	2.5E-02	8.7E-02		
Zr-95	-3E+00 +/- 1.1E+00	1.1E+00	3.6E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/2/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-10 Client ID BMS-AO300-10
Reference Date 03/21/03 Analysis Date 04/21/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.4E-01 +/- 2.3E-02	2.8E-02	8.8E-02		bc
Ag-108m	-3.1E-03 +/- 4.7E-03	4.7E-03	1.7E-02		
Ag-110m	-6E-04 +/- 7.6E-03	7.6E-03	2.7E-02		
Ba-140	4E-02 +/- 9.6E-02	9.7E-02	3.3E-01		
Be-7	-9.6E-02 +/- 6.1E-02	6.1E-02	2.2E-01		
Ce-141	-1E-03 +/- 1.4E-02	1.4E-02	4.7E-02		
Ce-144	1.8E-02 +/- 2.8E-02	2.8E-02	9.5E-02		
Co-57	-1.9E-03 +/- 3.6E-03	3.6E-03	1.2E-02		
Co-58	-8.7E-03 +/- 7.9E-03	7.9E-03	2.9E-02		
Co-60	3.3E-03 +/- 5.9E-03	5.9E-03	2.1E-02	3.8E-02	
Cr-51	-1.28E-01 +/- 7.7E-02	7.8E-02	2.8E-01		
Cs-134	1.1E-03 +/- 5.4E-03	5.4E-03	1.9E-02		
Cs-137	-9E-04 +/- 5.6E-03	5.6E-03	2.0E-02	1.1E+00	
Fe-59	3E-03 +/- 2.1E-02	2.1E-02	7.2E-02		
I-131	-3E-02 +/- 6.4E-02	6.4E-02	2.2E-01		
K-40	1.012E+01 +/- 2.7E-01	5.7E-01	2.5E-01		bc
La-140	-3E-02 +/- 5.2E-02	5.2E-02	1.8E-01		
Mn-54	1.05E-02 +/- 6.2E-03	6.2E-03	2.0E-02		
Nb-95	-1.4E-02 +/- 1.8E-02	1.8E-02	6.1E-02		
Ru-103	-6E-04 +/- 8.3E-03	8.3E-03	2.9E-02		
Ru-106	-1.9E-02 +/- 4.8E-02	4.8E-02	1.7E-01		
Sb-124	-1.2E-02 +/- 1.4E-02	1.4E-02	5.7E-02		
Sb-125	-9E-03 +/- 1.5E-02	1.5E-02	5.3E-02		
Se-75	4.7E-03 +/- 7.2E-03	7.2E-03	2.4E-02		
Zn-65	1.4E-02 +/- 2.9E-02	2.9E-02	9.8E-02		
Zr-95	-4.4E+00 +/- 1.5E+00	1.5E+00	4.9E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

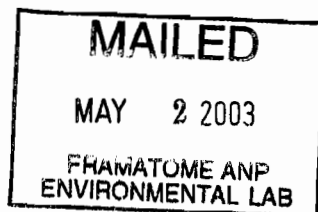
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/2/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-11 Client ID BMS-AO300-11
Reference Date 03/21/03 Analysis Date 04/21/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	5.8E-01 +/- 2.5E-02	3.9E-02	1.1E-01		bc
Ag-108m	-3.6E-03 +/- 5.3E-03	5.3E-03	1.8E-02		
Ag-110m	7E-03 +/- 1.0E-02	1.0E-02	3.5E-02		
Ba-140	-6E-03 +/- 3.0E-02	3.0E-02	1.1E-01		
Be-7	-5.9E-02 +/- 7.2E-02	7.3E-02	2.5E-01		
Ce-141	3.1E-02 +/- 2.3E-02	2.3E-02	7.6E-02		
Ce-144	-8E-02 +/- 3.7E-02	3.8E-02	1.3E-01		
Co-57	1.4E-03 +/- 4.8E-03	4.8E-03	1.6E-02		
Co-58	-2.8E-03 +/- 8.0E-03	8.0E-03	2.8E-02		
Co-60	2.278E-01 +/- 9.9E-03	1.5E-02	2.9E-02	3.8E-02	bc
Cr-51	6.3E-02 +/- 9.8E-02	9.8E-02	3.3E-01		
Cs-134	1.8E-03 +/- 9.8E-03	9.8E-03	3.3E-02		
Cs-137	1.03E-01 +/- 1.1E-02	1.2E-02	3.2E-02	1.1E+00	bc
Fe-59	-4E-03 +/- 2.2E-02	2.2E-02	7.6E-02		
I-131	-3.5E-02 +/- 8.6E-02	8.6E-02	3.0E-01		
K-40	1.394E+01 +/- 2.7E-01	7.5E-01	2.4E-01		bc
La-140	-6E-03 +/- 3.5E-02	3.5E-02	1.2E-01		
Mn-54	5E-03 +/- 6.8E-03	6.8E-03	2.3E-02		
Nb-95	-1.1E-02 +/- 1.9E-02	1.9E-02	6.3E-02		
Ru-103	3.9E-03 +/- 9.5E-03	9.5E-03	3.2E-02		
Ru-106	1.21E-01 +/- 6.3E-02	6.3E-02	2.1E-01		
Sb-124	-1E-02 +/- 1.6E-02	1.6E-02	5.8E-02		
Sb-125	-9E-03 +/- 1.7E-02	1.7E-02	5.8E-02		
Se-75	2.3E-03 +/- 8.0E-03	8.0E-03	2.7E-02		
Zn-65	-7E-03 +/- 1.7E-02	1.7E-02	5.9E-02		
Zr-95	1.9E-02 +/- 1.5E-02	1.5E-02	4.9E-02		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

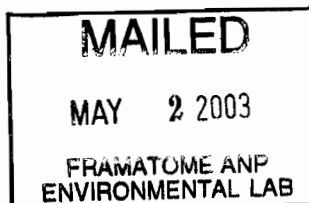
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/2/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-12 Client ID BMS-AO300-12
Reference Date 03/21/03 Analysis Date 04/21/03

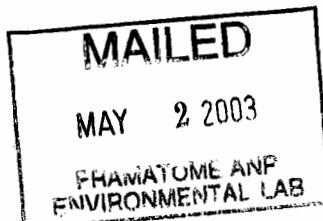
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.85E-01	+/- 2.5E-02	3.2E-02	9.2E-02		bc
Ag-108m	-7.4E-03	+/- 5.2E-03	5.2E-03	1.8E-02		
Ag-110m	-9.3E-03	+/- 9.4E-03	9.4E-03	3.4E-02		
Ba-140	-1E-01	+/- 1.2E-01	1.2E-01	4.1E-01		
Be-7	-8.7E-02	+/- 6.8E-02	6.8E-02	2.4E-01		
Ce-141	4E-03	+/- 1.6E-02	1.6E-02	5.5E-02		
Ce-144	-3.4E-02	+/- 4.0E-02	4.0E-02	1.4E-01		
Co-57	-7.7E-03	+/- 5.1E-03	5.1E-03	1.7E-02		
Co-58	-3.7E-03	+/- 7.1E-03	7.1E-03	2.5E-02		
Co-60	1.44E-02	+/- 7.0E-03	7.0E-03	2.2E-02	3.8E-02	
Cr-51	-4E-02	+/- 1.0E-01	1.0E-01	3.5E-01		
Cs-134	-1.4E-03	+/- 6.0E-03	6.0E-03	2.1E-02		
Cs-137	1.44E-02	+/- 7.4E-03	7.4E-03	2.4E-02	1.1E+00	c
Fe-59	3.1E-02	+/- 1.9E-02	1.9E-02	6.2E-02		
I-131	-9.4E-02	+/- 8.1E-02	8.1E-02	2.8E-01		
K-40	1.027E+01	+/- 2.5E-01	5.7E-01	2.5E-01		bc
La-140	-3E-03	+/- 5.5E-02	5.5E-02	1.9E-01		
Mn-54	4.7E-03	+/- 6.4E-03	6.4E-03	2.2E-02		
Nb-95	-4E-03	+/- 1.2E-02	1.2E-02	4.1E-02		
Ru-103	-9.5E-03	+/- 8.9E-03	8.9E-03	3.2E-02		
Ru-106	1.2E-02	+/- 5.6E-02	5.6E-02	1.9E-01		
Sb-124	8E-03	+/- 1.4E-02	1.4E-02	4.9E-02		
Sb-125	6E-03	+/- 1.6E-02	1.6E-02	5.5E-02		
Se-75	-1.15E-02	+/- 9.1E-03	9.1E-03	3.2E-02		
Zn-65	3.3E-02	+/- 3.0E-02	3.0E-02	1.0E-01		
Zr-95	-2.9E+00	+/- 1.8E+00	1.8E+00	5.8E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/06/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-13 Client ID BMS-AO300-13
Reference Date 03/21/03 Analysis Date 05/02/03

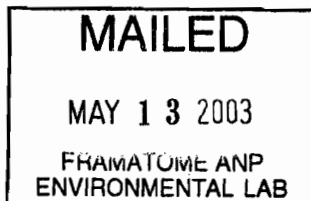
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	9.55E-01 +/- 2.1E-02	5.2E-02	7.3E-02		bc
Ag-108m	5.1E-03 +/- 4.3E-03	4.3E-03	1.4E-02		
Ag-110m	-3E-04 +/- 7.1E-03	7.1E-03	2.4E-02		
Ba-140	-4E-02 +/- 1.7E-01	1.7E-01	5.9E-01		
Be-7	-1.69E-01 +/- 7.6E-02	7.6E-02	2.6E-01		
Ce-141	4.9E-02 +/- 2.0E-02	2.0E-02	6.6E-02		
Ce-144	1E-03 +/- 3.5E-02	3.5E-02	1.2E-01		
Co-57	-2.6E-03 +/- 5.1E-03	5.1E-03	2.4E-02		
Co-58	-1.26E-02 +/- 7.0E-03	7.0E-03	2.4E-02		
Co-60	2.244E-01 +/- 6.8E-03	1.3E-02	1.9E-02	3.8E-02	bc
Cr-51	6E-02 +/- 1.1E-01	1.1E-01	3.8E-01		
Cs-134	8E-03 +/- 1.8E-02	1.8E-02	6.1E-02		
Cs-137	2.122E-01 +/- 8.7E-03	1.4E-02	2.1E-02	1.1E+00	bc
Fe-59	-6.9E-02 +/- 2.0E-02	2.0E-02	7.1E-02		
I-131	-9E-02 +/- 1.8E-01	1.8E-01	6.0E-01		
K-40	1.254E+01 +/- 1.8E-01	6.5E-01	1.9E-01		bc
La-140	2.46E-01 +/- 9.2E-02	9.3E-02	3.0E-01		
Mn-54	4.8E-03 +/- 6.3E-03	6.3E-03	2.1E-02		
Nb-95	-1.44E-01 +/- 1.6E-02	1.7E-02	5.7E-02		
Ru-103	-8E-03 +/- 1.0E-02	1.0E-02	3.5E-02		
Ru-106	-2.8E-02 +/- 5.0E-02	5.0E-02	1.7E-01		
Sb-124	-1.6E-02 +/- 1.1E-02	1.1E-02	4.2E-02		
Sb-125	-1.9E-02 +/- 1.3E-02	1.3E-02	4.6E-02		
Se-75	1.9E-03 +/- 8.3E-03	8.3E-03	2.8E-02		
Zn-65	-5E-03 +/- 2.5E-02	2.5E-02	8.4E-02		
Zr-95	1E-01 +/- 6.6E-02	6.6E-02	2.2E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/12/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/23/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-14 Client ID BMS-AO300-14
Reference Date 03/21/03 Analysis Date 04/21/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	9.77E-01 +/- 3.2E-02	5.8E-02	1.1E-01		bc
Ag-108m	1.7E-03 +/- 6.3E-03	6.3E-03	2.1E-02		
Ag-110m	1.4E-02 +/- 1.1E-02	1.1E-02	3.6E-02		
Ba-140	4E-01 +/- 1.5E-01	1.5E-01	5.3E-01		
Be-7	9.6E-02 +/- 8.7E-02	8.7E-02	2.9E-01		
Ce-141	2E-02 +/- 3.1E-02	3.1E-02	1.0E-01		
Ce-144	5E-03 +/- 5.4E-02	5.4E-02	1.8E-01		
Co-57	4E-03 +/- 6.9E-03	6.9E-03	2.3E-02		
Co-58	4.8E-03 +/- 9.0E-03	9.0E-03	3.2E-02		
Co-60	3.9E-03 +/- 8.3E-03	8.3E-03	2.9E-02	3.8E-02	
Cr-51	7E-02 +/- 1.3E-01	1.3E-01	4.4E-01		
Cs-134	2.32E-02 +/- 7.8E-03	7.9E-03	2.8E-02		
Cs-137	4.18E-02 +/- 9.6E-03	9.8E-03	3.0E-02	1.1E+00	bc
Fe-59	1.8E-02 +/- 2.4E-02	2.4E-02	8.6E-02		
I-131	4E-02 +/- 1.0E-01	1.0E-01	3.6E-01		
K-40	1.552E+01 +/- 3.0E-01	8.3E-01	2.8E-01		bc
La-140	7E-03 +/- 6.8E-02	6.8E-02	2.3E-01		
Mn-54	1.3E-02 +/- 8.2E-03	8.3E-03	2.9E-02		
Nb-95	6E-03 +/- 2.1E-02	2.1E-02	7.1E-02		
Ru-103	2E-02 +/- 1.3E-02	1.3E-02	4.5E-02		
Ru-106	3E-03 +/- 7.3E-02	7.3E-02	2.5E-01		
Sb-124	4E-03 +/- 1.5E-02	1.5E-02	5.2E-02		
Sb-125	1E-02 +/- 2.0E-02	2.0E-02	6.9E-02		
Se-75	3E-03 +/- 1.1E-02	1.1E-02	3.9E-02		
Zn-65	2.6E-02 +/- 3.7E-02	3.7E-02	1.3E-01		
Zr-95	6.2E+00 +/- 2.1E+00	2.1E+00	6.8E+00		

- Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

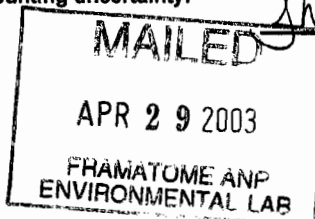
Approved by

J.M. Raimondi 4/24/03

J.M. Raimondi
Sample Control Manager

Reporting Level Ratio:

c:



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-15 Client ID BMS-AO300-15
Reference Date 03/21/03 Analysis Date 04/23/03

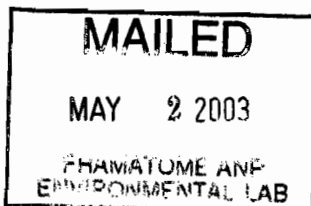
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	6.79E-01 +/- 3.2E-02	4.6E-02	1.2E-01		bc
Ag-108m	-1.15E-02 +/- 8.7E-03	8.7E-03	3.0E-02		
Ag-110m	-1.9E-02 +/- 1.1E-02	1.1E-02	3.8E-02		
Ba-140	-3.7E-01 +/- 1.8E-01	1.9E-01	6.5E-01		
Be-7	-5E-02 +/- 1.2E-01	1.2E-01	4.0E-01		
Ce-141	8.2E-02 +/- 3.8E-02	3.8E-02	1.2E-01		
Ce-144	-3.4E-02 +/- 5.7E-02	5.7E-02	1.9E-01		
Co-57	-1.17E-02 +/- 7.1E-03	7.1E-03	2.4E-02		
Co-58	-1.8E-02 +/- 1.0E-02	1.0E-02	3.6E-02		
Co-60	6.86E-01 +/- 1.4E-02	3.7E-02	2.7E-02	3.8E-02	bc
Cr-51	4E-02 +/- 1.6E-01	1.6E-01	5.3E-01		
Cs-134	3.5E-03 +/- 8.4E-03	8.4E-03	2.8E-02		
Cs-137	3.736E+00 +/- 3.8E-02	1.9E-01	3.3E-02	1.1E+00	bc
Fe-59	-5E-02 +/- 2.6E-02	2.6E-02	9.4E-02		
I-131	-2.7E-01 +/- 1.6E-01	1.6E-01	5.4E-01		
K-40	1.414E+01 +/- 2.7E-01	7.6E-01	2.6E-01		bc
La-140	1.62E-01 +/- 9.5E-02	9.6E-02	3.1E-01		
Mn-54	4.1E-03 +/- 8.0E-03	8.0E-03	2.7E-02		
Nb-95	-1.9E-02 +/- 1.5E-02	1.5E-02	5.4E-02		
Ru-103	-8E-03 +/- 1.6E-02	1.6E-02	5.5E-02		
Ru-106	1.54E-01 +/- 7.9E-02	8.0E-02	2.6E-01		
Sb-124	-8E-03 +/- 1.3E-02	1.3E-02	5.0E-02		
Sb-125	2.1E-02 +/- 2.7E-02	2.7E-02	9.1E-02		
Se-75	-2.2E-02 +/- 1.4E-02	1.4E-02	4.7E-02		
Zn-65	-1.3E-02 +/- 3.5E-02	3.5E-02	1.2E-01		
Zr-95	-2.7E-02 +/- 3.5E-02	3.5E-02	1.2E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/2/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/29/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-16 Client ID BMS-AO300-16
Reference Date 03/21/03 Analysis Date 04/23/03

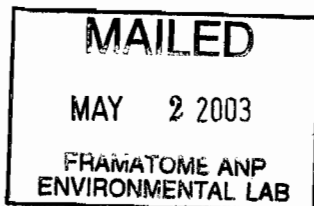
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	6.25E-01 +/- 3.2E-02	4.4E-02	1.2E-01		bc
Ag-108m	1.14E-02 +/- 7.4E-03	7.4E-03	2.4E-02		
Ag-110m	2.2E-02 +/- 1.2E-02	1.2E-02	4.1E-02		
Ba-140	6E-02 +/- 1.5E-01	1.5E-01	5.1E-01		
Be-7	9E-02 +/- 1.0E-01	1.0E-01	3.4E-01		
Ce-141	2.6E-02 +/- 2.3E-02	2.3E-02	7.5E-02		
Ce-144	-1E-02 +/- 5.4E-02	5.4E-02	1.8E-01		
Co-57	-1.3E-03 +/- 6.7E-03	6.7E-03	2.3E-02		
Co-58	-1.6E-02 +/- 1.1E-02	1.1E-02	3.8E-02		
Co-60	1.44E+00 +/- 1.9E-02	7.4E-02	2.5E-02	3.8E-02	bc
Cr-51	-3E-02 +/- 1.5E-01	1.5E-01	5.0E-01		
Cs-134	4.3E-02 +/- 2.5E-02	2.5E-02	8.3E-02		
Cs-137	8.17E-01 +/- 1.9E-02	4.5E-02	3.4E-02	1.1E+00	bc
Fe-59	-4E-02 +/- 2.9E-02	2.9E-02	1.0E-01		
I-131	1E-02 +/- 1.4E-01	1.4E-01	4.6E-01		
K-40	1.189E+01 +/- 2.4E-01	6.4E-01	2.2E-01		bc
La-140	5.4E-02 +/- 8.8E-02	8.8E-02	3.0E-01		
Mn-54	-4.2E-03 +/- 8.7E-03	8.7E-03	3.0E-02		
Nb-95	-1.9E-02 +/- 1.5E-02	1.5E-02	7.4E-02		
Ru-103	-2.1E-02 +/- 1.3E-02	1.3E-02	4.4E-02		
Ru-106	-7.9E-02 +/- 7.7E-02	7.7E-02	2.7E-01		
Sb-124	-1.4E-02 +/- 1.6E-02	1.6E-02	5.8E-02		
Sb-125	3.6E-02 +/- 2.3E-02	2.3E-02	7.7E-02		
Se-75	-2.2E-02 +/- 1.2E-02	1.2E-02	4.0E-02		
Zn-65	1.3E-02 +/- 3.8E-02	3.8E-02	1.3E-01		
Zr-95	-6.8E+00 +/- 2.4E+00	2.4E+00	7.9E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/2/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 04/30/03
Receipt Date 03/21/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5187-17 Client ID BMS-AO300-17
Reference Date 03/21/03 Analysis Date 04/28/03

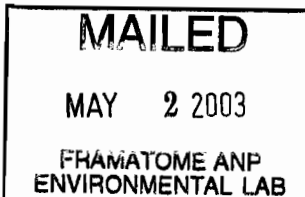
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	6.95E-01 +/- 4.5E-02	5.7E-02	1.6E-01		bc
Ag-108m	-3.3E-02 +/- 1.3E-02	1.3E-02	4.4E-02		
Ag-110m	1.2E-02 +/- 1.6E-02	1.6E-02	5.5E-02		
Ba-140	8E-02 +/- 3.2E-01	3.2E-01	1.1E+00		
Be-7	-1.2E-01 +/- 1.8E-01	1.8E-01	6.3E-01		
Ce-141	2.6E-02 +/- 4.1E-02	4.1E-02	1.4E-01		
Ce-144	3.8E-02 +/- 7.5E-02	7.5E-02	2.5E-01		
Co-57	-7E-04 +/- 9.8E-03	9.8E-03	3.3E-02		
Co-58	8E-03 +/- 1.5E-02	1.5E-02	5.1E-02		
Co-60	1.072E+00 +/- 2.3E-02	5.8E-02	3.7E-02	3.8E-02	bc
Cr-51	2.9E-01 +/- 2.4E-01	2.4E-01	7.9E-01		
Cs-134	-8E-03 +/- 1.1E-02	1.1E-02	3.9E-02		
Cs-137	2.835E+00 +/- 4.4E-02	1.5E-01	4.7E-02	1.1E+00	bc
Fe-59	-7.3E-02 +/- 4.2E-02	4.2E-02	1.5E-01		
I-131	-3.8E-01 +/- 3.2E-01	3.2E-01	1.1E+00		
K-40	1.33E+01 +/- 3.4E-01	7.5E-01	3.2E-01		bc
La-140	1.6E-01 +/- 1.9E-01	1.9E-01	6.4E-01		
Mn-54	3.5E-02 +/- 1.2E-02	1.2E-02	3.9E-02		
Nb-95	-3.1E-02 +/- 3.3E-02	3.3E-02	1.1E-01		
Ru-103	2.3E-02 +/- 2.3E-02	2.3E-02	7.6E-02		
Ru-106	-1.7E-01 +/- 1.1E-01	1.1E-01	3.9E-01		
Sb-124	-2.7E-02 +/- 1.7E-02	1.7E-02	7.3E-02		
Sb-125	7E-03 +/- 3.5E-02	3.5E-02	1.2E-01		
Se-75	-3E-02 +/- 1.9E-02	1.9E-02	6.6E-02		
Zn-65	1.4E-02 +/- 5.4E-02	5.4E-02	1.8E-01		
Zr-95	-9.2E-02 +/- 5.0E-02	5.0E-02	1.8E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/2/03
J.M. Raimondi
Sample Control Manager

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-01 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-1
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137, 1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 632.4 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/23/03 1128 Det No.: 4 Spectrum No.: 1134709
Counted by: ES
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-01 Product : GAMMA SPECTROMETRY
Client Id : BMS-AO300-1 Matrix : SO01 Soil
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	632.4		
Sample Weight-Dry	g			
Aliquot Weight	g	632.4		
FINAL WEIGHT	kg	.6324		
Container			WT5S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-01 analyzed by emml461 on 04/23/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-01 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1134704

Sampling Start: 03/21/2003 12:00:00 ✓ Counting Start: 04/23/2003 11:28:01
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.91E+002 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 12273 Sec
Sample Size 6.32E-001 kg ✓ Real Time 12276 Sec
Collection Efficiency 1.0000 | Spc. File 1134704.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.35 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.20	93.49	81	19	28	214	0.49	a
2	63.49	95.43	155	21	28	214	0.52	b
3	72.78	109.47	66	19	29	236	0.50	a
4	74.86	112.62	367	34	46	472	0.83	b
5	77.11	116.03	544	36	46	472	0.92	c
6	83.96	126.38	67	23	35	294	0.61	a
7	87.22	131.30	233	37	56	587	1.21	b
8	89.95	135.42	133	20	27	196	0.51	c
9	92.75	139.66	373	39	56	587	1.34	d
10	98.48	148.32	31	22	35	294	0.57	e NET< CL
11	129.19	194.74	-20	37	61	626	0.42	NET< CL
12	143.95	217.04	-1	30	49	448	0.03	NET< CL
13	153.77	231.89	72	34	54	497	1.95	Wide Pk
14	185.78	280.28	173	33	50	426	1.26	
15	209.17	315.63	76	31	48	397	0.80	
16	238.66	360.21	955	37	35	243	1.04	a
17	241.52	364.52	200	28	40	292	1.36	b
18	270.10	407.72	72	31	48	345	1.33	
19	295.24	445.71	267	24	29	170	0.99	a
20	300.17	453.17	38	16	25	136	0.96	b
21	327.65	494.71	17	20	32	192	0.48	NET< CL
22	338.46	511.04	182	25	34	202	1.23	
23	351.96	531.44	497	32	37	217	1.36	
24	463.10	699.43	60	19	29	133	1.26	
25	510.82	771.56	283	26	33	153	1.92	Wide Pk
26	583.28	881.08	301	24	27	105	1.39	
27	609.40	920.56	350	25	28	121	1.60	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	727.13	1098.51	84	18	26	95	1.83	
29	794.96	1201.03	36	15	23	85	1.36	
30	911.52	1377.21	184	20	23	89	1.68	
31	964.77	1457.69	44	12	16	50	1.69	a
32	969.14	1464.31	131	15	16	50	1.68	b
33	1120.50	1693.08	93	16	21	74	1.62	
34	1190.32	1798.61	18	16	26	100	1.75	NET< CL
35	1461.07	2207.84	1394	38	11	20	2.06	
36	1765.21	2667.55	68	10	10	14	2.35	
37	2104.45	3180.29	22	8	10	18	4.71	Wide Pk
38	2614.83	3951.72	114	11	6	5	2.23	

L5187-01 analyzed by emml461 on 04/23/2003

SEEKER' B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File:. EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.20	81	19	28	14	20	32	NET<CL
3	72.78	66	19	29	43	20	31	
5	77.11	544	36	46	517	37	47	
6	83.96	67	23	35	47	23	36	
7	87.22	233	38	56	221	38	57	
8	89.95	133	20	27	115	20	28	
9	92.75	373	39	56	237	40	60	
12	143.95	-1	30	49	-17	30	50	NET<CL
14	185.78	173	33	50	104	33	52	
16	238.66	955	37	35	900	38	37	
17	241.52	200	28	40	186	28	41	
18	270.10	72	31	48	67	31	49	
19	295.24	267	24	29	251	24	30	
20	300.17	38	16	25	32	17	26	
22	338.46	182	25	34	177	25	35	
23	351.96	497	32	37	461	32	39	
24	463.10	60	19	29	57	19	29	
25	510.82	283	26	33	108	27	40	
26	583.28	301	24	27	281	24	28	
27	609.40	350	25	28	331	25	29	
28	727.13	84	18	26	81	18	27	
30	911.52	184	20	23	175	20	24	
32	969.14	131	15	16	129	15	17	
33	1120.50	93	16	21	90	16	22	
35	1461.07	1394	38	11	1376	38	13	
36	1765.21	68	10	10	63	10	10	
38	2614.83	114	11	6	100	11	9	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	63.49	155	Th-234	97	2 of 2	100.00	1.50	
3	72.78	43	Tl-208	13	6 of 9	91.69	1.42	
4	74.86	367	Pb-212	222	5 of 6	100.00	1.00	
			Pb-214	106	5 of 7	97.33	0.97	
			Tl-208	24	6 of 9	91.04	0.91	
5	77.11	127	Pb-214	189	5 of 7	98.65	0.99	Split
42	77.11	390	Pb-212	390	5 of 6	100.00	1.00	AutoAdd
6	83.96	47	Tl-208	12	6 of 9	91.69	1.42	
7	87.22	10	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
41	87.22	211	Pb-212	211	5 of 6	100.00	1.50	AutoAdd
8	89.95	115	Cd-109	. . . . .	1 of 1	100.00	1.50	
9	92.75	237	Th-234	377	2 of 2	100.00	1.50	
			AcTh-228	92	10 of 36	77.90	0.78	
13	153.77	72	AcTh-228	24	10 of 36	77.90	1.28	
14	185.78	104	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
15	209.17	76	AcTh-228	97	10 of 36	93.20	1.43	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
16	238.66	900	Pb-212	1177	5 of 6	100.00	1.00	
17	241.52	186	Pb-214	120	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
18	270.10	67	AcTh-228	66	10 of 36	85.92	1.36	
19	295.24	251	Pb-214	411	5 of 7	100.00	1.50	
20	300.17	32	Pb-212	61	5 of 6	100.00	1.50	
22	338.46	177	AcTh-228	174	10 of 36	85.92	1.36	
23	351.96	461	Pb-214	696	5 of 7	100.00	1.50	
24	463.10	4	Sb-125	. . . . .	1 of 8	13.67	0.64	Split
40	463.10	53	AcTh-228	53	10 of 36	84.51	1.35	AutoAdd
25	510.82	27	Annul	. . . . .	1 of 1	100.00	1.50	Split
39	510.82	80	Tl-208	80	6 of 9	91.69	1.42	AutoAdd
26	583.28	281	Tl-208	294	6 of 9	91.69	1.42	
27	609.40	331	Bi-214	438	3 of 33	77.60	1.28	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
28	727.13	81	Bi-212	. . . . .	1 of 13	81.10	0.81	
29	794.96	36	AcTh-228	36	10 of 36	85.92	1.36	
			Cs-134	. . . . .	1 of 9	46.67	0.97	
30	911.52	175	AcTh-228	209	10 of 36	91.28	1.41	
31	964.77	44	AcTh-228	35	10 of 36	84.51	1.35	
32	969.14	129	AcTh-228	106	10 of 36	84.51	1.35	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
33	1120.50	90	Bi-214	69	3 of 33	71.64	1.22	
35	1461.07	1376	K-40	. . . . .	1 of 1	100.00	1.50	
36	1765.21	63	Bi-214	50	3 of 33	73.06	1.23	
37	2104.45	22	2615SEsc	. . . . .	0 of 0	. . . .	0.50	
38	2614.83	100	Tl-208	105	6 of 9	91.69	1.42	

L5187-01 analyzed by emml461 on 04/23/2003

SEEKER' FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-01

Sample ID: SOIL/SEDI Duratek Inc

Code: 1134704

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 11:28:01
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.91e+002 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 12273 Sec
Sample Size 6.32e-001 kg | Real Time 12276 Sec
Collection Efficiency 1.0000 | Spectrum File 1134704.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 4 (Canberra sn 10923050 det#4)
Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
Eff.=1/[1.58E-02*En^-3.09E+00 + 2.56E+02*En^7.93E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: L5187-01.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Th-234	Average:x	1.18E+03 +- 1.28E+02		*
	63.29	1.55E+03 +- 2.10E+02	5.82E+02		+	. . . . .
	92.59	9.69E+02 +- 1.62E+02	5.02E+02		+	. . . . .
Tl-208	Average:x	5.38E+02 +- 3.65E+01	. . . . .		*	. . . . .
	72.80	I.D.	. . . . .			. . . . .
	84.90	I.D.	. . . . .			. . . . .
	510.84	I.D.	. . . . .			. . . . .
	583.14	5.40E+02 +- 4.58E+01	1.12E+02		+	. . . . .
	2614.66	5.34E+02 +- 6.02E+01	1.06E+02		+	. . . . .
Pb-212	Average:x	5.82E+02 +- 2.43E+01	. . . . .		*	. . . . .
	74.81	I.D.	. . . . .			. . . . .
	77.12	I.D.	. . . . .			. . . . .
	87.30	I.D.	. . . . .			. . . . .
	238.63	5.88E+02 +- 2.45E+01	5.04E+01		+	. . . . .
	300.09	3.25E+02 +- 1.68E+02	5.49E+02		+	. . . . .
Pb-214	Average:x	4.84E+02 +- 2.57E+01	. . . . .		*	. . . . .
	77.11	I.D.	. . . . .			. . . . .
	241.98	7.31E+02 +- 1.10E+02	3.29E+02		+	. . . . .
	295.21	4.46E+02 +- 4.30E+01	1.12E+02		+	. . . . .
	351.92	4.85E+02 +- 3.34E+01	8.41E+01		+	. . . . .
Cd-109	88.03	I.D.	. . . . .			. . . . .
AcTh-228	Average:x	5.80E+02 +- 3.81E+01	. . . . .		*	. . . . .
	154.20	1.76E+03 +- 8.28E+02	2.70E+03		+	. . . . .
	209.28	4.59E+02 +- 1.84E+02	5.96E+02		+	. . . . .
	270.23	5.89E+02 +- 2.72E+02	8.88E+02		+	. . . . .
	338.32	5.87E+02 +- 8.32E+01	2.41E+02		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
Ra-226	463.00	5.80E+02 +- 3.05E+02	9.98E+02		+	.	.
	794.70	5.81E+02 +- 2.43E+02	7.77E+02		+	.	.
	911.07	5.21E+02 +- 5.87E+01	1.51E+02		++	.	.
	964.60	7.26E+02 +- 1.99E+02	5.92E+02		++	.	.
	969.11	6.73E+02 +- 8.01E+01	1.91E+02		++	.	.
Sb-125	186.22	7.75E+02 +- 2.49E+02	8.01E+02		++	.	.
Sb-125	Average:x	1.35E+01 +- 2.49E+01	.		.	.	.
	463.38	1.82E+01 +- 1.62E+02	5.46E+02		.	.	.
	427.89	N-1.43E+01 +- 2.52E+01	8.85E+01		x	.	.
Annil	511.00	1.53E+01 +- 2.59E+01	8.63E+01		+	.	.
Bi-214	Average:x	4.56E+02 +- 2.96E+01	.		*	.	.
	609.31	4.30E+02 +- 3.29E+01	7.89E+01		++	.	.
	1120.29	5.83E+02 +- 1.05E+02	2.96E+02		++	.	.
	1764.49	5.61E+02 +- 8.98E+01	2.07E+02		++	.	.
Bi-212	727.17	4.73E+02 +- 1.08E+02	3.27E+02		++	.	.
K-40	1460.81	1.55E+04 +- 4.28E+02	3.31E+02		++	.	.
Am-241	59.54	N 4.50E+01 +- 3.57E+01	1.18E+021		x	lbase	.
Co-57	122.06	N-1.71E+01 +- 7.12E+00	2.51E+01		x	.	.
Ce-144	133.54	N 1.12E+02 +- 5.85E+01	1.91E+02		x	.	.
Ce-141	145.44	N 2.54E+01 +- 2.36E+01	7.84E+01		x	.	.
Se-75	264.65	N-1.37E+01 +- 1.17E+01	4.15E+011		x	lbase	.
Cr-51	320.08	N-7.60E+01 +- 1.56E+02	5.44E+02		x	.	.
I-131	364.48	N 7.68E+01 +- 1.45E+02	4.91E+02		x	.	.
Ag-108m	433.93	N 5.12E-01 +- 7.95E+00	2.75E+01		x	.	.
Be-7	477.59	N-1.10E+02 +- 1.05E+02	3.77E+02		x	.	.
La-140	487.03	N-1.99E+01 +- 9.12E+01	3.20E+02		x	.	.
Ru-103	497.08	N-1.13E+01 +- 1.33E+01	4.80E+01		x	.	.
Ba-140	537.32	N 2.09E+02 +- 1.60E+02	5.33E+02		x	.	.
Cs-134	604.70	N 7.05E+00 +- 9.71E+00	3.29E+011		x	lbase	.
Ru-106	621.84	N 7.41E+01 +- 9.53E+01	3.23E+02		x	.	.
Cs-137	661.65	N 2.02E+00 +- 1.08E+01	3.74E+01		x	Y.	.
Zr-95	724.18	N-9.93E+01 +- 4.71E+01	1.76E+02L		x	LHROI	.
Nb-95	765.79	N-3.61E+01 +- 1.74E+01	6.57E+01		x	.	.
Co-58	810.76	N-5.38E+00 +- 1.23E+01	4.41E+01		x	.	.
Mn-54	834.83	N-1.48E+01 +- 8.98E+00	3.40E+01		x	.	.
Ag-110m	884.67	N-6.10E+00 +- 1.52E+01	5.41E+01		x	.	.
Fe-59	1099.22	N 0.00E+00 +- 3.24E+01	1.14E+02		x	.	.
Zn-65	1115.52	N 2.14E+01 +- 4.80E+01	1.62E+02P		x	PIC	.
Co-60	1332.49	N 7.22E+00 +- 9.85E+00	3.41E+01		x	Y.	.
Sb-124	1691.02	N 6.45E+01 +- 2.21E+01	6.06E+01		x	.	.

MEASURED TOTAL: 2.06E+04 +- 1.09E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.20	93.49	14	20	32	214	0.49	Deleted
10	98.48	148.32	31	22	35	294	0.57	Deleted
11	129.19	194.74	-21	37	61	627	0.42	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	143.95	217.04	-17	30	50	448	0.03	Deleted
21	327.65	494.71	17	20	32	192	0.48	Deleted
34	1190.32	1798.61	19	16	26	101	1.75	Deleted
37	2104.45	3180.29	22	8	10	18	4.71	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
43	59.54	89.46	37N	30	48	457	0.98	NET< CL LBase
44	122.06	183.96	-66N	27	47	443	1.04	NET< CL
45	133.54	201.31	54N	28	44	398	1.05	
46	145.44	219.30	28N	26	42	362	1.06	NET< CL
47	264.65	399.48	-22N	18	31	198	1.17	NET< CL LBase
48	320.08	483.26	-9N	19	31	176	1.21	NET< CL
49	364.48	550.37	9N	17	27	139	1.25	NET< CL
50	427.89	646.22	-9N	16	27	130	1.30	NET< CL
51	433.93	655.35	1N	16	25	120	1.30	NET< CL
52	477.59	721.34	-15N	14	24	110	1.34	NET< CL
53	487.03	735.60	-3N	14	23	96	1.34	NET< CL
54	497.08	750.79	-11N	13	22	89	1.35	NET< CL
55	537.32	811.62	16N	12	19	67	1.38	NET< CL
56	604.70	913.46	11N	15	25	104	1.43	NET< CL LBase
57	621.84	939.37	11N	14	23	90	1.44	NET< CL
58	661.65	999.54	3N	14	23	93	1.47	NET< CL
59	724.18	1094.05	-44N	21	38	112	1.52	NET< CL LHRoi
60	765.79	1156.94	-26N	13	22	98	1.55	NET< CL
61	810.76	1224.91	-5N	12	20	76	1.58	NET< CL
62	834.83	1261.30	-18N	11	19	72	1.60	NET< CL
63	884.67	1336.63	-5N	12	21	80	1.64	NET< CL
64	1099.22	1660.92	0N	11	19	65	1.79	NET< CL
65	1115.52	1685.55	10N	23	37	134	1.80	NET< CL PIC
66	1332.49	2013.50	6N	9	14	33	1.95	NET< CL
67	1691.02	2555.41	16N	5	6	7	2.20	

L5187-01 analyzed by emml461 on 04/23/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 11:28:01
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.91E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 12273 Sec
Sample Size 6.32E-01 kg | Real Time 12276 Sec
Collection Efficiency 1.0000 | Spectrum File 1134704.spc

Detector #: 4

Energy(keV)= 0.35 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
Eff.=1/[1.58e-02*En^-3.09e+00 + 2.56e+02*En^ 7.93e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5187-01.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	1.18E+03	1.28E+02	< 5.02E+02	2.46E+02	9.99E-01	MEAS +	YES
Tl-208	5.38E+02	3.65E+01	< 1.06E+02	4.59E+01	1.00E+00	MEAS +	YES
Pb-212	5.82E+02	2.43E+01	< 5.04E+01	2.43E+01	9.98E-01	MEAS +	YES
Pb-214	4.84E+02	2.57E+01	< 8.41E+01	4.06E+01	9.99E-01	MEAS +	YES
AcTh-228	5.80E+02	3.81E+01	< 1.51E+02	7.16E+01	1.00E+00	MEAS +	YES
Ra-226	7.75E+02	2.49E+02	< 8.01E+02	3.90E+02	1.00E+00	MEAS +	YES
Sb-125	-1.35E+01	2.49E+01	< 8.85E+01	4.21E+01	9.78E-01	MEAS +	YES
Annil	1.53E+01	2.59E+01	< 8.62E+01	4.24E+01	9.39E-01	MEAS +	YES
Bi-214	4.56E+02	2.96E+01	< 7.89E+01	3.77E+01	9.99E-01	MEAS +	YES
Bi-212	4.73E+02	1.08E+02	< 3.27E+02	1.56E+02	1.00E+00	MEAS +	YES
K-40	1.55E+04	4.28E+02	< 3.31E+02	1.50E+02	1.00E+00	MEAS +	YES
Am-241	4.50E+01	3.57E+01	< 1.18E+02	5.74E+01	1.00E+00	NET	YES
Co-57	-1.71E+01	7.12E+00	< 2.51E+01	1.22E+01	9.19E-01	NET	YES
Ce-144	1.12E+02	5.85E+01	< 1.91E+02	9.29E+01	9.23E-01	NET	YES
Ce-141	2.54E+01	2.36E+01	< 7.84E+01	3.80E+01	4.94E-01	NET	YES
Se-75	-1.37E+01	1.17E+01	< 4.15E+01	1.99E+01	8.26E-01	NET	YES
Cr-51	-7.59E+01	1.56E+02	< 5.44E+02	2.60E+02	4.38E-01	NET	YES
I-131	7.68E+01	1.45E+02	< 4.91E+02	2.34E+02	5.79E-02	NET	YES
Ag-108m	5.12E-01	7.95E+00	< 2.75E+01	1.31E+01	9.99E-01	NET	YES
Be-7	-1.10E+02	1.05E+02	< 3.77E+02	1.78E+02	6.51E-01	NET	YES
La-140	-1.99E+01	9.12E+01	< 3.20E+02	1.51E+02	1.67E-01	NET	YES
Ru-103	-1.13E+01	1.33E+01	< 4.80E+01	2.26E+01	5.59E-01	NET	YES
Ba-140	2.09E+02	1.60E+02	< 5.33E+02	2.49E+02	1.67E-01	NET	YES
Cs-134	7.05E+00	9.71E+00	< 3.29E+01	1.56E+01	9.70E-01	NET	YES
Ru-106	7.42E+01	9.53E+01	< 3.23E+02	1.52E+02	9.40E-01	NET	YES
Cs-137	2.02E+00	1.08E+01	< 3.74E+01	1.77E+01	9.98E-01	NET	YES
Zr-95	-9.93E+01	4.71E+01	< 1.76E+02	8.49E+01	6.99E-01	NET	YES
Nb-95	-3.61E+01	1.74E+01	< 6.57E+01	3.10E+01	5.20E-01	NET	YES
Co-58	-5.38E+00	1.23E+01	< 4.41E+01	2.06E+01	7.24E-01	NET	YES
Mn-54	-1.48E+01	8.98E+00	< 3.40E+01	1.59E+01	9.29E-01	NET	YES
Ag-110m	-6.10E+00	1.52E+01	< 5.41E+01	2.54E+01	9.12E-01	NET	YES
Fe-59	0.00E+00	3.24E+01	< 1.14E+02	5.32E+01	5.99E-01	NET	YES
Zn-65	2.14E+01	4.80E+01	< 1.62E+02	7.81E+01	9.10E-01	NET	YES

L5187-01 analyzed by emm1461 on 04/23/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	7.22E+00	9.85E+00	< 3.41E+01	1.55E+01	9.88E-01	NET	YES
Sb-124	6.45E+01	2.21E+01	< 6.06E+01	2.48E+01	6.84E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-02
Client: Duratek Inc
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-2
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

Count by Date: _____
(if required)
Delay Date: _____
(if required)

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG 5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 710.9 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/23/03 1129
Counted by: [Signature]

Det No.: 5

Spectrum No.: 1134708

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-02
Client Id : BMS-A0300-2
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	710.9		
Sample Weight-Dry	g			
Aliquot Weight	g	710.9		
FINAL WEIGHT	kg	.7109		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory

Environmental Gamma Isotopic Analysis

LSN: L5187-02 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1134705

Sampling Start:	03/21/2003 12:00:00	Counting Start:	04/23/2003 11:28:37
Sampling Stop:	03/21/2003 12:00:00	Decay Time	7.91E+002 Hrs
Buildup Time	0.00E+000 Hrs	Live Time	12398 Sec
Sample Size	7.11E-001 kg	Real Time	12410 Sec
Collection Efficiency	1.0000	Sp. File . . . . .	.1134705.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Energy (keV) = 0.50 + 0.661*Ch + 1.43E-07*Ch^2 + 0.00E+00*Ch^3 04/23/2003

FWHM (keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003

Where $E_n = \text{Sqrt}(\text{Energy in keV})$

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	64.12	96.24	75	26	40	351	0.83	a
2	67.27	101.00	20	20	33	263	0.57	b NET< CL
3	75.43	113.34	290	41	62	649	1.46	a
4	77.65	116.70	371	35	48	463	1.09	b
5	87.56	131.70	103	41	66	735	1.06	
6	93.43	140.57	47	31	50	508	1.07	a NET< CL
7	99.66	150.00	3	21	35	304	0.59	b NET< CL
8	106.27	160.00	14	22	35	304	0.58	c NET< CL
9	122.37	184.35	0	39	64	645	0.01	NET< CL
10	129.07	194.48	32	20	31	244	0.60	a
11	130.35	196.42	34	20	31	244	0.66	b
12	154.69	233.24	-24	37	61	589	1.05	NET< CL
13	186.64	281.55	256	36	54	456	1.84	Wide Pk
14	210.52	317.68	66	33	53	444	1.03	
15	239.20	361.05	783	36	37	271	1.05	a HiResid
16	241.94	365.20	185	35	52	433	1.69	b HiResid
17	270.77	408.80	93	29	45	321	1.10	
18	277.97	419.70	75	31	49	348	1.40	
19	295.71	446.53	276	27	34	217	1.24	a
20	300.75	454.15	61	34	55	398	2.37	b Wide Pk
21	327.46	494.54	24	13	20	95	0.67	a
22	328.85	496.64	41	18	28	158	0.99	b
23	338.79	511.68	101	27	42	276	0.87	
24	352.43	532.30	466	32	38	228	1.36	
25	464.06	701.12	18	20	33	172	0.47	NET< CL
26	511.59	773.01	366	29	36	187	1.99	
27	529.51	800.10	11	17	28	125	0.46	NET< CL
28	583.76	882.13	286	25	29	128	1.50	

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
29	609.77	921.46	424	28	32	148	1.63	
30	727.83	1099.98	58	17	26	115	1.49	
31	795.81	1202.76	27	14	21	89	1.54	a
32	803.50	1214.38	17	11	17	64	0.99	b
33	860.99	1301.31	19	16	26	109	0.91	NET< CL
34	911.83	1378.17	228	21	23	88	1.64	
35	969.77	1465.77	100	18	25	112	1.66	
36	1121.21	1694.69	72	19	28	125	1.19	
37	1239.14	1872.94	58	18	27	116	1.26	
38	1378.48	2083.55	3	10	17	48	0.46	NET< CL
39	1461.53	2209.06	2016	46	16	43	2.00	
40	1765.31	2668.12	68	11	12	24	3.02	
41	2615.26	3952.01	139	13	7	9	2.67	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File:. EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	64.12	75	26	40	41	26	41	NET<CL
2	67.27	20	20	33	13	21	33	NET<CL
3	75.43	290	41	62	261	42	63	
4	77.65	371	35	48	354	35	49	
5	87.56	103	41	66	88	41	66	
6	93.43	47	31	50	-53	32	53	NET<CL
9	122.37	-0	39	64	-2	39	64	NET<CL
13	186.64	256	36	54	189	37	56	
14	210.52	66	33	53	58	33	53	
15	239.20	783	36	37	746	36	39	
19	295.71	276	27	34	253	27	36	
23	338.79	101	27	42	101	27	42	
24	352.43	466	32	38	420	32	40	
26	511.59	367	29	36	76	29	46	
28	583.76	286	25	29	269	25	31	
29	609.77	424	28	32	393	28	33	
30	727.83	58	17	26	54	18	26	
32	803.50	17	11	17	5	11	18	NET<CL
33	860.99	19	16	26	19	16	26	NET<CL
34	911.83	228	21	23	212	21	24	
35	969.77	101	18	25	94	19	26	
36	1121.21	72	19	28	66	19	29	
38	1378.48	3	10	17	1	11	17	NET<CL
39	1461.53	2016	46	16	1991	46	19	
40	1765.31	68	11	12	61	11	13	
41	2615.26	139	13	7	119	13	11	

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.55 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	75.43	261	Pb-212	233	5 of 6	100.00	1.50	
			Pb-214	68	5 of 7	98.65	0.99	
			Pb-212	131	5 of 6	100.00	1.00	
			Tl-208	15	5 of 9	92.43	0.92	
			Pb-212	233	5 of 6	100.00	1.50	
4	77.65	354	Pb-214	. . . . .	0 of 0	. . . . .	. . . . .
			Pb-214	123	5 of 7	100.00	1.00	
5	87.56	88	Pb-212	139	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
10	129.07	32	AcTh-228	55	8 of 36	100.00	1.50	
11	130.35	34	La-140	2	2 of 15	20.04	0.70	
			AcTh-228	55	8 of 36	100.00	1.50	Matched
13	186.64	189	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
14	210.52	58	AcTh-228	73	8 of 36	94.41	1.44	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
15	239.20	746	Pb-212	1082	5 of 6	100.00	1.00	
16	241.94	185	Pb-214	109	5 of 7	100.00	1.50	
			La-140	1	3 of 15	19.94	0.20	LowScore
17	270.77	93	AcTh-228	50	8 of 36	77.00	1.27	
18	277.97	75	Tl-208	36	5 of 9	94.53	1.45	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
			Se-75	. . . . .	1 of 5	15.66	0.66	
19	295.71	253	Pb-214	252	5 of 7	100.00	1.50	
20	300.75	61	Pb-212	52	5 of 6	100.00	1.50	
21	327.46	24	AcTh-228	41	8 of 36	100.00	1.50	
			Bi-212	1	2 of 13	59.68	1.10	
			La-140	823	3 of 15	32.04	0.82	
22	328.85	41	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			AcTh-228	41	8 of 36	81.74	1.32	Matched
			Bi-212	1	2 of 13	59.32	1.09	
			La-140	823	3 of 15	23.72	0.74	
23	338.79	101	AcTh-228	147	8 of 36	94.41	1.44	
24	352.43	420	Pb-214	468	5 of 7	100.00	1.50	
26	511.59	76	Annil	. . . . .	1 of 1	100.00	1.50	
			Tl-208	76	5 of 9	94.53	1.45	
28	583.76	269	Tl-208	277	5 of 9	94.53	1.45	
29	609.77	393	Bi-214	363	4 of 33	81.14	1.31	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
30	727.83	54	Bi-212	1294	2 of 13	100.00	1.50	
			Te-129m		1 of 2	18.72	0.19	LowScore
31	795.81	27	AcTh-228	32	8 of 36	85.01	1.35	
			Cs-134		1 of 9	46.67	0.97	
34	911.83	212	AcTh-228	145	8 of 36	79.87	1.30	
35	969.77	94	AcTh-228	102	8 of 36	81.74	1.32	
			Sb-124		1 of 13	1.04	0.01	LowScore
36	1121.21	66	Bi-214	86	4 of 33	85.47	1.35	
37	1239.14	58	Bi-214	31	4 of 33	74.35	1.24	
39	1461.53	1991	K-40		1 of 1	100.00	1.50	
40	1765.31	61	Bi-214	66	4 of 33	82.94	1.33	
41	2615.26	119	Tl-208	119	5 of 9	94.53	1.45	

Environmental Laboratory

Environmental Gamma Isotopic Analysis

LSN: L5187-02

Sample ID: SOIL/SEDI Duratek Inc

Code: 1134705

Sampling Start:	03/21/2003 12:00:00	Counting Start:	04/23/2003 11:28:37
Sampling Stop:	03/21/2003 12:00:00	Decay Time	7.91e+002 Hrs
Buildup Time	0.00e+000 Hrs	Live Time	12398 Sec
Sample Size	7.11e-001 kg	Real Time	12410 Sec
Collection Efficiency	1.0000	Spectrum File . . . . .	.1134705.spc
Type I		Type I & II	
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

$$\text{Eff.} = 1 / [5.46\text{E-}03 * \text{En}^{-3.56\text{E}+00} + 1.55\text{E}+02 * \text{En}^{6.66\text{E-}01}] \quad 02/06/1998$$

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

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LSF File: . . . . .L5187-02.LSF (SOIL/SEDI: Duratek Inc)

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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	3.11E+02 +- 1.50E+01	. . . .		*	. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	3.11E+02 +- 1.50E+01	3.33E+01		+	. . . . .
	300.09	3.85E+02 +- 2.17E+02	7.12E+02		+	. . . . .
Pb-214	Average:x	2.79E+02 +- 1.65E+01	. . . .		*	. . . . .
	77.11	I.D.	. . . .			. . . . .
	241.98	4.63E+02 +- 8.64E+01	2.68E+02		+	. . . . .
	295.21	2.79E+02 +- 2.98E+01	8.23E+01		+	. . . . .
	351.92	2.68E+02 +- 2.03E+01	5.30E+01		+	. . . . .
AcTh-228	Average:x	2.82E+02 +- 2.25E+01	. . . .		*	. . . . .
	129.08	1.66E+02 +- 1.03E+02	3.41E+02		+	. . . . .
	209.28	2.28E+02 +- 1.30E+02	4.28E+02		+	. . . . .
	270.23	5.15E+02 +- 1.61E+02	5.15E+02		+	. . . . .
	327.64	1.71E+02 +- 9.12E+01	2.97E+02		+	. . . . .
	338.32	2.04E+02 +- 5.56E+01	1.76E+02		+	. . . . .
	794.70	2.41E+02 +- 1.23E+02	4.00E+02		+	. . . . .
	911.07	3.40E+02 +- 3.33E+01	8.25E+01		+	. . . . .
	969.11	2.64E+02 +- 5.19E+01	1.53E+02		+	. . . . .
La-140	487.03	N-3.80E+01 +- 6.42E+01	2.54E+02		x	. . . . .
	131.12	I.D.	. . . .			. . . . .
Ra-226	186.22	9.29E+02 +- 1.80E+02	5.63E+02		+	. . . . .
Tl-208	Average:x	2.98E+02 +- 2.06E+01	. . . .		*	. . . . .
	277.35	6.25E+02 +- 2.56E+02	8.31E+02		+	. . . . .
	583.14	2.94E+02 +- 2.71E+01	6.99E+01		+	. . . . .
	2614.66	2.99E+02 +- 3.19E+01	6.04E+01		+	. . . . .
Annil	511.00	2.45E+01 +- 9.51E+00	3.08E+01		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Bi-214	Average:x	2.85E+02 +- 1.83E+01	. . . . .	*		. . . . .
	609.31	2.90E+02 +- 2.09E+01	5.14E+01	++		. . . . .
	1120.29	2.24E+02 +- 6.55E+01	2.05E+02	++		. . . . .
	1238.11	5.32E+02 +- 1.65E+02	5.15E+02	++		. . . . .
	1764.49	2.69E+02 +- 4.87E+01	1.26E+02	++		. . . . .
Bi-212	727.17	1.75E+02 +- 5.69E+01	1.79E+02	++		. . . . .
K-40	1460.81	1.14E+04 +- 2.63E+02	2.29E+02	++		. . . . .
Am-241	59.54 N	7.79E+00 +- 3.35E+01	1.13E+021	x	lbase	. . . . .
Co-57	122.06 N	3.55E+00 +- 5.12E+00	1.71E+01	x		. . . . .
Ce-144	133.54 N	4.87E-01 +- 3.94E+01	1.34E+02r	x	rbase	. . . . .
Ce-141	145.44 N	1.76E+01 +- 1.87E+01	6.23E+01	x		. . . . .
Se-75	264.65 N	7.60E+00 +- 8.76E+00	3.05E+011	x	lbase	. . . . .
Cr-51	320.08 N	8.82E+01 +- 9.86E+01	3.46E+02	x		. . . . .
I-131	364.48 N	1.03E+01 +- 9.63E+01	3.30E+02	x		. . . . .
Sb-125	427.89 N	1.51E+01 +- 1.52E+01	5.11E+01	x		. . . . .
Ag-108m	433.93 N	3.13E+00 +- 5.19E+00	1.76E+01	x		. . . . .
Be-7	477.59 N	1.64E+01 +- 6.95E+01	2.39E+02	x		. . . . .
Ru-103	497.08 N	2.00E-01 +- 9.71E+00	3.36E+01	x		. . . . .
Ba-140	537.32 N	6.15E+01 +- 1.19E+02	4.04E+02	x		. . . . .
Cs-134	604.70 N	8.60E+00 +- 5.66E+00	2.05E+011	x	lbase	. . . . .
Ru-106	621.84 N	6.38E+01 +- 5.45E+01	1.96E+02	x		. . . . .
Cs-137	661.65 N	2.55E+00 +- 6.06E+00	2.14E+01	x	Y.	. . . . .
Zr-95	724.18 N	1.55E+03 +- 8.67E+02	2.86E+03P	x	PIC	. . . . .
Nb-95	765.79 N	3.82E+00 +- 1.14E+01	3.99E+01	x		. . . . .
Co-58	810.76 N	4.01E+00 +- 7.72E+00	2.74E+01	x		. . . . .
Mn-54	834.83 N	6.34E+00 +- 6.40E+00	2.15E+01	x		. . . . .
Ag-110m	884.67 N	3.30E+00 +- 8.63E+00	2.98E+01	x		. . . . .
Fe-59	1099.22 N	6.53E+00 +- 1.98E+01	6.98E+01	x		. . . . .
Zn-65	1115.52 N	2.48E+01 +- 2.91E+01	9.72E+01P	x	PIC	. . . . .
Co-60	1332.49 N	6.68E+00 +- 5.80E+00	2.17E+01	x	Y.	. . . . .
Sb-124	1691.02 N	8.04E+00 +- 1.24E+01	4.83E+01	x		. . . . .

MEASURED TOTAL: 1.40E+04 +- 6.03E+02 pCi/kg 0.00E+00
NOTE: *: N/S>3 #: Net<-3R

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	64.12	96.24	41	26	41	351	0.83	Deleted
2	67.27	101.00	13	21	33	263	0.57	Deleted
6	93.43	140.57	-53	32	53	508	1.07	Deleted
7	99.66	150.00	3	21	35	305	0.59	Deleted
8	106.27	160.00	14	22	35	305	0.58	Deleted
9	122.37	184.35	-2	39	64	645	0.01	Deleted
12	154.69	233.24	-24	37	61	589	1.05	Deleted
22	328.85	496.64	41	18	28	158	0.99	Unknown
25	464.06	701.12	18	20	33	172	0.47	Deleted
27	529.51	800.10	11	17	28	125	0.46	Deleted
32	803.50	1214.38	5	11	18	64	0.99	Deleted
33	860.99	1301.31	19	16	26	109	0.91	Deleted
38	1378.48	2083.55	1	11	17	48	0.46	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
42	59.54	89.31	6N	27	43	381	1.13	NET< CL LBase
43	122.06	183.88	19N	27	45	400	1.18	NET< CL
44	133.54	201.24	0N	27	44	397	1.19	NET< CL RBase
45	145.44	219.24	29N	30	49	432	1.20	NET< CL
46	264.65	399.55	-19N	22	37	249	1.29	NET< CL LBase
47	320.08	483.38	-17N	19	32	189	1.32	NET< CL
48	364.48	550.53	2N	19	31	173	1.36	NET< CL
49	427.89	646.43	16N	16	26	123	1.40	NET< CL
50	433.93	655.56	10N	17	28	131	1.41	NET< CL
51	477.59	721.59	4N	16	27	120	1.44	NET< CL
52	487.03	735.86	-10N	17	28	132	1.44	NET< CL
53	497.08	751.06	-0N	16	27	121	1.45	NET< CL
54	537.32	811.91	8N	16	25	111	1.48	NET< CL
55	604.70	913.80	-24N	16	27	126	1.52	NET< CL LBase
56	621.84	939.72	-17N	15	25	105	1.54	NET< CL
57	661.65	999.91	-6N	14	24	112	1.56	NET< CL
58	724.18	1094.46	-1241N	692	1140	193	1.60	NET< CL PIC
59	765.79	1157.38	-5N	15	25	113	1.63	NET< CL
60	810.76	1225.37	-7N	13	23	94	1.66	NET< CL
61	834.83	1261.76	14N	14	22	93	1.68	NET< CL
62	884.67	1337.11	5N	13	21	83	1.71	NET< CL
63	1099.22	1661.45	-4N	13	22	84	1.86	NET< CL
64	1115.52	1686.09	22N	26	43	171	1.87	NET< CL PIC
65	1332.49	2014.04	-12N	10	17	59	2.01	NET< CL
66	1691.02	2555.86	-4N	6	11	21	2.25	NET< CL

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 11:28:37
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.91E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 12398 Sec
Sample Size 7.11E-01 kg | Real Time 12410 Sec
Collection Efficiency 1.0000 | Spectrum File 1134705.spc

Detector #: 5

Energy(keV)= 0.50 + 0.661*Ch + 1.43E-07*Ch^2 + 1.43E-07*Ch^3 04/23/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File: . . . WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5187-02.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	3.11E+02	1.50E+01	< 3.33E+01	1.61E+01	9.98E-01	MEAS +	YES
Pb-214	2.79E+02	1.65E+01	< 5.30E+01	2.56E+01	9.99E-01	MEAS +	YES
AcTh-228	2.82E+02	2.25E+01	< 8.25E+01	3.91E+01	1.00E+00	MEAS +	YES
La-140	-3.80E+01	6.42E+01	< 2.54E+02	1.22E+02	1.67E-01	NET	YES
Ra-226	9.29E+02	1.80E+02	< 5.63E+02	2.75E+02	1.00E+00	MEAS +	YES
Tl-208	2.98E+02	2.06E+01	< 6.04E+01	2.68E+01	1.00E+00	MEAS +	YES
Annil	2.45E+01	9.51E+00	< 3.08E+01	1.49E+01	9.39E-01	MEAS +	YES
Bi-214	2.85E+02	1.84E+01	< 5.14E+01	2.47E+01	9.99E-01	MEAS +	YES
Bi-212	1.75E+02	5.70E+01	< 1.79E+02	8.51E+01	1.00E+00	MEAS +	YES
K-40	1.14E+04	2.63E+02	< 2.29E+02	1.07E+02	1.00E+00	MEAS +	YES
Am-241	7.79E+00	3.35E+01	< 1.13E+02	5.49E+01	1.00E+00	NET	YES
Co-57	3.55E+00	5.12E+00	< 1.71E+01	8.31E+00	9.19E-01	NET	YES
Ce-144	4.87E-01	3.94E+01	< 1.34E+02	6.49E+01	9.23E-01	NET	YES
Ce-141	1.76E+01	1.87E+01	< 6.23E+01	3.03E+01	4.94E-01	NET	YES
Se-75	-7.60E+00	8.76E+00	< 3.05E+01	1.47E+01	8.26E-01	NET	YES
Cr-51	-8.82E+01	9.86E+01	< 3.46E+02	1.66E+02	4.38E-01	NET	YES
I-131	1.03E+01	9.63E+01	< 3.30E+02	1.58E+02	5.79E-02	NET	YES
Sb-125	1.51E+01	1.52E+01	< 5.11E+01	2.43E+01	9.78E-01	NET	YES
Ag-108m	3.13E+00	5.19E+00	< 1.76E+01	8.39E+00	9.99E-01	NET	YES
Be-7	1.64E+01	6.95E+01	< 2.38E+02	1.14E+02	6.51E-01	NET	YES
Ru-103	-2.00E-01	9.71E+00	< 3.36E+01	1.60E+01	5.59E-01	NET	YES
Ba-140	6.15E+01	1.19E+02	< 4.04E+02	1.92E+02	1.67E-01	NET	YES
Cs-134	-8.60E+00	5.66E+00	< 2.05E+01	9.74E+00	9.70E-01	NET	YES
Ru-106	-6.38E+01	5.45E+01	< 1.96E+02	9.32E+01	9.40E-01	NET	YES
Cs-137	-2.55E+00	6.06E+00	< 2.14E+01	1.01E+01	9.98E-01	NET	YES
Zr-95	-1.56E+03	8.67E+02	< 2.86E+03	1.43E+03	6.99E-01	NET	YES
Nb-95	-3.82E+00	1.14E+01	< 3.99E+01	1.89E+01	5.20E-01	NET	YES
Co-58	-4.01E+00	7.72E+00	< 2.74E+01	1.29E+01	7.24E-01	NET	YES
Mn-54	6.34E+00	6.40E+00	< 2.15E+01	1.02E+01	9.29E-01	NET	YES
Ag-110m	3.30E+00	8.63E+00	< 2.98E+01	1.40E+01	9.12E-01	NET	YES
Fe-59	-6.53E+00	1.98E+01	< 6.98E+01	3.29E+01	5.99E-01	NET	YES
Zn-65	2.48E+01	2.91E+01	< 9.72E+01	4.71E+01	9.10E-01	NET	YES
Co-60	-6.68E+00	5.80E+00	< 2.17E+01	1.01E+01	9.88E-01	NET	YES
Sb-124	-8.03E+00	1.24E+01	< 4.83E+01	2.14E+01	6.83E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
=====							

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-03 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-3
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 655.9 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/21/03 11:29 Det No.: 6 Spectrum No.: 1139706
Counted by: 67
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : LS187-03
Client Id : BMS-AO300-3
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	655.9		
Sample Weight-Dry	g			
Aliquot Weight	g	655.9		
FINAL WEIGHT	kg	.6559		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-03 analyzed by emml461 on 04/23/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-03 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1134706

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 11:29:20
Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.91E+002 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time: 12426 Sec
Sample Size: 6.56E-001 kg | Real Time: 12438 Sec
Collection Efficiency: 1.0000 | Spc. File: 1134706.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV) = $-0.07 + 0.662 \cdot \text{Ch} + 0.00\text{E}+00 \cdot \text{Ch}^2 + 0.00\text{E}+00 \cdot \text{Ch}^3$ 04/23/2003

FWHM(keV) = $1.40 + -0.060 \cdot \text{En} + 3.59\text{E}-03 \cdot \text{En}^2 + -3.97\text{E}-05 \cdot \text{En}^3$ 03/04/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.10	95.45	162	43	67	770	1.02	
2	74.69	112.96	247	47	72	895	1.41	a
3	77.02	116.48	429	36	48	511	0.97	b
4	83.99	127.00	81	29	45	441	0.85	a HiResid
5	87.36	132.10	155	43	67	771	1.61	b HiResid Wide Pk
6	92.62	140.05	500	43	60	661	1.30	c HiResid
7	132.05	199.63	-29	38	63	686	0.86	NET< CL
8	185.71	280.71	340	41	60	609	1.08	
9	209.56	316.75	65	34	54	490	1.84	Wide Pk
10	221.67	335.04	49	32	51	449	1.80	NET< CL Wide Pk
11	238.57	360.57	1077	40	38	290	1.16	a
12	241.64	365.21	219	33	49	406	1.57	b
13	270.26	408.46	77	28	44	328	1.59	
14	295.14	446.06	398	31	39	265	1.43	a
15	299.93	453.29	72	20	31	189	1.06	b
16	338.23	511.17	232	28	38	243	1.29	
17	351.93	531.86	562	33	38	245	1.31	
18	409.24	618.46	-28	26	44	282	1.09	NET< CL
19	463.02	699.73	31	24	38	210	0.83	NET< CL
20	510.94	772.12	451	30	34	168	2.50	Wide Pk
21	583.20	881.30	358	27	32	155	1.49	
22	609.26	920.69	467	30	34	174	1.51	
23	661.25	999.24	35	14	21	92	1.32	a
24	665.51	1005.68	34	17	26	123	1.74	b
25	727.02	1098.63	82	20	30	150	1.50	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
26	767.88	1160.36	58	20	30	148	2.53	Wide Pk
27	794.64	1200.80	26	16	26	114	0.90	
28	860.43	1300.20	44	17	25	106	2.38	
29	911.21	1376.93	276	23	26	112	1.77	
30	969.33	1464.75	112	22	32	168	1.19	
31	1000.21	1511.41	35	17	26	106	2.95	Wide Pk
32	1045.20	1579.40	1	14	23	92	0.05	NET< CL
33	1120.11	1692.57	114	21	30	138	2.56	
34	1377.68	2081.77	17	11	17	53	2.49	NET< CL
35	1461.01	2207.67	2116	47	17	44	2.26	
36	1764.72	2666.57	104	12	11	18	2.52	
37	2614.79	3951.03	144	13	10	18	2.81	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.10	162	43	67	9	43	71	NET<CL
2	74.69	247	47	72	217	47	73	
3	77.02	429	36	48	407	36	49	
4	83.99	81	29	45	34	29	47	NET<CL
5	87.36	155	43	67	138	43	68	
6	92.62	500	43	60	136	43	68	
8	185.71	340	41	60	135	41	65	
11	238.57	1077	40	38	1016	40	41	
12	241.64	219	33	49	208	33	49	
13	270.26	77	28	44	68	28	44	
14	295.14	398	31	39	373	31	41	
16	338.23	232	28	38	224	28	39	
17	351.93	562	33	38	529	33	40	
20	510.94	451	30	34	160	30	45	
21	583.20	359	27	32	333	27	34	
22	609.26	467	30	34	436	30	36	
25	727.02	82	20	30	77	21	31	
26	767.88	58	20	30	48	20	31	
29	911.21	276	23	26	260	23	27	
30	969.33	113	22	32	108	22	32	
31	1000.21	35	17	26	17	17	27	NET<CL
33	1120.11	114	21	30	109	21	30	
35	1461.01	2116	47	17	2086	47	19	
36	1764.72	104	12	11	98	12	12	
37	2614.79	144	13	10	122	14	13	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.69	217	Pb-212	192	5 of 6	100.00	1.50	
			Tl-208	10	6 of 9	95.73	0.96	
			Pb-214	95	5 of 7	100.00	1.50	
			Tl-208	18	6 of 9	95.73	0.96	
3	77.02	407	Pb-212	336	5 of 6	100.00	1.50	
			Pb-214	171	5 of 7	98.65	0.99	
5	87.36	138	Pb-212	187	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	92.62	56	Th-234	. . . . .	1 of 2	100.00	1.00	Split
40	92.62	80	AcTh-228	80	7 of 36	72.35	1.22	AutoAdd
8	185.71	135	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
9	209.56	65	AcTh-228	103	7 of 36	90.43	1.40	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
11	238.57	1016	Pb-212	1148	5 of 6	100.00	1.50	
12	241.64	208	Pb-214	145	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
13	270.26	68	AcTh-228	72	7 of 36	77.18	1.27	
14	295.14	373	Pb-214	322	5 of 7	100.00	1.50	
15	299.93	72	Pb-212	69	5 of 6	100.00	1.50	
16	338.23	224	AcTh-228	188	7 of 36	75.67	1.26	
17	351.93	529	Pb-214	689	5 of 7	100.00	1.50	
20	510.94	72	Annul	. . . . .	1 of 1	100.00	1.50	Split
39	510.94	88	Tl-208	88	6 of 9	97.05	1.47	AutoAdd
21	583.20	333	Tl-208	308	6 of 9	97.05	1.47	
22	609.26	436	Bi-214	559	5 of 33	78.15	1.28	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.50	
23	661.25	35	Cs-137	. . . . .	1 of 1	100.00	1.50	
24	665.51	34	Bi-214	15	5 of 33	69.68	1.20	
25	727.02	77	Bi-212	. . . . .	1 of 13	100.00	1.00	
26	767.88	4	Pa-234	. . . . .	1 of 2	26.32	0.76	Split
38	767.88	43	Bi-214	43	5 of 33	74.95	1.25	AutoAdd
27	794.64	26	AcTh-228	45	7 of 36	94.23	1.44	
			Cs-134	. . . . .	1 of 9	46.67	0.97	
28	860.43	44	Tl-208	37	6 of 9	97.05	1.47	
29	911.21	260	AcTh-228	232	7 of 36	77.18	1.27	
30	969.33	108	AcTh-228	149	7 of 36	83.78	1.34	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
33	1120.11	109	Bi-214	100	5 of 33	74.95	1.25	
35	1461.01	2086	K-40	. . . . .	1 of 1	100.00	1.50	
36	1764.72	98	Bi-214	74	5 of 33	74.95	1.25	
37	2614.79	122	Tl-208	151	6 of 9	100.00	1.50	

 SEEKER` F I N A L A C T I V I T Y R E P O R T Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-03

Sample ID: SOIL/SEDI Duratek Inc

Code: 1134706

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 11:29:20
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.91e+002 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 12426 Sec
 Sample Size 6.56e-001 kg | Real Time 12438 Sec
 Collection Efficiency 1.0000 | Spectrum File 1134706.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[8.71E-03*En^-3.34E+00 + 1.54E+02*En^6.70E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5187-03.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	4.54E+02 +- 1.78E+01	. . . .	*		. . . . .
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	4.53E+02 +- 1.80E+01	3.75E+01	++		. . . . .
	300.09	4.84E+02 +- 1.38E+02	4.31E+02	++		. . . . .
Th-234	92.59	1.92E+02 +- 2.58E+02	8.53E+02	+		. . . . .
Ra-226	186.22	7.18E+02 +- 2.18E+02	7.04E+02	++		. . . . .
AcTh-228	Average:x	4.23E+02 +- 2.84E+01	. . . .	*		. . . . .
	209.28	2.73E+02 +- 1.41E+02	4.62E+02	+		. . . . .
	270.23	4.06E+02 +- 1.69E+02	5.49E+02	+		. . . . .
	338.32	4.89E+02 +- 6.07E+01	1.74E+02	++		. . . . .
	794.70	2.52E+02 +- 1.56E+02	5.14E+02	+		. . . . .
	911.07	4.52E+02 +- 4.01E+01	9.92E+01	++		. . . . .
	969.11	3.27E+02 +- 6.72E+01	2.03E+02	++		. . . . .
	93.35	I.D.	. . . .			. . . . .
Pb-214	Average:x	3.92E+02 +- 1.90E+01	. . . .	*		. . . . .
	241.98	5.58E+02 +- 8.94E+01	2.72E+02	++		. . . . .
	295.21	4.42E+02 +- 3.73E+01	1.00E+02	++		. . . . .
	351.92	3.62E+02 +- 2.28E+01	5.61E+01	++		. . . . .
Annul	511.00	2.51E+01 +- 1.82E+01	6.00E+01	+		. . . . .
Tl-208	Average:x	3.69E+02 +- 2.41E+01	. . . .	*		. . . . .
	583.14	3.93E+02 +- 3.24E+01	8.29E+01	++		. . . . .
	860.37	4.52E+02 +- 1.74E+02	5.54E+02	+		. . . . .
	2614.66	3.33E+02 +- 3.69E+01	7.78E+01	++		. . . . .
	510.84	I.D.	. . . .			. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
Bi-214	Average:x	3.67E+02 +- 2.12E+01	. . . .		*	. . . . .
	609.31	3.46E+02 +- 2.40E+01	5.92E+01		+	. . . . .
	665.45	8.48E+02 +- 4.15E+02	1.35E+03		+	. . . . .
	768.36	3.67E+02 +- 2.41E+02	7.93E+02		+	. . . . .
	1120.29	3.97E+02 +- 7.70E+01	2.30E+02		+	. . . . .
	1764.49	4.66E+02 +- 5.76E+01	1.23E+02		+	. . . . .
Cs-137	661.65	1.58E+01 +- 6.38E+00	2.03E+01		+	. . . . .
Bi-212	727.17	2.68E+02 +- 7.22E+01	2.25E+02		+	. . . . .
Pa-234	766.40	6.38E+02 +- 4.94E+03	1.66E+04		+	. . . . .
K-40	1460.81	1.29E+04 +- 2.91E+02	2.54E+02		+	. . . . .
Am-241	59.54	N-5.11E+01 +- 6.05E+01	2.06E+02L		x	LHROI	. . . . .
Co-57	122.06	N 1.19E+01 +- 5.98E+00	1.96E+01		x		. . . . .
Ce-144	133.54	N 4.75E+01 +- 4.61E+01	1.53E+02		x		. . . . .
Ce-141	145.44	N-1.92E+01 +- 1.95E+01	6.69E+01		x		. . . . .
Se-75	264.65	N-8.60E+00 +- 1.04E+01	3.59E+011		x	lbase	. . . . .
Cr-51	320.08	N-8.37E+01 +- 1.11E+02	3.88E+02		x		. . . . .
I-131	364.48	N-7.22E+01 +- 1.05E+02	3.65E+02		x		. . . . .
Sb-125	427.89	N 2.89E+01 +- 1.76E+01	5.80E+01		x		. . . . .
Ag-108m	433.93	N 4.56E+00 +- 5.44E+00	1.83E+01		x		. . . . .
Be-7	477.59	N 3.22E+01 +- 7.43E+01	2.54E+02		x		. . . . .
La-140	487.03	N-2.50E+01 +- 6.71E+01	2.35E+02		x		. . . . .
Ru-103	497.08	N 1.87E+01 +- 1.03E+01	3.37E+01		x		. . . . .
Ba-140	537.32	N-1.32E+01 +- 1.34E+02	4.64E+02		x		. . . . .
Cs-134	604.70	N-5.02E+00 +- 6.75E+00	2.37E+011		x	lbase	. . . . .
Ru-106	621.84	N-1.17E+02 +- 6.32E+01	2.31E+02		x		. . . . .
Zr-95	724.18	N-5.94E+01 +- 3.12E+01	1.15E+02L		x	LHROI	. . . . .
Nb-95	765.79	N 1.48E+01 +- 1.95E+01	6.52E+01P		x	PIC	. . . . .
Co-58	810.76	N 1.24E+01 +- 8.70E+00	2.88E+01		x		. . . . .
Mn-54	834.83	N-9.27E+00 +- 7.32E+00	2.64E+01		x		. . . . .
Ag-110m	884.67	N-7.83E+00 +- 9.73E+00	3.49E+01		x		. . . . .
Fe-59	1099.22	N 4.23E+00 +- 2.29E+01	7.91E+01		x		. . . . .
Zn-65	1115.52	N 3.31E+01 +- 3.29E+01	1.09E+02P		x	PIC	. . . . .
Co-60	1332.49	N 6.90E+00 +- 6.55E+00	2.21E+01		x	Y.	. . . . .
Sb-124	1691.02	N 1.52E+01 +- 1.39E+01	4.75E+01		x		. . . . .

MEASURED TOTAL: 1.68E+04 +- 5.91E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.10	95.45	9	43	71	770	1.02	Deleted
4	83.99	127.00	34	29	47	441	0.85	Deleted
7	132.05	199.63	-29	38	63	686	0.86	Deleted
10	221.67	335.04	49	32	51	449	1.80	Deleted
18	409.24	618.46	-28	26	44	282	1.09	Deleted
19	463.02	699.73	31	24	38	210	0.83	Deleted
31	1000.21	1511.41	17	17	27	106	2.95	Deleted
32	1045.20	1579.40	1	14	23	92	0.05	Deleted
34	1377.68	2081.77	17	11	17	53	2.49	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
41	59.54	90.07	-42N	50	83	640	1.13	NET< CL LHRoi
42	122.06	184.53	60N	30	47	453	1.12	
43	133.54	201.88	30N	29	47	451	1.13	NET< CL
44	145.44	219.86	-29N	29	49	453	1.13	NET< CL
45	264.65	399.99	-20N	24	40	301	1.21	NET< CL LBase
46	320.08	483.74	-15N	20	33	207	1.25	NET< CL
47	364.48	550.83	-13N	19	32	184	1.29	NET< CL
48	427.89	646.64	29N	17	27	134	1.35	
49	433.93	655.77	14N	17	27	132	1.36	NET< CL
50	477.59	721.74	7N	16	26	127	1.40	NET< CL
51	487.03	736.00	-6N	16	27	133	1.40	NET< CL
52	497.08	751.18	29N	16	25	105	1.41	
53	537.32	811.99	-2N	17	27	123	1.45	NET< CL
54	604.70	913.80	-13N	17	29	147	1.51	NET< CL LBase
55	621.84	939.70	-29N	16	27	126	1.53	NET< CL
56	724.18	1094.33	-44N	23	41	156	1.62	NET< CL LHRoi
57	765.79	1157.20	18N	24	38	187	1.66	NET< CL PIC
58	810.76	1225.15	20N	14	22	89	1.70	NET< CL
59	834.83	1261.52	-19N	15	26	122	1.72	NET< CL
60	884.67	1336.83	-11N	14	23	99	1.76	NET< CL
61	1099.22	1661.01	3N	14	23	93	1.92	NET< CL
62	1115.52	1685.64	28N	28	45	191	1.93	NET< CL PIC
63	1332.49	2013.48	11N	10	16	49	2.08	NET< CL
64	1691.02	2555.22	7N	6	10	17	2.26	NET< CL

L5187-03 analyzed by emml461 on 04/23/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 11:29:20
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.91E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 12426 Sec
Sample Size 6.56E-01 kg | Real Time 12438 Sec
Collection Efficiency 1.0000 | Spectrum File 1134706.spc

Detector #: 6

Energy(keV)= -0.07 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[8.71e-03*En^-3.34e+00 + 1.54e+02*En^ 6.70e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5187-03.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	4.54E+02	1.78E+01	< 3.75E+01	1.81E+01	1.00E+00	MEAS +	YES
Th-234	1.92E+02	2.58E+02	< 8.53E+02	4.22E+02	1.00E+00	MEAS +	YES
Ra-226	7.18E+02	2.18E+02	< 7.04E+02	3.45E+02	1.00E+00	MEAS +	YES
AcTh-228	4.23E+02	2.84E+01	< 9.92E+01	4.73E+01	9.99E-01	MEAS +	YES
Pb-214	3.92E+02	1.90E+01	< 5.61E+01	2.71E+01	1.00E+00	MEAS +	YES
Annil	2.51E+01	1.82E+01	< 6.00E+01	2.95E+01	9.39E-01	MEAS +	YES
Tl-208	3.69E+02	2.41E+01	< 7.78E+01	3.52E+01	9.99E-01	MEAS +	YES
Bi-214	3.67E+02	2.12E+01	< 5.92E+01	2.85E+01	1.00E+00	MEAS +	YES
Cs-137	1.58E+01	6.38E+00	< 2.03E+01	9.55E+00	9.98E-01	MEAS +	YES
Bi-212	2.68E+02	7.22E+01	< 2.25E+02	1.08E+02	9.99E-01	MEAS +	YES
Pa-234	6.38E+02	4.94E+03	< 1.66E+04	8.10E+03	1.00E+00	MEAS +	YES
K-40	1.29E+04	2.91E+02	< 2.54E+02	1.19E+02	1.00E+00	MEAS +	YES
Am-241	-5.10E+01	6.05E+01	< 2.06E+02	1.01E+02	1.00E+00	NET	YES
Co-57	1.19E+01	5.98E+00	< 1.95E+01	9.51E+00	9.19E-01	NET	YES
Ce-144	4.75E+01	4.61E+01	< 1.53E+02	7.45E+01	9.23E-01	NET	YES
Ce-141	-1.92E+01	1.95E+01	< 6.69E+01	3.25E+01	4.94E-01	NET	YES
Se-75	-8.60E+00	1.04E+01	< 3.59E+01	1.74E+01	8.26E-01	NET	YES
Cr-51	-8.37E+01	1.11E+02	< 3.88E+02	1.87E+02	4.38E-01	NET	YES
I-131	-7.22E+01	1.05E+02	< 3.65E+02	1.75E+02	5.79E-02	NET	YES
Sb-125	2.89E+01	1.76E+01	< 5.80E+01	2.76E+01	9.78E-01	NET	YES
Ag-108m	4.56E+00	5.44E+00	< 1.83E+01	8.71E+00	9.99E-01	NET	YES
Be-7	3.22E+01	7.43E+01	< 2.54E+02	1.21E+02	6.51E-01	NET	YES
La-140	-2.50E+01	6.71E+01	< 2.35E+02	1.12E+02	1.67E-01	NET	YES
Ru-103	1.87E+01	1.03E+01	< 3.37E+01	1.60E+01	5.59E-01	NET	YES
Ba-140	-1.32E+01	1.34E+02	< 4.64E+02	2.21E+02	1.67E-01	NET	YES
Cs-134	-5.02E+00	6.75E+00	< 2.37E+01	1.13E+01	9.70E-01	NET	YES
Ru-106	-1.17E+02	6.32E+01	< 2.31E+02	1.10E+02	9.40E-01	NET	YES
Zr-95	-5.94E+01	3.12E+01	< 1.14E+02	5.54E+01	6.99E-01	NET	YES
Nb-95	1.48E+01	1.95E+01	< 6.52E+01	3.15E+01	5.20E-01	NET	YES
Co-58	1.24E+01	8.70E+00	< 2.88E+01	1.36E+01	7.24E-01	NET	YES
Mn-54	-9.27E+00	7.32E+00	< 2.64E+01	1.25E+01	9.29E-01	NET	YES
Ag-110m	-7.83E+00	9.73E+00	< 3.49E+01	1.65E+01	9.12E-01	NET	YES
Fe-59	4.23E+00	2.29E+01	< 7.91E+01	3.73E+01	5.99E-01	NET	YES

L5187-03 analyzed by emm1461 on 04/23/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Zn-65	3.30E+01	3.29E+01	< 1.09E+02	5.31E+01	9.10E-01	NET	YES
Co-60	6.90E+00	6.55E+00	< 2.21E+01	1.02E+01	9.88E-01	NET	YES
Sb-124	1.52E+01	1.39E+01	< 4.75E+01	2.08E+01	6.83E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-04
Client: Duratek Inc
Project: OTHER ENVIRON-DJR
Sample Matrix: Soil
Sample Description: BMS-AO300-4
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

Count by Date: _____
(if required)
Delay Date: _____
(if required)

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 717.9 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/23/03 1130

Det No.: 8

Spectrum No.: 1134708

Counted by: 62

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-04
Client Id : BMS-AO300-4
Site :

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	717.9		
Sample Weight-Dry	g			
Aliquot Weight	g	717.9		
FINAL WEIGHT	kg	.7179		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-04 analyzed by emml461 on 04/23/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-04

Sample ID: SOIL/SEDI Duratek Inc

Code: 1134708

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 11:29:50
Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.91E+002 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 12480 Sec
Sample Size 7.18E-001 kg | Real Time 12492 Sec
Collection Efficiency 1.0000 | Spc. File 1134708.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Energy(keV)= 0.05 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.99	95.00	125	43	68	724	1.26	
2	74.81	112.84	219	36	54	587	1.02	a
3	76.93	116.03	379	38	54	587	1.03	b
4	84.10	126.86	71	31	49	486	1.06	a HiResid
5	87.20	131.53	206	37	56	583	1.26	b HiResid
6	92.81	140.01	243	38	56	583	1.39	c HiResid
7	99.06	149.44	37	39	63	680	1.53	d NET< CL HiResid
8	128.85	194.41	114	43	69	706	1.52	
9	154.48	233.08	27	41	67	669	1.21	NET< CL
10	185.86	280.46	367	44	65	588	1.76	
11	205.22	309.67	73	31	49	406	1.53	a
12	209.15	315.61	94	25	38	290	1.01	b
13	238.57	360.00	915	39	41	310	1.32	a
14	241.59	364.57	193	31	46	362	1.50	b
15	270.17	407.70	24	15	24	142	0.70	a NET< CL
16	277.21	418.32	22	21	34	237	1.17	b NET< CL
17	295.02	445.21	359	28	35	221	1.22	a
18	300.08	452.85	49	20	30	184	1.06	b
19	327.64	494.44	-10	23	38	245	0.53	NET< CL
20	338.26	510.48	181	29	42	276	1.85	
21	351.78	530.88	552	35	43	270	1.34	
22	414.03	624.83	-6	22	37	212	0.25	NET< CL
23	463.09	698.89	50	23	35	186	1.39	
24	510.90	771.05	439	29	32	178	2.01	
25	523.25	789.69	-13	22	36	202	0.92	NET< CL
26	559.16	843.88	15	18	29	146	0.74	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	569.06	858.84	20	18	29	151	2.56	NET< CL Wide Pk
28	583.16	880.11	322	26	30	158	1.62	
29	609.25	919.50	440	29	33	182	1.75	
30	726.58	1096.59	24	10	14	50	0.86	a
31	727.74	1098.34	58	15	21	87	1.56	b
32	768.11	1159.26	15	16	26	122	0.45	NET< CL
33	794.48	1199.08	10	18	30	148	0.50	NET< CL
34	861.39	1300.06	65	20	30	124	2.53	Wide Pk
35	911.15	1375.16	242	22	26	111	2.01	
36	968.94	1462.39	109	22	32	158	1.59	
37	1120.30	1690.85	107	21	31	141	2.46	
38	1377.71	2079.37	20	11	17	50	2.52	
39	1460.88	2204.90	2172	48	16	43	2.13	
40	1729.29	2610.03	27	10	14	31	1.92	
41	1764.65	2663.41	94	13	14	28	2.00	
42	2614.37	3945.93	129	13	11	18	2.59	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.99	125	43	68	68	43	69	NET<CL
2	74.81	219	36	54	197	36	55	
3	76.93	379	38	54	344	38	55	
4	84.10	71	31	49	53	31	50	
5	87.20	206	37	56	181	38	58	
6	92.81	243	38	56	104	38	60	
7	99.06	37	39	63	34	39	64	NET<CL
10	185.86	367	44	65	293	44	67	
13	238.57	915	39	41	858	39	43	
14	241.59	193	31	46	167	31	47	
17	295.02	359	28	35	304	29	37	
19	327.64	-10	23	38	-9	23	38	NET<CL
20	338.26	181	29	42	169	29	43	
21	351.78	552	35	43	473	35	46	
23	463.09	50	23	35	49	23	36	
24	510.90	439	29	32	124	29	44	
26	559.16	15	18	29	3	18	30	NET<CL
27	569.06	20	18	29	12	19	30	NET<CL
28	583.16	322	26	30	305	26	31	
29	609.25	441	29	33	370	29	37	
32	768.11	15	16	26	7	16	26	NET<CL
35	911.15	242	22	26	230	22	27	
36	968.94	109	22	32	101	22	32	
37	1120.30	107	21	31	96	22	32	
38	1377.71	20	11	17	14	12	18	NET<CL
39	1460.88	2172	48	16	2144	48	19	
40	1729.29	27	10	14	25	10	15	
41	1764.65	94	13	14	79	13	15	
42	2614.37	129	13	11	110	13	13	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.81	197	Pb-212	170	5 of 6	100.00	1.50	
			Pb-214	87	5 of 7	100.00	1.00	
			Tl-208	17	6 of 9	95.51	0.96	
3	76.93	344	Pb-212	300	5 of 6	100.00	1.50	
			Tl-208	17	6 of 9	95.51	0.96	
			Pb-214	158	5 of 7	100.00	1.00	
4	84.10	53	Tl-208	9	6 of 9	96.35	1.46	
5	87.20	17	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
45	87.20	164	Pb-212	164	5 of 6	100.00	1.50	AutoAdd
6	92.81	30	Th-234	. . . . .	1 of 2	100.00	1.50	Split
44	92.81	74	AcTh-228	74	7 of 36	74.61	1.25	AutoAdd
8	128.85	114	AcTh-228	68	7 of 36	73.38	1.23	
10	185.86	293	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
11	205.22	73	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
12	209.15	94	AcTh-228	90	7 of 36	77.89	1.28	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
13	238.57	858	Pb-212	970	5 of 6	100.00	1.50	
14	241.59	167	Pb-214	128	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
17	295.02	304	Pb-214	291	5 of 7	100.00	1.50	
18	300.08	49	Pb-212	58	5 of 6	100.00	1.50	
20	338.26	169	AcTh-228	174	7 of 36	77.89	1.28	
21	351.78	473	Pb-214	572	5 of 7	100.00	1.50	
23	463.09	49	AcTh-228	55	7 of 36	82.61	1.33	
			Sb-125	. . . . .	1 of 8	13.67	0.64	
24	510.90	45	Annil	. . . . .	1 of 1	100.00	1.50	Split
43	510.90	80	Tl-208	80	6 of 9	97.04	1.47	AutoAdd
28	583.16	305	Tl-208	273	6 of 9	97.04	1.47	
29	609.25	370	Bi-214	468	4 of 33	79.98	1.30	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
30	726.58	24	Bi-212	. . . . .	1 of 13	100.00	1.50	
31	727.74	58	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Bi-212	. . . . .	1 of 13	100.00	1.00	Matched
			Te-129m	. . . . .	1 of 2	18.72	0.19	LowScore
34	861.39	65	Tl-208	33	6 of 9	97.04	1.47	
35	911.15	230	AcTh-228	210	7 of 36	77.89	1.28	
36	968.94	101	AcTh-228	132	7 of 36	82.61	1.33	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
37	1120.30	96	Bi-214	84	4 of 33	77.50	1.27	
39	1460.88	2144	K-40	. . . . .	1 of 1	100.00	1.50	
40	1729.29	25	Bi-214	12	4 of 33	71.70	1.22	
41	1764.65	79	Bi-214	64	4 of 33	75.96	1.26	
42	2614.37	110	Tl-208	141	6 of 9	100.00	1.50	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-04

Sample ID: SOIL/SEDI Duratek Inc

Code: 1134708

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 11:29:50
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.91e+002 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 12480 Sec
 Sample Size 7.18e-001 kg | Real Time 12492 Sec
 Collection Efficiency 1.0000 | Spectrum File 1134708.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

 Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File: L5187-04.LSF (SOIL/SEDI: Duratek Inc)

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	3.28E+02 +- 1.50E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	3.29E+02 +- 1.51E+01	3.43E+01		+	. . . . .
	300.09	2.83E+02 +- 1.14E+02	3.66E+02		+	. . . . .
Tl-208	Average:x	2.86E+02 +- 1.95E+01	. . . .		*	. . . . .
	84.90	I.D.	. . . .			. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	3.06E+02 +- 2.59E+01	6.54E+01		+	. . . . .
	860.37	5.66E+02 +- 1.76E+02	5.55E+02		+	. . . . .
	2614.66	2.50E+02 +- 3.01E+01	6.69E+01		+	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	8.52E+01 +- 1.86E+02	6.18E+02		+	. . . . .
AcTh-228	Average:x	3.21E+02 +- 2.36E+01	. . . .		*	. . . . .
	129.08	5.35E+02 +- 2.04E+02	6.64E+02		+	. . . . .
	209.28	3.37E+02 +- 8.97E+01	2.82E+02		+	. . . . .
	338.32	3.15E+02 +- 5.40E+01	1.64E+02		+	. . . . .
	463.00	2.87E+02 +- 1.35E+02	4.40E+02		+	. . . . .
	911.07	3.38E+02 +- 3.28E+01	8.30E+01		+	. . . . .
	969.11	2.58E+02 +- 5.64E+01	1.72E+02		+	. . . . .
	93.35	I.D.	. . . .			. . . . .
Ra-226	186.22	1.33E+03 +- 2.01E+02	6.21E+02		+	. . . . .
Pb-214	Average:x	2.93E+02 +- 1.64E+01	. . . .		*	. . . . .
	241.98	3.84E+02 +- 7.24E+01	2.24E+02		+	. . . . .
	295.21	3.09E+02 +- 2.90E+01	7.83E+01		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Annul	351.92	2.77E+02 +- 2.07E+01	5.51E+01		+	. . . . .
Bi-214	511.00	1.32E+01 +- 1.51E+01	4.99E+01		+	. . . . .
	Average:x	2.63E+02 +- 1.78E+01	. . . . .		*	. . . . .
	609.31	2.50E+02 +- 1.99E+01	5.13E+01		+	. . . . .
	1120.29	2.97E+02 +- 6.66E+01	2.03E+02		+	. . . . .
	1729.59	5.21E+02 +- 2.12E+02	6.65E+02		+	. . . . .
	1764.49	3.15E+02 +- 5.16E+01	1.34E+02		+	. . . . .
Bi-212	727.17	7.19E+01 +- 2.94E+01	9.23E+01		+	. . . . .
K-40	1460.81	1.12E+04 +- 2.48E+02	2.10E+02		+	. . . . .
Am-241	59.54	N-1.20E+01 +- 4.51E+01	1.52E+02L		x	LHROI
Co-57	122.06	N 6.39E+00 +- 5.30E+00	1.75E+01		x	. . . . .
Ce-144	133.54	N 1.28E+01 +- 8.34E+01	2.77E+02P		x	PIC
Ce-141	145.44	N 4.73E+00 +- 1.73E+01	5.84E+01		x	. . . . .
Se-75	264.65	N-1.47E+01 +- 8.69E+00	3.06E+01		x	. . . . .
Cr-51	320.08	N 7.40E+01 +- 1.04E+02	3.51E+02		x	. . . . .
I-131	364.48	N-3.64E+01 +- 9.81E+01	3.38E+02		x	. . . . .
Sb-125	427.89	N 6.19E+00 +- 1.69E+01	5.75E+01		x	. . . . .
Ag-108m	433.93	N-6.35E+00 +- 5.34E+00	1.89E+01		x	. . . . .
Be-7	477.59	N-1.07E+02 +- 6.55E+01	2.36E+02		x	. . . . .
La-140	487.03	N-1.36E+01 +- 6.11E+01	2.12E+02		x	. . . . .
Ru-103	497.08	N-1.17E+00 +- 8.14E+00	2.84E+01		x	. . . . .
Ba-140	537.32	N 1.18E+02 +- 1.07E+02	3.59E+02		x	. . . . .
Cs-134	604.70	N-1.33E+01 +- 2.29E+01	7.66E+01P		x	PIC
Ru-106	621.84	N-3.09E+01 +- 5.38E+01	1.90E+02		x	. . . . .
Cs-137	661.65	N 8.15E+00 +- 6.44E+00	2.14E+01		x	Y.
Zr-95	724.18	N-2.06E+01 +- 2.37E+01	8.43E+01L		x	LHROI
Nb-95	765.79	N 8.25E-01 +- 1.11E+01	3.82E+01		x	. . . . .
Co-58	810.76	N 1.05E+00 +- 7.11E+00	2.47E+01		x	. . . . .
Mn-54	834.83	N-4.96E+00 +- 5.97E+00	2.13E+01		x	. . . . .
Ag-110m	884.67	N 4.82E+00 +- 8.69E+00	2.97E+01		x	. . . . .
Fe-59	1099.22	N-2.81E+01 +- 2.11E+01	7.60E+01		x	. . . . .
Zn-65	1115.52	N 5.03E+01 +- 2.94E+01	9.65E+01P		x	PIC
Co-60	1332.49	N-4.76E+00 +- 6.33E+00	2.29E+01		x	Y.
Sb-124	1691.02	N 1.83E-01 +- 1.21E+01	4.48E+01		x	. . . . .

MEASURED TOTAL: 1.42E+04 +- 7.72E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.99	95.00	68	43	69	724	1.26	Deleted
7	99.06	149.44	34	39	64	680	1.53	Deleted
9	154.48	233.08	27	41	67	669	1.21	Deleted
11	205.22	309.67	73	31	49	406	1.53	Unknown
15	270.17	407.70	24	15	24	142	0.70	Deleted
16	277.21	418.32	22	21	34	237	1.17	Deleted
19	327.64	494.44	-9	23	38	245	0.53	Deleted
22	414.03	624.83	-6	22	37	212	0.25	Deleted
25	523.25	789.69	-13	22	36	202	0.92	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
26	559.16	843.88	3	18	30	146	0.74	Deleted
27	569.06	858.84	12	19	30	151	2.56	Deleted
31	727.74	1098.34	58	15	21	87	1.56	Unknown
32	768.11	1159.26	7	16	26	122	0.45	Deleted
33	794.48	1199.08	10	18	30	148	0.50	Deleted
38	1377.71	2079.37	14	12	18	50	2.52	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
46	59.54	89.79	-12N	45	75	514	1.24	NET< CL LHRoi
47	122.06	184.15	38N	31	51	477	1.29	NET< CL
48	133.54	201.48	10N	63	103	1150	1.30	NET< CL PIC
49	145.44	219.44	8N	31	51	459	1.31	NET< CL
50	264.65	399.37	-40N	24	40	298	1.39	NET< CL
51	320.08	483.04	16N	22	35	214	1.43	NET< CL
52	364.48	550.05	-8N	21	34	201	1.46	NET< CL
53	427.89	645.76	7N	20	32	174	1.50	NET< CL
54	433.93	654.88	-23N	19	33	181	1.51	NET< CL
55	477.59	720.77	-27N	17	29	141	1.53	NET< CL
56	487.03	735.02	-4N	17	29	139	1.54	NET< CL
57	497.08	750.19	-2N	15	24	118	1.55	NET< CL
58	537.32	810.93	17N	16	25	120	1.57	NET< CL
59	604.70	912.63	-40N	70	115	306	1.62	NET< CL PIC
60	621.84	938.50	-9N	16	26	127	1.63	NET< CL
61	661.65	998.58	21N	17	26	127	1.66	NET< CL
62	724.18	1092.96	-18N	21	35	116	1.70	NET< CL LHRoi
63	765.79	1155.77	1N	16	26	121	1.73	NET< CL
64	810.76	1223.64	2N	14	22	91	1.76	NET< CL
65	834.83	1259.97	-12N	14	24	110	1.77	NET< CL
66	884.67	1335.20	8N	14	23	100	1.81	NET< CL
67	1099.22	1659.03	-21N	15	27	123	1.95	NET< CL
68	1115.52	1683.64	50N	29	47	202	1.96	PIC
69	1332.49	2011.12	-9N	12	20	76	2.10	NET< CL
70	1691.02	2552.27	0N	7	11	21	2.34	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc-----
Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 11:29:50
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.91E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 12480 Sec
Sample Size 7.18E-01 kg | Real Time 12492 Sec
Collection Efficiency 1.0000 | Spectrum File 1134708.spc

Detector #: 8

Energy(keV)= 0.05 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5187-04.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	3.28E+02	1.50E+01	< 3.43E+01	1.66E+01	9.97E-01	MEAS +	YES
Tl-208	2.86E+02	1.95E+01	< 6.54E+01	3.04E+01	1.00E+00	MEAS +	YES
Th-234	8.52E+01	1.86E+02	< 6.18E+02	3.05E+02	1.00E+00	MEAS +	YES
AcTh-228	3.21E+02	2.36E+01	< 8.30E+01	3.95E+01	1.00E+00	MEAS +	YES
Ra-226	1.33E+03	2.01E+02	< 6.21E+02	3.04E+02	1.00E+00	MEAS +	YES
Pb-214	2.93E+02	1.64E+01	< 5.51E+01	2.68E+01	1.00E+00	MEAS +	YES
Annil	1.32E+01	1.51E+01	< 4.99E+01	2.45E+01	9.39E-01	MEAS +	YES
Bi-214	2.63E+02	1.78E+01	< 5.13E+01	2.47E+01	1.00E+00	MEAS +	YES
Bi-212	7.19E+01	2.94E+01	< 9.23E+01	4.21E+01	1.00E+00	MEAS +	YES
K-40	1.12E+04	2.48E+02	< 2.10E+02	9.81E+01	1.00E+00	MEAS +	YES
Am-241	-1.20E+01	4.51E+01	< 1.52E+02	7.46E+01	1.00E+00	NET	YES
Co-57	6.39E+00	5.30E+00	< 1.75E+01	8.55E+00	9.19E-01	NET	YES
Ce-144	1.28E+01	8.33E+01	< 2.78E+02	1.37E+02	9.23E-01	NET	YES
Ce-141	4.73E+00	1.74E+01	< 5.83E+01	2.84E+01	4.94E-01	NET	YES
Se-75	-1.47E+01	8.69E+00	< 3.06E+01	1.48E+01	8.26E-01	NET	YES
Cr-51	7.40E+01	1.04E+02	< 3.51E+02	1.69E+02	4.38E-01	NET	YES
I-131	-3.64E+01	9.81E+01	< 3.38E+02	1.63E+02	5.79E-02	NET	YES
Sb-125	6.19E+00	1.69E+01	< 5.75E+01	2.76E+01	9.78E-01	NET	YES
Ag-108m	-6.35E+00	5.34E+00	< 1.89E+01	9.06E+00	9.99E-01	NET	YES
Be-7	-1.07E+02	6.55E+01	< 2.36E+02	1.13E+02	6.51E-01	NET	YES
La-140	-1.36E+01	6.12E+01	< 2.12E+02	1.01E+02	1.67E-01	NET	YES
Ru-103	-1.17E+00	8.14E+00	< 2.84E+01	1.35E+01	5.59E-01	NET	YES
Ba-140	1.18E+02	1.07E+02	< 3.59E+02	1.70E+02	1.67E-01	NET	YES
Cs-134	-1.33E+01	2.29E+01	< 7.66E+01	3.78E+01	9.70E-01	NET	YES
Ru-106	-3.09E+01	5.38E+01	< 1.90E+02	9.01E+01	9.40E-01	NET	YES
Cs-137	8.15E+00	6.44E+00	< 2.14E+01	1.02E+01	9.98E-01	NET	YES
Zr-95	-2.06E+01	2.37E+01	< 8.43E+01	4.06E+01	6.99E-01	NET	YES
Nb-95	8.25E-01	1.11E+01	< 3.82E+01	1.82E+01	5.20E-01	NET	YES
Co-58	1.05E+00	7.11E+00	< 2.47E+01	1.16E+01	7.24E-01	NET	YES
Mn-54	-4.96E+00	5.97E+00	< 2.13E+01	1.01E+01	9.29E-01	NET	YES
Ag-110m	4.82E+00	8.69E+00	< 2.97E+01	1.40E+01	9.12E-01	NET	YES
Fe-59	-2.81E+01	2.11E+01	< 7.60E+01	3.62E+01	5.99E-01	NET	YES
Zn-65	5.03E+01	2.94E+01	< 9.65E+01	4.69E+01	9.10E-01	NET	YES

L5187-04 analyzed by emml461 on 04/23/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	-4.76E+00	6.33E+00	< 2.29E+01	1.07E+01	9.88E-01	NET	YES
Sb-124	1.83E-01	1.21E+01	< 4.48E+01	1.99E+01	6.83E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-05 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-5
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 669.7 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/23/03 Det No.: 3 Spectrum No.: 1136903
Counted by: [Signature]
Recount Date/Time: 5/2/03 1743 Det No.: 6 Spectrum No.: 1227306
Counted by: [Signature]

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5187-05	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-A0300-5	Matrix	: S001 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/21/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	669.7		
Sample Weight-Dry	g			
Aliquot Weight	g	669.7		
FINAL WEIGHT	kg	.6697		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-05 analyzed by emm1461 on 04/23/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-05

not stored

Sample ID: SOIL/SEDI Duratek Inc

Code: 1136903

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:37:59
Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.97E+002 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 20000 Sec
Sample Size 6.70E-001 kg | Real Time 20010 Sec
Collection Efficiency 1.0000 | Spc. File 1136903.spc

Detector #: 3 (Canberra sn 10923049 det#3)
Energy(keV)= 0.10 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003
FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 0.00E+00*En^3 02/18/2003
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.88	94.92	138	53	86	1248	1.18	
2	74.22	112.06	455	42	60	800	0.97	a
3	76.49	115.49	687	45	60	800	0.77	b
4	83.83	126.59	134	46	73	996	1.25	a
5	86.57	130.73	311	53	83	1162	1.43	b Wide Pk
6	89.36	134.94	186	41	64	830	0.99	c
7	92.41	139.56	450	54	83	1162	1.51	d Wide Pk
8	104.56	157.92	12	44	72	947	0.16	NET< CL
9	120.90	182.63	92	43	69	871	1.36	a
10	122.02	184.33	43	26	42	436	0.63	b
11	128.53	194.16	58	38	62	775	0.86	NET< CL
12	139.08	210.12	36	47	77	1006	0.66	NET< CL
13	153.26	231.54	37	45	74	937	1.51	a NET< CL Wide Pk
14	158.95	240.15	51	36	58	669	1.09	b NET< CL
15	185.29	279.97	314	46	70	841	1.21	
16	208.68	315.33	87	37	59	641	0.93	
17	238.07	359.77	1172	44	47	441	1.03	a
18	241.03	364.25	292	40	60	617	1.51	b Wide Pk
19	269.97	408.00	67	38	62	604	1.26	
20	277.54	419.44	-3	37	61	596	0.08	NET< CL
21	294.54	445.15	364	31	39	310	1.00	a
22	299.60	452.78	101	26	39	310	1.08	b
23	327.19	494.50	42	27	44	352	0.68	NET< CL
24	337.79	510.53	200	31	45	377	1.21	
25	351.37	531.06	722	39	46	359	1.18	
26	358.01	541.10	-2	28	46	364	0.10	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	447.23	675.98	34	18	29	184	0.90	a
28	451.06	681.77	20	15	24	138	0.68	b NET< CL
29	462.19	698.60	55	25	40	294	1.08	
30	510.40	771.49	331	32	43	287	2.16	Wide Pk
31	582.67	880.73	362	30	38	210	1.32	
32	608.76	920.19	510	32	38	213	1.46	
33	661.18	999.44	3360	61	33	175	1.62	
34	726.93	1098.84	45	17	26	118	0.93	
35	755.13	1141.46	18	16	25	101	0.71	NET< CL
36	795.20	1202.05	29	19	29	120	1.05	NET< CL
37	835.51	1262.98	30	18	29	122	1.15	
38	910.69	1376.65	237	22	27	119	1.61	
39	964.61	1458.16	35	11	16	56	1.17	a
40	968.51	1464.06	151	16	18	68	1.40	b
41	1119.66	1692.57	112	19	26	102	1.67	
42	1173.01	1773.23	50	18	28	121	1.41	
43	1332.44	2014.25	40	15	23	75	2.87	Wide Pk
44	1376.51	2080.89	30	13	20	60	1.68	
45	1460.50	2207.86	1573	41	16	46	2.21	
46	1764.37	2667.25	77	12	14	30	2.11	
47	2203.87	3331.69	23	8	10	16	3.61	
48	2614.24	3952.10	153	13	6	6	3.71	

L5187-05 analyzed by emml461 on 04/23/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY03.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.88	138	53	86	54	54	88	NET<CL
2	74.22	455	42	60	403	43	62	
3	76.49	687	45	60	644	45	62	
4	83.83	134	46	73	95	47	75	
5	86.57	311	53	83	285	53	83	
6	89.36	186	41	64	170	42	65	
7	92.41	450	54	83	267	55	86	
11	128.53	58	38	62	52	39	63	NET<CL
12	139.08	36	47	77	28	47	77	NET<CL
15	185.29	314	46	70	221	47	73	
16	208.68	87	37	59	79	37	59	
17	238.07	1172	44	47	1104	45	49	
18	241.03	292	40	60	278	41	61	
19	269.97	67	38	62	64	39	63	
20	277.54	-3	37	61	-1	38	62	NET<CL
21	294.54	364	31	39	344	31	41	
24	337.79	200	31	45	178	31	47	
25	351.37	722	39	46	680	39	48	
29	462.19	55	25	40	53	26	40	
30	510.40	331	32	43	49	32	52	NET<CL
31	582.67	362	30	38	345	30	39	
32	608.76	510	32	38	467	33	40	
34	726.93	45	17	26	39	18	27	
38	910.69	237	22	27	224	23	28	
40	968.51	151	16	18	146	17	19	
41	1119.66	112	19	26	107	19	26	
45	1460.50	1573	41	16	1550	41	19	
46	1764.37	77	12	14	70	12	15	
48	2614.24	153	13	6	138	13	9	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.22	403	Pb-212	302	5 of 6	100.00	1.50	
			Tl-208	19	5 of 9	81.78	0.82	
			Pb-214	162	5 of 7	97.33	0.97	
			Tl-208	33	5 of 9	81.78	0.82	
3	76.49	644	Pb-212	519	5 of 6	100.00	1.50	
			Pb-214	162	5 of 7	97.33	0.97	
			Pb-212	302	5 of 6	100.00	1.00	
			Tl-208	33	5 of 9	81.78	0.82	
			Pb-214	284	5 of 7	100.00	1.00	
4	83.83	95	Tl-208	17	5 of 9	81.78	1.32	
5	86.57	285	Pb-212	271	5 of 6	100.00	1.50	
			Tl-208	17	5 of 9	81.78	0.82	Matched
			Cd-109	. . . . .	1 of 1	100.00	1.50	Matched
6	89.36	170	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	92.41	156	Th-234	. . . . .	1 of 2	58.74	0.59	Split
51	92.41	111	AcTh-228	111	9 of 36	76.43	1.26	AutoAdd
9	120.90	92	Se-75	. . . . .	1 of 5	10.38	0.60	
			Co-57	. . . . .	1 of 4	100.00	1.50	Matched
10	122.02	43	Co-57	. . . . .	1 of 4	100.00	1.50	
			Se-75	. . . . .	1 of 5	12.31	0.62	
15	185.29	221	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
16	208.68	79	AcTh-228	119	9 of 36	88.11	1.38	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
17	238.07	1104	Pb-212	1436	5 of 6	100.00	1.00	
18	241.03	278	Pb-214	174	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
19	269.97	64	AcTh-228	80	9 of 36	88.11	1.38	
21	294.54	344	Pb-214	417	5 of 7	100.00	1.50	
22	299.60	101	Pb-212	76	5 of 6	100.00	1.50	
24	337.79	178	AcTh-228	217	9 of 36	88.11	1.38	
25	351.37	680	Pb-214	1028	5 of 7	100.00	1.50	
27	447.23	34	Ag-110m	. . . . .	1 of 15	1.16	0.51	
29	462.19	53	AcTh-228	63	9 of 36	88.11	1.38	
			Sb-125	. . . . .	1 of 8	13.67	0.64	
31	582.67	345	Tl-208	408	5 of 9	82.36	1.32	
32	608.76	467	Bi-214	533	5 of 33	83.41	1.33	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
33	661.18	3360	Cs-137	. . . . .	1 of 1	100.00	1.50	
34	726.93	39	Bi-212	. . . . .	1 of 13	100.00	1.50	
37	835.51	15	Mn-54	. . . . .	1 of 1	100.00	1.50	Split
50	835.51	15	AcTh-228	15	9 of 36	77.22	1.27	AutoAdd
38	910.69	224	AcTh-228	228	9 of 36	83.34	1.33	
39	964.61	35	AcTh-228	41	9 of 36	88.11	1.38	
40	968.51	146	AcTh-228	123	9 of 36	83.34	1.33	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
41	1119.66	107	Bi-214	94	5 of 33	79.78	1.30	
42	1173.01	6	Cs-Sum	. . . . .	1 of 6	16.67	0.67	Split
49	1173.01	44	Co-60	44	2 of 2	100.00	1.50	AutoAdd
43	1332.44	40	Co-60	45	2 of 2	100.00	1.50	
44	1376.51	30	Bi-214	22	5 of 33	79.78	1.30	
45	1460.50	1550	K-40	. . . . .	1 of 1	100.00	1.50	
46	1764.37	70	Bi-214	68	5 of 33	81.45	1.31	
47	2203.87	23	Bi-214	18	5 of 33	79.78	1.30	
48	2614.24	138	Tl-208	118	5 of 9	82.36	1.32	

LSN: L5187-05

Sample ID: SOIL/SEDI Duratek Inc

Code: 1136903

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:37:59
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.97e+002 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 20000 Sec
 Sample Size 6.70e-001 kg | Real Time 20010 Sec
 Collection Efficiency 1.0000 | Spectrum File 1136903.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Canberra sn 10923049 det#3)
 Efficiency File: WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[3.20E-02*En^-2.77E+00 + 2.47E+02*En^8.30E-01] 04/30/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5187-05.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
Pb-212	Average:x	3.86E+02 +- 1.55E+01	. . . .			*	. . . . .
	74.81	I.D.	. . . .	. . . .			. . . . .
	77.12	I.D.	. . . .	. . . .			. . . . .
	87.30	I.D.	. . . .	. . . .			. . . . .
	238.63	3.84E+02 +- 1.56E+01	3.53E+01		++		. . . . .
	300.09	5.47E+02 +- 1.40E+02	4.41E+02		++		. . . . .
Tl-208	Average:x	3.87E+02 +- 2.49E+01	. . . .			*	. . . . .
	84.90	I.D.	. . . .	. . . .			. . . . .
	583.14	3.63E+02 +- 3.17E+01	8.48E+01		++		. . . . .
	2614.66	4.27E+02 +- 4.03E+01	6.61E+01		++		. . . . .
Cd-109	88.03	I.D.	. . . .	. . . .			. . . . .
Th-234	92.59	3.37E+02 +- 2.05E+02	6.75E+02		+		. . . . .
Se-75	Average:x	5.98E+00 +- 8.64E+00	. . . .				. . . . .
	121.11	7.30E+01 +- 3.39E+01	1.11E+02		+		. . . . .
	264.65 N	1.30E+00 +- 8.94E+00	3.03E+011		x	lbase	. . . . .
Co-57	122.06	5.94E+00 +- 3.66E+00	1.20E+01		+		. . . . .
Ra-226	186.22	8.79E+02 +- 1.85E+02	5.89E+02		++		. . . . .
AcTh-228	Average:x	3.66E+02 +- 2.44E+01	. . . .			*	. . . . .
	209.28	2.52E+02 +- 1.19E+02	3.88E+02		+		. . . . .
	270.23	3.02E+02 +- 1.84E+02	6.05E+02		+		. . . . .
	338.32	3.19E+02 +- 5.61E+01	1.72E+02		++		. . . . .
	463.00	3.17E+02 +- 1.53E+02	4.98E+02		+		. . . . .
	835.50	3.76E+02 +- 6.34E+02	2.13E+03		+		. . . . .
	911.07	3.73E+02 +- 3.77E+01	9.77E+01		++		. . . . .
	964.60	3.27E+02 +- 1.04E+02	3.17E+02		++		. . . . .
	969.11	4.28E+02 +- 4.84E+01	1.17E+02		++		. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-214	93.35	I.D.				
	Average:x	3.74E+02 +- 1.73E+01			*	
	241.98	5.82E+02 +- 8.51E+01	2.61E+02		+	
	295.21	3.27E+02 +- 2.97E+01	8.10E+01		+	
	351.92	3.85E+02 +- 2.21E+01	5.56E+01		+	
Ag-110m	884.67 N	3.48E+00 +- 7.99E+00	4.10E+01		x	
	446.80	I.D.				
Bi-214	Average:x	3.44E+02 +- 2.05E+01			*	
	609.31	3.34E+02 +- 2.33E+01	5.92E+01		+	
	1120.29	3.88E+02 +- 6.88E+01	2.00E+02		+	
	1377.67	4.74E+02 +- 2.12E+02	6.80E+02		+	
	1764.49	3.56E+02 +- 6.20E+01	1.62E+02		+	
	2204.22	4.38E+02 +- 1.48E+02	4.36E+02		+	
Cs-137	661.65	1.40E+03 +- 2.56E+01	2.88E+01		+	
Bi-212	727.17	1.27E+02 +- 5.72E+01	1.85E+02		+	
Mn-54	834.83	7.01E+00 +- 1.46E+01	4.90E+01		+	
Cs-Sum	1174.01	I.D.				
Co-60	Average:x	2.56E+01 +- 8.48E+00			*	
	1332.49	2.56E+01 +- 9.65E+00	3.06E+01		+	
	1173.22	2.56E+01 +- 1.78E+01	5.87E+01		+	
K-40	1460.81	9.91E+03 +- 2.62E+02	2.57E+02		+	
Am-241	59.54 N	3.74E+01 +- 1.90E+01	6.21E+01		x	lbase
Ce-144	133.54 N	2.12E+01 +- 3.45E+01	1.18E+02		x	
Ce-141	145.44 N	2.91E+01 +- 1.74E+01	5.99E+01		x	
Cr-51	320.08 N	4.95E+01 +- 1.06E+02	3.58E+02		x	
I-131	364.48 N	4.32E+01 +- 1.04E+02	3.57E+02		x	
Sb-125	427.89 N	1.12E+01 +- 2.03E+01	6.84E+01		x	
Ag-108m	433.93 N	1.14E+01 +- 6.60E+00	2.17E+01		x	
Be-7	477.59 N	4.00E+01 +- 8.84E+01	3.05E+02		x	
La-140	487.03 N	1.10E+02 +- 7.55E+01	2.49E+02		x	
Ru-103	497.08 N	1.52E+01 +- 1.07E+01	3.81E+01		x	
Ba-140	537.32 N	7.97E+01 +- 1.31E+02	4.42E+02		x	
Cs-134	604.70 N	1.87E+01 +- 2.53E+01	8.46E+01	P	x	PIC
Ru-106	621.84 N	3.65E+00 +- 5.88E+01	2.03E+02		x	
Zr-95	724.18 N	2.67E+01 +- 2.96E+01	9.69E+01	L	x	LHROI
Nb-95	765.79 N	5.15E-01 +- 1.22E+01	4.21E+01		x	
Co-58	810.76 N	1.43E+01 +- 7.91E+00	2.58E+01		x	
Fe-59	1099.22 N	3.20E+01 +- 2.10E+01	7.72E+01		x	
Zn-65	1115.52 N	2.14E+01 +- 3.16E+01	1.08E+02	P	x	PIC
Sb-124	1691.02 N	1.61E+01 +- 1.44E+01	5.77E+01		x	

MEASURED TOTAL: 1.46E+04 +- 8.73E+02 pCi/kg

0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.88	94.92	54	54	88	1248	1.18	Deleted
8	104.56	157.92	12	44	72	947	0.16	Deleted
11	128.53	194.16	52	39	63	775	0.86	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	139.08	210.12	28	47	77	1006	0.66	Deleted
13	153.26	231.54	37	45	74	937	1.51	Deleted
14	158.95	240.15	51	36	58	669	1.09	Deleted
20	277.54	419.44	-1	38	62	596	0.08	Deleted
23	327.19	494.50	42	27	44	352	0.68	Deleted
26	358.01	541.10	-2	28	46	364	0.10	Deleted
28	451.06	681.77	20	15	24	138	0.68	Deleted
30	510.40	771.49	49	32	52	287	2.16	Deleted
35	755.13	1141.46	18	16	25	101	0.71	Deleted
36	795.20	1202.05	29	19	29	120	1.05	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
52	59.54	89.86	64N	33	52	599	0.90	LBase
53	133.54	201.74	-19N	31	51	588	0.96	NET< CL
54	145.44	219.73	-61N	36	61	725	0.97	NET< CL
55	264.65	399.95	4N	26	43	374	1.07	NET< CL LBase
56	320.08	483.75	11N	23	38	289	1.12	NET< CL
57	364.48	550.88	-9N	22	37	269	1.16	NET< CL
58	427.89	646.74	13N	24	38	272	1.21	NET< CL
59	433.93	655.87	41N	24	38	261	1.21	
60	477.59	721.88	-10N	22	37	250	1.25	NET< CL
61	487.03	736.15	30N	21	33	197	1.26	NET< CL
62	497.08	751.34	-27N	19	32	194	1.26	NET< CL
63	537.32	812.18	11N	18	29	157	1.30	NET< CL
64	604.70	914.04	-54N	73	121	359	1.35	NET< CL PIC
65	621.84	939.96	1N	16	26	129	1.37	NET< CL
66	724.18	1094.68	21N	24	37	111	1.45	NET< CL LHRoi
67	765.79	1157.58	1N	16	26	114	1.48	NET< CL
68	810.76	1225.57	25N	14	21	74	1.52	
69	884.67	1337.31	5N	12	19	71	1.58	NET< CL
70	1099.22	1661.67	-20N	13	23	96	1.75	NET< CL
71	1115.52	1686.31	-18N	27	45	193	1.77	NET< CL PIC
72	1691.02	2556.36	-7N	6	11	23	2.23	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:37:59
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. . . . . 7.97E+02 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 20000 Sec
Sample Size . . . . . 6.70E-01 kg | Real Time . . . . . 20010 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1136903.spc
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Detector #: 3

Energy(keV)= 0.10 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 7.91E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[3.20e-02*En^-2.77e+00 + 2.47e+02*En^ 8.30e-01] 04/30/1998

Library File: SOILA.LIB LSF File: L5187-05.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	3.86E+02	1.55E+01	< 3.53E+01	1.72E+01	1.00E+00	MEAS +	YES
Tl-208	3.87E+02	2.49E+01	< 6.61E+01	2.89E+01	1.00E+00	MEAS +	YES
Th-234	3.37E+02	2.05E+02	< 6.75E+02	3.35E+02	1.00E+00	MEAS +	YES
Se-75	5.98E+00	8.65E+00	< 3.02E+01	1.47E+01	8.25E-01	MEAS +	YES
Co-57	5.94E+00	3.66E+00	< 1.21E+01	5.84E+00	9.18E-01	MEAS +	YES
Ra-226	8.79E+02	1.85E+02	< 5.89E+02	2.89E+02	1.00E+00	MEAS +	YES
AcTh-228	3.66E+02	2.44E+01	< 9.77E+01	4.66E+01	1.00E+00	MEAS +	YES
Pb-214	3.74E+02	1.74E+01	< 5.56E+01	2.70E+01	1.00E+00	MEAS +	YES
Ag-110m	3.48E+00	7.99E+00	< 4.10E+01	1.96E+01	9.12E-01	NET	YES
Bi-214	3.44E+02	2.05E+01	< 5.92E+01	2.86E+01	1.00E+00	MEAS +	YES
Cs-137	1.40E+03	2.56E+01	< 2.88E+01	1.38E+01	9.98E-01	MEAS +	YES
Bi-212	1.27E+02	5.72E+01	< 1.85E+02	8.80E+01	1.00E+00	MEAS +	YES
Mn-54	7.01E+00	1.46E+01	< 4.90E+01	2.39E+01	9.29E-01	MEAS +	YES
Co-60	2.56E+01	8.48E+00	< 3.05E+01	1.44E+01	9.88E-01	MEAS +	YES
K-40	9.91E+03	2.62E+02	< 2.58E+02	1.20E+02	1.00E+00	MEAS +	YES
Am-241	3.74E+01	1.90E+01	< 6.20E+01	3.02E+01	1.00E+00	NET	YES
Ce-144	-2.11E+01	3.45E+01	< 1.18E+02	5.73E+01	9.22E-01	NET	YES
Ce-141	-2.91E+01	1.74E+01	< 5.99E+01	2.93E+01	4.91E-01	NET	YES
Cr-51	4.95E+01	1.06E+02	< 3.58E+02	1.73E+02	4.35E-01	NET	YES
I-131	-4.32E+01	1.04E+02	< 3.57E+02	1.72E+02	5.66E-02	NET	YES
Sb-125	1.12E+01	2.03E+01	< 6.84E+01	3.30E+01	9.77E-01	NET	YES
Ag-108m	1.14E+01	6.60E+00	< 2.16E+01	1.04E+01	9.99E-01	NET	YES
Be-7	-4.00E+01	8.84E+01	< 3.05E+02	1.47E+02	6.49E-01	NET	YES
La-140	1.10E+02	7.55E+01	< 2.49E+02	1.20E+02	1.64E-01	NET	YES
Ru-103	-1.52E+01	1.07E+01	< 3.81E+01	1.83E+01	5.56E-01	NET	YES
Ba-140	7.97E+01	1.31E+02	< 4.42E+02	2.11E+02	1.64E-01	NET	YES
Cs-134	-1.87E+01	2.53E+01	< 8.46E+01	4.18E+01	9.70E-01	NET	YES
Ru-106	3.65E+00	5.88E+01	< 2.03E+02	9.65E+01	9.39E-01	NET	YES
Zr-95	2.67E+01	2.96E+01	< 9.69E+01	4.68E+01	6.97E-01	NET	YES
Nb-95	5.15E-01	1.22E+01	< 4.21E+01	2.00E+01	5.18E-01	NET	YES
Co-58	1.43E+01	7.91E+00	< 2.58E+01	1.21E+01	7.22E-01	NET	YES
Fe-59	-3.20E+01	2.10E+01	< 7.72E+01	3.65E+01	5.96E-01	NET	YES
Zn-65	-2.14E+01	3.16E+01	< 1.08E+02	5.26E+01	9.10E-01	NET	YES

L5187-05 analyzed by emm1461 on 04/23/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	-1.61E+01	1.44E+01	< 5.77E+01	2.57E+01	6.82E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

L5187-05 analyzed by emml461 on 05/02/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-05

street

Sample ID: SOIL/SEDI Duratek Inc

Code: 1227306

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 05/02/2003 17:43:27
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 1.01E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 40000 Sec
Sample Size 6.70E-001 kg | Real Time 40037 Sec
Collection Efficiency 1.0000 | Spc. File 1227306.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV)= 0.23 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/02/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.20	78.53	-25122	897	1499	28616	498.24	NET< CL Wide Pk
2	63.41	95.47	433	81	128	2813	1.03	
3	74.95	112.91	965	87	134	3059	1.43	a
4	77.16	116.26	1241	64	89	1748	0.86	b
5	84.39	127.18	324	62	98	1933	1.17	a
6	87.17	131.38	667	81	126	2707	1.47	b
7	89.91	135.52	434	71	112	2320	1.24	c
8	92.78	139.86	1625	79	112	2320	1.36	d
9	99.25	149.64	71	43	69	1160	0.56	e
10	121.81	183.73	132	84	136	2935	1.05	NET< CL
11	128.97	194.55	59	67	110	2245	0.46	NET< CL
12	143.63	216.71	132	74	119	2434	0.84	
13	163.66	246.97	37	78	128	2584	0.54	NET< CL
14	185.96	280.67	971	83	127	2561	1.24	
15	197.01	297.38	110	61	98	1782	1.35	a
16	198.30	299.32	131	61	98	1782	1.24	b
17	209.60	316.40	250	75	121	2316	1.28	
18	238.66	360.32	3147	77	88	1428	1.21	a
19	241.75	364.98	750	72	110	1904	1.70	b Wide Pk
20	270.31	408.15	296	61	96	1471	1.73	a Wide Pk
21	274.91	415.09	90	42	68	919	1.02	b
22	277.42	418.89	213	72	115	1838	2.11	c Wide Pk
23	295.20	445.76	955	51	67	893	1.12	a
24	300.03	453.05	211	43	67	893	1.07	b
25	328.08	495.44	156	51	82	1150	1.43	
26	338.22	510.77	562	59	89	1252	1.48	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	351.95	531.53	1818	69	89	1248	1.53	
28	409.74	618.85	76	50	81	1045	0.90	NET< CL
29	462.92	699.21	118	55	89	1164	0.67	
30	510.85	771.65	1188	62	84	983	2.18	Wide Pk
31	583.24	881.05	1134	52	64	612	1.41	
32	609.29	920.42	1552	54	61	599	1.63	
33	661.73	999.66	10290	107	54	498	1.66	
34	727.52	1099.08	247	34	49	396	1.68	
35	768.03	1160.31	175	33	50	405	1.90	
36	786.31	1187.94	86	30	47	369	2.24	a
37	794.91	1200.93	112	20	28	184	1.13	b
38	860.68	1300.32	191	34	52	396	2.05	
39	911.23	1376.71	855	40	44	320	1.64	
40	934.02	1411.15	68	28	44	312	1.94	
41	964.72	1457.54	181	28	40	281	1.92	a
42	969.13	1464.20	416	30	37	250	1.73	b
43	1000.91	1512.24	68	30	47	338	2.44	
44	1120.45	1692.88	326	34	48	352	1.99	
45	1173.34	1772.81	233	36	53	395	2.92	Wide Pk
46	1238.13	1870.72	114	28	43	344	2.57	
47	1281.43	1936.16	31	22	35	229	2.37	NET< CL
48	1332.75	2013.72	154	26	38	228	2.14	
49	1377.79	2081.79	51	18	28	144	1.62	
50	1408.62	2128.37	41	19	30	156	1.71	
51	1460.94	2207.44	5332	75	29	136	2.37	
52	1509.19	2280.35	25	15	23	92	1.82	
53	1588.15	2399.68	-3	15	25	125	0.12	NET< CL
54	1620.57	2448.66	41	14	20	67	2.68	a
55	1630.74	2464.04	50	11	15	45	1.83	b
56	1729.60	2613.44	65	14	19	64	2.59	
57	1764.61	2666.35	289	22	22	73	2.54	
58	1847.85	2792.15	20	13	20	70	2.03	
59	2103.49	3178.46	58	16	23	75	3.28	
60	2204.29	3330.80	68	15	21	67	1.99	
61	2614.58	3950.83	493	24	14	34	2.95	

L5187-05 analyzed by emml461 on 05/02/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	52.20	-25122	897	1499	-18947	920	1530	NET<CL
2	63.41	433	81	128	-58	83	137	NET<CL
3	74.95	965	87	134	870	88	137	
4	77.16	1241	64	89	1169	66	93	
5	84.39	324	62	98	172	65	105	
6	87.17	667	81	126	611	82	128	
7	89.91	434	71	112	368	73	115	
8	92.78	1625	79	112	454	82	130	
9	99.25	71	43	69	26	44	71	NET<CL
12	143.63	132	74	119	-1	75	123	NET<CL
13	163.66	37	78	128	-22	80	131	NET<CL
14	185.96	971	83	127	312	86	138	
15	197.01	110	61	98	49	61	100	NET<CL
16	198.30	131	61	98	64	62	102	NET<CL
18	238.66	3147	77	88	2951	79	93	
19	241.75	750	72	110	714	73	111	
20	270.31	296	61	96	266	62	98	
22	277.42	213	72	115	191	73	118	
23	295.20	955	51	67	873	53	72	
26	338.22	562	59	89	535	60	92	
27	351.95	1818	69	89	1711	70	93	
30	510.85	1188	62	84	250	64	102	
31	583.24	1134	52	64	1053	53	68	
32	609.29	1552	54	61	1453	56	66	
34	727.52	247	34	49	229	34	51	
35	768.03	175	33	50	143	34	53	
39	911.23	855	40	44	807	40	47	
42	969.13	416	30	37	402	31	39	
43	1000.91	68	30	47	8	31	50	NET<CL
44	1120.45	326	34	48	310	35	49	
45	1173.34	233	36	53	218	36	54	
46	1238.13	114	28	43	101	29	45	
51	1460.94	5333	75	29	5237	75	35	
57	1764.61	289	22	22	272	22	24	
61	2614.58	493	24	14	425	24	22	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.95	870	Pb-212	563	5 of 6	100.00	1.00	
			Pb-214	271	6 of 7	100.00	1.00	
			Tl-208	58	7 of 9	98.43	0.98	
4	77.16	1169	Pb-212	978	5 of 6	100.00	1.50	
			Pb-214	485	6 of 7	100.00	1.00	
5	84.39	172	Tl-208	32	7 of 9	98.43	1.48	
6	87.17	69	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
64	87.17	543	Pb-212	543	5 of 6	100.00	1.50	AutoAdd
7	89.91	368	Cd-109	. . . . .	1 of 1	100.00	1.50	
8	92.78	206	Th-234	. . . . .	1 of 2	58.74	0.59	Split
63	92.78	247	AcTh-228	247	11 of 36	81.31	1.31	AutoAdd
14	185.96	312	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
17	209.60	250	AcTh-228	315	11 of 36	89.61	1.40	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
18	238.66	2951	Pb-212	3632	5 of 6	100.00	1.00	
19	241.75	714	Pb-214	418	6 of 7	100.00	1.00	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
20	270.31	266	AcTh-228	219	11 of 36	84.91	1.35	
21	274.91	90	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Ba-133	. . . . .	1 of 5	5.46	0.55	Matched
22	277.42	191	Tl-208	135	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
23	295.20	873	Pb-214	1616	6 of 7	100.00	1.00	
24	300.03	211	Pb-212	201	5 of 6	100.00	1.50	
25	328.08	156	AcTh-228	173	11 of 36	88.01	1.38	
			Bi-212	4	4 of 13	82.79	1.33	
			La-140	28042	2 of 15	23.26	0.23	LowScore
26	338.22	535	AcTh-228	614	11 of 36	88.01	1.38	
27	351.95	1711	Pb-214	2794	6 of 7	100.00	1.00	
29	462.92	118	AcTh-228	190	11 of 36	93.21	1.43	
			Sb-125	. . . . .	1 of 8	13.67	0.64	
30	510.85	250	Tl-208	289	7 of 9	100.00	1.50	
			Annil	. . . . .	1 of 1	100.00	1.50	
31	583.24	1053	Tl-208	1004	7 of 9	100.00	1.50	
32	609.29	1453	Bi-214	1480	12 of 33	98.60	1.49	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . . . .	0.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
33	661.73	10290	Cs-137	. . . . .	1 of 1	100.00	1.50	
			1173SEsc	. . . . .	0 of 0	. . . .	0.50	
34	727.52	229	Bi-212	300	4 of 13	100.00	1.50	
			1238SEsc	. . . . .	0 of 0	. . . .	0.50	
35	768.03	143	Bi-214	136	12 of 33	97.60	1.48	
			Pa-234	. . . . .	1 of 2	26.32	0.26	LowScore
36	786.31	48	Pb-214	30	6 of 7	100.00	1.50	Split
62	786.31	38	Bi-212	38	4 of 13	100.00	1.50	AutoAdd
37	794.91	112	AcTh-228	140	11 of 36	89.61	1.40	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
38	860.68	191	Tl-208	116	7 of 9	100.00	1.50	
39	911.23	807	AcTh-228	720	11 of 36	86.64	1.37	
40	934.02	68	Bi-214	76	12 of 33	98.60	1.49	
41	964.72	181	AcTh-228	136	11 of 36	83.32	1.33	
42	969.13	402	AcTh-228	447	11 of 36	88.01	1.38	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
44	1120.45	310	Bi-214	318	12 of 33	98.60	1.49	
45	1173.34	218	Co-60	167	2 of 2	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.17	LowScore
46	1238.13	101	Bi-214	117	12 of 33	98.60	1.49	
48	1332.75	154	Co-60	201	2 of 2	100.00	1.50	
49	1377.79	51	Bi-214	76	12 of 33	98.60	1.49	
50	1408.62	41	Bi-214	45	12 of 33	98.60	1.49	
			Cs-Sum	194	2 of 6	33.33	0.33	LowScore
51	1460.94	5237	K-40	. . . . .	1 of 1	100.00	1.50	
52	1509.19	25	Bi-214	38	12 of 33	98.60	1.49	
54	1620.57	41	Bi-212	33	4 of 13	100.00	1.50	
55	1630.74	50	AcTh-228	34	11 of 36	83.32	1.33	
56	1729.60	65	Bi-214	46	12 of 33	90.74	1.41	
57	1764.61	272	Bi-214	241	12 of 33	96.60	1.47	
58	1847.85	20	Bi-214	31	12 of 33	98.60	1.49	
59	2103.49	58	2615SEsc	. . . . .	0 of 0	. . . .	0.50	
60	2204.29	68	Bi-214	66	12 of 33	98.60	1.49	
61	2614.58	425	Tl-208	463	7 of 9	100.00	1.50	

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-05

Sample ID: SOIL/SEDI Duratek Inc

Code: 1227306

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 05/02/2003 17:43:27
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 1.01e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 40000 Sec
 Sample Size 6.70e-001 kg | Real Time 40037 Sec
 Collection Efficiency 1.0000 | Spectrum File 1227306.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[8.71E-03*En^-3.34E+00 + 1.54E+02*En^6.70E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5187-05.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	4.02E+02 +- 1.06E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	4.01E+02 +- 1.07E+01	2.58E+01		+	. . . . .
	300.09	4.34E+02 +- 8.82E+01	2.79E+02		+	. . . . .
Tl-208	Average:x	3.70E+02 +- 1.36E+01	. . . .		*	. . . . .
	84.90	I.D.	. . . .			. . . . .
	277.35	5.22E+02 +- 1.99E+02	6.49E+02		+	. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	3.78E+02 +- 1.89E+01	4.98E+01		+	. . . . .
	860.37	6.00E+02 +- 1.08E+02	3.34E+02		+	. . . . .
	2614.66	3.51E+02 +- 2.02E+01	3.78E+01		+	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	2.16E+02 +- 1.49E+02	4.89E+02		+	. . . . .
Ce-141	145.44	N-3.54E-01 +- 1.84E+01	6.13E+01		X	. . . . .
Ra-226	186.22	5.03E+02 +- 1.38E+02	4.49E+02		+	. . . . .
AcTh-228	Average:x	3.96E+02 +- 1.43E+01	. . . .		*	. . . . .
	209.28	3.19E+02 +- 9.60E+01	3.12E+02		+	. . . . .
	270.23	4.84E+02 +- 1.13E+02	3.63E+02		+	. . . . .
	327.64	3.60E+02 +- 1.19E+02	3.86E+02		+	. . . . .
	338.32	3.55E+02 +- 4.00E+01	1.23E+02		+	. . . . .
	463.00	2.49E+02 +- 1.16E+02	3.81E+02		+	. . . . .
	794.70	3.24E+02 +- 5.88E+01	1.73E+02		+	. . . . .
	911.07	4.26E+02 +- 2.13E+01	5.13E+01		+	. . . . .
	964.60	5.29E+02 +- 8.15E+01	2.43E+02		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	N	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-214	969.11		3.69E+02 +- 2.86E+01	7.45E+01		+	.
	1630.40		5.79E+02 +- 1.32E+02	3.74E+02		+	.
	93.35		I.D.	.			.
	Average:x		3.50E+02 +- 1.14E+01	.		*	.
	241.98		5.83E+02 +- 5.95E+01	1.84E+02		+	.
	295.21		3.15E+02 +- 1.90E+01	5.28E+01		+	.
	351.92		3.57E+02 +- 1.46E+01	3.93E+01		+	.
Bi-214	785.91		5.82E+02 +- 6.34E+02	2.10E+03		+	.
	Average:x		3.53E+02 +- 1.11E+01	.		*	.
	609.31		3.51E+02 +- 1.34E+01	3.28E+01		+	.
	768.36		3.71E+02 +- 8.84E+01	2.80E+02		+	.
	934.06		3.13E+02 +- 1.29E+02	4.17E+02		+	.
	1120.29		3.45E+02 +- 3.85E+01	1.12E+02		+	.
	1238.11		3.06E+02 +- 8.76E+01	2.78E+02		+	.
	1377.67		2.39E+02 +- 8.65E+01	2.75E+02		+	.
	1407.98		3.21E+02 +- 1.51E+02	4.90E+02		+	.
	1509.23		2.27E+02 +- 1.37E+02	4.48E+02		+	.
	1729.59		4.95E+02 +- 1.08E+02	3.15E+02		+	.
	1764.49		3.92E+02 +- 3.19E+01	7.37E+01		+	.
	1847.42		2.29E+02 +- 1.48E+02	4.88E+02		+	.
	2204.22		3.60E+02 +- 8.04E+01	2.36E+02		+	.
Cs-137	661.65		1.43E+03 +- 1.48E+01	1.53E+01		+	.
Bi-212	Average:x		2.52E+02 +- 3.45E+01	.		*	.
	727.17		2.44E+02 +- 3.67E+01	1.12E+02		+	.
	785.46		2.53E+02 +- 2.90E+02	9.61E+02		+	.
	1620.62		3.17E+02 +- 1.07E+02	3.34E+02		+	.
Co-60	Average:x		3.28E+01 +- 3.93E+00	.		*	.
	1173.22		3.84E+01 +- 6.38E+00	1.96E+01		+	.
	1332.49		2.94E+01 +- 4.98E+00	1.49E+01		+	.
K-40	1460.81		9.85E+03 +- 1.42E+02	1.38E+02		+	.
Am-241	59.54	N	6.18E+01 +- 2.11E+01	6.86E+011		x	lbase
Co-57	122.06	N	1.09E+01 +- 3.70E+00	1.20E+01		x	.
Ce-144	133.54	N	3.33E+01 +- 2.84E+01	9.56E+01		x	.
Se-75	264.65	N	2.00E+01 +- 6.76E+00	2.33E+011		x	lbase
Cr-51	320.08	N	9.02E+01 +- 9.53E+01	3.16E+02		x	.
I-131	364.48	N	1.41E+02 +- 1.56E+02	5.17E+02		x	.
Sb-125	427.89	N	1.01E+01 +- 1.25E+01	4.15E+01		x	.
Ag-108m	433.93	N	3.27E+00 +- 3.83E+00	1.30E+01		x	.
Be-7	477.59	N	1.11E+01 +- 5.88E+01	1.98E+02		x	.
La-140	487.03	N	2.11E+01 +- 7.17E+01	2.41E+02		x	.
Ru-103	497.08	N	5.52E+00 +- 8.45E+00	2.82E+01		x	.
Ba-140	537.32	N	1.41E+02 +- 1.43E+02	4.88E+02		x	.
Cs-134	604.70	N	2.17E+00 +- 4.03E+00	1.37E+011		x	lbase
Ru-106	621.84	N	4.99E+01 +- 3.88E+01	1.34E+02		x	.
Zr-95	724.18	N	4.02E+01 +- 4.66E+01	1.55E+02P		x	PIC
Nb-95	765.79	N	6.02E+00 +- 1.14E+01	3.80E+01P		x	PIC
Co-58	810.76	N	3.92E+00 +- 4.88E+00	1.69E+01		x	.
Mn-54	834.83	N	3.79E+00 +- 3.85E+00	1.28E+01		x	.
Ag-110m	884.67	N	7.56E+00 +- 4.95E+00	1.74E+01		x	.
Fe-59	1099.22	N	8.52E+00 +- 1.34E+01	4.63E+01		x	.
Zn-65	1115.52	N	1.35E+01 +- 1.77E+01	5.87E+01P		x	PIC
Sb-124	1691.02	N	8.10E+00 +- 7.90E+00	2.92E+01		x	.

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)	ADDRESS CHANNEL					

MEASURED TOTAL: 1.42E+04 +- 5.43E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.20	78.53	-18947	920	1530	28616	498.24	Deleted
2	63.41	95.47	-58	83	137	2813	1.03	Deleted
9	99.25	149.64	26	44	71	1160	0.56	Deleted
10	121.81	183.73	132	84	136	2935	1.05	Deleted
11	128.97	194.55	59	67	110	2245	0.46	Deleted
13	163.66	246.97	-22	80	131	2584	0.54	Deleted
15	197.01	297.38	49	61	100	1782	1.35	Deleted
16	198.30	299.32	64	62	102	1782	1.24	Deleted
21	274.91	415.09	90	42	68	919	1.02	Unknown
28	409.74	618.85	76	50	81	1045	0.90	Deleted
43	1000.91	1512.24	8	31	50	338	2.44	Deleted
47	1281.43	1936.16	31	22	35	229	2.37	Deleted
53	1588.15	2399.68	-3	15	25	125	0.12	Deleted
59	2103.49	3178.46	58	16	23	75	3.28	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	143.63	216.71	-1N	75	123	2434	0.84	NET< CL
65	59.54	89.63	167N	57	91	1685	1.13	LBase
66	122.06	184.11	175N	59	95	1818	1.12	
67	133.54	201.46	-68N	58	96	1861	1.13	NET< CL
68	264.65	399.59	-145N	49	83	1270	1.21	NET< CL
								LBase
69	320.08	483.36	42N	44	72	963	1.25	NET< CL
70	364.48	550.46	37N	41	67	819	1.29	NET< CL
71	427.89	646.28	33N	40	66	761	1.35	NET< CL
72	433.93	655.41	-33N	39	64	763	1.35	NET< CL
73	477.59	721.39	-7N	37	61	695	1.40	NET< CL
74	487.03	735.65	10N	34	56	573	1.40	NET< CL
75	497.08	750.84	24N	36	59	603	1.41	NET< CL
76	537.32	811.65	-34N	35	58	540	1.45	NET< CL
77	604.70	913.48	-18N	34	56	541	1.51	NET< CL
								LBase
78	621.84	939.38	-40N	31	52	461	1.53	NET< CL
79	724.18	1094.04	-88N	103	169	544	1.62	NET< CL
								PIC
80	765.79	1156.92	20N	38	62	498	1.66	NET< CL
								PIC
81	810.76	1224.88	-19N	24	40	289	1.70	NET< CL

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NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
82	834.83	1261.25	25N	25	41	310	1.72	NET< CL
83	884.67	1336.57	-34N	22	38	265	1.76	NET< CL
84	1099.22	1660.80	-15N	24	39	270	1.92	NET< CL
85	1115.52	1685.43	36N	47	77	551	1.93	NET< CL
								PIC
86	1691.02	2555.14	-11N	11	18	63	2.26	NET< CL

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L5187-05 analyzed by emml461 on 05/02/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	-8.10E+00	7.90E+00	< 2.92E+01	1.36E+01	6.13E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-06 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-6
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5777

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 680.5 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/23/04 1639 Det No.: 64 Spectrum No.: 1136909
Counted by: EM
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-06
Client Id : BMS-A0300-6

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	680.5		
Sample Weight-Dry	g			
Aliquot Weight	g	680.5		
FINAL WEIGHT	kg	.6805		
Container			WTS5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-06 analyzed by emml461 on 04/23/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-06 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1136904

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:38:59
Sampling Stop: 03/21/2003 12:00:00 ✓ Decay Time: 7.97E+002 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 20000 Sec
Sample Size 6.80E-001 kg | Real Time 20010 Sec
Collection Efficiency 1.0000 | Spc. File 1136904.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.10 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.89	94.91	99	43	68	934	0.57	
2	74.50	112.46	582	50	72	1032	1.18	a
3	76.76	115.87	897	48	61	825	0.97	b
4	84.00	126.82	153	58	93	1383	1.63	a Wide Pk
5	87.00	131.34	399	50	75	1037	1.36	b
6	89.54	135.19	190	42	65	864	0.99	c
7	92.60	139.81	482	45	65	864	1.18	d
8	129.21	195.15	3	57	94	1293	0.05	NET< CL
9	143.55	216.82	-44	41	69	869	1.03	NET< CL
10	163.56	247.07	20	34	55	616	0.45	NET< CL
11	185.76	280.62	406	46	68	792	1.39	
12	208.95	315.68	120	37	58	624	1.30	a
13	211.34	319.29	41	23	36	312	0.56	b
14	238.33	360.08	1353	47	47	448	0.99	a
15	241.34	364.64	366	42	61	628	1.52	b
16	252.15	380.96	-12	30	50	463	0.30	NET< CL
17	269.57	407.30	70	43	69	662	0.89	
18	277.42	419.16	106	35	55	477	1.46	
19	294.89	445.57	503	35	44	353	1.19	a
20	299.86	453.07	93	25	38	294	1.01	b
21	327.68	495.13	57	28	44	362	0.87	
22	338.13	510.93	336	32	44	330	1.37	
23	351.68	531.40	805	41	48	363	1.38	
24	409.09	618.18	40	25	40	278	1.23	NET< CL
25	438.55	662.70	29	19	30	183	0.83	NET< CL
26	462.60	699.06	147	30	46	288	1.52	
27	510.81	771.92	469	37	50	326	2.40	Wide Pk

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	582.98	881.00	457	33	40	240	1.32	
29	609.04	920.40	610	33	36	204	1.56	
30	661.51	999.71	854	36	34	185	1.36	
31	727.02	1098.73	104	20	29	133	1.31	
32	785.59	1187.25	32	17	26	124	1.57	
33	794.15	1200.19	24	22	36	190	1.16	NET< CL
34	860.34	1300.23	16	17	27	135	0.62	NET< CL
35	903.40	1365.32	22	10	15	57	0.83	a
36	911.10	1376.95	340	23	22	100	1.54	b
37	964.59	1457.80	80	18	25	111	1.92	a
38	968.83	1464.22	180	19	23	99	1.69	b
39	1119.90	1692.55	157	22	30	143	1.74	
40	1173.24	1773.17	331	27	33	165	1.77	
41	1237.82	1870.79	39	21	33	166	1.85	
42	1332.51	2013.91	243	21	22	76	1.89	
43	1377.00	2081.14	20	13	21	64	0.96	NET< CL
44	1460.81	2207.83	1839	44	18	56	2.04	
45	1764.60	2667.00	109	14	14	35	1.69	
46	2614.59	3951.74	190	15	8	11	2.67	

L5187-06 analyzed by emml461 on 04/23/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.89	99	43	68	-11	43	71	NET<CL
2	74.50	582	50	72	544	50	73	
3	76.76	897	48	61	853	48	63	
4	84.00	153	58	93	121	58	94	
5	87.00	399	50	75	380	50	76	
6	89.54	190	42	65	161	42	66	
7	92.60	482	45	65	260	46	71	
9	143.55	-44	41	69	-71	41	70	NET<CL
10	163.56	20	34	55	17	34	56	NET<CL
11	185.76	406	46	68	293	47	71	
14	238.33	1353	47	47	1263	47	50	
15	241.34	366	42	61	344	42	62	
17	269.57	70	43	69	61	43	70	NET<CL
19	294.89	503	35	44	477	35	45	
20	299.86	93	25	38	83	26	40	
22	338.13	336	32	44	327	33	45	
23	351.68	805	41	48	747	41	50	
26	462.60	147	30	46	142	31	46	
27	510.81	469	37	50	184	38	58	
28	582.98	457	33	40	425	33	42	
29	609.04	610	33	36	579	33	38	
31	727.02	104	20	29	98	21	30	
36	911.10	340	23	23	324	23	24	
38	968.83	180	19	23	176	20	24	
39	1119.90	157	22	30	152	22	31	
44	1460.81	1839	44	18	1810	44	21	
45	1764.60	109	14	14	102	14	15	
46	2614.59	190	15	8	169	15	12	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.50	544	Pb-212	314	5 of 6	100.00	1.00	
			Tl-208	21	7 of 9	93.95	0.94	
			Pb-214	183	6 of 7	98.66	0.99	
			Tl-208	38	7 of 9	93.95	0.94	
3	76.76	853	Pb-214	324	6 of 7	100.00	1.00	
			Pb-214	183	6 of 7	98.66	0.99	
			Pb-212	314	5 of 6	99.30	0.99	
			Tl-208	38	7 of 9	93.95	0.94	
			Pb-212	552	5 of 6	100.00	1.00	
4	84.00	121	Tl-208	20	7 of 9	93.95	1.44	
5	87.00	97	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
50	87.00	283	Pb-212	283	5 of 6	100.00	1.50	AutoAdd
6	89.54	161	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	92.60	103	Th-234	. . . . .	1 of 2	58.74	0.59	Split
49	92.60	157	AcTh-228	157	8 of 36	74.38	1.24	AutoAdd
11	185.76	293	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
12	208.95	120	AcTh-228	169	8 of 36	84.05	1.34	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
13	211.34	41	Unknown	. . . . .	. . . . .	. . . .	. . . .
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
14	238.33	1263	Pb-212	1927	5 of 6	100.00	1.00	
15	241.34	344	Pb-214	205	6 of 7	100.00	1.00	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
18	277.42	106	Tl-208	64	7 of 9	94.62	1.45	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
19	294.89	477	Pb-214	758	6 of 7	100.00	1.50	
20	299.86	83	Pb-212	82	5 of 6	100.00	1.50	
21	327.68	57	AcTh-228	87	8 of 36	84.05	1.34	
			Bi-212	2	3 of 13	69.12	1.19	
			La-140	12998	2 of 15	23.26	0.23	LowScore
22	338.13	327	AcTh-228	295	8 of 36	77.77	1.28	
23	351.68	747	Pb-214	1283	6 of 7	100.00	1.00	
26	462.60	142	AcTh-228	90	8 of 36	75.11	1.25	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
27	510.81	57	Annul	. . . . .	1 of 1	100.00	1.50	Split
48	510.81	127	Tl-208	127	7 of 9	94.62	1.45	AutoAdd
28	582.98	425	Tl-208	491	7 of 9	94.62	1.45	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
29	609.04	579	Bi-214	708	5 of 33	78.50	1.28	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.50	
30	661.51	854	Cs-137	. . . . .	1 of 1	100.00	1.50	
			1173SEsc	. . . . .	0 of 0	. . .	0.50	
31	727.02	98	Bi-212	132	3 of 13	83.48	1.33	
32	785.59	16	Pb-214	14	6 of 7	100.00	1.50	Split
47	785.59	16	Bi-212	16	3 of 13	83.48	1.33	AutoAdd
35	903.40	22	Bi-214	1	5 of 33	65.83	1.16	
36	911.10	324	AcTh-228	345	8 of 36	79.18	1.29	
37	964.59	80	AcTh-228	60	8 of 36	76.96	1.27	
38	968.83	176	AcTh-228	195	8 of 36	79.18	1.29	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
39	1119.90	152	Bi-214	119	5 of 33	74.38	1.24	
40	1173.24	331	Co-60	269	2 of 2	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.17	LowScore
41	1237.82	39	Bi-214	44	5 of 33	78.50	1.28	
42	1332.51	243	Co-60	299	2 of 2	100.00	1.50	
44	1460.81	1810	K-40	. . . . .	1 of 1	100.00	1.50	
45	1764.60	102	Bi-214	87	5 of 33	75.43	1.25	
46	2614.59	169	Tl-208	160	7 of 9	94.62	1.45	

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-06

Sample ID: SOIL/SEDI Duratek Inc

Code: 1136904

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:38:59
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.97e+002 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 20000 Sec
 Sample Size 6.80e-001 kg | Real Time 20010 Sec
 Collection Efficiency 1.0000 | Spectrum File 1136904.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 4 (Canberra sn 10923050 det#4)
 Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
 Eff.=1/[1.58E-02*En^-3.09E+00 + 2.56E+02*En^7.93E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5187-06.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	4.69E+02 +- 1.73E+01		*
	74.81	I.D.	. . . . .			. . . . .
	87.30	I.D.	. . . . .			. . . . .
	238.63	4.69E+02 +- 1.74E+01	3.85E+01		++	. . . . .
	300.09	4.80E+02 +- 1.49E+02	4.73E+02		++	. . . . .
Pb-214	Average:x	4.73E+02 +- 1.97E+01	. . . . .		*	. . . . .
	77.11	I.D.	. . . . .			. . . . .
	241.98	7.69E+02 +- 9.35E+01	2.82E+02		++	. . . . .
	295.21	4.83E+02 +- 3.55E+01	9.42E+01		++	. . . . .
	351.92	4.48E+02 +- 2.45E+01	6.16E+01		++	. . . . .
	785.91	6.28E+02 +- 1.11E+03	3.73E+03		+	. . . . .
Tl-208	Average:x	4.87E+02 +- 2.79E+01	. . . . .		*	. . . . .
	84.90	I.D.	. . . . .			. . . . .
	277.35	8.02E+02 +- 2.65E+02	8.54E+02		++	. . . . .
	510.84	I.D.	. . . . .			. . . . .
	583.14	4.65E+02 +- 3.59E+01	9.47E+01		++	. . . . .
	2614.66	5.12E+02 +- 4.50E+01	7.96E+01		++	. . . . .
Cd-109	88.03	I.D.	. . . . .			. . . . .
Th-234	92.59	2.41E+02 +- 1.87E+02	6.16E+02		+	. . . . .
Ra-226	186.22	1.25E+03 +- 1.98E+02	6.19E+02		++	. . . . .
AcTh-228	Average:x	5.61E+02 +- 2.72E+01	. . . . .		*	. . . . .
	209.28	4.11E+02 +- 1.27E+02	4.08E+02		++	. . . . .
	327.64	3.75E+02 +- 1.84E+02	6.00E+02		+	. . . . .
	338.32	6.19E+02 +- 6.20E+01	1.75E+02		++	. . . . .
	463.00	8.88E+02 +- 1.92E+02	5.98E+02		++	. . . . .
	911.07	5.52E+02 +- 3.94E+01	8.60E+01		++	. . . . .

=====

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E (keV)		(pCi/kg)				
	964.60		7.56E+02	+ - 1.69E+02	5.06E+02	+	*	. . . . .
	969.11		5.25E+02	+ - 5.86E+01	1.51E+02	+	*	. . . . .
	93.35		I.D.	. . . . .	. . . . .			. . . . .
Annul	511.00		1.81E+01	+ - 2.11E+01	6.97E+01	+		. . . . .
Bi-214	Average:x		4.47E+02	+ - 2.22E+01	. . . . .	*		. . . . .
	609.31		4.29E+02	+ - 2.47E+01	5.81E+01	+	*	. . . . .
	904.25		9.75E+03	+ - 4.59E+03	1.47E+04	+		. . . . .
	1120.29		5.60E+02	+ - 8.26E+01	2.37E+02	+	*	. . . . .
	1238.11		3.91E+02	+ - 2.11E+02	6.90E+02	+		. . . . .
	1764.49		5.12E+02	+ - 6.94E+01	1.69E+02	+	*	. . . . .
Cs-137	661.65		3.68E+02	+ - 1.55E+01	3.07E+01	+	*	. . . . .
Bi-212	Average:x		3.28E+02	+ - 6.84E+01	. . . . .	*		. . . . .
	727.17		3.28E+02	+ - 6.90E+01	2.08E+02	+	*	. . . . .
	785.46		3.30E+02	+ - 5.08E+02	1.71E+03	+		. . . . .
Co-60	Average:x		1.72E+02	+ - 1.02E+01	. . . . .	*		. . . . .
	1173.22		1.93E+02	+ - 1.59E+01	4.06E+01	+	*	. . . . .
	1332.49		1.57E+02	+ - 1.33E+01	3.02E+01	+	*	. . . . .
K-40	1460.81		1.16E+04	+ - 2.85E+02	2.85E+02	+	*	. . . . .
Am-241	59.54	N	7.60E+01	+ - 2.66E+01	8.59E+011	x	lbase	. . . . .
Co-57	122.06	N	7.66E+00	+ - 5.38E+00	1.85E+01	x		. . . . .
Ce-144	133.54	N	6.56E+00	+ - 4.26E+01	1.44E+02	x		. . . . .
Ce-141	145.44	N	2.91E+01	+ - 1.83E+01	6.04E+01	x		. . . . .
Se-75	264.65	N	1.13E+01	+ - 8.96E+00	3.12E+011	x	lbase	. . . . .
Cr-51	320.08	N	1.45E+02	+ - 1.23E+02	4.10E+02	x		. . . . .
I-131	364.48	N	4.98E+00	+ - 1.13E+02	3.87E+02	x		. . . . .
Sb-125	427.89	N	1.81E+01	+ - 1.92E+01	6.69E+01	x		. . . . .
Ag-108m	433.93	N	1.46E+00	+ - 6.05E+00	2.08E+01	x		. . . . .
Be-7	477.59	N	1.67E+01	+ - 8.37E+01	2.88E+02	x		. . . . .
La-140	487.03	N	3.84E+01	+ - 7.05E+01	2.46E+02	x		. . . . .
Ru-103	497.08	N	2.24E+01	+ - 1.10E+01	3.96E+01	x		. . . . .
Ba-140	537.32	N	0.00E+00	+ - 1.33E+02	4.58E+02	x		. . . . .
Cs-134	604.70	N	6.49E+00	+ - 7.40E+00	2.58E+011	x	lbase	. . . . .
Ru-106	621.84	N	9.72E+01	+ - 6.76E+01	2.41E+02	x		. . . . .
Zr-95	724.18	N	6.46E+01	+ - 1.98E+02	6.57E+02P	x	PIC	. . . . .
Nb-95	765.79	N	1.37E+01	+ - 1.37E+01	4.59E+01	x		. . . . .
Co-58	810.76	N	1.95E+00	+ - 8.55E+00	2.95E+01	x		. . . . .
Mn-54	834.83	N	6.64E+00	+ - 7.10E+00	2.39E+01	x		. . . . .
Ag-110m	884.67	N	3.48E+00	+ - 1.04E+01	3.59E+01	x		. . . . .
Fe-59	1099.22	N	5.20E+01	+ - 2.42E+01	7.81E+01	x		. . . . .
Zn-65	1115.52	N	5.99E+01	+ - 3.61E+01	1.19E+02P	x	PIC	. . . . .
Sb-124	1691.02	N	1.61E+01	+ - 1.44E+01	4.92E+01	x		. . . . .

MEASURED TOTAL: 1.64E+04 +- 9.00E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.89	94.91	-11	43	71	934	0.57	Deleted
8	129.21	195.15	3	57	94	1293	0.05	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
9	143.55	216.82	-71	41	70	869	1.03	Deleted
10	163.56	247.07	17	34	56	616	0.45	Deleted
13	211.34	319.29	41	23	36	312	0.56	Unknown
16	252.15	380.96	-12	30	50	463	0.30	Deleted
17	269.57	407.30	61	43	70	662	0.89	Deleted
24	409.09	618.18	40	25	40	278	1.23	Deleted
25	438.55	662.70	29	19	30	183	0.83	Deleted
33	794.15	1200.19	25	22	36	191	1.16	Deleted
34	860.34	1300.23	16	17	27	135	0.62	Deleted
43	1377.00	2081.14	20	13	21	65	0.96	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
51	59.54	89.84	111N	39	61	753	0.98	LBase
52	122.06	184.34	-52N	36	61	743	1.04	NET< CL
53	133.54	201.69	-6N	36	59	698	1.05	NET< CL
54	145.44	219.68	57N	36	57	663	1.06	NET< CL
55	264.65	399.86	-31N	25	42	349	1.17	NET< CL
56	320.08	483.64	30N	25	41	310	1.21	LBase
57	364.48	550.75	-1N	23	38	260	1.25	NET< CL
58	427.89	646.59	-20N	21	36	234	1.30	NET< CL
59	433.93	655.72	-5N	21	34	217	1.30	NET< CL
60	477.59	721.71	-4N	20	33	202	1.34	NET< CL
61	487.03	735.98	-10N	18	31	174	1.34	NET< CL
62	497.08	751.17	-38N	19	32	192	1.35	NET< CL
63	537.32	812.00	0N	18	29	155	1.38	NET< CL
64	604.70	913.84	-18N	21	34	203	1.43	NET< CL
65	621.84	939.75	-26N	18	31	159	1.44	LBase
66	724.18	1094.43	-50N	154	253	224	1.52	NET< CL
67	765.79	1157.32	17N	17	27	149	1.55	PIC
68	810.76	1225.29	3N	14	23	107	1.58	NET< CL
69	834.83	1261.67	14N	15	24	112	1.60	NET< CL
70	884.67	1337.01	5N	15	24	110	1.64	NET< CL
71	1099.22	1661.29	32N	15	23	95	1.79	
72	1115.52	1685.93	50N	30	48	223	1.80	PIC
73	1691.02	2555.79	7N	6	9	16	2.20	NET< CL

L5187-06 analyzed by emm1461 on 04/23/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:38:59
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.97E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 20000 Sec
Sample Size 6.80E-01 kg | Real Time 20010 Sec
Collection Efficiency 1.0000 | Spectrum File 1136904.spc

Detector #: 4

Energy(keV)= 0.10 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
Eff.=1/[1.58e-02*En^-3.09e+00 + 2.56e+02*En^ 7.93e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5187-06.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	4.69E+02	1.73E+01	< 3.85E+01	1.87E+01	1.00E+00	MEAS +	YES
Pb-214	4.73E+02	1.97E+01	< 6.16E+01	3.00E+01	1.00E+00	MEAS +	YES
Tl-208	4.86E+02	2.79E+01	< 7.96E+01	3.57E+01	1.00E+00	MEAS +	YES
Th-234	2.41E+02	1.87E+02	< 6.16E+02	3.05E+02	1.00E+00	MEAS +	YES
Ra-226	1.25E+03	1.98E+02	< 6.19E+02	3.04E+02	1.00E+00	MEAS +	YES
AcTh-228	5.61E+02	2.72E+01	< 8.60E+01	4.07E+01	1.00E+00	MEAS +	YES
Annil	1.81E+01	2.11E+01	< 6.97E+01	3.44E+01	9.39E-01	MEAS +	YES
Bi-214	4.47E+02	2.22E+01	< 5.80E+01	2.80E+01	1.00E+00	MEAS +	YES
Cs-137	3.68E+02	1.55E+01	< 3.07E+01	1.48E+01	9.98E-01	MEAS +	YES
Bi-212	3.28E+02	6.84E+01	< 2.08E+02	9.96E+01	1.00E+00	MEAS +	YES
Co-60	1.72E+02	1.02E+01	< 3.02E+01	1.42E+01	9.88E-01	MEAS +	YES
K-40	1.16E+04	2.85E+02	< 2.86E+02	1.34E+02	1.00E+00	MEAS +	YES
Am-241	7.60E+01	2.66E+01	< 8.59E+01	4.20E+01	1.00E+00	NET	YES
Co-57	-7.66E+00	5.38E+00	< 1.85E+01	9.03E+00	9.18E-01	NET	YES
Ce-144	-6.56E+00	4.26E+01	< 1.44E+02	7.02E+01	9.22E-01	NET	YES
Ce-141	2.91E+01	1.83E+01	< 6.04E+01	2.95E+01	4.91E-01	NET	YES
Se-75	-1.13E+01	8.96E+00	< 3.12E+01	1.51E+01	8.25E-01	NET	YES
Cr-51	1.45E+02	1.24E+02	< 4.10E+02	1.98E+02	4.35E-01	NET	YES
I-131	-4.98E+00	1.13E+02	< 3.87E+02	1.87E+02	5.66E-02	NET	YES
Sb-125	-1.81E+01	1.92E+01	< 6.69E+01	3.22E+01	9.77E-01	NET	YES
Ag-108m	-1.46E+00	6.05E+00	< 2.08E+01	1.00E+01	9.99E-01	NET	YES
Be-7	-1.67E+01	8.37E+01	< 2.88E+02	1.38E+02	6.49E-01	NET	YES
La-140	-3.84E+01	7.05E+01	< 2.46E+02	1.18E+02	1.64E-01	NET	YES
Ru-103	-2.24E+01	1.10E+01	< 3.97E+01	1.90E+01	5.56E-01	NET	YES
Ba-140	0.00E+00	1.33E+02	< 4.58E+02	2.19E+02	1.64E-01	NET	YES
Cs-134	-6.49E+00	7.40E+00	< 2.58E+01	1.24E+01	9.70E-01	NET	YES
Ru-106	-9.72E+01	6.76E+01	< 2.41E+02	1.16E+02	9.39E-01	NET	YES
Zr-95	-6.46E+01	1.98E+02	< 6.56E+02	3.26E+02	6.97E-01	NET	YES
Nb-95	1.37E+01	1.37E+01	< 4.59E+01	2.19E+01	5.18E-01	NET	YES
Co-58	1.95E+00	8.55E+00	< 2.95E+01	1.40E+01	7.22E-01	NET	YES
Mn-54	6.64E+00	7.10E+00	< 2.39E+01	1.13E+01	9.29E-01	NET	YES
Ag-110m	3.48E+00	1.04E+01	< 3.59E+01	1.70E+01	9.12E-01	NET	YES
Fe-59	5.20E+01	2.42E+01	< 7.81E+01	3.69E+01	5.96E-01	NET	YES

L5187-06 analyzed by emm1461 on 04/23/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Zn-65	5.98E+01	3.61E+01	< 1.19E+02	5.77E+01	9.10E-01	NET	YES
Sb-124	1.61E+01	1.44E+01	< 4.92E+01	2.15E+01	6.82E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-07

Client: Duratek Inc

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMS-AO300-7

Collect Start Date/Time: _____

Collect Stop Date/Time: 03-21-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1.1; Co-60 .038

Count by Date: _____
(if required)

Delay Date: _____
(if required)

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 573.1 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/21/03 01:02

Det No.: 3

Spectrum No.: 1116803

Counted by: 6

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5187-07	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-AQ300-7	Matrix	: S001 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/21/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
=====				
Sample Weight	g	573.1		
Sample Weight-Dry	g			
Aliquot Weight	g	573.1		
FINAL WEIGHT	kg	.5731		
Container			WTS5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-07 analyzed by emml461 on 04/25/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-07

Sample ID: NONE

Code: 1116803

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 16:22:07
Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.48E+002 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 30000 Sec
Sample Size 5.73E-001 kg | Real Time 30018 Sec
Collection Efficiency 1.0000 | Spc. File 1116803.spc

Detector #: 3 (Canberra sn 10923049 det#3)

Energy(keV)= 0.88 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.03	93.97	202	78	127	2547	1.06	
2	75.03	112.11	1106	59	81	1460	0.90	a
3	77.22	115.42	1763	65	81	1460	0.89	b
4	84.45	126.35	256	39	58	818	0.70	a
5	87.35	130.74	752	57	82	1364	1.07	b
6	90.02	134.77	471	48	70	1091	0.90	c
7	93.01	139.30	955	59	82	1364	1.15	d
8	99.22	148.68	143	65	106	1910	1.60	e Wide Pk
9	105.43	158.07	103	67	109	1884	1.56	NET< CL Wide Pk
10	112.81	169.24	10	48	78	1227	0.19	NET< CL
11	129.18	193.98	107	47	76	1170	0.78	
12	143.82	216.12	61	46	75	1143	0.98	NET< CL
13	149.74	225.07	36	24	39	424	0.49	a NET< CL
14	154.57	232.38	138	46	72	1059	1.12	b
15	163.19	245.41	-26	49	80	1195	0.63	NET< CL
16	186.09	280.04	624	58	86	1272	1.28	
17	194.05	292.07	-54	46	76	1073	1.10	NET< CL
18	209.45	315.35	240	47	72	971	1.06	
19	238.72	359.61	2950	65	59	702	1.10	a
20	241.80	364.27	715	53	76	982	1.61	b Wide Pk
21	269.82	406.62	143	25	35	308	0.60	a
22	271.06	408.50	77	32	50	513	1.17	b
23	277.58	418.36	132	37	58	616	1.30	c
24	295.29	445.13	1065	43	47	447	1.05	a
25	300.02	452.29	191	32	47	447	1.00	b
26	313.13	472.12	45	32	52	499	1.38	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	328.53	495.39	100	42	67	707	1.10	
28	338.48	510.44	533	45	63	627	1.23	
29	352.05	530.96	1790	54	56	526	1.20	
30	409.75	618.20	38	28	45	372	0.58	NET< CL
31	434.88	656.18	30	29	47	376	1.42	a NET< CL
32	439.12	662.61	45	20	31	215	0.95	b
33	463.05	698.78	176	31	46	360	1.38	
34	511.02	771.30	706	39	47	351	1.76	
35	583.26	880.54	924	40	43	295	1.62	
36	609.39	920.04	1294	46	46	315	1.40	
37	661.80	999.28	1192	45	47	328	1.42	
38	727.32	1098.35	194	27	38	232	1.53	
39	768.08	1159.97	44	28	44	292	0.88	NET< CL
40	786.12	1187.25	34	19	30	153	1.50	
41	795.20	1200.97	102	25	37	202	1.50	
42	860.62	1299.90	96	22	32	188	1.40	
43	911.26	1376.46	595	32	34	195	1.71	
44	934.33	1411.34	44	26	41	242	0.90	
45	964.99	1457.69	127	23	33	187	2.04	a
46	969.08	1463.88	350	26	30	166	1.65	b
47	1120.29	1692.50	274	27	36	208	1.85	
48	1238.90	1871.83	84	30	46	301	1.52	
49	1281.13	1935.68	22	21	33	164	1.43	NET< CL
50	1332.66	2013.59	14	17	27	122	0.77	NET< CL
51	1377.57	2081.49	68	14	18	60	1.65	a
52	1385.75	2093.86	24	15	23	82	2.36	b
53	1408.44	2128.17	19	15	24	97	1.34	NET< CL
54	1460.94	2207.55	2986	56	22	82	2.18	
55	1509.22	2280.55	34	12	18	56	2.69	
56	1588.33	2400.15	-3	13	22	91	0.12	NET< CL
57	1660.71	2509.58	25	11	17	43	3.13	Wide Pk
58	1729.60	2613.74	56	11	14	32	1.90	
59	1764.75	2666.89	200	17	16	43	2.61	
60	1847.90	2792.61	12	10	16	41	1.00	NET< CL
61	2103.26	3178.70	32	11	15	39	2.46	
62	2203.96	3330.96	42	13	18	51	2.07	
63	2614.37	3951.48	310	19	13	26	3.41	

L5187-07 analyzed by emm1461 on 04/25/2003

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY03.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.03	202	78	127	77	79	129	NET<CL
2	75.03	1106	59	81	1029	60	83	
3	77.22	1763	65	81	1698	65	83	
4	84.45	256	39	58	198	40	61	
5	87.35	752	57	82	712	58	84	
6	90.02	471	48	70	446	49	72	
7	93.01	955	59	82	681	60	88	
8	99.22	143	65	106	143	66	107	
11	129.18	107	47	76	97	48	78	
12	143.82	61	46	75	28	47	77	NET<CL
15	163.19	-26	49	80	-27	49	82	NET<CL
16	186.09	624	58	86	485	59	90	
18	209.45	240	47	72	228	47	73	
19	238.72	2950	65	59	2848	66	63	
20	241.80	715	53	76	694	54	77	
21	269.82	143	25	35	138	26	38	
23	277.58	132	37	58	134	38	60	
24	295.29	1065	43	47	1034	44	50	
28	338.48	533	45	63	501	45	65	
29	352.05	1790	54	56	1728	55	58	
33	463.05	177	31	46	174	31	47	
34	511.02	706	39	47	283	40	60	
35	583.26	924	40	43	899	41	45	
36	609.39	1294	46	46	1230	46	49	
38	727.32	194	27	38	185	28	39	
43	911.26	595	32	34	576	33	36	
46	969.08	350	26	30	343	26	31	
47	1120.29	275	27	36	267	28	36	
48	1238.90	84	30	46	77	30	47	
54	1460.94	2986	56	22	2952	56	25	
59	1764.75	200	17	16	190	18	18	
63	2614.37	311	19	13	288	20	16	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	75.03	1029	Pb-212	740	5 of 6	99.30	0.99	
			Pb-214	427	6 of 7	98.66	0.99	
			Tl-208	80	7 of 9	98.43	0.98	
3	77.22	1698	Pb-212	1293	5 of 6	99.30	0.99	
			Pb-214	746	6 of 7	98.66	0.99	
4	84.45	198	Tl-208	41	7 of 9	98.43	0.98	
5	87.35	60	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
65	87.35	652	Pb-212	652	5 of 6	100.00	1.50	AutoAdd
6	90.02	446	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	93.01	681	AcTh-228	275	13 of 36	82.18	0.82	
			Th-234	. . . . .	1 of 2	58.74	0.59	LowScore
8	99.22	143	AcTh-228	83	13 of 36	84.55	1.35	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
			1120DEsc	. . . . .	0 of 0	. . . .	0.65	
11	129.18	97	AcTh-228	236	13 of 36	100.00	1.50	
			La-140	5	2 of 15	19.79	0.70	
14	154.57	138	AcTh-228	70	13 of 36	84.00	1.34	
16	186.09	485	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
18	209.45	228	AcTh-228	287	13 of 36	90.76	1.41	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
19	238.72	2848	Pb-212	3639	5 of 6	100.00	1.00	
20	241.80	694	Pb-214	471	6 of 7	98.66	0.99	
			La-140	3	3 of 15	19.94	0.20	LowScore
21	269.82	138	AcTh-228	200	13 of 36	90.76	1.41	
22	271.06	77	Unknown	. . . . .	. . . . .	. . . .	. . . .
			AcTh-228	200	13 of 36	100.00	1.00	Matched
23	277.58	134	Tl-208	130	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
			Se-75	. . . . .	1 of 5	14.63	0.15	LowScore
24	295.29	1034	Pb-214	1520	6 of 7	100.00	1.00	
25	300.02	191	Pb-212	183	5 of 6	100.00	1.50	
27	328.53	100	AcTh-228	147	13 of 36	90.76	1.41	
			Bi-212	4	3 of 13	69.12	1.19	
			La-140	. . . . .	3 of 15	23.72	0.74	
28	338.48	501	AcTh-228	510	13 of 36	89.18	1.39	
29	352.05	1728	Pb-214	2557	6 of 7	100.00	1.00	
32	439.12	45	1461DEsc	. . . . .	0 of 0	. . . .	0.65	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG	
33	463.05	174	Ba-140 AcTh-228 Sb-125	. . . . . 151	1 of 13 of 1 of	7 36 8	4.83 87.82 12.82	0.55 1.38 0.13	LowScore
34	511.02	31	Annul	. . . . .	1 of	1	100.00	1.50	Split
64	511.02	252	Tl-208	252	7 of	9	100.00	1.50	AutoAdd
35	583.26	899	Tl-208	868	7 of	9	100.00	1.50	
36	609.39	1230	Bi-214 Ru-103 1120SEsc	1366	11 of 1 of 0 of	33 2 0	88.94 5.92 . . .	1.39 0.06 0.65	LowScore
37	661.80	1192	Cs-137	. . . . .	1 of	1	100.00	1.50	
38	727.32	185	Bi-212	235	3 of	13	83.48	1.33	
40	786.12	34	Pb-214 Bi-212	39 29	6 of 3 of	7 13	98.66 83.48	1.49 1.33	
41	795.20	103	AcTh-228 Cs-134	102	13 of 1 of	36 9	89.18 46.67	1.39 0.47	LowScore
42	860.62	96	Tl-208	95	7 of	9	100.00	1.50	
43	911.26	576	AcTh-228	528	13 of	36	89.18	1.39	
44	934.33	44	Bi-214	62	11 of	33	91.42	1.41	
45	964.99	127	AcTh-228	97	13 of	36	86.18	1.36	
46	969.08	343	AcTh-228 Sb-124	304	13 of 1 of	36 13	89.18 1.04	1.39 0.01	LowScore
47	1120.29	267	Bi-214	247	11 of	33	87.88	1.38	
48	1238.90	77	Bi-214	90	11 of	33	90.16	1.40	
51	1377.57	68	Bi-214	57	11 of	33	85.77	1.36	
52	1385.75	24	Bi-214 Ag-110m	11	11 of 1 of	33 15	83.87 10.76	1.34 0.61	LowScore
54	1460.94	2952	K-40	. . . . .	1 of	1	100.00	1.50	
55	1509.22	34	Bi-214	29	11 of	33	85.77	1.36	
57	1660.71	25	Bi-214	14	11 of	33	83.87	1.34	
58	1729.60	57	Bi-214	34	11 of	33	83.87	1.34	
59	1764.75	190	Bi-214	177	11 of	33	87.88	1.38	
61	2103.26	32	2614SEsc	. . . . .	0 of	0	. . .	0.65	
62	2203.96	42	Bi-214	47	11 of	33	88.94	1.39	
63	2614.37	288	Tl-208	309	7 of	9	100.00	1.50	

L5187-07 analyzed by emm1461 on 04/25/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-07

Sample ID: NONE

Code: 1116803

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 16:22:07
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.48e+002 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 30000 Sec
Sample Size 5.73e-001 kg | Real Time 30018 Sec
Collection Efficiency 1.0000 | Spectrum File 1116803.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Canberra sn 10923049 det#3)
Efficiency File: WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[3.20E-02*En^-2.77E+00 + 2.47E+02*En^8.30E-01] 04/30/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
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MEASURED or MDA CONCENTRATIONS
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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes
Pb-212	Average:x	7.72E+02 +- 1.76E+01		*
	74.81	I.D. . . . .	. . . .	
	77.12	I.D. . . . .	. . . .	
	87.30	I.D. . . . .	. . . .	
	238.63	7.72E+02 +- 1.77E+01	3.46E+01		+
	300.09	8.08E+02 +- 1.34E+02	4.10E+02		+
Tl-208	Average:x	7.23E+02 +- 2.66E+01	. . . .		*
	84.90	I.D. . . . .	. . . .	
	277.35	7.44E+02 +- 2.11E+02	6.77E+02		+
	510.84	I.D. . . . .	. . . .	
	583.14	7.37E+02 +- 3.33E+01	7.63E+01		+
	860.37	7.33E+02 +- 1.66E+02	5.08E+02		+
	2614.66	6.93E+02 +- 4.69E+01	8.25E+01		+
Cd-109	88.03	I.D. . . . .	. . . .	
AcTh-228	Average:x	7.08E+02 +- 2.61E+01	. . . .		*
	93.35	I.D. . . . .	. . . .	
	99.45	1.21E+03 +- 5.61E+02	1.84E+03		+
	129.08	2.97E+02 +- 1.47E+02	4.83E+02		+
	154.20	1.40E+03 +- 4.62E+02	1.50E+03		+
	209.28	5.68E+02 +- 1.17E+02	3.72E+02		+
	270.23	5.09E+02 +- 9.59E+01	2.92E+02		+
	327.64	4.85E+02 +- 2.02E+02	6.59E+02		+
	338.32	6.97E+02 +- 6.33E+01	1.85E+02		+
	463.00	8.09E+02 +- 1.46E+02	4.48E+02		+
	794.70	7.14E+02 +- 1.72E+02	5.35E+02		+
	911.07	7.46E+02 +- 4.21E+01	9.70E+01		+
	964.60	9.15E+02 +- 1.65E+02	4.94E+02		+

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes
	ENERGY E (keV)					
Ra-226	969.11	7.81E+02 +- 6.00E+01	1.47E+02		+	*
	186.22	1.50E+03 +- 1.82E+02	5.64E+02		+	*
Pb-214	Average:x	7.81E+02 +- 1.90E+01	. . . .			*
	241.98	1.13E+03 +- 8.78E+01	2.56E+02		+	*
	295.21	7.68E+02 +- 3.29E+01	7.66E+01		+	*
	351.92	7.62E+02 +- 2.41E+01	5.26E+01		+	*
Annul	785.91	9.87E+02 +- 5.52E+02	1.81E+03		+	
	511.00	7.26E+00 +- 1.67E+01	5.53E+01		+	
Bi-214	Average:x	7.03E+02 +- 2.22E+01	. . . .			*
	609.31	6.84E+02 +- 2.56E+01	5.63E+01		+	*
	934.06	5.01E+02 +- 2.98E+02	9.78E+02		+	
	1120.29	7.53E+02 +- 7.77E+01	2.13E+02		+	*
	1238.11	6.02E+02 +- 2.32E+02	7.52E+02		+	
	1377.67	8.34E+02 +- 1.68E+02	4.77E+02		+	*
	1385.31	1.54E+03 +- 9.65E+02	3.18E+03		+	
	1509.23	8.34E+02 +- 3.03E+02	9.44E+02		+	
	1661.28	1.26E+03 +- 5.83E+02	1.87E+03		+	
	1729.59	1.16E+03 +- 2.36E+02	6.41E+02		+	*
	1764.49	7.48E+02 +- 6.92E+01	1.52E+02		+	*
	2204.22	6.27E+02 +- 1.88E+02	5.71E+02		+	*
Cs-137	661.65	3.87E+02 +- 1.46E+01	3.15E+01		+	*
Bi-212	727.17	4.67E+02 +- 6.96E+01	2.06E+02		+	*
K-40	1460.81	1.47E+04 +- 2.81E+02	2.62E+02		+	*
Am-241	59.54 N	4.84E+01 +- 2.87E+01	9.31E+01L		x	LHROI
Co-57	122.06 N	6.81E-01 +- 4.25E+00	1.43E+01		x	
Ce-144	133.54 N	2.27E+01 +- 3.37E+01	1.12E+02r		x	rbase
Ce-141	145.44 N	2.84E+01 +- 1.65E+01	5.42E+01		x	
Se-75	264.65 N	3.93E-01 +- 8.38E+00	2.83E+01		x	
Cr-51	320.08 N	9.09E+01 +- 9.27E+01	3.09E+02		x	
I-131	364.48 N	3.10E+01 +- 7.75E+01	2.61E+02		x	
Sb-125	427.89 N	2.01E+00 +- 1.78E+01	6.05E+01		x	
Ag-108m	433.93 N	4.98E+00 +- 5.71E+00	1.91E+01		x	
Be-7	477.59 N	4.86E+01 +- 7.54E+01	2.60E+02		x	
La-140	487.03 N	3.34E+01 +- 6.13E+01	2.11E+02		x	
Ru-103	497.08 N	5.52E+00 +- 9.64E+00	3.33E+01		x	
Ba-140	537.32 N	1.32E+02 +- 1.13E+02	3.95E+02		x	
Cs-134	604.70 N	5.40E+00 +- 5.65E+00	1.97E+01l		x	lbase
Ru-106	621.84 N	2.27E+01 +- 5.79E+01	2.00E+02		x	
Zr-95	724.18 N	7.32E+01 +- 1.22E+02	4.04E+02P		x	PIC
Nb-95	765.79 N	2.14E+01 +- 1.33E+01	4.67E+01		x	
Co-58	810.76 N	1.11E+00 +- 8.39E+00	2.89E+01		x	
Mn-54	834.83 N	1.19E+01 +- 6.96E+00	2.28E+01		x	
Ag-110m	884.67 N	1.25E+00 +- 8.86E+00	3.05E+01		x	
Fe-59	1099.22 N	1.45E+01 +- 2.24E+01	7.81E+01		x	
Zn-65	1115.52 N	4.38E+01 +- 3.45E+01	1.14E+02P		x	PIC
Co-60	1332.49 N	9.90E+00 +- 7.90E+00	2.63E+01		x	
Sb-124	1691.02 N	5.27E+00 +- 1.44E+01	5.31E+01		x	

MEASURED TOTAL: 2.07E+04 +- 6.75E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.03	93.97	77	79	129	2547	1.06	Deleted
9	105.43	158.07	103	67	109	1884	1.56	Deleted
10	112.81	169.24	10	48	78	1227	0.19	Deleted
12	143.82	216.12	28	47	77	1143	0.98	Deleted
13	149.74	225.07	36	25	39	424	0.49	Deleted
15	163.19	245.41	-27	49	82	1195	0.63	Deleted
17	194.05	292.07	-54	46	76	1073	1.10	Deleted
22	271.06	408.50	77	32	50	513	1.17	Unknown
26	313.13	472.12	45	32	52	499	1.38	Deleted
30	409.75	618.20	38	28	45	372	0.58	Deleted
31	434.88	656.18	30	29	47	376	1.42	Deleted
32	439.12	662.61	45	20	31	215	0.95	1461DEsc
39	768.08	1159.97	44	28	44	293	0.88	Deleted
49	1281.13	1935.68	22	21	33	164	1.43	Deleted
50	1332.66	2013.59	14	17	27	123	0.77	Deleted
53	1408.44	2128.17	19	15	24	97	1.34	Deleted
56	1588.33	2400.15	-3	13	22	91	0.12	Deleted
60	1847.90	2792.61	12	10	16	41	1.00	Deleted
61	2103.26	3178.70	32	11	15	39	2.46	2614SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
66	59.54	88.69	107N	63	101	1137	0.90	LHRoi
67	122.06	183.22	6N	40	65	935	0.95	NET< CL
68	133.54	200.58	26N	39	64	897	0.96	NET< CL RBase
69	145.44	218.57	79N	46	74	1111	0.97	
70	264.65	398.81	-2N	32	53	558	1.07	NET< CL
71	320.08	482.62	27N	27	44	394	1.12	NET< CL
72	364.48	549.75	10N	25	41	335	1.16	NET< CL
73	427.89	645.62	-3N	27	44	354	1.21	NET< CL
74	433.93	654.75	23N	26	43	336	1.21	NET< CL
75	477.59	720.77	-16N	25	41	317	1.25	NET< CL
76	487.03	735.04	-13N	24	40	291	1.26	NET< CL
77	497.08	750.23	-13N	23	38	264	1.26	NET< CL
78	537.32	811.07	-26N	22	38	260	1.30	NET< CL
79	604.70	912.95	-20N	21	35	229	1.35	NET< CL LBase
80	621.84	938.86	-8N	20	34	213	1.37	NET< CL
81	724.18	1093.60	-77N	127	210	394	1.45	NET< CL PIC
82	765.79	1156.51	-37N	23	39	259	1.48	NET< CL
83	810.76	1224.50	-3N	19	31	165	1.52	NET< CL
84	834.83	1260.90	33N	19	31	159	1.54	
85	884.67	1336.25	2N	17	28	150	1.58	NET< CL
86	1099.22	1660.64	-12N	18	31	177	1.75	NET< CL
87	1115.52	1685.29	48N	38	61	338	1.77	NET< CL PIC
88	1332.49	2013.33	20N	16	25	109	1.94	NET< CL

L5187-07 analyzed by emml461 on 04/25/2003

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
89	1691.02	2555.42	-3N	8	14	35	2.23	NET< CL

c:\seeker\Results\L5187-07.RES Analysis Results Saved.

L5187-07 analyzed by emml461 on 04/25/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 16:22:07
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.48E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 30000 Sec
Sample Size 5.73E-01 kg | Real Time 30018 Sec
Collection Efficiency 1.0000 | Spectrum File1116803.spc

Detector #: 3

Energy(keV)= 0.88 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 7.91E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[3.20e-02*En^-2.77e+00 + 2.47e+02*En^ 8.30e-01] 04/30/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-212	7.72E+02	1.76E+01	< 3.46E+01	1.69E+01	1.00E+00	MEAS +
Tl-208	7.23E+02	2.66E+01	< 7.63E+01	3.70E+01	1.00E+00	MEAS +
AcTh-228	7.08E+02	2.61E+01	< 9.70E+01	4.68E+01	1.00E+00	MEAS +
Ra-226	1.50E+03	1.82E+02	< 5.64E+02	2.78E+02	1.00E+00	MEAS +
Pb-214	7.81E+02	1.90E+01	< 5.26E+01	2.57E+01	1.00E+00	MEAS +
Annil	7.26E+00	1.67E+01	< 5.53E+01	2.73E+01	9.42E-01	MEAS +
Bi-214	7.02E+02	2.22E+01	< 5.62E+01	2.74E+01	1.00E+00	MEAS +
Cs-137	3.86E+02	1.46E+01	< 3.15E+01	1.53E+01	9.98E-01	MEAS +
Bi-212	4.67E+02	6.96E+01	< 2.06E+02	9.96E+01	1.00E+00	MEAS +
K-40	1.47E+04	2.81E+02	< 2.62E+02	1.24E+02	1.00E+00	MEAS +
Am-241	4.84E+01	2.87E+01	< 9.31E+01	4.59E+01	1.00E+00	NET
Co-57	6.81E-01	4.26E+00	< 1.43E+01	6.99E+00	9.23E-01	NET
Ce-144	2.27E+01	3.37E+01	< 1.12E+02	5.49E+01	9.26E-01	NET
Ce-141	2.84E+01	1.65E+01	< 5.42E+01	2.66E+01	5.12E-01	NET
Se-75	-3.93E-01	8.38E+00	< 2.83E+01	1.38E+01	8.34E-01	NET
Cr-51	9.09E+01	9.27E+01	< 3.09E+02	1.50E+02	4.56E-01	NET
I-131	3.10E+01	7.75E+01	< 2.61E+02	1.26E+02	6.70E-02	NET
Sb-125	-2.01E+00	1.78E+01	< 6.05E+01	2.93E+01	9.79E-01	NET
Ag-108m	4.98E+00	5.71E+00	< 1.91E+01	9.24E+00	9.99E-01	NET
Be-7	-4.85E+01	7.54E+01	< 2.60E+02	1.26E+02	6.66E-01	NET
La-140	-3.34E+01	6.13E+01	< 2.11E+02	1.02E+02	1.83E-01	NET
Ru-103	-5.52E+00	9.64E+00	< 3.33E+01	1.60E+01	5.76E-01	NET
Ba-140	-1.32E+02	1.13E+02	< 3.94E+02	1.90E+02	1.83E-01	NET
Cs-134	-5.40E+00	5.65E+00	< 1.97E+01	9.50E+00	9.72E-01	NET
Ru-106	-2.27E+01	5.79E+01	< 2.00E+02	9.62E+01	9.43E-01	NET
Zr-95	-7.32E+01	1.22E+02	< 4.04E+02	2.00E+02	7.12E-01	NET
Nb-95	-2.14E+01	1.33E+01	< 4.67E+01	2.26E+01	5.38E-01	NET
Co-58	-1.12E+00	8.39E+00	< 2.89E+01	1.39E+01	7.36E-01	NET
Mn-54	1.19E+01	6.96E+00	< 2.28E+01	1.09E+01	9.33E-01	NET
Ag-110m	1.25E+00	8.86E+00	< 3.05E+01	1.45E+01	9.17E-01	NET
Fe-59	-1.45E+01	2.24E+01	< 7.81E+01	3.74E+01	6.14E-01	NET
Zn-65	4.38E+01	3.45E+01	< 1.14E+02	5.57E+01	9.15E-01	NET
Co-60	9.90E+00	7.90E+00	< 2.63E+01	1.25E+01	9.89E-01	NET

L5187-07 analyzed by emm1461 on 04/25/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Sb-124	-5.27E+00	1.44E+01	< 5.31E+01	2.42E+01	6.97E-01	NET

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-08 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-8
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG577

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 740.2 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/21/03 1038 Det No.: 4 Spectrum No.: 1114404
Counted by: g
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-08
Client Id : BMS-AO300-8
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : S001 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	740.2		
Sample Weight-Dry	g			
Aliquot Weight	g	740.2		
FINAL WEIGHT	kg	.7402		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-08 analyzed by emml461 on 04/25/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-08 ✓

Sample ID: NONE

Code: 1114404

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:38:02
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.43E+002 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 17474 Sec
Sample Size 7.40E-001 kg | Real Time 17482 Sec
Collection Efficiency 1.0000 | Spc. File 1114404.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.57 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.25	79.63	7	38	63	543	1.18	a NET< CL HiResid
2	54.81	82.00	8	38	63	543	0.98	b NET< CL HiResid
3	63.56	95.22	122	36	57	648	1.14	
4	73.13	109.69	43	25	40	386	0.68	a
5	74.81	112.22	320	43	65	772	1.35	b
6	77.20	115.83	489	37	48	515	0.90	c
7	84.65	127.11	161	43	68	786	1.58	a Wide Pk
8	87.31	131.13	267	40	60	674	1.37	b
9	90.09	135.33	147	30	45	449	0.78	c
10	93.00	139.73	331	37	53	562	1.16	d
11	105.41	158.49	4	35	58	618	0.12	NET< CL
12	169.57	255.48	5	31	51	473	0.19	NET< CL
13	186.13	280.50	203	40	61	591	1.12	
14	197.39	297.52	56	19	29	203	0.58	a
15	198.60	299.35	38	18	29	203	0.60	b
16	209.65	316.06	26	37	60	571	0.45	NET< CL
17	238.70	359.98	920	37	36	254	1.04	a
18	241.68	364.47	223	32	46	356	1.51	b
19	270.19	407.57	68	30	47	345	0.92	
20	295.28	445.50	252	24	29	166	1.10	a
21	300.12	452.81	74	22	33	199	1.31	b
22	328.20	495.25	9	24	40	271	0.33	NET< CL
23	338.41	510.69	163	28	41	267	1.27	
24	351.95	531.16	455	30	36	217	1.17	
25	453.43	684.57	14	20	33	169	0.33	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
26	462.70	698.58	50	22	34	176	0.98	
27	510.84	771.34	334	29	38	200	2.04	Wide Pk
28	583.27	880.84	312	26	31	144	1.43	
29	609.31	920.19	344	27	33	158	1.55	
30	661.85	999.61	40	18	29	129	0.95	
31	727.71	1099.18	41	17	26	105	0.88	
32	794.92	1200.77	67	18	26	102	1.56	
33	861.53	1301.47	40	16	23	96	1.88	
34	911.21	1376.57	182	21	26	111	1.64	
35	934.46	1411.71	28	15	23	85	1.53	
36	969.20	1464.23	86	19	26	122	1.34	
37	1120.61	1693.10	63	20	30	140	1.14	
38	1460.93	2207.53	1895	45	16	41	2.05	
39	1764.48	2666.40	59	10	11	18	2.68	
40	2614.38	3951.13	110	12	10	15	2.53	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY04.BKG (BKG Framatome ANP)

 =====
 BACKGROUND SUBTRACT RESULTS
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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
3	63.56	122	36	57	26	37	60	NET<CL
4	73.13	43	25	40	10	25	42	NET<CL
6	77.20	489	37	48	451	37	50	
7	84.65	161	43	68	133	43	69	
8	87.31	267	40	60	250	40	61	
9	90.09	147	30	45	122	30	46	
10	93.00	331	37	53	137	37	58	
13	186.13	203	40	61	104	40	64	
14	197.39	56	19	29	39	19	30	
15	198.60	38	18	29	25	19	30	NET<CL
17	238.70	920	37	36	842	38	39	
18	241.68	223	32	46	204	32	47	
19	270.19	68	30	47	60	30	48	
20	295.28	252	24	29	230	24	30	
21	300.12	74	22	33	65	22	34	
23	338.41	163	28	41	156	28	42	
24	351.95	455	30	36	404	31	38	
26	462.70	50	22	34	45	22	35	
27	510.84	334	29	38	85	30	47	
28	583.27	312	26	31	284	26	33	
29	609.31	345	27	33	317	27	34	
31	727.71	41	17	26	36	17	26	
34	911.21	182	21	26	168	21	27	
36	969.20	86	19	26	82	19	27	
37	1120.61	63	20	30	58	20	30	
38	1460.93	1895	45	16	1870	45	18	
39	1764.48	59	10	11	52	10	12	
40	2614.38	110	12	10	91	12	12	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
5	74.81	320	Pb-212	217	5 of 6	100.00	1.50	
			Pb-214	96	5 of 7	98.65	0.99	
			Tl-208	23	6 of 9	95.51	0.96	
6	77.20	451	Pb-212	377	5 of 6	100.00	1.50	
			Pb-214	170	5 of 7	100.00	1.00	
7	84.65	133	Tl-208	12	6 of 9	95.51	1.46	
8	87.31	51	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
42	87.31	200	Pb-212	200	5 of 6	100.00	1.50	AutoAdd
9	90.09	122	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
10	93.00	137	AcTh-228	80	7 of 36	74.41	1.24	
			Th-234	. . . . .	1 of 2	58.74	0.59	LowScore
13	186.13	104	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.50	
14	197.39	39	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
17	238.70	842	Pb-212	1084	5 of 6	100.00	1.00	
18	241.68	204	Pb-214	107	5 of 7	100.00	1.00	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
19	270.19	60	AcTh-228	58	7 of 36	78.99	1.29	
20	295.28	230	Pb-214	252	5 of 7	100.00	1.50	
21	300.12	65	Pb-212	58	5 of 6	100.00	1.50	
23	338.41	156	AcTh-228	156	7 of 36	78.99	1.29	
24	351.95	404	Pb-214	763	5 of 7	100.00	1.50	
26	462.70	45	AcTh-228	47	7 of 36	78.99	1.29	
			Sb-125	. . . . .	1 of 8	13.67	0.64	LowScore
27	510.84	7	Annil	. . . . .	1 of 1	100.00	1.50	Split
41	510.84	78	Tl-208	78	6 of 9	97.04	1.47	AutoAdd
28	583.27	284	Tl-208	265	6 of 9	97.04	1.47	
29	609.31	317	Bi-214	342	4 of 33	85.05	1.35	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
30	661.85	40	Cs-137	. . . . .	1 of 1	100.00	1.50	
31	727.71	36	Bi-212	. . . . .	1 of 13	100.00	1.50	
			Te-129m	. . . . .	1 of 2	18.72	0.69	
32	794.92	67	AcTh-228	31	7 of 36	72.33	1.22	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
33	861.53	40	Tl-208	30	6 of 9	97.04	1.47	
34	911.21	168	AcTh-228	178	7 of 36	78.99	1.29	
35	934.46	28	Bi-214	16	4 of 33	72.93	1.23	
36	969.20	82	AcTh-228	103	7 of 36	87.35	1.37	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
37	1120.61	58	Bi-214	65	4 of 33	88.92	1.39	
38	1460.93	1870	K-40	. . . . .	1 of 1	100.00	1.50	
39	1764.48	52	Bi-214	47	4 of 33	82.46	1.32	
40	2614.38	91	Tl-208	104	6 of 9	97.04	1.47	

L5187-08 analyzed by emml461 on 04/25/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-08

Sample ID: NONE

Code: 1114404

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:38:02
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.43e+002 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 17474 Sec
Sample Size 7.40e-001 kg | Real Time 17482 Sec
Collection Efficiency 1.0000 | Spectrum File 1114404.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 4 (Canberra sn 10923050 det#4)

Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)

Eff.=1/[1.58E-02*En^-3.09E+00 + 2.56E+02*En^7.93E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
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MEASURED or MDA CONCENTRATIONS
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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes
Pb-212	Average:x	3.30E+02 +- 1.46E+01		*
	74.81	I.D. . . . .	. . . .	
	77.12	I.D. . . . .	. . . .	
	87.30	I.D. . . . .	. . . .	
	238.63	3.29E+02 +- 1.47E+01	3.16E+01		+
	300.09	3.96E+02 +- 1.35E+02	4.31E+02		+
Tl-208	Average:x	3.16E+02 +- 2.36E+01	. . . .		*
	84.90	I.D. . . . .	. . . .	
	510.84	I.D. . . . .	. . . .	
	583.14	3.27E+02 +- 3.02E+01	7.91E+01		+
	860.37	4.28E+02 +- 1.65E+02	5.26E+02		+
	2614.66	2.91E+02 +- 3.88E+01	8.75E+01		+
Cd-109	88.03	I.D. . . . .	. . . .	
AcTh-228	Average:x	3.03E+02 +- 2.64E+01	. . . .		*
	93.35	I.D. . . . .	. . . .	
	270.23	3.19E+02 +- 1.59E+02	5.21E+02		+
	338.32	3.11E+02 +- 5.65E+01	1.72E+02		+
	463.00	2.98E+02 +- 1.48E+02	4.83E+02		+
	794.70	6.52E+02 +- 1.70E+02	5.22E+02		+
	911.07	3.01E+02 +- 3.76E+01	1.02E+02		+
	969.11	2.58E+02 +- 5.88E+01	1.78E+02		+
Ra-226	186.22	4.68E+02 +- 1.80E+02	5.86E+02		+
Pb-214	Average:x	2.60E+02 +- 1.51E+01	. . . .		*
	241.98	4.81E+02 +- 7.49E+01	2.27E+02		+
	295.21	2.45E+02 +- 2.55E+01	6.78E+01		+
	351.92	2.55E+02 +- 1.94E+01	4.98E+01		+
Annul	511.00	2.23E+00 +- 1.75E+01	5.84E+01		+

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	N Concentration (pCi/kg)	MDA	Flags	Notes
Bi-214	Average:	x 2.51E+02 +- 1.92E+01	. . . . .		*
	609.31	2.47E+02 +- 2.14E+01	5.58E+01		+
	934.06	4.42E+02 +- 2.34E+02	7.60E+02		+
	1120.29	2.26E+02 +- 7.75E+01	2.46E+02		+
	1764.49	2.77E+02 +- 5.40E+01	1.39E+02		+
Cs-137	661.65	1.80E+01 +- 8.38E+00	2.72E+01		+
Bi-212	727.17	1.27E+02 +- 6.05E+01	1.96E+02		+
K-40	1460.81	1.26E+04 +- 3.02E+02	2.63E+02		+
Am-241	59.54	N 4.50E+01 +- 2.32E+01	7.59E+011		x lbase
Co-57	122.06	N-4.85E+00 +- 4.51E+00	1.55E+01		x
Ce-144	133.54	N-1.02E+01 +- 3.70E+01	1.26E+02		x
Ce-141	145.44	N 2.11E+01 +- 1.51E+01	4.99E+01		x
Se-75	264.65	N 2.64E+00 +- 7.46E+00	2.54E+011		x lbase
Cr-51	320.08	N-4.33E+01 +- 9.69E+01	3.35E+02		x
I-131	364.48	N-5.17E+01 +- 8.08E+01	2.82E+02		x
Sb-125	427.89	N-1.24E+01 +- 1.61E+01	5.68E+01		x
Ag-108m	433.93	N 5.23E+00 +- 5.13E+00	1.72E+01		x
Be-7	477.59	N-1.28E+01 +- 6.66E+01	2.32E+02		x
La-140	487.03	N 6.43E+01 +- 5.67E+01	1.89E+02		x
Ru-103	497.08	N 2.98E+00 +- 8.50E+00	2.92E+01		x
Ba-140	537.32	N-5.63E+01 +- 1.03E+02	3.64E+02		x
Cs-134	604.70	N 2.25E-01 +- 2.50E+01	8.34E+01P		x PIC
Ru-106	621.84	N-2.65E+00 +- 5.91E+01	2.06E+02		x
Zr-95	724.18	N 1.77E+01 +- 3.04E+01	1.01E+02L		x LHROI
Nb-95	765.79	N-8.91E+00 +- 1.12E+01	4.02E+01		x
Co-58	810.76	N 4.17E+00 +- 7.50E+00	2.58E+01		x
Mn-54	834.83	N-5.21E+00 +- 6.66E+00	2.39E+01		x
Ag-110m	884.67	N-1.38E+01 +- 9.74E+00	3.57E+01		x
Fe-59	1099.22	N 1.32E+01 +- 2.23E+01	7.61E+01		x
Zn-65	1115.52	N 2.82E+01 +- 3.47E+01	1.16E+02P		x PIC
Co-60	1332.49	N 4.92E+00 +- 7.35E+00	2.53E+01		x
Sb-124	1691.02	N 1.66E+01 +- 1.32E+01	4.45E+01		x

MEASURED TOTAL: 1.47E+04 +- 6.67E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.25	79.63	7	38	63	543	1.18	Deleted
2	54.81	82.00	8	38	63	543	0.98	Deleted
3	63.56	95.22	26	37	60	648	1.14	Deleted
4	73.13	109.69	10	25	42	386	0.68	Deleted
9	90.09	135.33	122	30	46	449	0.78	Unknown
11	105.41	158.49	4	35	58	618	0.12	Deleted
12	169.57	255.48	5	31	51	473	0.19	Deleted
14	197.39	297.52	39	19	30	203	0.58	Unknown
15	198.60	299.35	25	19	30	203	0.60	Deleted
16	209.65	316.06	26	37	60	571	0.45	Deleted
22	328.20	495.25	9	24	40	271	0.33	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	453.43	684.57	14	20	33	169	0.33	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
43	59.54	89.14	62N	32	51	526	0.98	LBase
44	122.06	183.65	-31N	29	49	474	1.04	NET< CL
45	133.54	201.01	-8N	30	49	484	1.05	NET< CL
46	145.44	218.99	41N	29	47	422	1.06	NET< CL
47	264.65	399.20	7N	20	32	210	1.17	NET< CL
								LBase
48	320.08	482.99	-9N	20	33	207	1.21	NET< CL
49	364.48	550.10	-12N	19	31	182	1.25	NET< CL
50	427.89	645.96	-13N	17	28	150	1.30	NET< CL
51	433.93	655.09	17N	17	27	131	1.30	NET< CL
52	477.59	721.08	-3N	16	26	123	1.34	NET< CL
53	487.03	735.35	18N	16	25	117	1.34	NET< CL
54	497.08	750.55	5N	14	23	99	1.35	NET< CL
55	537.32	811.37	-8N	15	25	111	1.38	NET< CL
56	604.70	913.23	1N	66	109	263	1.43	NET< CL
								PIC
57	621.84	939.14	-1N	15	25	103	1.44	NET< CL
58	724.18	1093.84	13N	23	37	107	1.52	NET< CL
								LHRoi
59	765.79	1156.74	-11N	14	24	111	1.55	NET< CL
60	810.76	1224.72	7N	12	20	75	1.58	NET< CL
61	834.83	1261.10	-11N	13	23	102	1.60	NET< CL
62	884.67	1336.44	-19N	13	23	99	1.64	NET< CL
63	1099.22	1660.76	8N	13	22	87	1.79	NET< CL
64	1115.52	1685.40	22N	28	45	200	1.80	NET< CL
								PIC
65	1332.49	2013.38	7N	11	17	52	1.95	NET< CL
66	1691.02	2555.35	7N	6	8	12	2.20	NET< CL

c:\seeker\Results\L5187-08.RES Analysis Results Saved.

L5187-08 analyzed by emml461 on 04/25/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:38:02
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.43E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 17474 Sec
Sample Size 7.40E-01 kg | Real Time 17482 Sec
Collection Efficiency 1.0000 | Spectrum File 1114404.spc

Detector #: 4

Energy(keV)= 0.57 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
Eff.=1/[1.58e-02*En^-3.09e+00 + 2.56e+02*En^ 7.93e-01] 02/09/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-212	3.30E+02	1.46E+01	< 3.16E+01	1.53E+01	1.00E+00	MEAS +
Tl-208	3.16E+02	2.36E+01	< 7.91E+01	3.80E+01	9.99E-01	MEAS +
AcTh-228	3.03E+02	2.64E+01	< 1.02E+02	4.85E+01	9.99E-01	MEAS +
Ra-226	4.68E+02	1.80E+02	< 5.86E+02	2.87E+02	1.00E+00	MEAS +
Pb-214	2.60E+02	1.51E+01	< 4.98E+01	2.41E+01	1.00E+00	MEAS +
Annul	2.23E+00	1.75E+01	< 5.84E+01	2.87E+01	9.43E-01	MEAS +
Bi-214	2.51E+02	1.92E+01	< 5.58E+01	2.68E+01	1.00E+00	MEAS +
Cs-137	1.80E+01	8.38E+00	< 2.72E+01	1.30E+01	9.98E-01	MEAS +
Bi-212	1.27E+02	6.05E+01	< 1.96E+02	9.33E+01	9.99E-01	MEAS +
K-40	1.26E+04	3.02E+02	< 2.63E+02	1.22E+02	1.00E+00	MEAS +
Am-241	4.50E+01	2.32E+01	< 7.59E+01	3.70E+01	1.00E+00	NET
Co-57	-4.85E+00	4.51E+00	< 1.55E+01	7.55E+00	9.24E-01	NET
Ce-144	-1.02E+01	3.70E+01	< 1.26E+02	6.12E+01	9.27E-01	NET
Ce-141	2.11E+01	1.51E+01	< 4.99E+01	2.42E+01	5.16E-01	NET
Se-75	2.64E+00	7.46E+00	< 2.54E+01	1.22E+01	8.36E-01	NET
Cr-51	-4.33E+01	9.69E+01	< 3.35E+02	1.61E+02	4.60E-01	NET
I-131	-5.17E+01	8.08E+01	< 2.82E+02	1.35E+02	6.89E-02	NET
Sb-125	-1.24E+01	1.61E+01	< 5.68E+01	2.71E+01	9.79E-01	NET
Ag-108m	5.22E+00	5.13E+00	< 1.72E+01	8.18E+00	9.99E-01	NET
Be-7	-1.28E+01	6.67E+01	< 2.32E+02	1.10E+02	6.69E-01	NET
La-140	6.43E+01	5.67E+01	< 1.89E+02	8.98E+01	1.86E-01	NET
Ru-103	2.98E+00	8.50E+00	< 2.92E+01	1.38E+01	5.79E-01	NET
Ba-140	-5.62E+01	1.03E+02	< 3.64E+02	1.72E+02	1.86E-01	NET
Cs-134	2.25E-01	2.50E+01	< 8.34E+01	4.12E+01	9.72E-01	NET
Ru-106	-2.65E+00	5.91E+01	< 2.06E+02	9.74E+01	9.43E-01	NET
Zr-95	1.77E+01	3.04E+01	< 1.01E+02	4.87E+01	7.15E-01	NET
Nb-95	-8.91E+00	1.12E+01	< 4.02E+01	1.90E+01	5.41E-01	NET
Co-58	4.17E+00	7.50E+00	< 2.58E+01	1.21E+01	7.38E-01	NET
Mn-54	-5.21E+00	6.66E+00	< 2.39E+01	1.13E+01	9.33E-01	NET
Ag-110m	-1.38E+01	9.74E+00	< 3.57E+01	1.69E+01	9.18E-01	NET
Fe-59	1.32E+01	2.23E+01	< 7.61E+01	3.58E+01	6.18E-01	NET
Zn-65	2.82E+01	3.47E+01	< 1.16E+02	5.62E+01	9.16E-01	NET
Co-60	4.92E+00	7.35E+00	< 2.52E+01	1.17E+01	9.89E-01	NET

L5187-08 analyzed by emml461 on 04/25/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Sb-124	1.66E+01	1.32E+01	< 4.45E+01	1.91E+01	7.00E-01	NET

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

133

CLIENT INFORMATION

Lab Sample Number: L5187-09

Count by Date: _____
(if required)

Client: Duratek Inc

Delay Date: _____
(if required)

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMS-AO300-9

Collect Start Date/Time: _____

Collect Stop Date/Time: 03-21-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 744.6 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 1/23/03 1640

Det No.: 5

Spectrum No.: 1136905

Counted by: GA

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-09
Client Id : BMS-AO300-9
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	744.6		
Sample Weight-Dry	g			
Aliquot Weight	g	744.6		
FINAL WEIGHT	kg	.7446		
Container			WTS5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-09 analyzed by emml461 on 04/25/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-09 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1136905

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:39:56
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.97E+002 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 17000 Sec
 Sample Size 7.45E-001 kg | Real Time 17022 Sec
 Collection Efficiency 1.0000 | Spc. File 1136905.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Energy(keV)= -0.08 + 0.661*Ch + -2.08E-07*Ch^2 + 7.37E-11*Ch^3 04/23/2003
 FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003
 Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.20	95.67	105	52	84	1121	1.48	
2	74.92	113.40	416	48	71	937	1.24	a
3	77.05	116.62	532	44	62	781	1.09	b
4	87.33	132.16	163	34	52	589	0.94	a
5	89.81	135.90	180	49	78	1031	1.41	b
6	92.90	140.58	408	51	78	1031	1.61	c
7	128.88	194.99	46	40	65	792	0.84	NET< CL
8	185.95	281.28	320	43	64	693	1.32	
9	209.17	316.40	85	43	70	765	1.09	
10	238.61	360.91	1386	46	46	419	1.18	a
11	241.64	365.49	282	39	59	587	1.43	b
12	270.14	408.59	149	33	51	435	1.72	
13	276.64	418.41	48	18	27	180	0.65	a
14	277.91	420.34	42	18	27	180	0.70	b
15	295.21	446.50	462	35	44	365	1.25	a
16	299.78	453.41	67	18	27	182	0.66	b
17	327.63	495.52	66	23	36	258	1.06	a
18	328.86	497.39	29	16	25	154	0.68	b
19	338.41	511.83	294	37	55	441	1.30	
20	351.94	532.29	841	43	53	408	1.49	
21	462.31	699.20	21	12	19	89	0.72	a
22	463.42	700.89	75	27	43	267	2.00	b
23	510.94	772.75	555	37	47	303	2.18	a
24	512.78	775.53	35	13	19	91	0.73	b
25	583.19	882.02	504	32	38	218	1.50	
26	609.35	921.58	677	36	40	234	1.68	
27	661.61	1000.62	246	25	31	182	1.46	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	727.32	1099.99	93	21	31	162	1.86	
29	768.37	1162.07	52	23	35	205	1.15	
30	785.91	1188.60	25	18	28	148	1.13	NET< CL
31	795.45	1203.03	38	21	34	177	0.94	
32	860.79	1301.84	42	22	34	182	1.08	
33	911.27	1378.18	319	27	33	168	1.58	
34	964.67	1458.93	83	17	25	112	1.64	a
35	969.02	1465.52	210	21	25	112	1.80	b
36	1001.74	1514.99	28	19	30	145	1.23	NET< CL
37	1120.38	1694.39	113	22	31	161	1.67	
38	1173.60	1774.86	118	24	35	187	2.17	
39	1238.26	1872.63	47	23	36	202	1.43	
40	1332.62	2015.29	178	18	21	75	2.35	
41	1377.42	2083.01	21	13	21	72	1.31	
42	1460.79	2209.04	2816	54	19	57	2.07	
43	1729.48	2615.09	35	10	13	27	3.65	Wide Pk
44	1764.83	2668.49	117	14	15	36	1.95	
45	2204.46	3332.43	39	9	12	21	3.58	
46	2614.97	3951.74	232	16	9	13	2.76	

L5187-09 analyzed by emml461 on 04/25/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.20	105	52	84	59	52	85	NET<CL
2	74.92	416	48	71	376	48	73	
3	77.05	532	44	62	508	45	63	
4	87.33	163	34	52	143	34	53	
6	92.90	408	51	78	270	52	81	
8	185.95	320	43	64	228	43	67	
9	209.17	85	43	70	74	44	70	
10	238.61	1386	46	46	1336	47	48	
15	295.21	462	35	44	430	35	47	
19	338.41	294	37	55	294	38	55	
20	351.94	841	43	53	778	44	55	
23	510.94	555	37	47	156	38	59	
25	583.19	504	32	38	481	33	40	
26	609.35	677	36	40	635	36	42	
28	727.32	93	21	31	87	21	31	
32	860.79	43	22	34	42	22	35	
33	911.27	319	27	33	298	27	34	
35	969.02	210	21	25	202	21	26	
36	1001.74	28	19	30	18	19	31	NET<CL
37	1120.38	113	22	31	105	22	32	
41	1377.42	21	13	21	19	14	21	NET<CL
42	1460.79	2816	54	19	2781	54	22	
44	1764.83	117	14	15	107	14	16	
46	2614.97	232	16	9	204	16	13	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0Minimum Score 0.55 | Decay Correction. ON
-----LIBRARY SEARCH RESULTS
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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.92	376	Pb-212	233	5 of 6	100.00	1.50	
			Pb-214	122	5 of 7	98.65	0.99	
			Tl-208	25	6 of 9	97.77	0.98	
3	77.05	508	Pb-212	416	5 of 6	100.00	1.50	
			Pb-214	220	5 of 7	98.65	0.99	
4	87.33	143	Pb-212	239	5 of 6	100.00	1.50	
			Cd-109	1	1 of 1	100.00	1.50	
5	89.81	180	Unknown					
6	92.90	165	Th-234		1 of 2	58.74	0.59	Split
48	92.90	105	AcTh-228	105	10 of 36	79.56	0.80	AutoAdd
8	185.95	228	Ra-226		1 of 1	100.00	1.50	
			U-235		1 of 3	100.00	1.00	
9	209.17	74	AcTh-228	136	10 of 36	100.00	1.50	
			Np-239		0 of 0		0.00	Decay
10	238.61	1336	Pb-212	1407	5 of 6	100.00	1.50	
11	241.64	282	Pb-214	196	5 of 7	100.00	1.50	
			La-140		1 of 15	0.40	0.00	LowScore
12	270.14	149	AcTh-228	93	10 of 36	86.12	1.36	
13	276.64	48	Ba-133		1 of 5	5.46	0.55	
			Tl-208	62	6 of 9	100.00	1.50	Matched
			Np-239		0 of 0		0.00	Decay
14	277.91	42	Tl-208	62	6 of 9	100.00	1.50	
			Np-239		0 of 0		0.00	Decay
15	295.21	430	Pb-214	464	5 of 7	100.00	1.50	
16	299.78	67	Pb-212	90	5 of 6	100.00	1.50	
17	327.63	66	AcTh-228	74	10 of 36	89.16	1.39	
			Bi-212	2	2 of 13	59.32	1.09	Matched
18	328.86	29	Bi-212	2	2 of 13	59.68	1.10	
			La-140	11090	2 of 15	31.48	0.31	LowScore
19	338.41	294	AcTh-228	253	10 of 36	87.68	1.38	
20	351.94	778	Pb-214	792	5 of 7	100.00	1.50	
21	462.31	21	Unknown					
			AcTh-228	81	10 of 36	100.00	1.00	Matched
22	463.42	75	AcTh-228	81	10 of 36	89.16	1.39	
			Sb-125		1 of 8	13.67	0.64	
23	510.94	25	Annul		1 of 1	100.00	1.50	Split
47	510.94	131	Tl-208	131	6 of 9	100.00	1.50	AutoAdd
24	512.78	35	Unknown					
25	583.19	481	Tl-208	461	6 of 9	100.00	1.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
26	609.35	635	Bi-214	612	7 of 33	87.19	1.37	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.55	
27	661.62	246	Cs-137	. . . . .	1 of 1	100.00	1.50	
			1174SEsc	. . . . .	0 of 0	. . .	0.55	
28	727.32	87	Bi-212	3560	2 of 13	100.00	1.50	
29	768.37	52	Bi-214	59	7 of 33	91.08	1.41	
31	795.45	38	AcTh-228	60	10 of 36	93.07	1.43	
			Cs-134	. . . . .	1 of 9	46.67	0.97	
32	860.79	42	Tl-208	54	6 of 9	100.00	1.50	
33	911.27	298	AcTh-228	360	10 of 36	89.16	1.39	
34	964.67	83	AcTh-228	58	10 of 36	86.12	1.36	
35	969.02	202	AcTh-228	183	10 of 36	87.68	1.38	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
37	1120.38	105	Bi-214	140	7 of 33	91.08	1.41	
38	1173.60	118	Co-60	194	2 of 2	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.17	LowScore
39	1238.26	47	Bi-214	50	7 of 33	89.21	1.39	
40	1332.62	178	Co-60	108	2 of 2	100.00	1.50	
42	1460.79	2781	K-40	. . . . .	1 of 1	100.00	1.50	
43	1729.48	35	Bi-214	20	7 of 33	83.22	1.33	
44	1764.83	107	Bi-214	106	7 of 33	87.19	1.37	
45	2204.46	39	Bi-214	29	7 of 33	85.10	1.35	
46	2614.97	204	Tl-208	207	6 of 9	100.00	1.50	

L5187-09 analyzed by emml461 on 04/25/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-09

Sample ID: SOIL/SEDI Duratek Inc

Code: 1136905

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:39:56
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.97e+002 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 17000 Sec
Sample Size 7.45e-001 kg | Real Time 17022 Sec
Collection Efficiency 1.0000 | Spectrum File 1136905.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[5.46E-03*En^-3.56E+00 + 1.55E+02*En^6.66E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: L5187-09.LSF (SOIL/SEDI: Duratek Inc)
=====

MEASURED or MDA CONCENTRATIONS
=====

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	3.84E+02 +- 1.34E+01	. . . .		*	. . . . .
	74.81	I.D. . . . .	. . . .			. . . . .
	77.12	I.D. . . . .	. . . .			. . . . .
	87.30	I.D. . . . .	. . . .			. . . . .
	238.63	3.87E+02 +- 1.36E+01	2.87E+01	++		. . . . .
	300.09	2.94E+02 +- 8.07E+01	2.50E+02	++		. . . . .
Th-234	92.59	3.75E+02 +- 2.04E+02	6.71E+02	+		. . . . .
Ra-226	186.22	7.80E+02 +- 1.48E+02	4.65E+02	++		. . . . .
AcTh-228	Average:x	3.65E+02 +- 2.01E+01	. . . .		*	. . . . .
	209.28	2.01E+02 +- 1.18E+02	3.89E+02	+		. . . . .
	270.23	5.76E+02 +- 1.28E+02	4.01E+02	++		. . . . .
	327.64	3.27E+02 +- 1.14E+02	3.65E+02	+		. . . . .
	338.32	4.15E+02 +- 5.30E+01	1.59E+02	++		. . . . .
	463.00	3.37E+02 +- 1.22E+02	3.94E+02	+		. . . . .
	794.70	2.31E+02 +- 1.32E+02	4.32E+02	+		. . . . .
	911.07	3.33E+02 +- 3.02E+01	7.95E+01	++		. . . . .
	964.60	5.14E+02 +- 1.08E+02	3.22E+02	++		. . . . .
	969.11	3.92E+02 +- 4.10E+01	1.05E+02	++		. . . . .
	93.35	I.D. . . . .	. . . .			. . . . .
Pb-214	Average:x	3.48E+02 +- 1.53E+01	. . . .		*	. . . . .
	241.98	4.91E+02 +- 6.85E+01	2.09E+02	++		. . . . .
	295.21	3.30E+02 +- 2.69E+01	7.35E+01	++		. . . . .
	351.92	3.45E+02 +- 1.93E+01	5.00E+01	++		. . . . .
Ba-133	276.40	9.85E+01 +- 3.68E+01	1.17E+02	+		. . . . .
Tl-208	Average:x	3.57E+02 +- 1.83E+01	. . . .		*	. . . . .
	277.35	2.43E+02 +- 1.02E+02	3.30E+02	+		. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
	510.84		I.D.	. . . . .	. . . . .			. . . . .
	583.14		3.66E+02	+- 2.49E+01	6.28E+01	++		. . . . .
	860.37		2.80E+02	+- 1.47E+02	4.79E+02	+		. . . . .
	2614.66		3.56E+02	+- 2.86E+01	5.05E+01	++		. . . . .
Bi-212	Average:x		1.99E+02	+- 4.78E+01	. . . . .	*		. . . . .
	327.96		3.51E+03	+- 1.96E+03	6.40E+03	+		. . . . .
	727.17		1.97E+02	+- 4.78E+01	1.47E+02	++		. . . . .
Annul	511.00		5.61E+00	+- 1.48E+01	4.91E+01	+		. . . . .
Bi-214	Average:x		3.23E+02	+- 1.56E+01	. . . . .	*		. . . . .
	609.31		3.26E+02	+- 1.84E+01	4.44E+01	++		. . . . .
	768.36		2.86E+02	+- 1.25E+02	4.03E+02	+		. . . . .
	1120.29		2.47E+02	+- 5.18E+01	1.57E+02	++		. . . . .
	1238.11		3.00E+02	+- 1.47E+02	4.79E+02	+		. . . . .
	1729.59		5.55E+02	+- 1.58E+02	4.61E+02	++		. . . . .
	1764.49		3.27E+02	+- 4.37E+01	1.08E+02	++		. . . . .
	2204.22		4.35E+02	+- 1.06E+02	2.95E+02	++		. . . . .
Cs-137	661.65		7.27E+01	+- 7.30E+00	1.93E+01	++		. . . . .
Co-60	Average:x		6.04E+01	+- 5.67E+00	. . . . .	*		. . . . .
	1173.22		4.39E+01	+- 8.81E+00	2.68E+01	++		. . . . .
	1332.49		7.21E+01	+- 7.41E+00	1.78E+01	++		. . . . .
K-40	1460.81		1.11E+04	+- 2.17E+02	1.84E+02	++		. . . . .
Am-241	59.54	N	1.14E+01	+- 4.82E+01	1.62E+02L	x	LHROI	. . . . .
Co-57	122.06	N	4.91E+00	+- 4.56E+00	1.51E+01	x		. . . . .
Ce-144	133.54	N	3.16E+01	+- 3.51E+01	1.20E+02	x		. . . . .
Ce-141	145.44	N	1.77E+01	+- 1.67E+01	5.53E+01	x		. . . . .
Se-75	264.65	N	1.12E+01	+- 7.79E+00	2.70E+01	x		. . . . .
Cr-51	320.08	N	6.91E+01	+- 9.00E+01	3.01E+02	x		. . . . .
I-131	364.48	N	5.51E+01	+- 8.05E+01	2.71E+02	x		. . . . .
Sb-125	427.89	N	1.51E+01	+- 1.26E+01	4.18E+01	x		. . . . .
Ag-108m	433.93	N	5.28E+00	+- 4.24E+00	1.41E+01	x		. . . . .
Be-7	477.59	N	5.97E+00	+- 6.38E+01	2.18E+02	x		. . . . .
La-140	487.03	N	8.64E+00	+- 6.01E+01	2.06E+02	x		. . . . .
Ru-103	497.08	N	9.22E+00	+- 8.39E+00	2.80E+01	x		. . . . .
Ba-140	537.32	N	2.21E+01	+- 1.04E+02	3.53E+02	x		. . . . .
Cs-134	604.70	N	2.04E+00	+- 5.29E+00	1.82E+01l	x	lbase	. . . . .
Ru-106	621.84	N	4.10E+01	+- 4.60E+01	1.54E+02	x		. . . . .
Zr-95	724.18	N	3.03E+03	+- 1.09E+03	3.58E+03P	x	PIC	. . . . .
Nb-95	765.79	N	1.35E+01	+- 1.47E+01	5.06E+01P	x	PIC	. . . . .
Co-58	810.76	N	2.80E+00	+- 6.64E+00	2.26E+01	x		. . . . .
Mn-54	834.83	N	7.88E+00	+- 5.42E+00	1.79E+01	x		. . . . .
Ag-110m	884.67	N	5.52E+00	+- 7.24E+00	2.56E+01	x		. . . . .
Fe-59	1099.22	N	1.12E+01	+- 1.84E+01	6.43E+01	x		. . . . .
Zn-65	1115.52	N	3.42E+01	+- 2.54E+01	8.75E+01P	x	PIC	. . . . .
Sb-124	1691.02	N	1.54E+01	+- 1.00E+01	4.01E+01	x		. . . . .

MEASURED TOTAL: 1.44E+04 +- 7.64E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.20	95.67	59	52	85	1121	1.48	Deleted
5	89.81	135.90	180	49	78	1031	1.41	Unknown
7	128.88	194.99	46	40	65	792	0.84	Deleted
21	462.31	699.21	21	12	19	89	0.72	Unknown
24	512.78	775.53	35	13	19	91	0.73	Unknown
30	785.91	1188.60	25	18	28	148	1.13	Deleted
36	1001.74	1514.99	18	19	31	145	1.23	Deleted
41	1377.42	2083.01	19	14	21	72	1.31	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
49	59.54	90.14	-13N	55	91	757	1.13	NET< CL LHRoi
50	122.06	184.67	38N	35	57	633	1.18	NET< CL
51	133.54	202.03	-31N	34	57	665	1.19	NET< CL
52	145.44	220.03	41N	39	63	728	1.20	NET< CL
53	264.65	400.30	-40N	28	47	410	1.29	NET< CL
54	320.09	484.12	19N	25	40	297	1.33	NET< CL
55	364.49	551.27	15N	22	36	233	1.36	NET< CL
56	427.91	647.18	23N	19	31	172	1.40	NET< CL
57	433.95	656.32	25N	20	32	189	1.41	NET< CL
58	477.62	722.36	2N	21	35	210	1.44	NET< CL
59	487.06	736.63	-3N	22	36	225	1.44	NET< CL
60	497.11	751.84	22N	20	32	175	1.45	NET< CL
61	537.36	812.71	4N	20	32	174	1.48	NET< CL
62	604.76	914.63	-8N	21	35	211	1.52	NET< CL LBase
63	621.90	940.56	16N	18	28	135	1.54	NET< CL
64	724.14	1095.19	-3471N	1244	2048	222	1.61	NET< CL PIC
65	765.77	1158.15	-25N	27	46	271	1.63	NET< CL PIC
66	810.76	1226.19	7N	17	27	134	1.66	NET< CL
67	834.85	1262.61	25N	17	27	135	1.68	NET< CL
68	884.71	1338.02	-12N	16	27	130	1.71	NET< CL
69	1099.16	1662.31	-11N	18	29	151	1.86	NET< CL
70	1115.48	1686.98	-45N	33	56	293	1.87	NET< CL PIC
71	1691.06	2557.04	-11N	7	13	31	2.25	NET< CL

L5187-09 analyzed by emml461 on 04/25/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:39:56
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.97E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 17000 Sec
Sample Size 7.45E-01 kg | Real Time 17022 Sec
Collection Efficiency 1.0000 | Spectrum File 1136905.spc

Detector #: 5

Energy(keV)= -0.08 + 0.661*Ch + -2.08E-07*Ch^2 + -2.08E-07*Ch^3 04/23/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5187-09.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
=====	=====	=====	=====	=====	=====	=====	=====
Pb-212	3.84E+02	1.34E+01	< 2.86E+01	1.39E+01	9.99E-01	MEAS +	YES
Th-234	3.75E+02	2.04E+02	< 6.71E+02	3.32E+02	1.00E+00	MEAS +	YES
Ra-226	7.80E+02	1.48E+02	< 4.65E+02	2.28E+02	1.00E+00	MEAS +	YES
AcTh-228	3.65E+02	2.01E+01	< 7.95E+01	3.82E+01	1.00E+00	MEAS +	YES
Pb-214	3.48E+02	1.53E+01	< 5.00E+01	2.44E+01	1.00E+00	MEAS +	YES
Ba-133	9.85E+01	3.68E+01	< 1.17E+02	5.58E+01	9.94E-01	MEAS +	YES
Tl-208	3.57E+02	1.83E+01	< 5.05E+01	2.29E+01	1.00E+00	MEAS +	YES
Bi-212	1.99E+02	4.78E+01	< 1.47E+02	7.07E+01	1.00E+00	MEAS +	YES
Annil	5.61E+00	1.48E+01	< 4.91E+01	2.42E+01	9.39E-01	MEAS +	YES
Bi-214	3.22E+02	1.56E+01	< 4.44E+01	2.15E+01	1.00E+00	MEAS +	YES
Cs-137	7.27E+01	7.30E+00	< 1.93E+01	9.27E+00	9.98E-01	MEAS +	YES
Co-60	6.04E+01	5.67E+00	< 1.78E+01	8.34E+00	9.88E-01	MEAS +	YES
K-40	1.11E+04	2.17E+02	< 1.84E+02	8.68E+01	1.00E+00	MEAS +	YES
Am-241	-1.14E+01	4.82E+01	< 1.62E+02	7.96E+01	1.00E+00	NET	YES
Co-57	4.91E+00	4.56E+00	< 1.51E+01	7.38E+00	9.18E-01	NET	YES
Ce-144	-3.16E+01	3.51E+01	< 1.20E+02	5.85E+01	9.22E-01	NET	YES
Ce-141	1.77E+01	1.67E+01	< 5.53E+01	2.71E+01	4.92E-01	NET	YES
Se-75	-1.12E+01	7.79E+00	< 2.70E+01	1.31E+01	8.25E-01	NET	YES
Cr-51	6.91E+01	9.00E+01	< 3.01E+02	1.46E+02	4.35E-01	NET	YES
I-131	5.51E+01	8.05E+01	< 2.71E+02	1.30E+02	5.67E-02	NET	YES
Sb-125	1.51E+01	1.26E+01	< 4.18E+01	2.00E+01	9.78E-01	NET	YES
Ag-108m	5.28E+00	4.24E+00	< 1.41E+01	6.75E+00	9.99E-01	NET	YES
Be-7	5.97E+00	6.38E+01	< 2.18E+02	1.05E+02	6.49E-01	NET	YES
La-140	-8.64E+00	6.01E+01	< 2.06E+02	9.92E+01	1.65E-01	NET	YES
Ru-103	9.22E+00	8.39E+00	< 2.80E+01	1.34E+01	5.56E-01	NET	YES
Ba-140	2.21E+01	1.04E+02	< 3.53E+02	1.70E+02	1.65E-01	NET	YES
Cs-134	-2.04E+00	5.29E+00	< 1.82E+01	8.78E+00	9.70E-01	NET	YES
Ru-106	4.10E+01	4.60E+01	< 1.54E+02	7.37E+01	9.39E-01	NET	YES
Zr-95	-3.03E+03	1.09E+03	< 3.58E+03	1.79E+03	6.97E-01	NET	YES
Nb-95	-1.35E+01	1.47E+01	< 5.06E+01	2.46E+01	5.18E-01	NET	YES
Co-58	2.80E+00	6.64E+00	< 2.26E+01	1.08E+01	7.22E-01	NET	YES
Mn-54	7.89E+00	5.42E+00	< 1.79E+01	8.52E+00	9.29E-01	NET	YES
Ag-110m	-5.52E+00	7.24E+00	< 2.56E+01	1.22E+01	9.12E-01	NET	YES

L5187-09 analyzed by emml461 on 04/25/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Fe-59	-1.12E+01	1.84E+01	< 6.43E+01	3.07E+01	5.96E-01	NET	YES
Zn-65	-3.42E+01	2.54E+01	< 8.75E+01	4.27E+01	9.10E-01	NET	YES
Sb-124	-1.54E+01	1.00E+01	< 4.01E+01	1.82E+01	6.82E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-10 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-10
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WGS177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 632.47197 g
1.26 4/14/03

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/21/03 03:37 Det No.: 3 Spectrum No.: 1114403
Counted by: gh
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5187-10	Product	: GAMMA SPECTROMETRY
Client Id	: BMS-A0300-10	Matrix	: SO01 Soil
Site	:		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/21/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	719.7		
Sample Weight-Dry	g			
Aliquot Weight	g	719.7		
FINAL WEIGHT	kg	.7197		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-10 analyzed by emml461 on 04/25/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-10 ✓

Sample ID: NONE

Code: 1114403

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:36:58
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.43E+002 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 18080 Sec
 Sample Size 7.20E-001 kg | Real Time 18089 Sec
 Collection Efficiency 1.0000 | Spc. File 1114403.spc

Detector #: 3 (Canberra sn 10923049 det#3)
 Energy(keV)= 0.88 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003
 FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 0.00E+00*En^3 02/18/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.34	94.44	74	27	43	454	0.64	a
2	68.34	102.00	14	20	33	302	0.45	b NET< CL
3	74.98	112.04	376	41	60	730	1.13	a
4	77.30	115.55	584	44	60	730	1.04	b
5	84.13	125.87	98	40	64	748	1.30	a Wide Pk
6	87.42	130.85	170	36	56	623	1.06	b
7	90.12	134.93	139	31	47	499	0.90	c
8	92.95	139.21	374	43	64	748	1.31	d Wide Pk
9	99.20	148.65	11	36	59	639	0.37	NET< CL
10	105.14	157.64	16	36	59	641	0.55	NET< CL
11	129.24	194.07	26	31	50	503	0.46	NET< CL
12	186.00	279.89	248	34	50	458	1.08	
13	197.18	296.80	-45	41	69	699	0.89	NET< CL
14	209.48	315.40	29	29	47	413	0.34	NET< CL
15	238.74	359.63	983	39	39	311	1.05	a HiResid
16	242.05	364.64	174	27	39	311	0.99	b HiResid
17	270.25	407.28	70	28	43	322	1.14	
18	277.24	417.84	32	22	34	238	1.07	a NET< CL
19	279.33	421.00	11	15	24	142	0.54	b NET< CL
20	295.33	445.19	351	26	30	186	1.10	a
21	300.25	452.64	65	20	30	186	1.03	b
22	328.28	495.01	75	25	39	253	0.97	
23	338.49	510.45	190	26	36	222	1.37	
24	352.02	530.92	575	32	36	217	1.19	
25	462.48	697.91	44	19	30	149	1.38	
26	510.82	771.01	312	28	35	182	2.59	Wide Pk
27	583.34	880.65	299	25	30	129	1.68	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	609.36	920.00	414	29	34	168	1.39	
29	727.44	1098.53	57	18	26	108	1.20	
30	767.98	1159.82	30	18	29	125	1.70	
31	794.99	1200.65	47	16	24	88	1.39	
32	859.61	1298.36	15	9	13	40	0.78	a
33	861.00	1300.47	32	12	17	61	1.33	b
34	911.33	1376.56	218	20	23	89	1.63	
35	965.04	1457.77	46	13	19	65	1.69	a
36	969.07	1463.85	110	15	19	65	1.71	b
37	1120.43	1692.71	97	17	22	81	2.02	
38	1377.15	2080.86	38	13	19	50	1.77	
39	1460.93	2207.53	1558	41	16	41	2.18	
40	1764.53	2666.57	73	10	10	17	2.11	
41	2614.37	3951.48	121	12	10	14	3.11	

L5187-10 analyzed by emml461 on 04/25/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY03.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.34	74	27	43	-2	28	46	NET<CL
3	74.98	376	41	60	329	42	62	
4	77.30	584	44	60	545	44	62	
5	84.13	98	40	64	63	40	65	NET<CL
6	87.42	170	36	56	147	37	57	
7	90.12	139	31	47	124	32	48	
8	92.95	374	43	64	209	44	68	
9	99.20	11	36	59	11	36	60	NET<CL
11	129.24	26	31	50	20	31	51	NET<CL
12	186.00	248	34	50	164	35	53	
13	197.18	-45	41	69	-60	41	69	NET<CL
14	209.48	29	29	47	22	29	48	NET<CL
15	238.74	983	39	39	922	40	42	
16	242.05	174	27	39	161	28	40	
17	270.25	70	28	43	67	28	44	
18	277.24	33	22	34	34	22	35	NET<CL
20	295.33	351	26	30	332	27	32	
23	338.49	190	26	36	171	26	38	
24	352.02	575	32	36	538	33	38	
25	462.48	44	19	30	42	19	30	
26	510.82	312	28	35	56	28	45	
27	583.34	299	25	30	283	25	31	
28	609.36	414	29	34	375	29	36	
29	727.44	57	18	26	52	18	27	
34	911.33	218	20	23	207	21	24	
36	969.07	110	15	19	106	16	19	
37	1120.43	97	17	22	92	17	23	
39	1460.93	1558	41	16	1537	41	18	
40	1764.53	73	11	10	67	11	11	
41	2614.37	121	12	10	107	13	12	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.98	329	Pb-212	246	5 of 6	100.00	1.50	
			Pb-214	134	5 of 7	100.00	1.00	
			Tl-208	25	5 of 9	94.86	0.95	
4	77.30	545	Pb-212	421	5 of 6	100.00	1.50	
			Pb-214	236	5 of 7	100.00	1.00	
6	87.42	147	Pb-212	224	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
7	90.12	124	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	92.95	209	AcTh-228	100	9 of 36	78.84	1.29	
			Th-234	. . . . .	1 of 2	58.74	0.59	LowScore
12	186.00	164	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
15	238.74	922	Pb-212	1092	5 of 6	100.00	1.50	
16	242.05	161	Pb-214	147	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
17	270.25	67	AcTh-228	72	9 of 36	90.11	1.40	
20	295.33	332	Pb-214	323	5 of 7	100.00	1.50	
21	300.25	65	Pb-212	62	5 of 6	100.00	1.50	
22	328.28	75	AcTh-228	54	9 of 36	83.12	1.33	
			Bi-212	1	2 of 13	59.32	1.09	
			La-140	6019	2 of 15	23.26	0.23	LowScore
23	338.49	171	AcTh-228	194	9 of 36	90.11	1.40	
24	352.02	538	Pb-214	565	5 of 7	100.00	1.50	
25	462.48	42	AcTh-228	57	9 of 36	91.76	1.42	
			Sb-125	. . . . .	1 of 8	13.67	0.64	LowScore
26	510.82	56	Tl-208	81	5 of 9	100.00	1.50	
			Annul	. . . . .	1 of 1	100.00	1.50	
27	583.34	283	Tl-208	275	5 of 9	97.02	1.47	
28	609.36	375	Bi-214	475	5 of 33	88.77	1.39	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
29	727.44	52	Bi-212	3532	2 of 13	100.00	1.50	
30	767.98	31	Bi-214	36	5 of 33	88.77	1.39	
			Pa-234	. . . . .	1 of 2	26.32	0.76	
31	794.99	47	AcTh-228	38	9 of 36	83.12	1.33	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
32	859.61	15	Tl-208	31	5 of 9	100.00	1.50	
33	861.00	32	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Tl-208	31	5 of 9	97.02	1.47	Matched
34	911.33	207	AcTh-228	201	9 of 36	84.75	1.35	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
35	965.04	46	AcTh-228	36	9 of 36	83.12	1.33	
36	969.07	106	AcTh-228	119	9 of 36	90.11	1.40	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
37	1120.43	92	Bi-214	77	5 of 33	81.72	1.32	
38	1377.15	38	Bi-214	18	5 of 33	77.22	1.27	
39	1460.93	1537	K-40	. . . . .	1 of 1	100.00	1.50	
40	1764.53	67	Bi-214	55	5 of 33	79.84	1.30	
41	2614.37	107	Tl-208	91	5 of 9	97.02	1.47	

L5187-10 analyzed by emml461 on 04/25/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-10

Sample ID: NONE

Code: 1114403

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:36:58
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.43e+002 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 18080 Sec
Sample Size 7.20e-001 kg | Real Time 18089 Sec
Collection Efficiency 1.0000 | Spectrum File 1114403.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Canberra sn 10923049 det#3)
Efficiency File: WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[3.20E-02*En^-2.77E+00 + 2.47E+02*En^8.30E-01] 04/30/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
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MEASURED or MDA CONCENTRATIONS
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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes
Pb-212	Average:x	3.31E+02 +- 1.41E+01		*
	74.81	I.D. . . . .	. . . .	
	77.12	I.D. . . . .	. . . .	
	87.30	I.D. . . . .	. . . .	
	238.63	3.31E+02 +- 1.42E+01	3.11E+01		++
	300.09	3.67E+02 +- 1.13E+02	3.55E+02		++
AcTh-228	Average:x	3.40E+02 +- 2.26E+01	. . . .		*
	93.35	I.D. . . . .	. . . .	
	270.23	3.27E+02 +- 1.37E+02	4.45E+02		+
	327.64	4.78E+02 +- 1.59E+02	5.09E+02		+
	338.32	3.14E+02 +- 4.85E+01	1.44E+02		++
	463.00	2.58E+02 +- 1.19E+02	3.87E+02		+
	794.70	4.32E+02 +- 1.46E+02	4.59E+02		+
	911.07	3.53E+02 +- 3.53E+01	8.81E+01		++
	964.60	4.39E+02 +- 1.26E+02	3.84E+02		++
	969.11	3.18E+02 +- 4.70E+01	1.25E+02		++
Ra-226	186.22	6.72E+02 +- 1.41E+02	4.43E+02		++
Pb-214	Average:x	3.19E+02 +- 1.49E+01	. . . .		*
	241.98	3.46E+02 +- 5.95E+01	1.80E+02		++
	295.21	3.26E+02 +- 2.63E+01	6.63E+01		++
	351.92	3.13E+02 +- 1.90E+01	4.56E+01		++
Tl-208	Average:x	3.07E+02 +- 2.18E+01	. . . .		*
	510.84	I.D. . . . .	. . . .	
	583.14	3.07E+02 +- 2.73E+01	6.99E+01		++
	860.37	1.48E+02 +- 8.75E+01	2.86E+02		+
	2614.66	3.41E+02 +- 3.99E+01	8.30E+01		++
Bi-214	Average:x	2.92E+02 +- 1.88E+01	. . . .		*

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes
	ENERGY E (keV)					
	609.31		2.76E+02 +- 2.14E+01	5.46E+01		++
	768.36		2.49E+02 +- 1.51E+02	4.97E+02		+
	1120.29		3.43E+02 +- 6.30E+01	1.81E+02		++
	1377.67		6.12E+02 +- 2.12E+02	6.60E+02		+
	1764.49		3.49E+02 +- 5.55E+01	1.31E+02		++
Bi-212	727.17		1.72E+02 +- 5.95E+01	1.88E+02		+
K-40	1460.81		1.01E+04 +- 2.68E+02	2.51E+02		++
Am-241	59.54	N	3.67E+01 +- 1.75E+01	5.69E+011		x lbase
Co-57	122.06	N	1.89E+00 +- 3.61E+00	1.24E+01		x
Ce-144	133.54	N	1.82E+01 +- 2.82E+01	9.47E+01		x
Ce-141	145.44	N	8.79E-01 +- 1.40E+01	4.75E+01		x
Se-75	264.65	N	4.73E+00 +- 7.19E+00	2.42E+01		x
Cr-51	320.08	N	1.28E+02 +- 7.73E+01	2.78E+02		x
I-131	364.48	N	2.99E+01 +- 6.36E+01	2.23E+02		x
Sb-125	427.89	N	8.85E+00 +- 1.52E+01	5.32E+01		x
Ag-108m	433.93	N	3.15E+00 +- 4.75E+00	1.67E+01		x
Be-7	477.59	N	9.58E+01 +- 6.11E+01	2.22E+02		x
La-140	487.03	N	3.00E+01 +- 5.20E+01	1.83E+02		x
Ru-103	497.08	N	5.58E-01 +- 8.26E+00	2.87E+01		x
Ba-140	537.32	N	3.96E+01 +- 9.65E+01	3.31E+02		x
Cs-134	604.70	N	1.07E+00 +- 5.39E+00	1.86E+011		x lbase
Ru-106	621.84	N	1.87E+01 +- 4.84E+01	1.72E+02		x
Cs-137	661.65	N	8.57E-01 +- 5.56E+00	1.95E+01		x
Zr-95	724.18	N	4.40E+03 +- 1.48E+03	4.88E+03P		x PIC
Nb-95	765.79	N	1.36E+01 +- 1.77E+01	6.11E+01P		x PIC
Co-58	810.76	N	8.71E+00 +- 7.88E+00	2.86E+01		x
Mn-54	834.83	N	1.05E+01 +- 6.19E+00	2.03E+01		x
Ag-110m	884.67	N	6.08E-01 +- 7.58E+00	2.69E+01		x
Fe-59	1099.22	N	3.18E+00 +- 2.07E+01	7.21E+01		x
Zn-65	1115.52	N	1.35E+01 +- 2.91E+01	9.81E+01P		x PIC
Co-60	1332.49	N	3.29E+00 +- 5.94E+00	2.07E+01		x
Sb-124	1691.02	N	1.16E+01 +- 1.44E+01	5.67E+01		x

MEASURED TOTAL: 1.25E+04 +- 5.61E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.34	94.44	-2	28	46	454	0.64	Deleted
2	68.34	102.00	14	20	33	302	0.45	Deleted
5	84.13	125.87	63	40	65	748	1.30	Deleted
7	90.12	134.93	124	32	48	499	0.90	Unknown
9	99.20	148.65	11	36	60	639	0.37	Deleted
10	105.14	157.64	16	36	59	641	0.55	Deleted
11	129.24	194.07	20	31	51	503	0.46	Deleted
13	197.18	296.80	-60	41	69	699	0.89	Deleted
14	209.48	315.40	22	29	48	413	0.34	Deleted
18	277.24	417.84	34	22	35	238	1.07	Deleted
19	279.33	421.00	11	15	24	143	0.54	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
33	861.00	1300.47	32	12	17	61	1.33	Unknown

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
42	59.54	88.69	61N	29	46	473	0.90	LBase
43	122.06	183.22	-13N	25	42	395	0.95	NET< CL
44	133.54	200.58	16N	25	40	358	0.96	NET< CL
45	145.44	218.57	-2N	30	49	463	0.97	NET< CL
46	264.65	398.81	14N	21	34	228	1.07	NET< CL
47	320.08	482.62	-29N	17	30	181	1.12	NET< CL
48	364.48	549.75	-8N	16	27	143	1.16	NET< CL
49	427.89	645.62	-10N	17	29	152	1.21	NET< CL
50	433.93	654.75	-11N	17	28	143	1.21	NET< CL
51	477.59	720.77	-24N	15	26	129	1.25	NET< CL
52	487.03	735.04	-9N	16	26	126	1.26	NET< CL
53	497.08	750.23	-1N	15	24	110	1.26	NET< CL
54	537.32	811.07	6N	15	24	104	1.30	NET< CL
55	604.70	912.95	3N	15	25	113	1.35	NET< CL
								LBase
56	621.84	938.86	-5N	13	22	86	1.37	NET< CL
57	661.65	999.06	-2N	13	21	85	1.40	NET< CL
58	724.18	1093.60	-3502N	1179	1942	191	1.45	NET< CL
								PIC
59	765.79	1156.51	-18N	23	39	172	1.48	NET< CL
								PIC
60	810.76	1224.50	-15N	13	23	90	1.52	NET< CL
61	834.83	1260.90	22N	13	20	69	1.54	
62	884.67	1336.25	-1N	11	18	64	1.58	NET< CL
63	1099.22	1660.64	2N	13	21	84	1.75	NET< CL
64	1115.52	1685.29	11N	24	39	149	1.77	NET< CL
								PIC
65	1332.49	2013.33	5N	9	14	36	1.94	NET< CL
66	1691.02	2555.42	-5N	6	11	22	2.23	NET< CL

L5187-10 analyzed by emml461 on 04/25/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:36:58
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.43E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 18080 Sec
Sample Size 7.20E-01 kg | Real Time 18089 Sec
Collection Efficiency 1.0000 | Spectrum File 1114403.spc

Detector #: 3

Energy(keV)= 0.88 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 0.84 + 0.001*En + 7.91E-04*En^2 + 7.91E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS003.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[3.20e-02*En^-2.77e+00 + 2.47e+02*En^ 8.30e-01] 04/30/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-212	3.31E+02	1.41E+01	< 3.11E+01	1.51E+01	9.98E-01	MEAS +
AcTh-228	3.40E+02	2.26E+01	< 8.81E+01	4.17E+01	1.00E+00	MEAS +
Ra-226	6.72E+02	1.41E+02	< 4.43E+02	2.16E+02	1.00E+00	MEAS +
Pb-214	3.19E+02	1.49E+01	< 4.56E+01	2.20E+01	1.00E+00	MEAS +
Tl-208	3.07E+02	2.18E+01	< 6.99E+01	3.35E+01	1.00E+00	MEAS +
Bi-214	2.92E+02	1.88E+01	< 5.46E+01	2.63E+01	1.00E+00	MEAS +
Bi-212	1.72E+02	5.95E+01	< 1.88E+02	8.96E+01	1.00E+00	MEAS +
K-40	1.01E+04	2.68E+02	< 2.51E+02	1.17E+02	1.00E+00	MEAS +
Am-241	3.67E+01	1.75E+01	< 5.69E+01	2.77E+01	1.00E+00	NET
Co-57	-1.89E+00	3.61E+00	< 1.24E+01	6.00E+00	9.24E-01	NET
Ce-144	1.82E+01	2.82E+01	< 9.47E+01	4.58E+01	9.27E-01	NET
Ce-141	-8.79E-01	1.40E+01	< 4.75E+01	2.31E+01	5.16E-01	NET
Se-75	4.73E+00	7.19E+00	< 2.42E+01	1.16E+01	8.36E-01	NET
Cr-51	-1.28E+02	7.73E+01	< 2.78E+02	1.33E+02	4.60E-01	NET
I-131	-2.99E+01	6.36E+01	< 2.23E+02	1.06E+02	6.88E-02	NET
Sb-125	-8.85E+00	1.52E+01	< 5.32E+01	2.54E+01	9.79E-01	NET
Ag-108m	-3.15E+00	4.74E+00	< 1.67E+01	7.96E+00	9.99E-01	NET
Be-7	-9.58E+01	6.11E+01	< 2.22E+02	1.06E+02	6.69E-01	NET
La-140	-3.00E+01	5.20E+01	< 1.83E+02	8.72E+01	1.86E-01	NET
Ru-103	-5.58E-01	8.26E+00	< 2.88E+01	1.36E+01	5.79E-01	NET
Ba-140	3.96E+01	9.65E+01	< 3.31E+02	1.56E+02	1.86E-01	NET
Cs-134	1.07E+00	5.39E+00	< 1.86E+01	8.81E+00	9.72E-01	NET
Ru-106	-1.87E+01	4.84E+01	< 1.72E+02	8.07E+01	9.43E-01	NET
Cs-137	-8.57E-01	5.56E+00	< 1.95E+01	9.19E+00	9.98E-01	NET
Zr-95	-4.40E+03	1.48E+03	< 4.88E+03	2.44E+03	7.15E-01	NET
Nb-95	-1.36E+01	1.77E+01	< 6.11E+01	2.95E+01	5.41E-01	NET
Co-58	-8.71E+00	7.88E+00	< 2.85E+01	1.35E+01	7.38E-01	NET
Mn-54	1.05E+01	6.19E+00	< 2.03E+01	9.50E+00	9.33E-01	NET
Ag-110m	-6.09E-01	7.58E+00	< 2.69E+01	1.25E+01	9.18E-01	NET
Fe-59	3.18E+00	2.07E+01	< 7.21E+01	3.39E+01	6.18E-01	NET
Zn-65	1.35E+01	2.91E+01	< 9.81E+01	4.74E+01	9.16E-01	NET
Co-60	3.29E+00	5.94E+00	< 2.07E+01	9.47E+00	9.89E-01	NET
Sb-124	-1.16E+01	1.44E+01	< 5.67E+01	2.52E+01	7.00E-01	NET

L5187-10 analyzed by emm1461 on 04/25/2003
Activity Units: pCi/kg
Nuclide Activity Uncertainty MDA CL ACT DECAY FLAG
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-11 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-11
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 595.4 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 1/21/03 1623 Det No.: 4 Spectrum No.: 1116804
Counted by: 67
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-11
Client Id : BMS-A0300-11
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	595.4		
Sample Weight-Dry	g			
Aliquot Weight	g	595.4		
FINAL WEIGHT	kg	.5954		
Container			WTS5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-11 analyzed by emm1461 on 04/25/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-11 ✓

Sample ID: NONE

Code: 1116804

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 16:22:57
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.48E+002 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time 30000 Sec
 Sample Size 5.95E-001 kg | Real Time 30018 Sec
 Collection Efficiency 1.0000 | Spc. File 1116804.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.57 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.20 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	58.50	87.57	97	27	42	494	0.51	a
2	63.44	95.04	329	44	67	987	0.97	b
3	74.94	112.42	798	52	71	1127	0.96	a
4	77.22	115.87	1276	56	71	1127	0.94	b
5	84.45	126.80	153	42	66	954	0.80	a
6	87.36	131.19	537	46	66	954	0.92	b
7	90.06	135.27	296	43	66	954	0.92	c
8	93.01	139.73	802	61	88	1431	1.25	d
9	105.37	158.42	10	50	82	1244	0.15	NET< CL
10	129.10	194.29	137	54	87	1286	1.00	
11	144.39	217.40	123	61	98	1531	1.19	
12	166.90	251.43	14	44	72	965	0.27	NET< CL
13	186.08	280.43	481	58	88	1233	1.34	
14	209.20	315.37	162	43	67	837	0.96	
15	238.70	359.97	2282	57	52	550	1.08	a
16	241.53	364.25	492	46	67	770	1.52	b
17	269.97	407.24	118	31	48	473	1.08	a
18	271.25	409.17	43	26	41	379	0.85	b
19	277.47	418.57	64	34	54	546	1.08	
20	295.24	445.44	672	40	51	484	1.20	a
21	300.21	452.96	108	29	45	403	1.08	b
22	328.23	495.31	109	34	54	489	1.22	
23	338.43	510.72	432	39	54	504	1.21	
24	352.02	531.27	1116	45	50	426	1.28	
25	409.50	618.15	30	29	47	382	0.84	NET< CL
26	463.05	699.10	120	33	52	399	1.12	
27	511.04	771.65	678	41	53	383	2.12	Wide Pk

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	583.27	880.84	724	39	46	314	1.36	
29	609.35	920.26	880	40	43	276	1.49	
30	661.69	999.38	314	34	48	342	1.39	
31	727.31	1098.58	176	28	40	234	1.64	
32	768.63	1161.04	49	24	38	253	1.53	
33	786.03	1187.33	64	26	41	263	2.34	a Wide Pk
34	795.06	1200.98	97	24	35	215	1.84	b
35	860.85	1300.43	48	23	36	223	1.15	
36	911.28	1376.67	462	32	38	236	1.72	
37	933.42	1410.13	34	27	43	270	1.45	NET< CL
38	964.95	1457.80	70	19	28	155	1.58	a
39	969.11	1464.09	304	24	28	155	1.62	b
40	1120.09	1692.31	110	19	25	134	1.30	a
41	1121.41	1694.31	56	14	19	90	0.90	b
42	1173.41	1772.91	496	33	39	236	2.03	
43	1238.39	1871.14	80	24	37	228	1.91	
44	1332.68	2013.67	478	28	28	118	1.96	
45	1460.93	2207.55	2889	55	19	64	2.19	
46	1588.35	2400.16	9	11	18	63	0.70	NET< CL
47	1730.09	2614.41	28	10	14	35	2.86	
48	1764.84	2666.93	139	16	17	44	1.98	
49	2102.45	3177.28	22	7	9	18	2.24	a
50	2104.66	3180.63	16	6	7	12	1.54	b
51	2204.69	3331.83	45	10	12	26	2.52	
52	2614.61	3951.48	254	17	11	20	3.05	

L5187-11 analyzed by emm1461 on 04/25/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File:. EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	63.44	329	44	67	165	46	72	
3	74.94	798	52	71	742	52	74	
4	77.22	1276	56	71	1211	57	74	
5	84.45	153	42	66	104	43	68	
6	87.36	537	46	66	508	47	67	
7	90.06	296	43	66	253	44	67	
8	93.01	802	61	88	468	61	95	
11	144.39	123	61	98	83	61	100	NET<CL
13	186.08	481	58	88	311	59	92	
15	238.70	2282	57	52	2147	58	57	
16	241.53	492	46	67	460	47	69	
17	269.97	118	31	48	105	33	51	
20	295.24	672	41	51	634	41	53	
21	300.21	108	29	45	94	30	47	
23	338.43	432	39	54	419	40	56	
24	352.02	1116	45	50	1029	46	54	
26	463.05	120	33	52	112	34	53	
27	511.04	678	41	53	250	43	65	
28	583.27	725	39	46	676	39	49	
29	609.35	880	40	43	833	40	46	
31	727.31	176	28	40	168	28	41	
36	911.28	462	32	38	438	32	39	
39	969.11	304	24	28	298	25	29	
40	1120.09	110	19	25	102	19	26	
45	1460.93	2889	55	19	2846	55	23	
48	1764.84	139	16	17	127	16	18	
52	2614.61	254	17	11	221	18	16	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File:ENVA.LIB (Environmental Library (Kocher 1981))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	58.50	76	Am-241	. . . . .	1 of 3	100.00	1.00	Split
56	58.50	21	AcTh-228	21	12 of 36	80.25	1.30	AutoAdd
2	63.44	165	Th-234	192	2 of 2	100.00	1.50	
3	74.94	742	Pb-212	531	5 of 6	100.00	1.00	
			Pb-214	249	6 of 7	98.66	0.99	
			Tl-208	54	7 of 9	98.43	0.98	
4	77.22	1211	Pb-212	933	5 of 6	100.00	1.00	
			Pb-214	428	6 of 7	98.66	0.99	
5	84.45	104	Tl-208	28	7 of 9	98.43	1.48	
6	87.36	29	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
55	87.36	479	Pb-212	479	5 of 6	100.00	1.50	AutoAdd
7	90.06	253	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	93.01	468	Th-234	402	2 of 2	100.00	1.50	
			AcTh-228	213	12 of 36	82.30	0.82	
10	129.10	137	AcTh-228	183	12 of 36	90.65	1.41	
13	186.08	311	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
14	209.20	162	AcTh-228	226	12 of 36	92.42	1.42	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
15	238.70	2147	Pb-212	2654	5 of 6	100.00	1.00	
16	241.53	460	Pb-214	287	6 of 7	100.00	1.00	
17	269.97	105	AcTh-228	153	12 of 36	92.42	1.42	
18	271.25	43	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			AcTh-228	153	12 of 36	100.00	1.00	Matched
19	277.47	64	Tl-208	94	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
20	295.24	634	Pb-214	1016	6 of 7	100.00	1.00	
21	300.21	94	Pb-212	139	5 of 6	100.00	1.50	
22	328.23	109	AcTh-228	116	12 of 36	90.65	1.41	
			Bi-212	3	3 of 13	69.12	0.69	
23	338.43	419	AcTh-228	400	12 of 36	90.65	1.41	
24	352.02	1029	Pb-214	1719	6 of 7	100.00	1.00	
26	463.05	112	AcTh-228	122	12 of 36	90.65	1.41	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
27	511.04	66	Annil	. . . . .	1 of 1	100.00	1.50	Split
54	511.04	184	Tl-208	184	7 of 9	100.00	1.50	AutoAdd
28	583.27	676	Tl-208	627	7 of 9	100.00	1.50	
29	609.35	833	Bi-214	511	7 of 33	85.98	0.86	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
			Ru-103		1 of 2	5.92	0.06	LowScore
			1120SEsc		0 of 0	. . .	0.50	
30	661.69	314	Cs-137		1 of 1	100.00	1.50	
			1173SEsc		0 of 0	. . .	0.50	
31	727.31	168	Bi-212	168	3 of 13	83.48	1.33	
32	768.63	49	Bi-214	77	7 of 33	95.90	1.46	
33	786.03	37	Pb-214	18	6 of 7	98.66	1.49	Split
53	786.03	26	Bi-212	26	3 of 13	83.48	1.33	AutoAdd
34	795.06	97	AcTh-228	83	12 of 36	88.13	1.38	
			Cs-134		1 of 9	46.67	0.47	LowScore
35	860.85	48	Tl-208	72	7 of 9	100.00	1.50	
36	911.28	438	AcTh-228	456	12 of 36	90.65	1.41	
38	964.95	70	AcTh-228	81	12 of 36	90.65	1.41	
39	969.11	298	AcTh-228	245	12 of 36	88.13	1.38	
			Sb-124		1 of 13	1.04	0.01	LowScore
40	1120.09	102	Unknown . . . . .		. . . . .	. . .	. . .
			Bi-214	170	7 of 33	95.90	0.96	Matched
41	1121.41	56	Bi-214	170	7 of 33	100.00	1.00	
42	1173.41	496	Co-60	528	2 of 2	100.00	1.50	
			Cs-Sum		1 of 6	16.67	0.17	LowScore
43	1238.39	81	Bi-214	61	7 of 33	83.76	1.34	
44	1332.68	478	Co-60	448	2 of 2	100.00	1.50	
45	1460.93	2846	K-40		1 of 1	100.00	1.50	
47	1730.09	28	Bi-214	24	7 of 33	85.98	1.36	
48	1764.84	127	Bi-214	123	7 of 33	85.98	1.36	
49	2102.45	22	2615SEsc		0 of 0	. . .	0.50	
50	2104.66	17	2615SEsc		0 of 0	. . .	0.50	
51	2204.69	45	Bi-214	32	7 of 33	83.76	1.34	
52	2614.61	221	Tl-208	244	7 of 9	100.00	1.50	

L5187-11 analyzed by emml461 on 04/25/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-11

Sample ID: NONE

Code: 1116804

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 16:22:57
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.48e+002 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 30000 Sec
 Sample Size 5.95e-001 kg | Real Time 30018 Sec
 Collection Efficiency 1.0000 | Spectrum File 1116804.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 4 (Canberra sn 10923050 det#4)
 Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
 Eff.=1/[1.58E-02*En^-3.09E+00 + 2.56E+02*En^7.93E-01] 02/09/1998

Library File: ENVA.LIB (Environmental Library (Kocher 1981))
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MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes
Am-241	59.54	3.98E+01 +- 2.49E+01	8.21E+01		+
Th-234	Average:x	8.05E+02 +- 9.56E+01	. . . . .		*
	63.29	7.14E+02 +- 1.98E+02	6.37E+02		+
	92.59	8.33E+02 +- 1.09E+02	3.41E+02		+
Pb-212	Average:x	6.05E+02 +- 1.63E+01	. . . . .		*
	74.81	I.D. . . . .	. . . . .	
	77.12	I.D. . . . .	. . . . .	
	87.30	I.D. . . . .	. . . . .	
	238.63	6.08E+02 +- 1.64E+01	3.31E+01		+
	300.09	4.12E+02 +- 1.33E+02	4.27E+02		+
Tl-208	Average:x	5.37E+02 +- 2.51E+01	. . . . .		*
	84.90	I.D. . . . .	. . . . .	
	277.35	3.70E+02 +- 1.97E+02	6.45E+02		+
	510.84	I.D. . . . .	. . . . .	
	583.14	5.64E+02 +- 3.28E+01	8.32E+01		+
	860.37	3.70E+02 +- 1.75E+02	5.69E+02		+
	2614.66	5.12E+02 +- 4.08E+01	7.81E+01		+
Cd-109	88.03	I.D. . . . .	. . . . .	
AcTh-228	Average:x	5.80E+02 +- 2.54E+01	. . . . .		*
	129.08	4.40E+02 +- 1.73E+02	5.65E+02		+
	209.28	4.23E+02 +- 1.12E+02	3.59E+02		+
	270.23	4.02E+02 +- 1.25E+02	4.01E+02		+
	327.64	5.47E+02 +- 1.71E+02	5.50E+02		+
	338.32	6.04E+02 +- 5.72E+01	1.65E+02		+
	463.00	5.37E+02 +- 1.63E+02	5.22E+02		+
	794.70	6.80E+02 +- 1.65E+02	5.12E+02		+
	911.07	5.68E+02 +- 4.13E+01	1.06E+02		+

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes
	ENERGY E (keV)					
Ce-141	964.60	5.05E+02 +- 1.37E+02	4.25E+02		++	
	969.11	6.78E+02 +- 5.63E+01	1.39E+02		++	
	59.00	5.80E+02 +- 1.08E+03	3.60E+03		+	
	145.44 N	3.12E+01 +- 2.30E+01	7.60E+01		x	
	186.22	1.01E+03 +- 1.91E+02	6.09E+02		++	
Pb-214	Average:x	4.89E+02 +- 1.70E+01	. . . .		*
Annul	241.98	7.83E+02 +- 8.02E+01	2.40E+02		++	
	295.21	4.89E+02 +- 3.17E+01	8.46E+01		++	
	351.92	4.70E+02 +- 2.09E+01	5.02E+01		++	
	785.91	1.09E+03 +- 1.33E+03	4.40E+03		+	
	511.00	1.60E+01 +- 1.79E+01	5.93E+01		+	
Bi-214	Average:x	4.05E+02 +- 1.82E+01	. . . .		*
Cs-137	609.31	4.71E+02 +- 2.27E+01	5.36E+01		++	
	768.36	3.05E+02 +- 1.51E+02	4.92E+02		+	
	1120.29	1.56E+02 +- 3.86E+01	1.15E+02		++	
	1238.11	6.21E+02 +- 1.88E+02	5.95E+02		++	
	1729.59	5.67E+02 +- 2.06E+02	6.33E+02		+	
Bi-212	1764.49	4.90E+02 +- 6.06E+01	1.50E+02		++	
	2204.22	6.59E+02 +- 1.46E+02	3.96E+02		++	
	661.65	1.03E+02 +- 1.12E+01	3.25E+01		++	
	Average:x	4.28E+02 +- 7.09E+01	. . . .		*
	727.17	4.28E+02 +- 7.14E+01	2.15E+02		++	
Co-60	785.46	4.28E+02 +- 6.05E+02	2.02E+03		+	
	Average:x	2.28E+02 +- 9.93E+00	. . . .		*
	1173.22	2.20E+02 +- 1.44E+01	3.59E+01		++	
	1332.49	2.35E+02 +- 1.37E+01	2.92E+01		++	
	1460.81	1.39E+04 +- 2.70E+02	2.41E+02		++	
Co-57	122.06 N	1.45E+00 +- 4.76E+00	1.59E+01		x	
Ce-144	133.54 N	7.96E+01 +- 3.74E+01	1.29E+02r		x	rbase
Se-75	264.65 N	2.28E+00 +- 7.99E+00	2.69E+01		x	
Cr-51	320.08 N	6.33E+01 +- 9.80E+01	3.28E+02		x	
I-131	364.48 N	3.53E+01 +- 8.64E+01	2.95E+02		x	
Sb-125	427.89 N	8.96E+00 +- 1.69E+01	5.80E+01		x	
Ag-108m	433.93 N	3.56E+00 +- 5.33E+00	1.84E+01		x	
Be-7	477.59 N	5.91E+01 +- 7.24E+01	2.51E+02		x	
Ru-103	497.08 N	3.91E+00 +- 9.53E+00	3.22E+01		x	
Ru-106	621.84 N	1.21E+02 +- 6.31E+01	2.06E+02		x	
Zr-95	756.72 N	1.85E+01 +- 1.46E+01	4.86E+01		x	
Nb-95	765.79 N	1.05E+01 +- 1.86E+01	6.32E+01P		x	PIC
Cs-134	795.84 N	1.76E+00 +- 9.83E+00	3.33E+01P		x	PIC
Co-58	810.76 N	2.80E+00 +- 8.00E+00	2.78E+01		x	
Mn-54	834.83 N	4.99E+00 +- 6.76E+00	2.28E+01		x	
Ag-110m	884.67 N	7.39E+00 +- 1.03E+01	3.47E+01		x	
Fe-59	1099.22 N	3.60E+00 +- 2.21E+01	7.61E+01		x	
Zn-65	1115.52 N	7.27E+00 +- 1.70E+01	5.91E+01l		x	lbase
Ba-140	1596.49 N	5.59E+00 +- 3.03E+01	1.08E+02		x	
La-140	1596.49 N	6.42E+00 +- 3.49E+01	1.24E+02		x	
Sb-124	1691.02 N	1.03E+01 +- 1.56E+01	5.77E+01		x	

MEASURED TOTAL: 1.92E+04 +- 7.94E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	90.06	135.27	253	44	67	954	0.92	Unknown
9	105.37	158.42	10	50	82	1244	0.15	Deleted
12	166.90	251.43	14	44	72	965	0.27	Deleted
18	271.25	409.17	43	26	41	379	0.85	Unknown
25	409.50	618.15	31	29	47	382	0.84	Deleted
37	933.42	1410.13	34	27	43	270	1.45	Deleted
40	1120.09	1692.31	102	19	26	134	1.30	Unknown
46	1588.35	2400.16	9	11	18	63	0.70	Deleted
49	2102.45	3177.28	22	7	9	18	2.24	2615SEsc
50	2104.66	3180.63	17	6	7	12	1.54	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
11	144.39	217.40	83N	61	100	1531	1.19	NET< CL
57	122.06	183.65	13N	42	69	964	1.04	NET< CL
58	133.54	201.01	-88N	41	70	980	1.05	NET< CL
RBase								
59	264.65	399.20	8N	29	48	462	1.17	NET< CL
60	320.08	482.99	18N	28	45	380	1.21	NET< CL
61	364.48	550.10	-11N	27	45	369	1.25	NET< CL
62	427.89	645.96	-13N	25	41	307	1.30	NET< CL
63	433.93	655.09	-16N	24	40	295	1.30	NET< CL
64	477.59	721.08	-19N	23	39	281	1.34	NET< CL
65	497.08	750.55	9N	22	36	236	1.35	NET< CL
66	621.84	939.14	42N	22	34	203	1.44	
67	756.72	1143.03	24N	19	29	172	1.54	NET< CL
68	765.79	1156.74	-18N	32	53	359	1.55	NET< CL
PIC								
69	795.84	1202.16	5N	25	41	239	1.57	NET< CL
PIC								
70	810.76	1224.72	-6N	18	30	173	1.58	NET< CL
71	834.83	1261.10	14N	19	30	181	1.60	NET< CL
72	884.67	1336.44	14N	20	32	184	1.64	NET< CL
73	1099.22	1660.76	-3N	18	30	170	1.79	NET< CL
74	1115.52	1685.40	-8N	19	31	179	1.80	NET< CL
LBase								
75	1596.49	2412.46	-2N	11	18	60	2.14	NET< CL
76	1596.49	2412.46	-2N	11	18	60	2.14	NET< CL
77	1691.02	2555.35	-6N	9	15	44	2.20	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 16:22:57
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.48E+02 Hrs
 Buildup Time: 0.00E+00 Hrs | Live Time 30000 Sec
 Sample Size 5.95E-01 kg | Real Time 30018 Sec
 Collection Efficiency 1.0000 | Spectrum File 1116804.spc

Detector #: 4

Energy(keV)= 0.57 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS004.EFF (450 ml in a WAT5 1.6 g/cc)
 Eff.=1/[1.58e-02*En^-3.09e+00 + 2.56e+02*En^ 7.93e-01] 02/09/1998

Library File: ENVA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Am-241	3.98E+01	2.50E+01	< 8.21E+01	4.03E+01	1.00E+00	MEAS +
Th-234	8.05E+02	9.56E+01	< 3.41E+02	1.68E+02	1.00E+00	MEAS +
Pb-212	6.05E+02	1.63E+01	< 3.31E+01	1.62E+01	1.00E+00	MEAS +
Tl-208	5.37E+02	2.51E+01	< 7.81E+01	3.59E+01	1.00E+00	MEAS +
AcTh-228	5.80E+02	2.54E+01	< 1.06E+02	5.11E+01	1.00E+00	MEAS +
Ce-141	3.12E+01	2.30E+01	< 7.60E+01	3.75E+01	5.12E-01	NET
Ra-226	1.01E+03	1.91E+02	< 6.09E+02	3.00E+02	1.00E+00	MEAS +
Pb-214	4.90E+02	1.70E+01	< 5.02E+01	2.45E+01	1.00E+00	MEAS +
Annul	1.60E+01	1.79E+01	< 5.93E+01	2.93E+01	9.42E-01	MEAS +
Bi-214	4.05E+02	1.82E+01	< 5.36E+01	2.60E+01	1.00E+00	MEAS +
Cs-137	1.03E+02	1.12E+01	< 3.25E+01	1.58E+01	9.98E-01	MEAS +
Bi-212	4.28E+02	7.09E+01	< 2.15E+02	1.04E+02	1.00E+00	MEAS +
Co-60	2.28E+02	9.93E+00	< 2.92E+01	1.39E+01	9.89E-01	MEAS +
K-40	1.39E+04	2.70E+02	< 2.41E+02	1.14E+02	1.00E+00	MEAS +
Co-57	1.45E+00	4.76E+00	< 1.59E+01	7.80E+00	9.23E-01	NET
Ce-144	-7.96E+01	3.74E+01	< 1.29E+02	6.31E+01	9.26E-01	NET
Se-75	2.28E+00	7.99E+00	< 2.69E+01	1.31E+01	8.34E-01	NET
Cr-51	6.33E+01	9.80E+01	< 3.28E+02	1.59E+02	4.56E-01	NET
I-131	-3.53E+01	8.64E+01	< 2.95E+02	1.43E+02	6.70E-02	NET
Sb-125	-8.96E+00	1.69E+01	< 5.80E+01	2.81E+01	9.79E-01	NET
Ag-108m	-3.56E+00	5.33E+00	< 1.84E+01	8.89E+00	9.99E-01	NET
Be-7	-5.91E+01	7.24E+01	< 2.51E+02	1.21E+02	6.66E-01	NET
Ru-103	3.91E+00	9.53E+00	< 3.22E+01	1.55E+01	5.76E-01	NET
Ru-106	1.21E+02	6.31E+01	< 2.06E+02	9.92E+01	9.43E-01	NET
Zr-95	1.85E+01	1.46E+01	< 4.86E+01	2.32E+01	7.12E-01	NET
Nb-95	-1.05E+01	1.86E+01	< 6.32E+01	3.08E+01	5.38E-01	NET
Cs-134	1.75E+00	9.83E+00	< 3.33E+01	1.61E+01	9.72E-01	NET
Co-58	-2.80E+00	8.00E+00	< 2.78E+01	1.33E+01	7.36E-01	NET
Mn-54	4.99E+00	6.76E+00	< 2.28E+01	1.09E+01	9.33E-01	NET
Ag-110m	7.39E+00	1.03E+01	< 3.47E+01	1.67E+01	9.17E-01	NET
Fe-59	-3.61E+00	2.21E+01	< 7.62E+01	3.65E+01	6.14E-01	NET
Zn-65	-7.27E+00	1.70E+01	< 5.90E+01	2.83E+01	9.15E-01	NET
Ba-140	-5.59E+00	3.03E+01	< 1.08E+02	5.03E+01	1.83E-01	NET

L5187-11 analyzed by emml461 on 04/25/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
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La-140	-6.42E+00	3.49E+01	< 1.24E+02	5.79E+01	1.83E-01	NET
Sb-124	-1.03E+01	1.56E+01	< 5.77E+01	2.65E+01	6.97E-01	NET

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-12 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-12
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG5777

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 687.1 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 1/21/03 1036 Det No.: 2 Spectrum No.: 114402
Counted by: GH
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-12
Client Id : BMS-AO300-12
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	687.1		
Sample Weight-Dry	g			
Aliquot Weight	g	687.1		
FINAL WEIGHT	kg	.6871		
Container			WTS5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-12 analyzed by emml461 on 04/25/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-12

Sample ID: NONE

Code: 1114402

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:35:59
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.43E+002 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 18763 Sec
 Sample Size 6.87E-001 kg | Real Time 18772 Sec
 Collection Efficiency 1.0000 | Spc. File 1114402.spc

Detector #: 2 (Canberra sn 9923043 det# 2)
 Energy(keV)= 1.12 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003
 FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.25	94.02	141	51	82	1135	0.80	
2	75.02	111.84	459	45	65	861	1.14	a
3	77.18	115.11	682	43	56	689	0.96	b
4	84.50	126.19	135	43	68	856	1.27	a
5	87.34	130.49	282	40	59	713	1.05	b
6	90.19	134.80	210	39	59	713	0.99	c
7	92.91	138.91	580	52	77	999	1.45	d
8	119.91	179.77	7	43	71	856	0.17	NET< CL
9	129.21	193.85	34	40	65	776	0.51	NET< CL
10	143.60	215.63	31	47	78	952	0.49	NET< CL
11	185.94	279.70	382	46	68	737	1.19	
12	199.33	299.97	26	21	33	275	0.59	a NET< CL
13	202.47	304.73	27	25	41	367	0.83	b NET< CL
14	209.35	315.13	103	41	65	667	1.22	
15	238.69	359.54	1288	45	44	385	1.13	a
16	241.75	364.18	303	38	56	539	1.44	b
17	269.98	406.89	124	28	41	318	1.36	a
18	277.47	418.23	92	21	31	212	0.84	b
19	295.27	445.18	458	30	34	234	1.10	a
20	299.97	452.28	87	25	39	281	1.30	b
21	328.45	495.39	50	30	48	361	0.79	
22	338.28	510.27	279	32	45	324	1.34	
23	351.95	530.96	795	38	42	300	1.30	
24	396.44	598.28	10	27	44	282	0.37	NET< CL
25	409.58	618.18	16	26	42	275	0.69	NET< CL
26	463.07	699.12	65	22	33	190	1.30	
27	510.80	771.36	508	33	40	225	2.23	Wide Pk

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	559.09	844.45	-36	19	33	190	1.51	NET< CL
29	583.23	880.99	423	30	35	183	1.50	
30	609.37	920.55	705	34	35	177	1.80	
31	661.75	999.83	36	19	29	145	1.38	
32	727.28	1099.00	87	20	29	143	1.47	
33	767.78	1160.30	31	20	32	179	1.22	NET< CL
34	795.02	1201.52	80	20	29	135	2.10	
35	860.34	1300.38	82	20	29	124	2.33	Wide Pk
36	911.21	1377.37	269	23	27	119	1.67	
37	934.10	1412.01	30	17	27	118	1.63	
38	969.16	1465.08	111	21	30	159	1.14	
39	1120.45	1694.04	125	22	31	150	1.88	
40	1401.20	2118.94	20	9	14	35	2.07	a
41	1408.27	2129.65	40	10	14	35	2.23	b
42	1460.84	2209.21	1865	45	19	58	2.03	
43	1729.72	2616.14	26	9	12	23	2.30	
44	1764.57	2668.89	102	13	13	27	2.04	
45	2103.87	3182.41	32	10	13	29	1.66	
46	2614.47	3955.17	192	15	7	8	3.66	

L5187-12 analyzed by emm1461 on 04/25/2003

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.25	141	51	82	45	52	84	NET<CL
2	75.02	459	45	65	406	46	67	
3	77.18	682	43	56	631	43	58	
4	84.50	135	43	68	104	43	69	
5	87.34	282	40	59	250	40	61	
7	92.91	580	52	77	318	53	82	
10	143.60	31	47	78	5	48	78	NET<CL
11	185.94	382	46	68	255	47	72	
12	199.33	26	21	33	-24	22	37	NET<CL
15	238.69	1288	45	44	1190	45	47	
16	241.75	303	38	56	284	39	58	
17	269.98	124	28	41	119	28	43	
19	295.27	458	30	34	419	30	37	
22	338.28	279	32	45	264	33	46	
23	351.95	795	38	42	732	38	45	
25	409.58	16	26	42	15	26	42	NET<CL
27	510.80	508	33	40	178	34	52	
28	559.09	-36	19	33	-50	20	35	NET<CL
29	583.23	423	30	35	395	30	37	
30	609.37	705	34	35	663	34	37	
32	727.28	87	20	29	82	20	29	
33	767.78	31	20	32	28	20	32	NET<CL
34	795.02	80	20	29	74	20	30	
36	911.21	269	23	27	247	23	29	
38	969.16	111	21	30	100	21	31	
39	1120.45	125	22	31	113	22	32	
42	1460.84	1865	45	19	1832	45	21	
43	1729.72	26	9	12	25	9	12	
44	1764.57	102	13	13	88	13	15	
46	2614.47	192	15	7	166	15	12	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.65 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	75.02	406	Pb-212	295	5 of 6	100.00	1.50	
			Pb-214	162	5 of 7	98.65	0.99	
			Tl-208	32	7 of 9	98.43	0.98	
3	77.18	631	Pb-212	510	5 of 6	100.00	1.50	
			Pb-214	286	5 of 7	98.65	0.99	
4	84.50	104	Tl-208	17	7 of 9	98.43	1.48	
5	87.34	250	Pb-212	273	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	90.19	210	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
7	92.91	318	AcTh-228	106	9 of 36	75.15	0.75	
			Th-234	. . . . .	1 of 2	58.74	0.59	LowScore
11	185.94	255	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
14	209.35	103	AcTh-228	114	9 of 36	87.35	1.37	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
15	238.69	1190	Pb-212	1465	5 of 6	100.00	1.00	
16	241.75	284	Pb-214	190	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
17	269.98	119	AcTh-228	77	9 of 36	80.82	1.31	
18	277.47	92	Tl-208	57	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
19	295.27	419	Pb-214	441	5 of 7	100.00	1.50	
20	299.97	87	Pb-212	82	5 of 6	100.00	1.50	
21	328.45	50	AcTh-228	61	9 of 36	90.85	1.41	
			Bi-212	2	2 of 13	59.32	1.09	
			La-140	10925	2 of 15	23.26	0.23	LowScore
22	338.28	264	AcTh-228	201	9 of 36	82.29	1.32	
23	351.95	732	Pb-214	1084	5 of 7	100.00	1.50	
26	463.07	65	AcTh-228	65	9 of 36	85.35	1.35	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
27	510.80	60	Annul	. . . . .	1 of 1	100.00	1.50	Split
48	510.80	118	Tl-208	118	7 of 9	100.00	1.50	AutoAdd
29	583.23	395	Tl-208	461	7 of 9	100.00	1.50	
30	609.37	663	Bi-214	575	7 of 33	78.16	1.28	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . . . .	0.65	
31	661.75	36	Cs-137	. . . . .	1 of 1	100.00	1.50	
32	727.28	82	Bi-212	2532	2 of 13	100.00	1.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
34	795.02	74	AcTh-228	45	9 of 36	80.82	1.31	
			Cs-134		1 of 9	46.67	0.47	LowScore
35	860.34	82	Tl-208	47	7 of 9	100.00	1.50	
36	911.21	247	AcTh-228	256	9 of 36	85.35	1.35	
37	934.10	30	Bi-214	33	7 of 33	78.16	1.28	
38	969.16	100	AcTh-228	154	9 of 36	96.59	1.47	
			Sb-124		1 of 13	1.04	0.01	LowScore
39	1120.45	113	Bi-214	136	7 of 33	79.65	1.30	
40	1401.20	20	Bi-214	10	7 of 33	71.82	1.22	
			Cs-Sum	20	2 of 6	40.00	0.90	
41	1408.27	19	Bi-214	19	7 of 33	71.82	1.22	Split
47	1408.27	20	Cs-Sum	20	2 of 6	33.33	0.83	AutoAdd
42	1460.84	1832	K-40		1 of 1	100.00	1.50	
43	1729.72	25	Bi-214	19	7 of 33	78.16	1.28	
44	1764.57	88	Bi-214	104	7 of 33	79.65	1.30	
45	2103.87	32	2614SEsc		0 of 0	. . .	0.65	
46	2614.47	166	Tl-208	169	7 of 9	100.00	1.50	

L5187-12 analyzed by emml461 on 04/25/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-12

Sample ID: NONE

Code: 1114402

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:35:59
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.43e+002 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 18763 Sec
Sample Size 6.87e-001 kg | Real Time 18772 Sec
Collection Efficiency 1.0000 | Spectrum File 1114402.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 2 (Canberra sn 9923043 det# 2)
Efficiency File: WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[1.15E-02*En^-3.19E+00 + 2.16E+02*En^7.29E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
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MEASURED or MDA CONCENTRATIONS

=====					
N					
Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes

Pb-212	Average:x	4.33E+02 +- 1.62E+01	. . . .		*
	74.81	I.D. . . . .	. . . .	
	77.12	I.D. . . . .	. . . .	
	87.30	I.D. . . . .	. . . .	
	238.63	4.32E+02 +- 1.63E+01	3.55E+01		++
	300.09	4.84E+02 +- 1.42E+02	4.49E+02		++
Tl-208	Average:x	4.22E+02 +- 2.32E+01	. . . .		*
	84.90	I.D. . . . .	. . . .	
	277.35	6.78E+02 +- 1.55E+02	4.75E+02		++
	510.84	I.D. . . . .	. . . .	
	583.14	4.01E+02 +- 3.04E+01	7.77E+01		++
	860.37	7.41E+02 +- 1.80E+02	5.52E+02		++
AcTh-228	2614.66	4.25E+02 +- 3.77E+01	6.69E+01		++
	Average:x	3.85E+02 +- 2.50E+01	. . . .		*
	93.35	I.D. . . . .	. . . .	
	209.28	3.49E+02 +- 1.38E+02	4.48E+02		+
	270.23	5.82E+02 +- 1.38E+02	4.31E+02		++
	327.64	3.14E+02 +- 1.89E+02	6.21E+02		+
Ra-226	338.32	4.79E+02 +- 5.91E+01	1.73E+02		++
	463.00	3.82E+02 +- 1.29E+02	4.10E+02		+
	794.70	6.19E+02 +- 1.69E+02	5.25E+02		++
	911.07	3.78E+02 +- 3.59E+01	9.16E+01		++
	969.11	2.68E+02 +- 5.73E+01	1.74E+02		++
	186.22	1.08E+03 +- 1.96E+02	6.17E+02		++
Pb-214	Average:x	4.24E+02 +- 1.72E+01	. . . .		*
	241.98	6.19E+02 +- 8.47E+01	2.57E+02		++
	295.21	4.10E+02 +- 2.96E+01	7.43E+01		++

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes
	ENERGY E (keV)					
Annul	351.92		4.18E+02 +- 2.19E+01	5.27E+01		+
Bi-214	511.00		1.78E+01 +- 1.76E+01	5.81E+01		+
	Average:x		4.39E+02 +- 2.05E+01	. . . . .		*
	609.31		4.53E+02 +- 2.34E+01	5.24E+01		+
	934.06		3.97E+02 +- 2.31E+02	7.56E+02		+
	1120.29		3.68E+02 +- 7.23E+01	2.17E+02		+
	1401.50		8.47E+02 +- 3.96E+02	1.26E+03		+
	1407.98		4.55E+02 +- 4.77E+02	1.60E+03		+
	1729.59		5.70E+02 +- 2.03E+02	6.16E+02		+
	1764.49		3.84E+02 +- 5.67E+01	1.41E+02		+
Cs-137	661.65		1.44E+01 +- 7.39E+00	2.41E+01		+
Bi-212	727.17		2.51E+02 +- 6.08E+01	1.86E+02		+
K-40	1460.81		1.03E+04 +- 2.51E+02	2.54E+02		+
Cs-Sum	1406.63		I.D. . . . .	. . . . .	
Am-241	59.54	N	2.81E+01 +- 2.56E+01	8.47E+01		x lbase
Co-57	122.06	N	7.72E+00 +- 5.05E+00	1.74E+01		x
Ce-144	133.54	N	3.36E+01 +- 4.01E+01	1.37E+02		x
Ce-141	145.44	N	4.33E+00 +- 1.63E+01	5.48E+01		x
Se-75	264.65	N	1.15E+01 +- 9.12E+00	3.16E+01		x lbase
Cr-51	320.08	N	3.51E+01 +- 1.02E+02	3.49E+02		x
I-131	364.48	N	9.36E+01 +- 8.05E+01	2.83E+02		x
Sb-125	427.89	N	5.97E+00 +- 1.61E+01	5.46E+01		x
Ag-108m	433.93	N	7.43E+00 +- 5.20E+00	1.85E+01		x
Be-7	477.59	N	8.75E+01 +- 6.77E+01	2.41E+02		x
La-140	487.03	N	3.17E+00 +- 5.45E+01	1.88E+02		x
Ru-103	497.08	N	9.53E+00 +- 8.92E+00	3.17E+01		x
Ba-140	537.32	N	9.83E+01 +- 1.18E+02	4.13E+02		x
Cs-134	604.70	N	1.38E+00 +- 6.04E+00	2.09E+01		x lbase
Ru-106	621.84	N	1.16E+01 +- 5.56E+01	1.91E+02		x
Zr-95	724.18	N	2.85E+03 +- 1.75E+03	5.76E+03		x PIC
Nb-95	765.79	N	3.87E+00 +- 1.16E+01	4.05E+01		x
Co-58	810.76	N	3.65E+00 +- 7.09E+00	2.52E+01		x
Mn-54	834.83	N	4.69E+00 +- 6.42E+00	2.18E+01		x
Ag-110m	884.67	N	9.35E+00 +- 9.43E+00	3.37E+01		x
Fe-59	1099.22	N	3.07E+01 +- 1.89E+01	6.21E+01		x
Zn-65	1115.52	N	3.30E+01 +- 3.03E+01	1.01E+02		x PIC
Co-60	1332.49	N	1.44E+01 +- 6.98E+00	2.25E+01		x
Sb-124	1691.02	N	7.77E+00 +- 1.37E+01	4.86E+01		x

MEASURED TOTAL: 1.37E+04 +- 6.35E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.25	94.02	45	52	84	1135	0.80	Deleted
6	90.19	134.80	210	39	59	713	0.99	Unknown
8	119.91	179.77	7	43	71	856	0.17	Deleted
9	129.21	193.85	34	40	65	776	0.51	Deleted
10	143.60	215.63	5	48	78	952	0.49	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	199.33	299.97	-24	22	37	275	0.59	Deleted
13	202.47	304.73	27	25	41	367	0.83	Deleted
24	396.44	598.28	10	27	44	282	0.37	Deleted
25	409.58	618.18	15	26	42	275	0.69	Deleted
28	559.09	844.45	-50	20	35	190	1.51	Deleted
33	767.78	1160.30	28	20	32	179	1.22	Deleted
45	2103.87	3182.41	32	10	13	29	1.66	2614SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
49	59.54	88.41	40N	36	59	694	1.08	NET< CL LBase
50	122.06	183.03	-52N	34	57	656	1.13	NET< CL
51	133.54	200.40	-28N	34	56	634	1.14	NET< CL
52	145.44	218.41	9N	33	55	599	1.15	NET< CL
53	264.65	398.83	-33N	26	44	360	1.23	NET< CL LBase
54	320.08	482.72	-8N	23	38	272	1.27	NET< CL
55	364.48	549.92	-24N	21	35	225	1.30	NET< CL
56	427.89	645.89	7N	19	31	174	1.35	NET< CL
57	433.93	655.03	-27N	19	32	192	1.35	NET< CL
58	477.59	721.11	-23N	18	30	170	1.38	NET< CL
59	487.03	735.39	-1N	17	28	148	1.39	NET< CL
60	497.08	750.60	-18N	17	29	151	1.39	NET< CL
61	537.32	811.51	-16N	19	32	174	1.42	NET< CL
62	604.70	913.48	-4N	18	30	155	1.47	NET< CL LBase
63	621.84	939.42	3N	16	26	117	1.48	NET< CL
64	724.18	1094.31	-2482N	1524	2508	237	1.55	NET< CL PIC
65	765.79	1157.28	-6N	17	28	144	1.58	NET< CL
66	810.76	1225.34	-7N	13	22	99	1.61	NET< CL
67	834.83	1261.77	11N	15	24	108	1.63	NET< CL
68	884.67	1337.20	-15N	15	26	122	1.66	NET< CL
69	1099.22	1661.91	22N	14	21	81	1.81	
70	1115.52	1686.58	31N	29	46	196	1.82	NET< CL PIC
71	1332.49	2014.96	25N	12	19	60	1.96	
72	1691.02	2557.57	4N	7	11	23	2.21	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

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Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:35:59
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. . . . . 7.43E+02 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 18763 Sec
Sample Size . . . . . 6.87E-01 kg | Real Time . . . . . 18772 Sec
Collection Efficiency . . . . 1.0000 | Spectrum File . . . . . .1114402.spc
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Detector #: 2

Energy(keV)= 1.12 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 6.55E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[1.15e-02*En^-3.19e+00 + 2.16e+02*En^ 7.29e-01] 02/06/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Pb-212	4.33E+02	1.62E+01	< 3.55E+01	1.72E+01	9.99E-01	MEAS +
Tl-208	4.22E+02	2.32E+01	< 6.69E+01	3.00E+01	9.99E-01	MEAS +
AcTh-228	3.85E+02	2.50E+01	< 9.16E+01	4.37E+01	9.99E-01	MEAS +
Ra-226	1.08E+03	1.96E+02	< 6.18E+02	3.03E+02	1.00E+00	MEAS +
Pb-214	4.24E+02	1.72E+01	< 5.27E+01	2.56E+01	1.00E+00	MEAS +
Annil	1.78E+01	1.76E+01	< 5.81E+01	2.86E+01	9.43E-01	MEAS +
Bi-214	4.39E+02	2.05E+01	< 5.24E+01	2.53E+01	1.00E+00	MEAS +
Cs-137	1.44E+01	7.39E+00	< 2.41E+01	1.15E+01	9.98E-01	MEAS +
Bi-212	2.51E+02	6.08E+01	< 1.86E+02	8.91E+01	9.99E-01	MEAS +
K-40	1.03E+04	2.51E+02	< 2.54E+02	1.20E+02	1.00E+00	MEAS +
Am-241	2.81E+01	2.56E+01	< 8.47E+01	4.14E+01	1.00E+00	NET
Co-57	-7.72E+00	5.05E+00	< 1.74E+01	8.49E+00	9.24E-01	NET
Ce-144	-3.36E+01	4.01E+01	< 1.37E+02	6.68E+01	9.27E-01	NET
Ce-141	4.34E+00	1.63E+01	< 5.48E+01	2.68E+01	5.16E-01	NET
Se-75	-1.15E+01	9.11E+00	< 3.16E+01	1.54E+01	8.36E-01	NET
Cr-51	-3.52E+01	1.02E+02	< 3.49E+02	1.69E+02	4.60E-01	NET
I-131	-9.36E+01	8.05E+01	< 2.83E+02	1.36E+02	6.88E-02	NET
Sb-125	5.97E+00	1.61E+01	< 5.46E+01	2.61E+01	9.79E-01	NET
Ag-108m	-7.43E+00	5.20E+00	< 1.85E+01	8.87E+00	9.99E-01	NET
Be-7	-8.75E+01	6.77E+01	< 2.41E+02	1.15E+02	6.69E-01	NET
La-140	-3.17E+00	5.45E+01	< 1.88E+02	8.98E+01	1.86E-01	NET
Ru-103	-9.53E+00	8.92E+00	< 3.17E+01	1.51E+01	5.79E-01	NET
Ba-140	-9.83E+01	1.18E+02	< 4.13E+02	1.98E+02	1.86E-01	NET
Cs-134	-1.38E+00	6.04E+00	< 2.09E+01	1.00E+01	9.72E-01	NET
Ru-106	1.16E+01	5.56E+01	< 1.91E+02	9.08E+01	9.43E-01	NET
Zr-95	-2.85E+03	1.75E+03	< 5.76E+03	2.88E+03	7.15E-01	NET
Nb-95	-3.87E+00	1.16E+01	< 4.05E+01	1.93E+01	5.41E-01	NET
Co-58	-3.65E+00	7.09E+00	< 2.52E+01	1.19E+01	7.38E-01	NET
Mn-54	4.69E+00	6.42E+00	< 2.18E+01	1.03E+01	9.33E-01	NET
Ag-110m	-9.35E+00	9.43E+00	< 3.37E+01	1.60E+01	9.18E-01	NET
Fe-59	3.07E+01	1.89E+01	< 6.21E+01	2.92E+01	6.18E-01	NET
Zn-65	3.30E+01	3.03E+01	< 1.01E+02	4.89E+01	9.16E-01	NET
Co-60	1.44E+01	6.98E+00	< 2.25E+01	1.05E+01	9.89E-01	NET

L5187-12 analyzed by emm1461 on 04/25/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Sb-124	7.77E+00	1.37E+01	< 4.86E+01	2.17E+01	7.00E-01	NET

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-13 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-13
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG 5777

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 540.2 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/21/03 1621 Det No.: 2 Spectrum No.: 1116802
Counted by: EM
Recount Date/Time: 5/5/03 1742 Det No.: 5 Spectrum No.: 1227305
Counted by: EM

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-13
Client Id : BMS-AO300-13
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	540.2		
Sample Weight-Dry	g			
Aliquot Weight	g	540.2		
FINAL WEIGHT	kg	.5402		
Container			WTS5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-13 analyzed by emml461 on 04/21/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-13

Not stored, Co?
es 5/5/03

Sample ID: NONE

Code: 1116802

 Sampling Start: 03/01/2003 12:00:00 | Counting Start: 04/21/2003 16:21:10
 Sampling Stop: 03/01/2003 12:00:00 | Decay Time: 1.23E+003 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time: 30000 Sec
 Sample Size: 5.40E-001 kg | Real Time: 30018 Sec
 Collection Efficiency: 1.0000 | Spc. File: 1116802.spc

Detector #: 2 (Canberra sn 9923043 det# 2)

Energy(keV)= 1.12 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.40	94.25	464	91	146	3147	1.47	
2	74.90	111.66	1471	78	111	2277	1.36	a
3	77.19	115.13	2121	75	97	1898	1.00	b
4	84.39	126.01	329	56	88	1553	1.03	a HiResid
5	87.24	130.33	733	60	88	1553	1.13	b HiResid
6	89.76	134.15	404	57	88	1553	1.01	c HiResid
7	93.00	139.05	1117	70	100	1864	1.36	d HiResid
8	99.76	149.28	29	46	75	1243	0.82	e NET< CL HiResid
9	105.52	158.00	13	38	62	932	0.56	f NET< CL HiResid
10	122.47	183.65	71	34	55	736	0.57	a
11	129.19	193.82	230	50	78	1228	1.10	b
12	143.97	216.18	42	49	79	1269	0.62	NET< CL
13	154.42	232.01	114	60	96	1588	1.01	
14	185.96	279.74	727	62	91	1426	1.44	
15	209.30	315.07	332	56	87	1301	1.05	
16	238.68	359.53	3939	76	71	922	1.23	a HiResid
17	241.62	363.98	753	60	88	1229	1.67	b HiResid
18	258.64	389.73	23	43	70	847	0.95	NET< CL
19	270.10	407.08	300	45	68	794	1.47	
20	277.45	418.21	189	44	68	799	1.40	
21	295.25	445.15	1062	45	51	528	1.14	a
22	300.10	452.48	238	35	51	528	1.04	b
23	328.30	495.16	202	44	69	753	1.12	
24	338.42	510.47	776	49	66	700	1.45	
25	352.00	531.04	1922	57	59	590	1.28	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
26	409.72	618.39	65	38	61	588	1.18	
27	463.33	699.52	244	42	64	575	1.30	
28	487.68	736.38	5	31	51	420	0.18	NET< CL
29	510.88	771.48	967	48	61	510	2.32	Wide Pk
30	583.27	881.05	1264	48	53	422	1.44	
31	609.38	920.57	1460	48	47	349	1.66	
32	661.77	999.85	652	41	53	410	1.50	
33	727.52	1099.36	258	29	39	286	1.39	
34	741.98	1121.25	25	23	37	250	0.75	NET< CL
35	768.53	1161.44	140	27	40	285	1.86	a
36	772.51	1167.46	52	20	30	190	1.21	b
37	786.04	1187.92	34	24	38	262	1.08	NET< CL
38	795.02	1201.52	149	28	41	281	1.44	
39	860.89	1301.21	84	25	38	253	1.23	
40	911.27	1377.46	841	38	39	255	1.89	
41	934.19	1412.14	24	27	43	292	0.94	NET< CL
42	964.93	1458.67	146	22	30	172	1.54	a
43	969.13	1465.03	501	30	33	197	1.63	b
44	1001.44	1513.93	23	22	36	226	0.79	NET< CL
45	1120.64	1694.33	352	31	42	255	2.05	
46	1155.93	1747.74	24	29	47	306	0.82	NET< CL
47	1173.40	1774.18	595	34	40	249	1.80	
48	1238.32	1872.43	102	28	42	280	1.90	
49	1281.43	1937.68	47	20	31	160	1.72	
50	1332.71	2015.28	464	29	31	147	1.81	
51	1378.10	2083.98	66	17	24	104	1.83	
52	1408.33	2129.74	8	18	29	139	0.45	NET< CL
53	1460.98	2209.42	3006	57	24	101	2.21	
54	1588.12	2401.83	19	15	24	105	0.72	NET< CL
55	1630.86	2466.53	5	14	22	81	0.59	NET< CL
56	1660.85	2511.92	24	12	19	56	1.94	
57	1729.85	2616.35	56	14	19	57	1.78	
58	1764.77	2669.19	287	19	15	38	2.17	
59	1847.46	2794.34	41	14	20	59	1.73	
60	2103.77	3182.25	77	14	17	51	3.11	
61	2204.03	3333.99	62	12	16	43	2.14	
62	2614.57	3955.32	495	23	9	13	2.86	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.40	464	91	146	311	92	149	
2	74.90	1471	78	111	1386	78	113	
3	77.19	2121	75	97	2040	75	99	
4	84.39	329	56	88	280	57	90	
5	87.24	733	60	88	681	61	90	
7	93.00	1117	70	100	698	71	108	
8	99.76	29	46	75	9	47	77	NET<CL
12	143.97	42	49	79	-0	49	81	NET<CL
13	154.42	114	60	96	95	61	99	NET<CL
14	185.96	727	62	91	525	63	97	
16	238.68	3939	76	71	3782	77	75	
17	241.62	753	60	88	722	61	90	
19	270.10	301	45	68	292	46	70	
21	295.25	1062	45	51	1000	46	55	
24	338.42	776	49	66	752	50	68	
25	352.00	1922	57	59	1821	57	63	
26	409.72	65	38	61	63	39	62	
29	510.88	967	48	61	440	50	74	
30	583.27	1265	48	53	1220	49	56	
31	609.38	1460	48	47	1392	48	50	
33	727.52	258	29	39	250	29	40	
35	768.53	140	27	40	135	27	41	
38	795.02	149	28	41	139	28	42	
40	911.27	841	38	39	805	38	42	
43	969.13	501	30	33	483	30	34	
44	1001.44	23	22	36	9	23	37	NET<CL
45	1120.64	352	31	42	332	32	43	
48	1238.32	102	28	42	93	28	43	
53	1460.98	3006	57	25	2952	57	28	
57	1729.85	56	14	19	54	14	20	
58	1764.77	287	19	15	266	20	18	
62	2614.57	495	23	9	454	23	15	

L5187-13 analyzed by emml461 on 04/21/2003

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	63.40	311	Th-234	283	2 of 2	100.00	1.50	
2	74.90	1386	Pb-212	892	5 of 6	99.30	0.99	
			Pb-214	397	5 of 7	97.33	0.97	
			Tl-208	91	7 of 9	98.43	0.98	
3	77.19	2040	Pb-212	1570	5 of 6	99.30	0.99	
			Pb-214	687	5 of 7	97.33	0.97	
4	84.39	280	Tl-208	48	7 of 9	98.43	0.98	
5	87.24	681	Pb-212	818	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	89.76	404	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	93.00	698	Th-234	766	2 of 2	100.00	1.50	
			AcTh-228	347	13 of 36	84.33	0.84	
10	122.47	71	Co-57	. . . . .	1 of 4	100.00	1.50	
			Se-75	. . . . .	1 of 5	10.38	0.60	
11	129.19	230	AcTh-228	300	13 of 36	90.34	1.40	
			La-140	. . . . .	1 of 15	0.51	0.01	LowScore
14	185.96	525	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
15	209.30	332	AcTh-228	375	13 of 36	89.54	1.40	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
16	238.68	3782	Pb-212	4734	5 of 6	100.00	1.00	
17	241.62	722	Pb-214	477	5 of 7	98.65	0.99	
			La-140	131	2 of 15	0.91	0.01	LowScore
19	270.10	292	AcTh-228	256	13 of 36	87.77	1.38	
20	277.45	189	Tl-208	162	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
21	295.25	1000	Pb-214	1614	5 of 7	100.00	1.00	
22	300.10	238	Pb-212	244	5 of 6	100.00	1.50	
23	328.30	202	AcTh-228	200	13 of 36	87.77	1.38	
			Bi-212	5	2 of 13	59.32	0.59	
			La-140	5042	3 of 15	23.72	0.24	LowScore
24	338.42	752	AcTh-228	684	13 of 36	87.77	1.38	
25	352.00	1821	Pb-214	2759	5 of 7	100.00	1.00	
26	409.72	63	AcTh-228	114	13 of 36	92.90	1.43	
27	463.33	244	AcTh-228	213	13 of 36	87.77	1.38	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
29	510.88	106	Annil	. . . . .	1 of 1	100.00	1.50	Split
63	510.88	333	Tl-208	333	7 of 9	100.00	1.50	AutoAdd

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
30	583.27	1220	Tl-208	1167	7 of 9	100.00	1.50	
31	609.38	1392	Bi-214	1603	11 of 33	89.40	1.39	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1121SEsc	. . . . .	0 of 0	. . .	0.50	
32	661.77	653	Cs-137	. . . . .	1 of 1	100.00	1.50	
			1173SEsc	. . . . .	0 of 0	. . .	0.50	
33	727.52	250	Bi-212	10282	2 of 13	71.65	0.72	
35	768.53	135	Bi-214	133	11 of 33	88.52	1.39	
36	772.51	52	AcTh-228	52	13 of 36	87.77	1.38	
			TeI-132	. . . . .	0 of 0	. . .	0.00	Decay
38	795.02	139	AcTh-228	151	13 of 36	88.63	1.39	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
39	860.89	84	Tl-208	135	7 of 9	100.00	1.50	
40	911.27	805	AcTh-228	836	13 of 36	87.77	1.38	
42	964.93	146	AcTh-228	148	13 of 36	87.77	1.38	
43	969.13	483	AcTh-228	468	13 of 36	87.77	1.38	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
45	1120.64	332	Bi-214	301	11 of 33	87.27	1.37	
47	1173.40	595	Co-60	509	2 of 2	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.17	LowScore
48	1238.32	93	Bi-214	111	11 of 33	91.72	1.42	
49	1281.43	47	Bi-214	27	11 of 33	85.84	1.36	
50	1332.71	464	Co-60	542	2 of 2	100.00	1.50	
51	1378.10	67	Bi-214	71	11 of 33	90.62	1.41	
53	1460.98	2952	K-40	. . . . .	1 of 1	100.00	1.50	
56	1660.85	24	Bi-214	17	11 of 33	86.39	1.36	
57	1729.85	54	Bi-214	43	11 of 33	86.39	1.36	
58	1764.77	266	Bi-214	223	11 of 33	86.39	1.36	
59	1847.46	41	Bi-214	29	11 of 33	86.39	1.36	
60	2103.77	77	2615SEsc	. . . . .	0 of 0	. . .	0.50	
61	2204.03	62	Bi-214	61	11 of 33	88.52	1.39	
62	2614.57	454	Tl-208	486	7 of 9	100.00	1.50	

L5187-13 analyzed by emml461 on 04/21/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-13

Sample ID: NONE

Code: 1116802

 Sampling Start: 03/01/2003 12:00:00 | Counting Start: 04/21/2003 16:21:10
 Sampling Stop: 03/01/2003 12:00:00 | Decay Time: 1.23e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 30000 Sec
 Sample Size 5.40e-001 kg | Real Time 30018 Sec
 Collection Efficiency 1.0000 | Spectrum File 1116802.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 2 (Canberra sn 9923043 det# 2)
 Efficiency File: WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[1.15E-02*En^-3.19E+00 + 2.16E+02*En^7.29E-01] 02/06/1998

 Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: \$ERROR\$.LSF (No LSF File Available)
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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Th-234	Average:x	1.32E+03 +- 1.27E+02	. . . . .	*	. . . . .
	63.29	1.44E+03 +- 4.27E+02	1.39E+03	++	. . . . .
	92.59	1.31E+03 +- 1.33E+02	4.10E+02	++	. . . . .
Pb-212	Average:x	1.09E+03 +- 2.19E+01	. . . . .	*	. . . . .
	74.81	I.D. . . . .	. . . . .		. . . . .
	77.12	I.D. . . . .	. . . . .		. . . . .
	87.30	I.D. . . . .	. . . . .		. . . . .
	238.63	1.09E+03 +- 2.21E+01	4.41E+01	++	. . . . .
	300.09	1.05E+03 +- 1.54E+02	4.65E+02	++	. . . . .
Tl-208	Average:x	9.50E+02 +- 2.95E+01	. . . . .	*	. . . . .
	84.90	I.D. . . . .	. . . . .		. . . . .
	277.35	1.10E+03 +- 2.56E+02	8.16E+02	++	. . . . .
	510.84	I.D. . . . .	. . . . .		. . . . .
	583.14	9.82E+02 +- 3.92E+01	9.19E+01	++	. . . . .
	860.37	6.05E+02 +- 1.80E+02	5.70E+02	++	. . . . .
	2614.66	9.22E+02 +- 4.71E+01	6.67E+01	++	. . . . .
Cd-109	88.03	I.D. . . . .	. . . . .		. . . . .
Co-57	122.06	8.88E+00 +- 4.28E+00	1.40E+01	+	. . . . .
AcTh-228	Average:x	1.00E+03 +- 2.95E+01	. . . . .	*	. . . . .
	129.08	7.75E+02 +- 1.67E+02	5.34E+02	++	. . . . .
	209.28	8.91E+02 +- 1.51E+02	4.76E+02	++	. . . . .
	270.23	1.14E+03 +- 1.78E+02	5.54E+02	++	. . . . .
	327.64	1.01E+03 +- 2.22E+02	7.05E+02	++	. . . . .
	338.32	1.08E+03 +- 7.17E+01	2.01E+02	++	. . . . .
	409.51	5.55E+02 +- 3.42E+02	1.12E+03	+	. . . . .
	463.00	1.14E+03 +- 1.97E+02	6.16E+02	++	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	N	Concentration (pCi/kg)	MDA	Flags	Notes	MDC	
Ra-226	772.17		9.97E+02 +- 3.77E+02	1.21E+03		+	
	794.70		9.21E+02 +- 1.88E+02	5.80E+02		++	
	911.07		9.79E+02 +- 4.62E+01	1.04E+02		++	
	964.60		9.87E+02 +- 1.46E+02	4.18E+02		++	
	969.11		1.03E+03 +- 6.45E+01	1.52E+02		++	
	186.22		1.76E+03 +- 2.11E+02	6.57E+02		++	
	Average:x		8.27E+02 +- 2.06E+01	. . . . .		*	. . . . .
	241.98		1.25E+03 +- 1.06E+02	3.17E+02		++	
	295.21		7.77E+02 +- 3.56E+01	8.70E+01		++	
	351.92		8.28E+02 +- 2.60E+01	5.82E+01		++	
Annul	511.00		2.59E+01 +- 2.12E+01	6.98E+01		+	
Bi-214	Average:x		7.87E+02 +- 2.25E+01	. . . . .		*	. . . . .
	609.31		7.57E+02 +- 2.62E+01	5.62E+01		++	
	768.36		7.98E+02 +- 1.62E+02	5.00E+02		++	
	1120.29		8.63E+02 +- 8.26E+01	2.30E+02		++	
	1238.11		6.59E+02 +- 1.99E+02	6.35E+02		++	
	1280.96		1.37E+03 +- 5.89E+02	1.90E+03		+	
	1377.67		7.38E+02 +- 1.88E+02	5.71E+02		++	
	1661.28		1.10E+03 +- 5.62E+02	1.82E+03		+	
	1729.59		9.77E+02 +- 2.54E+02	7.59E+02		++	
	1764.49		9.19E+02 +- 6.81E+01	1.35E+02		++	
Cs-137	1847.42		1.11E+03 +- 3.65E+02	1.13E+03		++	
	2204.22		7.98E+02 +- 1.61E+02	4.45E+02		++	
	661.65		2.05E+02 +- 1.29E+01	3.40E+01		++	
	727.17		6.07E+02 +- 7.05E+01	2.01E+02		++	
	Average:x		2.26E+02 +- 9.57E+00	. . . . .		*	. . . . .
	1173.22		2.46E+02 +- 1.42E+01	3.42E+01		++	
	1332.49		2.10E+02 +- 1.29E+01	2.91E+01		++	
	1460.81		1.32E+04 +- 2.54E+02	2.64E+02		++	
	Am-241	59.54	N	1.54E+02 +- 6.94E+01	2.28E+02P		x	PIC
	Ce-144	133.54	N	9.96E-01 +- 4.75E+01	1.59E+02r		x	rbase
Ce-141	145.44	N	1.93E+01 +- 2.91E+01	9.66E+01		x	
Se-75	264.65	N	9.33E+00 +- 1.17E+01	3.97E+01l		x	lbase	
Cr-51	320.08	N	5.23E+01 +- 1.98E+02	6.70E+02		x	
I-131	364.48	N	4.11E+02 +- 5.45E+02	1.86E+03		x	
Sb-125	427.89	N	2.61E+01 +- 1.92E+01	6.36E+01		x	
Ag-108m	433.93	N	5.69E+00 +- 5.95E+00	2.05E+01		x	
Be-7	477.59	N	1.18E+02 +- 1.04E+02	3.44E+02		x	
La-140	487.03	N	2.50E+02 +- 1.91E+02	6.32E+02		x	
Ru-103	497.08	N	6.02E+00 +- 1.47E+01	5.03E+01		x	
Ba-140	537.32	N	2.28E+02 +- 3.99E+02	1.34E+03		x	
Cs-134	604.70	N	1.97E+00 +- 7.17E+00	2.44E+01l		x	lbase	
Ru-106	621.84	N	4.74E+01 +- 7.02E+01	2.42E+02		x	
Zr-95	724.18	N	1.14E+04 +- 2.57E+03	8.47E+03P		x#	PIC	
Nb-95	765.79	N	2.29E+01 +- 2.73E+01	9.15E+01P		x	PIC	
Co-58	810.76	N	2.36E+01 +- 1.03E+01	3.32E+01		x	
Mn-54	834.83	N	2.84E+00 +- 7.71E+00	2.61E+01		x	
Ag-110m	884.67	N	1.57E+00 +- 1.12E+01	3.82E+01		x	
Fe-59	1099.22	N	3.50E+01 +- 2.95E+01	1.04E+02		x	
Zn-65	1115.52	N	5.00E+01 +- 3.68E+01	1.21E+02P		x	PIC	
Sb-124	1691.02	N	1.95E+01 +- 1.83E+01	6.20E+01		x	

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	N Concentration (pCi/kg)	MDA	Flags	Notes	MDC

MEASURED TOTAL:		2.20E+04 +- 8.35E+02 pCi/kg				0.00E+00
				NOTE:	*: N/S>3	#: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
8	99.76	149.28	9	47	77	1243	0.82	Deleted
9	105.52	158.00	13	38	62	932	0.56	Deleted
12	143.97	216.18	-0	49	81	1269	0.62	Deleted
13	154.42	232.01	95	61	99	1588	1.01	Deleted
18	258.64	389.73	23	43	70	847	0.95	Deleted
28	487.68	736.38	5	31	52	420	0.18	Deleted
34	741.98	1121.25	25	23	37	250	0.75	Deleted
37	786.04	1187.92	34	24	38	262	1.08	Deleted
41	934.19	1412.14	24	27	43	292	0.94	Deleted
44	1001.44	1513.93	9	23	37	226	0.79	Deleted
46	1155.93	1747.74	25	29	47	306	0.82	Deleted
52	1408.33	2129.74	8	18	29	139	0.45	Deleted
54	1588.12	2401.83	19	15	24	105	0.72	Deleted
55	1630.86	2466.53	5	14	22	81	0.59	Deleted
60	2103.77	3182.25	77	14	17	51	3.11	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
64	59.54	88.41	274N	124	201	4385	1.08	PIC
65	133.54	200.40	-1N	48	78	1240	1.14	NET< CL RBase
66	145.44	218.41	32N	48	79	1255	1.15	NET< CL
67	264.65	398.83	-30N	38	62	719	1.23	NET< CL LBase
68	320.08	482.72	-9N	34	56	587	1.27	NET< CL
69	364.48	549.92	-23N	31	51	477	1.30	NET< CL
70	427.89	645.89	38N	28	45	372	1.35	NET< CL
71	433.93	655.03	-26N	27	46	383	1.35	NET< CL
72	477.59	721.11	30N	26	42	331	1.38	NET< CL
73	487.03	735.39	33N	25	40	300	1.39	NET< CL
74	497.08	750.60	-10N	24	40	301	1.39	NET< CL
75	537.32	811.51	15N	27	44	327	1.42	NET< CL
76	604.70	913.48	-7N	27	44	331	1.47	NET< CL LBase
77	621.84	939.42	-17N	24	41	284	1.48	NET< CL
78	724.18	1094.31	-10013N	2257	3717	457	1.55	NET< CL PIC
79	765.79	1157.28	28N	33	54	362	1.58	NET< CL PIC
80	810.76	1225.34	46N	20	31	187	1.61	

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
81	834.83	1261.77	8N	22	35	232	1.63	NET< CL
82	884.67	1337.20	3N	21	35	227	1.66	NET< CL
83	1099.22	1661.91	-23N	19	33	200	1.81	NET< CL
84	1115.52	1686.58	56N	41	67	389	1.82	NET< CL
								PIC
85	1691.02	2557.57	10N	9	15	39	2.21	NET< CL

L5187-13 analyzed by emml461 on 04/21/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

Sampling Start: 03/01/2003 12:00:00 | Counting Start: 04/21/2003 16:21:10
Sampling Stop: 03/01/2003 12:00:00 | Decay Time. 1.23E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 30000 Sec
Sample Size 5.40E-01 kg | Real Time 30018 Sec
Collection Efficiency 1.0000 | Spectrum File 1116802.spc

Detector #: 2

Energy(keV)= 1.12 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 6.55E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS002.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[1.15e-02*En^-3.19e+00 + 2.16e+02*En^ 7.29e-01] 02/06/1998

Library File: SOILA.LIB LSF File: \$ERROR\$.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	1.32E+03	1.27E+02	< 4.10E+02	2.03E+02	1.00E+00	MEAS +	YES
Pb-212	1.09E+03	2.19E+01	< 4.41E+01	2.16E+01	1.00E+00	MEAS +	YES
Tl-208	9.50E+02	2.95E+01	< 6.67E+01	3.06E+01	1.00E+00	MEAS +	YES
Co-57	8.88E+00	4.28E+00	< 1.40E+01	6.82E+00	8.77E-01	MEAS +	YES
AcTh-228	1.00E+03	2.95E+01	< 1.04E+02	5.05E+01	1.00E+00	MEAS +	YES
Ra-226	1.76E+03	2.12E+02	< 6.57E+02	3.24E+02	1.00E+00	MEAS +	YES
Pb-214	8.27E+02	2.06E+01	< 5.82E+01	2.85E+01	1.00E+00	MEAS +	YES
Annil	2.59E+01	2.12E+01	< 6.98E+01	3.46E+01	9.07E-01	MEAS +	YES
Bi-214	7.87E+02	2.25E+01	< 5.62E+01	2.74E+01	1.00E+00	MEAS +	YES
Cs-137	2.06E+02	1.29E+01	< 3.40E+01	1.66E+01	9.97E-01	MEAS +	YES
Bi-212	6.06E+02	7.05E+01	< 2.01E+02	9.73E+01	1.00E+00	MEAS +	YES
Co-60	2.26E+02	9.57E+00	< 2.91E+01	1.39E+01	9.82E-01	MEAS +	YES
K-40	1.32E+04	2.54E+02	< 2.64E+02	1.26E+02	1.00E+00	MEAS +	YES
Am-241	1.54E+02	6.94E+01	< 2.28E+02	1.13E+02	1.00E+00	NET	YES
Ce-144	-9.96E-01	4.75E+01	< 1.59E+02	7.81E+01	8.82E-01	NET	YES
Ce-141	1.93E+01	2.91E+01	< 9.66E+01	4.75E+01	3.35E-01	NET	YES
Se-75	-9.33E+00	1.17E+01	< 3.97E+01	1.94E+01	7.43E-01	NET	YES
Cr-51	-5.23E+01	1.98E+02	< 6.70E+02	3.27E+02	2.77E-01	NET	YES
I-131	-4.11E+02	5.45E+02	< 1.86E+03	9.07E+02	1.20E-02	NET	YES
Sb-125	2.61E+01	1.92E+01	< 6.35E+01	3.09E+01	9.65E-01	NET	YES
Ag-108m	-5.69E+00	5.95E+00	< 2.05E+01	9.97E+00	9.99E-01	NET	YES
Be-7	1.18E+02	1.04E+02	< 3.44E+02	1.67E+02	5.14E-01	NET	YES
La-140	2.50E+02	1.91E+02	< 6.32E+02	3.06E+02	6.19E-02	NET	YES
Ru-103	-6.02E+00	1.47E+01	< 5.02E+01	2.43E+01	4.05E-01	NET	YES
Ba-140	2.28E+02	3.99E+02	< 1.34E+03	6.50E+02	6.19E-02	NET	YES
Cs-134	-1.97E+00	7.16E+00	< 2.44E+01	1.19E+01	9.54E-01	NET	YES
Ru-106	-4.74E+01	7.02E+01	< 2.42E+02	1.17E+02	9.08E-01	NET	YES
Zr-95	-1.14E+04	2.57E+03	< 8.47E+03	4.23E+03	5.74E-01	NET	YES
Nb-95	2.29E+01	2.73E+01	< 9.15E+01	4.46E+01	3.62E-01	NET	YES
Co-58	2.36E+01	1.03E+01	< 3.32E+01	1.59E+01	6.05E-01	NET	YES
Mn-54	2.84E+00	7.71E+00	< 2.61E+01	1.26E+01	8.92E-01	NET	YES
Ag-110m	1.57E+00	1.12E+01	< 3.82E+01	1.84E+01	8.67E-01	NET	YES
Fe-59	-3.50E+01	2.95E+01	< 1.04E+02	5.00E+01	4.51E-01	NET	YES

L5187-13 analyzed by emm1461 on 04/21/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Zn-65	5.00E+01	3.68E+01	< 1.21E+02	5.95E+01	8.64E-01	NET	YES
Sb-124	1.95E+01	1.83E+01	< 6.20E+01	2.84E+01	5.54E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-13

stred

Sample ID: SOIL/SEDI Duratek Inc

Code: 1227305

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 05/02/2003 17:42:30
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 1.01E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 40000 Sec
 Sample Size 5.40E-001 kg | Real Time 40037 Sec
 Collection Efficiency 1.0000 | Spc. File 1227305.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Energy(keV)= -0.72 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/02/2003
 FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	51.09	78.26	-27728	942	1573	31528	601.33	NET< CL Wide Pk
2	62.59	95.64	278	75	120	2679	1.00	
3	74.10	113.02	2049	97	141	3393	1.47	a
4	76.41	116.52	2711	85	110	2423	1.08	b
5	83.46	127.15	311	65	103	2124	1.14	a
6	86.50	131.76	1105	87	132	2974	1.47	b
7	89.18	135.80	556	58	88	1699	0.91	c
8	92.21	140.38	1352	80	117	2549	1.36	d
9	98.58	150.00	22	44	72	1274	0.58	e NET< CL
10	104.90	159.55	63	54	88	1699	0.92	f NET< CL
11	124.60	189.31	144	66	107	2113	1.36	a
12	128.49	195.19	361	60	93	1761	1.15	b
13	143.35	217.62	6	66	109	2190	0.11	NET< CL
14	152.66	231.69	276	82	131	2729	1.33	
15	185.39	281.14	1179	77	113	2177	1.45	a
16	192.23	291.46	62	38	62	933	0.62	b
17	208.50	316.04	473	69	109	2010	1.31	
18	238.07	360.70	6285	92	78	1231	1.17	a
19	240.98	365.10	1182	70	101	1723	1.49	b
20	258.38	391.39	42	49	80	1180	0.67	NET< CL
21	269.65	408.42	582	64	97	1501	1.67	
22	276.91	419.38	198	55	88	1323	1.03	
23	294.67	446.20	1945	62	72	961	1.34	a
24	299.54	453.56	369	48	72	961	1.27	b
25	308.82	467.59	-104	48	81	1107	2.38	NET< CL Wide Pk
26	327.53	495.85	299	55	86	1183	1.43	

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	337.84	511.42	1297	63	86	1172	1.48	
28	351.46	531.99	3396	78	85	1060	1.40	
29	401.14	607.03	25	43	70	825	0.45	NET< CL
30	409.52	619.70	141	47	75	901	0.97	
31	462.59	699.86	371	49	73	795	1.32	
32	480.51	726.94	29	33	54	534	1.39	a NET< CL
33	485.87	735.03	4	41	67	712	1.83	b NET< CL
34	510.56	772.32	1692	62	76	800	2.15	Wide Pk
35	582.97	881.71	2196	61	64	598	1.62	
36	609.09	921.16	2466	65	69	704	1.52	
37	661.50	1000.33	1226	50	59	606	1.71	
38	727.30	1099.73	541	41	55	491	1.92	
39	754.31	1140.53	46	37	60	564	0.80	NET< CL
40	763.89	1155.00	53	24	37	292	1.23	a
41	768.19	1161.50	267	37	54	486	2.08	b
42	772.06	1167.34	78	24	37	292	1.27	c
43	785.65	1187.86	139	37	58	520	1.64	
44	794.92	1201.88	272	36	53	469	1.88	
45	806.39	1219.21	13	31	50	440	0.29	NET< CL
46	835.83	1263.68	120	31	48	397	2.02	a
47	840.27	1270.37	110	31	48	397	2.00	b
48	860.64	1301.14	308	36	51	432	1.79	
49	911.34	1377.74	1401	49	51	431	1.66	
50	934.08	1412.08	94	28	43	341	1.25	
51	964.92	1458.66	306	34	48	375	2.11	a
52	969.12	1465.01	933	39	40	300	1.84	b
53	1102.92	1667.13	12	30	49	389	0.45	NET< CL
54	1120.52	1693.71	521	39	52	419	1.91	
55	1154.49	1745.04	135	36	56	445	2.05	
56	1173.53	1773.79	1009	46	54	448	1.81	
57	1238.40	1871.78	200	37	56	459	1.50	
58	1280.78	1935.79	35	28	45	309	1.67	NET< CL
59	1332.91	2014.54	958	39	39	257	1.99	
60	1378.05	2082.74	150	21	29	148	2.43	a
61	1385.65	2094.21	40	15	23	108	1.69	b
62	1402.23	2119.26	41	17	26	130	1.93	a
63	1408.50	2128.73	46	15	22	101	1.56	b
64	1461.25	2208.42	5457	77	33	179	2.17	
65	1509.45	2281.22	33	19	30	148	1.43	
66	1588.80	2401.09	106	17	23	99	1.93	a
67	1593.11	2407.60	62	15	21	88	1.82	b
68	1621.11	2449.89	48	15	22	97	1.88	a
69	1631.18	2465.11	58	15	21	86	1.70	b
70	1730.30	2614.83	68	17	24	96	2.27	
71	1764.96	2667.19	508	27	24	91	2.37	
72	1849.05	2794.21	78	17	24	84	2.79	
73	2103.85	3179.11	140	17	21	74	2.81	
74	2204.48	3331.12	105	18	24	95	3.27	
75	2447.58	3698.34	35	13	20	65	2.60	
76	2614.73	3950.84	891	31	16	43	3.06	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	62.59	278	75	120	171	76	124	
3	74.10	2049	97	141	1955	99	145	
4	76.41	2711	85	110	2655	85	112	
6	86.50	1105	87	132	1058	88	134	
8	92.21	1352	80	117	1029	82	124	
13	143.35	6	66	109	-50	67	111	NET<CL
15	185.39	1179	77	113	962	78	118	
17	208.50	473	69	109	448	71	111	
18	238.07	6285	92	78	6165	93	83	
23	294.67	1945	62	72	1869	64	77	
27	337.84	1297	64	86	1297	64	88	
28	351.46	3397	78	85	3249	79	90	
32	480.51	29	33	54	31	34	56	NET<CL
34	510.56	1692	62	76	754	64	96	
35	582.97	2197	61	64	2144	62	67	
36	609.09	2466	65	69	2368	66	73	
38	727.30	541	41	55	527	41	56	
48	860.64	308	36	51	306	37	53	
49	911.34	1401	49	51	1350	49	54	
52	969.12	933	39	40	913	40	43	
54	1120.52	521	39	52	502	40	54	
64	1461.25	5457	77	33	5375	77	38	
71	1764.96	508	27	24	486	27	26	
76	2614.73	891	31	16	826	32	23	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.60 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	62.59	171	Th-234	334	2 of 2	100.00	1.50	
3	74.10	1955	Pb-212	1079	5 of 6	99.30	0.99	
			Pb-214	507	5 of 7	89.61	0.90	
			Tl-208	109	7 of 9	98.47	0.98	
4	76.41	2655	Pb-212	1935	5 of 6	99.30	0.99	
			Pb-214	913	5 of 7	89.61	0.90	
5	83.46	311	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
6	86.50	1058	Pb-212	1071	5 of 6	99.30	1.49	
7	89.18	556	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	92.21	1029	Th-234	526	2 of 2	100.00	1.50	
11	124.60	144	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
12	128.49	361	AcTh-228	453	16 of 36	91.33	1.41	
14	152.66	276	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
15	185.39	962	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
16	192.23	62	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Fe-59	. . . . .	1 of 4	3.02	0.53	LowScore
17	208.50	448	AcTh-228	605	16 of 36	92.12	1.42	
18	238.07	6165	Pb-212	8443	5 of 6	99.30	0.99	
19	240.98	1182	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
21	269.65	582	AcTh-228	418	16 of 36	89.47	1.39	
22	276.91	198	Tl-208	270	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
23	294.67	1869	Pb-214	1968	5 of 7	90.83	1.41	
24	299.54	369	Pb-212	408	5 of 6	100.00	1.50	
26	327.53	299	AcTh-228	331	16 of 36	89.93	1.40	
			Bi-212	7	4 of 13	82.79	0.83	
27	337.84	1297	AcTh-228	1129	16 of 36	89.93	1.40	
28	351.46	3249	Pb-214	3403	5 of 7	90.83	1.41	
30	409.52	141	AcTh-228	191	16 of 36	92.12	1.42	
31	462.59	371	AcTh-228	362	16 of 36	89.93	1.40	
			Sb-125	. . . . .	1 of 8	12.54	0.13	LowScore
34	510.56	180	Annul	. . . . .	1 of 1	100.00	1.50	Split
79	510.56	574	Tl-208	574	7 of 9	100.00	1.50	AutoAdd
35	582.97	2144	Tl-208	1990	7 of 9	100.00	1.50	
36	609.09	2368	Bi-214	2536	15 of 33	92.89	1.43	
			1121SEsc	. . . . .	0 of 0	. . . . .	0.60	
37	661.50	1226	Cs-137	. . . . .	1 of 1	100.00	1.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
38	727.30	161	1238SEsc		0 of 0	. . . .	0.60	Split
78	727.30	366	Bi-212	366	4 of 13	100.00	1.50	AutoAdd
40	763.89	53	Tl-208	34	7 of 9	100.00	1.50	
			Ag-110m		1 of 15	8.99	0.59	LowScore
41	768.19	267	Bi-214	225	15 of 33	92.89	1.43	
42	772.06	78	AcTh-228	91	16 of 36	90.52	1.41	
			TeI-132		0 of 0	. . . .	0.00	Decay
43	785.65	59	Pb-214	56	5 of 7	90.83	1.41	Split
77	785.65	80	Bi-212	80	4 of 13	91.69	1.42	AutoAdd
44	794.92	272	AcTh-228	265	16 of 36	89.93	1.40	
			Cs-134		1 of 9	43.04	0.43	LowScore
46	835.83	120	AcTh-228	97	16 of 36	89.93	1.40	
47	840.27	110	AcTh-228	52	16 of 36	87.67	1.38	
48	860.64	306	Tl-208	236	7 of 9	100.00	1.50	
49	911.34	1350	AcTh-228	1529	16 of 36	89.93	1.40	
50	934.08	94	Bi-214	127	15 of 33	95.00	1.45	
51	964.92	306	AcTh-228	262	16 of 36	89.93	1.40	
52	969.12	913	AcTh-228	818	16 of 36	89.93	1.40	
			Sb-124		1 of 13	1.04	0.01	LowScore
54	1120.52	502	Bi-214	529	15 of 33	92.89	1.43	
55	1154.49	135	Bi-214	58	15 of 33	91.75	1.42	
56	1173.53	1009	Co-60	1043	2 of 2	100.00	1.50	
			Cs-Sum		1 of 6	16.67	0.17	LowScore
57	1238.40	200	Bi-214	194	15 of 33	92.89	1.43	
59	1332.91	958	Co-60	927	2 of 2	100.00	1.50	
60	1378.05	150	Bi-214	124	15 of 33	92.89	1.43	
61	1385.65	40	Bi-214	24	15 of 33	92.35	1.42	
62	1402.23	41	Bi-214	42	15 of 33	92.89	1.43	
63	1408.50	46	Bi-214	75	15 of 33	98.19	1.48	
64	1461.25	5375	K-40		1 of 1	100.00	1.50	
65	1509.45	33	Bi-214	64	15 of 33	98.19	1.48	
66	1588.80	106	AcTh-228	128	16 of 36	90.52	1.41	
67	1593.11	62	2615DEsc		0 of 0	. . . .	0.60	
			2104SEsc		0 of 0	. . . .	0.60	
68	1621.11	48	Bi-212	73	4 of 13	100.00	1.50	
69	1631.18	58	AcTh-228	66	16 of 36	90.52	1.41	
70	1730.30	68	Bi-214	78	15 of 33	92.89	1.43	
71	1764.96	486	Bi-214	397	15 of 33	92.89	0.93	
72	1849.05	78	Unknown . . . . .		. . . . .	. . . .	. . . .
73	2103.85	140	2615SEsc		0 of 0	. . . .	0.60	
74	2204.48	105	Bi-214	111	15 of 33	92.89	1.43	
75	2447.58	35	Bi-214	32	15 of 33	92.89	1.43	
76	2614.73	826	Tl-208	953	7 of 9	100.00	1.00	

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-13

Sample ID: SOIL/SEDI Duratek Inc

Code: 1227305

Sampling Start:	03/21/2003 12:00:00	Counting Start:	05/02/2003 17:42:30
Sampling Stop:	03/21/2003 12:00:00	Decay Time	1.01e+003 Hrs
Buildup Time	0.00e+000 Hrs	Live Time	40000 Sec
Sample Size	5.40e-001 kg	Real Time	40037 Sec
Collection Efficiency	1.0000	Spectrum File . . . . .	.1227305.spc
Type I		Type I & II	
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[5.46E-03*En^-3.56E+00 + 1.55E+02*En^6.66E-01] 02/06/1998

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Library File: . . . . . SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: . . . . . L5187-13.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	Concentration		MDA	Flags	Notes	MDC
		(pCi/kg)	(%)				
Th-234	Average:	1.30E+03	+ - 1.03E+02	. . . .		*	. . . .
	63.29	7.00E+02	+ - 3.13E+02	1.03E+03		+	. . . .
	92.59	1.37E+03	+ - 1.09E+02	3.33E+02		+*	. . . .
Pb-212	Average:	1.04E+03	+ - 1.57E+01	. . . .		*	. . . .
	74.81	I.D.	. . . .	. . . .			. . . .
	77.12	I.D.	. . . .	. . . .			. . . .
	87.30	I.D.	. . . .	. . . .			. . . .
	238.63	1.05E+03	+ - 1.59E+01	2.88E+01		+*	. . . .
AcTh-228	300.09	9.45E+02	+ - 1.23E+02	3.76E+02		+*	. . . .
	Average:	9.55E+02	+ - 2.07E+01	. . . .		*	. . . .
	129.08	7.65E+02	+ - 1.27E+02	4.02E+02		+*	. . . .
	209.28	7.13E+02	+ - 1.12E+02	3.56E+02		+*	. . . .
	270.23	1.32E+03	+ - 1.45E+02	4.48E+02		+*	. . . .
	327.64	8.64E+02	+ - 1.60E+02	5.07E+02		+*	. . . .
	338.32	1.07E+03	+ - 5.31E+01	1.47E+02		+*	. . . .
	409.51	7.06E+02	+ - 2.38E+02	7.71E+02		+	. . . .
	463.00	9.77E+02	+ - 1.28E+02	3.93E+02		+*	. . . .
	772.17	8.21E+02	+ - 2.55E+02	8.09E+02		+*	. . . .
	794.70	9.82E+02	+ - 1.31E+02	3.95E+02		+*	. . . .
	835.50	1.17E+03	+ - 3.04E+02	9.63E+02		+*	. . . .
	840.00	2.01E+03	+ - 5.65E+02	1.80E+03		+*	. . . .
	911.07	8.86E+02	+ - 3.24E+01	7.28E+01		+*	. . . .
	964.60	1.11E+03	+ - 1.23E+02	3.57E+02		+*	. . . .
	969.11	1.04E+03	+ - 4.55E+01	1.01E+02		+*	. . . .
	1588.00	7.94E+02	+ - 1.29E+02	3.59E+02		+*	. . . .
Ra-226	1630.40	8.28E+02	+ - 2.10E+02	6.29E+02		+*	. . . .
	186.22	1.93E+03	+ - 1.57E+02	4.80E+02		+*	. . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration		MDA	Flags	Notes	MDC
		N	(pCi/kg)				
Tl-208	Average:x	9.15E+02	+ - 2.07E+01	. . . . .	*		. . . . .
	277.35	6.73E+02	+ - 1.88E+02	6.08E+02	+	*	. . . . .
	510.84	I.D.	. . . . .	. . . . .			. . . . .
	583.14	9.57E+02	+ - 2.76E+01	6.12E+01	+	*	. . . . .
	763.13	1.46E+03	+ - 6.50E+02	2.11E+03	+		. . . . .
	860.37	1.20E+03	+ - 1.43E+02	4.23E+02	+	*	. . . . .
	2614.66	8.46E+02	+ - 3.26E+01	4.92E+01	+	*	. . . . .
Pb-214	Average:x	8.44E+02	+ - 1.67E+01	. . . . .	*		. . . . .
	295.21	8.41E+02	+ - 2.87E+01	7.07E+01	+	*	. . . . .
	351.92	8.46E+02	+ - 2.05E+01	4.74E+01	+	*	. . . . .
	785.91	8.86E+02	+ - 9.66E+02	3.20E+03	+		. . . . .
Annul	511.00	2.42E+01	+ - 1.51E+01	4.96E+01	+		. . . . .
Bi-214	Average:x	7.28E+02	+ - 1.64E+01	. . . . .	*		. . . . .
	609.31	7.12E+02	+ - 1.98E+01	4.49E+01	+	*	. . . . .
	768.36	8.61E+02	+ - 1.19E+02	3.59E+02	+	*	. . . . .
	934.06	5.42E+02	+ - 1.60E+02	5.11E+02	+	*	. . . . .
	1120.29	6.94E+02	+ - 5.46E+01	1.52E+02	+	*	. . . . .
	1155.19	1.69E+03	+ - 4.52E+02	1.44E+03	+	*	. . . . .
	1238.11	7.51E+02	+ - 1.38E+02	4.29E+02	+	*	. . . . .
	1377.67	8.72E+02	+ - 1.25E+02	3.54E+02	+	*	. . . . .
	1385.31	1.23E+03	+ - 4.71E+02	1.50E+03	+		. . . . .
	1401.50	7.16E+02	+ - 2.95E+02	9.47E+02	+		. . . . .
	1407.98	4.53E+02	+ - 1.44E+02	4.47E+02	+	*	. . . . .
	1509.23	3.83E+02	+ - 2.17E+02	7.11E+02	+		. . . . .
	1729.59	6.36E+02	+ - 1.60E+02	4.85E+02	+	*	. . . . .
	1764.49	8.69E+02	+ - 4.88E+01	9.94E+01	+	*	. . . . .
	2204.22	6.93E+02	+ - 1.19E+02	3.39E+02	+	*	. . . . .
	2447.86	7.80E+02	+ - 2.99E+02	9.42E+02	+		. . . . .
Cs-137	661.65	2.12E+02	+ - 8.68E+00	2.09E+01	+	*	. . . . .
Co-60	Average:x	2.24E+02	+ - 6.79E+00	. . . . .	*		. . . . .
	1173.22	2.20E+02	+ - 9.95E+00	2.40E+01	+	*	. . . . .
	1332.49	2.28E+02	+ - 9.28E+00	1.92E+01	+	*	. . . . .
K-40	1460.81	1.25E+04	+ - 1.80E+02	1.86E+02	+	*	. . . . .
Bi-212	Average:x	4.85E+02	+ - 1.05E+02	. . . . .	*		. . . . .
	1620.62	4.64E+02	+ - 1.48E+02	4.60E+02	+	*	. . . . .
	727.17	4.85E+02	+ - 1.60E+02	5.24E+02	+	*	. . . . .
	785.46	6.70E+02	+ - 4.41E+02	1.45E+03	+		. . . . .
Am-241	59.54	N-5.26E+01	+ - 5.79E+01	1.93E+02P	x	PIC	. . . . .
Co-57	122.06	N-2.64E+00	+ - 5.11E+00	2.39E+01L	x	LHROI	. . . . .
Ce-144	133.54	N 1.12E+00	+ - 3.52E+01	1.17E+02r	x	rbase	. . . . .
Ce-141	145.44	N 4.91E+01	+ - 2.02E+01	6.59E+01	x		. . . . .
Se-75	264.65	N 1.90E+00	+ - 8.30E+00	2.77E+011	x	lbase	. . . . .
Cr-51	320.08	N 5.63E+01	+ - 1.14E+02	3.79E+02	x		. . . . .
I-131	364.48	N-9.49E+01	+ - 1.76E+02	5.96E+02	x		. . . . .
Sb-125	427.89	N-1.89E+01	+ - 1.33E+01	4.57E+01	x		. . . . .
Ag-108m	433.93	N 5.07E+00	+ - 4.34E+00	1.44E+01	x		. . . . .
Be-7	477.59	N-1.68E+02	+ - 7.55E+01	2.61E+02	x		. . . . .
La-140	487.03	N 2.46E+02	+ - 9.24E+01	2.99E+02	x		. . . . .
Ru-103	497.08	N-7.55E+00	+ - 1.02E+01	3.47E+01	x		. . . . .
Ba-140	537.32	N-3.66E+01	+ - 1.73E+02	5.86E+02	x		. . . . .
Cs-134	604.70	N 8.48E+00	+ - 1.83E+01	6.06E+01P	x	PIC	. . . . .
Ru-106	621.84	N-2.78E+01	+ - 5.03E+01	1.71E+02	x		. . . . .
Zr-95	724.18	N 9.95E+01	+ - 6.55E+01	2.16E+02P	x	PIC	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
Nb-95	765.79	N-1.44E+02 +- 1.55E+01	5.75E+01P		x#	PIC	. . . . .
Co-58	810.76	N-1.26E+01 +- 7.00E+00	2.45E+01		x		. . . . .
Mn-54	834.83	N 4.84E+00 +- 6.33E+00	2.11E+01P		x	PIC	. . . . .
Ag-110m	884.67	N-2.76E-01 +- 7.11E+00	2.42E+01		x		. . . . .
Fe-59	1099.22	N-6.89E+01 +- 1.99E+01	7.13E+01		x#		. . . . .
Zn-65	1115.52	N-5.14E+00 +- 2.50E+01	8.37E+01P		x	PIC	. . . . .
Sb-124	1691.02	N-1.64E+01 +- 1.13E+01	4.19E+01		x		. . . . .

MEASURED TOTAL: 2.12E+04 +- 6.66E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	51.09	78.26	-27728	942	1573	31528	601.33	Deleted
5	83.46	127.15	311	65	103	2124	1.14	Unknown
7	89.18	135.80	556	58	88	1699	0.91	Unknown
9	98.58	150.00	22	44	72	1275	0.58	Deleted
10	104.90	159.55	63	54	88	1699	0.92	Deleted
11	124.60	189.31	144	66	107	2113	1.36	Unknown
13	143.35	217.62	-50	67	111	2190	0.11	Deleted
14	152.66	231.69	276	82	131	2729	1.33	Unknown
16	192.23	291.46	62	38	62	933	0.62	Unknown
19	240.98	365.10	1182	70	101	1723	1.49	Unknown
20	258.38	391.39	42	49	80	1180	0.67	Deleted
25	308.82	467.59	-104	48	81	1107	2.38	Deleted
29	401.14	607.03	25	43	70	825	0.45	Deleted
32	480.51	726.94	31	34	56	534	1.39	Deleted
33	485.87	735.03	4	41	67	712	1.83	Deleted
38	727.30	1099.73	161	128	209	491	1.92	1238SEsc
39	754.31	1140.53	46	37	60	564	0.80	Deleted
45	806.39	1219.21	13	31	50	440	0.29	Deleted
53	1102.92	1667.13	12	30	49	389	0.45	Deleted
58	1280.78	1935.79	35	28	45	309	1.67	Deleted
67	1593.11	2407.60	62	15	21	88	1.82	2615DEsc
72	1849.05	2794.21	78	17	24	84	2.79	Unknown
73	2103.85	3179.11	140	18	21	74	2.81	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
80	59.54	91.03	-102N	112	185	4375	1.13	NET< CL PIC
81	122.06	185.47	-34N	66	152	2087	1.18	NET< CL LHRoi
82	133.54	202.81	2N	58	95	1809	1.19	NET< CL RBase
83	145.44	220.79	160N	66	106	2077	1.20	

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
84	264.65	400.86	11N	48	79	1153	1.29	NET< CL LBase
85	320.08	484.59	21N	42	69	892	1.33	NET< CL
86	364.48	551.66	-20N	37	62	699	1.36	NET< CL
87	427.89	647.45	-49N	34	58	617	1.40	NET< CL
88	433.93	656.57	41N	35	57	595	1.41	NET< CL
89	477.59	722.52	-86N	38	65	718	1.44	NET< CL
90	487.03	736.78	94N	35	56	527	1.44	
91	497.08	751.96	-26N	35	59	589	1.45	NET< CL
92	537.32	812.75	-7N	34	56	533	1.48	NET< CL
93	604.70	914.53	58N	124	204	1030	1.52	NET< CL PIC
94	621.84	940.42	-18N	32	54	489	1.54	NET< CL
95	724.18	1095.02	176N	116	189	648	1.61	NET< CL PIC
96	765.79	1157.87	-384N	41	75	815	1.63	NET< CL PIC
97	810.76	1225.80	-49N	27	46	397	1.66	NET< CL
98	834.83	1262.16	26N	34	55	445	1.68	NET< CL PIC
99	884.67	1337.45	-1N	26	42	332	1.71	NET< CL
100	1099.22	1661.54	-98N	28	49	421	1.86	NET< CL
101	1115.52	1686.16	-11N	54	89	693	1.87	NET< CL PIC
102	1691.02	2555.50	-18N	12	22	86	2.25	NET< CL

 SEEKER ANALYSIS SUMMARY
 Environmental Laboratory
 Environmental Gamma Isotopic Analysis

 Sample ID : SOIL/SEDI Duratek Inc

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 05/02/2003 17:42:30
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 1.01E+03 Hrs
 Buildup Time. 0.00E+00 Hrs | Live Time 40000 Sec
 Sample Size 5.40E-01 kg | Real Time 40037 Sec
 Collection Efficiency 1.0000 | Spectrum File 1227305.spc

Detector #: 5
 Energy(keV)= -0.72 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/02/2003
 FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003
 Where En = Sqrt(Energy in keV)

Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5187-13.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	1.30E+03	1.03E+02	< 3.33E+02	1.65E+02	1.00E+00	MEAS +	YES
Pb-212	1.04E+03	1.57E+01	< 2.88E+01	1.41E+01	1.00E+00	MEAS +	YES
AcTh-228	9.55E+02	2.07E+01	< 7.28E+01	3.55E+01	1.00E+00	MEAS +	YES
Ra-226	1.93E+03	1.57E+02	< 4.80E+02	2.37E+02	1.00E+00	MEAS +	YES
Tl-208	9.15E+02	2.07E+01	< 4.92E+01	2.32E+01	1.00E+00	MEAS +	YES
Pb-214	8.44E+02	1.67E+01	< 4.74E+01	2.34E+01	1.00E+00	MEAS +	YES
Annil	2.42E+01	1.51E+01	< 4.96E+01	2.46E+01	9.23E-01	MEAS +	YES
Bi-214	7.28E+02	1.64E+01	< 4.49E+01	2.20E+01	1.00E+00	MEAS +	YES
Cs-137	2.12E+02	8.68E+00	< 2.09E+01	1.02E+01	9.97E-01	MEAS +	YES
Co-60	2.24E+02	6.79E+00	< 1.92E+01	9.30E+00	9.85E-01	MEAS +	YES
K-40	1.25E+04	1.80E+02	< 1.86E+02	8.97E+01	1.00E+00	MEAS +	YES
Bi-212	4.85E+02	1.06E+02	< 4.60E+02	2.17E+02	1.00E+00	MEAS +	YES
Am-241	-5.26E+01	5.79E+01	< 1.92E+02	9.56E+01	1.00E+00	NET	YES
Co-57	-2.63E+00	5.11E+00	< 2.39E+01	1.18E+01	8.97E-01	NET	YES
Ce-144	1.12E+00	3.52E+01	< 1.17E+02	5.78E+01	9.02E-01	NET	YES
Ce-141	4.91E+01	2.02E+01	< 6.59E+01	3.26E+01	4.04E-01	NET	YES
Se-75	1.90E+00	8.30E+00	< 2.77E+01	1.36E+01	7.82E-01	NET	YES
Cr-51	5.62E+01	1.14E+02	< 3.80E+02	1.86E+02	3.46E-01	NET	YES
I-131	-9.49E+01	1.76E+02	< 5.96E+02	2.92E+02	2.57E-02	NET	YES
Sb-125	-1.89E+01	1.33E+01	< 4.57E+01	2.23E+01	9.71E-01	NET	YES
Ag-108m	5.07E+00	4.34E+00	< 1.44E+01	7.02E+00	9.99E-01	NET	YES
Be-7	-1.68E+02	7.55E+01	< 2.61E+02	1.28E+02	5.76E-01	NET	YES
La-140	2.46E+02	9.24E+01	< 2.99E+02	1.46E+02	1.00E-01	NET	YES
Ru-103	-7.55E+00	1.02E+01	< 3.47E+01	1.70E+01	4.73E-01	NET	YES
Ba-140	-3.66E+01	1.73E+02	< 5.86E+02	2.86E+02	1.00E-01	NET	YES
Cs-134	8.48E+00	1.84E+01	< 6.07E+01	3.01E+01	9.62E-01	NET	YES
Ru-106	-2.78E+01	5.03E+01	< 1.71E+02	8.35E+01	9.23E-01	NET	YES
Zr-95	9.95E+01	6.55E+01	< 2.16E+02	1.07E+02	6.32E-01	NET	YES
Nb-95	-1.44E+02	1.55E+01	< 5.75E+01	2.82E+01	4.32E-01	NET	YES
Co-58	-1.26E+01	7.00E+00	< 2.45E+01	1.19E+01	6.60E-01	NET	YES
Mn-54	4.84E+00	6.34E+00	< 2.11E+01	1.03E+01	9.10E-01	NET	YES
Ag-110m	-2.76E-01	7.11E+00	< 2.42E+01	1.17E+01	8.89E-01	NET	YES
Fe-59	-6.89E+01	1.99E+01	< 7.13E+01	3.47E+01	5.17E-01	NET	YES
Zn-65	-5.14E+00	2.50E+01	< 8.37E+01	4.12E+01	8.87E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	-1.64E+01	1.13E+01	< 4.19E+01	1.97E+01	6.13E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-14 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-14
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 540.3 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/21/03 1040 Det No.: 6 Spectrum No.: 1114406
Counted by: gh
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-14 Product : GAMMA SPECTROMETRY
Client Id : BMS-AO300-14 Matrix : S001 Soil
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	540.3		
Sample Weight-Dry	g			
Aliquot Weight	g	540.3		
FINAL WEIGHT	kg	.5403		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-14 analyzed by emml461 on 04/23/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-14 ✓

Sample ID: NONE

Code: 1114406

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:39:43
Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.43E+002 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 16972 Sec
Sample Size 5.40E-001 kg | Real Time 16993 Sec
Collection Efficiency 1.0000 | Spc. File 1114406.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV)= 0.13 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.50 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.38	95.57	327	53	82	1255	1.11	
2	74.97	113.09	843	65	95	1546	1.44	a
3	77.23	116.51	1151	56	74	1104	1.06	b
4	87.41	131.88	373	48	73	1078	0.99	a HiResid
5	90.05	135.88	250	41	62	862	0.92	b HiResid
6	93.02	140.36	864	59	84	1293	1.22	c HiResid
7	128.71	194.29	121	52	84	1192	1.12	
8	143.75	217.02	92	55	90	1273	1.17	
9	186.04	280.92	722	54	76	993	1.30	
10	209.46	316.30	169	47	74	937	0.88	
11	238.76	360.58	2508	61	57	603	1.19	a
12	241.77	365.13	511	45	64	704	1.53	b
13	270.31	408.26	215	37	56	540	1.47	
14	277.41	418.98	113	37	58	567	1.63	
15	295.30	446.01	844	40	46	397	1.32	a
16	300.37	453.67	188	31	46	397	1.30	b
17	327.55	494.74	101	33	51	452	1.41	a
18	328.56	496.27	48	22	34	258	0.76	b
19	338.41	511.16	520	38	50	430	1.31	
20	352.07	531.79	1445	48	47	376	1.38	
21	409.35	618.35	86	33	52	393	1.81	
22	462.84	699.17	188	32	47	326	1.80	
23	511.04	772.00	722	39	47	332	2.19	Wide Pk
24	583.31	881.21	958	39	40	238	1.76	
25	609.45	920.70	1117	42	41	246	1.64	
26	661.60	999.51	103	24	35	227	1.67	
27	727.63	1099.28	169	28	40	250	1.56	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	768.63	1161.24	65	25	38	258	1.45	
29	795.23	1201.43	82	23	34	192	1.17	
30	860.87	1300.61	113	23	34	177	2.51	Wide Pk
31	911.41	1376.99	678	33	32	162	1.88	
32	933.83	1410.85	56	23	36	189	1.64	
33	964.74	1457.56	112	18	25	114	1.75	a
34	969.20	1464.30	381	25	25	114	1.79	b
35	1120.26	1692.56	233	26	35	186	1.76	
36	1238.66	1871.47	84	25	38	244	1.71	
37	1377.94	2081.92	53	16	24	96	4.71	Wide Pk
38	1461.11	2207.61	2865	55	21	73	2.31	
39	1730.34	2614.41	52	12	16	43	2.06	
40	1764.81	2666.51	209	18	18	55	2.33	
41	1848.29	2792.64	25	11	16	38	1.20	
42	2204.66	3331.13	46	11	15	33	2.67	
43	2614.83	3950.93	410	21	9	14	3.07	

L5187-14 analyzed by emml461 on 04/23/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.38	327	53	82	118	54	87	
2	74.97	843	65	95	803	65	96	
3	77.23	1151	56	74	1120	57	75	
4	87.41	373	48	73	350	49	74	
5	90.05	250	41	62	222	42	64	
6	93.02	864	59	84	367	59	92	
8	143.75	92	55	90	35	56	91	NET<CL
9	186.04	722	54	76	443	54	82	
11	238.76	2508	61	57	2424	61	60	
12	241.77	511	45	64	496	45	65	
13	270.31	215	37	56	202	38	57	
14	277.41	113	37	58	104	37	59	
15	295.30	844	40	46	809	41	48	
19	338.41	520	38	50	508	38	51	
20	352.07	1445	48	47	1400	48	49	
23	511.04	723	39	47	325	40	59	
24	583.31	959	39	40	924	40	42	
25	609.45	1117	42	41	1075	42	43	
27	727.63	169	28	40	161	28	41	
28	768.63	65	25	38	52	25	39	
31	911.41	678	33	32	657	33	34	
34	969.20	381	25	25	375	25	26	
35	1120.26	233	26	35	226	27	36	
36	1238.66	84	25	38	79	25	39	
38	1461.11	2865	55	21	2825	55	24	
40	1764.81	209	18	18	202	18	19	
43	2614.83	410	21	9	381	21	13	

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LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
25	609.45	1075	Bi-214	1090	10 of 33	93.41	1.43	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.50	
26	661.60	103	Cs-137	. . . . .	1 of 1	100.00	1.50	
27	727.63	161	Bi-212	5419	2 of 13	81.27	1.31	
			Te-129m	. . . . .	1 of 2	18.72	0.19	LowScore
28	768.63	52	Bi-214	101	10 of 33	100.00	1.50	
29	795.23	83	AcTh-228	117	12 of 36	92.79	1.43	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
30	860.87	113	Tl-208	105	6 of 9	100.00	1.50	
31	911.41	657	AcTh-228	627	12 of 36	88.02	1.38	
32	933.83	56	Bi-214	56	10 of 33	93.41	1.43	
33	964.74	112	AcTh-228	116	12 of 36	88.80	1.39	
34	969.20	375	AcTh-228	365	12 of 36	88.80	1.39	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
35	1120.26	226	Bi-214	235	10 of 33	94.39	1.44	
36	1238.66	79	Bi-214	86	10 of 33	94.39	1.44	
37	1377.94	53	Bi-214	56	10 of 33	94.39	1.44	
38	1461.11	2825	K-40	. . . . .	1 of 1	100.00	1.50	
39	1730.34	52	Bi-214	34	10 of 33	86.86	1.37	
40	1764.81	202	Bi-214	178	10 of 33	91.22	1.41	
41	1848.29	25	Bi-214	23	10 of 33	92.13	1.42	
42	2204.66	46	Bi-214	49	10 of 33	94.39	1.44	
43	2614.83	381	Tl-208	407	6 of 9	100.00	1.50	

L5187-14 analyzed by emml461 on 04/23/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-14

Sample ID: NONE

Code: 1114406

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:39:43
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.43e+002 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 16972 Sec
 Sample Size 5.40e-001 kg | Real Time 16993 Sec
 Collection Efficiency 1.0000 | Spectrum File 1114406.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)
 Eff.=1/[8.71E-03*En^-3.34E+00 + 1.54E+02*En^6.70E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 =====

MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes
Th-234	Average:x	1.11E+03 +- 1.69E+02	. . . . .		*
	63.29	1.03E+03 +- 4.71E+02	1.54E+03		+
	92.59	1.12E+03 +- 1.82E+02	5.74E+02		++
Pb-212	Average:x	9.65E+02 +- 2.41E+01	. . . . .		*
	74.81	I.D. . . . .	. . . . .	
	77.12	I.D. . . . .	. . . . .	
	87.30	I.D. . . . .	. . . . .	
	238.63	9.63E+02 +- 2.43E+01	4.85E+01		++
	300.09	1.13E+03 +- 1.88E+02	5.72E+02		++
Pb-214	Average:x	8.69E+02 +- 2.36E+01	. . . . .		*
	77.11	I.D. . . . .	. . . . .	
	241.98	1.18E+03 +- 1.08E+02	3.17E+02		++
	295.21	8.53E+02 +- 4.31E+01	1.05E+02		++
	351.92	8.54E+02 +- 2.92E+01	6.14E+01		++
AcTh-228	Average:x	9.77E+02 +- 3.18E+01	. . . . .		*
	129.08	6.01E+02 +- 2.59E+02	8.47E+02		+
	209.28	6.32E+02 +- 1.75E+02	5.64E+02		++
	270.23	1.08E+03 +- 2.00E+02	6.22E+02		++
	327.64	6.86E+02 +- 2.22E+02	7.15E+02		++
	338.32	9.86E+02 +- 7.47E+01	2.04E+02		++
	409.51	1.01E+03 +- 3.85E+02	1.25E+03		+
	463.00	1.16E+03 +- 1.96E+02	5.97E+02		++
	794.70	7.00E+02 +- 1.93E+02	6.04E+02		++
	911.07	1.01E+03 +- 5.06E+01	1.08E+02		++
	964.60	9.58E+02 +- 1.58E+02	4.48E+02		++
	969.11	1.01E+03 +- 6.68E+01	1.45E+02		++
Ce-141	145.44 N	1.97E+01 +- 3.14E+01	1.04E+02		x

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes
	ENERGY	E				
	(keV)					
Ra-226	186.22		2.09E+03 +- 2.56E+02	7.88E+02		+
Tl-208	Average:x		9.51E+02 +- 3.17E+01	. . . . .		*
	277.35		8.29E+02 +- 2.96E+02	9.57E+02		+
	510.84	I.D.	. . . . .	. . . . .
	583.14		9.70E+02 +- 4.16E+01	9.08E+01		+
	860.37		1.03E+03 +- 2.12E+02	6.45E+02		+
	2614.66		9.23E+02 +- 5.11E+01	7.07E+01		+
Bi-212	Average:x		5.07E+02 +- 8.66E+01	. . . . .		*
	327.96		7.97E+03 +- 3.64E+03	1.18E+04		+
	727.17		5.03E+02 +- 8.66E+01	2.62E+02		+
Annul	511.00		2.18E+01 +- 2.15E+01	7.12E+01		+
Bi-214	Average:x		7.61E+02 +- 2.52E+01	. . . . .		*
	609.31		7.58E+02 +- 2.96E+01	6.25E+01		+
	768.36		3.93E+02 +- 1.90E+02	6.18E+02		+
	934.06		7.58E+02 +- 3.11E+02	1.01E+03		+
	1120.29		7.36E+02 +- 8.63E+01	2.43E+02		+
	1238.11		6.97E+02 +- 2.21E+02	7.05E+02		+
	1377.67		7.27E+02 +- 2.23E+02	6.93E+02		+
	1729.59		1.15E+03 +- 2.72E+02	7.82E+02		+
	1764.49		8.51E+02 +- 7.76E+01	1.74E+02		+
	1847.42		8.28E+02 +- 3.54E+02	1.12E+03		+
	2204.22		7.14E+02 +- 1.76E+02	5.05E+02		+
Cs-137	661.65		4.18E+01 +- 9.58E+00	2.96E+01		+
K-40	1460.81		1.55E+04 +- 3.03E+02	2.81E+02		+
Am-241	59.54	N	1.87E+01 +- 4.42E+01	1.47E+02l		x lbase
Co-57	122.06	N	3.96E+00 +- 6.89E+00	2.30E+01		x
Ce-144	133.54	N	5.11E+00 +- 5.38E+01	1.81E+02r		x rbase
Se-75	264.65	N	2.65E+00 +- 1.15E+01	3.86E+01l		x lbase
Cr-51	320.08	N	7.07E+01 +- 1.30E+02	4.37E+02		x
I-131	364.48	N	4.15E+01 +- 1.05E+02	3.58E+02		x
Sb-125	427.89	N	1.02E+01 +- 2.04E+01	6.87E+01		x
Ag-108m	433.93	N	1.74E+00 +- 6.33E+00	2.15E+01		x
Be-7	477.59	N	9.56E+01 +- 8.67E+01	2.89E+02		x
La-140	487.03	N	6.64E+00 +- 6.85E+01	2.34E+02		x
Ru-103	497.08	N	1.96E+01 +- 1.30E+01	4.55E+01		x
Ba-140	537.32	N	3.99E+02 +- 1.48E+02	5.31E+02		x
Cs-134	604.70	N	2.32E+01 +- 7.80E+00	2.82E+01l		x lbase
Ru-106	621.84	N	2.98E+00 +- 7.35E+01	2.52E+02		x
Zr-95	724.18	N	6.16E+03 +- 2.06E+03	6.79E+03P		x PIC
Nb-95	765.79	N	5.60E+00 +- 2.10E+01	7.12E+01P		x PIC
Co-58	810.76	N	4.85E+00 +- 9.00E+00	3.15E+01		x
Mn-54	834.83	N	1.30E+01 +- 8.24E+00	2.94E+01		x
Ag-110m	884.67	N	1.38E+01 +- 1.08E+01	3.60E+01		x
Fe-59	1099.22	N	1.77E+01 +- 2.44E+01	8.55E+01		x
Zn-65	1115.52	N	2.59E+01 +- 3.70E+01	1.26E+02P		x PIC
Co-60	1332.49	N	3.90E+00 +- 8.32E+00	2.93E+01		x
Sb-124	1691.02	N	3.77E+00 +- 1.46E+01	5.24E+01		x

MEASURED TOTAL: 2.38E+04 +- 9.82E+02 pCi/kg

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
5	90.05	135.88	222	42	64	862	0.92	Unknown

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
8	143.75	217.02	35N	56	91	1273	1.17	NET< CL
46	59.54	89.77	17N	41	67	902	1.13	NET< CL LBase
47	122.06	184.24	22N	39	63	812	1.12	NET< CL
48	133.54	201.59	-4N	39	64	817	1.13	NET< CL RBase
49	264.65	399.70	7N	30	50	457	1.21	NET< CL LBase
50	320.08	483.46	15N	28	45	374	1.25	NET< CL
51	364.48	550.55	-10N	25	42	323	1.29	NET< CL
52	427.89	646.36	11N	23	37	245	1.35	NET< CL
53	433.93	655.49	6N	22	36	236	1.35	NET< CL
54	477.59	721.46	24N	22	35	225	1.40	NET< CL
55	487.03	735.73	2N	21	34	212	1.40	NET< CL
56	497.08	750.91	-36N	23	40	270	1.41	NET< CL
57	537.32	811.72	-62N	23	40	263	1.45	NET< CL
58	604.70	913.53	-68N	23	40	271	1.51	NET< CL LBase
59	621.84	939.43	-1N	21	34	195	1.53	NET< CL
60	724.18	1094.07	-5251N	1757	2893	319	1.62	NET< CL PIC
61	765.79	1156.94	-8N	30	49	314	1.66	NET< CL PIC
62	810.76	1224.90	-9N	17	28	144	1.70	NET< CL
63	834.83	1261.27	-30N	19	33	197	1.72	NET< CL
64	884.67	1336.58	22N	17	27	137	1.76	NET< CL
65	1099.22	1660.77	-13N	18	29	151	1.92	NET< CL
66	1115.52	1685.40	-25N	35	58	295	1.93	NET< CL PIC
67	1332.49	2013.25	-7N	15	25	115	2.08	NET< CL
68	1691.02	2555.01	2N	8	13	29	2.26	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : NONE

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Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/21/2003 10:39:43
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. . . . . 7.43E+02 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 16972 Sec
Sample Size . . . . . 5.40E-01 kg | Real Time . . . . . 16993 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1114406.spc
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Detector #: 6

Energy(keV)= 0.13 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/18/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[8.71e-03*En^-3.34e+00 + 1.54e+02*En^ 6.70e-01] 02/06/1998

Library File: SOILA.LIB LSF File: NONE

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
Th-234	1.11E+03	1.69E+02	< 5.74E+02	2.83E+02	1.00E+00	MEAS +
Pb-212	9.65E+02	2.41E+01	< 4.85E+01	2.37E+01	1.00E+00	MEAS +
Pb-214	8.69E+02	2.36E+01	< 6.14E+01	2.99E+01	1.00E+00	MEAS +
AcTh-228	9.77E+02	3.18E+01	< 1.08E+02	5.18E+01	9.99E-01	MEAS +
Ce-141	1.97E+01	3.14E+01	< 1.04E+02	5.14E+01	5.16E-01	NET
Ra-226	2.09E+03	2.56E+02	< 7.88E+02	3.88E+02	1.00E+00	MEAS +
Tl-208	9.51E+02	3.17E+01	< 7.07E+01	3.21E+01	9.99E-01	MEAS +
Bi-212	5.07E+02	8.66E+01	< 2.62E+02	1.27E+02	9.99E-01	MEAS +
Annil	2.18E+01	2.15E+01	< 7.12E+01	3.52E+01	9.43E-01	MEAS +
Bi-214	7.61E+02	2.52E+01	< 6.25E+01	3.03E+01	1.00E+00	MEAS +
Cs-137	4.18E+01	9.58E+00	< 2.96E+01	1.42E+01	9.98E-01	MEAS +
K-40	1.55E+04	3.03E+02	< 2.81E+02	1.33E+02	1.00E+00	MEAS +
Am-241	1.87E+01	4.42E+01	< 1.47E+02	7.23E+01	1.00E+00	NET
Co-57	3.96E+00	6.89E+00	< 2.30E+01	1.13E+01	9.24E-01	NET
Ce-144	-5.11E+00	5.38E+01	< 1.81E+02	8.87E+01	9.27E-01	NET
Se-75	2.64E+00	1.15E+01	< 3.86E+01	1.88E+01	8.36E-01	NET
Cr-51	7.07E+01	1.30E+02	< 4.37E+02	2.12E+02	4.60E-01	NET
I-131	-4.15E+01	1.05E+02	< 3.58E+02	1.74E+02	6.89E-02	NET
Sb-125	1.02E+01	2.04E+01	< 6.87E+01	3.32E+01	9.79E-01	NET
Ag-108m	1.74E+00	6.34E+00	< 2.15E+01	1.04E+01	9.99E-01	NET
Be-7	9.56E+01	8.67E+01	< 2.89E+02	1.39E+02	6.69E-01	NET
La-140	6.64E+00	6.85E+01	< 2.34E+02	1.12E+02	1.86E-01	NET
Ru-103	-1.96E+01	1.29E+01	< 4.55E+01	2.20E+01	5.79E-01	NET
Ba-140	-3.99E+02	1.48E+02	< 5.31E+02	2.57E+02	1.86E-01	NET
Cs-134	-2.32E+01	7.80E+00	< 2.82E+01	1.36E+01	9.72E-01	NET
Ru-106	-2.98E+00	7.35E+01	< 2.52E+02	1.21E+02	9.43E-01	NET
Zr-95	-6.16E+03	2.06E+03	< 6.79E+03	3.39E+03	7.15E-01	NET
Nb-95	-5.60E+00	2.10E+01	< 7.12E+01	3.47E+01	5.41E-01	NET
Co-58	-4.85E+00	9.00E+00	< 3.15E+01	1.50E+01	7.38E-01	NET
Mn-54	-1.30E+01	8.24E+00	< 2.94E+01	1.41E+01	9.33E-01	NET
Ag-110m	1.38E+01	1.08E+01	< 3.60E+01	1.71E+01	9.18E-01	NET
Fe-59	-1.77E+01	2.44E+01	< 8.55E+01	4.09E+01	6.18E-01	NET
Zn-65	-2.59E+01	3.70E+01	< 1.26E+02	6.14E+01	9.16E-01	NET

L5187-14 analyzed by emml461 on 04/23/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG
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Co-60	-3.90E+00	8.32E+00	< 2.93E+01	1.39E+01	9.89E-01	NET
Sb-124	3.77E+00	1.46E+01	< 5.24E+01	2.36E+01	7.00E-01	NET

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-15 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-15
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____
Work Group ID: WG5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: Ca23-1 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/23/03 1636 Det No.: 6 Spectrum No.: 1136406
Counted by: Q
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-15
Client Id : BMS-AO300-15
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	623.1		
Sample Weight-Dry	g			
Aliquot Weight	g	623.1		
FINAL WEIGHT	kg	.6231		
Container			WTS5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-15 analyzed by emml461 on 04/25/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5187-15

Sample ID: SOIL/SEDI Duratek Inc

Code: 1136906

 Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:36:29
 Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.97E+002 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time 17000 Sec
 Sample Size 6.23E-001 kg | Real Time 17022 Sec
 Collection Efficiency 1.0000 | Spc. File 1136906.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Energy(keV) = $-0.07 + 0.662 \cdot \text{Ch} + 0.00\text{E}+00 \cdot \text{Ch}^2 + 0.00\text{E}+00 \cdot \text{Ch}^3$ 04/23/2003
 FWHM(keV) = $1.40 + -0.060 \cdot \text{En} + 3.59\text{E}-03 \cdot \text{En}^2 + -3.97\text{E}-05 \cdot \text{En}^3$ 03/04/2003
 Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	51.20	77.47	-15749	710	1187	17948	312.39	NET< CL Wide Pk
2	63.06	95.38	124	69	113	2013	0.65	
3	74.72	113.01	528	55	82	1346	1.12	a
4	77.05	116.53	886	64	93	1615	1.23	b
5	84.27	127.44	228	57	90	1489	1.35	a HiResid
6	87.01	131.58	356	58	90	1489	1.31	b HiResid
7	92.60	140.03	894	68	101	1737	1.42	c HiResid
8	99.34	150.20	37	34	55	744	0.56	d NET< CL HiResid
9	110.20	166.61	25	60	99	1657	0.36	NET< CL
10	124.04	187.53	25	47	78	1217	1.08	a NET< CL
11	127.47	192.71	12	47	78	1217	1.04	b NET< CL
12	129.01	195.03	10	33	54	730	0.56	c NET< CL
13	143.24	216.53	170	66	106	1793	1.49	
14	185.72	280.72	522	68	105	1756	1.30	
15	209.23	316.24	150	69	113	1872	0.80	
16	238.55	360.54	2138	65	74	1018	1.24	a
17	241.38	364.83	393	49	74	1018	1.19	b
18	269.84	407.83	150	52	83	1099	1.48	
19	277.67	419.67	15	45	74	931	0.22	NET< CL
20	295.06	445.93	655	43	56	635	1.10	a
21	299.83	453.14	159	46	72	889	1.59	b
22	328.22	496.04	32	43	70	842	0.47	NET< CL
23	338.30	511.26	466	50	74	856	1.46	
24	351.80	531.66	954	54	74	863	1.31	
25	426.79	644.98	35	52	84	988	0.94	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
26	443.33	669.96	50	27	43	405	0.83	a
27	446.65	674.98	45	27	43	405	0.91	b
28	463.00	699.69	101	45	72	812	1.40	
29	510.85	772.00	626	46	63	590	2.22	Wide Pk
30	583.17	881.27	734	42	53	418	1.66	
31	609.32	920.78	914	45	54	438	1.52	
32	661.64	999.83	10628	107	46	363	1.58	
33	727.24	1098.95	146	27	40	284	1.26	
34	767.89	1160.37	37	28	45	340	1.01	NET< CL
35	794.58	1200.71	114	33	52	360	2.26	
36	860.64	1300.52	47	26	41	274	1.24	
37	911.20	1376.91	542	35	43	287	2.07	
38	964.99	1458.19	57	16	24	128	1.09	a
39	969.06	1464.35	304	27	33	204	1.75	b
40	1000.67	1512.10	40	25	40	243	1.24	
41	1119.96	1692.35	192	28	40	253	2.17	
42	1173.38	1773.06	1584	47	41	258	2.06	
43	1237.90	1870.55	68	23	36	215	2.33	
44	1332.65	2013.72	1391	41	26	115	2.03	
45	1378.05	2082.33	32	16	25	103	1.53	
46	1407.96	2127.51	9	14	22	85	0.76	NET< CL
47	1460.97	2207.61	3013	57	24	90	2.15	
48	1509.47	2280.90	25	12	19	53	1.68	
49	1588.26	2399.95	18	12	19	69	0.87	NET< CL
50	1729.81	2613.83	17	11	16	44	4.50	Wide Pk
51	1764.60	2666.40	170	16	15	37	2.16	
52	1847.65	2791.89	32	9	12	25	1.83	
53	2204.15	3330.55	62	11	12	22	2.66	
54	2614.87	3951.15	301	18	9	14	3.53	Wide Pk

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	63.06	124	69	113	-85	70	116	NET<CL
3	74.72	528	55	82	488	55	83	
4	77.05	886	64	93	855	64	94	
5	84.27	228	57	90	164	57	92	
6	87.01	356	58	90	332	58	90	
7	92.60	894	68	101	396	69	108	
8	99.34	37	34	55	18	34	56	NET<CL
9	110.20	25	60	99	-9	61	100	NET<CL
13	143.24	170	66	106	113	66	107	
14	185.72	522	68	105	242	68	110	
16	238.55	2138	65	74	2055	65	76	
17	241.38	393	49	74	378	49	75	
18	269.84	150	52	83	138	52	84	
19	277.67	15	45	74	6	45	75	NET<CL
20	295.06	655	43	56	621	43	58	
23	338.30	466	50	74	454	50	74	
24	351.80	954	54	74	909	55	75	
29	510.85	627	46	63	228	46	72	
30	583.17	735	42	53	700	42	55	
31	609.32	914	45	54	872	45	56	
33	727.24	147	27	40	139	28	41	
37	911.20	542	35	43	521	35	44	
39	969.06	304	27	33	298	27	34	
40	1000.67	40	25	40	14	25	41	NET<CL
41	1119.96	192	28	40	185	28	41	
43	1237.90	68	23	36	63	23	36	
47	1460.97	3013	57	24	2973	57	26	
51	1764.60	170	16	15	162	16	16	
54	2614.87	301	18	9	272	18	13	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.55 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.72	488	Pb-212	381	5 of 6	100.00	1.50	
			Pb-214	163	5 of 7	98.65	0.99	
			Tl-208	37	6 of 9	95.51	0.96	
4	77.05	168	Pb-214	294	5 of 7	98.65	0.99	Split
57	77.05	687	Pb-212	687	5 of 6	100.00	1.50	AutoAdd
5	84.27	164	Tl-208	21	6 of 9	95.51	1.46	
6	87.01	332	Pb-212	381	5 of 6	100.00	1.50	
7	92.60	228	Th-234	. . . . .	1 of 2	58.74	0.59	Split
56	92.60	168	AcTh-228	168	9 of 36	76.17	0.76	AutoAdd
13	143.24	113	U-235	52	2 of 3	100.00	1.50	
			Fe-59	. . . . .	1 of 4	0.99	0.51	LowScore
14	185.72	242	U-235	529	2 of 3	100.00	1.50	
			Ra-226	. . . . .	1 of 1	100.00	1.50	
15	209.23	150	AcTh-228	211	9 of 36	87.75	1.38	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
16	238.55	2055	Pb-212	2444	5 of 6	100.00	1.50	
17	241.38	378	Pb-214	247	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
18	269.84	138	AcTh-228	148	9 of 36	84.36	1.34	
20	295.06	621	Pb-214	550	5 of 7	100.00	1.50	
21	299.83	159	Pb-212	140	5 of 6	100.00	1.50	
23	338.30	454	AcTh-228	397	9 of 36	82.86	1.33	
24	351.80	909	Pb-214	1125	5 of 7	100.00	1.50	
26	443.33	50	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
27	446.65	45	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Ag-110m	. . . . .	1 of 15	1.16	0.51	LowScore
28	463.00	101	AcTh-228	128	9 of 36	87.75	1.38	
			Sb-125	. . . . .	1 of 8	13.67	0.64	
29	510.85	43	Annul	. . . . .	1 of 1	100.00	1.50	Split
55	510.85	185	Tl-208	185	6 of 9	97.04	1.47	AutoAdd
30	583.17	700	Tl-208	634	6 of 9	97.04	1.47	
31	609.32	872	Bi-214	939	9 of 33	89.00	1.39	
			1120SEsc	. . . . .	0 of 0	. . . . .	0.55	
32	661.64	10628	Cs-137	. . . . .	1 of 1	100.00	1.50	
			1173SEsc	. . . . .	0 of 0	. . . . .	0.55	
33	727.24	139	Bi-212	. . . . .	1 of 13	81.10	0.81	
35	794.58	114	AcTh-228	92	9 of 36	82.86	1.33	
36	860.64	47	Tl-208	76	6 of 9	100.00	1.50	
37	911.20	521	AcTh-228	499	9 of 36	82.86	1.33	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
38	964.99	57	AcTh-228	95	9 of 36	89.55	1.40	
39	969.06	298	AcTh-228	291	9 of 36	82.86	1.33	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
41	1119.96	185	Bi-214	195	9 of 33	89.00	1.39	
42	1173.38	1584	Co-60	1515	2 of 2	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.17	LowScore
43	1237.90	63	Bi-214	71	9 of 33	90.26	1.40	
44	1332.65	1391	Co-60	1454	2 of 2	100.00	1.50	
45	1378.05	32	Bi-214	46	9 of 33	95.18	1.45	
47	1460.97	2973	K-40	. . . . .	1 of 1	100.00	1.50	
48	1509.47	25	Bi-214	23	9 of 33	88.08	1.38	
50	1729.81	17	Bi-214	29	9 of 33	95.18	1.45	
51	1764.60	162	Bi-214	147	9 of 33	88.08	1.38	
52	1847.65	32	Bi-214	19	9 of 33	83.83	1.34	
53	2204.15	62	Bi-214	40	9 of 33	85.05	1.35	
54	2614.87	272	Tl-208	303	6 of 9	97.04	1.47	

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-15

Sample ID: SOIL/SEDI Duratek Inc

Code: 1136906

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Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:36:29
Sampling Stop: 03/21/2003 12:00:00 | Decay Time: . . . . . 7.97e+002 Hrs
Buildup Time: . . . . . 0.00e+000 Hrs | Live Time . . . . . 17000 Sec
Sample Size . . . . . 6.23e-001 kg | Real Time . . . . . 17022 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1136906.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Efficiency File: WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[8.71E-03*En^-3.34E+00 + 1.54E+02*En^6.70E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File: L5187-15.LSF (SOIL/SEDI: Duratek Inc)

MEASURED or MDA CONCENTRATIONS

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              N
      ENERGY E   Concentration
Nuclide   (keV)   (pCi/kg)   )   MDA   Flags   Notes   MDC
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Pb-212   Average:x 7.08E+02 +- 2.22E+01   . . . .   *   . . . .
          74.81     I.D.       . . . .   . . . .   . . . .
          77.12     I.D.       . . . .   . . . .   . . . .
          87.30     I.D.       . . . .   . . . .   . . . .
          238.63    7.07E+02 +- 2.23E+01   5.35E+01   +*   . . . .
          300.09    8.24E+02 +- 2.37E+02   7.64E+02   +*   . . . .
Pb-214   Average:x 5.23E+02 +- 2.27E+01   . . . .   *   . . . .
          77.11     I.D.       . . . .   . . . .   . . . .
          241.98    7.80E+02 +- 1.02E+02   3.15E+02   +*   . . . .
          295.21    5.66E+02 +- 3.92E+01   1.08E+02   +*   . . . .
          351.92    4.79E+02 +- 2.89E+01   8.07E+01   +*   . . . .
Tl-208   Average:x 5.98E+02 +- 2.69E+01   . . . .   *   . . . .
          84.90     I.D.       . . . .   . . . .   . . . .
          510.84    I.D.       . . . .   . . . .   . . . .
          583.14    6.34E+02 +- 3.84E+01   1.01E+02   +*   . . . .
          860.37    3.75E+02 +- 2.04E+02   6.69E+02   +   . . . .
          2614.66    5.69E+02 +- 3.84E+01   6.11E+01   +*   . . . .
Th-234   92.59     6.04E+02 +- 3.16E+02   1.04E+03   +   . . . .
U-235    Average:x 6.32E+01 +- 1.65E+01   . . . .   *   . . . .
          143.76    1.31E+02 +- 7.68E+01   2.53E+02   +   . . . .
          185.72    5.99E+01 +- 1.69E+01   5.50E+01   +*   . . . .
AcTh-228 Average:x 6.78E+02 +- 3.17E+01   . . . .   *   . . . .
          209.28    4.84E+02 +- 2.24E+02   7.35E+02   +   . . . .
          270.23    6.32E+02 +- 2.40E+02   7.83E+02   +   . . . .
          338.32    7.61E+02 +- 8.36E+01   2.53E+02   +*   . . . .
          463.00    5.39E+02 +- 2.39E+02   7.79E+02   +   . . . .
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MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY	E					
	(keV)						
	794.70		8.32E+02 +- 2.44E+02	7.79E+02		++	. . . . .
	911.07		6.95E+02 +- 4.69E+01	1.21E+02		++	. . . . .
	964.60		4.20E+02 +- 1.20E+02	3.69E+02		++	. . . . .
	969.11		6.91E+02 +- 6.23E+01	1.63E+02		++	. . . . .
	93.35		I.D.	. . . . .			. . . . .
Annul	511.00		1.15E+01 +- 2.16E+01	7.17E+01		+	. . . . .
Bi-214	Average:x		5.45E+02 +- 2.28E+01	. . . . .		*	. . . . .
	609.31		5.32E+02 +- 2.75E+01	7.01E+01		++	. . . . .
	1120.29		5.21E+02 +- 7.95E+01	2.37E+02		++	. . . . .
	1238.11		4.79E+02 +- 1.79E+02	5.74E+02		+	. . . . .
	1377.67		3.83E+02 +- 1.94E+02	6.32E+02		+	. . . . .
	1509.23		5.79E+02 +- 2.88E+02	9.31E+02		+	. . . . .
	1729.59		3.17E+02 +- 2.04E+02	6.74E+02		+	. . . . .
	1764.49		5.91E+02 +- 5.83E+01	1.26E+02		++	. . . . .
	1847.42		9.03E+02 +- 2.65E+02	7.73E+02		++	. . . . .
	2204.22		8.26E+02 +- 1.44E+02	3.60E+02		++	. . . . .
Cs-137	661.65		3.74E+03 +- 3.75E+01	3.31E+01		++	. . . . .
Bi-212	727.17		3.74E+02 +- 7.41E+01	2.28E+02		++	. . . . .
Co-60	Average:x		6.86E+02 +- 1.43E+01	. . . . .		*	. . . . .
	1173.22		7.02E+02 +- 2.08E+01	3.74E+01		++	. . . . .
	1332.49		6.72E+02 +- 1.96E+01	2.66E+01		++	. . . . .
K-40	1460.81		1.41E+04 +- 2.70E+02	2.63E+02		++	. . . . .
Am-241	59.54	N	5.14E+01 +- 6.97E+01	2.30E+02L		x LHROI	. . . . .
Co-57	122.06	N	1.17E+01 +- 7.07E+00	2.41E+01		x	. . . . .
Ce-144	133.54	N	3.42E+01 +- 5.66E+01	1.91E+02		x	. . . . .
Ce-141	145.44	N	8.16E+01 +- 3.77E+01	1.24E+02P		x PIC	. . . . .
Ra-226	186.22	N	2.27E+03 +- 2.06E+02	6.09E+02		x*	. . . . .
Se-75	264.65	N	2.22E+01 +- 1.36E+01	4.66E+01L		x lbase	. . . . .
Cr-51	320.08	N	3.89E+01 +- 1.58E+02	5.28E+02		x	. . . . .
I-131	364.48	N	2.70E+02 +- 1.57E+02	5.39E+02		x	. . . . .
Sb-125	427.89	N	2.10E+01 +- 2.74E+01	9.14E+01		x	. . . . .
Ag-108m	433.93	N	1.15E+01 +- 8.69E+00	2.98E+01		x	. . . . .
Be-7	477.59	N	4.62E+01 +- 1.19E+02	4.04E+02		x	. . . . .
La-140	487.03	N	1.62E+02 +- 9.54E+01	3.13E+02		x	. . . . .
Ru-103	497.08	N	7.56E+00 +- 1.61E+01	5.48E+01		x	. . . . .
Ba-140	537.32	N	3.70E+02 +- 1.85E+02	6.46E+02		x	. . . . .
Cs-134	604.70	N	3.47E+00 +- 8.35E+00	2.81E+01L		x lbase	. . . . .
Ru-106	621.84	N	1.54E+02 +- 7.94E+01	2.60E+02		x	. . . . .
Zr-95	724.18	N	2.71E+01 +- 3.46E+01	1.19E+02L		x LHROI	. . . . .
Nb-95	765.79	N	1.94E+01 +- 1.54E+01	5.36E+01		x	. . . . .
Co-58	810.76	N	1.76E+01 +- 1.00E+01	3.57E+01		x	. . . . .
Mn-54	834.83	N	4.13E+00 +- 7.98E+00	2.69E+01		x	. . . . .
Ag-110m	884.67	N	1.92E+01 +- 1.08E+01	3.84E+01		x	. . . . .
Fe-59	1099.22	N	5.04E+01 +- 2.63E+01	9.38E+01		x	. . . . .
Zn-65	1115.52	N	1.27E+01 +- 3.55E+01	1.20E+02P		x PIC	. . . . .
Sb-124	1691.02	N	8.38E+00 +- 1.33E+01	5.00E+01		x	. . . . .

MEASURED TOTAL: 2.49E+04 +- 1.08E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	51.20	77.47	-15749	710	1187	17948	312.39	Deleted
2	63.06	95.38	-85	70	116	2013	0.65	Deleted
8	99.34	150.20	18	34	56	745	0.56	Deleted
9	110.20	166.61	-9	61	100	1657	0.36	Deleted
10	124.04	187.53	25	47	78	1217	1.08	Deleted
11	127.47	192.71	12	47	78	1217	1.04	Deleted
12	129.01	195.03	10	33	54	730	0.56	Deleted
19	277.67	419.67	6	45	75	931	0.22	Deleted
22	328.22	496.04	32	43	70	842	0.47	Deleted
25	426.79	644.98	35	52	84	988	0.94	Deleted
26	443.33	669.96	50	27	43	405	0.83	Unknown
27	446.65	674.98	45	27	43	405	0.92	Unknown
34	767.89	1160.37	37	28	46	340	1.01	Deleted
40	1000.67	1512.10	14	25	41	243	1.24	Deleted
46	1407.96	2127.51	9	14	22	85	0.76	Deleted
49	1588.26	2399.95	18	12	19	69	0.87	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
58	59.54	90.07	55N	75	121	1361	1.13	NET< CL LHRoi
59	122.06	184.53	-76N	46	77	1183	1.12	NET< CL
60	133.54	201.88	-28N	47	77	1204	1.13	NET< CL
61	145.44	219.86	159N	73	119	1991	1.13	PIC
62	186.22	281.48	557N	50	73	1084	1.15	
63	264.65	399.99	-67N	41	69	880	1.21	NET< CL LBase
64	320.08	483.74	9N	37	60	662	1.25	NET< CL
65	364.48	550.83	-62N	36	60	676	1.29	NET< CL
66	427.89	646.64	27N	35	57	607	1.35	NET< CL
67	433.93	655.77	-46N	35	58	623	1.36	NET< CL
68	477.59	721.74	-13N	34	56	571	1.40	NET< CL
69	487.03	736.00	50N	29	47	407	1.40	
70	497.08	751.18	-15N	32	54	491	1.41	NET< CL
71	537.32	811.99	-59N	29	50	415	1.45	NET< CL
72	604.70	913.80	12N	28	46	359	1.51	NET< CL LBase
73	621.84	939.70	49N	26	40	278	1.53	
74	724.18	1094.33	-26N	33	56	290	1.62	NET< CL LHRoi
75	765.79	1157.20	-30N	24	41	292	1.66	NET< CL
76	810.76	1225.15	-37N	21	36	240	1.70	NET< CL
77	834.83	1261.52	11N	21	35	220	1.72	NET< CL
78	884.67	1336.83	-35N	20	34	210	1.76	NET< CL
79	1099.22	1661.01	-41N	21	36	230	1.92	NET< CL
80	1115.52	1685.64	-14N	39	64	397	1.93	NET< CL PIC
81	1691.02	2555.22	-5N	8	14	34	2.26	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:36:29
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. . . . . 7.97E+02 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 17000 Sec
Sample Size . . . . . 6.23E-01 kg | Real Time . . . . . 17022 Sec
Collection Efficiency . . . . 1.0000 | Spectrum File . . . . . 1136906.spc
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Detector #: 6

Energy(keV)= -0.07 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS006.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[8.71e-03*En^-3.34e+00 + 1.54e+02*En^ 6.70e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5187-15.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	7.08E+02	2.22E+01	< 5.35E+01	2.63E+01	9.99E-01	MEAS +	YES
Pb-214	5.23E+02	2.27E+01	< 8.07E+01	3.96E+01	1.00E+00	MEAS +	YES
Tl-208	5.98E+02	2.69E+01	< 6.10E+01	2.77E+01	1.00E+00	MEAS +	YES
Th-234	6.04E+02	3.16E+02	< 1.04E+03	5.15E+02	1.00E+00	MEAS +	YES
U-235	6.32E+01	1.65E+01	< 5.50E+01	2.71E+01	1.00E+00	MEAS +	YES
AcTh-228	6.78E+02	3.17E+01	< 1.21E+02	5.86E+01	1.00E+00	MEAS +	YES
Annil	1.15E+01	2.16E+01	< 7.17E+01	3.55E+01	9.39E-01	MEAS +	YES
Bi-214	5.45E+02	2.28E+01	< 7.01E+01	3.42E+01	1.00E+00	MEAS +	YES
Cs-137	3.74E+03	3.75E+01	< 3.31E+01	1.61E+01	9.98E-01	MEAS +	YES
Bi-212	3.74E+02	7.41E+01	< 2.28E+02	1.10E+02	1.00E+00	MEAS +	YES
Co-60	6.86E+02	1.42E+01	< 2.66E+01	1.26E+01	9.88E-01	MEAS +	YES
K-40	1.41E+04	2.70E+02	< 2.63E+02	1.25E+02	1.00E+00	MEAS +	YES
Am-241	5.14E+01	6.97E+01	< 2.30E+02	1.14E+02	1.00E+00	NET	YES
Co-57	-1.17E+01	7.07E+00	< 2.41E+01	1.18E+01	9.18E-01	NET	YES
Ce-144	-3.42E+01	5.66E+01	< 1.91E+02	9.37E+01	9.22E-01	NET	YES
Ce-141	8.16E+01	3.77E+01	< 1.24E+02	6.11E+01	4.92E-01	NET	YES
Ra-226	2.27E+03	2.06E+02	< 6.09E+02	2.99E+02	1.00E+00	NET	YES
Se-75	-2.22E+01	1.36E+01	< 4.66E+01	2.29E+01	8.25E-01	NET	YES
Cr-51	3.88E+01	1.58E+02	< 5.28E+02	2.58E+02	4.35E-01	NET	YES
I-131	-2.70E+02	1.57E+02	< 5.39E+02	2.64E+02	5.67E-02	NET	YES
Sb-125	2.10E+01	2.74E+01	< 9.14E+01	4.47E+01	9.78E-01	NET	YES
Ag-108m	-1.15E+01	8.69E+00	< 2.98E+01	1.46E+01	9.99E-01	NET	YES
Be-7	-4.62E+01	1.19E+02	< 4.04E+02	1.97E+02	6.49E-01	NET	YES
La-140	1.62E+02	9.54E+01	< 3.13E+02	1.52E+02	1.65E-01	NET	YES
Ru-103	-7.56E+00	1.61E+01	< 5.48E+01	2.67E+01	5.56E-01	NET	YES
Ba-140	-3.70E+02	1.85E+02	< 6.46E+02	3.14E+02	1.65E-01	NET	YES
Cs-134	3.47E+00	8.35E+00	< 2.81E+01	1.36E+01	9.70E-01	NET	YES
Ru-106	1.54E+02	7.94E+01	< 2.60E+02	1.26E+02	9.39E-01	NET	YES
Zr-95	-2.71E+01	3.46E+01	< 1.19E+02	5.83E+01	6.97E-01	NET	YES
Nb-95	-1.94E+01	1.54E+01	< 5.36E+01	2.59E+01	5.18E-01	NET	YES
Co-58	-1.76E+01	1.00E+01	< 3.57E+01	1.72E+01	7.22E-01	NET	YES
Mn-54	4.13E+00	7.98E+00	< 2.69E+01	1.30E+01	9.29E-01	NET	YES
Ag-110m	-1.92E+01	1.08E+01	< 3.84E+01	1.85E+01	9.12E-01	NET	YES

L5187-15 analyzed by emm1461 on 04/25/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Fe-59	-5.04E+01	2.63E+01	< 9.38E+01	4.52E+01	5.96E-01	NET	YES
Zn-65	-1.27E+01	3.55E+01	< 1.20E+02	5.86E+01	9.10E-01	NET	YES
Sb-124	-8.38E+00	1.33E+01	< 5.00E+01	2.27E+01	6.82E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-16

Count by Date: _____
(if required)

Client: Duratek Inc

Delay Date: _____
(if required)

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMS-AO300-16

Collect Start Date/Time: _____

Collect Stop Date/Time: 03-21-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5177

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 617.4 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/23/02 1637

Det No.: 8

Spectrum No.: 1136908

Counted by: gh

Recount Date/Time: _____

Det No.: _____

Spectrum No.: _____

Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-16
Client Id : BMS-AO300-16
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	617.4		
Sample Weight-Dry	g			
Aliquot Weight	g	617.4		
FINAL WEIGHT	kg	.6174		
Container			WTSS	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-16 analyzed by emml461 on 04/23/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-16 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1136908

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:36:57
Sampling Stop: 03/21/2003 12:00:00 | Decay Time: 7.97E+002 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 17000 Sec
Sample Size 6.17E-001 kg | Real Time 17022 Sec
Collection Efficiency 1.0000 | Spc. File 1136908.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
Energy(keV)= 0.05 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003
FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.68	94.53	154	62	100	1571	1.14	
2	74.64	112.58	833	65	96	1574	1.49	a
3	76.97	116.09	948	55	75	1124	1.16	b
4	84.33	127.21	170	50	80	1186	1.31	a HiResid
5	86.99	131.22	486	65	100	1581	1.65	b HiResid
6	89.77	135.41	310	52	80	1186	1.33	c HiResid
7	92.96	140.24	631	66	100	1581	1.75	d HiResid
8	104.76	158.04	57	66	107	1707	0.77	NET< CL
9	112.68	170.00	-88	48	80	1190	2.54	NET< CL Wide Pk
10	128.96	194.57	137	49	78	1133	1.78	
11	143.34	216.28	16	41	68	930	0.25	NET< CL
12	186.03	280.71	451	58	89	1264	1.75	
13	209.60	316.28	260	65	104	1485	2.12	Wide Pk
14	238.48	359.87	2247	62	66	798	1.36	a
15	241.46	364.36	431	49	74	931	1.44	b
16	269.99	407.44	171	41	64	699	1.42	a
17	277.17	418.27	148	41	64	699	1.55	b
18	280.12	422.72	40	31	50	499	1.09	c NET< CL
19	295.14	445.39	752	46	61	626	1.53	a
20	299.76	452.36	180	43	67	716	1.66	b
21	328.17	495.24	130	45	71	753	1.75	
22	338.11	510.25	423	49	73	777	1.46	
23	351.79	530.89	1268	54	68	678	1.44	
24	409.37	617.81	43	19	29	211	0.74	a
25	413.99	624.77	46	26	42	352	1.05	b
26	462.92	698.62	137	40	62	573	1.49	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	511.05	771.28	693	44	59	569	2.26	Wide Pk
28	557.39	841.21	14	38	62	566	0.65	NET< CL
29	583.00	879.87	840	43	53	464	1.57	
30	609.22	919.45	964	44	52	442	1.83	
31	661.57	998.47	2465	58	50	409	1.78	
32	727.38	1097.80	171	29	43	327	1.75	
33	756.09	1141.13	32	26	41	299	1.55	NET< CL
34	768.68	1160.13	44	27	42	330	1.22	
35	786.36	1186.81	38	28	44	344	1.25	NET< CL
36	795.16	1200.10	102	31	48	374	1.61	
37	859.89	1297.80	139	33	50	388	2.55	Wide Pk
38	911.18	1375.21	527	36	45	340	1.73	
39	933.42	1408.78	57	32	51	408	1.80	
40	968.96	1462.42	256	35	51	426	1.49	
41	1120.29	1690.83	194	30	44	308	2.01	
42	1173.26	1770.79	3553	65	41	278	1.94	
43	1238.40	1869.10	76	24	37	242	1.63	
44	1332.56	2011.22	3110	58	27	113	2.11	
45	1377.99	2079.80	29	16	24	96	0.92	
46	1408.27	2125.50	28	15	23	85	1.11	
47	1460.88	2204.91	2714	54	21	72	2.21	
48	1588.10	2396.93	12	14	22	81	1.09	NET< CL
49	1630.72	2461.26	18	12	18	55	0.77	NET< CL
50	1729.64	2610.55	24	12	18	49	1.58	
51	1764.72	2663.50	153	16	18	48	2.09	
52	1848.10	2789.36	23	12	17	51	1.69	
53	2103.08	3174.22	39	11	15	34	3.03	
54	2203.94	3326.45	53	11	14	34	2.10	
55	2505.64	3781.82	48	10	11	18	4.28	Wide Pk
56	2614.49	3946.10	351	19	9	11	3.39	

L5187-16 analyzed by emm1461 on 04/23/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.68	154	62	100	77	62	101	NET<CL
2	74.64	833	65	96	802	65	97	
3	76.97	948	55	75	899	55	76	
4	84.33	170	50	80	146	51	81	
5	86.99	486	65	100	453	65	101	
7	92.96	631	66	100	442	66	103	
9	112.68	-88	48	80	-100	48	81	NET<CL
11	143.34	16	41	68	-7	42	69	NET<CL
12	186.03	451	58	89	351	59	92	
14	238.48	2247	62	66	2169	62	68	
15	241.46	431	49	74	395	50	75	
19	295.14	752	46	61	678	46	63	
21	328.17	130	45	71	131	45	72	
22	338.11	423	49	73	407	49	73	
23	351.79	1268	54	68	1160	55	70	
26	462.92	137	40	62	135	40	63	
27	511.05	693	44	59	264	45	69	
28	557.39	15	38	62	-2	38	63	NET<CL
29	583.00	840	43	53	818	44	54	
30	609.22	965	44	52	868	45	55	
34	768.68	44	27	42	34	27	43	NET<CL
38	911.18	527	36	46	511	36	46	
39	933.42	57	32	51	54	32	51	
40	968.96	256	35	51	245	35	51	
41	1120.29	194	30	44	179	31	45	
43	1238.40	76	24	37	75	24	37	
45	1377.99	29	16	24	21	16	25	NET<CL
47	1460.88	2715	54	21	2677	54	24	
50	1729.64	24	12	18	21	12	18	
51	1764.72	153	16	18	134	17	19	
54	2203.94	53	11	14	48	12	15	
56	2614.49	351	19	9	325	20	12	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.64	802	Pb-212	435	5 of 6	100.00	1.00	
			Tl-208	26	8 of 9	99.30	0.99	
			Pb-214	205	5 of 7	98.65	0.99	
			Tl-208	47	8 of 9	99.30	0.99	
3	76.97	899	Pb-212	755	5 of 6	100.00	1.50	
			Tl-208	47	8 of 9	99.30	0.99	
			Pb-214	367	5 of 7	98.65	0.99	
4	84.33	146	Tl-208	26	8 of 9	99.30	1.49	
5	86.99	36	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
59	86.99	417	Pb-212	417	5 of 6	100.00	1.50	AutoAdd
6	89.77	310	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	92.96	272	Th-234	. . . . .	1 of 2	58.74	0.59	Split
58	92.96	169	AcTh-228	169	11 of 36	78.50	0.79	AutoAdd
10	128.96	137	AcTh-228	156	11 of 36	88.87	1.39	
12	186.03	351	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
13	209.60	260	AcTh-228	203	11 of 36	84.98	1.35	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
14	238.48	2169	Pb-212	2568	5 of 6	100.00	1.50	
15	241.46	395	Pb-214	297	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
16	269.99	171	AcTh-228	142	11 of 36	87.40	1.37	
17	277.17	148	Tl-208	103	8 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
19	295.14	678	Pb-214	895	5 of 7	100.00	1.50	
20	299.76	180	Pb-212	148	5 of 6	100.00	1.50	
21	328.17	131	AcTh-228	112	11 of 36	87.40	1.37	
			Bi-212	3	2 of 13	59.32	1.09	
			La-140	15537	2 of 15	23.26	0.23	LowScore
22	338.11	407	AcTh-228	390	11 of 36	87.40	1.37	
23	351.79	1160	Pb-214	1549	5 of 7	100.00	1.50	
24	409.37	43	AcTh-228	66	11 of 36	90.65	1.41	
25	413.99	46	Unknown	. . . . .	. . . . .	. . . .	. . . .
26	462.92	135	AcTh-228	123	11 of 36	87.40	1.37	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
27	511.05	44	Annul	. . . . .	1 of 1	100.00	1.50	Split
57	511.05	221	Tl-208	221	8 of 9	100.00	1.50	AutoAdd
29	583.00	818	Tl-208	772	8 of 9	100.00	1.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
30	609.22	868	Bi-214	830	9 of 33	88.44	1.38	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.50	
31	661.57	2465	Cs-137	. . . . .	1 of 1	100.00	1.50	
			1173SEsc	. . . . .	0 of 0	. . .	0.50	
32	727.38	171	Bi-212	7080	2 of 13	81.27	1.31	
36	795.16	102	AcTh-228	90	11 of 36	87.40	1.37	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
37	859.89	139	Tl-208	91	8 of 9	100.00	1.50	
38	911.18	511	AcTh-228	487	11 of 36	87.40	1.37	
39	933.42	54	Bi-214	45	9 of 33	86.46	1.36	
40	968.96	245	AcTh-228	296	11 of 36	88.87	1.39	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
41	1120.29	179	Bi-214	188	9 of 33	89.69	1.40	
42	1173.26	3553	Co-60	3382	2 of 2	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.17	LowScore
43	1238.40	75	Bi-214	69	9 of 33	88.44	1.38	
44	1332.56	3110	Co-60	3267	2 of 2	100.00	1.50	
46	1408.27	28	Bi-214	27	9 of 33	88.44	1.38	
			Cs-Sum	3154	2 of 6	40.00	0.40	LowScore
47	1460.88	2677	K-40	. . . . .	1 of 1	100.00	1.50	
50	1729.64	21	Bi-214	28	9 of 33	91.53	1.42	
51	1764.72	134	Bi-214	147	9 of 33	89.69	1.40	
52	1848.10	23	Bi-214	19	9 of 33	86.46	1.36	
53	2103.08	39	2614SEsc	. . . . .	0 of 0	. . .	0.50	
54	2203.94	48	Bi-214	39	9 of 33	86.46	1.36	
55	2505.64	48	Co-Sum	. . . . .	1 of 1	100.00	1.50	
56	2614.49	325	Tl-208	371	8 of 9	100.00	1.50	

L5187-16 analyzed by emm1461 on 04/23/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-16

Sample ID: SOIL/SEDI Duratek Inc

Code: 1136908

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:36:57
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.97e+002 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 17000 Sec
Sample Size 6.17e-001 kg | Real Time 17022 Sec
Collection Efficiency 1.0000 | Spectrum File 1136908.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Efficiency File: WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.18E-03*En^-3.49E+00 + 1.43E+02*En^6.59E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File: L5187-16.LSF (SOIL/SEDI: Duratek Inc)
=====

MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	7.11E+02 +- 2.03E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	7.09E+02 +- 2.04E+01	4.53E+01		+	. . . . .
	300.09	8.88E+02 +- 2.12E+02	6.77E+02		+	. . . . .
Tl-208	Average:x	6.73E+02 +- 2.63E+01	. . . .		*	. . . . .
	84.90	I.D.	. . . .			. . . . .
	277.35	9.69E+02 +- 2.67E+02	8.55E+02		+	. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	7.00E+02 +- 3.73E+01	9.50E+01		+	. . . . .
	860.37	1.04E+03 +- 2.43E+02	7.65E+02		+	. . . . .
	2614.66	6.31E+02 +- 3.80E+01	5.37E+01		+	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	6.57E+02 +- 2.77E+02	9.08E+02		+	. . . . .
AcTh-228	Average:x	6.25E+02 +- 3.16E+01	. . . .		*	. . . . .
	129.08	5.51E+02 +- 1.97E+02	6.40E+02		+	. . . . .
	209.28	7.96E+02 +- 1.99E+02	6.42E+02		+	. . . . .
	270.23	7.46E+02 +- 1.79E+02	5.70E+02		+	. . . . .
	327.64	7.29E+02 +- 2.50E+02	8.11E+02		+	. . . . .
	338.32	6.47E+02 +- 7.78E+01	2.37E+02		+	. . . . .
	409.51	4.16E+02 +- 1.83E+02	5.90E+02		+	. . . . .
	463.00	6.82E+02 +- 2.01E+02	6.46E+02		+	. . . . .
	794.70	7.05E+02 +- 2.12E+02	6.76E+02		+	. . . . .
	911.07	6.40E+02 +- 4.52E+01	1.19E+02		+	. . . . .
	969.11	5.33E+02 +- 7.61E+01	2.30E+02		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
	93.35	I.D.	. . . . .	. . . . .	
Ra-226	186.22	1.36E+03 +- 2.27E+02	7.18E+02	++		. . . . .
Pb-214	Average:x	5.92E+02 +- 2.20E+01	. . . . .	*		. . . . .
	241.98	7.75E+02 +- 9.76E+01	3.00E+02	++		. . . . .
	295.21	5.87E+02 +- 4.00E+01	1.11E+02	++		. . . . .
	351.92	5.81E+02 +- 2.74E+01	7.18E+01	++		. . . . .
Annul	511.00	1.11E+01 +- 1.99E+01	6.59E+01	+		. . . . .
Bi-214	Average:x	4.94E+02 +- 2.17E+01	. . . . .	*		. . . . .
	609.31	5.00E+02 +- 2.57E+01	6.49E+01	++		. . . . .
	934.06	5.98E+02 +- 3.54E+02	1.16E+03	+		. . . . .
	1120.29	4.73E+02 +- 8.06E+01	2.45E+02	++		. . . . .
	1238.11	5.34E+02 +- 1.74E+02	5.54E+02	++		. . . . .
	1407.98	5.17E+02 +- 2.73E+02	8.87E+02	+		. . . . .
	1729.59	3.73E+02 +- 2.15E+02	7.03E+02	+		. . . . .
	1764.49	4.55E+02 +- 5.62E+01	1.41E+02	++		. . . . .
	1847.42	6.00E+02 +- 3.06E+02	9.90E+02	+		. . . . .
	2204.22	5.96E+02 +- 1.44E+02	4.14E+02	++		. . . . .
Cs-137	661.65	8.17E+02 +- 1.93E+01	3.40E+01	++		. . . . .
Bi-212	727.17	4.33E+02 +- 7.46E+01	2.27E+02	++		. . . . .
Co-60	Average:x	1.44E+03 +- 1.87E+01	. . . . .	*		. . . . .
	1173.22	1.48E+03 +- 2.68E+01	3.49E+01	++		. . . . .
	1332.49	1.40E+03 +- 2.62E+01	2.52E+01	++		. . . . .
K-40	1460.81	1.19E+04 +- 2.39E+02	2.24E+02	++		. . . . .
Co-Sum	2505.71	I.D.	. . . . .			. . . . .
Am-241	59.54	N 2.65E+01 +- 5.65E+01	1.87E+02L	x	LHROI	. . . . .
Co-57	122.06	N-1.29E+00 +- 6.72E+00	2.25E+01	x		. . . . .
Ce-144	133.54	N-1.02E+01 +- 5.39E+01	1.81E+02r	x	rbase	. . . . .
Ce-141	145.44	N 2.61E+01 +- 2.27E+01	7.51E+01	x		. . . . .
Se-75	264.65	N-2.24E+01 +- 1.16E+01	3.99E+011	x	lbase	. . . . .
Cr-51	320.08	N-2.94E+01 +- 1.49E+02	5.04E+02	x		. . . . .
I-131	364.48	N 7.58E+00 +- 1.38E+02	4.64E+02	x		. . . . .
Sb-125	427.89	N 3.59E+01 +- 2.33E+01	7.66E+01	x		. . . . .
Ag-108m	433.93	N 1.14E+01 +- 7.36E+00	2.42E+01	x		. . . . .
Be-7	477.59	N 9.07E+01 +- 1.03E+02	3.42E+02	x		. . . . .
La-140	487.03	N 5.42E+01 +- 8.82E+01	2.95E+02	x		. . . . .
Ru-103	497.08	N-2.14E+01 +- 1.27E+01	4.43E+01	x		. . . . .
Ba-140	537.32	N 5.74E+01 +- 1.52E+02	5.12E+02	x		. . . . .
Cs-134	604.70	N 4.32E+01 +- 2.52E+01	8.28E+01P	x	PIC	. . . . .
Ru-106	621.84	N-7.93E+01 +- 7.67E+01	2.65E+02	x		. . . . .
Zr-95	724.18	N-6.77E+03 +- 2.38E+03	7.85E+03P	x	PIC	. . . . .
Nb-95	765.79	N-1.85E+01 +- 1.52E+01	7.39E+01L	x	LHROI	. . . . .
Co-58	810.76	N-1.57E+01 +- 1.07E+01	3.76E+01	x		. . . . .
Mn-54	834.83	N-4.24E+00 +- 8.73E+00	2.99E+01	x		. . . . .
Ag-110m	884.67	N 2.16E+01 +- 1.24E+01	4.06E+01	x		. . . . .
Fe-59	1099.22	N-4.03E+01 +- 2.87E+01	1.00E+02	x		. . . . .
Zn-65	1115.52	N 1.26E+01 +- 3.83E+01	1.28E+02P	x	PIC	. . . . .
Sb-124	1691.02	N-1.36E+01 +- 1.56E+01	5.78E+01	x		. . . . .

MEASURED TOTAL: 1.97E+04 +- 9.97E+02 pCi/kg

0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.68	94.53	77	62	101	1571	1.14	Deleted
8	104.76	158.04	57	66	107	1707	0.77	Deleted
9	112.68	170.00	-100	48	81	1190	2.54	Deleted
11	143.34	216.28	-7	42	69	930	0.25	Deleted
18	280.12	422.72	40	31	50	499	1.09	Deleted
25	413.99	624.78	46	26	42	352	1.05	Unknown
28	557.39	841.21	-2	38	63	566	0.65	Deleted
33	756.09	1141.13	32	26	41	299	1.55	Deleted
34	768.68	1160.13	34	27	43	330	1.22	Deleted
35	786.36	1186.81	38	28	44	344	1.25	Deleted
45	1377.99	2079.80	21	16	25	96	0.92	Deleted
48	1588.10	2396.93	12	14	22	81	1.09	Deleted
49	1630.72	2461.26	18	12	18	55	0.77	Deleted
53	2103.08	3174.22	39	11	15	34	3.03	2614SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
60	59.54	89.79	31N	66	108	1079	1.24	NET< CL LHRoi
61	122.06	184.15	-9N	47	77	1098	1.29	NET< CL
62	133.54	201.48	-9N	47	78	1131	1.30	NET< CL RBase
63	145.44	219.44	54N	47	76	1081	1.31	NET< CL
64	264.65	399.37	-71N	37	62	709	1.39	NET< CL LBase
65	320.08	483.04	-7N	36	60	617	1.43	NET< CL
66	364.48	550.05	2N	33	55	512	1.46	NET< CL
67	427.89	645.76	49N	32	51	436	1.50	NET< CL
68	433.93	654.88	48N	31	50	421	1.51	NET< CL
69	477.59	720.77	27N	31	50	420	1.53	NET< CL
70	487.03	735.02	18N	29	47	373	1.54	NET< CL
71	497.08	750.19	-45N	27	46	410	1.55	NET< CL
72	537.32	810.93	10N	25	42	340	1.57	NET< CL
73	604.70	912.63	154N	90	146	700	1.62	PIC
74	621.84	938.50	-27N	26	44	355	1.63	NET< CL
75	724.18	1092.96	-6901N	2432	4003	509	1.70	NET< CL PIC
76	765.79	1155.77	-31N	25	60	333	1.73	NET< CL LHRoi
77	810.76	1223.64	-35N	24	41	304	1.76	NET< CL
78	834.83	1259.97	-12N	25	41	311	1.77	NET< CL
79	884.67	1335.20	42N	24	38	268	1.81	
80	1099.22	1659.03	-35N	25	42	302	1.95	NET< CL
81	1115.52	1683.64	15N	45	73	527	1.96	NET< CL PIC
82	1691.02	2552.27	-9N	10	17	52	2.34	NET< CL

L5187-16 analyzed by emml461 on 04/23/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/23/2003 16:36:57
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 7.97E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 17000 Sec
Sample Size 6.17E-01 kg | Real Time 17022 Sec
Collection Efficiency 1.0000 | Spectrum File 1136908.spc

Detector #: 8

Energy(keV)= 0.05 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/23/2003
FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS008.EFF (450 ml Sand in a WAT5 1.6 g/cc)
Eff.=1/[5.18e-03*En^-3.49e+00 + 1.43e+02*En^ 6.59e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5187-16.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	7.11E+02	2.03E+01	< 4.53E+01	2.22E+01	9.99E-01	MEAS +	YES
Tl-208	6.73E+02	2.63E+01	< 5.37E+01	2.42E+01	1.00E+00	MEAS +	YES
Th-234	6.57E+02	2.77E+02	< 9.08E+02	4.51E+02	1.00E+00	MEAS +	YES
AcTh-228	6.25E+02	3.16E+01	< 1.19E+02	5.80E+01	1.00E+00	MEAS +	YES
Ra-226	1.36E+03	2.27E+02	< 7.18E+02	3.54E+02	1.00E+00	MEAS +	YES
Pb-214	5.92E+02	2.20E+01	< 7.18E+01	3.52E+01	1.00E+00	MEAS +	YES
Annil	1.11E+01	1.99E+01	< 6.59E+01	3.26E+01	9.39E-01	MEAS +	YES
Bi-214	4.94E+02	2.17E+01	< 6.49E+01	3.17E+01	1.00E+00	MEAS +	YES
Cs-137	8.17E+02	1.93E+01	< 3.40E+01	1.65E+01	9.98E-01	MEAS +	YES
Bi-212	4.32E+02	7.46E+01	< 2.27E+02	1.10E+02	1.00E+00	MEAS +	YES
Co-60	1.44E+03	1.88E+01	< 2.52E+01	1.20E+01	9.88E-01	MEAS +	YES
K-40	1.19E+04	2.39E+02	< 2.24E+02	1.06E+02	1.00E+00	MEAS +	YES
Am-241	2.65E+01	5.65E+01	< 1.87E+02	9.23E+01	1.00E+00	NET	YES
Co-57	-1.29E+00	6.72E+00	< 2.25E+01	1.11E+01	9.18E-01	NET	YES
Ce-144	-1.02E+01	5.39E+01	< 1.81E+02	8.88E+01	9.22E-01	NET	YES
Ce-141	2.60E+01	2.27E+01	< 7.51E+01	3.69E+01	4.92E-01	NET	YES
Se-75	-2.24E+01	1.16E+01	< 3.99E+01	1.95E+01	8.25E-01	NET	YES
Cr-51	-2.94E+01	1.49E+02	< 5.04E+02	2.46E+02	4.35E-01	NET	YES
I-131	7.58E+00	1.38E+02	< 4.64E+02	2.27E+02	5.67E-02	NET	YES
Sb-125	3.59E+01	2.33E+01	< 7.66E+01	3.73E+01	9.78E-01	NET	YES
Ag-108m	1.14E+01	7.36E+00	< 2.42E+01	1.18E+01	9.99E-01	NET	YES
Be-7	9.07E+01	1.03E+02	< 3.42E+02	1.67E+02	6.49E-01	NET	YES
La-140	5.42E+01	8.82E+01	< 2.95E+02	1.44E+02	1.65E-01	NET	YES
Ru-103	-2.14E+01	1.27E+01	< 4.43E+01	2.15E+01	5.56E-01	NET	YES
Ba-140	5.74E+01	1.52E+02	< 5.12E+02	2.48E+02	1.65E-01	NET	YES
Cs-134	4.32E+01	2.52E+01	< 8.28E+01	4.10E+01	9.70E-01	NET	YES
Ru-106	-7.93E+01	7.67E+01	< 2.65E+02	1.29E+02	9.39E-01	NET	YES
Zr-95	-6.76E+03	2.38E+03	< 7.85E+03	3.92E+03	6.97E-01	NET	YES
Nb-95	-1.85E+01	1.52E+01	< 7.39E+01	3.62E+01	5.18E-01	NET	YES
Co-58	-1.57E+01	1.07E+01	< 3.76E+01	1.82E+01	7.22E-01	NET	YES
Mn-54	-4.24E+00	8.73E+00	< 3.00E+01	1.45E+01	9.29E-01	NET	YES
Ag-110m	2.16E+01	1.24E+01	< 4.06E+01	1.96E+01	9.12E-01	NET	YES
Fe-59	-4.03E+01	2.87E+01	< 1.00E+02	4.86E+01	5.96E-01	NET	YES

Page 009

L5187-16 analyzed by emml461 on 04/23/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Zn-65	1.26E+01	3.83E+01	< 1.28E+02	6.28E+01	9.10E-01	NET	YES
Sb-124	-1.36E+01	1.56E+01	< 5.78E+01	2.68E+01	6.82E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5187-17 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMS-AO300-17
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-21-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1.1; Co-60 .038

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: W55777

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 1020.8 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 4/28/03 17:28 Det No.: 5 Spectrum No.: 1187205
Counted by: an
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP DE&S
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5187-17
Client Id : BMS-AO300-17
Site :
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/21/03 12:00

Product : GAMMA SPECTROMETRY
Matrix : SO01 Soil

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	620.8		
Sample Weight-Dry	g			
Aliquot Weight	g	620.8		
FINAL WEIGHT	kg	.6208		
Container			WTS5	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5187-17 analyzed by EMM on 04/28/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-17

Sample ID: SOIL/SEDI Duratek Inc

Code: 1187205

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/28/2003 17:27:37
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 9.17E+002 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 10000 Sec
Sample Size 6.21E-001 kg | Real Time 10011 Sec
Collection Efficiency 1.0000 | Spc. File 1187205.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Energy(keV)= -0.27 + 0.661*Ch +-1.95E-07*Ch^2 + 7.21E-11*Ch^3 04/28/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.49	79.77	-9632	576	961	11368	156.08	NET< CL Wide Pk
2	63.05	95.73	29	43	70	900	0.69	NET< CL
3	74.63	113.24	433	44	64	822	1.16	a
4	76.97	116.77	650	51	73	986	1.23	b
5	83.91	127.27	133	39	61	761	1.12	a
6	87.08	132.06	290	41	61	761	1.12	b
7	92.76	140.65	402	62	96	1369	1.98	c Wide Pk
8	105.41	159.77	27	37	60	732	0.55	NET< CL
9	128.62	194.86	98	53	85	1151	1.17	
10	144.36	218.66	-15	42	69	877	0.38	NET< CL
11	185.85	281.38	213	42	65	783	1.24	a
12	190.11	287.84	32	25	40	392	0.62	b NET< CL
13	208.94	316.31	98	49	78	967	1.45	
14	238.41	360.86	1486	49	50	512	1.18	a
15	241.52	365.57	301	43	65	718	1.58	b
16	259.26	392.38	14	33	55	549	0.37	NET< CL
17	270.18	408.90	94	46	75	822	1.20	
18	277.56	420.06	-2	32	52	501	0.08	NET< CL
19	288.35	436.37	15	31	51	481	0.40	NET< CL
20	295.04	446.49	465	34	44	382	1.15	a
21	300.06	454.08	75	28	44	382	1.14	b
22	327.66	495.80	45	37	60	564	1.23	NET< CL
23	338.21	511.76	288	42	63	584	1.21	
24	351.62	532.04	880	47	61	543	1.45	
25	409.70	619.87	-1	33	54	467	0.02	NET< CL
26	462.75	700.07	85	34	53	449	0.95	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	510.56	772.37	449	39	54	398	2.23	Wide Pk
28	583.02	881.94	500	34	42	262	1.70	
29	609.13	921.43	619	34	39	244	1.66	
30	661.48	1000.59	4706	72	37	243	1.62	
31	702.25	1062.23	16	15	24	122	0.61	NET< CL
32	726.96	1099.61	98	24	36	208	1.58	
33	767.96	1161.60	36	23	36	212	1.10	
34	794.80	1202.19	40	18	27	145	1.54	a
35	801.79	1212.76	22	12	18	83	0.91	b
36	860.48	1301.49	42	23	36	202	0.95	
37	910.98	1377.86	342	27	33	184	1.81	
38	968.61	1464.99	124	25	37	235	1.15	
39	1120.09	1694.02	175	26	36	184	2.37	
40	1173.03	1774.06	1412	42	32	161	1.86	
41	1237.99	1872.26	64	20	30	129	1.95	
42	1332.36	2014.90	1299	38	21	73	2.06	
43	1377.19	2082.68	31	12	17	48	1.28	
44	1460.59	2208.72	1659	42	17	44	2.08	
45	1508.83	2281.63	12	9	14	33	0.82	NET< CL
46	1587.92	2401.14	44	12	16	46	2.46	
47	1729.87	2615.60	12	9	13	28	0.79	NET< CL
48	1764.30	2667.61	128	13	10	16	2.06	
49	2204.06	3331.64	40	9	10	16	3.64	Wide Pk
50	2614.59	3950.90	220	16	8	11	2.66	

L5187-17 analyzed by EMM on 04/28/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	52.49	-9632	576	961	-8413	577	962	NET<CL
2	63.05	29	43	70	2	43	71	NET<CL
3	74.63	433	44	64	409	44	65	
4	76.97	650	51	73	636	51	73	
5	83.91	133	39	61	121	39	62	
6	87.08	290	41	61	278	41	62	
7	92.76	402	62	96	321	62	98	
10	144.36	-15	42	69	-29	42	69	NET<CL
11	185.85	213	42	65	159	42	67	
13	208.94	98	49	78	92	49	78	
14	238.41	1486	49	50	1457	49	52	
20	295.04	465	34	44	446	34	45	
23	338.21	289	42	63	288	42	63	
24	351.62	880	47	61	843	47	62	
27	510.56	449	39	54	214	39	60	
28	583.02	501	34	42	487	34	43	
29	609.13	619	34	39	595	35	40	
32	726.96	98	24	36	94	24	36	
35	801.79	22	12	18	12	12	19	NET<CL
36	860.48	42	23	36	42	23	36	
37	910.98	342	27	33	330	28	34	
38	968.61	124	25	37	119	25	37	
39	1120.09	175	26	36	171	26	36	
40	1173.03	1412	42	32	1410	42	32	
43	1377.19	31	12	17	30	12	17	
44	1460.59	1659	42	17	1638	42	18	
46	1587.92	44	12	16	45	12	17	
48	1764.30	128	13	10	123	13	11	
50	2614.59	220	16	8	203	16	11	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.63	409	Pb-212	255	5 of 6	100.00	1.00	
			Tl-208	14	7 of 9	96.39	0.96	
			Pb-214	130	5 of 7	98.65	0.99	
			Tl-208	25	7 of 9	96.39	0.96	
4	76.97	179	Pb-214	234	5 of 7	98.65	0.99	Split
55	76.97	457	Pb-212	457	5 of 6	100.00	1.00	AutoAdd
5	83.91	121	Tl-208	14	7 of 9	96.39	1.46	
6	87.08	18	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
54	87.08	261	Pb-212	261	5 of 6	100.00	1.50	AutoAdd
7	92.76	223	Th-234	. . . . .	1 of 2	58.74	0.59	Split
53	92.76	98	AcTh-228	98	10 of 36	77.20	0.77	AutoAdd
9	128.62	98	AcTh-228	94	10 of 36	88.94	1.39	
11	185.85	159	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
13	208.94	92	AcTh-228	126	10 of 36	94.22	1.44	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
14	238.41	1457	Pb-212	1923	5 of 6	100.00	1.00	
15	241.52	301	Pb-214	208	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
17	270.18	94	AcTh-228	88	10 of 36	86.94	1.37	
20	295.04	446	Pb-214	502	5 of 7	100.00	1.50	
21	300.06	75	Pb-212	100	5 of 6	100.00	1.50	
23	338.21	288	AcTh-228	234	10 of 36	85.50	1.36	
24	351.62	843	Pb-214	817	5 of 7	100.00	1.50	
26	462.75	9	Sb-125	. . . . .	1 of 8	13.67	0.64	Split
52	462.75	76	AcTh-228	76	10 of 36	86.94	1.37	AutoAdd
27	510.56	81	Annil	. . . . .	1 of 1	100.00	1.50	Split
51	510.56	134	Tl-208	134	7 of 9	97.07	1.47	AutoAdd
28	583.02	487	Tl-208	484	7 of 9	97.07	1.47	
29	609.13	595	Bi-214	731	7 of 33	90.27	1.40	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . . . .	0.50	
30	661.48	4706	Cs-137	. . . . .	1 of 1	100.00	1.50	
			1173SEsc	. . . . .	0 of 0	. . . . .	0.50	
32	726.96	94	Bi-212	. . . . .	1 of 13	81.10	0.81	
33	767.96	37	Bi-214	59	7 of 33	97.04	1.47	
			Pa-234	. . . . .	1 of 2	26.32	0.76	
34	794.80	40	AcTh-228	56	10 of 36	94.22	1.44	
			Cs-134	. . . . .	1 of 9	46.67	0.97	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
36	860.48	42	Tl-208	56	7 of 9	100.00	1.50	
37	910.98	330	AcTh-228	279	10 of 36	86.94	1.37	
38	968.61	119	AcTh-228	190	10 of 36	94.22	1.44	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
39	1120.09	171	Bi-214	135	7 of 33	88.23	1.38	
40	1173.03	1410	Co-60	1414	2 of 2	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.17	LowScore
41	1237.99	64	Bi-214	50	7 of 33	88.23	1.38	
42	1332.36	1299	Co-60	1295	2 of 2	100.00	1.50	
43	1377.19	30	Bi-214	33	7 of 33	90.27	1.40	
44	1460.59	1638	K-40	. . . . .	1 of 1	100.00	1.50	
46	1587.92	45	AcTh-228	26	10 of 36	83.13	1.33	
48	1764.30	123	Bi-214	104	7 of 33	88.23	1.38	
49	2204.06	40	Bi-214	29	7 of 33	85.23	1.35	
50	2614.59	203	Tl-208	219	7 of 9	97.07	1.47	

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5187-17

Sample ID: SOIL/SEDI Duratek Inc

Code: 1187205

Sampling Start:	03/21/2003 12:00:00	|	Counting Start:	04/28/2003 17:27:37
Sampling Stop:	03/21/2003 12:00:00	|	Decay Time.	9.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	|	Live Time	10000 Sec
Sample Size	6.21e-001 kg	|	Real Time	10011 Sec
Collection Efficiency	1.0000	|	Spectrum File . . . . .	.1187205.spc
Type I		|	Type I & II	
Cr. Level Confidence Interval:	95 %	|	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Efficiency File: WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46E-03*En^-3.56E+00 + 1.55E+02*En^6.66E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File: L5187-17.LSF (SOIL/SEDI: Duratek Inc)

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	8.57E+02 +- 2.90E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	8.60E+02 +- 2.92E+01	6.25E+01		+*	. . . . .
	300.09	6.69E+02 +- 2.48E+02	8.01E+02		+	. . . . .
Pb-214	Average:x	7.54E+02 +- 3.28E+01	. . . .		*	. . . . .
	77.11	I.D.	. . . .			. . . . .
	241.98	1.07E+03 +- 1.53E+02	4.70E+02		+*	. . . . .
	295.21	7.00E+02 +- 5.38E+01	1.44E+02		+*	. . . . .
	351.92	7.64E+02 +- 4.30E+01	1.14E+02		+*	. . . . .
Tl-208	Average:x	7.40E+02 +- 3.82E+01	. . . .		*	. . . . .
	84.90	I.D.	. . . .			. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	7.58E+02 +- 5.30E+01	1.37E+02		+*	. . . . .
	860.37	5.65E+02 +- 3.12E+02	1.02E+03		+	. . . . .
	2614.66	7.25E+02 +- 5.60E+01	8.67E+01		+*	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	1.03E+03 +- 4.98E+02	1.64E+03		+	. . . . .
AcTh-228	Average:x	6.95E+02 +- 4.54E+01	. . . .		*	. . . . .
	129.08	7.26E+02 +- 3.90E+02	1.28E+03		+	. . . . .
	209.28	5.11E+02 +- 2.69E+02	8.84E+02		+	. . . . .
	270.23	7.42E+02 +- 3.66E+02	1.20E+03		+	. . . . .
	338.32	8.31E+02 +- 1.21E+02	3.70E+02		+*	. . . . .
	463.00	6.95E+02 +- 4.39E+02	1.44E+03		+	. . . . .
	794.70	4.97E+02 +- 2.22E+02	7.16E+02		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	911.07	7.53E+02 +- 6.29E+01	1.62E+02		++	. . . . .
	969.11	4.72E+02 +- 9.94E+01	3.05E+02		++	. . . . .
	1588.00	1.17E+03 +- 3.16E+02	9.38E+02		++	. . . . .
	93.35	I.D.				. . . . .
Ra-226	186.22	1.11E+03 +- 2.96E+02	9.49E+02		++	. . . . .
Sb-125	Average:x	7.34E+00 +- 3.50E+01	. . . . .			. . . . .
	463.38	3.54E+01 +- 2.34E+02	7.81E+02			. . . . .
	427.89 N	6.71E+00 +- 3.54E+01	1.20E+02			. . . . .
Annil	511.00	3.73E+01 +- 3.16E+01	1.04E+02		+	. . . . .
Bi-214	Average:x	6.62E+02 +- 3.07E+01	. . . . .		*	. . . . .
	609.31	6.22E+02 +- 3.62E+01	8.73E+01		++	. . . . .
	768.36	4.09E+02 +- 2.55E+02	8.37E+02		+	. . . . .
	1120.29	8.21E+02 +- 1.24E+02	3.63E+02		++	. . . . .
	1238.11	8.37E+02 +- 2.57E+02	8.08E+02		++	. . . . .
	1377.67	6.03E+02 +- 2.39E+02	7.50E+02		+	. . . . .
	1764.49	7.65E+02 +- 8.02E+01	1.51E+02		++	. . . . .
	2204.22	9.08E+02 +- 1.98E+02	5.10E+02		++	. . . . .
Cs-137	661.65	2.84E+03 +- 4.35E+01	4.67E+01		++	. . . . .
Bi-212	727.17	4.34E+02 +- 1.10E+02	3.43E+02		++	. . . . .
Co-60	Average:x	1.07E+03 +- 2.25E+01	. . . . .		*	. . . . .
	1173.22	1.07E+03 +- 3.22E+01	5.12E+01		++	. . . . .
	1332.49	1.07E+03 +- 3.16E+01	3.67E+01		++	. . . . .
K-40	1460.81	1.33E+04 +- 3.41E+02	3.21E+02		++	. . . . .
Am-241	59.54 N	4.22E+01 +- 6.34E+01	2.11E+02		x	. . . . .
Co-57	122.06 N	7.25E-01 +- 9.79E+00	3.30E+01		x	. . . . .
Ce-144	133.54 N	3.78E+01 +- 7.53E+01	2.52E+02r		x	rbase
Ce-141	145.44 N	2.64E+01 +- 4.08E+01	1.36E+02		x	. . . . .
Se-75	264.65 N	2.99E+01 +- 1.93E+01	6.64E+01l		x	lbase
Cr-51	320.08 N	2.94E+02 +- 2.38E+02	7.89E+02		x	. . . . .
I-131	364.48 N	3.80E+02 +- 3.15E+02	1.09E+03		x	. . . . .
Ag-108m	433.93 N	3.29E+01 +- 1.26E+01	4.44E+01		x	. . . . .
Be-7	477.59 N	1.21E+02 +- 1.85E+02	6.33E+02		x	. . . . .
La-140	487.03 N	1.56E+02 +- 1.93E+02	6.44E+02		x	. . . . .
Ru-103	497.08 N	2.25E+01 +- 2.28E+01	7.61E+01		x	. . . . .
Ba-140	537.32 N	8.04E+01 +- 3.16E+02	1.07E+03		x	. . . . .
Cs-134	604.70 N	8.10E+00 +- 1.12E+01	3.89E+01l		x	lbase
Ru-106	621.84 N	1.66E+02 +- 1.09E+02	3.85E+02		x	. . . . .
Zr-95	724.18 N	9.22E+01 +- 5.00E+01	1.81E+02L		x	LHROI
Nb-95	765.79 N	3.08E+01 +- 3.33E+01	1.15E+02P		x	PIC
Co-58	810.76 N	7.71E+00 +- 1.50E+01	5.08E+01		x	. . . . .
Mn-54	834.83 N	3.51E+01 +- 1.23E+01	3.91E+01		x	. . . . .
Ag-110m	884.67 N	1.24E+01 +- 1.63E+01	5.51E+01		x	. . . . .
Fe-59	1099.22 N	7.33E+01 +- 4.17E+01	1.50E+02		x	. . . . .
Zn-65	1115.52 N	1.45E+01 +- 5.37E+01	1.80E+02P		x	PIC
Sb-124	1691.02 N	2.73E+01 +- 1.74E+01	7.28E+01		x	. . . . .

MEASURED TOTAL: 2.35E+04 +- 1.55E+03 pCi/kg

0.00E+00

NOTE: *: N/S>3

#: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.49	79.77	-8413	577	962	11368	156.08	Deleted
2	63.05	95.73	2	43	71	900	0.69	Deleted
8	105.41	159.77	27	37	60	732	0.55	Deleted
10	144.36	218.66	-29	42	69	877	0.38	Deleted
12	190.11	287.84	32	25	40	392	0.62	Deleted
16	259.26	392.38	14	33	55	549	0.37	Deleted
18	277.56	420.06	-2	32	52	501	0.08	Deleted
19	288.35	436.37	15	31	51	481	0.40	Deleted
22	327.66	495.80	45	37	60	564	1.23	Deleted
25	409.70	619.87	-1	33	54	467	0.02	Deleted
31	702.25	1062.23	16	15	24	122	0.61	Deleted
35	801.79	1212.76	12	12	19	83	0.91	Deleted
45	1508.83	2281.63	12	9	14	33	0.82	Deleted
47	1729.87	2615.60	12	9	13	28	0.79	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
56	59.54	90.42	24N	35	58	668	1.13	NET< CL
57	122.06	184.94	-3N	36	60	720	1.18	NET< CL
58	133.54	202.30	18N	36	59	690	1.19	NET< CL
								RBase
59	145.44	220.29	27N	42	68	857	1.20	NET< CL
60	264.65	400.54	-51N	33	55	566	1.29	NET< CL
								LBase
61	320.09	484.36	35N	28	46	385	1.32	NET< CL
62	364.49	551.50	-33N	27	46	392	1.36	NET< CL
63	427.91	647.40	5N	26	43	345	1.40	NET< CL
64	433.95	656.53	-77N	29	50	431	1.41	NET< CL
65	477.62	722.56	-19N	28	47	383	1.44	NET< CL
66	487.06	736.84	21N	26	43	313	1.44	NET< CL
67	497.11	752.04	24N	24	39	265	1.45	NET< CL
68	537.36	812.90	6N	22	36	226	1.48	NET< CL
69	604.76	914.81	-16N	22	37	230	1.52	NET< CL
								LBase
70	621.90	940.74	-31N	20	34	202	1.54	NET< CL
71	724.14	1095.34	-49N	27	47	201	1.61	NET< CL
								LHRoi
72	765.77	1158.29	-26N	28	46	276	1.63	NET< CL
								PIC
73	810.76	1226.32	9N	17	28	148	1.66	NET< CL
74	834.84	1262.73	54N	19	29	152	1.68	
75	884.71	1338.14	13N	17	28	141	1.71	NET< CL
76	1099.15	1662.37	-32N	18	31	170	1.86	NET< CL
77	1115.47	1687.04	9N	34	55	293	1.87	NET< CL
								PIC
78	1691.04	2556.94	-9N	6	11	21	2.25	NET< CL

L5187-17 analyzed by EMM on 04/28/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/21/2003 12:00:00 | Counting Start: 04/28/2003 17:27:37
Sampling Stop: 03/21/2003 12:00:00 | Decay Time. 9.17E+02 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 10000 Sec
Sample Size 6.21E-01 kg | Real Time 10011 Sec
Collection Efficiency 1.0000 | Spectrum File 1187205.spc

Detector #: 5

Energy(keV)= -0.27 + 0.661*Ch + -1.95E-07*Ch^2 + -1.95E-07*Ch^3 04/28/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT5SS005.EFF (450 ml Sand in a WAT5 1.6 g/cc)

Eff.=1/[5.46e-03*En^-3.56e+00 + 1.55e+02*En^ 6.66e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5187-17.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	8.58E+02	2.90E+01	< 6.25E+01	3.04E+01	1.00E+00	MEAS +	YES
Pb-214	7.54E+02	3.28E+01	< 1.14E+02	5.59E+01	1.00E+00	MEAS +	YES
Tl-208	7.40E+02	3.82E+01	< 8.67E+01	3.85E+01	1.00E+00	MEAS +	YES
Th-234	1.03E+03	4.98E+02	< 1.64E+03	8.12E+02	1.00E+00	MEAS +	YES
AcTh-228	6.95E+02	4.54E+01	< 1.62E+02	7.79E+01	1.00E+00	MEAS +	YES
Ra-226	1.11E+03	2.96E+02	< 9.49E+02	4.65E+02	1.00E+00	MEAS +	YES
Sb-125	7.34E+00	3.50E+01	< 1.20E+02	5.80E+01	9.74E-01	MEAS +	YES
Annil	3.73E+01	3.16E+01	< 1.04E+02	5.15E+01	9.30E-01	MEAS +	YES
Bi-214	6.62E+02	3.08E+01	< 8.73E+01	4.22E+01	9.99E-01	MEAS +	YES
Cs-137	2.84E+03	4.35E+01	< 4.67E+01	2.25E+01	9.98E-01	MEAS +	YES
Bi-212	4.34E+02	1.10E+02	< 3.43E+02	1.65E+02	1.00E+00	MEAS +	YES
Co-60	1.07E+03	2.25E+01	< 3.68E+01	1.73E+01	9.86E-01	MEAS +	YES
K-40	1.33E+04	3.41E+02	< 3.21E+02	1.50E+02	1.00E+00	MEAS +	YES
Am-241	4.22E+01	6.34E+01	< 2.11E+02	1.03E+02	1.00E+00	NET	YES
Co-57	-7.25E-01	9.79E+00	< 3.30E+01	1.61E+01	9.07E-01	NET	YES
Ce-144	3.78E+01	7.53E+01	< 2.52E+02	1.23E+02	9.11E-01	NET	YES
Ce-141	2.64E+01	4.08E+01	< 1.36E+02	6.66E+01	4.42E-01	NET	YES
Se-75	-2.99E+01	1.92E+01	< 6.64E+01	3.24E+01	8.01E-01	NET	YES
Cr-51	2.94E+02	2.38E+02	< 7.89E+02	3.83E+02	3.84E-01	NET	YES
I-131	-3.80E+02	3.16E+02	< 1.09E+03	5.30E+02	3.69E-02	NET	YES
Ag-108m	-3.29E+01	1.26E+01	< 4.44E+01	2.16E+01	9.99E-01	NET	YES
Be-7	-1.21E+02	1.85E+02	< 6.33E+02	3.08E+02	6.09E-01	NET	YES
La-140	1.56E+02	1.93E+02	< 6.44E+02	3.12E+02	1.26E-01	NET	YES
Ru-103	2.25E+01	2.28E+01	< 7.61E+01	3.68E+01	5.10E-01	NET	YES
Ba-140	8.04E+01	3.16E+02	< 1.07E+03	5.17E+02	1.26E-01	NET	YES
Cs-134	-8.10E+00	1.12E+01	< 3.89E+01	1.88E+01	9.65E-01	NET	YES
Ru-106	-1.66E+02	1.08E+02	< 3.85E+02	1.85E+02	9.30E-01	NET	YES
Zr-95	-9.22E+01	5.00E+01	< 1.81E+02	8.78E+01	6.61E-01	NET	YES
Nb-95	-3.08E+01	3.33E+01	< 1.15E+02	5.57E+01	4.69E-01	NET	YES
Co-58	7.71E+00	1.50E+01	< 5.08E+01	2.43E+01	6.88E-01	NET	YES
Mn-54	3.51E+01	1.23E+01	< 3.91E+01	1.86E+01	9.19E-01	NET	YES
Ag-110m	1.24E+01	1.63E+01	< 5.51E+01	2.63E+01	8.99E-01	NET	YES
Fe-59	-7.33E+01	4.17E+01	< 1.50E+02	7.19E+01	5.52E-01	NET	YES

L5187-17 analyzed by EMM on 04/28/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Zn-65	1.44E+01	5.37E+01	< 1.80E+02	8.79E+01	8.97E-01	NET	YES
Sb-124	-2.73E+01	1.74E+01	< 7.28E+01	3.23E+01	6.44E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

An AREVA and Siemens Company

DURATEK, INC. DATA PACKETS

Samples
L5445-01 - L5445-15
and Calibrations



FRAMATOME ANP

ENVIRONMENTAL LABORATORY
29 Research Drive
Westborough, MA 01581-3913
(508) 898-9970 Fax (508) 836-9815

Client Name:	Duratek-Bristol Myers Squibb		
Client Purchase Order/Contract:			
Date of Shipment:			
Program:	REMP <input type="checkbox"/>	Non-REMP <input type="checkbox"/>	
Requested Turnaround Time (TAT):	<input type="checkbox"/> Standard	<input type="checkbox"/> Rush	

Phone: Fax:

Chain of Custody		Field Treatment/Comments	SPECIFY METHOD	ELAB ACCEPTANCE STAMP
Relinquished By:	Date:		(Internal Lab Use ONLY)	
Collected By:	Phone Number:		RA-226 (A)	
Received By: <i>BP</i>	Date: <i>4/12/13</i>		RADIUM_A_EPA	
ELAB Comments:			RA-228 (PROC. 1300)	
<i>15348</i>			RA-228_EPA (PROC. 1311)	
			I-131LL (BETA/GAMMA)	
			I-131LL (GAS PROPORTIONAL)	
			OTHER	

L5348

(10 CFR 50/61 SAMPLES)

FORM 605.2, Rev. 14

Client: Duratek, Inc
Project: Bristol-Myers Squibb

Duratek Purchase Order # 15313

Samples Collected by
Betty & Doug Kjos, Don Schumaker

CHAIN OF CUSTODY RECORD

BMS-004

FRAMATOME
ACC

APR 18 2003

MONITOR

#24

Duratek, Inc.
1009 Commerce Park
Oak Ridge, TN 337830

Project Manager: Paul Ely
(732) 519-3341-BMS Office
(865) 425-4590-Duratek Office
(865) 414-1973-cell

Page 1 of 2

Sample ID	date	Sample turnaround time	matrix	preservative	number of containers	Gamma-spec					MEDIA CODE		YEAR	Remarks
BMS-E0200-21	3/26/03	Std	S	N/A	1	X					Soil		03	Soil Sample X19570
BMS-E0200-55	3/26/03	Std	S	N/A	1	X								Soil Sample X19571
BMS-E0200-116	3/26/03	Std	S	N/A	1	X								Soil Sample X19572
BMS-E0200-129	3/26/03	Std	S	N/A	1	X								Soil Sample X19573
BMS-E0200-135	3/26/03	Std	S	N/A	1	X								Soil Sample X19574
BMS-E0200-180	3/26/03	Std	S	N/A	1	X								Soil Sample X19575
BMS-E0200-260	3/26/03	Std	S	N/A	1	X								Soil Sample X19576
BMS-E0200-281	3/26/03	Std	S	N/A	1	X								Soil Sample X19577
BMS-E0200-362	3/26/03	Std	S	N/A	1	X								Soil Sample X19578
BMS-E0200-371	3/26/03	Std	S	N/A	1	X								Soil Sample X19579
BMS-E0200-402	3/26/03	Std	S	N/A	1	X								Soil Sample X19580

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
	4-17-03	1030					
Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Remarks:	
						FRAMATOME ACC	

Matrix codes: s-Soil, m-Misc Solid, V-Vegetation, L-Sludge, W-Water, G-Ground Water, D-Drinking Water, Z-Waste Water, M-Misc Liquid, F-Filter or Smear

RLUD: NDA

4/18/03

APR 18 2003

MONITOR

Don

Client: Duratek, Inc
Project: Bristol-Myers Squibb

Duratek Purchase Order # 15313

Samples Collected by
Betty & Doug Kjos, Don Schumaker

CHAIN OF CUSTODY RECORD

BMS-004

FRAMATOME
ACCES

APR 18 2003

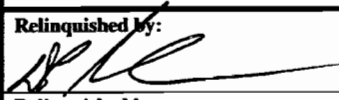
MONITOR

NDH

Duratek, Inc.
1009 Commerce Park
Oak Ridge, TN 337830

Project Manager: Paul Ely
(732) 519-3341-BMS Office
865) 425-4590-Duratek Office
(865) 414-1973-cell

Page 2 of 2

Sample ID	date	Sample turnaround time	matrix	preservative	number of containers	Gamma-spec					MEDIA CODE			YEAR	Remarks
BMS-E0200-552	3/26/03	Std	S	N/A	1	X					SOIL			03	Soil Sample X19581
BMS-E0200-592	3/26/03	Std	S	N/A	1	X									Soil Sample X19582
BMS-E0200-658	3/26/03	Std	S	N/A	1	X									Soil Sample X19583
BMS-E0200-693	3/26/03	Std	S	N/A	1	X									Soil Sample X19584
BMS-E0200-726	3/26/03	Std	S	N/A	1	X									Soil Sample X19585
Relinquished by:	Date:	Time:	Received by:			Relinquished by:			Date:	Time:	Received by:				
	4-17-03	1030													
Relinquished by:	Date:	Time:	Received by:			Date:	Time:	Remarks:							

Matrix codes: s-Soil, m-Misc Solid, V-Vegetation, L-Sludge, W-Water, G-Ground Water, D-Drinking Water, Z-Waste Water, M-Misc Liquid, F-Filter or Smear

BLVD: NDH 4/18/03



Framatome ANP

Login Chain of Custody Report (In01)

Apr. 28, 2003

01:44 PM

Login Number: L5348

Account: 00435

Duratek Inc

Project: OTHER ENVIRON-DUR Duratek Other Environmental

Page: 1 of 1

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due Date	Start Date Comments	Volume
L5348-01	BMA-E0200-21	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-02	BMA-E0200-55	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-03	BMA-E0200-116	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-04	BMA-E0200-129	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-05	BMA-E0200-135	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-06	BMA-E0200-180	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-07	BMA-E0200-260	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-08	BMA-E0200-281	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-09	BMA-E0200-362	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-10	BMA-E0200-371	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-11	BMA-E0200-402	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-12	BMA-E0200-552	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-13	BMA-E0200-592	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-14	BMA-E0200-658	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-15	BMA-E0200-693	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					
L5348-16	BMA-E0200-726	26-MAR-03 12:00	17-APR-03			
Soil	S GAMMA SPECTROME Hold:					

Signature : 

Date : 4/28/03

**Environmental Laboratory**

29 Research Drive
Westborough, MA 01581

July 07, 2003

Duratek Inc
1009 Commerce Park Drive
Suite 100
Oak Ridge, TN 37830
ATT: Paul Ely

Dear Paul Ely :

Framatome-ANP Environmental Laboratory received the samples listed below from your company on 17-APR-03. Please verify that the data and requested analyses are correct. Analysis reports will be submitted when the requested analyses have been completed and the results approved.

<u>Media</u>	<u>Client ID</u>	<u>Site</u>	<u>Reference Date</u>	<u>Lab Sample #</u>	<u>Analysis Requested</u>
Soil	BMA-E0200-21	REF-X19570	26-MAR-03 12:00	L5348-01	GAMMA SPECTROMETRY
Soil	BMA-E0200-55	REF-X19571	26-MAR-03 12:00	L5348-02	GAMMA SPECTROMETRY
Soil	BMA-E0200-116	REF-X19572	26-MAR-03 12:00	L5348-03	GAMMA SPECTROMETRY
Soil	BMA-E0200-129	REF-X19573	26-MAR-03 12:00	L5348-04	GAMMA SPECTROMETRY
Soil	BMA-E0200-135	REF-X19574	26-MAR-03 12:00	L5348-05	GAMMA SPECTROMETRY
Soil	BMA-E0200-180	REF-X19575	26-MAR-03 12:00	L5348-06	GAMMA SPECTROMETRY
Soil	BMA-E0200-260	REF-X19576	26-MAR-03 12:00	L5348-07	GAMMA SPECTROMETRY
Soil	BMA-E0200-281	REF-X19577	26-MAR-03 12:00	L5348-08	GAMMA SPECTROMETRY
Soil	BMA-E0200-362	REF-X19578	26-MAR-03 12:00	L5348-09	GAMMA SPECTROMETRY
Soil	BMA-E0200-371	REF-X19579	26-MAR-03 12:00	L5348-10	GAMMA SPECTROMETRY
Soil	BMA-E0200-402	REF-X19580	26-MAR-03 12:00	L5348-11	GAMMA SPECTROMETRY
Soil	BMA-E0200-552	REF-X19581	26-MAR-03 12:00	L5348-12	GAMMA SPECTROMETRY
Soil	BMA-E0200-592	REF-X19582	26-MAR-03 12:00	L5348-13	GAMMA SPECTROMETRY
Soil	BMA-E0200-658	REF-X19583	26-MAR-03 12:00	L5348-14	GAMMA SPECTROMETRY
Soil	BMA-E0200-693	REF-X19584	26-MAR-03 12:00	L5348-15	GAMMA SPECTROMETRY
Soil	BMA-E0200-726	REF-X19585	26-MAR-03 12:00	L5348-16	GAMMA SPECTROMETRY

If you have any questions regarding these samples, please contact me at (508)898-9970, ext. 2557 or email:
Sakshi.Punjabi@Framatome-anp.com.

Sincerely,

Sakshi Punjabi
Sample Receipt Technician

Notes:
c:

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/12/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-01 Client ID BMA-E0200-21 REF-X19570 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/07/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	9.59E-01 +/- 4.1E-02	6.3E-02	1.7E-01		bc
Ag-108m	-5.3E-03 +/- 9.5E-03	9.5E-03	3.2E-02		
Ag-110m	6E-03 +/- 1.6E-02	1.6E-02	5.3E-02		
Ba-140	-8.1E-01 +/- 3.5E-01	3.5E-01	1.2E+00		
Be-7	3.8E-01 +/- 1.5E-01	1.5E-01	4.9E-01		
Ce-141	5E-02 +/- 4.4E-02	4.4E-02	1.4E-01		
Ce-144	-2.2E-02 +/- 5.6E-02	5.6E-02	1.9E-01		
Co-57	2.4E-03 +/- 7.9E-03	7.9E-03	2.7E-02		
Co-58	-3.8E-02 +/- 1.4E-02	1.4E-02	5.1E-02		
Co-60	5.3E-03 +/- 9.8E-03	9.8E-03	3.3E-02	3.8E-02	
Cr-51	-9E-02 +/- 2.1E-01	2.1E-01	7.3E-01		
Cs-134	-1.3E-02 +/- 1.1E-02	1.1E-02	3.8E-02		
Cs-137	3.78E-01 +/- 1.8E-02	2.6E-02	4.2E-02	1.1E+00	bc
Fe-59	-4.3E-02 +/- 3.9E-02	3.9E-02	1.4E-01		
I-131	7E-02 +/- 3.5E-01	3.5E-01	1.2E+00		
K-40	1.449E+01 +/- 3.4E-01	8.0E-01	4.9E-01		bc
La-140	-1E-01 +/- 1.9E-01	1.9E-01	6.5E-01		
Mn-54	2E-03 +/- 1.1E-02	1.1E-02	3.7E-02		
Nb-95	0E+00 +/- 3.7E-02	3.7E-02	1.2E-01		
Ru-103	-1.2E-02 +/- 2.0E-02	2.0E-02	6.9E-02		
Ru-106	3E-02 +/- 1.0E-01	1.0E-01	3.4E-01		
Sb-124	2E-02 +/- 3.1E-02	3.1E-02	1.1E-01		
Sb-125	1E-02 +/- 2.7E-02	2.7E-02	9.1E-02		
Se-75	2.5E-02 +/- 1.5E-02	1.5E-02	5.0E-02		
Zn-65	3.6E-02 +/- 4.9E-02	4.9E-02	1.6E-01		
Zr-95	-1.58E+01 +/- 3.5E+00	3.6E+00	1.1E+01		

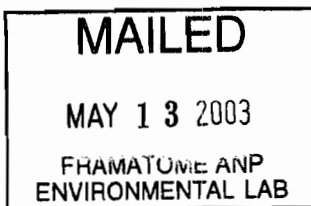
Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by
J.M. Raimondi 5/12/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/12/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-02 Client ID BMA-E0200-55 REF-X19571 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/07/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	1.086E+00 +/- 4.1E-02	6.8E-02	1.7E-01		bc
Ag-108m	1.2E-03 +/- 8.7E-03	8.7E-03	2.9E-02		
Ag-110m	-1.6E-02 +/- 1.5E-02	1.5E-02	5.1E-02		
Ba-140	3E-02 +/- 3.9E-01	3.9E-01	1.3E+00		
Be-7	-6E-02 +/- 1.4E-01	1.4E-01	4.7E-01		
Ce-141	3E-02 +/- 3.8E-02	3.8E-02	1.3E-01		
Ce-144	1E-01 +/- 5.9E-02	6.0E-02	2.0E-01		
Co-57	6.5E-03 +/- 7.7E-03	7.7E-03	2.6E-02		
Co-58	-1.7E-02 +/- 1.5E-02	1.5E-02	5.2E-02		
Co-60	1.5E-02 +/- 1.1E-02	1.1E-02	3.6E-02	3.8E-02	
Cr-51	-8E-02 +/- 2.2E-01	2.2E-01	7.6E-01		
Cs-134	4.4E-02 +/- 4.0E-02	4.0E-02	1.3E-01		
Cs-137	3.84E-01 +/- 1.9E-02	2.7E-02	4.6E-02	1.1E+00	bc
Fe-59	-5.8E-02 +/- 3.9E-02	3.9E-02	1.4E-01		
I-131	7E-02 +/- 3.7E-01	3.7E-01	1.3E+00		
K-40	1.501E+01 +/- 3.4E-01	8.2E-01	5.1E-01		bc
La-140	-1E-01 +/- 1.8E-01	1.8E-01	6.1E-01		
Mn-54	1.6E-02 +/- 1.5E-02	1.5E-02	5.0E-02		
Nb-95	5E-02 +/- 3.3E-02	3.3E-02	1.1E-01		
Ru-103	-4E-03 +/- 2.1E-02	2.1E-02	7.2E-02		
Ru-106	-1E-01 +/- 1.1E-01	1.1E-01	3.7E-01		
Sb-124	7E-03 +/- 3.1E-02	3.1E-02	1.1E-01		
Sb-125	8E-03 +/- 3.0E-02	3.0E-02	1.0E-01		
Se-75	-2.4E-02 +/- 1.6E-02	1.6E-02	5.4E-02		
Zn-65	4.4E-02 +/- 5.0E-02	5.0E-02	1.7E-01		
Zr-95	5E-02 +/- 1.9E-01	1.9E-01	6.2E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/12/03

J.M. Raimondi
Sample Control Manager

MAILED

MAY 13 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/12/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-03 Client ID BMA-E0200-116 REF-X19572
Reference Date 03/26/03 Analysis Date 05/07/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	1.031E+00 +/- 3.8E-02	6.4E-02	1.6E-01		bc
Ag-108m	-9.3E-03 +/- 8.6E-03	8.6E-03	2.9E-02		
Ag-110m	3E-03 +/- 1.3E-02	1.3E-02	4.5E-02		
Ba-140	1.8E-01 +/- 3.2E-01	3.2E-01	1.1E+00		
Be-7	-2.1E-01 +/- 1.3E-01	1.3E-01	4.6E-01		
Ce-141	3.9E-02 +/- 3.0E-02	3.0E-02	9.9E-02		
Ce-144	-2.3E-02 +/- 5.8E-02	5.8E-02	1.9E-01		
Co-57	-1.98E-02 +/- 7.2E-03	7.3E-03	2.5E-02		
Co-58	-2.9E-02 +/- 1.3E-02	1.3E-02	4.6E-02		
Co-60	-1E-02 +/- 1.0E-02	1.0E-02	3.5E-02	3.8E-02	
Cr-51	8E-02 +/- 2.1E-01	2.1E-01	7.1E-01		
Cs-134	8.7E-02 +/- 3.7E-02	3.7E-02	1.2E-01		
Cs-137	3.57E-01 +/- 1.7E-02	2.5E-02	4.0E-02	1.1E+00	bc
Fe-59	4.5E-02 +/- 3.7E-02	3.7E-02	1.2E-01		
I-131	2E-01 +/- 3.5E-01	3.5E-01	1.2E+00		
K-40	1.447E+01 +/- 3.1E-01	7.9E-01	4.2E-01		bc
La-140	3E-02 +/- 1.7E-01	1.7E-01	5.6E-01		
Mn-54	-9E-03 +/- 1.0E-02	1.0E-02	3.6E-02		
Nb-95	-3.7E-02 +/- 3.1E-02	3.1E-02	1.1E-01		
Ru-103	1.3E-02 +/- 1.7E-02	1.7E-02	5.8E-02		
Ru-106	-5.6E-02 +/- 9.6E-02	9.6E-02	3.3E-01		
Sb-124	2E-02 +/- 2.9E-02	2.9E-02	9.7E-02		
Sb-125	-3.2E-02 +/- 2.7E-02	2.7E-02	9.4E-02		
Se-75	-2E-02 +/- 1.4E-02	1.4E-02	4.7E-02		
Zn-65	3.6E-02 +/- 4.5E-02	4.5E-02	1.5E-01		
Zr-95	1.2E-01 +/- 1.0E-01	1.0E-01	3.3E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

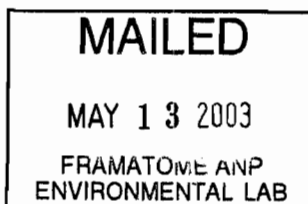
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/12/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/16/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

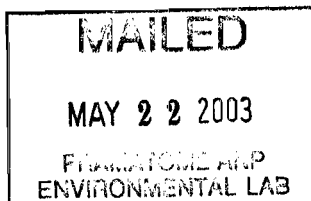
Lab. Sample No. L5348-04 Client ID BMA-E0200-129 REF-X19573 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/09/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	1.359E+00 +/- 3.8E-02	7.8E-02	1.4E-01		bc
Ag-108m	2.8E-03 +/- 7.6E-03	7.6E-03	2.5E-02		
Ag-110m	-1.6E-02 +/- 1.4E-02	1.4E-02	4.8E-02		
Ba-140	-5.1E-01 +/- 3.8E-01	3.8E-01	1.3E+00		
Be-7	1.2E-01 +/- 1.2E-01	1.2E-01	4.1E-01		
Ce-141	-1.9E-02 +/- 4.0E-02	4.0E-02	1.4E-01		
Ce-144	-4.3E-02 +/- 5.3E-02	5.3E-02	1.8E-01		
Co-57	1.18E-02 +/- 6.9E-03	6.9E-03	2.3E-02		
Co-58	1.8E-02 +/- 1.3E-02	1.3E-02	4.4E-02		
Co-60	1.6E-02 +/- 1.0E-02	1.0E-02	3.3E-02	3.8E-02	
Cr-51	4.6E-01 +/- 2.1E-01	2.1E-01	6.9E-01		
Cs-134	-2.1E-02 +/- 3.8E-02	3.8E-02	1.3E-01		
Cs-137	2.3E-01 +/- 1.5E-02	1.9E-02	4.1E-02	1.1E+00	bc
Fe-59	4E-03 +/- 3.6E-02	3.6E-02	1.2E-01		
I-131	-3.7E-01 +/- 3.9E-01	3.9E-01	1.3E+00		
K-40	1.773E+01 +/- 3.3E-01	9.5E-01	4.4E-01		bc
La-140	2.2E-01 +/- 1.7E-01	1.7E-01	5.8E-01		
Mn-54	4E-03 +/- 2.0E-02	2.0E-02	6.5E-02		
Nb-95	-6.9E-02 +/- 3.3E-02	3.4E-02	1.2E-01		
Ru-103	0E+00 +/- 1.9E-02	1.9E-02	6.4E-02		
Ru-106	0E+00 +/- 9.5E-02	9.5E-02	3.2E-01		
Sb-124	-8E-03 +/- 2.7E-02	2.7E-02	9.6E-02		
Sb-125	7.4E-02 +/- 2.5E-02	2.5E-02	8.1E-02		
Se-75	-3.3E-02 +/- 1.4E-02	1.4E-02	4.9E-02		
Zn-65	2.6E-02 +/- 4.8E-02	4.8E-02	1.6E-01		
Zr-95	-1.5E-01 +/- 1.7E-01	1.7E-01	5.8E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/21/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/16/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-05 Client ID BMA-E0200-135 REF-X19574 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/09/03 Matrix Soil

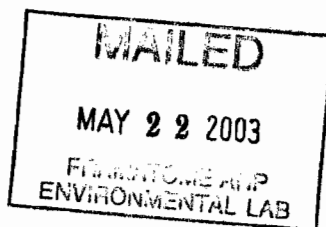
Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	6.43E-01 +/- 2.3E-02	4.0E-02	1.1E-01		bc
Ag-108m	-4.6E-03 +/- 4.7E-03	4.7E-03	1.6E-02		
Ag-110m	-2.3E-03 +/- 8.9E-03	8.9E-03	3.0E-02		
Ba-140	-1E-02 +/- 2.0E-01	2.0E-01	6.9E-01		
Be-7	2.76E-01 +/- 9.4E-02	9.5E-02	3.0E-01		c
Ce-141	-1.3E-02 +/- 2.1E-02	2.1E-02	7.1E-02		
Ce-144	-1E-03 +/- 3.0E-02	3.0E-02	9.9E-02		
Co-57	3.9E-03 +/- 3.7E-03	3.7E-03	1.2E-02		
Co-58	-5.1E-03 +/- 7.9E-03	7.9E-03	2.7E-02		
Co-60	3.4E-03 +/- 6.7E-03	6.7E-03	2.3E-02	3.8E-02	
Cr-51	-8E-02 +/- 1.3E-01	1.3E-01	4.3E-01		
Cs-134	-2.4E-02 +/- 2.4E-02	2.4E-02	8.0E-02		
Cs-137	3.56E-01 +/- 1.1E-02	2.1E-02	2.5E-02	1.1E+00	bc
Fe-59	3.4E-02 +/- 2.3E-02	2.3E-02	7.6E-02		
I-131	-1.4E-01 +/- 2.4E-01	2.4E-01	8.2E-01		
K-40	1.132E+01 +/- 2.1E-01	6.0E-01	3.4E-01		bc
La-140	2.5E-01 +/- 1.1E-01	1.1E-01	3.5E-01		
Mn-54	9.4E-03 +/- 6.3E-03	6.3E-03	2.1E-02		
Nb-95	-1.8E-02 +/- 2.1E-02	2.1E-02	6.9E-02		
Ru-103	-1.2E-02 +/- 1.1E-02	1.1E-02	3.7E-02		
Ru-106	8E-02 +/- 5.9E-02	5.9E-02	1.9E-01		
Sb-124	-3.1E-02 +/- 1.9E-02	1.9E-02	6.9E-02		
Sb-125	1E-03 +/- 1.5E-02	1.5E-02	5.1E-02		
Se-75	-5.1E-03 +/- 7.1E-03	7.1E-03	2.4E-02		
Zn-65	9E-03 +/- 3.2E-02	3.2E-02	1.1E-01		
Zr-95	-4.3E+00 +/- 1.5E+00	1.5E+00	4.8E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by
J.M. Raimondi 5/21/03
J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/16/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-06 Client ID BMA-E0200-180 REF-X19575 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/09/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	9.54E-01 +/- 2.5E-02	5.4E-02	1.0E-01		bc
Ag-108m	-7.5E-03 +/- 5.0E-03	5.0E-03	1.7E-02		
Ag-110m	9E-04 +/- 9.4E-03	9.4E-03	3.2E-02		
Ba-140	1.2E-01 +/- 2.5E-01	2.5E-01	8.2E-01		
Be-7	2.4E-02 +/- 8.3E-02	8.3E-02	2.8E-01		
Ce-141	1.7E-02 +/- 2.9E-02	2.9E-02	9.6E-02		
Ce-144	-3.5E-02 +/- 3.4E-02	3.4E-02	1.1E-01		
Co-57	2.4E-03 +/- 4.2E-03	4.2E-03	1.4E-02		
Co-58	5E-03 +/- 1.2E-02	1.2E-02	4.1E-02		
Co-60	1.28E-02 +/- 7.2E-03	7.3E-03	2.4E-02	3.8E-02	
Cr-51	-2.7E-01 +/- 1.4E-01	1.4E-01	4.7E-01		
Cs-134	-4E-04 +/- 6.6E-03	6.6E-03	2.2E-02		
Cs-137	1.994E-01 +/- 9.9E-03	1.4E-02	2.7E-02	1.1E+00	bc
Fe-59	-2.9E-02 +/- 2.4E-02	2.4E-02	8.3E-02		
I-131	-3.3E-01 +/- 2.6E-01	2.6E-01	9.0E-01		
K-40	1.408E+01 +/- 2.2E-01	7.4E-01	3.4E-01		bc
La-140	1.2E-01 +/- 1.2E-01	1.2E-01	3.9E-01		
Mn-54	-3.1E-03 +/- 7.2E-03	7.2E-03	2.4E-02		
Nb-95	1.2E-02 +/- 2.2E-02	2.2E-02	7.2E-02		
Ru-103	-2.1E-02 +/- 1.2E-02	1.2E-02	4.0E-02		
Ru-106	-1.3E-02 +/- 6.4E-02	6.4E-02	2.1E-01		
Sb-124	-6E-03 +/- 2.0E-02	2.0E-02	6.8E-02		
Sb-125	3.5E-02 +/- 1.6E-02	1.6E-02	5.4E-02		
Se-75	-2.65E-02 +/- 9.5E-03	9.6E-03	3.2E-02		
Zn-65	2.2E-02 +/- 3.2E-02	3.2E-02	1.0E-01		
Zr-95	-3E-02 +/- 1.2E-01	1.2E-01	4.0E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

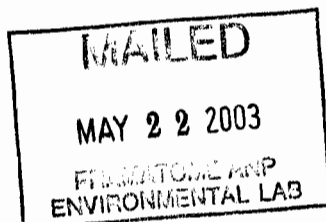
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/21/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/22/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-07 Client ID BMA-E0200-260 REF-X19576 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/16/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	9.69E-01 +/- 3.0E-02	5.7E-02	1.2E-01		bc
Ag-108m	4E-04 +/- 6.6E-03	6.6E-03	2.2E-02		
Ag-110m	-1.1E-02 +/- 1.0E-02	1.0E-02	3.6E-02		
Ba-140	2.7E-01 +/- 4.0E-01	4.0E-01	1.3E+00		
Be-7	-6E-02 +/- 1.1E-01	1.1E-01	3.9E-01		
Ce-141	2.6E-02 +/- 2.9E-02	2.9E-02	9.7E-02		
Ce-144	-3E-02 +/- 4.8E-02	4.8E-02	1.6E-01		
Co-57	-7.6E-03 +/- 6.0E-03	6.0E-03	2.0E-02		
Co-58	8E-03 +/- 1.0E-02	1.0E-02	3.5E-02		
Co-60	6.1E-03 +/- 7.8E-03	7.8E-03	2.6E-02	3.8E-02	
Cr-51	2.4E-01 +/- 2.1E-01	2.1E-01	7.1E-01		
Cs-134	-1.9E-02 +/- 2.8E-02	2.8E-02	9.2E-02		
Cs-137	4.29E-01 +/- 1.4E-02	2.6E-02	3.2E-02	1.1E+00	bc
Fe-59	3.2E-02 +/- 3.2E-02	3.2E-02	1.1E-01		
I-131	-4.7E-01 +/- 6.1E-01	6.1E-01	2.1E+00		
K-40	1.373E+01 +/- 2.5E-01	7.3E-01	3.2E-01		bc
La-140	-2.6E-01 +/- 2.2E-01	2.2E-01	7.5E-01		
Mn-54	3.1E-03 +/- 8.4E-03	8.5E-03	2.8E-02		
Nb-95	5E-03 +/- 2.5E-02	2.5E-02	8.3E-02		
Ru-103	3E-03 +/- 1.5E-02	1.5E-02	5.2E-02		
Ru-106	-2E-02 +/- 7.4E-02	7.4E-02	2.5E-01		
Sb-124	3.2E-02 +/- 2.3E-02	2.4E-02	7.8E-02		
Sb-125	6E-03 +/- 2.1E-02	2.1E-02	7.0E-02		
Se-75	3E-03 +/- 1.1E-02	1.1E-02	3.8E-02		
Zn-65	6.1E-02 +/- 3.6E-02	3.6E-02	1.2E-01		
Zr-95	8E-02 +/- 1.1E-01	1.1E-01	3.6E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

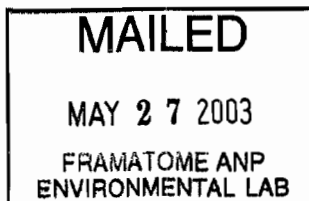
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/27/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/16/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-08 Client ID BMA-E0200-281 REF-X19577 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/09/03 Matrix Soil

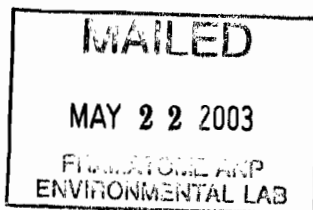
Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	1.079E+00 +/- 3.4E-02	6.4E-02	1.3E-01		bc
Ag-108m	7E-04 +/- 7.8E-03	7.8E-03	2.6E-02		
Ag-110m	-5E-03 +/- 1.2E-02	1.2E-02	4.0E-02		
Ba-140	4.1E-01 +/- 3.2E-01	3.2E-01	1.1E+00		
Be-7	-7E-02 +/- 1.2E-01	1.2E-01	4.1E-01		
Ce-141	6.5E-02 +/- 2.9E-02	2.9E-02	9.4E-02		
Ce-144	-2.3E-02 +/- 5.4E-02	5.4E-02	1.8E-01		
Co-57	1.35E-02 +/- 6.7E-03	6.7E-03	2.2E-02		
Co-58	7E-03 +/- 1.2E-02	1.2E-02	3.9E-02		
Co-60	1.44E-02 +/- 9.1E-03	9.1E-03	3.0E-02	3.8E-02	
Cr-51	-9E-02 +/- 2.1E-01	2.1E-01	7.0E-01		
Cs-134	-5.8E-03 +/- 7.9E-03	7.9E-03	2.7E-02		
Cs-137	3.84E-01 +/- 1.6E-02	2.5E-02	3.7E-02	1.1E+00	bc
Fe-59	-1.3E-02 +/- 3.3E-02	3.3E-02	1.1E-01		
I-131	6.6E-01 +/- 3.8E-01	3.8E-01	1.2E+00		
K-40	1.519E+01 +/- 2.9E-01	8.1E-01	3.7E-01		bc
La-140	-6E-02 +/- 1.7E-01	1.7E-01	5.7E-01		
Mn-54	-1.5E-03 +/- 9.0E-03	9.0E-03	3.1E-02		
Nb-95	3.7E-02 +/- 3.0E-02	3.0E-02	9.9E-02		
Ru-103	1.4E-02 +/- 1.6E-02	1.6E-02	5.2E-02		
Ru-106	-6.2E-02 +/- 8.9E-02	8.9E-02	3.0E-01		
Sb-124	-2.1E-02 +/- 2.8E-02	2.8E-02	1.0E-01		
Sb-125	-4.6E-02 +/- 2.5E-02	2.5E-02	8.6E-02		
Se-75	-2.2E-02 +/- 1.2E-02	1.2E-02	4.2E-02		
Zn-65	-8.7E-02 +/- 4.3E-02	4.3E-02	1.5E-01		
Zr-95	-1.02E+01 +/- 2.8E+00	2.9E+00	9.4E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by
J.M. Raimondi 5/21/03
J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/22/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-09 Client ID BMA-E0200-362 REF-X19578
Reference Date 03/26/03 Analysis Date 05/16/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	7.66E-01 +/- 2.9E-02	4.8E-02	1.2E-01		bc
Ag-108m	-1.12E-02 +/- 5.9E-03	5.9E-03	2.1E-02		
Ag-110m	-1.5E-02 +/- 1.1E-02	1.1E-02	3.9E-02		
Ba-140	-1.4E-01 +/- 4.3E-01	4.3E-01	1.5E+00		
Be-7	1.7E-01 +/- 1.0E-01	1.0E-01	3.4E-01		
Ce-141	-1.1E-02 +/- 2.5E-02	2.5E-02	8.4E-02		
Ce-144	-1.22E-01 +/- 4.2E-02	4.2E-02	1.5E-01		
Co-57	4.2E-03 +/- 5.3E-03	5.3E-03	1.8E-02		
Co-58	-2E-03 +/- 1.1E-02	1.1E-02	3.7E-02		
Co-60	5.1E-03 +/- 7.7E-03	7.7E-03	2.6E-02	3.8E-02	
Cr-51	-1.5E-01 +/- 1.9E-01	1.9E-01	6.5E-01		
Cs-134	-5.7E-02 +/- 2.8E-02	2.8E-02	9.4E-02		
Cs-137	1.87E-01 +/- 1.2E-02	1.5E-02	3.1E-02	1.1E+00	bc
Fe-59	-3.4E-02 +/- 3.2E-02	3.2E-02	1.1E-01		
I-131	3.4E-01 +/- 5.4E-01	5.4E-01	1.8E+00		
K-40	1.434E+01 +/- 2.7E-01	7.7E-01	3.6E-01		bc
La-140	3.2E-01 +/- 1.9E-01	1.9E-01	6.3E-01		
Mn-54	4.3E-03 +/- 8.3E-03	8.3E-03	2.8E-02		
Nb-95	3.7E-02 +/- 2.8E-02	2.8E-02	9.3E-02		
Ru-103	1.5E-02 +/- 1.6E-02	1.6E-02	5.5E-02		
Ru-106	4.8E-02 +/- 7.2E-02	7.2E-02	2.4E-01		
Sb-124	2E-02 +/- 2.1E-02	2.1E-02	7.0E-02		
Sb-125	3E-03 +/- 2.0E-02	2.0E-02	6.8E-02		
Se-75	-1.7E-02 +/- 1.1E-02	1.1E-02	3.9E-02		
Zn-65	3.2E-02 +/- 3.3E-02	3.3E-02	1.1E-01		
Zr-95	-4E+00 +/- 2.3E+00	2.3E+00	7.4E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/27/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/22/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-10 Client ID BMA-E0200-371 REF-X19579 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/16/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	8.84E-01 +/- 2.9E-02	5.3E-02	1.1E-01		bc
Ag-108m	2.6E-03 +/- 6.0E-03	6.0E-03	2.0E-02		
Ag-110m	1E-03 +/- 1.1E-02	1.1E-02	3.6E-02		
Ba-140	1.6E-01 +/- 3.9E-01	3.9E-01	1.3E+00		
Be-7	1E-01 +/- 1.2E-01	1.2E-01	4.0E-01		
Ce-141	2.1E-02 +/- 2.8E-02	2.8E-02	9.3E-02		
Ce-144	1E-02 +/- 8.5E-02	8.5E-02	2.8E-01		
Co-57	7E-04 +/- 5.9E-03	5.9E-03	2.0E-02		
Co-58	-1.2E-02 +/- 1.1E-02	1.1E-02	3.9E-02		
Co-60	7.6E-03 +/- 7.5E-03	7.5E-03	2.5E-02	3.8E-02	
Cr-51	-1.2E-01 +/- 1.9E-01	1.9E-01	6.5E-01		
Cs-134	4E-03 +/- 2.8E-02	2.8E-02	9.2E-02		
Cs-137	2.2E-01 +/- 1.2E-02	1.6E-02	3.0E-02	1.1E+00	bc
Fe-59	-1.2E-02 +/- 3.1E-02	3.1E-02	1.1E-01		
I-131	1.33E+00 +/- 5.6E-01	5.7E-01	1.8E+00		
K-40	1.241E+01 +/- 2.5E-01	6.7E-01	3.3E-01		bc
La-140	1.9E-01 +/- 2.1E-01	2.1E-01	7.0E-01		
Mn-54	6E-03 +/- 8.0E-03	8.0E-03	2.7E-02		
Nb-95	6.9E-02 +/- 2.6E-02	2.6E-02	8.3E-02		
Ru-103	-2E-03 +/- 1.7E-02	1.7E-02	5.7E-02		
Ru-106	-7.1E-02 +/- 7.1E-02	7.1E-02	2.5E-01		
Sb-124	4.8E-02 +/- 2.5E-02	2.5E-02	8.0E-02		
Sb-125	-6E-03 +/- 1.9E-02	1.9E-02	6.4E-02		
Se-75	-1.8E-02 +/- 1.1E-02	1.1E-02	3.8E-02		
Zn-65	7.9E-02 +/- 3.7E-02	3.7E-02	1.2E-01		
Zr-95	-1.25E+01 +/- 2.7E+00	2.8E+00	9.0E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

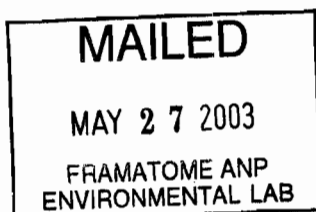
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/27/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/12/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-11 Client ID BMA-E0200-402 REF-X19580
Reference Date 03/26/03 Analysis Date 05/07/03

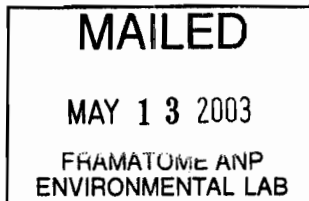
Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	6.04E-01 +/- 3.0E-02	4.3E-02	1.1E-01		bc
Ag-108m	-5.7E-03 +/- 6.5E-03	6.5E-03	2.2E-02		
Ag-110m	-1E-03 +/- 1.2E-02	1.2E-02	4.1E-02		
Ba-140	2.8E-01 +/- 2.7E-01	2.7E-01	9.0E-01		
Be-7	1.12E-01 +/- 9.6E-02	9.6E-02	3.2E-01		
Ce-141	-5E-02 +/- 2.2E-02	2.2E-02	7.5E-02		
Ce-144	6E-03 +/- 4.2E-02	4.2E-02	1.4E-01		
Co-57	1.6E-03 +/- 5.4E-03	5.4E-03	1.8E-02		
Co-58	-8E-03 +/- 1.0E-02	1.0E-02	3.7E-02		
Co-60	-6.9E-03 +/- 9.0E-03	9.0E-03	3.2E-02	3.8E-02	
Cr-51	1.7E-01 +/- 1.6E-01	1.6E-01	5.3E-01		
Cs-134	3.1E-02 +/- 3.1E-02	3.1E-02	1.0E-01		
Cs-137	4.9E-02 +/- 1.0E-02	1.1E-02	3.2E-02	1.1E+00	bc
Fe-59	-2E-03 +/- 2.9E-02	2.9E-02	1.0E-01		
I-131	4E-02 +/- 2.7E-01	2.7E-01	9.0E-01		
K-40	1.494E+01 +/- 3.1E-01	8.1E-01	3.8E-01		bc
La-140	1.1E-01 +/- 1.3E-01	1.3E-01	4.2E-01		
Mn-54	1.4E-02 +/- 9.3E-03	9.3E-03	3.1E-02		
Nb-95	-1.1E-02 +/- 2.3E-02	2.3E-02	7.8E-02		
Ru-103	-5E-03 +/- 1.4E-02	1.4E-02	4.9E-02		
Ru-106	9.9E-02 +/- 8.0E-02	8.0E-02	2.7E-01		
Sb-124	-1.5E-02 +/- 2.3E-02	2.3E-02	8.5E-02		
Sb-125	2.4E-02 +/- 2.1E-02	2.1E-02	6.9E-02		
Se-75	-2E-03 +/- 1.1E-02	1.1E-02	3.8E-02		
Zn-65	2.3E-02 +/- 4.1E-02	4.1E-02	1.4E-01		
Zr-95	-4.3E+00 +/- 2.2E+00	2.2E+00	7.2E+00		

- Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/12/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/16/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-12 Client ID BMA-E0200-552 REF-X19581
Reference Date 03/26/03 Analysis Date 05/09/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	5.37E-01 +/- 3.1E-02	4.1E-02	1.3E-01		bc
Ag-108m	-3E-03 +/- 7.6E-03	7.6E-03	2.6E-02		
Ag-110m	8E-03 +/- 1.2E-02	1.2E-02	4.1E-02		
Ba-140	3.3E-01 +/- 3.1E-01	3.1E-01	6.4E-01		
Be-7	2.3E-01 +/- 1.2E-01	1.2E-01	3.8E-01		
Ce-141	5E-03 +/- 2.7E-02	2.7E-02	9.1E-02		
Ce-144	1E-03 +/- 4.4E-02	4.4E-02	1.5E-01		
Co-57	-2.2E-03 +/- 6.4E-03	6.4E-03	2.2E-02		
Co-58	-5E-03 +/- 1.2E-02	1.2E-02	4.0E-02		
Co-60	2.9E-03 +/- 8.2E-03	8.2E-03	2.8E-02	3.8E-02	
Cr-51	-9E-02 +/- 1.8E-01	1.8E-01	6.2E-01		
Cs-134	7.9E-03 +/- 9.0E-03	9.0E-03	3.0E-02		
Cs-137	7.1E-02 +/- 1.1E-02	1.2E-02	3.5E-02	1.1E+00	bc
Fe-59	1.5E-02 +/- 3.3E-02	3.3E-02	1.1E-01		
I-131	-3.5E-01 +/- 3.4E-01	3.4E-01	1.2E+00		
K-40	1.494E+01 +/- 2.9E-01	8.0E-01	4.0E-01		bc
La-140	-1.6E-01 +/- 1.7E-01	1.7E-01	5.7E-01		
Mn-54	1.9E-03 +/- 9.4E-03	9.4E-03	3.2E-02		
Nb-95	3.5E-02 +/- 2.0E-02	2.0E-02	6.5E-02		
Ru-103	8E-03 +/- 1.6E-02	1.6E-02	5.5E-02		
Ru-106	1.8E-02 +/- 8.3E-02	8.3E-02	2.8E-01		
Sb-124	2E-02 +/- 2.4E-02	2.4E-02	8.1E-02		
Sb-125	1.4E-02 +/- 2.1E-02	2.1E-02	7.0E-02		
Se-75	1.6E-02 +/- 1.2E-02	1.2E-02	4.1E-02		
Zn-65	4.7E-02 +/- 3.9E-02	3.9E-02	1.3E-01		
Zr-95	-9.8E-02 +/- 4.2E-02	4.2E-02	1.5E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

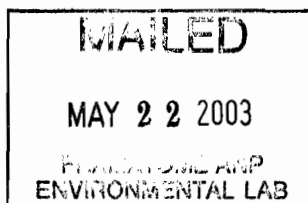
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/21/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/12/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

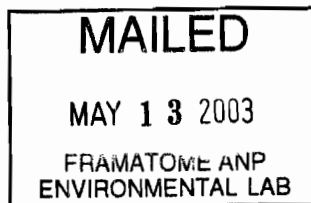
Lab. Sample No. L5348-13 Client ID BMA-E0200-592 REF-X19582 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/07/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	4.88E-01 +/- 3.1E-02	3.9E-02	1.2E-01		bc
Ag-108m	-1.01E-02 +/- 6.1E-03	6.2E-03	2.2E-02		
Ag-110m	6E-03 +/- 1.2E-02	1.2E-02	4.1E-02		
Ba-140	-2E-02 +/- 2.2E-01	2.2E-01	7.7E-01		
Be-7	-4E-03 +/- 9.5E-02	9.5E-02	3.2E-01		
Ce-141	-3E-03 +/- 2.1E-02	2.1E-02	7.1E-02		
Ce-144	2.6E-02 +/- 3.9E-02	3.9E-02	1.3E-01		
Co-57	2.1E-03 +/- 5.0E-03	5.0E-03	1.7E-02		
Co-58	-1.9E-02 +/- 1.1E-02	1.1E-02	3.9E-02		
Co-60	5E-04 +/- 9.0E-03	9.0E-03	3.1E-02	3.8E-02	
Cr-51	2.2E-01 +/- 1.5E-01	1.5E-01	5.0E-01		
Cs-134	3.6E-02 +/- 3.3E-02	3.3E-02	1.1E-01		
Cs-137	3.1E-02 +/- 1.1E-02	1.1E-02	3.6E-02	1.1E+00	c
Fe-59	-2.8E-02 +/- 3.4E-02	3.4E-02	1.2E-01		
I-131	1.1E-01 +/- 2.7E-01	2.7E-01	9.1E-01		
K-40	1.475E+01 +/- 3.3E-01	8.1E-01	3.9E-01		bc
La-140	2.5E-01 +/- 1.2E-01	1.2E-01	3.9E-01		
Mn-54	3.4E-03 +/- 8.2E-03	8.2E-03	2.8E-02		
Nb-95	4E-03 +/- 1.8E-02	1.8E-02	6.0E-02		
Ru-103	-1.3E-02 +/- 1.4E-02	1.4E-02	4.8E-02		
Ru-106	-1.99E-01 +/- 8.1E-02	8.2E-02	2.9E-01		
Sb-124	-3.9E-02 +/- 2.5E-02	2.5E-02	9.6E-02		
Sb-125	1.7E-02 +/- 2.0E-02	2.0E-02	6.5E-02		
Se-75	7.8E-03 +/- 9.5E-03	9.5E-03	3.2E-02		
Zn-65	-2.2E-02 +/- 4.3E-02	4.3E-02	1.5E-01		
Zr-95	-2.8E-02 +/- 4.3E-02	4.3E-02	1.5E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:



Approved by
J.M. Raimondi 5/12/03
J.M. Raimondi
Sample Control Manager

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/22/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-14 Client ID BMA-E0200-658 REF-X19583 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/16/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	5.33E-01 +/- 2.8E-02	3.9E-02	1.3E-01		bc
Ag-108m	-4.2E-03 +/- 5.7E-03	5.7E-03	2.0E-02		
Ag-110m	8E-03 +/- 1.1E-02	1.1E-02	3.8E-02		
Ba-140	2.7E-01 +/- 3.4E-01	3.4E-01	1.1E+00		
Be-7	-1.1E-01 +/- 1.0E-01	1.0E-01	3.5E-01		
Ce-141	8E-03 +/- 2.5E-02	2.5E-02	8.3E-02		
Ce-144	-2.6E-02 +/- 3.7E-02	3.7E-02	1.2E-01		
Co-57	3E-04 +/- 4.6E-03	4.6E-03	1.6E-02		
Co-58	-2.2E-02 +/- 1.0E-02	1.0E-02	3.7E-02		
Co-60	8.1E-03 +/- 7.8E-03	7.8E-03	2.6E-02	3.8E-02	
Cr-51	-2E-02 +/- 1.7E-01	1.7E-01	5.9E-01		
Cs-134	4.8E-02 +/- 3.2E-02	3.2E-02	1.0E-01		
Cs-137	2.19E-02 +/- 9.3E-03	9.4E-03	3.0E-02	1.1E+00	c
Fe-59	-2.3E-02 +/- 3.1E-02	3.1E-02	1.1E-01		
I-131	-6.7E-01 +/- 5.1E-01	5.1E-01	1.8E+00		
K-40	1.251E+01 +/- 2.8E-01	6.9E-01	3.7E-01		bc
La-140	2.1E-01 +/- 1.8E-01	1.8E-01	6.0E-01		
Mn-54	8.3E-03 +/- 7.7E-03	7.7E-03	2.6E-02		
Nb-95	2.3E-02 +/- 1.9E-02	1.9E-02	6.3E-02		
Ru-103	-1.7E-02 +/- 1.5E-02	1.5E-02	5.1E-02		
Ru-106	-1.07E-01 +/- 7.1E-02	7.1E-02	2.5E-01		
Sb-124	-2.4E-02 +/- 2.6E-02	2.6E-02	9.6E-02		
Sb-125	-6E-03 +/- 1.9E-02	1.9E-02	6.4E-02		
Se-75	-1.74E-02 +/- 9.1E-03	9.1E-03	3.2E-02		
Zn-65	4.2E-02 +/- 3.8E-02	3.8E-02	1.3E-01		
Zr-95	-8.6E+00 +/- 2.9E+00	2.9E+00	9.5E+00		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

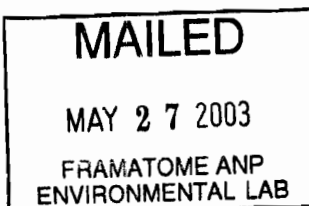
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/27/03

J.M. Raimondi
Sample Control Manager



Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/27/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-15 **Client ID** BMA-E0200-693 REF-X19584
Reference Date 03/26/03 **Analysis Date** 05/22/03

Product GAMMA SPECTROMETRY
Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)		TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.7E-01	+/- 2.7E-02	3.3E-02	1.1E-01		bc
Ag-108m	0E+00	+/- 5.5E-03	5.5E-03	1.9E-02		
Ag-110m	-1E-03	+/- 1.1E-02	1.1E-02	3.7E-02		
Ba-140	9.4E-01	+/- 5.3E-01	5.3E-01	1.7E+00		
Be-7	-2E-02	+/- 1.0E-01	1.0E-01	3.4E-01		
Ce-141	1.2E-02	+/- 3.0E-02	3.0E-02	9.9E-02		
Ce-144	-4.7E-02	+/- 3.9E-02	3.9E-02	1.3E-01		
Co-57	1.8E-03	+/- 5.0E-03	5.0E-03	1.7E-02		
Co-58	-1.7E-02	+/- 1.1E-02	1.1E-02	4.0E-02		
Co-60	1.51E-02	+/- 8.0E-03	8.0E-03	2.6E-02	3.8E-02	
Cr-51	2.6E-01	+/- 2.0E-01	2.0E-01	6.7E-01		
Cs-134	-5E-03	+/- 2.6E-02	2.6E-02	8.8E-02		
Cs-137	3E-02	+/- 6.1E-03	6.3E-03	1.8E-02	1.1E+00	bc
Fe-59	2.7E-02	+/- 3.5E-02	3.5E-02	1.2E-01		
I-131	-2.6E-01	+/- 8.2E-01	8.2E-01	2.8E+00		
K-40	1.793E+01	+/- 2.9E-01	9.4E-01	3.1E-01		bc
La-140	2.5E-01	+/- 2.3E-01	2.3E-01	7.7E-01		
Mn-54	9.8E-03	+/- 8.0E-03	8.0E-03	2.6E-02		
Nb-95	-2E-03	+/- 2.0E-02	2.0E-02	6.8E-02		
Ru-103	1.6E-02	+/- 1.8E-02	1.8E-02	6.0E-02		
Ru-106	-1E-03	+/- 7.0E-02	7.0E-02	2.4E-01		
Sb-124	1.8E-02	+/- 2.0E-02	2.0E-02	6.9E-02		
Sb-125	-4E-03	+/- 1.8E-02	1.8E-02	6.3E-02		
Se-75	-8E-03	+/- 1.1E-02	1.1E-02	3.7E-02		
Zn-65	-3E-02	+/- 3.3E-02	3.3E-02	1.1E-01		
Zr-95	-5.8E-02	+/- 3.9E-02	3.9E-02	1.4E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/27/03

J.M. Raimondi

Sample Control Manager

MAILED

MAY 27 2003

FRAMATOME ANP
ENVIRONMENTAL LAB

Environmental Laboratory Analysis Report

29 Research Drive
Westboro, MA 01581
508-898-9970

Customer Duratek Inc
Attention Paul Ely

Report Date 05/22/03
Receipt Date 04/17/03

Duratek Inc
c/o Bristol Meyers Squibb
Bldg 115, One Squibb Drive
New Brunswick, NJ 08903

Lab. Sample No. L5348-16 Client ID BMA-E0200-726 REF-X19585 Product GAMMA SPECTROMETRY
Reference Date 03/26/03 Analysis Date 05/16/03 Matrix Soil

Nuclide	Activity Concentration +/- 1 - Sigma (pCi/g)	TPU 1 Sigma (pCi/g)	Measured MDC (pCi/g)	Required MDC (pCi/g)	Flags
AcTh-228	3.8E-01 +/- 2.7E-02	3.3E-02	1.2E-01		bc
Ag-108m	-6.8E-03 +/- 5.5E-03	5.5E-03	1.9E-02		
Ag-110m	-1E-03 +/- 1.2E-02	1.2E-02	3.9E-02		
Ba-140	-5E-02 +/- 3.9E-01	3.9E-01	1.3E+00		
Be-7	1.61E-01 +/- 9.4E-02	9.5E-02	3.1E-01		
Ce-141	7E-03 +/- 1.9E-02	1.9E-02	6.4E-02		
Ce-144	-1.7E-02 +/- 3.6E-02	3.6E-02	1.2E-01		
Co-57	-8E-03 +/- 4.5E-03	4.5E-03	1.6E-02		
Co-58	-1.31E-02 +/- 9.8E-03	9.8E-03	3.5E-02		
Co-60	-2.2E-03 +/- 8.1E-03	8.1E-03	2.8E-02	3.8E-02	
Cr-51	-3E-02 +/- 1.7E-01	1.7E-01	5.8E-01		
Cs-134	-9.4E-03 +/- 7.5E-03	7.5E-03	2.6E-02		
Cs-137	1.92E-02 +/- 7.5E-03	7.6E-03	2.4E-02	1.1E+00	
Fe-59	2.7E-02 +/- 3.2E-02	3.2E-02	1.1E-01		
I-131	1E-01 +/- 5.1E-01	5.1E-01	1.7E+00		
K-40	1.91E+01 +/- 3.1E-01	1.0E+00	3.4E-01		bc
La-140	2.7E-01 +/- 1.9E-01	1.9E-01	6.1E-01		
Mn-54	6.2E-03 +/- 8.1E-03	8.1E-03	2.7E-02		
Nb-95	-2.2E-02 +/- 2.0E-02	2.0E-02	6.9E-02		
Ru-103	-2E-03 +/- 1.4E-02	1.4E-02	4.7E-02		
Ru-106	0E+00 +/- 6.8E-02	6.8E-02	2.3E-01		
Sb-124	3.4E-02 +/- 2.1E-02	2.1E-02	6.8E-02		
Sb-125	6E-03 +/- 1.7E-02	1.7E-02	5.9E-02		
Se-75	-1.7E-02 +/- 1.0E-02	1.1E-02	3.6E-02		
Zn-65	1.8E-02 +/- 3.7E-02	3.7E-02	1.2E-01		
Zr-95	-3.3E-02 +/- 3.7E-02	3.7E-02	1.3E-01		

Flags: a The measured MDC is greater than the required MDC
b The activity concentration is greater than three times its one sigma counting uncertainty.
c Peak was found

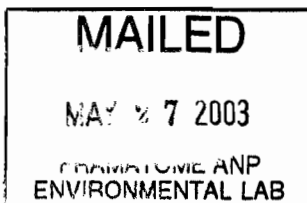
Reporting Level Ratio:

c:

Approved by

J.M. Raimondi 5/27/03

J.M. Raimondi
Sample Control Manager



GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-01 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-21 REF-X19570
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG 5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 96.3 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9224

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/7/03 1731 Det No.: 5 Spectrum No.: 1277205
Counted by: [Signature]
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5348-01	Product : GAMMA SPECTROMETRY
Client Id : BMA-E0200-21	Matrix : S001 Soil
Site : REF-X19570	
Comments :	
Client : 00435 Duratek Inc	
Project : OTHER ENVIRON-DUR	
Start Date :	
Collect Date : 03/26/03 12:00	

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	96.3		
Sample Weight-Dry	g			
Aliquot Weight	g	96.3		
FINAL WEIGHT	kg	.0963		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-01

Sample ID: SOIL/SEDI Duratek Inc

Code: 1277205

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:30:59
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 56818 Sec
 Sample Size 9.63E-002 kg | Real Time 56867 Sec
 Collection Efficiency 1.0000 | Spc. File 1277205.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Energy(keV)= 0.60 + 0.661*Ch + -1.07E-07*Ch^2 + 4.75E-11*Ch^3 05/07/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.11	77.89	-15526	712	1189	17822	222.48	NET< CL Wide Pk
2	63.95	95.81	236	44	68	1015	0.95	a
3	66.72	100.00	28	34	56	762	0.57	b NET< CL
4	75.46	113.21	995	65	94	1624	1.25	a
5	77.77	116.70	1530	63	82	1353	1.05	b
6	84.84	127.40	254	47	73	1084	1.18	a
7	87.90	132.03	543	50	73	1084	1.06	b
8	90.54	136.02	386	49	73	1084	1.12	c
9	93.50	140.50	1142	67	94	1518	1.51	d
10	129.60	195.09	128	54	87	1306	1.06	
11	140.48	211.55	108	42	67	898	1.02	a
12	144.59	217.76	151	59	95	1436	1.66	b
13	154.60	232.90	37	58	96	1445	0.39	NET< CL
14	186.52	281.18	824	58	83	1172	1.37	
15	197.89	298.38	83	40	64	830	1.10	a
16	199.22	300.39	67	29	45	498	0.62	b
17	209.79	316.37	79	51	83	1185	0.44	NET< CL
18	236.86	357.31	70	26	41	405	0.66	a
19	239.26	360.95	3010	68	66	809	1.24	b
20	242.19	365.37	674	48	66	809	1.38	c
21	270.71	408.52	211	44	68	799	1.66	
22	278.02	419.57	15	42	69	820	0.22	NET< CL
23	295.84	446.52	905	43	52	538	1.19	a
24	300.75	453.94	193	34	52	538	1.10	b
25	328.44	495.83	218	47	74	814	1.87	Wide Pk
26	338.87	511.61	562	48	68	727	1.35	
27	352.56	532.30	1658	59	70	734	1.58	

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	410.72	620.28	90	41	65	632	1.66	
29	463.58	700.22	172	35	54	463	1.29	
30	511.62	772.88	1603	55	62	570	2.52	Wide Pk
31	559.07	844.65	23	26	42	296	0.80	NET< CL
32	570.28	861.60	26	24	39	275	0.77	NET< CL
33	583.84	882.11	911	44	53	417	1.44	
34	609.94	921.58	1246	46	49	384	1.62	
35	662.30	1000.78	857	40	46	368	1.58	
36	727.76	1099.79	162	31	47	362	1.56	
37	768.35	1161.17	114	30	46	342	1.78	
38	786.76	1189.02	39	25	39	270	1.79	NET< CL
39	795.56	1202.32	108	23	33	218	1.51	a
40	803.46	1214.28	42	19	30	187	1.19	b
41	860.87	1301.10	68	27	42	294	1.39	
42	911.78	1378.09	575	35	42	279	1.69	
43	934.48	1412.42	40	24	39	245	0.98	
44	965.46	1459.29	93	19	26	148	1.25	a
45	969.58	1465.52	352	27	33	197	1.70	b
46	1001.49	1513.77	30	23	36	218	1.38	NET< CL
47	1120.71	1694.05	259	29	39	234	2.04	
48	1238.51	1872.19	92	28	43	278	2.10	
49	1378.27	2083.50	46	14	20	83	1.47	a
50	1386.23	2095.53	17	10	16	60	1.03	b
51	1407.99	2128.44	23	20	31	157	1.58	NET< CL
52	1461.43	2209.23	2408	52	29	133	2.19	
53	1588.45	2401.24	19	17	27	125	0.99	NET< CL
54	1622.65	2452.94	16	17	26	108	1.19	NET< CL
55	1765.15	2668.32	211	20	23	89	2.31	
56	1847.80	2793.22	16	14	22	81	1.04	NET< CL
57	2118.68	3202.47	14	13	21	74	1.09	NET< CL
58	2204.95	3332.78	67	15	21	75	2.09	
59	2615.31	3952.32	405	21	12	23	3.01	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	52.11	-15526	712	1189	-8601	757	1254	NET<CL
2	63.95	236	44	68	83	48	78	
3	66.72	28	34	56	-3	38	62	NET<CL
4	75.46	995	65	94	862	70	105	
5	77.77	1530	63	82	1452	65	88	
6	84.84	254	47	73	181	50	79	
7	87.90	543	50	73	476	54	80	
9	93.50	1142	67	94	683	70	107	
11	140.48	108	42	67	8	47	78	NET<CL
12	144.59	151	59	95	72	62	101	NET<CL
14	186.52	825	58	83	516	62	95	
15	197.89	83	40	64	-90	45	76	NET<CL
17	209.79	79	51	83	44	54	88	NET<CL
19	239.26	3010	68	66	2841	71	77	
23	295.84	905	43	52	798	48	64	
26	338.87	562	48	68	562	50	72	
27	352.56	1659	59	70	1448	62	81	
30	511.62	1603	55	62	271	61	96	
31	559.07	23	26	42	-20	30	49	NET<CL
32	570.28	26	24	39	-6	28	46	NET<CL
33	583.84	911	44	53	836	47	61	
34	609.94	1246	46	49	1107	49	59	
36	727.76	163	31	47	142	33	51	
40	803.46	42	19	30	-13	23	38	NET<CL
41	860.87	68	27	42	67	29	46	
42	911.78	575	35	42	503	37	48	
45	969.58	352	27	33	325	29	38	
46	1001.49	30	23	36	-3	25	42	NET<CL
47	1120.71	259	29	39	233	30	43	
52	1461.43	2408	52	29	2293	53	38	
53	1588.45	19	17	27	21	18	29	NET<CL
55	1765.15	211	20	23	180	22	28	
56	1847.80	16	14	22	14	16	26	NET<CL
59	2615.31	405	21	12	313	23	23	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG

2	63.95	83	Th-234	83	2 of	2	100.00	1.50
4	75.46	862	Pb-212	553	5 of	6	99.30	0.99
			Pb-214	254	5 of	7	98.65	0.99
			Tl-208	52	6 of	9	95.51	0.96
5	77.77	467	Pb-214	455	5 of	7	98.65	0.99 Split
62	77.77	985	Pb-212	985	5 of	6	99.30	0.99 AutoAdd
6	84.84	181	Tl-208	29	6 of	9	95.51	0.96
7	87.90	476	Pb-212	536	5 of	6	100.00	1.50
			Cd-109	. . . . .	1 of	1	100.00	1.50
8	90.54	386	Unknown	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
9	93.50	445	AcTh-228	214	10 of	36	76.84	0.77 Split
61	93.50	238	Th-234	238	2 of	2	100.00	1.50 AutoAdd
10	129.60	129	AcTh-228	201	10 of	36	89.22	1.39
14	186.52	516	Ra-226	. . . . .	1 of	1	100.00	1.50
			U-235	. . . . .	1 of	3	83.72	0.84
16	199.22	67	Unknown	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
18	236.86	70	Unknown	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
19	239.26	2841	Pb-212	4102	5 of	6	100.00	1.00
20	242.19	674	Pb-214	372	5 of	7	98.65	0.99
			La-140	. . . . .	1 of	15	0.40	0.00 LowScore
21	270.71	211	AcTh-228	176	10 of	36	83.61	1.34
23	295.84	798	Pb-214	. . . . .	5 of	7	100.00	1.00
24	300.75	193	Pb-212	184	5 of	6	100.00	1.50
25	328.44	219	AcTh-228	136	10 of	36	79.98	1.30
			Bi-212	3	2 of	13	59.32	0.59 LowScore
			La-140	25883	2 of	15	23.26	0.23 LowScore
26	338.87	562	AcTh-228	461	10 of	36	83.61	1.34
27	352.56	1448	Pb-214	2567	5 of	7	100.00	1.00
28	410.72	91	Unknown	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
29	463.58	172	AcTh-228	146	10 of	36	83.61	1.34
			Sb-125	. . . . .	1 of	8	12.82	0.13 LowScore
30	511.62	39	Annul	. . . . .	1 of	1	100.00	1.50 Split
60	511.62	232	Tl-208	232	6 of	9	97.04	1.47 AutoAdd
33	583.84	836	Tl-208	805	6 of	9	97.04	1.47
34	609.94	1107	Bi-214	1152	9 of	33	91.20	1.41
			Ru-103	. . . . .	1 of	2	5.92	0.06 LowScore
			1121SEsc	. . . . .	0 of	0	. . . . .	0.65
35	662.30	857	Cs-137	. . . . .	1 of	1	100.00	1.50
36	727.76	142	Bi-212	11036	2 of	13	100.00	1.00
37	768.35	114	Bi-214	102	9 of	33	91.20	1.41

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
39	795.56	108	AcTh-228	103	10 of 36	83.61	1.34	
			Cs-134		1 of 9	46.67	0.47	LowScore
41	860.87	67	Tl-208	92	6 of 9	97.04	1.47	
42	911.78	503	AcTh-228	600	10 of 36	86.02	1.36	
43	934.48	40	Bi-214	57	9 of 33	97.15	1.47	
44	965.46	93	AcTh-228	101	10 of 36	86.02	1.36	
45	969.58	325	AcTh-228	319	10 of 36	84.49	1.34	
47	1120.71	233	Bi-214	232	9 of 33	91.20	1.41	
48	1238.51	92	Bi-214	85	9 of 33	91.20	1.41	
49	1378.27	46	Bi-214	54	9 of 33	93.06	1.43	
50	1386.23	17	Bi-214	10	9 of 33	82.81	1.33	
52	1461.43	2293	K-40		1 of 1	100.00	1.50	
55	1765.15	180	Bi-214	173	9 of 33	91.20	1.41	
58	2204.95	67	Bi-214	46	9 of 33	85.59	1.36	
59	2615.31	313	Tl-208	325	6 of 9	97.04	1.47	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-01

Sample ID: SOIL/SEDI Duratek Inc

Code: 1277205

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:30:59
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 56818 Sec
 Sample Size 9.63e-002 kg | Real Time 56867 Sec
 Collection Efficiency 1.0000 | Spectrum File 1277205.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Efficiency File: WT1SS005.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[5.28E-03*En^-3.33E+00 + 1.03E+02*En^7.42E-01] 02/06/1998

 Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-01.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS

=====						
N						
Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC

Th-234	Average:x	6.98E+02 +- 3.13E+02	. . . . .			. . . . .
	63.29	6.98E+02 +- 4.03E+02	1.32E+03		+	. . . . .
	92.59	6.98E+02 +- 4.96E+02	1.63E+03		+	. . . . .
Pb-212	Average:x	1.14E+03 +- 2.82E+01	. . . . .		*	. . . . .
	74.81	I.D.	. . . . .			. . . . .
	77.12	I.D.	. . . . .			. . . . .
	87.30	I.D.	. . . . .			. . . . .
	238.63	1.14E+03 +- 2.84E+01	6.28E+01		++	. . . . .
	300.09	1.19E+03 +- 2.11E+02	6.53E+02		++	. . . . .
Pb-214	Average:x	9.46E+02 +- 3.02E+01	. . . . .		*	. . . . .
	77.11	I.D.	. . . . .			. . . . .
	241.98	1.62E+03 +- 1.15E+02	3.26E+02		++	. . . . .
	295.21	8.62E+02 +- 5.19E+01	1.41E+02		++	. . . . .
	351.92	9.16E+02 +- 3.93E+01	1.04E+02		++	. . . . .
Tl-208	Average:x	9.24E+02 +- 4.07E+01	. . . . .		*	. . . . .
	84.90	I.D.	. . . . .			. . . . .
	510.84	I.D.	. . . . .			. . . . .
	583.14	9.43E+02 +- 5.28E+01	1.40E+02		++	. . . . .
	860.37	6.76E+02 +- 2.95E+02	9.61E+02		+	. . . . .
	2614.66	9.07E+02 +- 6.54E+01	1.41E+02		++	. . . . .
AcTh-228	Average:x	9.59E+02 +- 4.11E+01	. . . . .		*	. . . . .
	93.35	I.D.	. . . . .			. . . . .
	129.08	6.20E+02 +- 2.62E+02	8.57E+02		+	. . . . .
	270.23	1.14E+03 +- 2.38E+02	7.55E+02		++	. . . . .
	327.64	1.53E+03 +- 3.31E+02	1.06E+03		++	. . . . .
	338.32	1.13E+03 +- 9.93E+01	2.92E+02		++	. . . . .
	463.00	1.13E+03 +- 2.31E+02	7.25E+02		++	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N	Concentration		MDA	Flags	Notes	MDC
			(pCi/kg)				
	794.70		1.00E+03	+- 2.12E+02	6.46E+02		++	. . . . .
	911.07		8.63E+02	+- 6.34E+01	1.70E+02		++	. . . . .
	964.60		8.84E+02	+- 1.78E+02	5.30E+02		++	. . . . .
	969.11		9.72E+02	+- 8.80E+01	2.37E+02		++	. . . . .
Ce-141	145.44	N	5.04E+01	+- 4.35E+01	1.44E+02		x	. . . . .
Ra-226	186.22		2.41E+03	+- 2.89E+02	8.96E+02		++	. . . . .
Annul	511.00		1.31E+01	+- 3.54E+01	1.17E+02		+	. . . . .
Bi-214	Average:x		8.52E+02	+- 3.23E+01	. . . . .		*	. . . . .
	609.31		8.43E+02	+- 3.73E+01	9.23E+01		++	. . . . .
	768.36		9.43E+02	+- 2.47E+02	7.81E+02		++	. . . . .
	934.06		6.03E+02	+- 3.67E+02	1.21E+03		+	. . . . .
	1120.29		8.53E+02	+- 1.10E+02	3.22E+02		++	. . . . .
	1238.11		9.19E+02	+- 2.81E+02	8.97E+02		++	. . . . .
	1377.67		7.16E+02	+- 2.14E+02	6.58E+02		++	. . . . .
	1385.31		1.45E+03	+- 8.54E+02	2.81E+03		+	. . . . .
	1764.49		8.86E+02	+- 1.06E+02	2.85E+02		++	. . . . .
	2204.22		1.23E+03	+- 2.82E+02	8.35E+02		++	. . . . .
Cs-137	661.65		3.78E+02	+- 1.79E+01	4.18E+01		++	. . . . .
Bi-212	727.17		4.85E+02	+- 1.13E+02	3.55E+02		++	. . . . .
K-40	1460.81		1.45E+04	+- 3.36E+02	4.94E+02		++	. . . . .
Am-241	59.54	N	1.11E+02	+- 4.63E+01	1.51E+021		x lbase	. . . . .
Co-57	122.06	N	2.38E+00	+- 7.94E+00	2.65E+01		x	. . . . .
Ce-144	133.54	N	2.23E+01	+- 5.62E+01	1.90E+02r		x rbase	. . . . .
Se-75	264.65	N	2.46E+01	+- 1.51E+01	4.96E+01		x	. . . . .
Cr-51	320.08	N	9.08E+01	+- 2.15E+02	7.29E+02		x	. . . . .
I-131	364.48	N	6.99E+01	+- 3.48E+02	1.17E+03		x	. . . . .
Sb-125	427.89	N	9.53E+00	+- 2.71E+01	9.11E+01		x	. . . . .
Ag-108m	433.93	N	5.35E+00	+- 9.47E+00	3.23E+01		x	. . . . .
Be-7	477.59	N	3.84E+02	+- 1.50E+02	4.87E+02		x	. . . . .
La-140	487.03	N	1.02E+02	+- 1.89E+02	6.46E+02		x	. . . . .
Ru-103	497.08	N	1.23E+01	+- 2.02E+01	6.92E+01		x	. . . . .
Ba-140	537.32	N	8.15E+02	+- 3.48E+02	1.23E+03		x	. . . . .
Cs-134	604.70	N	1.25E+01	+- 1.10E+01	3.79E+011		x lbase	. . . . .
Ru-106	621.84	N	2.84E+01	+- 1.01E+02	3.43E+02		x	. . . . .
Zr-95	724.18	N	1.58E+04	+- 3.49E+03	1.15E+04P		x# PIC	. . . . .
Nb-95	765.79	N	1.45E-01	+- 3.70E+01	1.24E+02P		x PIC	. . . . .
Co-58	810.76	N	3.79E+01	+- 1.39E+01	5.05E+01		x	. . . . .
Mn-54	834.83	N	2.45E+00	+- 1.10E+01	3.75E+01		x	. . . . .
Ag-110m	884.67	N	6.49E+00	+- 1.56E+01	5.27E+01		x	. . . . .
Fe-59	1099.22	N	4.28E+01	+- 3.90E+01	1.37E+02		x	. . . . .
Zn-65	1115.52	N	3.62E+01	+- 4.88E+01	1.62E+02P		x PIC	. . . . .
Co-60	1332.49	N	5.31E+00	+- 9.82E+00	3.35E+01		x Y.	. . . . .
Sb-124	1691.02	N	2.00E+01	+- 3.09E+01	1.06E+02		x	. . . . .

MEASURED TOTAL: 2.33E+04 +- 1.28E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.11	77.89	-8601	757	1254	17822	222.48	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
3	66.72	100.00	-3	38	62	762	0.57	Deleted
8	90.54	136.02	386	49	73	1084	1.12	Unknown
11	140.48	211.55	8	47	78	898	1.02	Deleted
13	154.60	232.90	37	58	96	1445	0.39	Deleted
15	197.89	298.38	-90	45	76	830	1.10	Deleted
16	199.22	300.39	67	29	45	498	0.62	Unknown
17	209.79	316.37	44	54	88	1185	0.44	Deleted
18	236.86	357.31	70	26	41	405	0.66	Unknown
22	278.02	419.57	15	42	69	820	0.22	Deleted
28	410.72	620.28	91	41	65	632	1.66	Unknown
31	559.07	844.65	-20	30	49	296	0.80	Deleted
32	570.28	861.60	-6	28	46	275	0.77	Deleted
38	786.76	1189.02	39	25	39	270	1.79	Deleted
40	803.46	1214.28	-13	23	38	187	1.19	Deleted
46	1001.49	1513.77	-3	25	42	218	1.38	Deleted
51	1407.99	2128.44	23	20	31	157	1.58	Deleted
53	1588.45	2401.24	21	18	29	125	0.99	Deleted
54	1622.65	2452.94	16	17	26	108	1.19	Deleted
56	1847.80	2793.22	14	16	26	81	1.04	Deleted
57	2118.68	3202.47	14	13	21	74	1.09	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	144.59	217.76	72N	62	101	1436	1.66	NET< CL
63	59.54	89.14	107N	45	71	1026	1.13	LBBase
64	122.06	183.69	14N	45	74	921	1.18	NET< CL
65	133.54	201.05	-16N	40	67	900	1.19	NET< CL
								RBase
66	264.65	399.35	60N	37	59	644	1.28	
67	320.09	483.19	-14N	33	55	556	1.32	NET< CL
68	364.49	550.35	6N	30	49	444	1.36	NET< CL
69	427.90	646.26	10N	28	46	398	1.40	NET< CL
70	433.94	655.39	-18N	31	51	452	1.41	NET< CL
71	477.61	721.44	78N	31	48	398	1.44	
72	487.05	735.72	-16N	29	48	389	1.44	NET< CL
73	497.10	750.92	-17N	28	47	371	1.45	NET< CL
74	537.35	811.79	-63N	27	46	365	1.48	NET< CL
75	604.74	913.72	-34N	29	49	417	1.52	NET< CL
								LBBase
76	621.88	939.64	7N	26	42	300	1.54	NET< CL
77	724.24	1094.46	-10864N	2398	3949	506	1.61	NET< CL
								PIC
78	765.73	1157.21	0N	38	63	487	1.63	NET< CL
								PIC
79	810.72	1225.25	-57N	21	37	248	1.66	NET< CL
80	834.79	1261.66	5N	23	37	252	1.68	NET< CL
81	884.65	1337.07	9N	22	35	229	1.71	NET< CL
82	1099.17	1661.49	-23N	21	35	215	1.86	NET< CL
83	1115.48	1686.16	30N	40	65	380	1.87	NET< CL
								PIC

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
84	1332.48	2014.28	8N	15	25	120	2.01	NET< CL
85	1691.02	2556.28	8N	12	20	72	2.25	NET< CL

 SEEKER ANALYSIS SUMMARY
 Environmental Laboratory
 Environmental Gamma Isotopic Analysis

 Sample ID : SOIL/SEDI Duratek Inc

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:30:59
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01E+03 Hrs
 Buildup Time. 0.00E+00 Hrs | Live Time 56818 Sec
 Sample Size 9.63E-02 kg | Real Time 56867 Sec
 Collection Efficiency 1.0000 | Spectrum File 1277205.spc

Detector #: 5
 Energy(keV)= 0.60 + 0.661*Ch + -1.07E-07*Ch^2 + -1.07E-07*Ch^3 05/07/2003
 FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003
 Where En = Sqrt(Energy in keV)

 Efficiency File:WT1SS005.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[5.28e-03*En^-3.33e+00 + 1.03e+02*En^ 7.42e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-01.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	6.98E+02	3.12E+02	< 1.32E+03	6.50E+02	1.00E+00	MEAS +	YES
Pb-212	1.14E+03	2.82E+01	< 6.28E+01	3.08E+01	9.99E-01	MEAS +	YES
Pb-214	9.46E+02	3.02E+01	< 1.04E+02	5.10E+01	1.00E+00	MEAS +	YES
Tl-208	9.24E+02	4.07E+01	< 1.40E+02	6.68E+01	1.00E+00	MEAS +	YES
AcTh-228	9.59E+02	4.11E+01	< 1.70E+02	8.28E+01	1.00E+00	MEAS +	YES
Ce-141	5.04E+01	4.35E+01	< 1.44E+02	7.10E+01	4.03E-01	NET	YES
Ra-226	2.41E+03	2.89E+02	< 8.96E+02	4.42E+02	1.00E+00	MEAS +	YES
Annil	1.31E+01	3.54E+01	< 1.17E+02	5.82E+01	9.22E-01	MEAS +	YES
Bi-214	8.52E+02	3.22E+01	< 9.23E+01	4.51E+01	1.00E+00	MEAS +	YES
Cs-137	3.78E+02	1.79E+01	< 4.18E+01	2.03E+01	9.97E-01	MEAS +	YES
Bi-212	4.85E+02	1.13E+02	< 3.55E+02	1.73E+02	1.00E+00	MEAS +	YES
K-40	1.45E+04	3.36E+02	< 4.94E+02	2.38E+02	1.00E+00	MEAS +	YES
Am-241	1.11E+02	4.63E+01	< 1.51E+02	7.41E+01	1.00E+00	NET	YES
Co-57	2.38E+00	7.94E+00	< 2.65E+01	1.30E+01	8.97E-01	NET	YES
Ce-144	-2.22E+01	5.62E+01	< 1.90E+02	9.29E+01	9.01E-01	NET	YES
Se-75	2.46E+01	1.51E+01	< 4.96E+01	2.42E+01	7.82E-01	NET	YES
Cr-51	-9.08E+01	2.15E+02	< 7.29E+02	3.56E+02	3.45E-01	NET	YES
I-131	6.99E+01	3.48E+02	< 1.17E+03	5.71E+02	2.55E-02	NET	YES
Sb-125	9.53E+00	2.71E+01	< 9.11E+01	4.42E+01	9.71E-01	NET	YES
Ag-108m	-5.35E+00	9.47E+00	< 3.23E+01	1.57E+01	9.99E-01	NET	YES
Be-7	3.84E+02	1.50E+02	< 4.87E+02	2.37E+02	5.76E-01	NET	YES
La-140	-1.02E+02	1.89E+02	< 6.46E+02	3.14E+02	9.97E-02	NET	YES
Ru-103	-1.23E+01	2.02E+01	< 6.92E+01	3.36E+01	4.73E-01	NET	YES
Ba-140	-8.15E+02	3.48E+02	< 1.23E+03	5.97E+02	9.97E-02	NET	YES
Cs-134	-1.25E+01	1.10E+01	< 3.79E+01	1.85E+01	9.62E-01	NET	YES
Ru-106	2.84E+01	1.01E+02	< 3.43E+02	1.66E+02	9.23E-01	NET	YES
Zr-95	-1.58E+04	3.49E+03	< 1.15E+04	5.74E+03	6.31E-01	NET	YES
Nb-95	1.45E-01	3.70E+01	< 1.24E+02	6.09E+01	4.31E-01	NET	YES
Co-58	-3.79E+01	1.39E+01	< 5.05E+01	2.44E+01	6.59E-01	NET	YES
Mn-54	2.45E+00	1.10E+01	< 3.75E+01	1.81E+01	9.10E-01	NET	YES
Ag-110m	6.49E+00	1.56E+01	< 5.27E+01	2.54E+01	8.89E-01	NET	YES
Fe-59	-4.28E+01	3.90E+01	< 1.37E+02	6.58E+01	5.16E-01	NET	YES
Zn-65	3.62E+01	4.88E+01	< 1.62E+02	7.96E+01	8.86E-01	NET	YES
Co-60	5.31E+00	9.82E+00	< 3.35E+01	1.59E+01	9.85E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	2.00E+01	3.09E+01	< 1.06E+02	4.94E+01	6.13E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-02 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-55 REF-X19571
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 95.7 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/7/03 01231 Det No.: 6 Spectrum No.: 1277306
Counted by: GM
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5348-02	Product	: GAMMA SPECTROMETRY
Client Id	: BMA-E0200-55	Matrix	: SO01 Soil
Site	: REF-X19571		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/26/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	95.7		
Sample Weight-Dry	g			
Aliquot Weight	g	95.7		
FINAL WEIGHT	kg	.0957		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-02 analyzed by emml461 on 05/07/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5348-02

Sample ID: SOIL/SEDI Duratek Inc

Code: 1277306

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:31:23
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 56834 Sec
Sample Size 9.57E-002 kg | Real Time 56883 Sec
Collection Efficiency 1.0000 | Spc. File 1277306.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV) = -0.15 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/07/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + -3.97E-05*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.82	80.05	-19135	802	1339	22331	451.55	NET< CL Wide Pk
2	63.09	95.58	687	72	110	2046	1.22	
3	74.63	113.02	1182	65	90	1634	1.18	a
4	76.92	116.48	1730	69	90	1634	1.00	b
5	83.87	126.99	300	53	82	1372	1.05	a
6	86.96	131.65	689	57	82	1372	1.14	b
7	89.81	135.96	466	55	82	1372	0.99	c
8	92.49	140.01	2354	75	94	1646	1.39	d
9	105.51	159.70	58	53	87	1385	0.61	NET< CL
10	114.93	173.93	-39	46	76	1152	0.50	NET< CL
11	128.67	194.69	170	53	85	1321	0.88	
12	139.45	210.98	37	31	50	628	0.56	a NET< CL
13	143.73	217.45	234	52	82	1256	1.27	b
14	163.17	246.82	98	55	89	1346	0.75	
15	185.64	280.79	1339	65	89	1345	1.23	
16	197.73	299.06	140	55	88	1310	1.16	
17	209.12	316.27	195	54	86	1254	1.12	
18	229.86	347.61	14	32	53	622	0.27	NET< CL
19	238.40	360.52	3327	71	69	884	1.22	a
20	241.34	364.96	731	59	86	1179	1.77	b Wide Pk
21	270.11	408.44	296	51	79	988	1.56	
22	277.09	419.00	150	44	69	814	1.51	
23	288.03	435.52	41	42	68	793	0.87	NET< CL
24	294.96	446.01	1043	48	59	652	1.33	a
25	299.81	453.33	147	34	52	543	1.03	b
26	327.87	495.74	124	42	67	756	1.28	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	338.16	511.30	654	50	70	771	1.36	
28	351.74	531.82	1751	56	62	665	1.32	
29	409.04	618.41	77	42	68	678	1.67	
30	462.62	699.38	185	39	61	546	1.41	
31	510.74	772.10	1724	56	61	552	2.38	Wide Pk
32	558.19	843.82	43	32	51	415	1.01	NET< CL
33	569.92	861.54	40	34	55	444	0.88	NET< CL
34	583.02	881.35	1080	47	54	434	1.63	
35	609.09	920.74	1296	50	58	494	1.55	
36	661.54	1000.01	881	43	51	450	1.52	
37	727.07	1099.05	267	33	48	371	1.86	
38	767.19	1159.67	97	32	50	405	1.80	
39	785.66	1187.59	15	26	42	305	0.51	NET< CL
40	794.72	1201.28	116	26	39	276	1.75	a
41	802.76	1213.44	46	16	24	138	0.85	b
42	835.72	1263.24	76	18	26	154	1.18	a
43	839.44	1268.87	56	21	33	216	1.47	b
44	860.30	1300.39	139	33	50	375	1.93	
45	911.11	1377.18	724	37	42	280	1.90	
46	932.34	1409.26	28	17	27	154	1.26	a
47	934.07	1411.87	47	16	24	129	1.19	b
48	964.47	1457.83	109	20	28	164	1.27	a
49	968.99	1464.66	386	27	31	192	1.42	b
50	1001.33	1513.53	120	28	43	272	1.93	
51	1120.16	1693.11	275	31	43	286	1.54	
52	1237.93	1871.10	119	27	40	274	1.61	
53	1377.73	2082.37	58	23	37	206	1.70	
54	1460.83	2207.95	2553	54	31	153	2.22	
55	1588.29	2400.58	31	17	26	127	1.60	
56	1620.28	2448.93	29	16	25	101	1.59	
57	1730.31	2615.22	65	16	22	77	2.52	
58	1764.56	2666.98	229	20	22	79	2.64	
59	1847.04	2791.63	24	13	21	71	1.65	
60	2101.89	3176.78	22	10	15	43	1.93	a
61	2104.57	3180.82	45	12	16	48	2.23	b
62	2204.70	3332.16	68	16	22	74	2.68	
63	2614.73	3951.83	423	23	16	41	3.49	Wide Pk

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	52.82	-19135	802	1339	-10361	852	1412	NET<CL
2	63.09	687	72	110	-12	77	126	NET<CL
3	74.63	1182	65	90	1048	68	99	
4	76.92	1730	69	90	1628	71	97	
5	83.87	300	53	82	85	60	98	NET<CL
6	86.96	689	57	82	610	59	88	
7	89.81	466	55	82	371	58	91	
8	92.49	2354	75	94	690	81	126	
12	139.45	37	31	50	-44	37	61	NET<CL
13	143.73	234	52	82	44	55	90	NET<CL
14	163.17	98	55	89	14	60	98	NET<CL
15	185.64	1339	65	89	403	71	112	
16	197.73	140	55	88	45	58	94	NET<CL
19	238.40	3327	71	69	3048	74	81	
20	241.34	731	59	86	680	61	90	
21	270.11	296	51	79	253	53	84	
22	277.09	150	44	69	119	48	77	
24	294.96	1043	48	59	927	52	70	
27	338.16	654	50	70	616	53	76	
28	351.74	1751	57	62	1600	59	72	
31	510.74	1724	56	61	392	61	95	
32	558.19	43	32	51	2	35	57	NET<CL
33	569.92	40	34	55	8	37	61	NET<CL
34	583.02	1080	47	54	965	49	62	
35	609.09	1296	50	58	1154	53	67	
37	727.07	267	33	48	242	35	51	
38	767.19	97	32	50	52	34	55	NET<CL
41	802.76	46	16	24	-13	19	32	NET<CL
45	911.11	725	37	42	656	39	48	
49	968.99	386	27	31	367	29	36	
50	1001.33	120	28	43	35	31	50	NET<CL
51	1120.16	275	31	43	252	32	46	
52	1237.93	119	27	40	101	28	43	
54	1460.83	2553	54	31	2417	55	40	
58	1764.56	229	20	22	204	21	26	
63	2614.73	423	23	16	325	24	26	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.63	1048	Pb-212	632	5 of 6	99.30	0.99	
			Tl-208	35	7 of 9	98.64	0.99	
			Pb-214	304	5 of 7	97.33	0.97	
			Tl-208	62	7 of 9	98.64	0.99	
4	76.92	1628	Pb-212	1123	5 of 6	99.30	0.99	
			Tl-208	62	7 of 9	98.64	0.99	
			Pb-214	543	5 of 7	98.65	0.99	
6	86.96	11	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
67	86.96	600	Pb-212	600	5 of 6	100.00	1.50	AutoAdd
7	89.81	371	Cd-109	. . . . .	1 of 1	100.00	1.50	
8	92.49	435	Th-234	. . . . .	1 of 2	58.74	0.59	Split
66	92.49	255	AcTh-228	255	15 of 36	89.08	0.89	AutoAdd
11	128.67	170	AcTh-228	232	15 of 36	96.51	1.47	
15	185.64	403	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
17	209.12	195	AcTh-228	299	15 of 36	98.36	1.48	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
19	238.40	3048	Pb-212	4208	5 of 6	100.00	1.00	
20	241.34	680	Pb-214	415	5 of 7	98.65	0.99	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
21	270.11	253	AcTh-228	202	15 of 36	93.24	1.43	
22	277.09	119	Tl-208	127	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
24	294.96	927	Pb-214	1519	5 of 7	100.00	1.00	
25	299.81	147	Pb-212	199	5 of 6	100.00	1.50	
26	327.87	124	AcTh-228	158	15 of 36	96.51	1.47	
			Bi-212	5	3 of 13	73.00	1.23	
			La-140	26150	2 of 15	23.26	0.23	LowScore
27	338.16	616	AcTh-228	535	15 of 36	93.24	1.43	
28	351.74	1600	Pb-214	2594	5 of 7	100.00	1.00	
29	409.04	77	AcTh-228	89	15 of 36	96.51	1.47	
30	462.62	185	AcTh-228	168	15 of 36	94.67	1.45	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
31	510.74	133	Annul	. . . . .	1 of 1	100.00	1.50	Split
65	510.74	259	Tl-208	259	7 of 9	100.00	1.50	AutoAdd
34	583.02	965	Tl-208	885	7 of 9	100.00	1.50	
35	609.09	1154	Bi-214	1264	9 of 33	91.16	1.41	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
			1120SEsc		0 of 0	. . . .	0.50	
36	661.54	881	Cs-137		1 of 1	100.00	1.50	
37	727.07	242	Bi-212	242	3 of 13	100.00	1.50	
			1238SEsc		0 of 0	. . . .	0.50	
40	794.72	116	AcTh-228	118	15 of 36	95.52	1.46	
			Cs-134		1 of 9	46.67	0.47	LowScore
42	835.72	33	Mn-54		1 of 1	100.00	1.50	Split
64	835.72	43	AcTh-228	43	15 of 36	90.60	1.41	AutoAdd
43	839.44	56	AcTh-228	23	15 of 36	90.01	1.40	
44	860.30	139	Tl-208	103	7 of 9	100.00	1.50	
45	911.11	656	AcTh-228	641	15 of 36	94.67	1.45	
46	932.34	28	Bi-214	60	9 of 33	95.22	1.45	
47	934.07	47	Unknown					
			Bi-214	60	9 of 33	91.16	1.41	Matched
48	964.47	109	AcTh-228	117	15 of 36	96.51	1.47	
49	968.99	367	AcTh-228	372	15 of 36	95.52	1.46	
			Sb-124		1 of 13	1.04	0.01	LowScore
51	1120.16	252	Bi-214	246	9 of 33	91.16	1.41	
52	1237.93	101	Bi-214	90	9 of 33	89.88	1.40	
53	1377.73	58	Bi-214	58	9 of 33	91.16	1.41	
54	1460.83	2417	K-40		1 of 1	100.00	1.50	
55	1588.29	31	AcTh-228	55	15 of 36	100.00	1.50	
56	1620.28	29	Bi-212	31	3 of 13	100.00	1.50	
57	1730.31	65	Bi-214	35	9 of 33	82.72	1.33	
58	1764.56	204	Bi-214	182	9 of 33	91.16	1.41	
59	1847.04	24	Bi-214	24	9 of 33	91.16	1.41	
60	2101.89	22	2615SEsc		0 of 0	. . . .	0.50	
61	2104.57	45	2615SEsc		0 of 0	. . . .	0.50	
62	2204.70	68	Bi-214	49	9 of 33	85.21	1.35	
63	2614.73	325	Tl-208	388	7 of 9	100.00	1.50	

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-02

Sample ID: SOIL/SEDI Duratek Inc

Code: 1277306

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:31:23
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 56834 Sec
 Sample Size 9.57e-002 kg | Real Time 56883 Sec
 Collection Efficiency 1.0000 | Spectrum File 1277306.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Efficiency File: WT1SS006.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[4.58E-03*En^-3.34E+00 + 1.01E+02*En^7.37E-01] 02/06/1998

 Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-02.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	1.20E+03 +- 2.90E+01	. . . .		*	. . . . .
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	1.21E+03 +- 2.93E+01	6.50E+01	+	*	. . . . .
	300.09	8.97E+02 +- 2.06E+02	6.49E+02	+	*	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	1.21E+03 +- 3.90E+02	1.28E+03	+	*	. . . . .
AcTh-228	Average:x	1.09E+03 +- 4.08E+01	. . . .		*	. . . . .
	129.08	8.01E+02 +- 2.50E+02	8.09E+02	+	*	. . . . .
	209.28	7.19E+02 +- 1.99E+02	6.43E+02	+	*	. . . . .
	270.23	1.36E+03 +- 2.86E+02	9.12E+02	+	*	. . . . .
	327.64	8.57E+02 +- 2.90E+02	9.39E+02	+		. . . . .
	338.32	1.22E+03 +- 1.05E+02	3.09E+02	+	*	. . . . .
	409.51	9.40E+02 +- 5.14E+02	1.69E+03	+		. . . . .
	463.00	1.20E+03 +- 2.54E+02	8.03E+02	+	*	. . . . .
	794.70	1.07E+03 +- 2.38E+02	7.36E+02	+	*	. . . . .
	835.50	1.09E+03 +- 6.42E+02	2.11E+03	+		. . . . .
	840.00	2.63E+03 +- 1.01E+03	3.23E+03	+		. . . . .
	911.07	1.11E+03 +- 6.56E+01	1.67E+02	+	*	. . . . .
	964.60	1.02E+03 +- 1.87E+02	5.49E+02	+	*	. . . . .
	969.11	1.08E+03 +- 8.63E+01	2.23E+02	+	*	. . . . .
	1588.00	6.24E+02 +- 3.40E+02	1.11E+03	+		. . . . .
	93.35	I.D.	. . . .			. . . . .
Ce-141	145.44 N	3.01E+01 +- 3.83E+01	1.27E+02		x	. . . . .
Ra-226	186.22	1.86E+03 +- 3.27E+02	1.05E+03		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
Pb-214	Average:x	1.03E+03 +- 3.02E+01	. . . . .		*	. . . . .
	241.98	1.62E+03 +- 1.45E+02	4.38E+02		++	. . . . .
	295.21	9.91E+02 +- 5.57E+01	1.52E+02		++	. . . . .
	351.92	1.00E+03 +- 3.71E+01	9.18E+01		++	. . . . .
Tl-208	Average:x	1.02E+03 +- 4.18E+01	. . . . .		*	. . . . .
	277.35	9.58E+02 +- 3.85E+02	1.26E+03		+	. . . . .
	510.84	I.D.	. . . . .			. . . . .
	583.14	1.07E+03 +- 5.42E+01	1.40E+02		++	. . . . .
	860.37	1.39E+03 +- 3.29E+02	1.04E+03		++	. . . . .
	2614.66	9.24E+02 +- 6.78E+01	1.54E+02		++	. . . . .
Annul	511.00	4.41E+01 +- 3.53E+01	1.16E+02		+	. . . . .
Bi-214	Average:x	8.89E+02 +- 3.41E+01	. . . . .		*	. . . . .
	609.31	8.67E+02 +- 3.98E+01	1.03E+02		++	. . . . .
	934.06	4.19E+02 +- 2.56E+02	8.44E+02		+	. . . . .
	1120.29	9.11E+02 +- 1.16E+02	3.41E+02		++	. . . . .
	1238.11	9.97E+02 +- 2.79E+02	8.83E+02		++	. . . . .
	1377.67	8.99E+02 +- 3.63E+02	1.17E+03		+	. . . . .
	1729.59	1.65E+03 +- 3.93E+02	1.17E+03		++	. . . . .
	1764.49	9.82E+02 +- 1.03E+02	2.67E+02		++	. . . . .
	1847.42	9.12E+02 +- 5.06E+02	1.65E+03		+	. . . . .
	2204.22	1.22E+03 +- 2.83E+02	8.40E+02		++	. . . . .
Cs-137	661.65	3.84E+02 +- 1.87E+01	4.55E+01		++	. . . . .
Bi-212	Average:x	8.07E+02 +- 1.12E+02	. . . . .		*	. . . . .
	727.17	8.12E+02 +- 1.17E+02	3.52E+02		++	. . . . .
	1620.62	7.44E+02 +- 4.21E+02	1.38E+03		+	. . . . .
Nb-95	765.79 N	4.97E+01 +- 3.27E+01	1.08E+02		x	. . . . .
Mn-54	834.83	1.57E+01 +- 1.51E+01	5.02E+01		(+) Ac228 ✓	. . . . .
K-40	1460.81	1.50E+04 +- 3.41E+02	5.15E+02		++	. . . . .
Am-241	59.54 N	3.51E+01 +- 7.61E+01	2.52E+02L		x	LHROI	
Co-57	122.06 N	6.47E+00 +- 7.69E+00	2.55E+01		x	. . . . .
Ce-144	133.54 N	1.00E+02 +- 5.94E+01	1.95E+02r		x	rbase	
Se-75	264.65 N	2.36E+01 +- 1.57E+01	5.38E+01l		x	lbase	
Cr-51	320.08 N	6.42E+01 +- 2.24E+02	7.58E+02		x	. . . . .
I-131	364.48 N	6.92E+01 +- 3.73E+02	1.25E+03		x	. . . . .
Sb-125	427.89 N	8.49E+00 +- 2.98E+01	1.00E+02		x	. . . . .
Ag-108m	433.93 N	1.21E+00 +- 8.71E+00	2.94E+01		x	. . . . .
Be-7	477.59 N	6.30E+01 +- 1.36E+02	4.65E+02		x	. . . . .
La-140	487.03 N	1.04E+02 +- 1.78E+02	6.08E+02		x	. . . . .
Ru-103	497.08 N	3.92E+00 +- 2.12E+01	7.18E+01		x	. . . . .
Ba-140	537.32 N	2.80E+01 +- 3.88E+02	1.31E+03		x	. . . . .
Cs-134	604.70 N	4.42E+01 +- 4.01E+01	1.32E+02P		x	PIC	
Ru-106	621.84 N	9.96E+01 +- 1.06E+02	3.66E+02		x	. . . . .
Zr-95	724.18 N	5.13E+01 +- 1.88E+02	6.21E+02P		x	PIC	
Co-58	810.76 N	1.70E+01 +- 1.49E+01	5.22E+01		x	. . . . .
Ag-110m	884.67 N	1.63E+01 +- 1.47E+01	5.15E+01		x	. . . . .
Fe-59	1099.22 N	5.83E+01 +- 3.86E+01	1.37E+02		x	. . . . .
Zn-65	1115.52 N	4.37E+01 +- 4.99E+01	1.66E+02P		x	PIC	
Co-60	1332.49 N	1.51E+01 +- 1.09E+01	3.61E+01		x	Y.	
Sb-124	1691.02 N	7.38E+00 +- 3.08E+01	1.07E+02		x	. . . . .

MEASURED TOTAL: 2.46E+04 +- 1.42E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.82	80.05	-10361	852	1412	22331	451.55	Deleted
2	63.09	95.58	-12	77	126	2046	1.22	Deleted
5	83.87	126.99	85	60	98	1372	1.05	Deleted
9	105.51	159.70	58	53	87	1385	0.61	Deleted
10	114.93	173.93	-39	46	76	1152	0.50	Deleted
12	139.45	210.98	-44	37	61	628	0.56	Deleted
14	163.17	246.82	14	60	98	1346	0.75	Deleted
16	197.73	299.06	45	58	94	1310	1.16	Deleted
18	229.86	347.61	14	32	53	622	0.27	Deleted
23	288.03	435.52	41	42	68	793	0.87	Deleted
32	558.19	843.82	2	35	57	415	1.01	Deleted
33	569.92	861.54	8	37	61	444	0.88	Deleted
39	785.66	1187.59	15	26	42	305	0.51	Deleted
41	802.76	1213.44	-13	19	32	138	0.85	Deleted
47	934.07	1411.87	47	16	24	129	1.19	Unknown
50	1001.33	1513.53	35	31	50	272	1.93	Deleted
60	2101.89	3176.78	22	10	15	43	1.93	2615SEsc
61	2104.56	3180.82	45	12	16	48	2.23	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	143.73	217.45	44N	55	90	1256	1.27	b NET< CL
38	767.19	1159.67	52N	34	55	405	1.80	NET< CL
68	59.54	90.22	37N	80	131	1591	1.13	NET< CL
69	122.06	184.70	38N	45	73	1073	1.12	LHRoi
70	133.54	202.05	74N	44	70	999	1.13	NET< CL
71	264.65	400.19	-58N	39	65	777	1.21	RBase
72	320.08	483.97	-10N	35	58	616	1.25	NET< CL
73	364.48	551.07	6N	32	53	520	1.29	NET< CL
74	427.89	646.90	9N	32	52	423	1.35	NET< CL
75	433.93	656.02	4N	29	47	414	1.36	NET< CL
76	477.59	722.01	-13N	28	47	401	1.40	NET< CL
77	487.03	736.27	-16N	27	45	381	1.40	NET< CL
78	497.08	751.46	-6N	30	49	410	1.41	NET< CL
79	537.32	812.28	2N	30	50	361	1.45	NET< CL
80	604.70	914.11	120N	109	178	752	1.51	NET< CL
81	621.84	940.01	-26N	27	46	354	1.53	PIC
82	724.18	1094.67	36N	131	215	478	1.62	NET< CL
83	810.76	1225.52	-26N	23	38	273	1.70	PIC
84	884.67	1337.22	-23N	21	35	225	1.76	NET< CL
85	1099.22	1661.46	-32N	21	36	222	1.92	NET< CL
86	1115.52	1686.10	36N	41	67	425	1.93	NET< CL
87	1332.49	2014.00	24N	17	27	138	2.08	PIC
88	1691.02	2555.84	3N	13	20	77	2.26	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc-----
Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:31:23
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 56834 Sec
Sample Size 9.57E-02 kg | Real Time 56883 Sec
Collection Efficiency 1.0000 | Spectrum File 1277306.spc

Detector #: 6

Energy(keV)= -0.15 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/07/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT1SS006.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)Eff.=1/[4.58e-03*En^-3.34e+00 + 1.01e+02*En^ 7.37e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-02.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	1.20E+03	2.90E+01	< 6.51E+01	3.20E+01	1.00E+00	MEAS +	YES
Th-234	1.21E+03	3.90E+02	< 1.28E+03	6.35E+02	1.00E+00	MEAS +	YES
AcTh-228	1.09E+03	4.08E+01	< 1.67E+02	8.11E+01	1.00E+00	MEAS +	YES
Ce-141	3.01E+01	3.83E+01	< 1.27E+02	6.26E+01	4.03E-01	NET	YES
Ra-226	1.86E+03	3.27E+02	< 1.04E+03	5.16E+02	1.00E+00	MEAS +	YES
Pb-214	1.02E+03	3.02E+01	< 9.18E+01	4.51E+01	1.00E+00	MEAS +	YES
Tl-208	1.02E+03	4.18E+01	< 1.40E+02	6.87E+01	1.00E+00	MEAS +	YES
Annil	4.41E+01	3.53E+01	< 1.16E+02	5.77E+01	9.22E-01	MEAS +	YES
Bi-214	8.89E+02	3.42E+01	< 1.02E+02	5.02E+01	1.00E+00	MEAS +	YES
Cs-137	3.84E+02	1.87E+01	< 4.55E+01	2.22E+01	9.97E-01	MEAS +	YES
Bi-212	8.07E+02	1.12E+02	< 3.52E+02	1.72E+02	1.00E+00	MEAS +	YES
Nb-95	4.97E+01	3.27E+01	< 1.08E+02	5.26E+01	4.31E-01	NET	YES
Mn-54	1.57E+01	1.51E+01	< 5.02E+01	2.45E+01	9.10E-01	MEAS +	YES
K-40	1.50E+04	3.41E+02	< 5.15E+02	2.49E+02	1.00E+00	MEAS +	YES
Am-241	3.51E+01	7.61E+01	< 2.52E+02	1.24E+02	1.00E+00	NET	YES
Co-57	6.47E+00	7.69E+00	< 2.55E+01	1.25E+01	8.97E-01	NET	YES
Ce-144	1.00E+02	5.94E+01	< 1.95E+02	9.58E+01	9.01E-01	NET	YES
Se-75	-2.36E+01	1.57E+01	< 5.38E+01	2.64E+01	7.82E-01	NET	YES
Cr-51	-6.42E+01	2.24E+02	< 7.58E+02	3.70E+02	3.45E-01	NET	YES
I-131	6.92E+01	3.73E+02	< 1.25E+03	6.12E+02	2.55E-02	NET	YES
Sb-125	8.49E+00	2.98E+01	< 1.00E+02	4.88E+01	9.71E-01	NET	YES
Ag-108m	1.21E+00	8.71E+00	< 2.94E+01	1.43E+01	9.99E-01	NET	YES
Be-7	-6.30E+01	1.36E+02	< 4.65E+02	2.26E+02	5.76E-01	NET	YES
La-140	-1.04E+02	1.78E+02	< 6.08E+02	2.95E+02	9.97E-02	NET	YES
Ru-103	-3.92E+00	2.12E+01	< 7.18E+01	3.49E+01	4.73E-01	NET	YES
Ba-140	2.80E+01	3.88E+02	< 1.31E+03	6.37E+02	9.97E-02	NET	YES
Cs-134	4.42E+01	4.01E+01	< 1.32E+02	6.56E+01	9.62E-01	NET	YES
Ru-106	-9.96E+01	1.06E+02	< 3.66E+02	1.78E+02	9.23E-01	NET	YES
Zr-95	5.13E+01	1.88E+02	< 6.21E+02	3.09E+02	6.31E-01	NET	YES
Co-58	-1.70E+01	1.49E+01	< 5.22E+01	2.52E+01	6.59E-01	NET	YES
Ag-110m	-1.63E+01	1.47E+01	< 5.15E+01	2.48E+01	8.89E-01	NET	YES
Fe-59	-5.82E+01	3.86E+01	< 1.36E+02	6.58E+01	5.16E-01	NET	YES
Zn-65	4.38E+01	4.99E+01	< 1.66E+02	8.12E+01	8.86E-01	NET	YES

L5348-02 analyzed by emml461 on 05/07/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	1.51E+01	1.09E+01	< 3.61E+01	1.72E+01	9.85E-01	NET	YES
Sb-124	7.38E+00	3.08E+01	< 1.07E+02	5.02E+01	6.13E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-03 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-116 REF-X19572
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 99.0 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/7/03 1732 Det No.: 8 Spectrum No.: 1277308
Counted by: [Signature]
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5348-03	Product : GAMMA SPECTROMETRY
Client Id : BMA-E0200-116	Matrix : S001 Soil
Site : REF-X19572	
Comments :	
Client : 00435 Duratek Inc	
Project : OTHER ENVIRON-DUR	
Start Date :	
Collect Date : 03/26/03 12:00	

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	99		
Sample Weight-Dry	g			
Aliquot Weight	g	99		
FINAL WEIGHT	kg	.099		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-03 analyzed by emml461 on 05/07/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5348-03

Sample ID: SOIL/SEDI Duratek Inc

Code: 1277308

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:31:47
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 56847 Sec
Sample Size 9.90E-002 kg | Real Time 56896 Sec
Collection Efficiency 1.0000 | Spc. File 1277308.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Energy(keV)= -0.03 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/07/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	51.86	78.30	-16534	736	1228	19012	283.15	NET< CL Wide Pk
2	63.22	95.45	386	65	102	1788	1.18	
3	74.61	112.65	1288	68	95	1665	1.40	a
4	76.90	116.09	1803	66	83	1388	1.12	b
5	84.07	126.93	295	48	73	1085	1.01	a
6	86.95	131.27	784	64	94	1519	1.62	b
7	89.76	135.50	488	56	84	1302	1.22	c
8	92.62	139.82	1420	74	105	1736	1.78	d Wide Pk
9	98.77	149.10	173	71	115	1953	2.04	e Wide Pk
10	128.99	194.72	150	61	98	1511	1.09	
11	143.49	216.60	53	50	81	1204	0.46	NET< CL
12	154.42	233.10	29	75	123	1973	0.48	NET< CL
13	185.56	280.10	826	69	103	1560	1.41	
14	197.23	297.72	106	73	119	1835	1.83	NET< CL
15	209.26	315.86	289	61	96	1359	1.45	
16	238.39	359.83	3538	71	64	768	1.36	a HiResid
17	241.43	364.42	651	47	64	768	1.39	b HiResid
18	258.10	389.58	-18	62	101	1342	0.43	NET< CL
19	269.92	407.42	203	48	75	889	1.50	
20	277.22	418.44	139	43	69	806	1.41	a
21	283.51	427.93	19	42	69	806	1.48	b NET< CL
22	294.95	445.20	1217	48	54	537	1.36	a
23	299.90	452.67	242	44	67	716	1.78	b
24	327.63	494.52	134	44	69	764	1.03	
25	338.09	510.30	655	47	65	676	1.52	
26	351.70	530.85	1934	61	70	717	1.47	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	410.05	618.91	87	45	73	742	1.57	
28	463.05	698.91	192	36	55	485	1.52	
29	510.66	770.76	1798	55	59	562	2.30	Wide Pk
30	558.00	842.20	34	34	55	502	1.38	NET< CL
31	582.99	879.92	1056	46	53	456	1.64	
32	609.11	919.35	1471	52	58	549	1.62	
33	661.59	998.55	920	43	51	422	1.79	
34	727.21	1097.59	256	32	45	338	1.85	
35	768.20	1159.46	87	29	45	358	1.40	
36	786.01	1186.32	61	26	40	280	1.12	
37	794.72	1199.47	101	29	44	321	1.34	
38	860.29	1298.43	80	25	39	267	1.34	
39	911.15	1375.20	799	40	46	312	1.90	
40	933.81	1409.40	62	26	41	271	2.10	
41	964.71	1456.04	118	22	31	186	1.46	a
42	968.84	1462.27	410	29	34	213	1.72	b
43	1000.49	1510.04	48	24	38	232	2.04	
44	1120.11	1690.58	312	32	44	284	1.91	
45	1155.30	1743.68	25	21	34	196	1.40	NET< CL
46	1238.14	1868.72	94	30	46	341	2.04	
47	1377.24	2078.65	54	21	33	176	1.74	
48	1408.04	2125.14	19	20	32	170	0.53	NET< CL
49	1460.80	2204.76	2702	55	27	120	2.22	
50	1587.30	2395.69	-2	20	33	176	0.13	NET< CL
51	1621.07	2446.66	17	9	13	44	1.15	a
52	1631.37	2462.20	24	11	17	62	1.46	b
53	1729.74	2610.67	66	18	26	102	2.45	
54	1764.75	2663.51	264	23	27	112	2.49	
55	1838.21	2774.37	15	8	13	38	1.22	a
56	1848.11	2789.32	29	11	15	51	1.73	b
57	2104.80	3176.73	52	19	28	120	2.10	
58	2204.42	3327.07	65	15	22	78	2.06	
59	2447.61	3694.12	10	11	18	55	0.90	NET< CL
60	2614.66	3946.23	433	24	19	55	3.10	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	51.86	-16534	736	1228	-9860	776	1288	NET<CL
2	63.22	387	65	102	160	68	109	
3	74.61	1288	68	95	1182	70	101	
4	76.90	1803	66	83	1729	68	89	
5	84.07	295	48	73	252	49	77	
8	92.62	1420	74	105	831	77	118	
9	98.77	173	71	115	155	72	117	
11	143.49	53	50	81	-17	52	86	NET<CL
13	185.56	826	69	103	438	73	115	
14	197.23	106	73	119	-72	76	126	NET<CL
16	238.39	3538	71	64	3271	74	77	
17	241.43	651	47	64	595	49	71	
19	269.92	203	48	75	210	53	83	
22	294.95	1217	48	54	1159	52	65	
25	338.09	655	47	65	615	50	71	
26	351.70	1934	61	70	1756	64	79	
29	510.66	1798	55	59	383	61	94	
30	558.00	35	34	55	-32	37	62	NET<CL
31	582.99	1056	46	53	959	48	60	
32	609.11	1471	52	58	1310	55	68	
35	768.20	87	29	45	56	32	51	
39	911.15	799	40	46	736	41	51	
42	968.84	410	29	34	359	31	40	
43	1000.49	48	24	38	23	26	42	NET<CL
44	1120.11	312	32	44	270	33	47	
46	1238.14	94	30	46	76	31	49	
49	1460.80	2702	55	27	2594	55	36	
53	1729.74	66	18	26	58	19	29	
54	1764.75	264	23	27	225	25	32	
58	2204.42	66	15	22	53	17	25	
60	2614.66	433	24	19	349	25	27	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. 2.00 | Decay Limit (Halflives) 8.0Minimum Score 0.50 | Decay Correction. ON
-----LIBRARY SEARCH RESULTS
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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	63.22	160	Th-234	160	2 of 2	100.00	1.50	
3	74.61	1182	Pb-212	706	5 of 6	99.30	0.99	
			Tl-208	37	8 of 9	99.30	0.99	
			Pb-214	401	6 of 7	98.66	0.99	
			Tl-208	65	8 of 9	99.30	0.99	
4	76.90	1729	Pb-214	653	6 of 7	100.00	1.00	
			Tl-208	65	8 of 9	99.30	0.99	
			Pb-212	1248	5 of 6	99.30	0.99	
5	84.07	252	Tl-208	35	8 of 9	99.30	0.99	
6	86.95	129	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
64	86.95	655	Pb-212	655	5 of 6	100.00	1.50	AutoAdd
7	89.76	488	Cd-109	. . . . .	1 of 1	100.00	1.50	
8	92.62	415	AcTh-228	273	14 of 36	85.15	0.85	Split
63	92.62	415	Th-234	415	2 of 2	100.00	1.50	AutoAdd
9	98.77	155	AcTh-228	84	14 of 36	87.48	1.37	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
			1120DEsc	. . . . .	0 of 0	. . . . .	0.50	
10	128.99	150	AcTh-228	247	14 of 36	94.77	1.45	
13	185.56	438	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
15	209.26	289	AcTh-228	315	14 of 36	93.10	1.43	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
16	238.39	3271	Pb-212	4559	5 of 6	100.00	1.00	
17	241.43	595	Pb-214	519	6 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
19	269.92	210	AcTh-228	217	14 of 36	93.10	1.43	
20	277.22	139	Tl-208	130	8 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.05	LowScore
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
22	294.95	1159	Pb-214	1327	6 of 7	100.00	1.50	
23	299.90	242	Pb-212	215	5 of 6	100.00	1.50	
24	327.63	134	AcTh-228	169	14 of 36	94.77	1.45	
			Bi-212	5	4 of 13	82.79	1.33	
			La-140	22877	2 of 15	23.26	0.23	LowScore
25	338.09	615	AcTh-228	578	14 of 36	90.86	1.41	
26	351.70	1756	Pb-214	2265	6 of 7	100.00	1.50	
27	410.05	87	AcTh-228	95	14 of 36	93.10	1.43	
28	463.05	192	AcTh-228	179	14 of 36	90.86	1.41	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
29	510.66	119	Annil	. . . . .	1 of 1	100.00	1.50	Split
62	510.66	264	Tl-208	264	8 of 9	100.00	1.50	AutoAdd
31	582.99	959	Tl-208	927	8 of 9	100.00	1.50	
32	609.11	1310	Bi-214	1303	11 of 33	95.74	1.46	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.50	
33	661.59	920	Cs-137	. . . . .	1 of 1	100.00	1.50	
34	727.21	257	Bi-212	147	4 of 13	100.00	1.50	
35	768.20	56	Bi-214	121	11 of 33	100.00	1.50	
			Pa-234	. . . . .	1 of 2	26.32	0.76	
36	786.01	24	Pb-214	33	6 of 7	100.00	1.50	Split
61	786.01	37	Bi-212	37	4 of 13	100.00	1.50	AutoAdd
37	794.72	101	AcTh-228	126	14 of 36	94.77	1.45	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
38	860.29	80	Tl-208	106	8 of 9	100.00	1.50	
39	911.15	736	AcTh-228	651	14 of 36	90.86	1.41	
40	933.81	62	Bi-214	66	11 of 33	95.74	1.46	
41	964.71	118	AcTh-228	123	14 of 36	93.10	1.43	
42	968.84	359	AcTh-228	399	14 of 36	93.10	1.43	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
44	1120.11	270	Bi-214	271	11 of 33	95.74	1.46	
46	1238.14	76	Bi-214	99	11 of 33	95.74	1.46	
47	1377.24	55	Bi-214	63	11 of 33	95.74	1.46	
49	1460.80	2594	K-40	. . . . .	1 of 1	100.00	1.50	
51	1621.07	17	Bi-212	34	4 of 13	100.00	1.50	
52	1631.37	24	AcTh-228	30	14 of 36	94.77	1.45	
53	1729.74	58	Bi-214	38	11 of 33	87.75	1.38	
54	1764.75	225	Bi-214	200	11 of 33	94.29	1.44	
55	1838.21	15	Bi-214	5	11 of 33	85.85	1.36	
56	1848.11	29	Bi-214	26	11 of 33	94.29	1.44	
57	2104.80	52	2615SEsc	. . . . .	0 of 0	. . .	0.50	
58	2204.42	53	Bi-214	54	11 of 33	95.74	1.46	
60	2614.66	349	Tl-208	375	8 of 9	100.00	1.50	

L5348-03 analyzed by emml461 on 05/07/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5348-03

Sample ID: SOIL/SEDI Duratek Inc

Code: 1277308

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:31:47
Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.01e+003 Hrs
Buildup Time: 0.00e+000 Hrs | Live Time 56847 Sec
Sample Size 9.90e-002 kg | Real Time 56896 Sec
Collection Efficiency 1.0000 | Spectrum File 1277308.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)

Efficiency File: WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[7.49E-03*En^-3.10E+00 + 9.34E+01*En^7.45E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File: L5348-03.LSF (SOIL/SEDI: Duratek Inc)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Th-234	Average:x	1.02E+03 +- 3.29E+02	. . . . .		*	. . . . .
	63.29	1.02E+03 +- 4.31E+02	1.41E+03		+	. . . . .
	92.59	1.02E+03 +- 5.08E+02	1.67E+03		+	. . . . .
Pb-212	Average:x	1.15E+03 +- 2.58E+01	. . . . .		*	. . . . .
	74.81	I.D.	. . . . .			. . . . .
	87.30	I.D.	. . . . .			. . . . .
	238.63	1.15E+03 +- 2.60E+01	5.50E+01		++	. . . . .
	300.09	1.31E+03 +- 2.36E+02	7.42E+02		++	. . . . .
Pb-214	Average:x	1.04E+03 +- 2.78E+01	. . . . .		*	. . . . .
	77.11	I.D.	. . . . .			. . . . .
	241.98	1.26E+03 +- 1.04E+02	3.05E+02		++	. . . . .
	295.21	1.10E+03 +- 4.93E+01	1.25E+02		++	. . . . .
	351.92	9.77E+02 +- 3.56E+01	8.99E+01		++	. . . . .
	785.91	8.04E+02 +- 1.52E+03	5.07E+03		+	. . . . .
Tl-208	Average:x	9.27E+02 +- 3.73E+01	. . . . .		*	. . . . .
	84.90	I.D.	. . . . .			. . . . .
	277.35	9.91E+02 +- 3.10E+02	1.00E+03		++	. . . . .
	510.84	I.D.	. . . . .			. . . . .
	583.14	9.52E+02 +- 4.76E+01	1.22E+02		++	. . . . .
	860.37	7.20E+02 +- 2.28E+02	7.26E+02		++	. . . . .
	2614.66	8.95E+02 +- 6.38E+01	1.46E+02		++	. . . . .
Cd-109	88.03	I.D.	. . . . .			. . . . .
AcTh-228	Average:x	1.03E+03 +- 3.81E+01	. . . . .		*	. . . . .
	93.35	I.D.	. . . . .			. . . . .
	99.45	1.90E+03 +- 8.80E+02	2.88E+03		+	. . . . .
	129.08	6.33E+02 +- 2.55E+02	8.34E+02		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
Ra-226	209.28		9.48E+02 +- 1.99E+02		6.38E+02	+	*	. . . . .
	270.23		1.00E+03 +- 2.50E+02		8.05E+02	+	*	. . . . .
	327.64		8.23E+02 +- 2.69E+02		8.69E+02	+	*	. . . . .
	338.32		1.08E+03 +- 8.79E+01		2.56E+02	+	*	. . . . .
	409.51		9.48E+02 +- 4.93E+02		1.62E+03	+		. . . . .
	463.00		1.10E+03 +- 2.09E+02		6.53E+02	+	*	. . . . .
	794.70		8.28E+02 +- 2.36E+02		7.49E+02	+	*	. . . . .
	911.07		1.11E+03 +- 6.26E+01		1.60E+02	+	*	. . . . .
	964.60		9.92E+02 +- 1.82E+02		5.39E+02	+	*	. . . . .
	969.11		9.49E+02 +- 8.10E+01		2.17E+02	+	*	. . . . .
	1630.40		8.35E+02 +- 3.93E+02		1.26E+03	+		. . . . .
	186.22		1.80E+03 +- 3.00E+02		9.56E+02	+	*	. . . . .
	511.00		3.52E+01 +- 3.12E+01		1.03E+02	+		. . . . .
	Average:x		8.77E+02 +- 3.17E+01		. . . . .	*		. . . . .
	609.31		8.78E+02 +- 3.67E+01		9.25E+01	+	*	. . . . .
	768.36		4.12E+02 +- 2.32E+02		7.61E+02	+		. . . . .
	934.06		8.20E+02 +- 3.44E+02		1.12E+03	+		. . . . .
	1120.29		8.74E+02 +- 1.07E+02		3.13E+02	+	*	. . . . .
	1238.11		6.74E+02 +- 2.73E+02		8.87E+02	+		. . . . .
	1377.67		7.55E+02 +- 2.97E+02		9.54E+02	+		. . . . .
	1729.59		1.32E+03 +- 4.32E+02		1.36E+03	+	*	. . . . .
Cs-137	1764.49		9.78E+02 +- 1.07E+02		2.89E+02	+	*	. . . . .
	1838.00		2.64E+03 +- 1.54E+03		5.02E+03	+		. . . . .
	1847.42		9.78E+02 +- 3.63E+02		1.12E+03	+		. . . . .
	2204.22		8.54E+02 +- 2.72E+02		8.50E+02	+	*	. . . . .
	661.65		3.57E+02 +- 1.68E+01		4.05E+01	+	*	. . . . .
	Average:x		7.06E+02 +- 8.65E+01		. . . . .	*		. . . . .
	727.17		7.69E+02 +- 9.56E+01		2.80E+02	+	*	. . . . .
	785.46		7.10E+02 +- 6.95E+02		2.31E+03	+		. . . . .
	1620.62		3.96E+02 +- 2.12E+02		6.88E+02	+		. . . . .
	1460.81		1.45E+04 +- 3.09E+02		4.16E+02	+	*	. . . . .
Am-241	59.54	N	1.22E+02 +- 9.70E+01		3.19E+02P	x	PIC	. . . . .
Co-57	122.06	N	1.98E+01 +- 7.22E+00		2.49E+01	x		. . . . .
Ce-144	133.54	N	2.31E+01 +- 5.80E+01		1.95E+02r	x	rbase	. . . . .
Ce-141	145.44	N	3.89E+01 +- 3.00E+01		9.91E+01	x		. . . . .
Se-75	264.65	N	1.99E+01 +- 1.36E+01		4.67E+011	x	lbase	. . . . .
Cr-51	320.08	N	8.36E+01 +- 2.11E+02		7.05E+02	x		. . . . .
I-131	364.48	N	1.98E+02 +- 3.54E+02		1.18E+03	x		. . . . .
Sb-125	427.89	N	3.21E+01 +- 2.73E+01		9.36E+01	x		. . . . .
Ag-108m	433.93	N	9.27E+00 +- 8.58E+00		2.94E+01	x		. . . . .
Be-7	477.59	N	2.06E+02 +- 1.34E+02		4.64E+02	x		. . . . .
La-140	487.03	N	3.18E+01 +- 1.67E+02		5.63E+02	x		. . . . .
Ru-103	497.08	N	1.30E+01 +- 1.74E+01		5.80E+01	x		. . . . .
Ba-140	537.32	N	1.78E+02 +- 3.20E+02		1.07E+03	x		. . . . .
Cs-134	604.70	N	8.65E+01 +- 3.70E+01		1.21E+02P	x	PIC	. . . . .
Ru-106	621.84	N	5.57E+01 +- 9.55E+01		3.27E+02	x		. . . . .
Zr-95	724.18	N	1.24E+02 +- 1.01E+02		3.32E+02P	x	PIC	. . . . .
Nb-95	765.79	N	3.72E+01 +- 3.08E+01		1.05E+02P	x	PIC	. . . . .
Co-58	810.76	N	2.93E+01 +- 1.30E+01		4.64E+01	x		. . . . .
Mn-54	834.83	N	9.05E+00 +- 1.04E+01		3.61E+01	x		. . . . .
Ag-110m	884.67	N	3.17E+00 +- 1.33E+01		4.53E+01	x		. . . . .
Fe-59	1099.22	N	4.52E+01 +- 3.68E+01		1.22E+02	x		. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E (keV)		(pCi/kg)				
Zn-65	1115.52	N	3.60E+01	+ - 4.51E+01	1.54E+02P		x PIC	. . . . .
Co-60	1332.49	N	9.59E+00	+ - 9.95E+00	3.52E+01		x	Y.
Sb-124	1691.02	N	2.03E+01	+ - 2.85E+01	9.72E+01		x	. . . . .

MEASURED TOTAL: 2.34E+04 + - 1.23E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	51.86	78.30	-9860	776	1288	19012	283.15	Deleted
11	143.49	216.60	-17	52	86	1204	0.46	Deleted
12	154.42	233.10	29	75	123	1973	0.48	Deleted
14	197.23	297.72	-72	76	126	1835	1.83	Deleted
18	258.10	389.58	-18	62	101	1342	0.43	Deleted
21	283.51	427.93	19	42	69	806	1.48	Deleted
30	558.00	842.20	-32	37	62	503	1.38	Deleted
43	1000.49	1510.04	23	26	42	233	2.04	Deleted
45	1155.30	1743.68	25	21	34	196	1.40	Deleted
48	1408.04	2125.14	19	20	32	170	0.53	Deleted
50	1587.30	2395.69	-3	20	33	176	0.13	Deleted
57	2104.80	3176.73	52	19	28	120	2.10	2615SEsc
59	2447.61	3694.12	10	11	18	55	0.90	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
65	59.54	89.90	158N	125	205	3002	1.24	NET< CL PIC
66	122.06	184.26	-129N	47	80	1172	1.29	NET< CL
67	133.54	201.58	-19N	48	79	1147	1.30	NET< CL RBase
68	145.44	219.54	63N	49	79	1150	1.31	NET< CL
69	264.65	399.46	-55N	38	63	740	1.39	NET< CL LBase
70	320.08	483.12	15N	37	61	625	1.43	NET< CL
71	364.48	550.13	19N	35	56	544	1.46	NET< CL
72	427.89	645.84	-38N	33	54	506	1.50	NET< CL
73	433.93	654.95	-35N	32	53	487	1.50	NET< CL
74	477.59	720.85	-48N	31	52	468	1.53	NET< CL
75	487.03	735.09	6N	29	47	382	1.54	NET< CL
76	497.08	750.26	21N	27	44	389	1.55	NET< CL
77	537.32	810.99	16N	28	46	345	1.57	NET< CL
78	604.70	912.69	263N	113	183	796	1.62	PIC
79	621.84	938.56	-16N	27	46	384	1.63	NET< CL
80	724.18	1093.01	97N	79	128	497	1.70	NET< CL PIC

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
81	765.79	1155.81	-44N	36	60	482	1.73	NET< CL PIC
82	810.76	1223.69	-50N	22	38	270	1.76	NET< CL
83	834.83	1260.01	-21N	24	40	303	1.77	NET< CL
84	884.67	1335.24	5N	21	34	218	1.81	NET< CL
85	1099.22	1659.05	27N	22	36	222	1.95	NET< CL
86	1115.52	1683.65	33N	42	70	412	1.96	NET< CL PIC
87	1332.49	2011.11	-17N	18	30	164	2.10	NET< CL
88	1691.02	2552.23	9N	13	21	75	2.34	NET< CL

L5348-03 analyzed by emml461 on 05/07/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:31:47
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 56847 Sec
Sample Size 9.90E-02 kg | Real Time 56896 Sec
Collection Efficiency 1.0000 | Spectrum File 1277308.spc

Detector #: 8

Energy(keV)= -0.03 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/07/2003

FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[7.49e-03*En^-3.10e+00 + 9.34e+01*En^ 7.45e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-03.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	1.02E+03	3.29E+02	< 1.41E+03	6.97E+02	1.00E+00	MEAS +	YES
Pb-212	1.16E+03	2.58E+01	< 5.50E+01	2.70E+01	1.00E+00	MEAS +	YES
Pb-214	1.04E+03	2.78E+01	< 8.99E+01	4.42E+01	1.00E+00	MEAS +	YES
Tl-208	9.27E+02	3.73E+01	< 1.22E+02	5.97E+01	1.00E+00	MEAS +	YES
AcTh-228	1.03E+03	3.81E+01	< 1.60E+02	7.78E+01	1.00E+00	MEAS +	YES
Ra-226	1.80E+03	3.00E+02	< 9.56E+02	4.73E+02	1.00E+00	MEAS +	YES
Annil	3.52E+01	3.12E+01	< 1.03E+02	5.10E+01	9.22E-01	MEAS +	YES
Bi-214	8.77E+02	3.17E+01	< 9.25E+01	4.53E+01	1.00E+00	MEAS +	YES
Cs-137	3.57E+02	1.68E+01	< 4.05E+01	1.97E+01	9.97E-01	MEAS +	YES
Bi-212	7.06E+02	8.65E+01	< 2.80E+02	1.36E+02	1.00E+00	MEAS +	YES
K-40	1.45E+04	3.09E+02	< 4.16E+02	2.00E+02	1.00E+00	MEAS +	YES
Am-241	1.22E+02	9.70E+01	< 3.20E+02	1.59E+02	1.00E+00	NET	YES
Co-57	-1.98E+01	7.22E+00	< 2.49E+01	1.22E+01	8.97E-01	NET	YES
Ce-144	-2.31E+01	5.80E+01	< 1.95E+02	9.58E+01	9.01E-01	NET	YES
Ce-141	3.89E+01	3.00E+01	< 9.92E+01	4.87E+01	4.03E-01	NET	YES
Se-75	-1.99E+01	1.36E+01	< 4.67E+01	2.29E+01	7.82E-01	NET	YES
Cr-51	8.36E+01	2.11E+02	< 7.05E+02	3.45E+02	3.45E-01	NET	YES
I-131	1.98E+02	3.54E+02	< 1.18E+03	5.78E+02	2.55E-02	NET	YES
Sb-125	-3.21E+01	2.73E+01	< 9.36E+01	4.57E+01	9.71E-01	NET	YES
Ag-108m	-9.27E+00	8.57E+00	< 2.94E+01	1.43E+01	9.99E-01	NET	YES
Be-7	-2.06E+02	1.34E+02	< 4.64E+02	2.26E+02	5.76E-01	NET	YES
La-140	3.18E+01	1.67E+02	< 5.63E+02	2.74E+02	9.97E-02	NET	YES
Ru-103	1.30E+01	1.74E+01	< 5.80E+01	2.82E+01	4.73E-01	NET	YES
Ba-140	1.78E+02	3.20E+02	< 1.07E+03	5.21E+02	9.97E-02	NET	YES
Cs-134	8.65E+01	3.70E+01	< 1.22E+02	6.03E+01	9.62E-01	NET	YES
Ru-106	-5.57E+01	9.55E+01	< 3.27E+02	1.59E+02	9.23E-01	NET	YES
Zr-95	1.24E+02	1.00E+02	< 3.32E+02	1.64E+02	6.31E-01	NET	YES
Nb-95	-3.72E+01	3.08E+01	< 1.05E+02	5.15E+01	4.31E-01	NET	YES
Co-58	-2.93E+01	1.30E+01	< 4.64E+01	2.24E+01	6.59E-01	NET	YES
Mn-54	-9.06E+00	1.04E+01	< 3.61E+01	1.75E+01	9.10E-01	NET	YES
Ag-110m	3.17E+00	1.33E+01	< 4.53E+01	2.18E+01	8.89E-01	NET	YES
Fe-59	4.52E+01	3.68E+01	< 1.22E+02	5.89E+01	5.16E-01	NET	YES
Zn-65	3.60E+01	4.51E+01	< 1.54E+02	7.57E+01	8.86E-01	NET	YES

L5348-03 analyzed by emm1461 on 05/07/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	-9.59E+00	9.95E+00	< 3.52E+01	1.68E+01	9.85E-01	NET	YES
Sb-124	2.03E+01	2.85E+01	< 9.72E+01	4.56E+01	6.13E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-04 Count by Date: _____
(if required)

Client: Duratek Inc Delay Date: _____
(if required)

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMA-E0200-129 REF-X19573

Collect Start Date/Time: _____

Collect Stop Date/Time: 03-26-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 109.1 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: R9220

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/9/03 1551 Det No.: 6 Spectrum No.: 1296606

Counted by: gh

Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____

Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5348-04	Product : GAMMA SPECTROMETRY
Client Id : BMA-E0200-129	Matrix : SO01 Soil
Site : REF-X19573	
Comments :	
Client : 00435 Duratek Inc	
Project : OTHER ENVIRON-DUR	
Start Date :	
Collect Date : 03/26/03 12:00	

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	109.1		
Sample Weight-Dry	g			
Aliquot Weight	g	109.1		
FINAL WEIGHT	kg	.1091		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-04 analyzed by emml461 on 05/09/2003

SEEKER` G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5348-04 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1296606

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:51:01
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 60000 Sec
Sample Size 1.09E-001 kg | Real Time 60051 Sec
Collection Efficiency 1.0000 | Spc. File 1296606.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV) = -0.15 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/09/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	51.51	78.08	-21122	827	1381	24304	287.41	NET< CL Wide Pk
2	63.08	95.56	851	79	121	2512	1.29	
3	74.64	113.04	1621	79	112	2322	1.33	a
4	76.94	116.52	2391	77	98	1935	1.04	b
5	84.08	127.30	486	64	99	1814	1.19	a
6	86.96	131.65	969	68	99	1814	1.31	b
7	89.79	135.93	673	59	87	1512	1.04	c
8	92.53	140.08	2498	78	99	1814	1.40	d
9	98.47	149.04	210	77	124	2419	1.64	e Wide Pk
10	104.93	158.82	150	50	79	1273	1.03	a
11	109.79	166.16	237	77	125	2292	1.93	b Wide Pk
12	114.97	173.98	147	50	79	1273	1.10	c
13	129.00	195.19	264	65	103	1802	1.26	
14	143.54	217.17	170	65	104	1857	0.94	
15	153.36	232.00	51	48	77	1206	0.63	NET< CL
16	163.31	247.04	123	65	105	1755	1.09	
17	175.45	265.40	68	64	105	1748	1.25	NET< CL
18	185.64	280.80	1738	71	95	1524	1.32	
19	197.28	298.39	110	46	74	1118	1.02	a
20	198.68	300.50	143	47	74	1118	1.00	b
21	209.06	316.19	380	60	94	1492	1.19	
22	215.71	326.23	45	49	80	1176	0.69	NET< CL
23	238.44	360.60	4625	79	67	895	1.14	a
24	241.25	364.83	882	65	95	1432	1.65	b
25	269.94	408.20	290	40	60	725	1.18	a
26	277.18	419.14	153	43	69	870	1.21	b

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	288.41	436.12	64	31	49	533	0.80	a
28	294.99	446.06	1181	53	66	799	1.25	b
29	299.80	453.32	212	38	57	666	1.12	c
30	327.86	495.73	287	55	86	1086	1.60	
31	338.12	511.24	914	51	68	793	1.39	
32	351.74	531.83	2005	61	67	770	1.35	
33	375.95	568.42	35	37	61	630	0.87	NET< CL
34	409.67	619.38	56	46	75	837	0.85	NET< CL
35	428.68	648.11	28	28	45	408	0.71	NET< CL
36	437.90	662.04	36	38	62	617	1.29	NET< CL
37	462.78	699.64	241	41	63	623	1.40	
38	477.21	721.45	16	34	55	514	0.36	NET< CL
39	510.71	772.08	1833	58	64	612	2.32	Wide Pk
40	557.91	843.41	-4	34	56	501	0.10	NET< CL
41	582.99	881.32	1572	53	57	480	1.67	
42	609.17	920.88	1549	55	63	588	1.56	
43	661.57	1000.08	636	42	55	492	1.62	
44	727.15	1099.19	370	36	50	419	1.64	
45	755.05	1141.35	26	24	39	292	0.69	NET< CL
46	767.91	1160.79	101	34	53	466	1.72	
47	785.82	1187.85	40	32	51	425	1.54	NET< CL
48	794.79	1201.42	132	25	37	274	1.50	a
49	803.01	1213.84	69	29	45	352	1.92	b
50	835.45	1262.86	75	28	44	336	1.96	
51	846.22	1279.14	-14	32	53	434	0.57	NET< CL
52	860.42	1300.60	198	35	52	400	2.02	
53	880.75	1331.33	20	27	44	322	0.64	NET< CL
54	911.09	1377.18	1050	41	43	298	1.83	
55	934.30	1412.26	44	30	48	362	1.06	NET< CL
56	964.64	1458.11	172	26	37	257	1.67	a
57	968.89	1464.54	609	33	37	257	1.70	b
58	1000.77	1512.72	84	33	52	375	1.20	
59	1120.34	1693.42	346	36	50	369	2.19	
60	1238.27	1871.65	131	30	46	349	1.97	
61	1332.52	2014.10	9	22	36	215	0.69	NET< CL
62	1377.83	2082.58	76	22	33	180	2.05	
63	1408.18	2128.44	27	20	31	172	1.49	NET< CL
64	1460.85	2208.05	3579	63	31	155	2.17	
65	1508.51	2280.07	40	20	31	153	1.73	
66	1588.17	2400.46	96	18	25	113	2.47	a
67	1592.33	2406.75	45	13	18	72	1.52	b
68	1621.24	2450.45	57	18	27	118	2.80	a
69	1630.64	2464.65	33	12	17	64	1.51	b
70	1730.39	2615.40	65	18	26	108	1.91	
71	1764.51	2666.98	260	23	27	114	2.17	
72	2104.09	3180.18	118	18	24	82	5.29	Wide Pk
73	2204.06	3331.28	63	17	25	97	1.78	
74	2614.63	3951.78	598	27	18	51	2.84	

 SEEKER' BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	51.51	-21122	827	1381	-11859	881	1460	NET<CL
2	63.08	851	79	121	114	84	138	NET<CL
3	74.64	1621	79	112	1479	82	120	
4	76.94	2391	77	98	2282	80	105	
5	84.08	486	64	99	259	71	114	
6	86.96	969	68	99	887	70	104	
7	89.79	673	59	87	573	63	95	
8	92.53	2498	78	99	740	84	131	
9	98.47	210	77	124	143	78	126	
11	109.79	237	77	125	114	82	133	NET<CL
14	143.54	170	65	104	-31	67	111	NET<CL
16	163.31	123	65	105	35	69	114	NET<CL
18	185.64	1738	71	95	750	77	118	
19	197.28	110	46	74	18	48	79	NET<CL
20	198.68	143	47	74	43	51	83	NET<CL
23	238.44	4625	79	67	4330	82	79	
24	241.25	882	65	95	828	67	99	
25	269.94	290	40	60	245	44	67	
26	277.18	153	44	69	121	48	77	
28	294.99	1181	53	66	1058	56	76	
31	338.12	914	51	68	873	55	76	
32	351.74	2005	61	67	1845	64	77	
35	428.68	28	28	45	26	31	50	NET<CL
39	510.71	1833	58	64	427	64	99	
40	557.91	-4	34	56	-48	37	63	NET<CL
41	582.99	1572	53	57	1451	55	65	
42	609.17	1549	55	63	1399	58	72	
44	727.15	370	36	50	344	38	54	
46	767.91	101	34	53	53	36	59	NET<CL
49	803.01	69	29	45	8	31	51	NET<CL
54	911.09	1051	41	43	978	43	49	
57	968.89	609	34	37	589	35	42	
58	1000.77	84	33	52	-6	35	58	NET<CL
59	1120.34	346	36	50	322	37	53	
60	1238.27	131	30	46	111	31	49	
64	1460.85	3579	63	31	3436	64	41	
71	1764.51	260	23	27	233	24	30	
74	2614.63	598	27	18	495	28	27	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.64	1479	Pb-212	899	6 of 6	100.00	1.00	
			Tl-208	52	8 of 9	99.30	0.99	
			Pb-214	345	5 of 7	97.33	0.97	
			Tl-208	93	8 of 9	99.30	0.99	
4	76.94	2282	Pb-212	1597	6 of 6	100.00	1.00	
			Tl-208	93	8 of 9	99.30	0.99	
			Pb-214	624	5 of 7	97.33	0.97	
5	84.08	259	Tl-208	51	8 of 9	99.30	1.49	
6	86.96	34	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
78	86.96	853	Pb-212	853	6 of 6	100.00	1.50	AutoAdd
7	89.79	573	Cd-109	. . . . .	1 of 1	100.00	1.50	
8	92.53	358	Th-234	. . . . .	1 of 2	58.74	0.59	Split
77	92.53	382	AcTh-228	382	16 of 36	90.40	0.90	AutoAdd
9	98.47	143	AcTh-228	119	16 of 36	92.77	1.43	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
			1120DEsc	. . . . .	0 of 0	. . . .	0.50	
10	104.93	150	AcTh-228	191	16 of 36	96.98	1.47	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
12	114.97	147	Pb-212	78	6 of 6	100.00	1.50	
13	129.00	265	AcTh-228	348	16 of 36	96.98	1.47	
18	185.64	750	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
21	209.06	380	AcTh-228	444	16 of 36	95.50	1.45	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
23	238.44	4330	Pb-212	6177	6 of 6	100.00	1.00	
24	241.25	828	Pb-214	. . . . .	5 of 7	98.65	0.99	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
25	269.94	245	AcTh-228	307	16 of 36	96.98	1.47	
26	277.18	121	Tl-208	192	8 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . .	0.00	Decay
27	288.41	64	Bi-212	19	4 of 13	77.00	1.27	
28	294.99	1058	Pb-214	. . . . .	5 of 7	100.00	1.00	
29	299.80	212	Pb-212	283	6 of 6	100.00	1.50	
30	327.86	287	AcTh-228	235	16 of 36	92.77	1.43	
			Bi-212	7	4 of 13	74.59	0.75	
			La-140	31818	2 of 15	21.89	0.22	LowScore
31	338.12	873	AcTh-228	811	16 of 36	94.52	1.45	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
32	351.74	1845	Pb-214	3156	5 of 7	100.00	1.00	
37	462.78	241	AcTh-228	253	16 of 36	95.50	1.45	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
39	510.71	36	Annul	. . . . .	1 of 1	100.00	1.50	Split
76	510.71	391	Tl-208	391	8 of 9	100.00	1.50	AutoAdd
41	582.99	1451	Tl-208	1298	8 of 9	100.00	1.50	
42	609.17	1399	Bi-214	1537	8 of 33	87.13	1.37	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.50	
43	661.57	636	Cs-137	. . . . .	1 of 1	100.00	1.50	
44	727.15	344	Bi-212	487	4 of 13	88.39	1.38	
			1238SEsc	. . . . .	0 of 0	. . .	0.50	
48	794.79	132	AcTh-228	179	16 of 36	96.98	1.47	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
50	835.45	10	Mn-54	. . . . .	1 of 1	100.00	1.50	Split
75	835.45	65	AcTh-228	65	16 of 36	92.77	1.43	AutoAdd
52	860.42	198	Tl-208	154	8 of 9	100.00	1.50	
54	911.09	978	AcTh-228	959	16 of 36	95.50	1.45	
56	964.64	172	AcTh-228	174	16 of 36	95.50	1.45	
57	968.89	589	AcTh-228	545	16 of 36	94.52	1.45	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
59	1120.34	322	Bi-214	296	8 of 33	85.92	1.36	
60	1238.27	111	Bi-214	109	8 of 33	85.92	1.36	
62	1377.83	76	Bi-214	70	8 of 33	85.92	1.36	
64	1460.85	3436	K-40	. . . . .	1 of 1	100.00	1.50	
65	1508.51	40	Bi-214	35	8 of 33	85.92	1.36	
66	1588.17	96	AcTh-228	81	16 of 36	92.77	1.43	
67	1592.33	45	2615DEsc	. . . . .	0 of 0	. . .	0.50	
			2104SEsc	. . . . .	0 of 0	. . .	0.50	
68	1621.24	57	Bi-212	45	4 of 13	88.39	1.38	
69	1630.64	33	AcTh-228	42	16 of 36	96.98	1.47	
70	1730.39	65	Bi-214	42	8 of 33	80.18	1.30	
71	1764.51	233	Bi-214	222	8 of 33	85.92	1.36	
72	2104.09	118	2615SEsc	. . . . .	0 of 0	. . .	0.50	
73	2204.06	63	Bi-214	60	8 of 33	85.92	1.36	
74	2614.63	495	Tl-208	570	8 of 9	100.00	1.50	

L5348-04 analyzed by emm1461 on 05/09/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-04

Sample ID: SOIL/SEDI Duratek Inc

Code: 1296606

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:51:01
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 60000 Sec
 Sample Size 1.09e-001 kg | Real Time 60051 Sec
 Collection Efficiency 1.0000 | Spectrum File 1296606.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Efficiency File: WT1SS006.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[4.58E-03*En^-3.34E+00 + 1.01E+02*En^7.37E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-04.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	1.42E+03 +- 2.67E+01	. . . .		*	. . . . .
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	115.19	I.D.	. . . .			. . . . .
	238.63	1.43E+03 +- 2.69E+01	5.33E+01		++	. . . . .
	300.09	1.07E+03 +- 1.92E+02	5.95E+02		++	. . . . .
Tl-208	Average:x	1.28E+03 +- 3.95E+01	. . . .		*	. . . . .
	84.90	I.D.	. . . .			. . . . .
	277.35	8.07E+02 +- 3.22E+02	1.05E+03		+	. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	1.34E+03 +- 5.08E+01	1.23E+02		++	. . . . .
	860.37	1.64E+03 +- 2.88E+02	8.89E+02		++	. . . . .
	2614.66	1.17E+03 +- 6.57E+01	1.36E+02		++	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	8.27E+02 +- 3.38E+02	1.11E+03		+	. . . . .
AcTh-228	Average:x	1.36E+03 +- 3.77E+01	. . . .		*	. . . . .
	99.45	1.63E+03 +- 8.89E+02	2.92E+03		+	. . . . .
	105.00	I.D.	. . . .			. . . . .
	129.08	1.04E+03 +- 2.53E+02	8.16E+02		++	. . . . .
	209.28	1.17E+03 +- 1.85E+02	5.83E+02		++	. . . . .
	270.23	1.09E+03 +- 1.94E+02	6.07E+02		++	. . . . .
	327.64	1.65E+03 +- 3.15E+02	1.00E+03		++	. . . . .
	338.32	1.44E+03 +- 9.02E+01	2.54E+02		++	. . . . .
	463.00	1.30E+03 +- 2.21E+02	6.89E+02		++	. . . . .
	794.70	1.01E+03 +- 1.94E+02	5.91E+02		++	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	835.50	1.36E+03 +- 8.30E+02	2.73E+03		+	.
	911.07	1.37E+03 +- 6.04E+01	1.40E+02		+	.
	964.60	1.34E+03 +- 2.04E+02	6.03E+02		+	.
	969.11	1.44E+03 +- 8.66E+01	2.14E+02		+	.
	1588.00	1.60E+03 +- 3.05E+02	8.95E+02		+	.
	1630.40	1.05E+03 +- 3.81E+02	1.19E+03		+	.
	93.35	I.D.	.		.	.
Ce-141	145.44	N-1.86E+01 +- 4.04E+01	1.35E+02		x	.
Ra-226	186.22	2.88E+03 +- 2.95E+02	9.16E+02		+	.
Pb-214	Average:x	9.83E+02 +- 2.70E+01	.		*	.
	241.98	1.64E+03 +- 1.33E+02	3.99E+02		+	.
	295.21	9.40E+02 +- 5.02E+01	1.37E+02		+	.
	351.92	9.60E+02 +- 3.30E+01	8.15E+01		+	.
Bi-212	Average:x	9.89E+02 +- 1.02E+02	.		*	.
	288.07	3.35E+03 +- 1.62E+03	5.28E+03		+	.
	727.17	9.60E+02 +- 1.06E+02	3.10E+02		+	.
	1620.62	1.24E+03 +- 3.92E+02	1.23E+03		+	.
Annil	511.00	9.95E+00 +- 3.07E+01	1.02E+02		+	.
Bi-214	Average:x	8.95E+02 +- 3.14E+01	.		*	.
	609.31	8.74E+02 +- 3.60E+01	9.19E+01		+	.
	1120.29	9.66E+02 +- 1.10E+02	3.25E+02		+	.
	1238.11	9.13E+02 +- 2.57E+02	8.19E+02		+	.
	1377.67	9.75E+02 +- 2.79E+02	8.75E+02		+	.
	1509.23	1.01E+03 +- 5.03E+02	1.64E+03		+	.
	1729.59	1.37E+03 +- 3.78E+02	1.17E+03		+	.
	1764.49	9.34E+02 +- 9.62E+01	2.55E+02		+	.
	2204.22	9.49E+02 +- 2.57E+02	7.91E+02		+	.
Cs-137	661.65	2.30E+02 +- 1.51E+01	4.06E+01		+	.
Mn-54	834.83	3.87E+00 +- 1.96E+01	6.55E+01		+	.
K-40	1460.81	1.77E+04 +- 3.29E+02	4.36E+02		+	.
Am-241	59.54	N 2.68E+01 +- 7.04E+01	2.33E+02L		x	LHROI
Co-57	122.06	N 1.18E+01 +- 6.90E+00	2.27E+01		x	.
Ce-144	133.54	N-4.28E+01 +- 5.33E+01	1.80E+02r		x	rbase
Se-75	264.65	N-3.35E+01 +- 1.42E+01	4.89E+01		x	.
Cr-51	320.08	N 4.59E+02 +- 2.12E+02	6.91E+02		x	.
I-131	364.48	N-3.74E+02 +- 3.88E+02	1.33E+03		x	.
Sb-125	427.89	N 7.37E+01 +- 2.52E+01	8.11E+01		x	.
Ag-108m	433.93	N 2.76E+00 +- 7.56E+00	2.54E+01		x	.
Be-7	477.59	N 1.20E+02 +- 1.23E+02	4.10E+02		x	.
La-140	487.03	N 2.16E+02 +- 1.74E+02	5.76E+02		x	.
Ru-103	497.08	N 3.06E-01 +- 1.89E+01	6.37E+01		x	.
Ba-140	537.32	N-5.05E+02 +- 3.82E+02	1.31E+03		x	.
Cs-134	604.70	N-2.07E+01 +- 3.84E+01	1.27E+02P		x	PIC
Ru-106	621.84	N 0.00E+00 +- 9.49E+01	3.21E+02		x	.
Zr-95	724.18	N-1.49E+02 +- 1.75E+02	5.80E+02P		x	PIC
Nb-95	765.79	N-6.86E+01 +- 3.34E+01	1.18E+02L		x	LHROI
Co-58	810.76	N 1.83E+01 +- 1.34E+01	4.44E+01		x	.
Ag-110m	884.67	N-1.60E+01 +- 1.39E+01	4.83E+01		x	.
Fe-59	1099.22	N 3.55E+00 +- 3.64E+01	1.24E+02		x	.
Zn-65	1115.52	N 2.62E+01 +- 4.82E+01	1.60E+02P		x	PIC
Co-60	1332.49	N 1.57E+01 +- 1.01E+01	3.31E+01		x	Y.
Sb-124	1691.02	N-8.36E+00 +- 2.71E+01	9.58E+01		x	.

MEASURED or MDA CONCENTRATIONS

Nuclide	N		MDA	Flags	Notes	MDC
	ENERGY E (keV)	Concentration (pCi/kg)				

MEASURED TOTAL: 2.86E+04 +- 1.29E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	51.51	78.08	-11859	881	1460	24304	287.41	Deleted
2	63.08	95.56	114	84	138	2512	1.29	Deleted
11	109.79	166.16	114	82	133	2292	1.93	Deleted
15	153.36	232.00	51	48	77	1206	0.63	Deleted
16	163.31	247.04	35	69	114	1755	1.09	Deleted
17	175.45	265.40	68	64	105	1748	1.25	Deleted
19	197.28	298.39	18	48	79	1118	1.02	Deleted
20	198.68	300.50	43	51	83	1118	1.00	Deleted
22	215.71	326.23	45	49	80	1176	0.69	Deleted
33	375.95	568.42	35	37	61	630	0.87	Deleted
34	409.67	619.38	56	46	75	837	0.85	Deleted
35	428.68	648.11	26	31	50	408	0.71	Deleted
36	437.90	662.04	36	38	62	617	1.29	Deleted
38	477.21	721.45	16	34	55	515	0.36	Deleted
40	557.91	843.41	-48	37	63	501	0.10	Deleted
45	755.05	1141.35	26	24	39	292	0.69	Deleted
46	767.91	1160.79	53	36	59	466	1.72	Deleted
47	785.82	1187.85	40	32	51	425	1.54	Deleted
49	803.01	1213.84	8	31	51	352	1.92	Deleted
51	846.22	1279.14	-14	32	53	435	0.57	Deleted
53	880.75	1331.33	20	27	44	323	0.64	Deleted
55	934.30	1412.26	44	30	48	362	1.06	Deleted
58	1000.77	1512.72	-6	35	58	375	1.20	Deleted
61	1332.52	2014.10	9	22	36	215	0.69	Deleted
63	1408.18	2128.44	27	20	31	172	1.49	Deleted
67	1592.33	2406.75	45	13	18	72	1.52	2615DEsc
72	2104.09	3180.18	118	18	24	82	5.29	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	143.54	217.17	-31N	67	111	1857	0.94	NET< CL
79	59.54	90.22	34N	89	146	1978	1.13	NET< CL LHRoi
80	122.06	184.70	83N	48	78	1218	1.12	
81	133.54	202.05	-38N	47	78	1222	1.13	NET< CL RBase
82	264.65	400.20	-98N	41	70	910	1.21	NET< CL
83	320.08	483.98	82N	38	60	674	1.25	
84	364.48	551.08	-33N	34	57	604	1.29	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
85	427.89	646.91	94N	32	50	468	1.35	
86	433.93	656.04	11N	30	49	448	1.36	NET< CL
87	477.59	722.02	29N	30	48	431	1.40	NET< CL
88	487.03	736.29	36N	29	47	401	1.40	NET< CL
89	497.08	751.48	1N	31	51	438	1.41	NET< CL
90	537.32	812.30	-43N	32	54	433	1.45	NET< CL
91	604.70	914.13	-67N	125	206	1055	1.51	NET< CL PIC
92	621.84	940.03	0N	29	48	392	1.53	NET< CL
93	724.18	1094.70	-122N	144	237	606	1.62	NET< CL PIC
94	765.79	1157.59	-83N	40	70	451	1.66	NET< CL LHRoi
95	810.76	1225.55	33N	24	39	276	1.70	NET< CL
96	884.67	1337.25	-27N	23	39	287	1.76	NET< CL
97	1099.22	1661.51	2N	23	38	250	1.92	NET< CL
98	1115.52	1686.14	26N	48	78	565	1.93	NET< CL PIC
99	1332.49	2014.05	30N	19	30	170	2.08	NET< CL
100	1691.02	2555.91	-4N	13	22	86	2.26	NET< CL

L5348-04 analyzed by emml461 on 05/09/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:51:01
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 60000 Sec
Sample Size 1.09E-01 kg | Real Time 60051 Sec
Collection Efficiency 1.0000 | Spectrum File 1296606.spc

Detector #: 6

Energy(keV)= -0.15 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/09/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File: WT1SS006.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[4.58e-03*En^-3.34e+00 + 1.01e+02*En^ 7.37e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-04.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
=====	=====	=====	=====	=====	=====	=====	=====
Pb-212	1.42E+03	2.67E+01	< 5.33E+01	2.62E+01	1.00E+00	MEAS +	YES
Tl-208	1.28E+03	3.95E+01	< 1.23E+02	6.01E+01	9.99E-01	MEAS +	YES
Th-234	8.27E+02	3.38E+02	< 1.11E+03	5.52E+02	1.00E+00	MEAS +	YES
AcTh-228	1.36E+03	3.77E+01	< 1.40E+02	6.82E+01	9.99E-01	MEAS +	YES
Ce-141	-1.86E+01	4.05E+01	< 1.35E+02	6.68E+01	3.87E-01	NET	YES
Ra-226	2.88E+03	2.95E+02	< 9.16E+02	4.53E+02	1.00E+00	MEAS +	YES
Pb-214	9.83E+02	2.70E+01	< 8.15E+01	4.00E+01	1.00E+00	MEAS +	YES
Bi-212	9.89E+02	1.02E+02	< 3.10E+02	1.51E+02	9.99E-01	MEAS +	YES
Annil	9.95E+00	3.07E+01	< 1.02E+02	5.05E+01	9.19E-01	MEAS +	YES
Bi-214	8.95E+02	3.14E+01	< 9.19E+01	4.51E+01	1.00E+00	MEAS +	YES
Cs-137	2.30E+02	1.51E+01	< 4.06E+01	1.98E+01	9.97E-01	MEAS +	YES
Mn-54	3.87E+00	1.96E+01	< 6.55E+01	3.22E+01	9.06E-01	MEAS +	YES
K-40	1.77E+04	3.28E+02	< 4.36E+02	2.11E+02	1.00E+00	MEAS +	YES
Am-241	2.68E+01	7.04E+01	< 2.33E+02	1.15E+02	1.00E+00	NET	YES
Co-57	1.18E+01	6.90E+00	< 2.27E+01	1.11E+01	8.92E-01	NET	YES
Ce-144	-4.28E+01	5.33E+01	< 1.80E+02	8.84E+01	8.97E-01	NET	YES
Se-75	-3.35E+01	1.42E+01	< 4.89E+01	2.40E+01	7.73E-01	NET	YES
Cr-51	4.59E+02	2.12E+02	< 6.91E+02	3.38E+02	3.29E-01	NET	YES
I-131	-3.74E+02	3.88E+02	< 1.33E+03	6.48E+02	2.16E-02	NET	YES
Sb-125	7.37E+01	2.52E+01	< 8.11E+01	3.95E+01	9.70E-01	NET	YES
Ag-108m	2.76E+00	7.56E+00	< 2.54E+01	1.24E+01	9.99E-01	NET	YES
Be-7	1.20E+02	1.23E+02	< 4.10E+02	2.00E+02	5.62E-01	NET	YES
La-140	2.16E+02	1.74E+02	< 5.76E+02	2.80E+02	8.97E-02	NET	YES
Ru-103	3.06E-01	1.89E+01	< 6.37E+01	3.10E+01	4.57E-01	NET	YES
Ba-140	-5.05E+02	3.82E+02	< 1.31E+03	6.41E+02	8.97E-02	NET	YES
Cs-134	-2.07E+01	3.84E+01	< 1.28E+02	6.33E+01	9.60E-01	NET	YES
Ru-106	0.00E+00	9.49E+01	< 3.21E+02	1.56E+02	9.20E-01	NET	YES
Zr-95	-1.49E+02	1.75E+02	< 5.80E+02	2.88E+02	6.18E-01	NET	YES
Nb-95	-6.86E+01	3.34E+01	< 1.18E+02	5.77E+01	4.15E-01	NET	YES
Co-58	1.83E+01	1.34E+01	< 4.44E+01	2.15E+01	6.47E-01	NET	YES
Ag-110m	-1.60E+01	1.39E+01	< 4.83E+01	2.34E+01	8.84E-01	NET	YES
Fe-59	3.55E+00	3.64E+01	< 1.24E+02	5.98E+01	5.01E-01	NET	YES
Zn-65	2.62E+01	4.82E+01	< 1.60E+02	7.88E+01	8.81E-01	NET	YES

L5348-04 analyzed by emm1461 on 05/09/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	1.57E+01	1.01E+01	< 3.31E+01	1.59E+01	9.84E-01	NET	YES
Sb-124	-8.36E+00	2.71E+01	< 9.58E+01	4.51E+01	5.99E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-05 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-135 REF-X19574
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 121.5 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/19/03 1550 Det No.: 4 Spectrum No.: 1296509
Counted by: [Signature]
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s) : Co-60,38;Cs-137,1100;

Sample Id : L5348-05	Product : GAMMA SPECTROMETRY
Client Id : BMA-E0200-135	Matrix : SO01 Soil
Site : REF-X19574	
Comments :	
Client : 00435 Duratek Inc	
Project : OTHER ENVIRON-DUR	
Start Date :	
Collect Date : 03/26/03 12:00	

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	121.5		
Sample Weight-Dry	g			
Aliquot Weight	g	12.5		
FINAL WEIGHT	kg	.0125		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-05

Sample ID: SOIL/SEDI Duratek Inc

Code: 1296504

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:49:58
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 150000 Sec
 Sample Size 1.25E-001 kg | Real Time 150044 Sec
 Collection Efficiency 1.0000 | Spc. File 1296504.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.90 + 0.661*Ch + -8.81E-08*Ch^2 + 2.96E-11*Ch^3 05/14/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.48	94.61	1202	91	138	3500	0.99	
2	75.10	112.19	2336	87	119	2836	0.99	a HiResid
3	77.39	115.64	3291	84	101	2269	0.87	b HiResid
4	81.28	121.52	60	51	83	1701	0.55	c NET< CL HiResid
5	84.51	126.42	532	76	119	2836	1.12	d HiResid
6	87.44	130.84	1309	81	119	2836	1.03	e HiResid
7	90.21	135.03	735	67	101	2269	0.87	f HiResid
8	93.07	139.36	2697	89	119	2836	1.13	g HiResid
9	99.35	148.86	28	81	133	3010	0.21	NET< CL
10	105.38	157.96	150	73	119	2616	1.26	a HiResid
11	109.02	163.47	49	35	56	872	0.53	b NET< CL HiResid
12	110.31	165.42	113	46	73	1308	0.55	c HiResid
13	129.28	194.10	306	81	130	2888	1.00	
14	144.25	216.74	153	71	115	2456	0.91	
15	155.45	233.67	95	101	165	3755	0.84	NET< CL
16	186.19	280.15	1623	83	120	2445	1.15	
17	197.45	297.19	168	49	77	1322	0.82	a
18	198.44	298.68	122	48	77	1322	0.81	b
19	209.63	315.60	417	72	113	2193	1.01	
20	238.84	359.76	5162	87	80	1291	1.10	a
21	241.75	364.16	1177	71	103	1807	1.44	b
22	259.00	390.25	92	59	96	1576	0.97	NET< CL
23	269.30	405.81	77	32	51	650	0.65	a
24	270.46	407.57	316	48	73	1083	1.07	b
25	277.58	418.33	144	52	83	1280	1.12	
26	284.48	428.77	37	57	93	1478	0.49	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	295.44	445.34	1515	58	70	982	1.09	a
28	300.34	452.75	286	46	70	982	1.05	b
29	327.96	494.51	152	49	78	1115	0.81	
30	338.55	510.53	1008	66	94	1408	1.34	
31	352.15	531.09	2574	71	81	1115	1.17	
32	401.81	606.18	18	45	74	929	0.59	NET< CL
33	409.52	617.84	83	41	65	787	0.97	
34	427.52	645.06	-27	44	73	915	0.65	NET< CL
35	463.18	698.98	370	53	81	963	1.33	
36	477.80	721.09	131	45	71	803	2.03	Wide Pk
37	511.19	771.58	2560	73	87	1040	2.64	Wide Pk
38	558.54	843.17	72	26	41	364	0.97	a
39	562.63	849.36	36	21	33	273	0.70	b
40	570.20	860.81	18	37	60	614	0.92	NET< CL
41	583.37	880.72	1548	59	72	766	1.42	
42	609.50	920.23	1800	62	74	819	1.48	
43	661.85	999.38	1868	58	63	637	1.55	
44	693.64	1047.46	78	45	73	743	2.98	Wide Pk
45	727.72	1099.00	367	41	60	531	1.75	
46	754.52	1139.52	63	35	56	495	2.60	Wide Pk
47	767.84	1159.66	102	40	63	659	1.41	
48	785.91	1186.99	40	29	46	424	0.88	NET< CL
49	795.08	1200.85	132	27	40	333	1.28	a
50	803.17	1213.08	73	28	44	388	1.60	b
51	835.84	1262.49	30	34	56	543	0.78	NET< CL
52	860.54	1299.83	142	34	52	464	1.23	
53	911.38	1376.71	954	45	53	466	1.56	
54	933.92	1410.79	120	33	51	434	1.76	
55	965.03	1457.83	175	28	41	327	1.59	a
56	969.11	1464.00	471	33	41	327	1.47	b
57	1001.01	1512.23	61	30	48	380	1.27	
58	1120.57	1693.01	377	38	54	450	1.76	
59	1154.31	1744.04	22	36	58	496	0.76	NET< CL
60	1173.22	1772.63	38	28	46	361	0.86	NET< CL
61	1238.38	1871.15	151	34	52	426	1.76	
62	1378.10	2082.39	123	25	37	228	2.54	
63	1460.97	2207.67	3959	67	36	222	2.02	
64	1509.31	2280.76	69	21	32	167	2.14	
65	1588.59	2400.61	73	16	22	102	1.42	a
66	1592.85	2407.05	80	22	32	175	2.56	b
67	1630.79	2464.40	-22	23	38	227	1.39	NET< CL
68	1729.83	2614.11	56	21	32	155	3.18	Wide Pk
69	1764.61	2666.69	284	25	29	145	2.01	
70	2102.17	3176.86	28	11	15	56	1.24	a
71	2104.46	3180.32	87	15	20	83	2.04	b
72	2204.46	3331.43	84	18	26	113	3.27	
73	2614.98	3951.61	556	27	20	64	2.76	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.48	1202	91	138	381	104	169	
2	75.10	2336	87	119	2053	97	142	
3	77.39	3291	84	101	2965	93	123	
5	84.51	532	76	119	291	86	139	
6	87.44	1309	81	119	1165	88	133	
7	90.21	735	67	101	520	72	112	
8	93.07	2697	89	119	1030	103	162	
11	109.02	49	35	56	-152	58	97	NET<CL
14	144.25	153	71	115	-49	81	134	NET<CL
16	186.19	1623	83	120	774	98	155	
17	197.45	168	49	77	20	61	100	NET<CL
18	198.44	122	48	77	12	55	90	NET<CL
20	238.84	5162	87	80	4489	95	111	
21	241.75	1177	71	103	1014	81	122	
23	269.30	77	32	51	11	54	88	NET<CL
27	295.44	1515	58	70	1324	67	93	
28	300.34	286	46	70	214	62	99	
30	338.55	1008	66	94	942	74	112	
31	352.15	2574	71	81	2140	80	107	
35	463.18	370	53	81	332	62	98	
37	511.19	2560	73	87	423	91	145	
38	558.54	72	26	41	51	36	58	NET<CL
40	570.20	18	37	60	-46	46	76	NET<CL
41	583.37	1548	59	72	1305	66	92	
42	609.50	1800	62	74	1566	71	97	
45	727.72	367	41	60	327	48	74	
50	803.17	73	28	44	11	37	61	NET<CL
53	911.38	954	45	53	836	50	67	
56	969.11	471	33	41	441	40	56	
57	1001.01	61	30	48	31	36	58	NET<CL
58	1120.57	377	38	54	340	43	63	
63	1460.97	3959	67	36	3741	70	55	
69	1764.61	284	25	29	227	29	40	
73	2614.98	556	27	20	393	31	39	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 1.50 | Decay Limit (Halflives) 8.0
 Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	63.48	381	Th-234	476	2 of 2	100.00	1.50	
2	75.10	2053	Pb-212	1280	5 of 6	99.30	0.99	
			Pb-214	. . . . .	5 of 7	97.33	0.97	
			Tl-208	133	7 of 9	98.43	0.98	
3	77.39	2965	Pb-212	2228	5 of 6	99.30	0.99	
			Pb-214	1041	5 of 7	97.33	0.97	
5	84.51	291	Tl-208	67	7 of 9	98.43	1.48	
6	87.44	329	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
75	87.44	836	Pb-212	836	5 of 6	100.00	1.50	AutoAdd
7	90.21	520	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	93.07	1030	Th-234	823	2 of 2	100.00	1.50	
			AcTh-228	473	16 of 36	90.27	0.90	
10	105.38	150	AcTh-228	225	16 of 36	100.00	1.50	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
12	110.31	113	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			La-140	. . . . .	1 of 15	0.18	0.50	LowScore
13	129.28	306	AcTh-228	388	16 of 36	97.10	1.47	
16	186.19	774	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
19	209.63	417	AcTh-228	461	16 of 36	93.16	1.43	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
20	238.84	4489	Pb-212	5859	5 of 6	100.00	1.00	
21	241.75	1014	Pb-214	. . . . .	5 of 7	97.33	0.97	
			La-140	169	2 of 15	0.58	0.01	LowScore
24	270.46	316	AcTh-228	306	16 of 36	93.16	1.43	
25	277.58	144	Tl-208	196	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	LowScore
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
27	295.44	1324	Pb-214	2209	5 of 7	100.00	1.00	
28	300.34	214	Pb-212	299	5 of 6	100.00	1.50	
29	327.96	152	AcTh-228	234	16 of 36	100.00	1.50	
			Bi-212	7	2 of 13	59.32	1.09	
			La-140	. . . . .	3 of 15	23.42	0.23	LowScore
30	338.55	942	AcTh-228	780	16 of 36	93.16	1.43	
31	352.15	2140	Pb-214	3689	5 of 7	100.00	1.00	
33	409.52	83	AcTh-228	128	16 of 36	100.00	1.50	
35	463.18	332	AcTh-228	235	16 of 36	93.16	1.43	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
36	477.80	131	Be-7	. . . . .	1 of 1	100.00	1.50	
37	511.19	55	Annil	. . . . .	1 of 1	100.00	1.50	Split

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
74	511.19	368	Tl-208	368	7 of 9	100.00	1.50	AutoAdd
39	562.63	36	AcTh-228	43	16 of 36	95.42	1.45	
			Cs-134	17	2 of 9	45.35	0.95	
41	583.37	1305	Tl-208	1247	7 of 9	100.00	1.50	
42	609.50	1566	Bi-214	1862	10 of 33	95.85	1.46	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1121SEsc	. . . . .	0 of 0	. . .	0.65	
43	661.85	1868	Cs-137	. . . . .	1 of 1	100.00	1.50	
44	693.64	78	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
45	727.72	327	Bi-212	6934	2 of 13	71.65	1.22	
			1238SEsc	. . . . .	0 of 0	. . .	0.65	
46	754.52	63	AcTh-228	37	16 of 36	91.45	1.41	
47	767.84	102	Bi-214	147	10 of 33	100.00	1.50	
			Pa-234	. . . . .	1 of 2	26.32	0.76	
49	795.08	132	AcTh-228	156	16 of 36	94.58	1.45	
			Cs-134	269	2 of 9	49.00	0.99	
52	860.54	142	Tl-208	135	7 of 9	100.00	1.50	
53	911.38	836	AcTh-228	825	16 of 36	93.16	1.43	
54	933.92	120	Bi-214	78	10 of 33	88.66	1.39	
55	965.03	175	AcTh-228	147	16 of 36	93.16	1.43	
56	969.11	441	AcTh-228	477	16 of 36	93.16	1.43	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
58	1120.57	340	Bi-214	312	10 of 33	95.85	1.46	
61	1238.38	151	Bi-214	113	10 of 33	93.23	1.43	
62	1378.10	123	Bi-214	71	10 of 33	86.97	1.37	
63	1460.97	3741	K-40	. . . . .	1 of 1	100.00	1.50	
64	1509.31	69	Bi-214	35	10 of 33	86.97	1.37	
65	1588.59	73	AcTh-228	64	16 of 36	93.16	1.43	
66	1592.85	80	2615DEsc	. . . . .	0 of 0	. . .	0.65	
68	1729.83	56	Bi-214	42	10 of 33	93.23	1.43	
69	1764.61	227	Bi-214	221	10 of 33	95.85	1.46	
70	2102.17	28	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
71	2104.46	87	2615SEsc	. . . . .	0 of 0	. . .	0.65	
72	2204.46	84	Bi-214	57	10 of 33	88.66	1.39	
73	2614.98	393	Tl-208	418	7 of 9	100.00	1.50	

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5348-05

Sample ID: SOIL/SEDI Duratek Inc

Code: 1296504

Sampling Start:	03/26/2003 12:00:00	Counting Start:	05/09/2003 15:49:58
Sampling Stop:	03/26/2003 12:00:00	Decay Time	1.06e+003 Hrs
Buildup Time	0.00e+000 Hrs	Live Time	150000 Sec
Sample Size	1.25e-001 kg	Real Time	150044 Sec
Collection Efficiency	1.0000	Spectrum File . . . . .	.1296504.spc
Type I		Type I & II	
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Canberra sn 10923050 det#4)
Efficiency File: WT1SS004.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
Eff.=1/[2.12E-02*En^-2.69E+00 + 1.61E+02*En^8.72E-01] 02/09/1998

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Library File: . . . . . SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: . . . . . L5348-05.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Th-234	Average:x	8.74E+02 +- 8.27E+01	. . . .		*	. . . . .
	63.29	7.24E+02 +- 1.99E+02	6.48E+02		++	. . . . .
	92.59	9.06E+02 +- 9.09E+01	2.87E+02		++	. . . . .
Pb-212	Average:x	6.82E+02 +- 1.44E+01	. . . .		*	. . . . .
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	6.84E+02 +- 1.45E+01	3.42E+01		++	. . . . .
Tl-208	300.09	5.15E+02 +- 1.48E+02	4.81E+02		++	. . . . .
	Average:x	6.11E+02 +- 2.55E+01	. . . .		*	. . . . .
	84.90	I.D.	. . . .			. . . . .
	277.35	4.53E+02 +- 1.64E+02	5.32E+02		+	. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	6.26E+02 +- 3.19E+01	8.93E+01		++	. . . . .
	860.37	6.43E+02 +- 1.53E+02	4.82E+02		++	. . . . .
	2614.66	5.89E+02 +- 4.62E+01	1.20E+02		++	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
AcTh-228	Average:x	6.43E+02 +- 2.31E+01	. . . .		*	. . . . .
	105.00	I.D.	. . . .			. . . . .
	129.08	5.07E+02 +- 1.34E+02	4.36E+02		++	. . . . .
	209.28	5.81E+02 +- 1.00E+02	3.20E+02		++	. . . . .
	270.23	6.60E+02 +- 1.00E+02	3.12E+02		++	. . . . .
	327.64	4.19E+02 +- 1.35E+02	4.36E+02		++	. . . . .
	338.32	7.50E+02 +- 5.93E+01	1.80E+02		++	. . . . .
	409.51	4.16E+02 +- 2.04E+02	6.68E+02		+	. . . . .
	463.00	8.97E+02 +- 1.68E+02	5.35E+02		++	. . . . .
	562.30	5.33E+02 +- 3.15E+02	1.04E+03		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	755.18	1.10E+03 +- 6.04E+02	1.98E+03		+	. . . . .
	794.70	5.44E+02 +- 1.10E+02	3.39E+02		+	. . . . .
	911.07	6.46E+02 +- 3.85E+01	1.05E+02		+	. . . . .
	964.60	7.58E+02 +- 1.21E+02	3.64E+02		+	. . . . .
	969.11	6.00E+02 +- 5.41E+01	1.55E+02		+	. . . . .
	1588.00	7.20E+02 +- 1.56E+02	4.57E+02		+	. . . . .
Ce-141	145.44	N-1.28E+01 +- 2.13E+01	7.12E+01		x	. . . . .
Ra-226	186.22	1.33E+03 +- 1.69E+02	5.38E+02		+	. . . . .
Pb-214	Average:x	5.64E+02 +- 1.60E+01	. . . . .		*	. . . . .
	241.98	9.31E+02 +- 7.41E+01	2.27E+02		+	. . . . .
	295.21	5.58E+02 +- 2.84E+01	7.97E+01		+	. . . . .
	351.92	5.40E+02 +- 2.01E+01	5.45E+01		+	. . . . .
Be-7	477.59	2.76E+02 +- 9.40E+01	3.05E+02		+	. . . . .
Annul	511.00	7.77E+00 +- 2.23E+01	7.35E+01		+	. . . . .
Bi-214	Average:x	5.33E+02 +- 2.01E+01	. . . . .		*	. . . . .
	609.31	5.10E+02 +- 2.31E+01	6.41E+01		+	. . . . .
	768.36	3.74E+02 +- 1.46E+02	4.74E+02		+	. . . . .
	934.06	8.19E+02 +- 2.26E+02	7.19E+02		+	. . . . .
	1120.29	5.78E+02 +- 7.23E+01	2.19E+02		+	. . . . .
	1238.11	7.10E+02 +- 1.61E+02	5.05E+02		+	. . . . .
	1377.67	9.18E+02 +- 1.87E+02	5.70E+02		+	. . . . .
	1509.23	1.04E+03 +- 3.13E+02	9.84E+02		+	. . . . .
	1729.59	7.01E+02 +- 2.61E+02	8.35E+02		+	. . . . .
	1764.49	5.47E+02 +- 6.88E+01	1.99E+02		+	. . . . .
	2204.22	7.78E+02 +- 1.68E+02	5.04E+02		+	. . . . .
Cs-137	661.65	3.56E+02 +- 1.11E+01	2.47E+01		+	. . . . .
Bi-212	727.17	4.87E+02 +- 7.22E+01	2.24E+02		+	. . . . .
K-40	1460.81	1.13E+04 +- 2.11E+02	3.42E+02		+	. . . . .
Am-241	59.54	N 4.37E+01 +- 1.57E+01	5.11E+01		x	lbase
Co-57	122.06	N 3.89E+00 +- 3.72E+00	1.23E+01		x	. . . . .
Ce-144	133.54	N-5.66E-01 +- 2.96E+01	9.86E+01		x	rbase
Se-75	264.65	N-5.13E+00 +- 7.09E+00	2.40E+01		x	. . . . .
Cr-51	320.08	N-8.42E+01 +- 1.27E+02	4.28E+02		x	. . . . .
I-131	364.48	N-1.44E+02 +- 2.44E+02	8.24E+02		x	. . . . .
Sb-125	427.89	N 7.80E-01 +- 1.52E+01	5.12E+01		x	. . . . .
Ag-108m	433.93	N-4.63E+00 +- 4.74E+00	1.61E+01		x	. . . . .
La-140	487.03	N 2.50E+02 +- 1.09E+02	3.54E+02		x	. . . . .
Ru-103	497.08	N-1.19E+01 +- 1.09E+01	3.72E+01		x	. . . . .
Ba-140	537.32	N-1.24E+01 +- 2.04E+02	6.88E+02		x	. . . . .
Cs-134	604.70	N-2.41E+01 +- 2.40E+01	7.97E+01		x	PIC
Ru-106	621.84	N 8.01E+01 +- 5.87E+01	1.94E+02		x	. . . . .
Zr-95	724.18	N-4.27E+03 +- 1.45E+03	4.79E+03		x	PIC
Nb-95	765.79	N-1.84E+01 +- 2.05E+01	6.94E+01		x	PIC
Co-58	810.76	N-5.06E+00 +- 7.89E+00	2.71E+01		x	. . . . .
Mn-54	834.83	N 9.37E+00 +- 6.30E+00	2.08E+01		x	. . . . .
Ag-110m	884.67	N-2.28E+00 +- 8.91E+00	3.03E+01		x	. . . . .
Fe-59	1099.22	N 3.41E+01 +- 2.30E+01	7.58E+01		x	. . . . .
Zn-65	1115.52	N 9.11E+00 +- 3.17E+01	1.06E+02		x	PIC
Co-60	1332.49	N 3.41E+00 +- 6.67E+00	2.25E+01		x	Y.
Sb-124	1691.02	N-3.14E+01 +- 1.90E+01	6.93E+01		x	. . . . .

MEASURED TOTAL: 1.77E+04 +- 7.61E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
4	81.28	121.52	60	51	83	1702	0.55	Deleted
7	90.21	135.03	520	72	112	2269	0.87	Unknown
9	99.35	148.86	28	81	133	3010	0.21	Deleted
11	109.02	163.47	-152	58	97	872	0.53	Deleted
12	110.31	165.42	113	46	73	1308	0.55	Unknown
15	155.45	233.67	95	101	165	3755	0.84	Deleted
17	197.45	297.19	20	61	100	1322	0.82	Deleted
18	198.44	298.68	12	55	90	1322	0.81	Deleted
22	259.00	390.25	92	59	96	1576	0.97	Deleted
23	269.30	405.81	11	54	88	650	0.65	Deleted
26	284.48	428.77	37	57	93	1478	0.49	Deleted
32	401.81	606.18	18	45	74	929	0.59	Deleted
34	427.52	645.06	-27	44	73	915	0.65	Deleted
38	558.54	843.17	51	36	58	364	0.97	Deleted
40	570.20	860.81	-46	46	76	614	0.92	Deleted
44	693.64	1047.46	78	45	73	743	2.98	Unknown
48	785.91	1186.99	41	29	46	424	0.88	Deleted
50	803.17	1213.08	11	37	61	389	1.60	Deleted
51	835.84	1262.49	30	34	56	543	0.78	Deleted
57	1001.01	1512.23	31	36	58	380	1.27	Deleted
59	1154.31	1744.04	23	36	58	497	0.76	Deleted
60	1173.22	1772.63	38	28	46	361	0.86	Deleted
66	1592.85	2407.05	80	22	32	175	2.56	2615DEsc
67	1630.79	2464.40	-22	23	38	227	1.39	Deleted
70	2102.17	3176.86	28	11	15	56	1.24	Unknown
71	2104.46	3180.32	87	15	20	83	2.04	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	144.25	216.74	-49N	81	134	2456	0.91	NET< CL
76	59.54	88.66	195N	70	113	2560	0.98	LBase
77	122.06	183.19	65N	62	101	2053	1.04	NET< CL
78	133.54	200.55	-1N	61	100	2024	1.05	NET< CL
								RBase
79	264.65	398.79	-32N	44	73	1085	1.17	NET< CL
80	320.08	482.61	-31N	47	77	1108	1.21	NET< CL
81	364.48	549.74	-25N	42	70	907	1.25	NET< CL
82	427.90	645.63	2N	39	64	762	1.30	NET< CL
83	433.94	654.76	-37N	38	63	736	1.30	NET< CL
84	487.04	735.06	80N	35	55	566	1.34	
85	497.09	750.26	-38N	35	58	619	1.35	NET< CL
86	537.34	811.11	-2N	33	54	541	1.38	NET< CL
87	604.72	913.01	-151N	150	248	1433	1.43	NET< CL
								PIC
88	621.86	938.93	47N	34	55	525	1.44	NET< CL
89	724.22	1093.70	-6543N	2227	3666	835	1.52	NET< CL
								PIC
90	765.84	1156.63	-41N	46	76	782	1.55	NET< CL
								PIC
91	810.81	1224.64	-17N	26	43	373	1.58	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
92	834.89	1261.05	43N	29	46	418	1.60	NET< CL
93	884.61	1336.23	-7N	27	45	378	1.64	NET< CL
94	1099.22	1660.74	38N	26	41	309	1.79	NET< CL
95	1115.53	1685.39	16N	56	91	801	1.80	NET< CL PIC
96	1332.47	2013.40	11N	22	36	223	1.95	NET< CL
97	1690.98	2555.40	-25N	15	26	127	2.20	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:49:58
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 150000 Sec
Sample Size 1.25E-01 kg | Real Time 150044 Sec
Collection Efficiency 1.0000 | Spectrum File 1296504.spc

Detector #: 4

Energy(keV)= 0.90 + 0.661*Ch + -8.81E-08*Ch^2 + -8.81E-08*Ch^3 05/14/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS004.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[2.12e-02*En^-2.69e+00 + 1.61e+02*En^ 8.72e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5348-05.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	8.74E+02	8.27E+01	< 2.87E+02	1.42E+02	1.00E+00	MEAS +	YES
Pb-212	6.82E+02	1.44E+01	< 3.42E+01	1.69E+01	1.00E+00	MEAS +	YES
Tl-208	6.11E+02	2.55E+01	< 8.93E+01	4.40E+01	1.00E+00	MEAS +	YES
AcTh-228	6.43E+02	2.31E+01	< 1.05E+02	5.16E+01	1.00E+00	MEAS +	YES
Ce-141	-1.28E+01	2.13E+01	< 7.12E+01	3.52E+01	3.83E-01	NET	YES
Ra-226	1.33E+03	1.69E+02	< 5.38E+02	2.66E+02	1.00E+00	MEAS +	YES
Pb-214	5.64E+02	1.60E+01	< 5.45E+01	2.69E+01	1.00E+00	MEAS +	YES
Be-7	2.76E+02	9.40E+01	< 3.05E+02	1.50E+02	5.58E-01	MEAS +	YES
Annil	7.77E+00	2.23E+01	< 7.35E+01	3.66E+01	9.18E-01	MEAS +	YES
Bi-214	5.33E+02	2.01E+01	< 6.41E+01	3.16E+01	1.00E+00	MEAS +	YES
Cs-137	3.56E+02	1.11E+01	< 2.47E+01	1.21E+01	9.97E-01	MEAS +	YES
Bi-212	4.87E+02	7.22E+01	< 2.24E+02	1.10E+02	1.00E+00	MEAS +	YES
K-40	1.13E+04	2.11E+02	< 3.42E+02	1.67E+02	1.00E+00	MEAS +	YES
Am-241	4.37E+01	1.56E+01	< 5.11E+01	2.52E+01	1.00E+00	NET	YES
Co-57	3.89E+00	3.72E+00	< 1.23E+01	6.07E+00	8.91E-01	NET	YES
Ce-144	-5.66E-01	2.96E+01	< 9.86E+01	4.86E+01	8.96E-01	NET	YES
Se-75	-5.13E+00	7.09E+00	< 2.40E+01	1.18E+01	7.71E-01	NET	YES
Cr-51	-8.42E+01	1.27E+02	< 4.28E+02	2.10E+02	3.24E-01	NET	YES
I-131	-1.44E+02	2.44E+02	< 8.24E+02	4.04E+02	2.06E-02	NET	YES
Sb-125	7.80E-01	1.52E+01	< 5.12E+01	2.51E+01	9.70E-01	NET	YES
Ag-108m	-4.63E+00	4.74E+00	< 1.61E+01	7.89E+00	9.99E-01	NET	YES
La-140	2.50E+02	1.09E+02	< 3.54E+02	1.73E+02	8.72E-02	NET	YES
Ru-103	-1.19E+01	1.09E+01	< 3.72E+01	1.82E+01	4.52E-01	NET	YES
Ba-140	-1.24E+01	2.04E+02	< 6.88E+02	3.36E+02	8.72E-02	NET	YES
Cs-134	-2.41E+01	2.40E+01	< 7.97E+01	3.96E+01	9.59E-01	NET	YES
Ru-106	8.01E+01	5.87E+01	< 1.94E+02	9.46E+01	9.19E-01	NET	YES
Zr-95	-4.27E+03	1.45E+03	< 4.79E+03	2.39E+03	6.14E-01	NET	YES
Nb-95	-1.84E+01	2.05E+01	< 6.94E+01	3.41E+01	4.11E-01	NET	YES
Co-58	-5.06E+00	7.89E+00	< 2.71E+01	1.31E+01	6.44E-01	NET	YES
Mn-54	9.37E+00	6.30E+00	< 2.08E+01	1.01E+01	9.05E-01	NET	YES
Ag-110m	-2.28E+00	8.91E+00	< 3.03E+01	1.47E+01	8.83E-01	NET	YES
Fe-59	3.41E+01	2.30E+01	< 7.58E+01	3.67E+01	4.97E-01	NET	YES
Zn-65	9.11E+00	3.17E+01	< 1.06E+02	5.21E+01	8.80E-01	NET	YES
Co-60	3.41E+00	6.67E+00	< 2.25E+01	1.08E+01	9.84E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	-3.14E+01	1.90E+01	< 6.93E+01	3.30E+01	5.95E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-06 Count by Date: _____
(if required)

Client: Duratek Inc Delay Date: _____
(if required)

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMA-E0200-180 REF-X19575

Collect Start Date/Time: _____

Collect Stop Date/Time: 03-26-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: L5G 5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 117.5 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/10/03 1544 Det No.: 2 Spectrum No.: 1296502

Counted by: Ch

Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____

Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5348-06	Product	: GAMMA SPECTROMETRY
Client Id	: BMA-E0200-180	Matrix	: SO01 Soil
Site	: REF-X19575		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/26/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	117.5		
Sample Weight-Dry	g			
Aliquot Weight	g	117.5		
FINAL WEIGHT	kg	.1175		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5348-06

Sample ID: SOIL/SEDI Duratek Inc

Code: 1296502

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:48:53
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 150000 Sec
Sample Size 1.17E-001 kg | Real Time 150044 Sec
Collection Efficiency 1.0000 | Spc. File 1296502.spc

Detector #: 2 (Canberra sn 9923043 det# 2)

Energy(keV)= 1.40 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/09/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.12	87.37	266	190	312	10280	3.22	a NET< CL MANUAL Wide Pk
2	63.48	93.98	1522	78	111	2741	0.96	b MANUAL
3	72.96	108.33	446	120	194	5964	1.73	a HiResid Wide Pk
4	75.07	111.52	3371	111	156	4473	1.27	b HiResid
5	77.30	114.89	4410	97	116	2982	0.96	c HiResid
6	84.30	125.49	882	81	124	3124	1.18	a HiResid
7	87.36	130.12	1635	86	124	3124	1.16	b HiResid
8	90.08	134.25	1005	82	124	3124	1.01	c HiResid
9	92.98	138.64	3422	114	160	4374	1.42	d HiResid
10	99.83	149.00	12	53	87	1874	0.56	e NET< CL HiResid
11	105.60	157.74	28	65	106	2499	0.86	f NET< CL HiResid
12	129.23	193.51	589	90	142	3439	1.27	
13	144.44	216.53	270	98	159	4023	1.18	
14	154.37	231.57	118	86	140	3328	1.15	NET< CL
15	186.07	279.56	2223	101	147	3415	1.38	
16	197.98	297.58	403	89	143	3236	2.35	Wide Pk
17	205.53	309.01	133	52	83	1515	0.83	a
18	209.50	315.02	727	65	97	1894	1.12	b
19	236.01	355.15	124	56	90	1632	0.98	a HiResid
20	238.81	359.39	7145	101	90	1632	1.17	b HiResid
21	241.74	363.83	1598	81	116	2284	1.58	c HiResid
22	259.79	391.15	95	67	109	2010	1.01	NET< CL
23	270.50	407.35	503	68	106	1909	1.19	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	277.77	418.37	176	67	108	1972	0.75	
25	295.39	445.04	2298	71	86	1368	1.28	a
26	300.19	452.31	535	57	86	1368	1.20	b
27	328.12	494.59	232	62	98	1648	0.94	
28	338.50	510.30	1402	73	104	1712	1.30	
29	352.11	530.90	3716	82	90	1388	1.29	
30	388.83	586.48	43	58	95	1441	0.82	NET< CL
31	401.77	606.08	100	56	91	1303	1.64	
32	409.54	617.84	184	63	101	1500	1.32	
33	426.80	643.96	18	64	106	1543	0.49	NET< CL
34	463.32	699.25	362	59	92	1262	1.36	
35	511.12	771.61	3324	82	95	1263	2.54	Wide Pk
36	558.95	844.01	30	33	53	568	0.75	NET< CL
37	569.95	860.66	86	47	75	895	2.76	Wide Pk
38	583.38	881.00	2250	68	80	944	1.47	
39	609.45	920.46	2660	69	76	923	1.65	
40	661.83	999.76	1106	55	72	828	1.36	
41	727.43	1099.05	440	44	64	717	1.73	
42	768.33	1160.97	234	32	46	455	1.37	a
43	772.33	1167.02	84	26	41	379	1.10	b
44	785.87	1187.52	43	35	56	586	1.26	NET< CL
45	795.05	1201.42	289	34	48	450	1.42	a
46	804.01	1214.99	209	71	115	1349	4.47	b Wide Pk
47	835.98	1263.37	18	36	58	629	0.52	NET< CL
48	860.68	1300.76	258	41	62	631	1.61	
49	911.43	1377.59	1469	49	51	477	1.74	a
50	917.54	1386.83	38	29	46	417	1.49	b NET< CL
51	934.05	1411.83	98	43	68	688	1.72	
52	964.91	1458.55	293	36	52	469	1.93	a
53	969.20	1465.04	871	39	43	365	1.60	b
54	1000.76	1512.81	53	38	61	584	0.67	NET< CL
55	1120.43	1693.97	538	44	62	600	1.85	
56	1155.17	1746.56	55	25	40	339	1.80	
57	1172.87	1773.36	-3	35	58	546	0.09	NET< CL
58	1238.37	1872.50	158	41	65	653	1.97	
59	1377.75	2083.50	154	29	44	322	1.56	
60	1408.11	2129.46	48	29	46	342	1.14	
61	1461.11	2209.70	5448	78	41	280	2.09	
62	1509.29	2282.62	73	29	45	288	2.07	
63	1588.54	2402.60	97	22	32	187	2.14	a
64	1592.59	2408.72	87	23	34	206	2.36	b
65	1620.92	2451.61	54	23	35	211	2.55	a
66	1631.28	2467.28	40	13	19	88	1.15	b
67	1660.88	2512.10	16	19	31	166	0.47	NET< CL
68	1729.76	2616.36	82	22	32	173	2.01	
69	1764.84	2669.47	415	28	32	176	2.34	
70	1847.29	2794.28	52	22	34	183	2.94	
71	2104.25	3183.27	113	21	31	155	3.27	a
72	2107.99	3188.93	18	10	16	62	1.25	b
73	2119.02	3205.62	72	21	31	146	3.91	Wide Pk
74	2149.88	3252.34	13	15	23	106	0.59	NET< CL
75	2204.67	3335.28	109	23	33	180	1.99	
76	2447.88	3703.44	60	20	30	136	3.10	

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
77	2614.78	3956.10	887	33	23	81	2.62	
78	63.48	93.98	1252	112	174	5178	0.92	DELETED

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	63.48	1522	78	111	755	101	159	
4	75.07	3371	111	156	2945	124	183	
5	77.30	4410	97	116	4004	106	139	
6	84.30	882	81	125	638	96	152	
7	87.36	1635	86	125	1375	97	147	
9	92.98	3422	114	160	1328	130	205	
10	99.83	12	53	87	-93	69	114	NET<CL
13	144.44	270	98	159	61	107	176	NET<CL
14	154.37	119	86	140	25	103	169	NET<CL
15	186.07	2223	101	147	1211	119	187	
16	197.98	403	89	143	5	106	174	NET<CL
20	238.81	7145	101	90	6360	110	124	
21	241.74	1598	81	116	1444	94	141	
23	270.50	503	68	106	459	81	128	
25	295.39	2298	71	86	1990	83	115	
28	338.50	1402	73	104	1283	84	125	
29	352.11	3716	82	90	3213	92	119	
32	409.54	184	63	101	173	73	118	
35	511.12	3324	82	95	687	102	162	
36	558.95	30	33	53	-80	45	75	NET<CL
37	569.95	86	47	75	20	56	92	NET<CL
38	583.38	2251	68	80	2030	77	102	
39	609.45	2660	69	76	2324	79	103	
41	727.43	440	44	64	402	49	73	
42	768.33	234	32	46	208	35	53	
45	795.05	289	34	48	239	41	62	
46	804.01	209	71	115	140	77	126	
49	911.43	1469	49	51	1288	56	70	
53	969.20	871	39	43	782	47	62	
54	1000.76	53	38	61	-17	44	72	NET<CL
55	1120.43	539	44	62	439	50	75	
58	1238.37	158	41	65	114	47	75	
61	1461.11	5448	78	41	5180	81	61	
68	1729.76	82	22	32	73	26	40	
69	1764.84	415	28	32	307	34	48	
77	2614.78	887	33	23	683	37	43	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 1.50 | Decay Limit (Halflives) 8.0
 Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	59.12	192	Am-241	. . . . .	1 of 3	100.00	1.50	Split
80	59.12	73	AcTh-228	73	16 of 36	88.05	1.38	AutoAdd
2	63.48	755	Th-234	594	2 of 2	100.00	1.50	
3	72.96	446	Tl-208	105	8 of 9	99.30	1.49	
4	75.07	2945	Pb-212	1705	5 of 6	99.30	0.99	
			Pb-214	. . . . .	5 of 7	97.33	0.97	
			Tl-208	184	8 of 9	99.30	0.99	
5	77.30	4004	Pb-212	2976	5 of 6	99.30	0.99	
			Pb-214	1439	5 of 7	97.33	0.97	
6	84.30	638	Tl-208	94	8 of 9	99.30	0.99	
7	87.36	1375	Pb-212	1951	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
8	90.08	1005	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
9	92.98	1328	Th-234	1687	2 of 2	100.00	1.50	
			AcTh-228	666	16 of 36	89.81	0.90	
12	129.23	589	AcTh-228	552	16 of 36	92.98	1.43	
15	186.07	1211	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	78.03	0.78	
17	205.53	133	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
18	209.50	727	AcTh-228	670	16 of 36	92.15	1.42	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
19	236.01	124	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
20	238.81	6360	Pb-212	8536	5 of 6	99.30	0.99	
21	241.74	1444	Pb-214	. . . . .	5 of 7	97.33	0.97	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
23	270.50	459	AcTh-228	457	16 of 36	93.88	1.44	
24	277.77	176	Tl-208	293	8 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	LowScore
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
25	295.39	1990	Pb-214	. . . . .	5 of 7	98.65	0.99	
26	300.19	535	Pb-212	377	5 of 6	99.30	1.49	
27	328.12	233	AcTh-228	353	16 of 36	94.84	1.45	
			Bi-212	8	3 of 13	73.00	0.73	
			La-140	54397	2 of 15	23.26	0.23	LowScore
28	338.50	1283	AcTh-228	1204	16 of 36	92.98	1.43	
29	352.11	3213	Pb-214	5371	5 of 7	100.00	1.00	
31	401.77	100	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Se-75	. . . . .	1 of 5	6.62	0.57	LowScore
32	409.54	173	AcTh-228	195	16 of 36	93.88	1.44	
34	463.32	363	AcTh-228	366	16 of 36	93.88	1.44	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
35	511.12	117	Annil	. . . . .	1 of 1	100.00	1.50	Split
79	511.12	570	Tl-208	570	8 of 9	100.00	1.50	AutoAdd
38	583.38	2030	Tl-208	1978	8 of 9	100.00	1.50	
39	609.45	2324	Bi-214	2306	15 of 33	97.48	1.47	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.65	
40	661.83	1106	Cs-137	. . . . .	1 of 1	100.00	1.50	
41	727.43	402	Bi-212	442	3 of 13	88.17	1.38	
			1238SEsc	. . . . .	0 of 0	. . .	0.65	
42	768.33	208	Bi-214	209	15 of 33	97.48	1.47	
43	772.33	84	AcTh-228	85	16 of 36	93.88	1.44	
			TeI-132	. . . . .	0 of 0	. . .	0.00	Decay
45	795.05	239	AcTh-228	248	16 of 36	93.88	1.44	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
46	804.01	140	Unknown	. . . . .	. . . . .	. . .	. . .
48	860.68	258	Tl-208	216	8 of 9	100.00	1.50	
49	911.43	1288	AcTh-228	1365	16 of 36	93.88	1.44	
51	934.05	99	Bi-214	114	15 of 33	98.65	1.49	
52	964.91	293	AcTh-228	237	16 of 36	91.34	1.41	
53	969.20	782	AcTh-228	756	16 of 36	93.88	1.44	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
55	1120.43	439	Bi-214	465	15 of 33	98.65	1.49	
56	1155.17	55	Bi-214	51	15 of 33	96.48	1.46	
58	1238.37	114	Bi-214	169	15 of 33	100.00	1.50	
59	1377.75	154	Bi-214	106	15 of 33	94.39	1.44	
60	1408.11	48	Bi-214	64	15 of 33	100.00	1.50	
			Cs-Sum	. . . . .	1 of 6	16.67	0.67	
61	1461.11	5180	K-40	. . . . .	1 of 1	100.00	1.50	
62	1509.29	73	Bi-214	53	15 of 33	94.39	1.44	
63	1588.54	97	AcTh-228	108	16 of 36	93.88	1.44	
64	1592.59	87	2615DEsc	. . . . .	0 of 0	. . .	0.65	
			2104SEsc	. . . . .	0 of 0	. . .	0.65	
65	1620.92	54	Bi-212	49	3 of 13	88.17	1.38	
66	1631.28	40	AcTh-228	56	16 of 36	94.84	1.45	
68	1729.76	73	Bi-214	64	15 of 33	94.39	1.44	
69	1764.84	307	Bi-214	338	15 of 33	98.65	1.49	
70	1847.29	52	Bi-214	43	15 of 33	94.39	1.44	
71	2104.25	113	2615SEsc	. . . . .	0 of 0	. . .	0.65	
72	2107.99	18	Unknown	. . . . .	. . . . .	. . .	. . .
73	2119.02	72	Bi-214	21	15 of 33	92.93	1.43	
75	2204.67	109	Bi-214	88	15 of 33	94.39	1.44	
76	2447.88	60	Bi-214	25	15 of 33	93.24	1.43	
77	2614.78	683	Tl-208	721	8 of 9	100.00	1.50	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-06

Sample ID: SOIL/SEDI Duratek Inc

Code: 1296502

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:48:53
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 150000 Sec
 Sample Size 1.17e-001 kg | Real Time 150044 Sec
 Collection Efficiency 1.0000 | Spectrum File 1296502.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 2 (Canberra sn 9923043 det# 2)
 Efficiency File: WT1SS002.EFF (Sand in a 4 oz. Jar: 1.6 g/cc)
 Eff.=1/[1.49E-02*En^-2.83E+00 + 1.39E+02*En^8.08E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-06.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

		N							
		ENERGY E	Concentration			MDA	Flags	Notes	MDC
Nuclide	(keV)	(pCi/kg)						
Am-241	59.54	4.74E+01	+ - 8.12E+01	2.68E+02				+ <i>kc</i>	. . . . .
Th-234	Average:x	1.32E+03	+ - 1.05E+02	. . . . .				*	. . . . .
	63.29	1.57E+03	+ - 2.09E+02	6.67E+02				+*	. . . . .
	92.59	1.24E+03	+ - 1.21E+02	3.84E+02				+*	. . . . .
Tl-208	Average:x	9.11E+02	+ - 2.77E+01	. . . . .				*	. . . . .
	72.80	I.D.	. . . . .	. . . . .					. . . . .
	84.90	I.D.	. . . . .	. . . . .					. . . . .
	277.35	5.54E+02	+ - 2.10E+02	6.84E+02				+	. . . . .
	510.84	I.D.	. . . . .	. . . . .					. . . . .
	583.14	9.28E+02	+ - 3.51E+01	9.46E+01				+*	. . . . .
	860.37	1.09E+03	+ - 1.73E+02	5.35E+02				+*	. . . . .
	2614.66	8.85E+02	+ - 4.81E+01	1.16E+02				+*	. . . . .
Pb-212	Average:x	9.80E+02	+ - 1.67E+01	. . . . .				*	. . . . .
	74.81	I.D.	. . . . .	. . . . .					. . . . .
	77.12	I.D.	. . . . .	. . . . .					. . . . .
	87.30	I.D.	. . . . .	. . . . .					. . . . .
	238.63	9.76E+02	+ - 1.68E+01	3.83E+01				+*	. . . . .
	300.09	1.28E+03	+ - 1.37E+02	4.18E+02				+*	. . . . .
AcTh-228	Average:x	9.54E+02	+ - 2.52E+01	. . . . .				*	. . . . .
	129.08	1.02E+03	+ - 1.55E+02	4.95E+02				+*	. . . . .
	209.28	1.03E+03	+ - 9.17E+01	2.78E+02				+*	. . . . .
	270.23	9.59E+02	+ - 1.68E+02	5.39E+02				+*	. . . . .
	327.64	6.34E+02	+ - 1.68E+02	5.44E+02				+*	. . . . .
	338.32	1.01E+03	+ - 6.58E+01	1.98E+02				+*	. . . . .
	409.51	8.45E+02	+ - 3.56E+02	1.16E+03				+	. . . . .
	463.00	9.46E+02	+ - 1.55E+02	4.89E+02				+*	. . . . .
	772.17	9.36E+02	+ - 2.96E+02	9.44E+02				+*	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N	Concentration		MDA	Flags	Notes	MDC
			(pCi/kg)				
	794.70		9.22E+02	+- 1.56E+02	4.86E+02		+	.
	911.07		9.21E+02	+- 3.99E+01	1.03E+02		+	.
	964.60		1.17E+03	+- 1.43E+02	4.25E+02		+	.
	969.11		9.81E+02	+- 5.89E+01	1.59E+02		+	.
	1588.00		8.56E+02	+- 1.92E+02	5.88E+02		+	.
	1630.40		6.84E+02	+- 2.23E+02	6.90E+02		+	.
	59.00		9.54E+02	+- 3.51E+03	1.16E+04		+	.
Ce-141	145.44	N	1.66E+01	+- 2.91E+01	9.64E+01		x	.
Ra-226	186.22		2.13E+03	+- 2.09E+02	6.61E+02		+	.
Pb-214	Average:x		8.33E+02	+- 1.86E+01	.		*	.
	241.98		1.33E+03	+- 8.65E+01	2.63E+02		+	.
	295.21		8.34E+02	+- 3.47E+01	9.75E+01		+	.
	351.92		7.97E+02	+- 2.28E+01	5.99E+01		+	.
Annil	511.00		1.58E+01	+- 2.40E+01	7.92E+01		+	.
Bi-214	Average:x		7.17E+02	+- 2.11E+01	.		*	.
	609.31		7.19E+02	+- 2.44E+01	6.43E+01		+	.
	768.36		7.14E+02	+- 1.21E+02	3.73E+02		+	.
	934.06		6.20E+02	+- 2.69E+02	8.76E+02		+	.
	1120.29		6.80E+02	+- 7.76E+01	2.36E+02		+	.
	1155.19		7.76E+02	+- 3.59E+02	1.17E+03		+	.
	1238.11		4.87E+02	+- 2.00E+02	6.52E+02		+	.
	1377.67		1.04E+03	+- 1.98E+02	6.07E+02		+	.
	1407.98		5.44E+02	+- 3.27E+02	1.07E+03		+	.
	1509.23		9.79E+02	+- 3.84E+02	1.24E+03		+	.
	1729.59		8.13E+02	+- 2.89E+02	9.29E+02		+	.
	1764.49		6.56E+02	+- 7.25E+01	2.10E+02		+	.
	1847.42		8.67E+02	+- 3.65E+02	1.18E+03		+	.
	2118.55		2.41E+03	+- 6.90E+02	2.16E+03		+	.
	2204.22		8.85E+02	+- 1.84E+02	5.59E+02		+	.
	2447.86		1.69E+03	+- 5.56E+02	1.76E+03		+	.
Cs-137	661.65		1.99E+02	+- 9.94E+00	2.66E+01		+	.
Bi-212	Average:x		5.66E+02	+- 6.61E+01	.		*	.
	727.17		5.62E+02	+- 6.83E+01	2.09E+02		+	.
	1620.62		6.18E+02	+- 2.61E+02	8.44E+02		+	.
K-40	1460.81		1.41E+04	+- 2.20E+02	3.39E+02		+	.
Co-57	122.06	N	2.36E+00	+- 4.22E+00	1.40E+01		x	.
Ce-144	133.54	N	3.50E+01	+- 3.38E+01	1.13E+02r		x	rbase
Se-75	264.65	N	2.65E+01	+- 9.47E+00	3.23E+011		x	lbase
Cr-51	320.08	N	2.74E+02	+- 1.39E+02	4.72E+02		x	.
I-131	364.48	N	3.34E+02	+- 2.64E+02	8.96E+02		x	.
Sb-125	427.89	N	3.45E+01	+- 1.64E+01	5.35E+01		x	.
Ag-108m	433.93	N	7.53E+00	+- 5.03E+00	1.72E+01		x	.
Be-7	477.59	N	2.43E+01	+- 8.25E+01	2.76E+02		x	.
La-140	487.03	N	1.23E+02	+- 1.18E+02	3.91E+02		x	.
Ru-103	497.08	N	2.11E+01	+- 1.16E+01	3.99E+01		x	.
Ba-140	537.32	N	1.18E+02	+- 2.45E+02	8.18E+02		x	.
Cs-134	604.70	N	3.55E-01	+- 6.57E+00	2.20E+011		x	lbase
Ru-106	621.84	N	1.29E+01	+- 6.37E+01	2.15E+02		x	.
Zr-95	724.18	N	3.49E+01	+- 1.20E+02	3.96E+02P		x	PIC
Nb-95	765.79	N	1.20E+01	+- 2.16E+01	7.24E+01P		x	PIC
Co-58	810.76	N	5.35E+00	+- 1.25E+01	4.14E+01R		x	RHROI
Mn-54	834.83	N	3.06E+00	+- 7.23E+00	2.45E+01		x	.
Ag-110m	884.67	N	9.06E-01	+- 9.43E+00	3.18E+01		x	.

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
Fe-59	1099.22	N-2.87E+01	+- 2.39E+01	8.25E+01		x		
Zn-65	1115.52	N 2.25E+01	+- 3.15E+01	1.04E+02P		x	PIC	
Co-60	1332.49	N 1.28E+01	+- 7.25E+00	2.38E+01		x	Y.	
Sb-124	1691.02	N-5.59E+00	+- 1.97E+01	6.82E+01		x		

MEASURED TOTAL: 2.27E+04 +- 8.24E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
8	90.08	134.25	1005	82	125	3124	1.01	Unknown
10	99.83	149.00	-93	69	114	1875	0.56	Deleted
11	105.60	157.74	28	65	106	2499	0.86	Deleted
14	154.37	231.57	25	103	169	3329	1.15	Deleted
16	197.98	297.58	5	106	174	3236	2.35	Deleted
17	205.53	309.01	133	52	83	1515	0.83	Unknown
19	236.01	355.15	124	56	90	1632	0.98	Unknown
22	259.79	391.15	95	67	109	2010	1.01	Deleted
30	388.83	586.48	43	58	95	1441	0.82	Deleted
31	401.77	606.08	100	56	91	1303	1.64	Unknown
33	426.80	643.96	18	64	106	1543	0.49	Deleted
36	558.95	844.01	-80	45	75	568	0.75	Deleted
37	569.95	860.66	20	56	92	895	2.76	Deleted
44	785.87	1187.52	43	35	56	586	1.26	Deleted
46	804.01	1214.99	140	77	126	1349	4.47	Unknown
47	835.98	1263.37	18	36	58	629	0.52	Deleted
50	917.54	1386.83	38	29	46	417	1.49	Deleted
54	1000.76	1512.81	-17	44	72	584	0.67	Deleted
57	1172.87	1773.36	-3	35	58	546	0.09	Deleted
64	1592.59	2408.72	87	23	34	206	2.36	2615DEsc
67	1660.88	2512.10	16	19	31	166	0.47	Deleted
71	2104.25	3183.27	113	21	31	155	3.27	2615SEsc
72	2107.99	3188.93	18	10	16	62	1.25	Unknown
74	2149.88	3252.34	13	15	23	106	0.59	Deleted
78	63.48	93.98	1252	112	174	5178	0.92	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	144.44	216.53	61N	107	176	4023	1.18	NET< CL
81	122.06	182.65	38N	67	110	2453	1.13	NET< CL
82	133.54	200.03	-69N	67	111	2483	1.14	NET< CL
83	264.65	398.50	-165N	59	99	1822	1.23	NET< CL
84	320.08	482.41	-102N	52	86	1379	1.27	NET< CL
85	364.48	549.63	-59N	47	78	1118	1.30	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
86	427.89	645.61	91N	43	69	886	1.35	
87	433.93	654.76	-62N	41	69	888	1.35	NET< CL
88	477.59	720.85	12N	41	67	824	1.38	NET< CL
89	487.03	735.14	41N	39	64	747	1.39	NET< CL
90	497.08	750.35	-70N	38	65	773	1.39	NET< CL
91	537.32	811.27	20N	41	68	778	1.42	NET< CL
92	604.70	913.27	-2N	43	71	863	1.47	NET< CL
								LBase
93	621.84	939.21	-8N	39	65	721	1.48	NET< CL
94	724.18	1094.13	-57N	195	321	1103	1.55	NET< CL
								PIC
95	765.79	1157.12	29N	51	85	746	1.58	NET< CL
								PIC
96	810.76	1225.20	19N	44	72	481	1.61	NET< CL
								RHRoi
97	834.83	1261.64	-15N	35	59	636	1.63	NET< CL
98	884.67	1337.08	3N	31	51	486	1.66	NET< CL
99	1099.22	1661.86	-35N	29	49	442	1.81	NET< CL
100	1115.52	1686.54	43N	60	99	939	1.82	NET< CL
								PIC
101	1332.49	2014.99	47N	26	42	308	1.96	
102	1691.02	2557.72	-5N	18	29	157	2.21	NET< CL

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:48:53
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 150000 Sec
Sample Size 1.17E-01 kg | Real Time 150044 Sec
Collection Efficiency 1.0000 | Spectrum File 1296502.spc

Detector #: 2

Energy(keV)= 1.40 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/09/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 6.55E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS002.EFF (Sand in a 4 oz. Jar: 1.6 g/cc)
Eff.=1/[1.49e-02*En^-2.83e+00 + 1.39e+02*En^ 8.08e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-06.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Am-241	4.74E+01	8.12E+01	< 2.68E+02	1.34E+02	1.00E+00	MEAS +	YES
Th-234	1.32E+03	1.04E+02	< 3.84E+02	1.91E+02	1.00E+00	MEAS +	YES
Tl-208	9.11E+02	2.77E+01	< 9.46E+01	4.67E+01	1.00E+00	MEAS +	YES
Pb-212	9.80E+02	1.67E+01	< 3.83E+01	1.90E+01	1.00E+00	MEAS +	YES
AcTh-228	9.54E+02	2.52E+01	< 1.03E+02	5.04E+01	1.00E+00	MEAS +	YES
Ce-141	1.66E+01	2.91E+01	< 9.64E+01	4.78E+01	3.83E-01	NET	YES
Ra-226	2.13E+03	2.09E+02	< 6.61E+02	3.28E+02	1.00E+00	MEAS +	YES
Pb-214	8.33E+02	1.86E+01	< 5.99E+01	2.96E+01	1.00E+00	MEAS +	YES
Annul	1.58E+01	2.40E+01	< 7.92E+01	3.94E+01	9.18E-01	MEAS +	YES
Bi-214	7.17E+02	2.11E+01	< 6.43E+01	3.17E+01	1.00E+00	MEAS +	YES
Cs-137	1.99E+02	9.94E+00	< 2.66E+01	1.30E+01	9.97E-01	MEAS +	YES
Bi-212	5.66E+02	6.61E+01	< 2.09E+02	1.02E+02	1.00E+00	MEAS +	YES
K-40	1.41E+04	2.20E+02	< 3.39E+02	1.66E+02	1.00E+00	MEAS +	YES
Co-57	2.36E+00	4.22E+00	< 1.40E+01	6.92E+00	8.91E-01	NET	YES
Ce-144	-3.50E+01	3.38E+01	< 1.13E+02	5.60E+01	8.96E-01	NET	YES
Se-75	-2.65E+01	9.47E+00	< 3.23E+01	1.59E+01	7.71E-01	NET	YES
Cr-51	-2.74E+02	1.38E+02	< 4.72E+02	2.32E+02	3.24E-01	NET	YES
I-131	-3.34E+02	2.64E+02	< 8.96E+02	4.40E+02	2.06E-02	NET	YES
Sb-125	3.45E+01	1.64E+01	< 5.35E+01	2.63E+01	9.70E-01	NET	YES
Ag-108m	-7.53E+00	5.03E+00	< 1.72E+01	8.41E+00	9.99E-01	NET	YES
Be-7	2.43E+01	8.26E+01	< 2.76E+02	1.35E+02	5.58E-01	NET	YES
La-140	1.23E+02	1.18E+02	< 3.91E+02	1.91E+02	8.72E-02	NET	YES
Ru-103	-2.11E+01	1.16E+01	< 3.99E+01	1.95E+01	4.52E-01	NET	YES
Ba-140	1.18E+02	2.45E+02	< 8.18E+02	4.01E+02	8.72E-02	NET	YES
Cs-134	-3.55E-01	6.57E+00	< 2.20E+01	1.08E+01	9.59E-01	NET	YES
Ru-106	-1.29E+01	6.37E+01	< 2.15E+02	1.05E+02	9.19E-01	NET	YES
Zr-95	-3.50E+01	1.20E+02	< 3.96E+02	1.97E+02	6.14E-01	NET	YES
Nb-95	1.20E+01	2.16E+01	< 7.24E+01	3.56E+01	4.11E-01	NET	YES
Co-58	5.36E+00	1.25E+01	< 4.14E+01	2.03E+01	6.44E-01	NET	YES
Mn-54	-3.06E+00	7.23E+00	< 2.45E+01	1.20E+01	9.05E-01	NET	YES
Ag-110m	9.06E-01	9.43E+00	< 3.18E+01	1.55E+01	8.83E-01	NET	YES
Fe-59	-2.87E+01	2.39E+01	< 8.25E+01	4.01E+01	4.97E-01	NET	YES
Zn-65	2.25E+01	3.15E+01	< 1.04E+02	5.15E+01	8.80E-01	NET	YES
Co-60	1.28E+01	7.25E+00	< 2.38E+01	1.15E+01	9.84E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	-5.59E+00	1.97E+01	< 6.82E+01	3.26E+01	5.95E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-07 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-260 REF-X19576
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 131.4 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/14/03 12:22 Det No.: 8 Spectrum No.: 1367108
Counted by: gh
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5348-07	Product : GAMMA SPECTROMETRY
Client Id : BMA-E0200-260	Matrix : S001 Soil
Site : REF-X19576	
Comments :	
Client : 00435 Duratek Inc	
Project : OTHER ENVIRON-DUR	
Start Date :	
Collect Date : 03/26/03 12:00	

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	131.4		
Sample Weight-Dry	g			
Aliquot Weight	g	131.4		
FINAL WEIGHT	kg	.1314		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-07

Sample ID: SOIL/SEDI Duratek Inc

Code: 1367108

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:12:50
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.23E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 60000 Sec
 Sample Size 1.31E-001 kg | Real Time 60051 Sec
 Collection Efficiency 1.0000 | Spc. File 1367108.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Energy(keV)= -0.30 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/20/2003
 FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 0.70 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.81	90.71	87	39	62	949	0.62	a
2	62.65	95.00	461	51	76	1265	0.95	b
3	74.23	112.47	1686	84	121	2484	1.53	a HiResid
4	76.46	115.85	2305	75	94	1774	1.01	b HiResid
5	83.66	126.72	306	62	98	1788	1.32	a
6	86.62	131.17	878	60	86	1490	1.19	b
7	89.32	135.26	404	49	73	1192	0.88	c
8	92.28	139.72	1274	70	98	1788	1.32	d
9	98.83	149.61	33	37	60	894	0.67	e NET< CL
10	104.61	158.32	68	45	73	1192	0.80	f NET< CL
11	128.65	194.60	262	70	112	1969	1.46	
12	143.38	216.84	53	87	143	2677	0.46	NET< CL
13	153.09	231.50	-60	86	141	2602	1.26	NET< CL
14	162.58	245.81	14	58	95	1544	0.26	NET< CL
15	177.15	267.81	-9	56	93	1463	0.21	NET< CL
16	185.36	280.19	1138	75	110	1790	1.57	
17	196.72	297.34	131	51	82	1241	1.27	a
18	198.26	299.66	101	38	61	827	0.94	b
19	208.74	315.48	404	68	107	1688	1.27	
20	238.06	359.72	4647	82	74	1014	1.22	a HiResid
21	240.87	363.96	929	64	92	1352	1.64	b HiResid
22	269.47	407.13	346	59	93	1270	1.40	
23	277.65	419.47	105	57	92	1242	0.97	
24	294.58	445.02	1328	53	64	749	1.29	a
25	299.45	452.37	252	37	56	624	1.06	b
26	313.25	473.20	31	42	68	784	0.84	NET< CL
27	323.83	489.16	21	24	39	370	0.72	a NET< CL
28	327.25	494.33	199	41	63	741	1.35	b

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
29	337.74	510.16	860	58	83	1024	1.30	
30	351.33	530.66	2276	68	79	926	1.47	
31	381.85	576.73	39	46	75	830	0.95	NET< CL
32	401.05	605.70	55	29	46	428	0.99	a
33	404.33	610.65	88	37	59	598	1.43	b
34	408.97	617.65	105	30	46	428	1.10	c
35	448.34	677.07	4	34	55	522	0.09	NET< CL
36	462.35	698.22	204	40	62	612	1.61	
37	510.31	770.60	1887	58	64	679	2.38	Wide Pk
38	540.20	815.70	15	34	55	522	1.91	NET< CL
39	557.60	841.97	-2	31	52	492	0.08	NET< CL
40	569.20	859.47	37	39	64	638	4.60	NET< CL Wide Pk
41	582.68	879.81	1434	52	59	578	1.56	
42	608.78	919.21	1761	56	61	614	1.58	
43	661.14	998.23	1547	52	56	506	1.62	
44	678.13	1023.86	6	17	28	191	0.84	a NET< CL
45	682.59	1030.60	11	20	32	239	0.98	b NET< CL
46	704.48	1063.64	3	27	44	390	0.14	NET< CL
47	726.70	1097.16	333	33	46	370	1.92	
48	767.55	1158.82	164	29	43	318	2.05	a
49	771.72	1165.10	65	19	28	177	1.01	b
50	785.69	1186.19	98	30	47	368	1.56	
51	794.65	1199.71	139	31	47	370	1.44	
52	802.30	1211.25	31	21	33	232	1.32	a NET< CL
53	805.76	1216.48	42	23	37	271	1.58	b
54	835.67	1261.61	-4	27	45	375	0.17	NET< CL
55	860.23	1298.68	196	32	48	360	1.71	
56	910.77	1374.96	981	43	47	348	1.84	
57	933.60	1409.41	68	29	46	334	1.29	
58	949.48	1433.38	6	29	48	342	0.15	NET< CL
59	964.45	1455.97	221	30	42	295	2.15	a
60	968.58	1462.20	558	31	32	206	1.59	b
61	1000.39	1510.20	42	26	42	288	1.36	NET< CL
62	1044.29	1576.45	-2	25	41	278	0.14	NET< CL
63	1079.96	1630.29	31	31	50	341	1.39	NET< CL
64	1119.85	1690.49	396	35	48	336	2.20	
65	1154.26	1742.42	32	24	38	249	1.64	NET< CL
66	1238.10	1868.95	150	29	44	336	1.47	
67	1280.38	1932.75	63	25	39	248	3.28	Wide Pk
68	1377.78	2079.75	119	20	27	138	2.23	a
69	1385.65	2091.63	25	16	25	124	1.87	b
70	1400.74	2114.40	38	14	20	86	1.44	a
71	1407.46	2124.54	71	24	37	197	3.37	b Wide Pk
72	1460.53	2204.64	3562	62	30	148	2.16	
73	1509.34	2278.29	42	17	27	125	2.46	
74	1588.28	2397.44	31	18	28	149	1.15	
75	1620.37	2445.86	24	14	21	84	1.91	a
76	1631.03	2461.94	36	11	16	56	1.30	b
77	1729.05	2609.87	56	18	26	109	1.54	
78	1764.28	2663.04	335	25	27	111	2.34	
79	1847.03	2787.92	65	17	25	106	2.60	
80	2103.57	3175.09	100	18	25	89	5.51	Wide Pk

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
81	2118.19	3197.16	28	18	28	114	5.81	NET< CL Wide Pk
82	2164.29	3266.73	18	14	22	79	1.52	NET< CL
83	2203.70	3326.20	82	16	21	75	2.91	
84	2614.23	3945.75	655	28	19	51	3.06	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File:. EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	62.65	461	51	76	222	54	86	
3	74.23	1686	84	121	1574	86	126	
4	76.46	2305	75	94	2227	77	100	
5	83.66	306	62	98	261	64	101	
8	92.28	1274	70	98	653	73	113	
9	98.83	33	37	60	14	39	64	NET<CL
12	143.38	53	87	143	-21	89	146	NET<CL
14	162.58	15	58	95	-10	63	104	NET<CL
16	185.36	1138	75	110	728	79	123	
18	198.26	101	38	61	-87	45	76	NET<CL
20	238.06	4647	82	74	4366	84	86	
21	240.87	929	64	92	870	66	97	
22	269.47	346	59	93	354	64	100	
24	294.58	1328	53	64	1266	57	74	
29	337.74	861	59	83	818	61	88	
30	351.33	2277	68	79	2089	71	89	
37	510.31	1887	58	64	395	64	100	
39	557.60	-2	31	52	-73	35	59	NET<CL
40	569.20	37	39	64	-2	42	70	NET<CL
41	582.68	1434	52	59	1331	54	67	
42	608.78	1761	56	61	1591	59	71	
48	767.55	164	29	43	132	32	49	
52	802.30	31	21	33	-32	24	41	NET<CL
56	910.77	981	43	47	915	44	53	
60	968.58	558	31	32	504	33	39	
61	1000.39	42	26	42	16	28	46	NET<CL
64	1119.85	396	35	48	353	36	51	
72	1460.53	3562	62	30	3447	63	39	
78	1764.28	335	25	27	295	26	32	
83	2203.70	82	16	21	69	17	24	
84	2614.23	655	28	19	566	29	27	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
1	59.81	54	Am-241	. . . . .	1 of 3	100.00	1.50	Split
90	59.81	33	AcTh-228	33	15 of 36	85.30	1.35	AutoAdd
2	62.65	222	Th-234	252	2 of 2	100.00	1.50	
3	74.23	1574	Pb-212	939	5 of 6	99.30	0.99	
			Pb-214	427	5 of 7	89.61	0.90	
			Tl-208	97	6 of 9	97.77	0.98	
4	76.46	2227	Pb-212	1660	5 of 6	99.30	0.99	
			Pb-214	741	5 of 7	89.61	0.90	
5	83.66	261	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
6	86.62	878	Pb-212	871	5 of 6	100.00	1.50	
7	89.32	404	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	92.28	653	Th-234	576	2 of 2	100.00	1.50	
11	128.65	262	AcTh-228	324	15 of 36	92.24	1.42	
16	185.36	728	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
17	196.72	131	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
19	208.74	405	AcTh-228	414	15 of 36	91.43	1.41	
20	238.06	4366	Pb-212	5629	5 of 6	100.00	1.00	
21	240.87	870	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
22	269.47	354	AcTh-228	284	15 of 36	88.83	1.39	
23	277.65	105	Tl-208	192	6 of 9	100.00	1.50	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
24	294.58	1266	Pb-214	1728	5 of 7	90.83	1.41	
25	299.45	252	Pb-212	285	5 of 6	100.00	1.50	
28	327.25	199	AcTh-228	222	15 of 36	91.43	1.41	
			Bi-212	4	4 of 13	82.79	0.83	
29	337.74	818	AcTh-228	761	15 of 36	90.50	1.40	
30	351.33	2089	Pb-214	2949	5 of 7	90.83	1.41	
32	401.05	55	Se-75	. . . . .	1 of 5	6.62	0.57	
33	404.33	88	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
34	408.97	105	AcTh-228	125	15 of 36	92.24	1.42	
36	462.35	204	AcTh-228	237	15 of 36	91.43	1.41	
37	510.31	5	Annul	. . . . .	1 of 1	100.00	1.50	Split
89	510.31	390	Tl-208	390	6 of 9	100.00	1.50	AutoAdd
41	582.68	1331	Tl-208	1454	6 of 9	100.00	1.50	
42	608.78	1591	Bi-214	1834	16 of 33	97.35	1.47	
			1120SEsc	. . . . .	0 of 0	. . . . .	0.50	
43	661.14	1547	Cs-137	. . . . .	1 of 1	100.00	1.50	
47	726.70	128	1238SEsc	. . . . .	0 of 0	. . . . .	0.50	Split
88	726.70	205	Bi-212	205	4 of 13	100.00	1.50	AutoAdd

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
48	767.55	132	Bi-214	152	16 of 33	100.00	1.50	
49	771.72	65	AcTh-228	57	15 of 36	88.83	1.39	
			TeI-132		0 of 0	. . . .	0.00	Decay
50	785.69	48	Pb-214	35	5 of 7	89.61	1.40	Split
87	785.69	50	Bi-212	50	4 of 13	94.60	1.45	AutoAdd
51	794.65	139	AcTh-228	166	15 of 36	92.24	1.42	
53	805.76	42	Bi-214	36	16 of 33	94.15	1.44	
55	860.23	196	Tl-208	152	6 of 9	100.00	1.50	
56	910.77	915	AcTh-228	888	15 of 36	90.50	1.40	
57	933.60	68	Bi-214	84	16 of 33	100.00	1.50	
59	964.45	221	AcTh-228	160	15 of 36	88.83	1.39	
60	968.58	504	AcTh-228	517	15 of 36	91.43	1.41	
			Sb-124		1 of 13	1.04	0.01	LowScore
64	1119.85	353	Bi-214	342	16 of 33	95.97	1.46	
66	1238.10	150	Bi-214	125	16 of 33	94.15	1.44	
67	1280.38	63	Bi-214	30	16 of 33	94.15	1.44	
68	1377.78	119	Bi-214	80	16 of 33	94.15	1.44	
69	1385.65	25	Bi-214	15	16 of 33	94.15	1.44	
70	1400.74	12	Cs-Sum	23	2 of 6	33.33	0.83	Split
86	1400.74	27	Bi-214	27	16 of 33	94.15	1.44	AutoAdd
71	1407.46	23	Cs-Sum	38	2 of 6	33.33	0.83	Split
85	1407.46	48	Bi-214	48	16 of 33	94.15	1.44	AutoAdd
72	1460.53	3447	K-40		1 of 1	100.00	1.50	
73	1509.34	42	Bi-214	41	16 of 33	95.97	1.46	
74	1588.28	31	AcTh-228	76	15 of 36	96.40	1.46	
75	1620.37	24	Bi-212	44	4 of 13	100.00	1.50	
76	1631.03	36	AcTh-228	39	15 of 36	91.43	1.41	
77	1729.05	56	Bi-214	49	16 of 33	95.05	1.45	
78	1764.28	295	Bi-214	253	16 of 33	95.05	1.45	
79	1847.03	65	Bi-214	33	16 of 33	94.15	1.44	
80	2103.57	100	2614SEsc		0 of 0	. . . .	0.50	
83	2203.70	69	Bi-214	69	16 of 33	95.97	1.46	
84	2614.23	566	Tl-208	518	6 of 9	100.00	1.50	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-07

Sample ID: SOIL/SEDI Duratek Inc

Code: 1367108

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:12:50
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.23e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 60000 Sec
 Sample Size 1.31e-001 kg | Real Time 60051 Sec
 Collection Efficiency 1.0000 | Spectrum File 1367108.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[7.49E-03*En^-3.10E+00 + 9.34E+01*En^7.45E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-07.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS

		N							
		ENERGY E	Concentration			MDA	Flags	Notes	MDC
Nuclide	(keV)	(pCi/kg)						
Am-241	59.54	2.98E+01 +- 3.72E+01	1.23E+02						
Th-234	Average:x	1.12E+03 +- 1.14E+02	. . . . .					
	63.29	1.01E+03 +- 2.46E+02	7.91E+02						
	92.59	1.15E+03 +- 1.29E+02	4.03E+02						
Pb-212	Average:x	1.10E+03 +- 2.10E+01	. . . . .					
	74.81	I.D.	. . . . .					
	77.12	I.D.	. . . . .					
	87.30	I.D.	. . . . .					
	238.63	1.10E+03 +- 2.12E+01	4.38E+01						
	300.09	9.73E+02 +- 1.44E+02	4.40E+02						
AcTh-228	Average:x	9.69E+02 +- 2.96E+01	. . . . .					
	129.08	7.87E+02 +- 2.10E+02	6.79E+02						
	209.28	9.48E+02 +- 1.59E+02	5.07E+02						
	270.23	1.20E+03 +- 2.17E+02	6.91E+02						
	327.64	8.72E+02 +- 1.80E+02	5.67E+02						
	338.32	1.03E+03 +- 7.66E+01	2.26E+02						
	409.51	8.15E+02 +- 2.31E+02	7.35E+02						
	463.00	8.38E+02 +- 1.66E+02	5.22E+02						
	772.17	1.11E+03 +- 3.20E+02	9.97E+02						
	794.70	8.16E+02 +- 1.83E+02	5.73E+02						
	911.07	9.87E+02 +- 4.78E+01	1.18E+02						
	964.60	1.33E+03 +- 1.78E+02	5.25E+02						
	969.11	9.51E+02 +- 6.15E+01	1.52E+02						
	1588.00	4.01E+02 +- 2.34E+02	7.69E+02						
	1630.40	8.90E+02 +- 2.77E+02	8.38E+02						
	59.00	9.69E+02 +- 1.61E+03	5.35E+03						
Ra-226	186.22	2.13E+03 +- 2.32E+02	7.27E+02						

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration		MDA	Flags	Notes	MDC
		(pCi/kg)				
Tl-208	Average:x	9.78E+02	+ - 3.07E+01	. . . . .		*	. . . . .
	277.35	5.36E+02	+ - 2.89E+02	9.50E+02		+	. . . . .
	510.84	I.D.	. . . . .	. . . . .			. . . . .
	583.14	9.44E+02	+ - 3.86E+01	9.63E+01		++	. . . . .
	860.37	1.25E+03	+ - 2.07E+02	6.33E+02		++	. . . . .
	2614.66	1.04E+03	+ - 5.31E+01	1.05E+02		++	. . . . .
Pb-214	Average:x	8.40E+02	+ - 2.27E+01	. . . . .		*	. . . . .
	295.21	8.58E+02	+ - 3.88E+01	1.02E+02		++	. . . . .
	351.92	8.30E+02	+ - 2.81E+01	7.15E+01		++	. . . . .
	785.91	1.17E+03	+ - 1.29E+03	4.27E+03		+	. . . . .
Se-75	Average:x	2.54E+00	+ - 1.10E+01	. . . . .			. . . . .
	400.65	1.05E+02	+ - 5.56E+01	1.82E+02		+	. . . . .
	264.65	N-1.63E+00	+ - 1.12E+01	3.77E+01	WMD OK 8/5/2013	x lbase	. . . . .
Annul	511.00	9.92E-01	+ - 2.39E+01	7.93E+01		+	. . . . .
Bi-214	Average:x	7.92E+02	+ - 2.41E+01	. . . . .		*	. . . . .
	609.31	7.61E+02	+ - 2.82E+01	6.95E+01		++	. . . . .
	768.36	6.88E+02	+ - 1.66E+02	5.25E+02		++	. . . . .
	806.17	9.25E+02	+ - 5.20E+02	1.71E+03		+	. . . . .
	934.06	6.44E+02	+ - 2.78E+02	9.04E+02		+	. . . . .
	1120.29	8.14E+02	+ - 8.36E+01	2.41E+02		++	. . . . .
	1238.11	9.45E+02	+ - 1.85E+02	5.69E+02		++	. . . . .
	1280.96	1.63E+03	+ - 6.55E+02	2.12E+03		+	. . . . .
	1377.67	1.17E+03	+ - 1.96E+02	5.68E+02		++	. . . . .
	1385.31	1.32E+03	+ - 8.45E+02	2.79E+03		+	. . . . .
	1401.50	7.92E+02	+ - 5.69E+02	1.88E+03		+	. . . . .
	1407.98	7.94E+02	+ - 5.67E+02	1.87E+03		+	. . . . .
	1509.23	8.16E+02	+ - 3.42E+02	1.10E+03		+	. . . . .
	1729.59	9.05E+02	+ - 2.84E+02	8.90E+02		++	. . . . .
	1764.49	9.12E+02	+ - 8.07E+01	2.08E+02		++	. . . . .
	1847.42	1.57E+03	+ - 4.16E+02	1.27E+03		++	. . . . .
	2204.22	7.97E+02	+ - 1.97E+02	5.97E+02		++	. . . . .
Cs-137	661.65	4.29E+02	+ - 1.44E+01	3.16E+01		++	. . . . .
Cs-Sum	1400.54	I.D.	. . . . .	. . . . .			. . . . .
	1406.63	I.D.	. . . . .	. . . . .			. . . . .
K-40	1460.81	1.37E+04	+ - 2.52E+02	3.21E+02		++	. . . . .
Bi-212	Average:x	4.39E+02	+ - 1.56E+02	. . . . .			. . . . .
	1620.62	4.03E+02	+ - 2.25E+02	7.38E+02		+	. . . . .
	727.17	4.39E+02	+ - 2.34E+02	7.68E+02		+	. . . . .
	785.46	6.85E+02	+ - 5.89E+02	1.95E+03		+	. . . . .
Co-57	122.06	N-7.63E+00	+ - 6.01E+00	2.03E+01		x	. . . . .
Ce-144	133.54	N-3.02E+01	+ - 4.76E+01	1.60E+02	r	x rbase	. . . . .
Ce-141	145.44	N 2.56E+01	+ - 2.91E+01	9.65E+01		x	. . . . .
Cr-51	320.08	N 2.38E+02	+ - 2.13E+02	7.06E+02		x	. . . . .
I-131	364.48	N-4.71E+02	+ - 6.12E+02	2.08E+03		x	. . . . .
Sb-125	427.89	N 5.62E+00	+ - 2.07E+01	6.96E+01		x	. . . . .
Ag-108m	433.93	N 4.15E-01	+ - 6.64E+00	2.23E+01		x	. . . . .
Be-7	477.59	N-5.83E+01	+ - 1.14E+02	3.88E+02		x	. . . . .
La-140	487.03	N-2.62E+02	+ - 2.18E+02	7.50E+02		x	. . . . .
Ru-103	497.08	N 3.32E+00	+ - 1.53E+01	5.17E+01		x	. . . . .
Ba-140	537.32	N 2.69E+02	+ - 3.99E+02	1.33E+03		x	. . . . .
Cs-134	604.70	N-1.93E+01	+ - 2.78E+01	9.25E+01	P	x PIC	. . . . .
Ru-106	621.84	N-2.02E+01	+ - 7.39E+01	2.51E+02		x	. . . . .
Zr-95	724.18	N 8.43E+01	+ - 1.08E+02	3.56E+02	P	x PIC	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E		Concentration		MDA	Flags	Notes	MDC
	(keV)	N	(pCi/kg)				
Nb-95	765.79	N	5.25E+00	+ - 2.47E+01	8.29E+01P		x PIC	. . . . .
Co-58	810.76	N	8.22E+00	+ - 1.05E+01	3.52E+01r		x rbase	. . . . .
Mn-54	834.83	N	3.14E+00	+ - 8.45E+00	2.85E+01		x	. . . . .
Ag-110m	884.67	N	1.12E+01	+ - 1.03E+01	3.60E+01		x	. . . . .
Fe-59	1099.22	N	3.15E+01	+ - 3.19E+01	1.06E+02		x	. . . . .
Zn-65	1115.52	N	6.12E+01	+ - 3.62E+01	1.22E+02P		x PIC	. . . . .
Co-60	1332.49	N	6.06E+00	+ - 7.81E+00	2.63E+01		x	Y.
Sb-124	1691.02	N	3.15E+01	+ - 2.35E+01	7.80E+01		x	. . . . .

MEASURED TOTAL: 2.26E+04 +- 9.70E+02 pCi/kg 0.00E+00
NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
5	83.66	126.72	261	64	101	1788	1.32	Unknown
7	89.32	135.26	404	49	73	1192	0.88	Unknown
9	98.83	149.61	14	39	64	894	0.67	Deleted
10	104.61	158.32	68	45	73	1192	0.80	Deleted
12	143.38	216.84	-21	89	146	2677	0.46	Deleted
13	153.09	231.50	-60	86	141	2602	1.26	Deleted
14	162.58	245.81	-10	63	104	1544	0.26	Deleted
15	177.15	267.81	-9	56	93	1463	0.21	Deleted
17	196.72	297.34	131	51	82	1241	1.27	Unknown
18	198.26	299.66	-87	45	76	827	0.94	Deleted
21	240.87	363.96	870	66	97	1352	1.64	Unknown
26	313.25	473.20	31	42	68	784	0.84	Deleted
27	323.83	489.16	21	24	39	371	0.72	Deleted
31	381.85	576.73	40	46	75	830	0.95	Deleted
33	404.33	610.65	88	37	59	599	1.43	Unknown
35	448.34	677.07	4	34	55	522	0.09	Deleted
38	540.20	815.70	15	34	55	522	1.91	Deleted
39	557.60	841.97	-73	35	59	492	0.08	Deleted
40	569.20	859.47	-2	42	70	638	4.60	Deleted
44	678.13	1023.86	6	17	28	191	0.84	Deleted
45	682.59	1030.60	11	20	32	239	0.98	Deleted
46	704.48	1063.64	3	27	45	390	0.14	Deleted
47	726.70	1097.16	128	114	187	370	1.92	1238SEsc
52	802.30	1211.25	-32	24	41	233	1.32	Deleted
54	835.67	1261.61	-4	27	45	375	0.17	Deleted
58	949.48	1433.38	6	29	48	342	0.15	Deleted
61	1000.39	1510.20	16	28	46	288	1.36	Deleted
62	1044.29	1576.45	-3	25	41	278	0.14	Deleted
63	1079.96	1630.29	31	31	50	341	1.39	Deleted
65	1154.26	1742.42	32	24	38	249	1.64	Deleted
80	2103.57	3175.09	100	18	25	89	5.51	2614SEsc
81	2118.19	3197.16	28	18	28	114	5.81	Deleted
82	2164.29	3266.73	18	14	22	79	1.52	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
91	122.06	184.66	-68N	54	89	1471	1.29	NET< CL
92	133.54	201.99	-34N	54	89	1457	1.30	NET< CL
								RBase
93	145.44	219.95	48N	55	89	1462	1.31	NET< CL
94	264.65	399.85	-6N	41	68	855	1.39	NET< CL
								LBase
95	320.08	483.51	47N	42	68	786	1.43	NET< CL
96	364.48	550.51	-30N	38	64	698	1.46	NET< CL
97	427.89	646.21	9N	34	56	544	1.50	NET< CL
98	433.93	655.32	2N	35	57	552	1.50	NET< CL
99	477.59	721.21	-17N	33	55	510	1.53	NET< CL
100	487.03	735.46	-39N	32	54	504	1.54	NET< CL
101	497.08	750.63	6N	29	47	443	1.55	NET< CL
102	537.32	811.36	20N	30	49	399	1.57	NET< CL
103	604.70	913.04	-82N	118	194	947	1.62	NET< CL
								PIC
104	621.84	938.91	-8N	29	48	431	1.63	NET< CL
105	724.18	1093.36	84N	107	175	575	1.70	NET< CL
								PIC
106	765.79	1156.16	7N	34	55	406	1.73	NET< CL
								PIC
107	810.76	1224.02	18N	23	37	255	1.76	NET< CL
								RBase
108	834.83	1260.35	10N	27	44	357	1.77	NET< CL
109	884.67	1335.57	-24N	22	37	259	1.81	NET< CL
110	1099.22	1659.36	23N	24	38	250	1.95	NET< CL
111	1115.52	1683.96	77N	46	76	479	1.96	PIC
112	1332.49	2011.40	15N	19	31	179	2.10	NET< CL
113	1691.02	2552.48	18N	13	21	77	2.34	NET< CL

 S E E K E R A N A L Y S I S S U M M A R Y
 Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:12:50
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.23E+03 Hrs
 Buildup Time. 0.00E+00 Hrs | Live Time 60000 Sec
 Sample Size 1.31E-01 kg | Real Time 60051 Sec
 Collection Efficiency 1.0000 | Spectrum File 1367108.spc

Detector #: 8
 Energy(keV)= -0.30 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/20/2003
 FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003
 Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[7.49e-03*En^-3.10e+00 + 9.34e+01*En^ 7.45e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-07.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Am-241	2.98E+01	3.72E+01	< 1.23E+02	6.08E+01	1.00E+00	MEAS +	YES
Th-234	1.12E+03	1.14E+02	< 4.03E+02	1.99E+02	1.00E+00	MEAS +	YES
Pb-212	1.10E+03	2.10E+01	< 4.38E+01	2.16E+01	1.00E+00	MEAS +	YES
AcTh-228	9.69E+02	2.96E+01	< 1.18E+02	5.74E+01	9.99E-01	MEAS +	YES
Ra-226	2.13E+03	2.32E+02	< 7.27E+02	3.60E+02	1.00E+00	MEAS +	YES
Tl-208	9.78E+02	3.07E+01	< 9.63E+01	4.72E+01	9.99E-01	MEAS +	YES
Pb-214	8.40E+02	2.27E+01	< 7.15E+01	3.52E+01	1.00E+00	MEAS +	YES
Se-75	2.54E+00	1.10E+01	< 3.77E+01	1.85E+01	7.42E-01	MEAS +	YES
Annil	9.92E-01	2.39E+01	< 7.93E+01	3.94E+01	9.07E-01	MEAS +	YES
Bi-214	7.92E+02	2.41E+01	< 6.95E+01	3.41E+01	1.00E+00	MEAS +	YES
Cs-137	4.29E+02	1.44E+01	< 3.16E+01	1.54E+01	9.97E-01	MEAS +	YES
K-40	1.37E+04	2.52E+02	< 3.21E+02	1.55E+02	1.00E+00	MEAS +	YES
Bi-212	4.39E+02	1.56E+02	< 7.38E+02	3.46E+02	9.99E-01	MEAS +	YES
Co-57	-7.62E+00	6.01E+00	< 2.03E+01	1.00E+01	8.76E-01	NET	YES
Ce-144	-3.02E+01	4.76E+01	< 1.60E+02	7.88E+01	8.82E-01	NET	YES
Ce-141	2.56E+01	2.91E+01	< 9.65E+01	4.75E+01	3.33E-01	NET	YES
Cr-51	2.38E+02	2.13E+02	< 7.06E+02	3.46E+02	2.75E-01	NET	YES
I-131	-4.71E+02	6.12E+02	< 2.08E+03	1.02E+03	1.17E-02	NET	YES
Sb-125	5.62E+00	2.08E+01	< 6.96E+01	3.40E+01	9.65E-01	NET	YES
Ag-108m	4.15E-01	6.64E+00	< 2.23E+01	1.09E+01	9.99E-01	NET	YES
Be-7	-5.83E+01	1.14E+02	< 3.88E+02	1.89E+02	5.12E-01	NET	YES
La-140	-2.62E+02	2.18E+02	< 7.50E+02	3.66E+02	6.12E-02	NET	YES
Ru-103	3.32E+00	1.53E+01	< 5.17E+01	2.51E+01	4.03E-01	NET	YES
Ba-140	2.69E+02	3.99E+02	< 1.33E+03	6.49E+02	6.12E-02	NET	YES
Cs-134	-1.93E+01	2.78E+01	< 9.25E+01	4.59E+01	9.54E-01	NET	YES
Ru-106	-2.02E+01	7.39E+01	< 2.51E+02	1.22E+02	9.08E-01	NET	YES
Zr-95	8.43E+01	1.08E+02	< 3.56E+02	1.77E+02	5.72E-01	NET	YES
Nb-95	5.25E+00	2.47E+01	< 8.28E+01	4.04E+01	3.61E-01	NET	YES
Co-58	8.22E+00	1.05E+01	< 3.52E+01	1.70E+01	6.04E-01	NET	YES
Mn-54	3.14E+00	8.45E+00	< 2.85E+01	1.38E+01	8.92E-01	NET	YES
Ag-110m	-1.11E+01	1.03E+01	< 3.60E+01	1.74E+01	8.67E-01	NET	YES
Fe-59	3.15E+01	3.19E+01	< 1.06E+02	5.13E+01	4.49E-01	NET	YES
Zn-65	6.12E+01	3.62E+01	< 1.22E+02	6.00E+01	8.64E-01	NET	YES
Co-60	6.06E+00	7.80E+00	< 2.62E+01	1.26E+01	9.82E-01	NET	YES

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	3.15E+01	2.35E+01	< 7.80E+01	3.66E+01	5.52E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-08 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-281 REF-X19577
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: W65268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 110.3 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/9/03 16:10 Det No.: 8 Spectrum No.: 1296708
Counted by: Elk
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5348-08	Product	: GAMMA SPECTROMETRY
Client Id	: BMA-E0200-281	Matrix	: SO01 Soil
Site	: REF-X19577		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/26/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	110.3		
Sample Weight-Dry	g			
Aliquot Weight	g	110.3		
FINAL WEIGHT	kg	.1103		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5348-08

Sample ID: SOIL/SEDI Duratek Inc

Code: 1296708

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 16:10:04
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 60000 Sec
Sample Size 1.10E-001 kg | Real Time 60051 Sec
Collection Efficiency 1.0000 | Spc. File 1296708.spc

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
Energy(keV)= 0.70 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/09/2003
FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 0.00E+00*En^3 03/07/2003
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.46	79.63	-20403	831	1388	23722	595.05	NET< CL Wide Pk
2	63.88	95.37	449	71	111	2108	1.20	
3	75.32	112.63	1639	80	113	2196	1.41	a
4	77.60	116.08	2271	72	88	1568	1.15	b
5	84.80	126.94	304	52	81	1318	1.08	a
6	87.69	131.30	965	64	93	1582	1.36	b
7	90.44	135.46	594	61	93	1582	1.20	c
8	93.32	139.79	1597	75	104	1846	1.60	d
9	105.46	158.13	45	66	108	1864	0.60	NET< CL
10	129.58	194.53	313	59	92	1454	1.89	Wide Pk
11	144.06	216.38	24	53	87	1385	0.36	NET< CL
12	154.17	231.65	123	67	109	1758	1.18	
13	164.06	246.58	63	62	100	1595	1.01	NET< CL
14	186.36	280.23	948	72	107	1701	1.36	
15	198.71	298.87	272	77	123	1984	2.84	Wide Pk
16	209.70	315.45	311	73	116	1867	1.37	
17	239.12	359.87	4054	77	70	906	1.26	a
18	242.07	364.32	923	61	87	1208	1.79	b
19	252.86	380.61	-27	45	74	944	0.59	NET< CL
20	270.67	407.48	363	51	78	963	1.70	a
21	277.76	418.18	222	45	70	842	1.61	b
22	295.69	445.25	1200	51	62	702	1.33	a
23	300.57	452.61	207	40	62	702	1.32	b
24	328.65	495.00	186	51	80	956	1.22	
25	338.75	510.24	798	55	78	897	1.51	
26	352.41	530.86	1987	65	77	879	1.38	
27	402.78	606.90	52	44	72	768	1.26	NET< CL

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	410.09	617.92	124	40	64	644	1.48	
29	463.39	698.37	220	44	69	658	1.74	
30	511.45	770.91	1779	56	60	629	2.44	Wide Pk
31	583.67	879.92	1266	49	56	508	1.55	
32	609.83	919.40	1614	54	58	556	1.87	
33	662.24	998.51	1162	48	55	498	1.72	
34	727.83	1097.51	288	35	51	424	1.74	
35	768.84	1159.42	115	32	49	416	1.75	
36	786.49	1186.05	6	28	45	358	0.20	NET< CL
37	795.41	1199.52	95	23	34	248	1.32	a
38	804.08	1212.60	43	22	34	248	1.38	b
39	860.94	1298.43	141	29	44	315	2.02	
40	911.76	1375.13	860	39	42	285	1.70	
41	934.34	1409.21	14	26	42	302	0.51	NET< CL
42	951.13	1434.56	34	25	41	272	1.32	NET< CL
43	965.17	1455.75	209	31	46	309	2.62	a Wide Pk
44	969.56	1462.38	588	32	33	206	1.81	b
45	1001.70	1510.89	67	27	42	276	1.75	
46	1120.98	1690.92	319	31	42	289	1.59	
47	1238.96	1868.99	111	32	50	400	1.29	
48	1281.98	1933.93	21	23	37	245	0.94	NET< CL
49	1378.25	2079.24	107	19	26	129	2.16	a
50	1386.40	2091.54	31	14	20	90	1.45	b
51	1409.27	2126.06	28	19	31	158	2.18	NET< CL
52	1461.44	2204.81	3316	60	29	139	2.17	
53	1497.10	2258.63	-2	20	33	168	0.10	NET< CL
54	1588.15	2396.05	42	18	27	138	5.51	Wide Pk
55	1731.21	2611.99	66	17	25	95	2.88	
56	1765.23	2663.34	286	23	24	92	2.85	
57	1847.67	2787.77	16	16	25	113	1.41	NET< CL
58	2104.10	3174.82	62	16	23	88	2.71	
59	2204.98	3327.09	91	17	24	81	4.83	Wide Pk
60	2615.13	3946.16	539	26	19	57	2.85	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY08.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	53.46	-20403	831	1388	-13359	872	1447	NET<CL
2	63.88	449	71	111	210	73	118	
3	75.32	1639	80	113	1527	82	119	
4	77.60	2271	72	88	2193	74	94	
5	84.80	304	52	81	259	54	84	
8	93.32	1597	75	104	975	78	118	
11	144.06	24	53	87	-50	55	92	NET<CL
13	164.06	63	62	100	39	66	108	NET<CL
14	186.36	948	72	107	538	77	120	
15	198.71	272	77	123	85	80	131	NET<CL
17	239.12	4054	77	70	3772	79	82	
18	242.07	923	61	87	865	63	92	
22	295.69	1200	51	62	1139	55	72	
25	338.75	798	55	78	756	58	83	
26	352.41	1987	65	77	1800	68	87	
30	511.45	1779	56	60	287	62	98	
31	583.67	1266	49	56	1163	51	63	
32	609.83	1614	54	58	1443	57	69	
35	768.84	115	32	49	82	34	54	
40	911.76	860	39	42	794	41	48	
44	969.56	588	32	33	535	33	40	
45	1001.70	67	27	42	41	29	46	NET<CL
46	1120.98	319	31	42	276	32	46	
52	1461.44	3316	60	29	3202	61	38	
55	1731.21	66	17	25	58	19	28	
56	1765.23	286	23	25	245	24	30	
60	2615.13	539	26	19	451	27	28	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	63.88	210	Th-234	210	2 of 2	100.00	1.50	
3	75.32	1527	Pb-212	810	5 of 6	99.30	0.99	
			Pb-214	366	5 of 7	97.33	0.97	
			Tl-208	82	7 of 9	98.43	0.98	
4	77.60	763	Pb-214	648	5 of 7	97.33	0.97	Split
63	77.60	1431	Pb-212	1431	5 of 6	99.30	0.99	AutoAdd
5	84.80	259	Tl-208	44	7 of 9	98.43	0.98	
6	87.69	331	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
62	87.69	634	Pb-212	634	5 of 6	99.30	1.49	AutoAdd
7	90.44	594	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
8	93.32	431	AcTh-228	336	13 of 36	83.18	0.83	Split
61	93.32	544	Th-234	544	2 of 2	100.00	1.50	AutoAdd
10	129.58	313	AcTh-228	301	13 of 36	89.20	1.39	
12	154.17	123	AcTh-228	93	13 of 36	86.65	1.37	
14	186.36	538	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
16	209.70	311	AcTh-228	389	13 of 36	91.52	1.42	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
17	239.12	3772	Pb-212	5510	5 of 6	100.00	1.00	
18	242.07	865	Pb-214	510	5 of 7	98.65	0.99	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
20	270.67	363	AcTh-228	264	13 of 36	86.65	1.37	
21	277.76	222	Tl-208	161	7 of 9	100.00	1.50	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
22	295.69	1139	Pb-214	. . . . .	5 of 7	100.00	1.00	
23	300.57	207	Pb-212	315	5 of 6	100.00	1.50	
24	328.65	187	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Bi-212	6	2 of 13	59.32	0.59	LowScore
			La-140	33222	2 of 15	23.26	0.23	LowScore
25	338.75	756	AcTh-228	713	13 of 36	89.20	1.39	
26	352.41	1800	Pb-214	3294	5 of 7	100.00	1.00	
28	410.09	124	AcTh-228	117	13 of 36	89.20	1.39	
29	463.39	220	AcTh-228	221	13 of 36	89.20	1.39	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
30	511.45	287	Tl-208	332	7 of 9	100.00	1.50	
			Annil	. . . . .	1 of 1	100.00	1.50	
31	583.67	1163	Tl-208	1175	7 of 9	100.00	1.50	
32	609.83	1443	Bi-214	1506	7 of 33	88.23	1.38	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1121SEsc	. . . . .	0 of 0	. . . . .	0.65	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
33	662.24	1162	Cs-137	. . . . .	1 of 1	100.00	1.50	
34	727.83	288	Bi-212	9402	2 of 13	71.65	0.72	
			1239SEsc	. . . . .	0 of 0	. . .	0.65	
35	768.84	82	Bi-214	135	7 of 33	94.03	1.44	
37	795.41	95	AcTh-228	157	13 of 36	94.98	1.45	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
38	804.08	43	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
39	860.94	141	Tl-208	129	7 of 9	100.00	1.50	
40	911.76	794	AcTh-228	905	13 of 36	89.20	1.39	
43	965.17	209	AcTh-228	150	13 of 36	86.65	1.37	
44	969.56	535	AcTh-228	466	13 of 36	86.65	1.37	
46	1120.98	276	Bi-214	305	7 of 33	88.23	1.38	
47	1238.96	111	Bi-214	110	7 of 33	88.23	1.38	
49	1378.25	107	Bi-214	70	7 of 33	81.11	1.31	
50	1386.40	31	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
52	1461.44	3202	K-40	. . . . .	1 of 1	100.00	1.50	
54	1588.15	42	AcTh-228	71	13 of 36	94.98	1.45	
55	1731.21	58	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
56	1765.23	245	Bi-214	223	7 of 33	88.23	1.38	
58	2104.10	62	2615SEsc	. . . . .	0 of 0	. . .	0.65	
59	2204.98	91	Bi-214	60	7 of 33	81.11	1.31	
60	2615.13	451	Tl-208	452	7 of 9	100.00	1.50	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-08

Sample ID: SOIL/SEDI Duratek Inc

Code: 1296708

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 16:10:04
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 60000 Sec
 Sample Size 1.10e-001 kg | Real Time 60051 Sec
 Collection Efficiency 1.0000 | Spectrum File 1296708.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8 Canberra GC4019 SN 6953489)
 Efficiency File: WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[7.49E-03*En^-3.10E+00 + 9.34E+01*En^7.45E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-08.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Th-234	Average:x	1.14E+03 +- 3.01E+02		*
	63.29	1.14E+03 +- 3.97E+02	1.30E+03		+	. . . . .
	92.59	1.14E+03 +- 4.60E+02	1.51E+03		+	. . . . .
Pb-212	Average:x	1.13E+03 +- 2.36E+01	. . . . .		*	. . . . .
	74.81	I.D.	. . . . .			. . . . .
	77.12	I.D.	. . . . .			. . . . .
	87.30	I.D.	. . . . .			. . . . .
	238.63	1.13E+03 +- 2.37E+01	5.01E+01		+	. . . . .
	300.09	9.51E+02 +- 1.85E+02	5.79E+02		+	. . . . .
Pb-214	Average:x	9.08E+02 +- 2.54E+01	. . . . .		*	. . . . .
	77.11	I.D.	. . . . .			. . . . .
	241.98	1.56E+03 +- 1.14E+02	3.38E+02		+	. . . . .
	295.21	9.20E+02 +- 4.47E+01	1.19E+02		+	. . . . .
	351.92	8.51E+02 +- 3.20E+01	8.35E+01		+	. . . . .
Tl-208	Average:x	9.91E+02 +- 3.43E+01	. . . . .		*	. . . . .
	84.90	I.D.	. . . . .			. . . . .
	277.35	1.35E+03 +- 2.75E+02	8.71E+02		+	. . . . .
	510.84	I.D.	. . . . .			. . . . .
	583.14	9.83E+02 +- 4.34E+01	1.09E+02		+	. . . . .
	860.37	1.07E+03 +- 2.22E+02	6.88E+02		+	. . . . .
	2614.66	9.84E+02 +- 5.92E+01	1.27E+02		+	. . . . .
Cd-109	88.03	I.D.	. . . . .			. . . . .
AcTh-228	Average:x	1.08E+03 +- 3.43E+01	. . . . .		*	. . . . .
	93.35	I.D.	. . . . .			. . . . .
	129.08	1.12E+03 +- 2.11E+02	6.71E+02		+	. . . . .
	154.20	1.43E+03 +- 7.82E+02	2.57E+03		+	. . . . .
	209.28	8.69E+02 +- 2.03E+02	6.56E+02		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	ENERGY E (keV)						
	270.23	1.47E+03 +- 2.07E+02	6.42E+02	++		. . . . .
	338.32	1.13E+03 +- 8.65E+01	2.54E+02	++		. . . . .
	409.51	1.15E+03 +- 3.72E+02	1.20E+03	++		. . . . .
	463.00	1.08E+03 +- 2.18E+02	6.88E+02	++		. . . . .
	794.70	6.68E+02 +- 1.61E+02	4.98E+02	++		. . . . .
	911.07	1.02E+03 +- 5.23E+01	1.28E+02	++		. . . . .
	964.60	1.49E+03 +- 2.24E+02	6.73E+02	++		. . . . .
	969.11	1.20E+03 +- 7.51E+01	1.85E+02	++		. . . . .
	1588.00	6.47E+02 +- 2.75E+02	8.83E+02	+		. . . . .
Ra-226	186.22	1.88E+03 +- 2.68E+02	8.49E+02	++		. . . . .
Bi-214	Average:x	8.31E+02 +- 2.78E+01	. . . . .	*		. . . . .
	609.31	8.22E+02 +- 3.22E+01	8.00E+01	++		. . . . .
	768.36	5.11E+02 +- 2.13E+02	6.93E+02	+		. . . . .
	1120.29	7.59E+02 +- 8.89E+01	2.58E+02	++		. . . . .
	1238.11	8.33E+02 +- 2.42E+02	7.72E+02	++		. . . . .
	1377.67	1.26E+03 +- 2.25E+02	6.55E+02	++		. . . . .
	1764.49	9.03E+02 +- 8.93E+01	2.34E+02	++		. . . . .
	2204.22	1.26E+03 +- 2.39E+02	6.94E+02	++		. . . . .
Cs-137	661.65	3.84E+02 +- 1.58E+01	3.73E+01	++		. . . . .
Bi-212	727.17	7.36E+02 +- 8.99E+01	2.66E+02	++		. . . . .
K-40	1460.81	1.52E+04 +- 2.90E+02	3.75E+02	++		. . . . .
Am-241	59.54	N 4.02E+01 +- 3.71E+01	1.23E+021	x	lbase	. . . . .
Co-57	122.06	N 1.35E+01 +- 6.66E+00	2.18E+01	x		. . . . .
Ce-144	133.54	N-2.28E+01 +- 5.35E+01	1.80E+02r	x	rbase	. . . . .
Ce-141	145.44	N 6.52E+01 +- 2.86E+01	9.36E+01	x		. . . . .
Se-75	264.65	N-2.17E+01 +- 1.23E+01	4.21E+011	x	lbase	. . . . .
Cr-51	320.08	N-9.50E+01 +- 2.08E+02	7.03E+02	x		. . . . .
I-131	364.48	N 6.60E+02 +- 3.79E+02	1.25E+03	x		. . . . .
Sb-125	427.89	N-4.57E+01 +- 2.48E+01	8.58E+01	x		. . . . .
Ag-108m	433.93	N 7.23E-01 +- 7.81E+00	2.63E+01	x		. . . . .
Be-7	477.59	N-6.65E+01 +- 1.20E+02	4.10E+02	x		. . . . .
La-140	487.03	N-5.75E+01 +- 1.68E+02	5.69E+02	x		. . . . .
Ru-103	497.08	N 1.35E+01 +- 1.56E+01	5.19E+01	x		. . . . .
Ba-140	537.32	N 4.07E+02 +- 3.20E+02	1.06E+03	x		. . . . .
Cs-134	604.70	N-5.85E+00 +- 7.89E+00	2.71E+011	x	lbase	. . . . .
Ru-106	621.84	N-6.24E+01 +- 8.90E+01	3.04E+02	x		. . . . .
Zr-95	724.18	N-1.02E+04 +- 2.84E+03	9.37E+03P	x#	PIC	. . . . .
Nb-95	765.79	N 3.67E+01 +- 3.00E+01	9.94E+01P	x	PIC	. . . . .
Co-58	810.76	N 7.11E+00 +- 1.16E+01	3.92E+01r	x	rbase	. . . . .
Mn-54	834.83	N-1.47E+00 +- 9.02E+00	3.08E+01	x		. . . . .
Ag-110m	884.67	N-5.43E+00 +- 1.17E+01	4.04E+01	x		. . . . .
Fe-59	1099.22	N-1.34E+01 +- 3.33E+01	1.15E+02	x		. . . . .
Zn-65	1115.52	N-8.66E+01 +- 4.31E+01	1.51E+02P	x	PIC	. . . . .
Co-60	1332.49	N 1.44E+01 +- 9.06E+00	2.98E+01	x		Y.	
Sb-124	1691.02	N-2.08E+01 +- 2.82E+01	1.00E+02	x		. . . . .

MEASURED TOTAL: 2.43E+04 +- 1.11E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.46	79.63	-13359	872	1447	23722	595.05	Deleted
7	90.44	135.46	594	61	93	1582	1.20	Unknown
9	105.46	158.13	45	66	108	1864	0.60	Deleted
11	144.06	216.38	-50	55	92	1385	0.36	Deleted
13	164.06	246.58	39	66	108	1595	1.01	Deleted
15	198.71	298.87	85	80	131	1984	2.84	Deleted
19	252.86	380.61	-27	45	74	944	0.59	Deleted
24	328.65	495.00	187	51	80	956	1.22	Unknown
27	402.78	606.90	52	44	72	768	1.26	Deleted
36	786.49	1186.05	6	28	45	358	0.20	Deleted
38	804.08	1212.60	43	22	34	248	1.38	Unknown
41	934.34	1409.21	15	26	42	302	0.51	Deleted
42	951.13	1434.56	35	25	41	273	1.32	Deleted
45	1001.70	1510.89	41	29	46	276	1.75	Deleted
48	1281.98	1933.93	21	23	37	245	0.94	Deleted
50	1386.40	2091.54	31	14	20	90	1.45	Unknown
51	1409.27	2126.06	28	19	31	158	2.18	Deleted
53	1497.10	2258.63	-2	20	33	168	0.10	Deleted
55	1731.21	2611.99	58	19	28	95	2.88	Unknown
57	1847.67	2787.77	16	16	25	113	1.41	Deleted
58	2104.10	3174.82	62	16	23	88	2.71	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
64	59.54	88.81	61N	56	92	1558	1.24	NET< CL LBase
65	122.06	183.18	103N	51	82	1236	1.29	
66	133.54	200.51	-22N	52	85	1339	1.30	NET< CL RBase
67	145.44	218.47	119N	52	84	1305	1.31	
68	264.65	398.40	-70N	40	66	817	1.39	NET< CL LBase
69	320.08	482.06	-19N	41	68	782	1.43	NET< CL
70	364.48	549.08	64N	37	59	595	1.46	
71	427.89	644.79	-64N	35	59	588	1.50	NET< CL
72	433.93	653.91	3N	34	56	538	1.51	NET< CL
73	477.59	719.81	-18N	32	53	481	1.53	NET< CL
74	487.03	734.05	-11N	31	51	438	1.54	NET< CL
75	497.08	749.22	24N	28	45	401	1.55	NET< CL
76	537.32	809.96	38N	30	48	375	1.57	NET< CL
77	604.70	911.66	-21N	28	47	435	1.62	NET< CL LBase
78	621.84	937.53	-21N	30	50	459	1.63	NET< CL
79	724.18	1092.00	-9130N	2559	4212	660	1.70	NET< CL PIC
80	765.79	1154.81	49N	40	64	525	1.73	NET< CL PIC
81	810.76	1222.68	14N	23	37	256	1.76	NET< CL RBase
82	834.83	1259.02	-4N	24	40	302	1.77	NET< CL

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
83	884.67	1334.24	-10N	22	36	238	1.81	NET< CL
84	1099.22	1658.08	-9N	23	38	254	1.95	NET< CL
85	1115.52	1682.68	-94N	47	80	569	1.96	NET< CL PIC
86	1332.49	2010.17	30N	19	30	163	2.10	
87	1691.02	2551.33	-11N	15	25	108	2.34	NET< CL

 SEEKER ANALYSIS SUMMARY
 Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 16:10:04
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.06E+03 Hrs
 Buildup Time. 0.00E+00 Hrs | Live Time 60000 Sec
 Sample Size 1.10E-01 kg | Real Time 60051 Sec
 Collection Efficiency 1.0000 | Spectrum File 1296708.spc

Detector #: 8
 Energy(keV)= 0.70 + 0.663*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/09/2003
 FWHM(keV) = 1.19 + 0.002*En + 6.36E-04*En^2 + 6.36E-04*En^3 03/07/2003
 Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS008.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[7.49e-03*En^-3.10e+00 + 9.34e+01*En^ 7.45e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-08.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Th-234	1.14E+03	3.01E+02	< 1.30E+03	6.40E+02	1.00E+00	MEAS +	YES
Pb-212	1.13E+03	2.35E+01	< 5.02E+01	2.47E+01	1.00E+00	MEAS +	YES
Pb-214	9.08E+02	2.54E+01	< 8.35E+01	4.11E+01	1.00E+00	MEAS +	YES
Tl-208	9.91E+02	3.43E+01	< 1.09E+02	5.35E+01	9.99E-01	MEAS +	YES
AcTh-228	1.08E+03	3.43E+01	< 1.28E+02	6.20E+01	9.99E-01	MEAS +	YES
Ra-226	1.88E+03	2.68E+02	< 8.49E+02	4.20E+02	1.00E+00	MEAS +	YES
Bi-214	8.32E+02	2.78E+01	< 8.00E+01	3.92E+01	1.00E+00	MEAS +	YES
Cs-137	3.84E+02	1.58E+01	< 3.73E+01	1.82E+01	9.97E-01	MEAS +	YES
Bi-212	7.36E+02	8.99E+01	< 2.66E+02	1.30E+02	9.99E-01	MEAS +	YES
K-40	1.52E+04	2.90E+02	< 3.75E+02	1.81E+02	1.00E+00	MEAS +	YES
Am-241	4.02E+01	3.71E+01	< 1.23E+02	6.05E+01	1.00E+00	NET	YES
Co-57	1.35E+01	6.66E+00	< 2.18E+01	1.07E+01	8.92E-01	NET	YES
Ce-144	-2.29E+01	5.35E+01	< 1.80E+02	8.84E+01	8.97E-01	NET	YES
Ce-141	6.52E+01	2.86E+01	< 9.36E+01	4.60E+01	3.87E-01	NET	YES
Se-75	-2.17E+01	1.23E+01	< 4.21E+01	2.06E+01	7.73E-01	NET	YES
Cr-51	-9.50E+01	2.08E+02	< 7.03E+02	3.44E+02	3.28E-01	NET	YES
I-131	6.60E+02	3.79E+02	< 1.25E+03	6.09E+02	2.15E-02	NET	YES
Sb-125	-4.57E+01	2.48E+01	< 8.58E+01	4.19E+01	9.70E-01	NET	YES
Ag-108m	7.23E-01	7.81E+00	< 2.63E+01	1.28E+01	9.99E-01	NET	YES
Be-7	-6.65E+01	1.20E+02	< 4.10E+02	2.00E+02	5.61E-01	NET	YES
La-140	-5.75E+01	1.68E+02	< 5.69E+02	2.77E+02	8.96E-02	NET	YES
Ru-103	1.35E+01	1.56E+01	< 5.19E+01	2.52E+01	4.56E-01	NET	YES
Ba-140	4.07E+02	3.20E+02	< 1.06E+03	5.14E+02	8.96E-02	NET	YES
Cs-134	-5.85E+00	7.89E+00	< 2.71E+01	1.32E+01	9.60E-01	NET	YES
Ru-106	-6.24E+01	8.90E+01	< 3.04E+02	1.48E+02	9.20E-01	NET	YES
Zr-95	-1.02E+04	2.84E+03	< 9.37E+03	4.68E+03	6.18E-01	NET	YES
Nb-95	3.67E+01	3.00E+01	< 9.94E+01	4.87E+01	4.15E-01	NET	YES
Co-58	7.11E+00	1.16E+01	< 3.92E+01	1.89E+01	6.47E-01	NET	YES
Mn-54	-1.47E+00	9.02E+00	< 3.08E+01	1.49E+01	9.06E-01	NET	YES
Ag-110m	-5.43E+00	1.17E+01	< 4.04E+01	1.95E+01	8.84E-01	NET	YES
Fe-59	-1.34E+01	3.33E+01	< 1.15E+02	5.53E+01	5.01E-01	NET	YES
Zn-65	-8.66E+01	4.31E+01	< 1.51E+02	7.42E+01	8.81E-01	NET	YES
Co-60	1.44E+01	9.06E+00	< 2.98E+01	1.43E+01	9.84E-01	NET	YES
Sb-124	-2.08E+01	2.82E+01	< 1.00E+02	4.76E+01	5.99E-01	NET	YES

Activity Units: pCi/kg
Nuclide Activity Uncertainty MDA CL ACT DECAY FLAG SEN MET
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PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-09 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-362 REF-X19578
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 133.9 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/16/03 1209 Det No.: 6 Spectrum No.: 1367106
Counted by: EL
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5348-09 Product : GAMMA SPECTROMETRY
Client Id : BMA-E0200-362 Matrix : SO01 Soil
Site : REF-X19578
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/26/03 12:00

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	133.9		
Sample Weight-Dry	g			
Aliquot Weight	g	133.9		
FINAL WEIGHT	kg	.1339		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-09 analyzed by emml461 on 05/21/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.
 Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-09

Sample ID: SOIL/SEDI Duratek Inc

Code: 1367106

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:09:56
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.23E+003 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time 60000 Sec
 Sample Size 1.34E-001 kg | Real Time 60051 Sec
 Collection Efficiency 1.0000 | Spc. File 1367106.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Energy(keV)= -1.40 + 0.661*Ch + 5.38E-08*Ch^2 + 0.00E+00*Ch^3 05/16/2003
 FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 +-3.97E-05*En^3 03/04/2003
 Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.20 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	61.72	95.43	751	80	123	2407	1.25	
2	73.26	112.88	1015	63	90	1616	1.06	a
3	75.47	116.22	1483	67	90	1616	1.13	b
4	82.58	126.97	366	52	80	1292	1.03	a
5	85.63	131.57	647	61	92	1551	1.23	b
6	88.33	135.66	424	53	80	1292	1.00	c
7	91.09	139.84	2229	73	92	1551	1.37	d
8	97.18	149.04	89	56	92	1551	1.22	e NET< CL
9	127.30	194.58	158	67	108	1836	0.91	
10	138.34	211.27	128	57	92	1451	1.61	a Wide Pk
11	142.28	217.23	321	53	82	1244	1.23	b
12	152.53	232.72	72	63	103	1673	0.87	NET< CL
13	161.83	246.78	11	55	90	1371	0.20	NET< CL
14	184.21	280.62	1298	71	100	1589	1.33	
15	196.21	298.76	243	61	97	1495	1.78	Wide Pk
16	203.70	310.09	117	42	67	895	1.14	a
17	207.54	315.90	289	55	86	1253	1.43	b
18	237.01	360.44	2976	66	61	738	1.13	a
19	239.89	364.80	682	59	86	1181	1.71	b Wide Pk
20	268.63	408.25	358	46	70	831	1.59	a
21	275.60	418.79	207	58	93	1187	2.11	b Wide Pk
22	293.52	445.88	856	44	54	580	1.17	a
23	298.36	453.19	183	35	54	580	1.14	b
24	326.23	495.33	79	42	67	765	0.84	
25	336.70	511.16	613	46	64	706	1.28	
26	350.28	531.69	1431	55	66	696	1.38	
27	407.39	618.02	39	35	57	548	0.94	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	461.28	699.50	242	36	54	467	1.64	
29	509.22	771.97	1687	55	60	534	2.34	Wide Pk
30	581.54	881.30	1004	46	55	453	1.57	
31	607.58	920.66	1108	48	57	482	1.59	
32	659.91	999.76	633	40	50	442	1.45	
33	725.55	1098.99	230	34	51	397	1.59	
34	765.99	1160.12	96	34	54	446	1.36	
35	793.32	1201.44	117	30	46	344	2.07	a
36	800.98	1213.02	50	20	31	206	1.23	b
37	858.39	1299.80	81	27	42	307	1.17	
38	909.42	1376.93	703	38	45	322	1.88	
39	932.39	1411.65	47	25	40	266	2.35	
40	962.80	1457.63	108	25	38	251	1.88	a
41	967.26	1464.37	443	30	35	223	1.74	b
42	999.53	1513.14	93	28	44	301	1.53	
43	1118.66	1693.22	304	31	42	262	2.14	
44	1236.58	1871.45	90	28	44	328	1.49	
45	1376.45	2082.85	12	20	32	175	0.42	NET< CL
46	1405.27	2126.41	14	18	29	144	1.25	NET< CL
47	1459.21	2207.93	3554	63	32	160	2.14	
48	1629.55	2465.39	20	16	26	114	0.85	NET< CL
49	1762.93	2666.95	222	20	23	86	3.04	
50	1845.88	2792.31	37	14	21	76	1.32	
51	2101.41	3178.47	54	15	21	69	3.14	
52	2202.23	3330.83	43	17	27	97	8.11	Wide Pk
53	2613.00	3951.50	424	23	17	47	2.59	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	61.72	751	80	123	14	85	140	NET<CL
2	73.26	1015	63	90	972	66	96	
3	75.47	1483	67	90	1341	71	99	
4	82.58	366	52	80	138	60	98	
6	88.33	424	53	80	341	55	86	
7	91.09	2229	73	92	2129	76	100	
8	97.18	89	56	92	21	58	95	NET<CL
10	138.34	128	57	92	43	61	99	NET<CL
11	142.28	321	53	82	120	56	91	
13	161.83	11	55	90	-77	60	100	NET<CL
14	184.21	1298	71	100	309	77	123	
15	196.21	243	61	97	151	62	101	
16	203.70	117	42	67	100	47	76	
18	237.01	2976	66	61	2682	69	74	
20	268.63	358	46	70	313	49	76	
21	275.60	207	58	93	174	62	99	
22	293.52	856	44	54	733	48	66	
25	336.70	613	46	64	572	50	72	
26	350.28	1431	55	66	1271	58	76	
29	509.22	1687	55	60	281	61	97	
30	581.54	1004	46	55	883	49	63	
31	607.58	1108	48	57	958	51	67	
33	725.55	230	34	51	203	36	54	
34	765.99	96	34	54	48	37	59	NET<CL
36	800.98	50	20	31	-12	23	39	NET<CL
38	909.42	703	38	45	631	40	51	
41	967.26	443	30	35	423	32	40	
42	999.53	93	28	44	3	31	51	NET<CL
43	1118.66	304	31	42	280	32	45	
44	1236.58	90	28	44	71	30	47	
47	1459.21	3554	63	32	3411	64	41	
49	1762.93	222	20	23	196	22	27	
53	2613.00	424	23	17	321	24	27	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	73.26	972	Pb-212	359	5 of 6	99.30	0.99	
			Tl-208	32	8 of 9	99.30	0.99	
			Pb-214	241	4 of 7	89.49	0.89	
			Tl-208	58	8 of 9	99.30	0.99	
3	75.47	1341	Pb-212	269	5 of 6	100.00	1.00	
			Pb-214	241	4 of 7	88.29	0.88	
			Pb-212	359	5 of 6	99.30	0.99	
			Tl-208	58	8 of 9	99.30	0.99	
			Pb-214	431	4 of 7	89.49	0.89	
4	82.58	138	Ba-133	294	2 of 5	39.94	0.90	
5	85.63	615	Pb-212	. . . . .	5 of 6	100.00	1.00	Split
56	85.63	31	Tl-208	31	8 of 9	99.30	0.99	AutoAdd
6	88.33	341	Cd-109	. . . . .	1 of 1	100.00	1.50	
			Pb-212	. . . . .	5 of 6	100.00	1.00	
7	91.09	2129	Th-234	. . . . .	1 of 2	58.74	0.59	
9	127.30	158	AcTh-228	242	10 of 36	88.66	1.39	
11	142.28	120	U-235	68	2 of 3	100.00	1.50	
			Mo-99	. . . . .	0 of 0	. . . . .	0.00	Decay
			Fe-59	. . . . .	1 of 4	0.99	0.51	
14	184.21	309	U-235	550	2 of 3	100.00	1.50	
15	196.21	151	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
16	203.70	100	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
17	207.54	289	AcTh-228	307	10 of 36	85.40	1.35	
18	237.01	2682	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			Pb-212	3531	5 of 6	100.00	1.00	Matched
19	239.89	682	Pb-212	3531	5 of 6	100.00	1.00	
20	268.63	313	AcTh-228	208	10 of 36	80.13	1.30	
21	275.60	56	Ba-133	26	2 of 5	31.57	0.82	Split
55	275.60	118	Tl-208	118	8 of 9	100.00	1.50	AutoAdd
22	293.52	733	Pb-214	. . . . .	4 of 7	90.71	0.91	
23	298.36	183	Pb-212	112	5 of 6	100.00	1.50	
24	326.23	79	AcTh-228	165	10 of 36	92.30	1.42	
			Bi-212	4	2 of 13	59.32	1.09	
25	336.70	572	AcTh-228	569	10 of 36	83.76	1.34	
26	350.28	1271	Pb-214	. . . . .	4 of 7	90.71	0.91	
28	461.28	242	AcTh-228	173	10 of 36	80.13	1.30	
29	509.22	38	Annil	. . . . .	1 of 1	100.00	1.50	Split
54	509.22	243	Tl-208	243	8 of 9	100.00	1.50	AutoAdd
30	581.54	883	Tl-208	834	8 of 9	100.00	1.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
31	607.58	958	Bi-214	1257	7 of 33	84.73	1.35	
			Sb-125	. . . . .	1 of 8	5.97	0.06	LowScore
			1119SEsc	. . . . .	0 of 0	. . .	0.50	
32	659.91	633	Cs-137	. . . . .	1 of 1	100.00	1.50	
33	725.55	203	Bi-212	3987	2 of 13	81.27	1.31	
			Zr-95	. . . . .	1 of 2	44.14	0.44	LowScore
35	793.32	117	AcTh-228	123	10 of 36	85.40	1.35	
37	858.39	81	Tl-208	96	8 of 9	100.00	1.50	
38	909.42	631	AcTh-228	695	10 of 36	85.40	1.35	
39	932.39	47	Bi-214	52	7 of 33	86.69	1.37	
40	962.80	108	AcTh-228	121	10 of 36	85.40	1.35	
41	967.26	423	AcTh-228	373	10 of 36	82.48	1.32	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
43	1118.66	280	Bi-214	207	7 of 33	82.40	1.32	
44	1236.58	71	Bi-214	78	7 of 33	86.69	1.37	
47	1459.21	3411	K-40	. . . . .	1 of 1	100.00	1.50	
49	1762.93	196	Bi-214	156	7 of 33	83.54	1.34	
50	1845.88	37	Bi-214	20	7 of 33	77.68	1.28	
51	2101.41	54	2613SEsc	. . . . .	0 of 0	. . .	0.50	
52	2202.23	43	Bi-214	43	7 of 33	84.73	1.35	
53	2613.00	321	Tl-208	347	8 of 9	100.00	1.50	

L5348-09 analyzed by emml461 on 05/21/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-09

Sample ID: SOIL/SEDI Duratek Inc

Code: 1367106

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:09:56
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.23e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 60000 Sec
 Sample Size 1.34e-001 kg | Real Time 60051 Sec
 Collection Efficiency 1.0000 | Spectrum File 1367106.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Efficiency File: WT1SS006.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[4.58E-03*En^-3.34E+00 + 1.01E+02*En^7.37E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-09.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	1.90E+02 +- 1.57E+01	. . . .		*	. . . . .
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	1.83E+02 +- 1.58E+01	4.72E+01		+	. . . . .
	300.09	7.54E+02 +- 1.46E+02	4.54E+02		+	. . . . .
Ba-133	Average:x	5.16E+01 +- 2.22E+01	. . . .			. . . . .
	81.00	5.10E+01 +- 2.23E+01	7.30E+01		+	. . . . .
	276.40	1.08E+02 +- 2.07E+02	6.85E+02		+	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	4.01E+03 +- 1.44E+02	3.81E+02		+	. . . . .
AcTh-228	Average:x	7.66E+02 +- 2.90E+01	. . . .		*	. . . . .
	129.08	5.04E+02 +- 2.13E+02	6.96E+02		+	. . . . .
	209.28	7.23E+02 +- 1.37E+02	4.36E+02		+	. . . . .
	270.23	1.14E+03 +- 1.79E+02	5.60E+02		+	. . . . .
	327.64	3.68E+02 +- 1.95E+02	6.40E+02		+	. . . . .
	338.32	7.70E+02 +- 6.72E+01	1.98E+02		+	. . . . .
	463.00	1.06E+03 +- 1.60E+02	4.87E+02		+	. . . . .
	794.70	7.27E+02 +- 1.86E+02	5.87E+02		+	. . . . .
	911.07	7.22E+02 +- 4.57E+01	1.20E+02		+	. . . . .
	964.60	6.89E+02 +- 1.61E+02	5.00E+02		+	. . . . .
	969.11	8.45E+02 +- 6.36E+01	1.65E+02		+	. . . . .
U-235	Average:x	6.24E+01 +- 1.39E+01	. . . .		*	. . . . .
	143.76	1.04E+02 +- 4.89E+01	1.60E+02		+	. . . . .
	185.72	5.87E+01 +- 1.45E+01	4.70E+01		+	. . . . .
Pb-214	Average:x	5.36E+02 +- 2.02E+01	. . . .		*	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	Concentration		MDA	Flags	Notes	MDC
		(pCi/kg)				
Annul Tl-208	295.21	5.31E+02	+- 3.50E+01	9.72E+01	++	. . . . .
	351.92	5.39E+02	+- 2.48E+01	6.57E+01	++	. . . . .
	511.00	8.74E+00	+- 2.43E+01	8.03E+01	+	. . . . .
	Average:x	6.46E+02	+- 2.84E+01	. . . . .	*	. . . . .
	583.14	6.66E+02	+- 3.67E+01	9.78E+01	++	. . . . .
	860.37	5.49E+02	+- 1.84E+02	5.88E+02	+	. . . . .
	2614.66	6.19E+02	+- 4.66E+01	1.08E+02	++	. . . . .
Bi-214	84.90	I.D.	. . . . .	. . . . .		. . . . .
	277.35	6.46E+02	+- 4.76E+02	1.57E+03	+	. . . . .
	510.84	I.D.	. . . . .	. . . . .		. . . . .
	Average:x	5.22E+02	+- 2.29E+01	. . . . .	*	. . . . .
	609.31	4.87E+02	+- 2.60E+01	6.96E+01	++	. . . . .
	934.06	4.70E+02	+- 2.55E+02	8.37E+02	+	. . . . .
	1120.29	6.83E+02	+- 7.89E+01	2.29E+02	++	. . . . .
Cs-137	1238.11	4.74E+02	+- 2.00E+02	6.49E+02	+	. . . . .
	1764.49	6.39E+02	+- 7.10E+01	1.88E+02	++	. . . . .
	1847.42	9.54E+02	+- 3.64E+02	1.15E+03	+	. . . . .
	2204.22	5.26E+02	+- 2.13E+02	6.82E+02	+	. . . . .
	661.65	1.87E+02	+- 1.17E+01	3.06E+01	++	. . . . .
	727.17	4.62E+02	+- 8.17E+01	2.53E+02	++	. . . . .
	765.79	N 3.71E+01	+- 2.83E+01	9.34E+01	x	. . . . .
K-40	1460.81	1.43E+04	+- 2.67E+02	3.58E+02	++	. . . . .
Am-241	59.54	N 4.41E+02	+- 4.91E+01	1.43E+02L	x*	LHROI	. . . . .
Co-57	122.06	N 4.20E+00	+- 5.32E+00	1.77E+011	x	lbase	. . . . .
Ce-144	133.54	N-1.22E+02	+- 4.21E+01	1.45E+021	x	lbase	. . . . .
Ce-141	145.44	N-1.10E+01	+- 2.50E+01	8.42E+01r	x	rbase	. . . . .
Ra-226	186.22	N 2.33E+03	+- 8.40E+02	2.76E+03P	x	PIC	. . . . .
Se-75	264.65	N-1.68E+01	+- 1.14E+01	3.90E+011	x	lbase	. . . . .
Cr-51	320.08	N-1.52E+02	+- 1.89E+02	6.45E+02	x	. . . . .
I-131	364.48	N 3.39E+02	+- 5.36E+02	1.79E+03	x	. . . . .
Sb-125	427.89	N 3.15E+00	+- 2.03E+01	6.83E+01	x	. . . . .
Ag-108m	433.93	N-1.12E+01	+- 5.92E+00	2.07E+01	x	. . . . .
Be-7	477.59	N 1.66E+02	+- 1.03E+02	3.40E+02	x	. . . . .
La-140	487.03	N 3.23E+02	+- 1.92E+02	6.30E+02	x	. . . . .
Ru-103	497.08	N 1.53E+01	+- 1.64E+01	5.47E+01	x	. . . . .
Ba-140	537.32	N-1.42E+02	+- 4.34E+02	1.47E+03	x	. . . . .
Cs-134	604.70	N-5.69E+01	+- 2.82E+01	9.43E+01P	x	PIC	. . . . .
Ru-106	621.84	N 4.75E+01	+- 7.22E+01	2.42E+02	x	. . . . .
Zr-95	724.18	N-4.03E+03	+- 2.26E+03	7.44E+03P	x	PIC	. . . . .
Co-58	810.76	N-2.42E+00	+- 1.08E+01	3.71E+01	x	. . . . .
Mn-54	834.83	N 4.33E+00	+- 8.26E+00	2.78E+01	x	. . . . .
Ag-110m	884.67	N-1.53E+01	+- 1.11E+01	3.89E+01	x	. . . . .
Fe-59	1099.22	N-3.39E+01	+- 3.16E+01	1.10E+02	x	. . . . .
Zn-65	1115.52	N 3.23E+01	+- 3.31E+01	1.10E+02P	x	PIC	. . . . .
Co-60	1332.49	N 5.13E+00	+- 7.69E+00	2.60E+01	x	Y.	. . . . .
Sb-124	1691.02	N 2.03E+01	+- 2.08E+01	7.04E+01	x	. . . . .

MEASURED TOTAL: 2.22E+04 +- 7.30E+02 pCi/kg

0.00E+00

NOTE: *: N/S>3

#: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	61.72	95.43	14	85	140	2407	1.25	Deleted
8	97.18	149.04	21	58	95	1551	1.22	Deleted
10	138.34	211.27	43	61	99	1451	1.61	Deleted
12	152.53	232.72	72	63	103	1673	0.87	Deleted
13	161.83	246.78	-77	60	100	1371	0.20	Deleted
15	196.21	298.76	151	62	101	1495	1.78	Unknown
16	203.70	310.09	100	47	76	895	1.14	Unknown
18	237.01	360.44	2682	69	74	738	1.13	Unknown
27	407.39	618.03	39	35	57	548	0.94	Deleted
36	800.98	1213.02	-12	23	39	206	1.23	Deleted
42	999.53	1513.14	3	31	51	301	1.53	Deleted
45	1376.45	2082.85	12	20	32	175	0.42	Deleted
46	1405.27	2126.41	14	18	29	144	1.25	Deleted
48	1629.55	2465.39	20	16	26	114	0.85	Deleted
51	2101.41	3178.47	54	15	21	69	3.14	2613SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
34	765.99	1160.12	48N	37	59	446	1.36	NET< CL
57	59.54	92.14	686N	76	110	1116	1.13	LHRoi
58	122.06	186.66	35N	45	73	1072	1.12	NET< CL
								LBase
59	133.54	204.02	-129N	45	76	1159	1.13	NET< CL
								LBase
60	145.44	222.01	-19N	44	73	1068	1.13	NET< CL
								RBase
61	186.22	283.66	746N	269	440	1787	1.15	PIC
62	264.65	402.23	-58N	39	66	801	1.21	NET< CL
								LBase
63	320.08	486.03	-28N	35	58	620	1.25	NET< CL
64	364.48	553.16	20N	32	51	490	1.29	NET< CL
65	427.89	649.02	5N	32	52	416	1.35	NET< CL
66	433.93	658.15	-55N	29	49	447	1.35	NET< CL
67	477.59	724.15	45N	28	45	370	1.40	
68	487.03	738.43	45N	27	43	335	1.40	
69	497.08	753.62	27N	29	47	378	1.41	NET< CL
70	537.32	814.45	-10N	31	51	371	1.45	NET< CL
71	604.70	916.31	-226N	112	186	793	1.51	NET< CL
								PIC
72	621.84	942.22	18N	27	44	324	1.53	NET< CL
73	724.18	1096.92	-3769N	2113	3477	440	1.62	NET< CL
								PIC
74	810.76	1227.80	-5N	22	37	252	1.70	NET< CL
75	834.83	1264.19	13N	25	40	301	1.72	NET< CL
76	884.67	1339.53	-31N	22	38	268	1.76	NET< CL
77	1099.22	1663.83	-24N	22	37	240	1.92	NET< CL
78	1115.52	1688.47	39N	39	64	406	1.93	NET< CL
								PIC
79	1332.49	2016.41	12N	18	29	156	2.08	NET< CL

L5348-09 analyzed by emml461 on 05/21/2003

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
80	1691.02	2558.28	11N	11	18	58	2.26	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:09:56
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. . . . . 1.23E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 60000 Sec
Sample Size . . . . . 1.34E-01 kg | Real Time . . . . . 60051 Sec
Collection Efficiency . . . . 1.0000 | Spectrum File . . . . . 1367106.spc
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Detector #: 6

Energy(keV) = -1.40 + 0.661*Ch + 5.38E-08*Ch^2 + 5.38E-08*Ch^3 05/16/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS006.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[4.58e-03*En^-3.34e+00 + 1.01e+02*En^ 7.37e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-09.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	1.90E+02	1.57E+01	< 4.72E+01	2.32E+01	1.00E+00	MEAS +	YES
Ba-133	5.16E+01	2.22E+01	< 7.30E+01	3.60E+01	9.91E-01	MEAS +	YES
Th-234	4.01E+03	1.44E+02	< 3.81E+02	1.88E+02	1.00E+00	MEAS +	YES
AcTh-228	7.66E+02	2.90E+01	< 1.20E+02	5.85E+01	9.99E-01	MEAS +	YES
U-235	6.24E+01	1.39E+01	< 4.70E+01	2.32E+01	1.00E+00	MEAS +	YES
Pb-214	5.36E+02	2.02E+01	< 6.57E+01	3.23E+01	1.00E+00	MEAS +	YES
Annil	8.74E+00	2.43E+01	< 8.03E+01	3.98E+01	9.07E-01	MEAS +	YES
Tl-208	6.46E+02	2.84E+01	< 9.78E+01	4.79E+01	9.99E-01	MEAS +	YES
Bi-214	5.22E+02	2.29E+01	< 6.96E+01	3.41E+01	1.00E+00	MEAS +	YES
Cs-137	1.87E+02	1.17E+01	< 3.05E+01	1.49E+01	9.97E-01	MEAS +	YES
Bi-212	4.62E+02	8.17E+01	< 2.53E+02	1.23E+02	9.99E-01	MEAS +	YES
Nb-95	3.71E+01	2.83E+01	< 9.34E+01	4.56E+01	3.61E-01	NET	YES
K-40	1.43E+04	2.67E+02	< 3.58E+02	1.73E+02	1.00E+00	MEAS +	YES
Am-241	4.41E+02	4.91E+01	< 1.43E+02	7.06E+01	1.00E+00	NET	YES
Co-57	4.20E+00	5.32E+00	< 1.77E+01	8.68E+00	8.76E-01	NET	YES
Ce-144	-1.22E+02	4.21E+01	< 1.45E+02	7.14E+01	8.82E-01	NET	YES
Ce-141	-1.10E+01	2.50E+01	< 8.42E+01	4.13E+01	3.33E-01	NET	YES
Ra-226	2.33E+03	8.40E+02	< 2.76E+03	1.38E+03	1.00E+00	NET	YES
Se-75	-1.68E+01	1.14E+01	< 3.90E+01	1.91E+01	7.42E-01	NET	YES
Cr-51	-1.52E+02	1.89E+02	< 6.45E+02	3.15E+02	2.75E-01	NET	YES
I-131	3.39E+02	5.36E+02	< 1.79E+03	8.73E+02	1.17E-02	NET	YES
Sb-125	3.15E+00	2.03E+01	< 6.83E+01	3.33E+01	9.65E-01	NET	YES
Ag-108m	-1.12E+01	5.92E+00	< 2.07E+01	1.01E+01	9.99E-01	NET	YES
Be-7	1.66E+02	1.03E+02	< 3.40E+02	1.65E+02	5.12E-01	NET	YES
La-140	3.23E+02	1.92E+02	< 6.30E+02	3.05E+02	6.12E-02	NET	YES
Ru-103	1.53E+01	1.64E+01	< 5.48E+01	2.66E+01	4.03E-01	NET	YES
Ba-140	-1.42E+02	4.34E+02	< 1.47E+03	7.17E+02	6.12E-02	NET	YES
Cs-134	-5.69E+01	2.82E+01	< 9.43E+01	4.68E+01	9.54E-01	NET	YES
Ru-106	4.75E+01	7.22E+01	< 2.42E+02	1.17E+02	9.08E-01	NET	YES
Zr-95	-4.03E+03	2.26E+03	< 7.44E+03	3.72E+03	5.72E-01	NET	YES
Co-58	-2.42E+00	1.08E+01	< 3.71E+01	1.79E+01	6.04E-01	NET	YES
Mn-54	4.33E+00	8.26E+00	< 2.78E+01	1.34E+01	8.92E-01	NET	YES
Ag-110m	-1.53E+01	1.11E+01	< 3.89E+01	1.88E+01	8.67E-01	NET	YES

L5348-09 analyzed by emm1461 on 05/21/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Fe-59	-3.39E+01	3.16E+01	< 1.10E+02	5.32E+01	4.49E-01	NET	YES
Zn-65	3.23E+01	3.31E+01	< 1.10E+02	5.38E+01	8.64E-01	NET	YES
Co-60	5.13E+00	7.69E+00	< 2.60E+01	1.24E+01	9.82E-01	NET	YES
Sb-124	2.03E+01	2.08E+01	< 7.04E+01	3.27E+01	5.52E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-10 Count by Date: _____
(if required) _____
Client: Duratek Inc Delay Date: _____
(if required) _____
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-371 REF-X19579
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required) _____
Total Sample Weight: _____ g
(if required) _____
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required) _____
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 137.1 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/16/05 (709) Det No.: 5 Spectrum No.: 1367105
Counted by: Ch
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5348-10	Product	: GAMMA SPECTROMETRY
Client Id	: BMA-E0200-371	Matrix	: S001 Soil
Site	: REF-X19579		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/26/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	137.1		
Sample Weight-Dry	g			
Aliquot Weight	g	137.1		
FINAL WEIGHT	kg	.1371		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-10 analyzed by emml461 on 05/21/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-10

Sample ID: SOIL/SEDI Duratek Inc

Code: 1367105

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:09:30
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.23E+003 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time 60000 Sec
 Sample Size 1.37E-001 kg | Real Time 60051 Sec
 Collection Efficiency 1.0000 | Spc. File 1367105.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Energy(keV)= -0.01 + 0.662*Ch + -2.33E-07*Ch^2 + 8.18E-11*Ch^3 05/16/2003
 FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.20 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.13	95.45	252	73	118	2203	1.13	
2	74.75	113.02	1302	70	99	1808	1.40	a
3	77.00	116.42	1767	67	86	1507	1.15	b
4	84.24	127.37	303	51	79	1246	1.17	a
5	87.10	131.68	800	62	90	1495	1.23	b
6	89.82	135.81	547	59	90	1495	1.34	c
7	92.74	140.21	1126	64	90	1495	1.35	d
8	105.48	159.48	129	34	53	687	0.60	a
9	109.87	166.11	67	53	86	1374	1.29	b NET< CL
10	129.25	195.41	219	66	106	1765	1.27	
11	139.19	210.44	82	52	84	1293	1.22	a NET< CL
12	143.98	217.68	122	46	73	1078	1.14	b
13	153.05	231.39	84	64	104	1711	0.82	NET< CL
14	185.82	280.94	763	61	90	1371	1.27	
15	196.91	297.70	86	31	49	583	0.64	a
16	198.16	299.60	54	30	49	583	0.62	b
17	209.17	316.24	215	56	89	1339	1.01	
18	238.54	360.65	3784	74	69	881	1.28	a
19	241.42	365.00	772	55	78	1028	1.61	b
20	270.14	408.42	256	52	81	1051	1.40	
21	277.47	419.51	127	50	80	1005	1.12	
22	295.09	446.15	1015	49	60	676	1.28	a
23	299.98	453.55	230	40	60	676	1.40	b
24	327.98	495.88	237	51	80	936	1.36	
25	338.23	511.38	736	51	70	787	1.53	
26	351.86	531.99	1709	61	74	807	1.34	
27	364.36	550.89	37	53	87	986	1.07	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	409.28	618.81	43	40	65	669	0.75	NET< CL
29	463.08	700.16	226	41	63	580	1.59	
30	510.86	772.41	1815	58	64	570	2.54	Wide Pk
31	568.84	860.08	-8	35	58	502	0.22	NET< CL
32	583.06	881.59	1220	49	56	458	1.65	
33	609.16	921.04	1388	52	59	519	1.58	
34	661.52	1000.23	750	40	49	416	1.63	
35	727.14	1099.45	220	34	51	429	1.61	
36	768.37	1161.80	126	23	33	224	1.31	a
37	772.47	1168.00	46	21	33	224	1.25	b
38	785.42	1187.57	35	25	39	287	0.78	NET< CL
39	795.14	1202.28	101	29	44	325	1.27	
40	860.47	1301.07	100	28	44	312	1.23	
41	911.02	1377.50	854	39	41	280	1.79	
42	933.51	1411.51	70	26	40	262	1.52	
43	964.67	1458.62	138	22	30	178	1.56	a
44	968.80	1464.86	488	30	33	203	1.83	b
45	1000.25	1512.41	26	33	53	376	1.48	NET< CL
46	1120.30	1693.92	298	33	45	304	2.34	
47	1238.05	1871.93	156	29	44	285	1.82	
48	1377.39	2082.54	83	20	29	140	1.75	
49	1408.32	2129.29	24	20	33	172	1.28	NET< CL
50	1460.56	2208.25	3075	58	29	131	2.16	
51	1587.58	2400.18	51	12	16	62	1.34	a
52	1592.62	2407.80	40	15	22	94	1.91	b
53	1629.99	2464.27	27	18	28	119	1.60	NET< CL
54	1661.59	2512.00	19	16	26	102	1.35	NET< CL
55	1729.94	2615.25	49	16	24	92	2.53	
56	1764.39	2667.29	238	21	23	86	2.23	
57	2103.57	3179.44	46	16	23	90	3.20	a
58	2105.50	3182.36	13	8	12	36	1.26	b
59	2204.13	3331.19	58	14	19	67	2.02	
60	2614.74	3950.42	531	25	16	39	3.28	

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.13	252	73	118	91	76	124	NET<CL
2	74.75	1302	70	99	1161	75	110	
3	77.00	1767	67	86	1683	70	92	
4	84.24	303	51	79	226	54	85	
5	87.10	800	62	90	730	65	96	
7	92.74	1126	64	90	641	68	104	
9	109.87	67	53	86	22	57	94	NET<CL
11	139.19	82	52	84	-25	57	94	NET<CL
12	143.98	122	46	73	37	49	81	NET<CL
14	185.82	763	61	90	437	65	101	
15	196.91	86	31	49	-96	38	64	NET<CL
17	209.17	215	56	89	178	59	94	
18	238.54	3784	74	69	3604	77	80	
22	295.09	1015	49	60	902	53	72	
25	338.23	736	51	70	736	53	75	
26	351.86	1709	61	74	1487	64	84	
30	510.86	1815	58	64	408	64	99	
31	568.84	-8	35	58	-41	38	64	NET<CL
32	583.06	1221	49	56	1142	51	63	
33	609.16	1388	52	59	1241	55	69	
35	727.14	220	34	51	199	36	55	
40	860.47	101	28	44	99	31	48	
41	911.02	854	39	41	779	40	48	
44	968.80	488	30	33	459	32	39	
45	1000.25	26	33	53	-9	35	57	NET<CL
46	1120.30	299	33	45	270	34	49	
48	1377.39	83	20	29	75	21	32	
50	1460.56	3075	58	29	2953	59	38	
51	1587.58	51	12	16	53	14	20	
56	1764.39	238	21	23	206	22	28	
60	2614.74	531	25	16	434	26	26	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.75	1161	Pb-212	705	5 of 6	99.30	0.99	
			Tl-208	40	8 of 9	99.30	0.99	
			Pb-214	269	5 of 7	97.33	0.97	
			Tl-208	71	8 of 9	99.30	0.99	
3	77.00	427	Pb-214	483	5 of 7	98.65	0.99	Split
64	77.00	1256	Pb-212	1256	5 of 6	99.30	0.99	AutoAdd
4	84.24	226	Tl-208	39	8 of 9	99.30	0.99	
5	87.10	50	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
63	87.10	680	Pb-212	680	5 of 6	100.00	1.50	AutoAdd
6	89.82	547	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	92.74	346	Th-234	. . . . .	1 of 2	58.74	0.59	Split
62	92.74	295	AcTh-228	295	14 of 36	88.44	0.88	AutoAdd
8	105.48	129	AcTh-228	152	14 of 36	93.29	1.43	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
10	129.25	219	AcTh-228	281	14 of 36	94.25	1.44	
			La-140	. . . . .	1 of 15	0.51	0.01	LowScore
14	185.82	437	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
16	198.16	54	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
17	209.17	178	AcTh-228	362	14 of 36	97.79	0.98	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
18	238.54	3604	Pb-212	4732	5 of 6	100.00	1.00	
19	241.42	772	Pb-214	404	5 of 7	98.65	0.99	
			La-140	128	2 of 15	0.91	0.01	LowScore
20	270.14	256	AcTh-228	250	14 of 36	92.46	1.42	
21	277.47	127	Tl-208	156	8 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
22	295.09	902	Pb-214	. . . . .	5 of 7	100.00	1.00	
23	299.98	230	Pb-212	236	5 of 6	100.00	1.50	
24	327.98	237	AcTh-228	193	14 of 36	90.63	1.41	
			Bi-212	4	2 of 13	59.32	0.59	
			La-140	. . . . .	3 of 15	23.72	0.24	LowScore
25	338.23	736	AcTh-228	645	14 of 36	91.56	1.42	
26	351.86	1487	Pb-214	2941	5 of 7	100.00	1.00	
29	463.08	227	AcTh-228	206	14 of 36	91.56	1.42	
			Sb-125	. . . . .	1 of 8	12.82	0.13	LowScore
30	510.86	90	Annul	. . . . .	1 of 1	100.00	1.50	Split

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
61	510.86	318	Tl-208	318	8 of 9	100.00	1.50	AutoAdd
32	583.06	1142	Tl-208	1122	8 of 9	100.00	1.50	
33	609.16	1241	Bi-214	1386	9 of 33	93.83	1.44	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . .	0.50	
34	661.52	750	Cs-137	. . . . .	1 of 1	100.00	1.50	
35	727.14	199	Bi-212	11970	2 of 13	81.27	0.81	
			1238SEsc	. . . . .	0 of 0	. . .	0.50	
36	768.37	126	Bi-214	117	9 of 33	91.24	1.41	
			Pa-234	. . . . .	1 of 2	26.32	0.26	LowScore
37	772.47	46	AcTh-228	50	14 of 36	93.29	1.43	
			TeI-132	. . . . .	0 of 0	. . .	0.00	Decay
39	795.14	101	AcTh-228	146	14 of 36	95.93	1.46	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
40	860.47	99	Tl-208	126	8 of 9	100.00	1.50	
41	911.02	779	AcTh-228	794	14 of 36	92.46	1.42	
42	933.51	71	Bi-214	65	9 of 33	91.24	1.41	
43	964.67	138	AcTh-228	142	14 of 36	92.46	1.42	
44	968.80	459	AcTh-228	449	14 of 36	92.46	1.42	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
46	1120.30	270	Bi-214	266	9 of 33	92.51	1.43	
47	1238.05	156	Bi-214	96	9 of 33	85.14	1.35	
48	1377.39	75	Bi-214	62	9 of 33	88.75	1.39	
50	1460.56	2953	K-40	. . . . .	1 of 1	100.00	1.50	
51	1587.58	53	AcTh-228	66	14 of 36	93.29	1.43	
52	1592.62	40	2615DEsc	. . . . .	0 of 0	. . .	0.50	
55	1729.94	49	Bi-214	38	9 of 33	87.89	1.38	
56	1764.39	206	Bi-214	198	9 of 33	92.51	1.43	
57	2103.57	46	2615SEsc	. . . . .	0 of 0	. . .	0.50	
58	2105.50	13	2615SEsc	. . . . .	0 of 0	. . .	0.50	
59	2204.13	58	Bi-214	53	9 of 33	91.24	1.41	
60	2614.74	434	Tl-208	445	8 of 9	100.00	1.50	

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-10

Sample ID: SOIL/SEDI Duratek Inc

Code: 1367105

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:09:30
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.23e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 60000 Sec
 Sample Size 1.37e-001 kg | Real Time 60051 Sec
 Collection Efficiency 1.0000 | Spectrum File 1367105.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)

Efficiency File: WT1SS005.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[5.28E-03*En^-3.33E+00 + 1.03E+02*En^7.42E-01] 02/06/1998

 Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-10.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	9.61E+02 +- 2.05E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	9.62E+02 +- 2.06E+01	4.36E+01		+	. . . . .
	300.09	9.43E+02 +- 1.63E+02	5.06E+02		+	. . . . .
Pb-214	Average:x	6.69E+02 +- 2.14E+01	. . . .		*	. . . . .
	77.11	I.D.	. . . .			. . . . .
	241.98	1.24E+03 +- 8.78E+01	2.53E+02		+	. . . . .
	295.21	6.48E+02 +- 3.82E+01	1.06E+02		+	. . . . .
	351.92	6.26E+02 +- 2.70E+01	7.23E+01		+	. . . . .
Tl-208	Average:x	8.44E+02 +- 3.00E+01	. . . .		*	. . . . .
	84.90	I.D.	. . . .			. . . . .
	277.35	6.86E+02 +- 2.69E+02	8.77E+02		+	. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	8.57E+02 +- 3.85E+01	9.73E+01		+	. . . . .
	860.37	6.68E+02 +- 2.07E+02	6.61E+02		+	. . . . .
	2614.66	8.37E+02 +- 5.03E+01	1.05E+02		+	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	6.74E+02 +- 2.30E+02	7.53E+02		+	. . . . .
AcTh-228	Average:x	8.84E+02 +- 2.91E+01	. . . .		*	. . . . .
	105.00	I.D.	. . . .			. . . . .
	129.08	7.02E+02 +- 2.11E+02	6.87E+02		+	. . . . .
	209.28	4.42E+02 +- 1.46E+02	4.74E+02		+	. . . . .
	270.23	9.23E+02 +- 1.87E+02	5.97E+02		+	. . . . .
	327.64	1.10E+03 +- 2.36E+02	7.52E+02		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration		MDA	Flags	Notes	MDC
		(pCi/kg)				
	338.32	9.83E+02	+ - 7.05E+01	2.03E+02		+	.
	463.00	9.86E+02	+ - 1.78E+02	5.57E+02		+	.
	772.17	8.36E+02	+ - 3.77E+02	1.22E+03		+	.
	794.70	6.27E+02	+ - 1.79E+02	5.69E+02		+	.
	911.07	8.89E+02	+ - 4.60E+01	1.12E+02		+	.
	964.60	8.76E+02	+ - 1.38E+02	3.98E+02		+	.
	969.11	9.14E+02	+ - 6.38E+01	1.62E+02		+	.
	1588.00	7.21E+02	+ - 1.94E+02	5.85E+02		+	.
	93.35	I.D.	.	.		.	.
Ce-141	145.44	N 2.13E+01	+ - 2.81E+01	9.33E+01		x	.
Ra-226	186.22	1.36E+03	+ - 2.02E+02	6.39E+02		+	.
Annul	511.00	2.05E+01	+ - 2.52E+01	8.32E+01		+	.
Bi-214	Average:	6.49E+02	+ - 2.35E+01	.		*	.
	609.31	6.29E+02	+ - 2.76E+01	7.08E+01		+	.
	768.36	6.94E+02	+ - 1.26E+02	3.74E+02		+	.
	934.06	7.07E+02	+ - 2.58E+02	8.29E+02		+	.
	1120.29	6.60E+02	+ - 8.30E+01	2.46E+02		+	.
	1238.11	1.04E+03	+ - 1.97E+02	6.05E+02		+	.
	1377.67	7.82E+02	+ - 2.22E+02	6.94E+02		+	.
	1729.59	8.34E+02	+ - 2.77E+02	8.67E+02		+	.
	1764.49	6.72E+02	+ - 7.29E+01	1.93E+02		+	.
	2204.22	7.07E+02	+ - 1.72E+02	5.09E+02		+	.
Cs-137	661.65	2.20E+02	+ - 1.19E+01	2.95E+01		+	.
Bi-212	727.17	4.51E+02	+ - 8.23E+01	2.56E+02		+	.
K-40	1460.81	1.24E+04	+ - 2.49E+02	3.33E+02		+	.
Am-241	59.54	N 4.70E+01	+ - 5.48E+01	1.80E+02L		x	LHROI
Co-57	122.06	N 6.57E-01	+ - 5.92E+00	1.98E+01		x	.
Ce-144	133.54	N 1.01E+01	+ - 8.51E+01	2.82E+02P		x	PIC
Se-75	264.65	N-1.76E+01	+ - 1.12E+01	3.85E+01l		x	lbase
Cr-51	320.08	N-1.19E+02	+ - 1.92E+02	6.52E+02		x	.
I-131	364.48	N 1.33E+03	+ - 5.64E+02	1.83E+03		x	.
Sb-125	427.89	N-6.38E+00	+ - 1.90E+01	6.44E+01		x	.
Ag-108m	433.93	N 2.64E+00	+ - 5.96E+00	2.00E+01		x	.
Be-7	477.59	N 1.01E+02	+ - 1.20E+02	3.99E+02		x	.
La-140	487.03	N 1.85E+02	+ - 2.11E+02	7.03E+02		x	.
Ru-103	497.08	N-2.44E+00	+ - 1.67E+01	5.65E+01		x	.
Ba-140	537.32	N 1.56E+02	+ - 3.91E+02	1.31E+03		x	.
Cs-134	604.70	N 4.21E+00	+ - 2.77E+01	9.18E+01P		x	PIC
Ru-106	621.84	N-7.05E+01	+ - 7.12E+01	2.46E+02		x	.
Zr-95	724.18	N-1.25E+04	+ - 2.73E+03	9.00E+03P		x#	PIC
Nb-95	765.79	N 6.85E+01	+ - 2.57E+01	8.33E+01P		x	PIC
Co-58	810.76	N-1.21E+01	+ - 1.11E+01	3.87E+01		x	.
Mn-54	834.83	N 5.98E+00	+ - 7.96E+00	2.67E+01		x	.
Ag-110m	884.67	N 1.47E+00	+ - 1.05E+01	3.58E+01		x	.
Fe-59	1099.22	N-1.18E+01	+ - 3.12E+01	1.07E+02		x	.
Zn-65	1115.52	N 7.86E+01	+ - 3.69E+01	1.21E+02P		x	PIC
Co-60	1332.49	N 7.64E+00	+ - 7.48E+00	2.50E+01		x	Y.
Sb-124	1691.02	N 4.80E+01	+ - 2.46E+01	7.99E+01		x	.

MEASURED TOTAL: 1.91E+04 +- 9.25E+02 pCi/kg

0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.13	95.45	91	76	124	2203	1.13	Deleted
9	109.87	166.11	22	57	94	1374	1.29	Deleted
11	139.19	210.44	-25	57	94	1293	1.22	Deleted
13	153.05	231.39	84	64	104	1711	0.82	Deleted
15	196.91	297.70	-96	38	64	583	0.64	Deleted
16	198.16	299.60	54	30	49	583	0.62	Unknown
27	364.36	550.89	37	53	87	986	1.07	Deleted
28	409.28	618.81	43	40	65	669	0.75	Deleted
31	568.84	860.08	-41	38	64	503	0.22	Deleted
38	785.42	1187.57	35	25	39	287	0.78	Deleted
45	1000.25	1512.41	-9	35	57	376	1.48	Deleted
49	1408.32	2129.29	24	20	33	172	1.28	Deleted
52	1592.62	2407.80	40	15	22	94	1.91	2615DEsc
53	1629.99	2464.27	27	18	28	119	1.60	Deleted
54	1661.59	2512.00	19	16	26	102	1.35	Deleted
57	2103.57	3179.44	46	16	23	90	3.20	2615SEsc
58	2105.50	3182.36	13	8	12	36	1.26	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	143.98	217.68	37N	49	81	1078	1.14	b NET< CL
65	59.54	90.03	68N	79	129	1540	1.13	NET< CL
66	122.06	184.54	5N	49	81	1128	1.18	LHRoi NET< CL
67	133.54	201.90	11N	90	148	2572	1.19	NET< CL
68	264.66	400.13	-61N	39	65	792	1.29	PIC NET< CL
69	320.09	483.95	-22N	36	59	644	1.33	LBase NET< CL
70	364.49	551.09	79N	33	53	521	1.36	NET< CL
71	427.91	646.98	-10N	30	49	446	1.40	NET< CL
72	433.95	656.12	13N	29	48	424	1.41	NET< CL
73	477.62	722.15	28N	33	53	480	1.44	NET< CL
74	487.06	736.42	26N	30	48	392	1.44	NET< CL
75	497.11	751.62	-4N	30	49	408	1.45	NET< CL
76	537.36	812.49	11N	28	46	356	1.48	NET< CL
77	604.76	914.40	17N	111	182	885	1.52	NET< CL
78	621.78	940.13	-26N	27	45	338	1.54	PIC NET< CL
79	724.16	1094.94	-11731N	2564	4222	578	1.61	NET< CL
80	765.78	1157.89	89N	33	53	374	1.63	PIC
81	810.78	1225.92	-25N	23	39	277	1.66	NET< CL
82	834.86	1262.34	18N	24	39	278	1.68	NET< CL
83	884.73	1337.75	3N	21	35	227	1.71	NET< CL
84	1099.20	1662.01	-8N	22	36	227	1.86	NET< CL
85	1115.52	1686.68	94N	44	71	439	1.87	PIC
86	1332.50	2014.69	18N	18	28	152	2.01	NET< CL
87	1691.07	2556.53	26N	13	20	76	2.25	

L5348-10 analyzed by emm1461 on 05/21/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:09:30
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.23E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 60000 Sec
Sample Size 1.37E-01 kg | Real Time 60051 Sec
Collection Efficiency 1.0000 | Spectrum File 1367105.spc

Detector #: 5

Energy(keV)= -0.01 + 0.662*Ch + -2.33E-07*Ch^2 + -2.33E-07*Ch^3 05/16/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS005.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[5.28e-03*En^-3.33e+00 + 1.03e+02*En^ 7.42e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-10.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	9.61E+02	2.05E+01	< 4.36E+01	2.14E+01	1.00E+00	MEAS +	YES
Pb-214	6.69E+02	2.14E+01	< 7.23E+01	3.56E+01	1.00E+00	MEAS +	YES
Tl-208	8.44E+02	3.00E+01	< 9.73E+01	4.76E+01	9.99E-01	MEAS +	YES
Th-234	6.74E+02	2.30E+02	< 7.53E+02	3.74E+02	1.00E+00	MEAS +	YES
AcTh-228	8.84E+02	2.91E+01	< 1.12E+02	5.47E+01	9.99E-01	MEAS +	YES
Ce-141	2.13E+01	2.81E+01	< 9.33E+01	4.59E+01	3.33E-01	NET	YES
Ra-226	1.36E+03	2.02E+02	< 6.39E+02	3.15E+02	1.00E+00	MEAS +	YES
Annul	2.05E+01	2.52E+01	< 8.32E+01	4.13E+01	9.07E-01	MEAS +	YES
Bi-214	6.49E+02	2.35E+01	< 7.08E+01	3.47E+01	1.00E+00	MEAS +	YES
Cs-137	2.20E+02	1.19E+01	< 2.95E+01	1.44E+01	9.97E-01	MEAS +	YES
Bi-212	4.51E+02	8.23E+01	< 2.56E+02	1.25E+02	9.99E-01	MEAS +	YES
K-40	1.24E+04	2.48E+02	< 3.33E+02	1.61E+02	1.00E+00	MEAS +	YES
Am-241	4.70E+01	5.48E+01	< 1.80E+02	8.92E+01	1.00E+00	NET	YES
Co-57	6.57E-01	5.92E+00	< 1.98E+01	9.73E+00	8.76E-01	NET	YES
Ce-144	1.01E+01	8.51E+01	< 2.82E+02	1.40E+02	8.82E-01	NET	YES
Se-75	-1.76E+01	1.12E+01	< 3.85E+01	1.89E+01	7.42E-01	NET	YES
Cr-51	-1.19E+02	1.92E+02	< 6.52E+02	3.19E+02	2.75E-01	NET	YES
I-131	1.33E+03	5.64E+02	< 1.83E+03	8.94E+02	1.17E-02	NET	YES
Sb-125	-6.38E+00	1.90E+01	< 6.44E+01	3.14E+01	9.65E-01	NET	YES
Ag-108m	2.64E+00	5.96E+00	< 2.00E+01	9.73E+00	9.99E-01	NET	YES
Be-7	1.01E+02	1.20E+02	< 3.99E+02	1.94E+02	5.12E-01	NET	YES
La-140	1.85E+02	2.11E+02	< 7.03E+02	3.42E+02	6.12E-02	NET	YES
Ru-103	-2.44E+00	1.67E+01	< 5.65E+01	2.75E+01	4.03E-01	NET	YES
Ba-140	1.56E+02	3.91E+02	< 1.31E+03	6.38E+02	6.12E-02	NET	YES
Cs-134	4.21E+00	2.77E+01	< 9.18E+01	4.55E+01	9.54E-01	NET	YES
Ru-106	-7.05E+01	7.12E+01	< 2.46E+02	1.19E+02	9.08E-01	NET	YES
Zr-95	-1.25E+04	2.73E+03	< 9.00E+03	4.50E+03	5.72E-01	NET	YES
Nb-95	6.85E+01	2.57E+01	< 8.33E+01	4.06E+01	3.61E-01	NET	YES
Co-58	-1.21E+01	1.11E+01	< 3.87E+01	1.87E+01	6.04E-01	NET	YES
Mn-54	5.98E+00	7.96E+00	< 2.67E+01	1.29E+01	8.92E-01	NET	YES
Ag-110m	1.47E+00	1.05E+01	< 3.58E+01	1.72E+01	8.67E-01	NET	YES
Fe-59	-1.18E+01	3.12E+01	< 1.07E+02	5.18E+01	4.49E-01	NET	YES
Zn-65	7.86E+01	3.69E+01	< 1.21E+02	5.92E+01	8.64E-01	NET	YES

L5348-10 analyzed by emm1461 on 05/21/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	7.64E+00	7.48E+00	< 2.50E+01	1.19E+01	9.82E-01	NET	YES
Sb-124	4.80E+01	2.46E+01	< 7.99E+01	3.75E+01	5.52E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-11 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-402 REF-X19580
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137, 1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 152.1 g

Filter/Smear Data

Volume: _____
Units: _____

Work Group ID: W65268 Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/7/03 01725 Det No.: 2 Spectrum No.: 1277202
Counted by: [Signature]
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5348-11	Product : GAMMA SPECTROMETRY
Client Id : BMA-E0200-402	Matrix : SO01 Soil
Site : REF-X19580	
Comments :	
Client : 00435 Duratek Inc	
Project : OTHER ENVIRON-DUR	
Start Date :	
Collect Date : 03/26/03 12:00	

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	152.1		
Sample Weight-Dry	g			
Aliquot Weight	g	152.1		
FINAL WEIGHT	kg	.1521		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-11 analyzed by emm1461 on 05/08/2003

 SEEKER. G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-11

Sample ID: SOIL/SEDI Duratek Inc

Code: 1277202

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:25:27
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 57104 Sec
 Sample Size 1.52E-001 kg | Real Time 57122 Sec
 Collection Efficiency 1.0000 | Spc. File 1277202.spc

Detector #: 2 (Canberra sn 9923043 det# 2)

Energy(keV)= 0.51 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/07/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.61	93.96	403	67	106	1903	1.10	
2	71.94	108.07	216	57	90	1504	1.31	a HiResid
3	74.09	111.33	1086	64	90	1504	1.19	b HiResid
4	76.37	114.77	1417	67	90	1504	1.32	c HiResid
5	80.48	121.00	5	34	55	752	0.55	d NET< CL HiResid
6	83.36	125.36	216	50	79	1253	1.16	e HiResid
7	86.47	130.06	521	53	79	1253	1.05	f HiResid
8	89.18	134.16	242	44	67	1003	0.88	g HiResid
9	92.22	138.76	1090	70	101	1755	1.57	h HiResid Wide Pk
10	98.70	148.57	13	48	79	1253	0.98	i NET< CL HiResid
11	104.55	157.42	15	48	79	1253	1.06	j NET< CL HiResid
12	128.62	193.84	97	62	101	1600	0.90	NET< CL
13	143.14	215.81	-14	54	89	1354	0.18	NET< CL
14	185.31	279.62	700	61	90	1281	1.52	
15	196.78	296.98	58	60	98	1416	1.35	NET< CL
16	208.83	315.20	179	55	87	1201	1.01	
17	218.07	329.18	16	46	76	981	0.35	NET< CL
18	238.00	359.34	2352	59	55	608	1.18	a
19	240.99	363.86	513	53	78	973	1.64	b
20	251.62	379.95	-8	37	61	677	0.19	NET< CL
21	269.69	407.30	192	45	71	788	1.69	
22	276.88	418.16	108	45	71	803	2.33	Wide Pk
23	294.66	445.07	618	39	50	510	1.06	a

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	299.63	452.58	100	24	35	306	0.64	b
25	327.46	494.70	77	37	60	609	0.72	
26	337.78	510.31	426	44	64	648	1.22	
27	351.37	530.88	1169	48	57	545	1.31	
28	375.69	567.68	-39	35	59	551	1.58	NET< CL
29	409.19	618.36	24	32	51	447	0.56	NET< CL
30	437.90	661.80	17	39	63	557	0.45	NET< CL
31	462.19	698.56	171	39	60	495	1.56	
32	510.37	771.46	1179	51	62	527	2.50	Wide Pk
33	582.70	880.90	736	41	50	369	1.46	
34	608.80	920.38	849	42	50	363	1.58	
35	661.06	999.47	133	28	43	288	1.21	
36	726.86	1099.02	183	28	40	278	1.47	
37	763.19	1153.99	21	17	27	171	1.05	a NET< CL
38	767.74	1160.88	62	18	27	171	1.18	b
39	785.67	1188.01	8	25	41	278	0.48	NET< CL
40	794.65	1201.59	91	26	39	249	1.57	
41	802.55	1213.55	23	22	35	220	0.52	NET< CL
42	861.07	1302.10	94	27	42	275	1.63	
43	903.89	1366.89	50	22	34	205	1.90	a
44	910.93	1377.54	460	29	31	182	1.69	b
45	964.67	1458.85	92	20	29	160	1.51	a
46	968.72	1464.98	290	24	29	160	1.58	b
47	1120.19	1694.16	136	29	43	289	1.77	
48	1238.45	1873.10	32	25	40	268	1.42	NET< CL
49	1377.56	2083.59	14	14	23	97	0.77	NET< CL
50	1460.79	2209.52	2812	55	25	106	2.23	
51	1508.95	2282.38	41	16	25	94	2.74	
52	1588.38	2402.57	13	15	23	100	0.92	NET< CL
53	1764.58	2669.18	161	17	18	49	2.75	
54	2104.21	3183.07	37	13	19	64	2.44	
55	2204.09	3334.19	30	13	19	61	1.76	
56	2614.83	3955.68	312	19	12	23	2.60	

L5348-11 analyzed by emml461 on 05/08/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	62.61	403	67	106	111	71	116	NET<CL
3	74.09	1086	64	90	924	67	99	
4	76.37	1417	67	90	1262	68	96	
7	86.47	521	53	79	422	56	85	
9	92.22	1090	70	101	292	74	118	
10	98.70	13	48	79	-26	51	84	NET<CL
13	143.14	-14	54	89	-93	56	94	NET<CL
14	185.31	700	61	90	314	65	103	
15	196.78	58	60	98	-93	64	106	NET<CL
18	238.00	2352	59	55	2053	61	68	
19	240.99	513	53	78	454	56	85	
21	269.69	192	45	71	175	48	76	
23	294.66	618	39	50	501	43	60	
26	337.78	426	44	64	381	47	70	
27	351.37	1169	48	57	978	51	66	
29	409.19	24	32	51	20	34	56	NET<CL
32	510.37	1179	51	62	176	56	89	
33	582.70	736	41	50	652	43	57	
34	608.80	849	42	50	721	44	58	
36	726.86	183	28	40	168	29	42	
38	767.74	62	18	27	52	19	29	
40	794.65	91	26	39	72	27	42	
41	802.55	23	22	35	-3	24	40	NET<CL
44	910.93	460	29	31	391	30	38	
46	968.72	290	24	29	256	26	34	
47	1120.19	136	29	43	98	30	47	
48	1238.45	32	25	40	15	27	43	NET<CL
50	1460.79	2812	55	25	2710	56	33	
53	1764.58	161	17	18	120	18	24	
56	2614.83	312	19	12	235	20	22	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 1.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	71.94	216	Tl-208	35	7 of 9	98.64	0.99	
3	74.09	924	Pb-212	543	5 of 6	100.00	1.00	
			Pb-214	234	5 of 7	97.33	0.97	
			Tl-208	61	7 of 9	98.64	0.99	
4	76.37	314	Pb-214	412	5 of 7	97.33	0.97	Split
57	76.37	948	Pb-212	948	5 of 6	100.00	1.00	AutoAdd
6	83.36	216	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
7	86.47	422	Pb-212	478	5 of 6	100.00	1.50	
8	89.18	242	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
9	92.22	292	Th-234	. . . . .	1 of 2	58.74	0.59	
14	185.31	314	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
16	208.83	179	AcTh-228	212	9 of 36	85.70	1.36	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
18	238.00	2053	Pb-212	2357	5 of 6	100.00	1.50	
19	240.99	454	Pb-214	263	5 of 7	100.00	1.00	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
21	269.69	175	AcTh-228	142	9 of 36	83.16	1.33	
22	276.88	108	Tl-208	96	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
23	294.66	501	Pb-214	1001	5 of 7	100.00	1.00	
24	299.63	100	Pb-212	131	5 of 6	100.00	1.50	
25	327.46	77	AcTh-228	110	9 of 36	87.68	1.38	
			Bi-212	4	2 of 13	59.32	1.09	
26	337.78	381	AcTh-228	379	9 of 36	85.70	1.36	
27	351.37	978	Pb-214	1689	5 of 7	100.00	1.00	
31	462.19	171	AcTh-228	113	9 of 36	79.73	1.30	
32	510.37	176	Tl-208	189	7 of 9	100.00	1.50	
			Annil	. . . . .	1 of 1	100.00	1.50	
33	582.70	652	Tl-208	673	7 of 9	100.00	1.50	
34	608.80	721	Bi-214	696	7 of 33	84.66	1.35	
35	661.06	133	Cs-137	. . . . .	1 of 1	100.00	1.50	
36	726.86	168	Bi-212	3696	2 of 13	81.27	1.31	
38	767.74	52	Bi-214	65	7 of 33	89.91	1.40	
40	794.65	72	AcTh-228	77	9 of 36	85.70	1.36	
42	861.07	94	Tl-208	71	7 of 9	100.00	1.50	
43	903.89	50	Bi-214	1	7 of 33	70.81	1.21	
44	910.93	391	AcTh-228	438	9 of 36	85.70	1.36	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
45	964.67	92	AcTh-228	74	9 of 36	83.16	1.33	
46	968.72	256	AcTh-228	232	9 of 36	85.70	1.36	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
47	1120.19	98	Bi-214	146	7 of 33	95.61	1.46	
50	1460.79	2710	K-40	. . . . .	1 of 1	100.00	1.50	
51	1508.95	41	Bi-214	16	7 of 33	74.35	1.24	
53	1764.58	120	Bi-214	102	7 of 33	83.02	1.33	
54	2104.21	37	2615SEsc	. . . . .	0 of 0	. . .	0.50	
55	2204.09	30	Bi-214	27	7 of 33	83.02	1.33	
56	2614.83	235	Tl-208	232	7 of 9	100.00	1.50	

L5348-11 analyzed by emm1461 on 05/08/2003

SEEKER . F I N A L A C T I V I T Y R E P O R T Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5348-11

Sample ID: SOIL/SEDI Duratek Inc

Code: 1277202

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:25:27
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01e+003 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 57104 Sec
Sample Size 1.52e-001 kg | Real Time 57122 Sec
Collection Efficiency 1.0000 | Spectrum File 1277202.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 2 (Canberra sn 9923043 det# 2)

Efficiency File: WT1SS002.EFF (Sand in a 4 oz. Jar: 1.6 g/cc)

Eff.=1/[1.49E-02*En^-2.83E+00 + 1.39E+02*En^8.08E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
LSF File: L5348-11.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Tl-208	Average:x	6.14E+02 +- 3.14E+01		*
	72.80	I.D.	. . . .			. . . . .
	277.35	6.91E+02 +- 2.84E+02	9.25E+02		+	. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	6.05E+02 +- 3.98E+01	1.08E+02		+	. . . . .
	860.37	8.05E+02 +- 2.34E+02	7.44E+02		+	. . . . .
	2614.66	6.17E+02 +- 5.33E+01	1.22E+02		+	. . . . .
Pb-212	Average:x	6.35E+02 +- 1.88E+01	. . . .		*	. . . . .
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	6.39E+02 +- 1.90E+01	4.29E+01		+	. . . . .
	300.09	4.83E+02 +- 1.15E+02	3.55E-02		+	. . . . .
Pb-214	Average:x	4.85E+02 +- 2.06E+01	. . . .		*	. . . . .
	77.11	I.D.	. . . .			. . . . .
	241.98	8.51E+02 +- 1.04E+02	3.23E+02		+	. . . . .
	295.21	4.26E+02 +- 3.63E+01	1.04E+02		+	. . . . .
	351.92	4.92E+02 +- 2.57E+01	6.82E+01		+	. . . . .
Th-234	92.59	5.52E+02 +- 1.40E+02	4.52E+02		+	. . . . .
Ra-226	186.22	1.12E+03 +- 2.32E+02	7.46E+02		+	. . . . .
AcTh-228	Average:x	6.04E+02 +- 3.02E+01	. . . .		*	. . . . .
	209.28	5.13E+02 +- 1.57E+02	5.08E+02		+	. . . . .
	270.23	7.43E+02 +- 2.03E+02	6.54E+02		+	. . . . .
	327.64	4.26E+02 +- 2.07E+02	6.76E+02		+	. . . . .
	338.32	6.07E+02 +- 7.43E+01	2.26E+02		+	. . . . .
	463.00	9.06E+02 +- 2.05E+02	6.48E+02		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
Bi-214	794.70		5.67E+02	+- 2.11E+02	6.79E+02		+	. . . . .
	911.07		5.68E+02	+- 4.41E+01	1.14E+02		+	. . . . .
	964.60		7.43E+02	+- 1.60E+02	4.83E+02		+	. . . . .
	969.11		6.53E+02	+- 6.66E+01	1.80E+02		+	. . . . .
	Average:x		4.49E+02	+- 2.46E+01	. . . . .		*	. . . . .
	609.31		4.52E+02	+- 2.78E+01	7.44E+01		+	. . . . .
	768.36		3.60E+02	+- 1.34E+02	4.28E+02		+	. . . . .
	904.25		1.87E+04	+- 8.30E+03	2.69E+04		+	. . . . .
	1120.29		3.09E+02	+- 9.44E+01	3.02E+02		+	. . . . .
	1509.23		1.12E+03	+- 4.44E+02	1.42E+03		+	. . . . .
	1764.49		5.19E+02	+- 7.81E+01	2.16E+02		+	. . . . .
	2204.22		5.00E+02	+- 2.09E+02	6.66E+02		+	. . . . .
Cs-137	661.65		4.87E+01	+- 1.04E+01	3.22E+01		+	. . . . .
Bi-212	727.17		4.78E+02	+- 8.20E+01	2.49E+02		+	. . . . .
K-40	1460.81		1.49E+04	+- 3.08E+02	3.81E+02		+	. . . . .
Am-241	59.54	N	3.20E+01	+- 3.98E+01	1.31E+02L		x	LHROI
Co-57	122.06	N	1.64E+00	+- 5.39E+00	1.80E+01		x	. . . . .
Ce-144	133.54	N	5.59E+00	+- 4.24E+01	1.42E+02		x	. . . . .
Ce-141	145.44	N	5.04E+01	+- 2.17E+01	7.48E+01		x	. . . . .
Se-75	264.65	N	1.93E+00	+- 1.14E+01	3.85E+01l		x	lbase
Cr-51	320.08	N	1.69E+02	+- 1.61E+02	5.34E+02		x	. . . . .
I-131	364.48	N	3.72E+01	+- 2.68E+02	9.04E+02		x	. . . . .
Sb-125	427.89	N	2.38E+01	+- 2.07E+01	6.86E+01		x	. . . . .
Ag-108m	433.93	N	5.66E+00	+- 6.48E+00	2.23E+01		x	. . . . .
Be-7	477.59	N	1.11E+02	+- 9.59E+01	3.19E+02		x	. . . . .
La-140	487.03	N	1.12E+02	+- 1.27E+02	4.25E+02		x	. . . . .
Ru-103	497.08	N	4.69E+00	+- 1.43E+01	4.89E+01		x	. . . . .
Ba-140	537.32	N	2.76E+02	+- 2.71E+02	9.02E+02		x	. . . . .
Cs-134	604.70	N	3.09E+01	+- 3.08E+01	1.02E+02P		x	PIC
Ru-106	621.84	N	9.91E+01	+- 8.01E+01	2.66E+02		x	. . . . .
Zr-95	724.18	N	4.28E+03	+- 2.17E+03	7.16E+03P		x	PIC
Nb-95	765.79	N	1.08E+01	+- 2.28E+01	7.84E+01P		x	PIC
Co-58	810.76	N	7.95E+00	+- 1.04E+01	3.66E+01		x	. . . . .
Mn-54	834.83	N	1.40E+01	+- 9.30E+00	3.07E+01		x	. . . . .
Ag-110m	884.67	N	1.22E+00	+- 1.20E+01	4.12E+01		x	. . . . .
Fe-59	1099.22	N	1.60E+00	+- 2.89E+01	9.96E+01		x	. . . . .
Zn-65	1115.52	N	2.30E+01	+- 4.10E+01	1.37E+02P		x	PIC
Co-60	1332.49	N	6.86E+00	+- 8.99E+00	3.18E+01		x	Y.
Sb-124	1691.02	N	1.54E+01	+- 2.34E+01	8.55E+01		x	. . . . .

MEASURED TOTAL: 1.99E+04 +- 8.98E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.61	93.96	111	71	116	1903	1.10	Deleted
5	80.48	121.00	5	34	55	752	0.55	Deleted
6	83.36	125.36	216	50	79	1253	1.16	Unknown
8	89.18	134.16	242	44	67	1003	0.88	Unknown

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
10	98.70	148.57	-26	51	84	1253	0.98	Deleted
11	104.55	157.42	15	48	79	1253	1.06	Deleted
12	128.62	193.84	97	62	101	1600	0.90	Deleted
13	143.14	215.81	-93	56	94	1355	0.18	Deleted
15	196.78	296.98	-93	64	106	1416	1.35	Deleted
17	218.07	329.18	16	46	76	981	0.35	Deleted
20	251.62	379.95	-8	37	61	677	0.19	Deleted
28	375.69	567.68	-39	35	59	551	1.58	Deleted
29	409.19	618.36	20	34	56	447	0.56	Deleted
30	437.90	661.80	17	39	63	557	0.45	Deleted
37	763.19	1153.99	21	17	27	171	1.05	Deleted
39	785.67	1188.01	9	25	41	278	0.48	Deleted
41	802.55	1213.55	-3	24	40	220	0.52	Deleted
48	1238.45	1873.10	15	27	43	268	1.42	Deleted
49	1377.56	2083.59	14	14	23	97	0.77	Deleted
52	1588.38	2402.57	13	15	23	100	0.92	Deleted
54	2104.21	3183.07	37	13	19	64	2.44	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
58	59.54	89.32	64N	80	130	1554	1.08	NET< CL LHRoi
59	122.06	183.91	13N	43	70	985	1.13	NET< CL
60	133.54	201.28	6N	42	69	948	1.14	NET< CL
61	145.44	219.29	-96N	42	70	993	1.15	NET< CL
62	264.65	399.66	-6N	36	59	634	1.23	NET< CL LBase
63	320.08	483.53	33N	31	51	475	1.27	NET< CL
64	364.48	550.71	4N	29	47	413	1.30	NET< CL
65	427.89	646.66	31N	27	43	346	1.35	NET< CL
66	433.93	655.80	-23N	26	44	358	1.35	NET< CL
67	477.59	721.86	28N	24	39	276	1.38	NET< CL
68	487.03	736.14	21N	24	38	272	1.39	NET< CL
69	497.08	751.35	-8N	24	40	301	1.39	NET< CL
70	537.32	812.23	26N	26	41	293	1.42	NET< CL
71	604.70	914.19	100N	100	164	642	1.47	NET< CL PIC
72	621.84	940.12	30N	25	39	264	1.48	NET< CL
73	724.18	1094.97	-3536N	1794	2953	426	1.55	NET< CL PIC
74	765.79	1157.93	-13N	28	47	290	1.58	NET< CL PIC
75	810.76	1225.97	-14N	19	31	194	1.61	NET< CL
76	834.83	1262.39	34N	23	36	238	1.62	NET< CL
77	884.67	1337.80	-2N	20	32	195	1.66	NET< CL
78	1099.22	1662.43	-1N	18	30	163	1.80	NET< CL
79	1115.52	1687.10	22N	39	64	410	1.82	NET< CL PIC
80	1332.49	2015.39	-12N	16	27	129	1.96	NET< CL

L5348-11 analyzed by emm1461 on 05/08/2003

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
81	1691.02	2557.87	-7N	11	18	60	2.21	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:25:27
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. . . . . 1.01E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 57104 Sec
Sample Size . . . . . 1.52E-01 kg | Real Time . . . . . 57122 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1277202.spc
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Detector #: 2

Energy(keV)= 0.51 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/07/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 6.55E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS002.EFF (Sand in a 4 oz. Jar: 1.6 g/cc)

Eff.=1/[1.49e-02*En^-2.83e+00 + 1.39e+02*En^ 8.08e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-11.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Tl-208	6.14E+02	3.14E+01	< 1.08E+02	5.27E+01	1.00E+00	MEAS +	YES
Pb-212	6.35E+02	1.88E+01	< 4.29E+01	2.10E+01	1.00E+00	MEAS +	YES
Pb-214	4.85E+02	2.05E+01	< 6.82E+01	3.34E+01	1.00E+00	MEAS +	YES
Th-234	5.52E+02	1.40E+02	< 4.52E+02	2.23E+02	1.00E+00	MEAS +	YES
Ra-226	1.12E+03	2.32E+02	< 7.46E+02	3.68E+02	1.00E+00	MEAS +	YES
AcTh-228	6.04E+02	3.02E+01	< 1.14E+02	5.52E+01	1.00E+00	MEAS +	YES
Bi-214	4.49E+02	2.46E+01	< 7.44E+01	3.63E+01	1.00E+00	MEAS +	YES
Cs-137	4.87E+01	1.04E+01	< 3.22E+01	1.56E+01	9.97E-01	MEAS +	YES
Bi-212	4.78E+02	8.20E+01	< 2.49E+02	1.21E+02	1.00E+00	MEAS +	YES
K-40	1.49E+04	3.08E+02	< 3.81E+02	1.83E-02	1.00E+00	MEAS +	YES
Am-241	3.20E+01	3.98E+01	< 1.31E+02	6.48E+01	1.00E+00	NET	YES
Co-57	1.64E+00	5.39E+00	< 1.80E+01	8.84E-00	8.97E-01	NET	YES
Ce-144	5.59E+00	4.25E+01	< 1.42E+02	6.97E+01	9.01E-01	NET	YES
Ce-141	-5.04E+01	2.17E+01	< 7.48E+01	3.67E+01	4.04E-01	NET	YES
Se-75	-1.93E+00	1.14E+01	< 3.85E+01	1.88E+01	7.82E-01	NET	YES
Cr-51	1.69E+02	1.61E+02	< 5.34E+02	2.60E+02	3.45E-01	NET	YES
I-131	3.72E+01	2.68E+02	< 9.04E+02	4.39E+02	2.55E-02	NET	YES
Sb-125	2.38E+01	2.06E+01	< 6.86E+01	3.32E+01	9.71E-01	NET	YES
Ag-108m	-5.66E+00	6.48E+00	< 2.24E+01	1.08E+01	9.99E-01	NET	YES
Be-7	1.12E+02	9.59E+01	< 3.19E+02	1.54E+02	5.76E-01	NET	YES
La-140	1.12E+02	1.27E+02	< 4.25E+02	2.05E+02	9.97E-02	NET	YES
Ru-103	-4.69E+00	1.43E+01	< 4.89E+01	2.37E+01	4.73E-01	NET	YES
Ba-140	2.76E+02	2.71E+02	< 9.02E+02	4.37E+02	9.97E-02	NET	YES
Cs-134	3.09E+01	3.08E+01	< 1.02E+02	5.03E+01	9.62E-01	NET	YES
Ru-106	9.91E+01	8.01E+01	< 2.66E+02	1.28E+02	9.23E-01	NET	YES
Zr-95	-4.28E+03	2.17E+03	< 7.16E+03	3.58E+03	6.31E-01	NET	YES
Nb-95	-1.08E+01	2.28E+01	< 7.84E+01	3.81E+01	4.31E-01	NET	YES
Co-58	-7.95E+00	1.04E+01	< 3.66E+01	1.75E+01	6.59E-01	NET	YES
Mn-54	1.40E+01	9.30E+00	< 3.07E+01	1.48E+01	9.10E-01	NET	YES
Ag-110m	-1.22E+00	1.20E+01	< 4.12E+01	1.98E+01	8.89E-01	NET	YES
Fe-59	-1.60E+00	2.89E+01	< 9.96E+01	4.76E+01	5.16E-01	NET	YES
Zn-65	2.30E+01	4.10E+01	< 1.37E+02	6.69E+01	8.86E-01	NET	YES
Co-60	-6.86E+00	8.99E+00	< 3.18E+01	1.51E+01	9.85E-01	NET	YES

L5348-11 analyzed by emm1461 on 05/08/2003
 Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Sb-124	-1.54E+01	2.35E+01	< 8.55E+01	3.98E+01	6.13E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-12 Count by Date: _____
(if required)

Client: Duratek Inc Delay Date: _____
(if required)

Project: OTHER ENVIRON-DUR

Sample Matrix: Soil

Sample Description: BMA-E0200-552 REF-X19581

Collect Start Date/Time: _____

Collect Stop Date/Time: 03-26-03 12:00

Product: GAMMA SPECTROMETRY

Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)

Total Sample Weight: _____ g
(if required)

Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)

Wet Weight: _____ g

Dry Weight: _____ g

Aliquot Weight: 102.0 g

Filter/Smear Data

Volume: _____

Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/9/03 1550 Det No.: 5 Spectrum No.: 1296505

Counted by: CE

Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____

Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5348-12	Product	: GAMMA SPECTROMETRY
Client Id	: BMA-E0200-552	Matrix	: SO01 Soil
Site	: REF-X19581		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/26/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	102		
Sample Weight-Dry	g			
Aliquot Weight	g	102		
FINAL WEIGHT	kg	.102		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-12 analyzed by emml461 on 05/09/2003

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5348-12

Sample ID: SOIL/SEDI Duratek Inc

Code: 1296505

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:50:25
Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.06E+003 Hrs
Buildup Time: 0.00E+000 Hrs | Live Time 70000 Sec
Sample Size 1.02E-001 kg | Real Time 70056 Sec
Collection Efficiency 1.0000 | Spc. File 1296505.spc

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
Energy(keV) = -0.14 + 0.661*Ch + -2.41E-07*Ch^2 + 8.09E-11*Ch^3 05/09/2003
FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 0.00E+00*En^3 02/28/2003
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.71	79.93	-16051	731	1221	18576	262.29	NET< CL Wide Pk
2	63.22	95.82	198	62	99	1661	0.97	
3	74.81	113.34	878	68	101	1727	1.47	a
4	77.03	116.71	1164	59	78	1233	1.05	b
5	84.19	127.54	220	53	83	1278	1.27	a
6	87.16	132.02	428	49	73	1065	1.03	b
7	89.69	135.85	295	47	73	1065	1.17	c
8	92.67	140.36	984	59	83	1278	1.26	d
9	99.13	150.13	48	32	51	639	0.59	e NET< CL
10	127.90	193.63	-54	67	111	1826	0.91	NET< CL
11	143.09	216.62	36	60	99	1545	0.42	NET< CL
12	185.87	281.32	620	61	92	1343	1.21	
13	196.61	297.56	50	28	45	494	0.68	a
14	198.38	300.24	188	62	100	1482	2.05	b Wide Pk
15	204.93	310.14	79	40	64	823	1.17	c
16	209.17	316.55	145	30	45	494	0.63	d
17	238.57	361.02	2355	64	68	855	1.23	a
18	241.64	365.66	455	56	85	1140	1.64	b
19	269.70	408.10	114	45	71	868	1.22	
20	277.31	419.62	68	42	67	777	1.56	
21	295.14	446.58	642	41	52	553	1.15	a
22	299.76	453.57	104	42	67	775	1.49	b
23	328.00	496.28	55	45	73	855	0.61	NET< CL
24	338.21	511.72	424	51	77	867	1.33	
25	351.86	532.38	1095	52	67	701	1.63	
26	405.76	613.91	43	26	42	349	1.17	a

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	409.05	618.89	97	34	54	489	1.48	b
28	462.81	700.20	107	29	45	374	1.37	a
29	468.27	708.46	41	18	28	187	0.74	b
30	510.77	772.76	1891	60	68	633	2.32	Wide Pk
31	558.36	844.75	29	38	61	522	0.55	NET< CL
32	583.12	882.20	753	43	54	432	1.56	
33	609.20	921.65	846	46	59	516	1.50	
34	661.49	1000.76	209	34	50	435	1.11	
35	695.71	1052.52	52	36	58	516	2.02	NET< CL
36	727.12	1100.04	151	36	56	462	1.58	
37	767.68	1161.38	-30	26	44	350	1.14	NET< CL
38	794.75	1202.33	71	20	30	192	1.29	a
39	803.12	1215.00	82	22	34	224	1.47	b
40	860.52	1301.82	66	31	49	368	2.12	
41	911.13	1378.39	458	33	41	274	1.83	
42	933.65	1412.45	26	27	44	296	0.85	NET< CL
43	964.71	1459.42	92	21	31	192	1.56	a
44	968.70	1465.47	312	29	38	246	1.96	b
45	1000.73	1513.91	-2	24	39	252	0.37	NET< CL
46	1120.25	1694.69	154	29	42	294	1.63	
47	1238.61	1873.69	77	30	48	336	2.01	
48	1377.75	2084.10	38	20	31	158	2.16	
49	1407.94	2129.74	-10	19	32	174	0.43	NET< CL
50	1460.67	2209.47	3226	59	28	136	2.17	
51	1630.80	2466.66	50	18	27	108	2.88	
52	1730.07	2616.69	50	16	23	94	3.62	Wide Pk
53	1764.60	2668.88	139	18	23	91	1.82	
54	2104.35	3182.11	31	16	25	101	1.42	
55	2203.48	3331.79	74	16	23	81	3.24	
56	2614.94	3952.60	365	22	19	56	2.82	

L5348-12 analyzed by emm1461 on 05/09/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY05.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	52.71	-16051	731	1221	-7520	796	1318	NET<CL
2	63.22	198	62	99	10	66	109	NET<CL
3	74.81	878	68	101	714	75	115	
4	77.03	1164	59	78	1067	62	87	
5	84.19	220	53	83	131	56	91	
6	87.16	428	49	73	346	54	83	
8	92.67	984	59	83	418	65	101	
11	143.09	36	60	99	-62	64	106	NET<CL
12	185.87	620	61	92	240	67	107	
13	196.61	50	28	45	-164	38	66	NET<CL
15	204.93	79	40	64	39	45	73	NET<CL
16	209.17	145	30	45	102	36	58	
17	238.57	2355	64	68	2146	68	83	
21	295.14	642	41	52	510	48	69	
24	338.21	424	51	77	424	54	82	
25	351.86	1095	52	67	836	57	81	
30	510.77	1891	60	68	249	68	108	
31	558.36	29	38	61	-24	42	69	NET<CL
32	583.12	753	43	54	661	47	64	
33	609.20	846	46	59	675	50	71	
36	727.12	151	36	56	126	39	61	
39	803.12	82	22	34	15	27	44	NET<CL
40	860.52	67	31	49	64	33	53	
41	911.13	458	33	41	370	36	49	
44	968.70	312	29	38	278	32	45	
45	1000.73	-2	24	39	-42	27	46	NET<CL
46	1120.25	154	29	42	122	31	47	
48	1377.75	38	20	31	29	22	34	NET<CL
50	1460.67	3226	59	28	3084	61	40	
53	1764.60	139	18	23	101	21	30	
56	2614.94	365	22	19	251	24	29	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
3	74.81	714	Pb-212	415	5 of 6	100.00	1.00	
			Pb-214	152	5 of 7	98.65	0.99	
			Tl-208	42	7 of 9	98.43	0.98	
4	77.03	326	Pb-214	272	5 of 7	98.65	0.99	Split
59	77.03	740	Pb-212	740	5 of 6	100.00	1.00	AutoAdd
5	84.19	131	Tl-208	23	7 of 9	98.43	1.48	
6	87.16	346	Pb-212	404	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
7	89.69	295	Cd-109	. . . . .	1 of 1	100.00	1.50	
8	92.67	263	Th-234	. . . . .	1 of 2	58.74	0.59	Split
58	92.67	156	AcTh-228	156	11 of 36	81.55	0.82	AutoAdd
12	185.87	240	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
14	198.38	188	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
16	209.17	102	AcTh-228	196	11 of 36	96.83	1.47	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
17	238.57	2146	Pb-212	3073	5 of 6	100.00	1.00	
18	241.64	455	Pb-214	222	5 of 7	100.00	1.00	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
19	269.70	114	AcTh-228	130	11 of 36	89.99	1.40	
20	277.31	68	Tl-208	91	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
21	295.14	510	Pb-214	1016	5 of 7	100.00	1.00	
22	299.76	104	Pb-212	139	5 of 6	100.00	1.50	
24	338.21	424	AcTh-228	337	11 of 36	88.50	1.38	
25	351.86	836	Pb-214	1734	5 of 7	100.00	1.00	
26	405.76	43	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
27	409.05	97	AcTh-228	56	11 of 36	83.95	1.34	
28	462.81	107	AcTh-228	107	11 of 36	88.50	1.38	
			Sb-125	. . . . .	1 of 8	13.67	0.14	LowScore
29	468.27	41	Ba-140	. . . . .	1 of 7	0.36	0.50	
30	510.77	64	Annil	. . . . .	1 of 1	100.00	1.50	Split
57	510.77	185	Tl-208	185	7 of 9	100.00	1.50	AutoAdd
32	583.12	661	Tl-208	655	7 of 9	100.00	1.50	
33	609.20	675	Bi-214	737	6 of 33	88.05	1.38	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . . . .	0.50	
34	661.49	209	Cs-137	. . . . .	1 of 1	100.00	1.50	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
36	727.12	126	Bi-212	. . . . .	1 of 13	100.00	1.00	
38	794.75	71	AcTh-228	75	11 of 36	88.50	1.38	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
40	860.52	64	Tl-208	73	7 of 9	100.00	1.50	
41	911.13	370	AcTh-228	437	11 of 36	88.50	1.38	
43	964.71	92	AcTh-228	73	11 of 36	88.50	1.38	
44	968.70	278	AcTh-228	224	11 of 36	88.50	1.38	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
46	1120.25	122	Bi-214	145	6 of 33	90.87	1.41	
47	1238.61	77	Bi-214	52	6 of 33	84.22	1.34	
50	1460.67	3084	K-40	. . . . .	1 of 1	100.00	1.50	
51	1630.80	50	AcTh-228	18	11 of 36	81.55	1.32	
52	1730.07	50	Bi-214	20	6 of 33	78.21	1.28	
53	1764.60	101	Bi-214	108	6 of 33	90.87	1.41	
54	2104.35	31	2615SEsc	. . . . .	0 of 0	. . .	0.50	
55	2203.48	74	Bi-214	28	6 of 33	75.74	1.26	
56	2614.94	251	Tl-208	259	7 of 9	100.00	1.50	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-12

Sample ID: SOIL/SEDI Duratek Inc

Code: 1296505

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:50:25
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time 1.06e+003 Hrs
 Buildup Time 0.00e+000 Hrs | Live Time 70000 Sec
 Sample Size 1.02e-001 kg | Real Time 70056 Sec
 Collection Efficiency 1.0000 | Spectrum File 1296505.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 5 (Canberra SN 6953483 Inst-1 Detector #5)
 Efficiency File: WT1SS005.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[5.28E-03*En^-3.33E+00 + 1.03E+02*En^7.42E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-12.LSF (SOIL/SEDI: Duratek Inc)
 =====

MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	6.58E+02 +- 2.09E+01	. . . .		*	. . . . .
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	6.59E+02 +- 2.10E+01	5.16E+01		+	. . . . .
	300.09	4.91E+02 +- 1.99E+02	6.48E+02		+	. . . . .
Pb-214	Average:x	4.31E+02 +- 2.22E+01	. . . .		*	. . . . .
	77.11	I.D.	. . . .			. . . . .
	241.98	8.41E+02 +- 1.03E+02	3.19E+02		+	. . . . .
	295.21	4.22E+02 +- 3.96E+01	1.17E+02		+	. . . . .
	351.92	4.05E+02 +- 2.77E+01	8.01E+01		+	. . . . .
Tl-208	Average:x	5.64E+02 +- 3.17E+01	. . . .		*	. . . . .
	84.90	I.D.	. . . .			. . . . .
	277.35	4.24E+02 +- 2.61E+02	8.58E+02		+	. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	5.72E+02 +- 4.05E+01	1.14E+02		+	. . . . .
	860.37	5.02E+02 +- 2.61E+02	8.53E+02		+	. . . . .
	2614.66	5.58E+02 +- 5.32E+01	1.37E+02		+	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	5.89E+02 +- 2.53E+02	8.31E+02		+	. . . . .
Ra-226	186.22	8.59E+02 +- 2.39E+02	7.73E+02		+	. . . . .
AcTh-228	Average:x	5.37E+02 +- 3.07E+01	. . . .		*	. . . . .
	209.28	2.91E+02 +- 1.04E+02	3.37E+02		+	. . . . .
	270.23	4.73E+02 +- 1.85E+02	6.03E+02		+	. . . . .
	338.32	6.52E+02 +- 8.27E+01	2.55E+02		+	. . . . .
	409.51	9.20E+02 +- 3.22E+02	1.04E+03		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
	463.00		5.38E+02	+ - 1.47E+02	4.65E+02		+	.
	794.70		5.09E+02	+ - 1.44E+02	4.51E+02		+	.
	911.07		4.87E+02	+ - 4.68E+01	1.33E+02		+	.
	964.60		6.73E+02	+ - 1.55E+02	4.75E+02		+	.
	969.11		6.38E+02	+ - 7.32E+01	2.11E+02		+	.
	1630.40		1.51E+03	+ - 5.39E+02	1.71E+03		+	.
	93.35		I.D.	.	.			.
Ba-140	537.32	N	3.31E+02	+ - 3.09E+02	6.37E+02		x	.
	467.57		I.D.	.	.			.
Annil	511.00		1.66E+01	+ - 3.03E+01	1.00E+02		+	.
Bi-214	Average:x		4.02E+02	+ - 2.58E+01	.		*	.
	609.31		3.94E+02	+ - 2.94E+01	8.44E+01		+	.
	1120.29		3.42E+02	+ - 8.66E+01	2.74E+02		+	.
	1238.11		5.93E+02	+ - 2.33E+02	7.55E+02		+	.
	1729.59		9.76E+02	+ - 3.09E+02	9.63E+02		+	.
	1764.49		3.80E+02	+ - 7.75E+01	2.33E+02		+	.
	2204.22		1.05E+03	+ - 2.31E+02	6.85E+02		+	.
Cs-137	661.65		7.06E+01	+ - 1.14E+01	3.48E+01		+	.
Bi-212	727.17		3.30E+02	+ - 1.01E+02	3.24E+02		+	.
K-40	1460.81		1.49E+04	+ - 2.94E+02	4.04E+02		+	.
Am-241	59.54	N	6.97E+01	+ - 3.55E+01	1.16E+021		x	lbase
Co-57	122.06	N	2.16E+00	+ - 6.40E+00	2.15E+01		x	.
Ce-144	133.54	N	7.14E-01	+ - 4.43E+01	1.49E+02		x	.
Ce-141	145.44	N	4.51E+00	+ - 2.72E+01	9.09E+01		x	.
Se-75	264.65	N	1.59E+01	+ - 1.24E+01	4.11E+011		x	lbase
Cr-51	320.08	N	9.40E+01	+ - 1.82E+02	6.18E+02		x	.
I-131	364.48	N	3.50E+02	+ - 3.38E+02	1.16E+03		x	.
Sb-125	427.89	N	1.39E+01	+ - 2.09E+01	6.98E+01		x	.
Ag-108m	433.93	N	2.97E+00	+ - 7.56E+00	2.57E+01		x	.
Be-7	477.59	N	2.26E+02	+ - 1.16E+02	3.78E+02		x	.
La-140	487.03	N	1.64E+02	+ - 1.66E+02	5.69E+02		x	.
Ru-103	497.08	N	7.73E+00	+ - 1.64E+01	5.52E+01		x	.
Cs-134	604.70	N	7.89E+00	+ - 9.03E+00	3.01E+011		x	lbase
Ru-106	621.84	N	1.83E+01	+ - 8.33E+01	2.81E+02		x	.
Zr-95	724.18	N	9.79E+01	+ - 4.19E+01	1.49E+02L		x	LHROI
Nb-95	765.79	N	3.48E+01	+ - 1.98E+01	6.49E+01		x	.
Co-58	810.76	N	4.68E+00	+ - 1.16E+01	3.98E+01		x	.
Mn-54	834.83	N	1.88E+00	+ - 9.42E+00	3.19E+01		x	.
Ag-110m	884.67	N	8.33E+00	+ - 1.22E+01	4.09E+01		x	.
Fe-59	1099.22	N	1.48E+01	+ - 3.27E+01	1.10E+02		x	.
Zn-65	1115.52	N	4.72E+01	+ - 3.92E+01	1.30E+02P		x	PIC
Co-60	1332.49	N	2.89E+00	+ - 8.18E+00	2.79E+01		x	Y.
Sb-124	1691.02	N	1.96E+01	+ - 2.37E+01	8.07E+01		x	.

MEASURED TOTAL: 1.94E+04 +- 1.06E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	52.71	79.93	-7520	796	1318	18576	262.29	Deleted
2	63.22	95.82	10	66	109	1661	0.97	Deleted
9	99.13	150.13	48	32	51	639	0.59	Deleted
10	127.90	193.63	-55	67	111	1826	0.91	Deleted
11	143.09	216.62	-62	64	106	1545	0.42	Deleted
13	196.61	297.56	-164	38	66	494	0.68	Deleted
14	198.38	300.24	188	62	100	1482	2.05	Unknown
15	204.93	310.14	39	45	73	823	1.17	Deleted
23	328.00	496.28	55	45	73	855	0.61	Deleted
26	405.76	613.91	43	26	42	349	1.17	Unknown
31	558.36	844.75	-24	42	69	522	0.55	Deleted
35	695.71	1052.52	52	36	58	516	2.02	Deleted
37	767.68	1161.38	-30	26	44	350	1.14	Deleted
39	803.12	1215.00	15	27	44	224	1.47	Deleted
42	933.65	1412.45	26	27	44	296	0.85	Deleted
45	1000.73	1513.91	-42	27	46	253	0.37	Deleted
48	1377.75	2084.10	29	22	34	158	2.16	Deleted
49	1407.94	2129.74	-10	19	32	174	0.43	Deleted
54	2104.35	3182.11	31	16	25	101	1.42	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
60	59.54	90.26	88N	45	72	1038	1.13	LBase
61	122.06	184.81	-16N	47	78	955	1.18	NET< CL
62	133.54	202.17	1N	41	68	933	1.19	NET< CL
63	145.44	220.17	8N	48	79	1162	1.20	NET< CL
64	264.66	400.48	50N	39	63	737	1.28	NET< CL
LBase								
65	320.09	484.32	-18N	35	58	617	1.32	NET< CL
66	364.49	551.49	-33N	32	53	523	1.36	NET< CL
67	427.91	647.42	19N	29	46	397	1.40	NET< CL
68	433.95	656.56	-13N	32	53	488	1.41	NET< CL
69	477.62	722.61	59N	30	48	387	1.44	
70	487.06	736.89	-29N	29	49	414	1.44	NET< CL
71	497.11	752.10	14N	29	47	375	1.45	NET< CL
72	537.36	812.98	30N	28	45	350	1.48	NET< CL
73	604.76	914.94	28N	31	51	445	1.52	NET< CL
LBase								
74	621.78	940.67	6N	27	45	343	1.54	NET< CL
75	724.15	1095.55	-86N	37	64	382	1.61	NET< CL
LHRoi								
76	765.78	1158.52	45N	26	41	304	1.63	
77	810.78	1226.58	-9N	22	37	252	1.66	NET< CL
78	834.86	1263.01	5N	25	41	310	1.68	NET< CL
79	884.73	1338.45	15N	22	35	232	1.71	NET< CL
80	1099.20	1662.84	10N	22	36	225	1.86	NET< CL
81	1115.51	1687.52	50N	41	67	457	1.87	NET< CL
PIC								
82	1332.49	2015.66	6N	17	27	143	2.01	NET< CL

L5348-12 analyzed by emm1461 on 05/09/2003

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
83	1691.05	2557.73	10N	12	19	68	2.25	NET< CL

L5348-12 analyzed by emml461 on 05/09/2003

SEEKER ANALYSIS SUMMARY

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/09/2003 15:50:25
Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.06E+03 Hrs
Buildup Time: 0.00E+00 Hrs | Live Time 70000 Sec
Sample Size 1.02E-01 kg | Real Time 70056 Sec
Collection Efficiency 1.0000 | Spectrum File 1296505.spc

Detector #: 5

Energy(keV)= -0.14 + 0.661*Ch + -2.41E-07*Ch^2 + -2.41E-07*Ch^3 05/09/2003

FWHM(keV) = 1.06 + 0.004*En + 6.14E-04*En^2 + 6.14E-04*En^3 02/28/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS005.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[5.28e-03*En^-3.33e+00 + 1.03e+02*En^ 7.42e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-12.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	6.58E+02	2.09E+01	< 5.16E+01	2.54E+01	1.00E+00	MEAS +	YES
Pb-214	4.31E+02	2.22E+01	< 8.01E+01	3.94E+01	1.00E+00	MEAS +	YES
Tl-208	5.64E+02	3.18E+01	< 1.14E+02	5.57E+01	1.00E+00	MEAS +	YES
Th-234	5.89E+02	2.53E+02	< 8.31E+02	4.13E+02	1.00E+00	MEAS +	YES
Ra-226	8.59E+02	2.39E+02	< 7.73E+02	3.82E+02	1.00E+00	MEAS +	YES
AcTh-228	5.36E+02	3.07E+01	< 1.33E+02	6.48E+01	1.00E+00	MEAS +	YES
Ba-140	3.30E+02	3.09E+02	< 6.37E+02	3.04E+02	8.94E-02	NET	YES
Annl	1.66E+01	3.03E+01	< 1.00E+02	4.98E+01	9.19E-01	MEAS +	YES
Bi-214	4.02E+02	2.58E+01	< 8.44E+01	4.14E+01	1.00E+00	MEAS +	YES
Cs-137	7.06E+01	1.14E+01	< 3.48E+01	1.69E+01	9.97E-01	MEAS +	YES
Bi-212	3.30E+02	1.01E+02	< 3.24E+02	1.58E+02	1.00E+00	MEAS +	YES
K-40	1.49E+04	2.94E+02	< 4.04E+02	1.95E+02	1.00E+00	MEAS +	YES
Am-241	6.97E+01	3.55E+01	< 1.16E+02	5.71E+01	1.00E+00	NET	YES
Co-57	-2.16E+00	6.40E+00	< 2.15E+01	1.06E+01	8.92E-01	NET	YES
Ce-144	7.14E-01	4.43E+01	< 1.49E+02	7.29E+01	8.97E-01	NET	YES
Ce-141	4.51E+00	2.72E+01	< 9.09E+01	4.47E+01	3.87E-01	NET	YES
Se-75	1.59E+01	1.24E+01	< 4.11E+01	2.01E+01	7.73E-01	NET	YES
Cr-51	-9.40E+01	1.82E+02	< 6.18E+02	3.02E+02	3.28E-01	NET	YES
I-131	-3.50E+02	3.38E+02	< 1.16E+03	5.65E+02	2.15E-02	NET	YES
Sb-125	1.39E+01	2.09E+01	< 6.98E+01	3.39E+01	9.70E-01	NET	YES
Ag-108m	-2.96E+00	7.56E+00	< 2.57E+01	1.25E+01	9.99E-01	NET	YES
Be-7	2.26E+02	1.16E+02	< 3.78E+02	1.84E+02	5.61E-01	NET	YES
La-140	-1.64E+02	1.66E+02	< 5.69E+02	2.77E+02	8.94E-02	NET	YES
Ru-103	7.73E+00	1.64E+01	< 5.52E+01	2.68E+01	4.56E-01	NET	YES
Cs-134	7.89E+00	9.03E+00	< 3.01E+01	1.46E+01	9.60E-01	NET	YES
Ru-106	1.83E+01	8.33E+01	< 2.81E+02	1.36E+02	9.19E-01	NET	YES
Zr-95	-9.79E+01	4.19E+01	< 1.50E+02	7.32E+01	6.17E-01	NET	YES
Nb-95	3.48E+01	1.98E+01	< 6.49E+01	3.14E+01	4.14E-01	NET	YES
Co-58	-4.68E+00	1.16E+01	< 3.98E+01	1.92E+01	6.46E-01	NET	YES
Mn-54	1.88E+00	9.42E+00	< 3.19E+01	1.54E+01	9.06E-01	NET	YES
Ag-110m	8.33E+00	1.21E+01	< 4.08E+01	1.97E+01	8.84E-01	NET	YES
Fe-59	1.48E+01	3.27E+01	< 1.10E+02	5.32E+01	5.01E-01	NET	YES
Zn-65	4.72E+01	3.92E+01	< 1.30E+02	6.35E+01	8.81E-01	NET	YES

L5348-12 analyzed by emm1461 on 05/09/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	2.89E+00	8.18E+00	< 2.79E+01	1.33E+01	9.84E-01	NET	YES
Sb-124	1.96E+01	2.37E+01	< 8.07E+01	3.77E+01	5.99E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-13 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-592 REF-X19582
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 155.1 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/7/03 1731 Det No.: 4 Spectrum No.: 1277209
Counted by: [Signature]
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5348-13	Product	: GAMMA SPECTROMETRY
Client Id	: BMA-E0200-592	Matrix	: S001 Soil
Site	: REF-X19582		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/26/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	155.1		
Sample Weight-Dry	g			
Aliquot Weight	g	155.1		
FINAL WEIGHT	kg	.1551		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-13 analyzed by emml461 on 05/07/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-13 ✓

Sample ID: SOIL/SEDI Duratek Inc

Code: 1277204

 Sampling Start: 03/26/2003 12:00:00 ✓ Counting Start: 05/07/2003 17:30:34
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.01E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 56834 Sec
 Sample Size 1.55E-001 kg | Real Time 56853 Sec
 Collection Efficiency 1.0000 | Spc. File 1277204.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.40 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/07/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.02	94.66	373	56	86	1375	0.96	
2	74.60	112.18	797	48	63	893	0.94	a HiResid
3	76.94	115.71	963	50	63	893	0.82	b HiResid
4	79.01	118.84	22	25	40	447	0.50	c NET< CL HiResid
5	83.96	126.32	210	41	63	893	0.92	d HiResid
6	87.01	130.93	424	50	74	1117	1.03	e HiResid
7	89.69	134.98	285	42	63	893	0.90	f HiResid
8	92.57	139.33	1048	61	85	1340	1.19	g HiResid
9	105.01	158.15	4	58	95	1420	0.06	NET< CL
10	143.95	217.01	32	51	83	1185	0.45	NET< CL
11	154.47	232.91	21	54	89	1241	0.46	NET< CL
12	179.56	270.84	29	35	57	662	1.17	a NET< CL
13	185.72	280.15	570	42	57	662	1.09	b
14	197.22	297.54	16	40	66	802	0.29	NET< CL
15	209.17	315.60	132	49	79	993	1.23	
16	238.36	359.73	1687	52	53	558	1.00	a HiResid
17	241.47	364.42	321	41	60	669	1.29	b HiResid
18	257.98	389.39	37	34	54	543	1.01	NET< CL
19	269.39	406.64	92	30	46	429	1.02	a
20	270.45	408.24	72	21	32	258	0.69	b
21	277.12	418.33	26	33	53	522	0.56	NET< CL
22	294.97	445.31	532	35	43	372	1.12	a
23	299.99	452.89	99	28	43	372	1.13	b
24	327.69	494.77	26	33	54	494	0.34	NET< CL
25	338.19	510.65	304	37	54	494	1.20	
26	351.69	531.05	895	43	51	446	1.24	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	462.33	698.31	82	32	51	382	1.39	
28	510.73	771.47	978	44	51	367	2.34	Wide Pk
29	558.09	843.07	19	29	46	318	0.82	NET< CL
30	583.04	880.78	528	33	40	249	1.46	
31	609.15	920.25	738	39	46	312	1.41	
32	661.38	999.21	76	28	44	280	0.94	
33	726.98	1098.38	102	24	35	196	1.74	
34	794.81	1200.92	46	18	28	158	0.99	
35	860.45	1300.14	60	21	31	172	1.33	
36	910.94	1376.48	404	28	31	159	1.89	
37	933.15	1410.05	48	22	34	186	1.27	
38	968.90	1464.10	154	24	35	208	1.14	
39	1001.22	1512.96	34	20	32	169	1.62	
40	1120.30	1692.97	153	25	36	202	1.65	
41	1377.58	2081.89	25	15	24	87	2.21	
42	1407.83	2127.63	10	14	23	91	1.05	NET< CL
43	1460.76	2207.64	2374	50	22	79	2.29	
44	1764.69	2667.09	114	16	19	60	2.21	
45	2102.62	3177.95	46	13	18	48	3.43	
46	2203.65	3330.67	18	10	15	38	1.57	
47	2614.53	3951.82	186	16	13	28	2.39	

L5348-13 analyzed by emml461 on 05/07/2003

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Background File: EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.02	373	56	86	62	59	97	NET<CL
2	74.60	797	48	63	690	51	71	
3	76.94	963	50	63	840	52	70	
5	83.96	210	41	63	118	44	70	
6	87.01	424	50	74	369	51	79	
7	89.69	285	42	63	204	43	67	
8	92.57	1048	61	85	416	64	100	
10	143.95	32	51	83	-45	53	88	NET<CL
13	185.72	570	42	57	249	47	72	
14	197.22	16	40	66	-40	43	71	NET<CL
16	238.36	1687	52	53	1432	54	64	
17	241.47	321	41	60	259	43	66	
19	269.39	92	30	46	67	34	54	
22	294.97	532	35	43	459	37	50	
23	299.99	99	28	43	72	32	51	
25	338.19	304	37	54	279	39	59	
26	351.69	895	43	51	731	45	60	
27	462.33	82	32	51	67	35	55	
28	510.73	978	44	51	169	49	77	
29	558.09	19	29	46	11	30	49	NET<CL
30	583.04	528	33	40	436	35	47	
31	609.15	738	39	46	649	41	53	
33	726.98	102	24	35	87	26	39	
36	910.94	404	28	31	359	29	36	
38	968.90	154	24	35	143	26	38	
39	1001.22	34	20	32	23	22	35	NET<CL
40	1120.30	153	25	36	139	26	38	
43	1460.76	2374	50	22	2291	51	29	
44	1764.69	114	16	19	92	17	22	
47	2614.53	186	16	13	124	17	21	

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.60	690	Pb-212	425	5 of 6	100.00	1.00	
			Tl-208	25	7 of 9	96.39	0.96	
			Pb-214	207	5 of 7	97.33	0.97	
			Tl-208	44	7 of 9	96.39	0.96	
3	76.94	840	Pb-212	713	5 of 6	100.00	1.50	
			Tl-208	44	7 of 9	96.39	0.96	
			Pb-214	363	5 of 7	100.00	1.00	
5	83.96	118	Tl-208	22	7 of 9	96.39	1.46	
6	87.01	3	Cd-109	. . . . .	1 of 1	100.00	1.50	Split
50	87.01	367	Pb-212	367	5 of 6	100.00	1.50	AutoAdd
7	89.69	204	Cd-109	. . . . .	1 of 1	100.00	1.50	
8	92.57	247	Th-234	. . . . .	1 of 2	58.74	0.59	Split
49	92.57	169	AcTh-228	169	8 of 36	73.51	0.74	AutoAdd
13	185.72	249	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
15	209.17	132	AcTh-228	166	8 of 36	90.93	1.41	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
16	238.36	1432	Pb-212	1631	5 of 6	100.00	1.50	
17	241.47	259	Pb-214	211	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
19	269.39	67	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
			AcTh-228	114	8 of 36	92.70	1.43	Matched
20	270.45	72	AcTh-228	114	8 of 36	92.70	1.43	
22	294.97	459	Pb-214	564	5 of 7	100.00	1.50	
23	299.99	72	Pb-212	94	5 of 6	100.00	1.50	
25	338.19	279	AcTh-228	291	8 of 36	80.52	1.31	
26	351.69	731	Pb-214	942	5 of 7	100.00	1.50	
27	462.33	67	AcTh-228	85	8 of 36	92.70	1.43	
			Sb-125	. . . . .	1 of 8	13.67	0.64	
28	510.73	46	Annil	. . . . .	1 of 1	100.00	1.50	Split
48	510.73	122	Tl-208	122	7 of 9	97.07	1.47	AutoAdd
30	583.04	436	Tl-208	420	7 of 9	97.07	1.47	
31	609.15	649	Bi-214	689	6 of 33	86.52	1.37	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
			1120SEsc	. . . . .	0 of 0	. . . . .	0.50	
32	661.38	76	Cs-137	. . . . .	1 of 1	100.00	1.50	
33	726.98	87	Bi-212	. . . . .	1 of 13	100.00	1.00	
34	794.81	46	AcTh-228	56	8 of 36	85.62	1.36	
			Cs-134	. . . . .	1 of 9	46.67	0.97	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
35	860.45	60	Tl-208	45	7 of 9	97.07	1.47	
36	910.94	359	AcTh-228	252	8 of 36	80.52	1.31	
37	933.15	48	Bi-214	31	6 of 33	81.18	1.31	
38	968.90	143	AcTh-228	174	8 of 36	85.62	1.36	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
40	1120.30	139	Bi-214	125	6 of 33	86.52	1.37	
41	1377.58	25	Bi-214	29	6 of 33	86.52	1.37	
43	1460.76	2291	K-40	. . . . .	1 of 1	100.00	1.50	
44	1764.69	92	Bi-214	88	6 of 33	86.52	1.37	
45	2102.62	46	2615SEsc	. . . . .	0 of 0	. . .	0.50	
46	2203.65	18	Bi-214	23	6 of 33	89.07	1.39	
47	2614.53	124	Tl-208	144	7 of 9	97.07	1.47	

L5348-13 analyzed by emml461 on 05/07/2003

SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

LSN: L5348-13

Sample ID: SOIL/SEDI Duratek Inc

Code: 1277204

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:30:34
Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.01e+003 Hrs
Buildup Time: 0.00e+000 Hrs | Live Time 56834 Sec
Sample Size 1.55e-001 kg | Real Time 56853 Sec
Collection Efficiency 1.0000 | Spectrum File 1277204.spc
Type I | Type I & II
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 4 (Canberra sn 10923050 det#4)

Efficiency File: WT1SS004.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[2.12E-02*En^-2.69E+00 + 1.61E+02*En^8.72E-01] 02/09/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

LSF File: L5348-13.LSF (SOIL/SEDI: Duratek Inc)

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	4.63E+02 +- 1.74E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	4.64E+02 +- 1.75E+01	4.21E+01	+*		. . . . .
	300.09	3.69E+02 +- 1.64E+02	5.35E+02	+		. . . . .
Tl-208	Average:x	4.32E+02 +- 2.96E+01	. . . .		*	. . . . .
	84.90	I.D.	. . . .			. . . . .
	510.84	I.D.	. . . .			. . . . .
	583.14	4.45E+02 +- 3.60E+01	9.84E+01	+*		. . . . .
	860.37	5.79E+02 +- 2.00E+02	6.35E+02	+		. . . . .
	2614.66	3.94E+02 +- 5.36E+01	1.41E+02	+*		. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	4.62E+02 +- 2.09E+02	6.86E+02	+		. . . . .
Ra-226	186.22	9.09E+02 +- 1.71E+02	5.38E+02	+*		. . . . .
AcTh-228	Average:x	4.88E+02 +- 3.06E+01	. . . .		*	. . . . .
	209.28	3.91E+02 +- 1.47E+02	4.78E+02	+		. . . . .
	270.23	3.20E+02 +- 9.51E+01	2.99E+02	+*		. . . . .
	338.32	4.72E+02 +- 6.68E+01	2.04E+02	+*		. . . . .
	463.00	3.86E+02 +- 1.98E+02	6.50E+02	+		. . . . .
	794.70	4.00E+02 +- 1.62E+02	5.21E+02	+		. . . . .
	911.07	5.91E+02 +- 4.74E+01	1.22E+02	+*		. . . . .
	969.11	4.13E+02 +- 7.48E+01	2.26E+02	+*		. . . . .
	93.35	I.D.	. . . .			. . . . .
Pb-214	Average:x	4.04E+02 +- 1.91E+01	. . . .		*	. . . . .
	241.98	5.06E+02 +- 8.42E+01	2.63E+02	+*		. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	N		Concentration		MDA	Flags	Notes	MDC
	ENERGY E	(keV)	(pCi/kg)				
Annul Bi-214	295.21		4.11E+02 +- 3.34E+01		9.23E+01		++	. . . . .
	351.92		3.92E+02 +- 2.43E+01		6.57E+01		++	. . . . .
	511.00		1.37E+01 +- 2.53E+01		8.38E+01		+	. . . . .
	Average:x		4.55E+02 +- 2.55E+01		. . . . .		*	. . . . .
	609.31		4.50E+02 +- 2.85E+01		7.54E+01		++	. . . . .
	934.06		6.92E+02 +- 3.13E+02		1.02E+03		+	. . . . .
	1120.29		5.01E+02 +- 9.45E+01		2.88E+02		++	. . . . .
	1377.67		4.03E+02 +- 2.41E+02		7.92E+02		+	. . . . .
	1764.49		4.74E+02 +- 8.52E+01		2.43E+02		++	. . . . .
Cs-137 Bi-212 K-40 Am-241 Co-57 Ce-144 Ce-141 Se-75 Cr-51 I-131 Sb-125 Ag-108m Be-7 La-140 Ru-103 Ba-140 Cs-134 Ru-106 Zr-95 Nb-95 Co-58 Mn-54 Ag-110m Fe-59 Zn-65 Co-60 Sb-124	2204.22		3.57E+02 +- 1.95E+02		6.31E+02		+	. . . . .
	661.65		3.06E+01 +- 1.13E+01		3.65E+01		+	. . . . .
	727.17		2.75E+02 +- 8.10E+01		2.57E+02		++	. . . . .
	1460.81		1.48E+04 +- 3.29E+02		3.95E+02		++	. . . . .
	59.54	N-3.65E+00 +- 2.09E+01		7.01E+011		x	lbase	. . . . .
	122.06	N 2.14E+00 +- 4.95E+00		1.66E+01		x		. . . . .
	133.54	N 2.58E+01 +- 3.89E+01		1.30E+02		x		. . . . .
	145.44	N-3.36E+00 +- 2.11E+01		7.10E+01		x		. . . . .
	264.65	N 7.84E+00 +- 9.49E+00		3.17E+011		x	lbase	. . . . .
	320.08	N 2.23E+02 +- 1.52E+02		5.03E+02		x		. . . . .
	364.48	N 1.09E+02 +- 2.70E+02		9.08E+02		x		. . . . .
	427.89	N 1.66E+01 +- 1.95E+01		6.52E+01		x		. . . . .
	433.93	N-1.01E+01 +- 6.15E+00		2.16E+01		x		. . . . .
	477.59	N-4.33E+00 +- 9.51E+01		3.25E+02		x		. . . . .
	487.03	N 2.50E+02 +- 1.21E+02		3.93E+02		x		. . . . .
	497.08	N-1.28E+01 +- 1.36E+01		4.76E+01		x		. . . . .
	537.32	N-2.31E+01 +- 2.25E+02		7.73E+02		x		. . . . .
	604.70	N 3.62E+01 +- 3.29E+01		1.08E+02P		x	PIC	. . . . .
	621.84	N-1.98E+02 +- 8.12E+01		2.91E+02		x		. . . . .
	724.18	N-2.79E+01 +- 4.31E+01		1.48E+02L		x	LHROI	. . . . .
	765.79	N 3.86E+00 +- 1.76E+01		6.01E+01		x		. . . . .
	810.76	N-1.93E+01 +- 1.09E+01		3.93E+01		x		. . . . .
	834.83	N 3.36E+00 +- 8.20E+00		2.79E+01		x		. . . . .
	884.67	N 6.19E+00 +- 1.20E+01		4.08E+01		x		. . . . .
	1099.22	N-2.76E+01 +- 3.35E+01		1.18E+02		x		. . . . .
	1115.52	N-2.15E+01 +- 4.29E+01		1.45E+02P		x	PIC	. . . . .
	1332.49	N 4.83E-01 +- 9.03E+00		3.14E+01		x	Y.	. . . . .
	1691.02	N-3.90E+01 +- 2.51E+01		9.59E+01		x		. . . . .

MEASURED TOTAL: 1.87E+04 +- 9.48E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.02	94.66	62	59	97	1375	0.96	Deleted
4	79.01	118.84	22	25	40	447	0.50	Deleted
9	105.01	158.15	4	58	95	1420	0.06	Deleted
10	143.95	217.01	-45	53	88	1185	0.45	Deleted
11	154.47	232.91	21	54	89	1241	0.46	Deleted
12	179.56	270.84	29	35	57	662	1.17	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	197.22	297.54	-40	43	71	802	0.29	Deleted
18	257.98	389.39	37	34	54	543	1.01	Deleted
19	269.39	406.64	67	34	54	429	1.02	Unknown
21	277.12	418.33	26	33	53	522	0.56	Deleted
24	327.69	494.77	26	33	54	494	0.34	Deleted
29	558.09	843.07	11	30	49	318	0.82	Deleted
39	1001.22	1512.96	23	22	35	169	1.62	Deleted
42	1407.83	2127.63	10	14	23	91	1.05	Deleted
45	2102.62	3177.95	46	13	18	48	3.43	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
51	59.54	89.40	-8N	44	72	1052	0.98	NET< CL LBase
52	122.06	183.92	17N	39	64	819	1.04	NET< CL
53	133.54	201.27	25N	38	62	771	1.05	NET< CL
54	145.44	219.26	-6N	40	66	868	1.06	NET< CL
55	264.65	399.47	23N	28	46	422	1.17	NET< CL LBase
56	320.08	483.27	41N	28	45	373	1.21	NET< CL
57	364.48	550.39	11N	27	44	364	1.25	NET< CL
58	427.89	646.24	20N	24	38	267	1.30	NET< CL
59	433.93	655.37	-38N	23	39	286	1.30	NET< CL
60	477.59	721.38	-1N	22	36	242	1.34	NET< CL
61	487.03	735.65	43N	21	32	194	1.34	
62	497.08	750.84	-20N	21	36	238	1.35	NET< CL
63	537.32	811.67	-2N	19	32	191	1.38	NET< CL
64	604.70	913.53	107N	97	158	488	1.43	NET< CL PIC
65	621.84	939.44	-55N	22	39	259	1.44	NET< CL
66	724.18	1094.15	-21N	32	54	227	1.52	NET< CL LHRoi
67	765.79	1157.05	4N	19	32	198	1.55	NET< CL
68	810.76	1225.03	-31N	17	30	177	1.58	NET< CL
69	834.83	1261.42	7N	18	29	163	1.60	NET< CL
70	884.67	1336.76	9N	17	28	148	1.64	NET< CL
71	1099.22	1661.10	-15N	18	31	174	1.79	NET< CL
72	1115.52	1685.74	-18N	36	59	353	1.80	NET< CL PIC
73	1332.49	2013.74	1N	14	23	92	1.95	NET< CL
74	1691.02	2555.73	-15N	10	17	54	2.20	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/07/2003 17:30:34
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. . . . . 1.01E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 56834 Sec
Sample Size . . . . . 1.55E-01 kg | Real Time . . . . . 56853 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1277204.spc
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Detector #: 4

Energy(keV)= 0.40 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/07/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS004.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[2.12e-02*En^-2.69e+00 + 1.61e+02*En^ 8.72e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5348-13.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	4.63E+02	1.74E+01	< 4.21E+01	2.06E+01	1.00E+00	MEAS +	YES
Tl-208	4.32E+02	2.96E+01	< 9.84E+01	4.78E+01	9.99E-01	MEAS +	YES
Th-234	4.62E+02	2.09E+02	< 6.86E+02	3.41E+02	1.00E+00	MEAS +	YES
Ra-226	9.09E+02	1.70E+02	< 5.38E+02	2.64E+02	1.00E+00	MEAS +	YES
AcTh-228	4.88E+02	3.06E+01	< 1.22E+02	5.87E+01	9.99E-01	MEAS +	YES
Pb-214	4.04E+02	1.91E+01	< 6.57E+01	3.21E+01	1.00E+00	MEAS +	YES
Annil	1.37E+01	2.53E+01	< 8.38E+01	4.15E+01	9.22E-01	MEAS +	YES
Bi-214	4.55E+02	2.55E+01	< 7.54E+01	3.68E+01	1.00E+00	MEAS +	YES
Cs-137	3.06E+01	1.13E+01	< 3.65E+01	1.77E+01	9.97E-01	MEAS +	YES
Bi-212	2.75E+02	8.10E+01	< 2.57E+02	1.24E+02	9.99E-01	MEAS +	YES
K-40	1.48E+04	3.29E+02	< 3.94E+02	1.88E+02	1.00E+00	MEAS +	YES
Am-241	-3.65E+00	2.09E+01	< 7.01E+01	3.44E+01	1.00E+00	NET	YES
Co-57	2.14E+00	4.95E+00	< 1.65E+01	8.10E+00	8.97E-01	NET	YES
Ce-144	2.58E+01	3.89E+01	< 1.30E+02	6.35E+01	9.01E-01	NET	YES
Ce-141	-3.36E+00	2.11E+01	< 7.10E+01	3.48E+01	4.03E-01	NET	YES
Se-75	7.84E+00	9.49E+00	< 3.17E+01	1.54E+01	7.82E-01	NET	YES
Cr-51	2.23E+02	1.52E+02	< 5.03E+02	2.44E+02	3.45E-01	NET	YES
I-131	1.09E+02	2.70E+02	< 9.08E+02	4.40E+02	2.55E-02	NET	YES
Sb-125	1.66E+01	1.95E+01	< 6.52E+01	3.15E+01	9.71E-01	NET	YES
Ag-108m	-1.01E+01	6.14E+00	< 2.16E+01	1.05E+01	9.99E-01	NET	YES
Be-7	-4.33E+00	9.51E+01	< 3.25E+02	1.56E+02	5.76E-01	NET	YES
La-140	2.50E+02	1.21E+02	< 3.93E+02	1.88E+02	9.97E-02	NET	YES
Ru-103	-1.28E+01	1.36E+01	< 4.76E+01	2.29E+01	4.73E-01	NET	YES
Ba-140	-2.31E+01	2.25E+02	< 7.73E+02	3.71E+02	9.97E-02	NET	YES
Cs-134	3.62E+01	3.29E+01	< 1.08E+02	5.38E+01	9.62E-01	NET	YES
Ru-106	-1.98E+02	8.12E+01	< 2.91E+02	1.41E+02	9.23E-01	NET	YES
Zr-95	-2.79E+01	4.31E+01	< 1.48E+02	7.23E+01	6.31E-01	NET	YES
Nb-95	3.86E+00	1.76E+01	< 6.01E+01	2.88E+01	4.31E-01	NET	YES
Co-58	-1.93E+01	1.09E+01	< 3.93E+01	1.88E+01	6.59E-01	NET	YES
Mn-54	3.36E+00	8.20E+00	< 2.79E+01	1.33E+01	9.10E-01	NET	YES
Ag-110m	6.19E+00	1.20E+01	< 4.08E+01	1.95E+01	8.89E-01	NET	YES
Fe-59	-2.76E+01	3.35E+01	< 1.18E+02	5.64E+01	5.16E-01	NET	YES
Zn-65	-2.15E+01	4.29E+01	< 1.46E+02	7.11E+01	8.86E-01	NET	YES

L5348-13 analyzed by emm1461 on 05/07/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	4.83E-01	9.03E+00	< 3.14E+01	1.48E+01	9.85E-01	NET	YES
Sb-124	-3.90E+01	2.51E+01	< 9.59E+01	4.45E+01	6.13E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-14 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-658 REF-X19583
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG 5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 150.5 g

Filter/Smear Data

Volume: _____
Units: _____

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/16/03 1709 Det No.: 4 Spectrum No.: 1367104
Counted by: en
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5348-14	Product	: GAMMA SPECTROMETRY
Client Id	: BMA-E0200-658	Matrix	: SO01 Soil
Site	: REF-X19583		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/26/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	150.5		
Sample Weight-Dry	g			
Aliquot Weight	g	150.5		
FINAL WEIGHT	kg	.1505		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-14 analyzed by emml461 on 05/16/2003
 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-14

Sample ID: SOIL/SEDI Duratek Inc

Code: 1367104

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:09:02
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.23E+003 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time 70000 Sec
 Sample Size 1.50E-001 kg | Real Time 70027 Sec
 Collection Efficiency 1.0000 | Spc. File 1367104.spc

Detector #: 4 (Canberra sn 10923050 det#4)

Energy(keV)= 0.58 + 0.661*Ch + -1.23E-07*Ch^2 + 3.39E-11*Ch^3 05/16/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 0.00E+00*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.23	94.71	364	61	95	1683	0.72	
2	74.84	112.27	978	54	73	1187	0.97	a
3	77.05	115.61	1566	60	73	1187	0.91	b
4	84.15	126.35	362	57	88	1425	1.23	a
5	87.07	130.77	537	52	77	1188	1.16	b
6	89.79	134.87	379	44	65	950	0.92	c
7	92.67	139.24	1305	70	99	1662	1.41	d
8	105.33	158.37	120	51	82	1248	1.36	a
9	109.69	164.96	82	38	61	832	0.77	b
10	128.92	194.04	81	56	92	1428	0.61	NET< CL
11	139.87	210.59	58	24	37	375	0.54	a
12	143.55	216.17	110	43	68	938	1.01	b
13	154.33	232.46	81	47	76	1074	0.81	
14	176.08	265.36	-61	50	82	1161	2.20	NET< CL Wide Pk
15	185.80	280.04	730	57	82	1158	1.23	
16	197.75	298.12	102	50	80	1096	1.05	
17	205.30	309.53	60	32	50	565	0.85	a
18	209.20	315.42	268	44	68	848	1.36	b
19	238.58	359.86	2385	59	55	608	1.11	a
20	241.52	364.31	471	48	71	852	1.49	b
21	270.26	407.75	177	42	66	734	1.63	
22	277.09	418.09	21	35	57	603	0.53	NET< CL
23	283.57	427.88	-5	46	76	855	0.12	NET< CL
24	295.08	445.29	642	39	48	472	1.06	a
25	300.13	452.93	131	32	48	472	1.14	b
26	328.38	495.64	154	51	81	858	1.51	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
27	338.31	510.66	440	41	57	556	1.40	
28	351.86	531.15	1077	47	55	516	1.22	
29	409.28	617.97	77	31	50	419	2.16	Wide Pk
30	462.79	698.90	105	30	46	363	0.86	
31	492.71	744.13	-18	32	52	405	2.24	NET< CL
32	510.99	771.78	1144	49	59	480	2.44	Wide Pk
33	558.63	843.83	24	24	38	265	0.52	NET< CL
34	583.08	880.80	692	39	48	334	1.38	
35	609.24	920.35	890	41	47	332	1.51	
36	642.00	969.90	-30	31	52	370	2.00	NET< CL
37	661.65	999.61	64	27	43	295	0.94	
38	727.27	1098.85	130	31	47	302	1.27	
39	767.45	1159.61	28	24	38	267	0.95	NET< CL
40	794.76	1200.90	60	27	43	287	1.28	
41	820.74	1240.20	6	24	40	262	0.31	NET< CL
42	835.68	1262.79	5	27	45	309	0.13	NET< CL
43	860.72	1300.66	59	26	40	253	1.36	
44	911.08	1376.82	394	31	39	256	1.46	
45	934.07	1411.59	20	22	36	210	1.13	NET< CL
46	964.67	1457.87	72	18	25	137	1.37 a	
47	968.89	1464.24	249	25	31	183	1.66 b	
48	989.35	1495.19	34	29	46	274	2.75	NET< CL
49	1014.48	1533.18	11	22	35	204	0.66	Wide Pk
50	1120.24	1693.12	164	27	39	239	1.58	NET< CL
51	1238.00	1871.19	51	29	45	291	2.03	
52	1376.73	2080.97	25	19	30	119	1.88	NET< CL
53	1460.63	2207.83	2424	51	24	98	2.14	
54	1592.11	2406.62	25	15	24	103	3.09	Wide Pk
55	1729.59	2614.48	15	11	17	54	0.97	NET< CL
56	1764.27	2666.91	121	17	21	70	2.17	
57	2104.16	3180.68	30	11	17	49	1.42	
58	2614.71	3952.09	245	18	15	33	2.54	

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY04.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.23	364	61	95	-19	66	108	NET<CL
2	74.84	978	54	73	845	58	83	
3	77.05	1566	60	73	1415	62	81	
4	84.15	362	57	88	250	60	95	
5	87.07	537	52	77	471	55	82	
6	89.79	379	44	65	279	46	70	
7	92.67	1305	70	99	527	74	116	
9	109.69	82	38	61	-12	44	73	NET<CL
11	139.87	58	24	37	23	34	56	NET<CL
12	143.55	110	43	68	16	47	76	NET<CL
14	176.08	-61	50	83	-64	53	88	NET<CL
15	185.80	730	57	82	333	62	97	
16	197.75	103	50	80	34	53	86	NET<CL
19	238.58	2385	59	55	2071	62	69	
20	241.52	471	48	71	395	51	78	
21	270.26	177	42	66	146	47	74	
24	295.08	642	39	48	552	42	57	
25	300.13	131	32	48	98	37	59	
27	338.31	440	41	57	409	44	64	
28	351.86	1077	47	55	875	50	66	
30	462.79	105	30	46	87	34	53	
32	510.99	1144	49	59	147	55	89	
33	558.63	24	24	38	14	26	43	NET<CL
34	583.08	692	39	48	578	42	56	
35	609.24	891	41	47	781	45	57	
38	727.27	130	31	47	111	33	51	
44	911.08	394	31	40	339	33	45	
47	968.89	249	25	31	235	27	36	
50	1120.24	164	27	39	147	29	42	
53	1460.63	2424	51	24	2322	52	33	
56	1764.27	121	17	21	94	18	25	
58	2614.71	245	18	15	168	19	24	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.50 | Decay Correction. ON

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.84	845	Pb-212	588	5 of 6	100.00	1.00	
			Pb-214	251	5 of 7	97.33	0.97	
			Tl-208	58	6 of 9	95.51	0.96	
3	77.05	391	Pb-214	441	5 of 7	97.33	0.97	Split
60	77.05	1023	Pb-212	1023	5 of 6	100.00	1.00	AutoAdd
4	84.15	250	Tl-208	29	6 of 9	95.51	0.96	
5	87.07	471	Pb-212	511	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	89.79	279	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	92.67	305	Th-234	. . . . .	1 of 2	58.74	0.59	Split
59	92.67	222	AcTh-228	222	13 of 36	85.22	0.85	AutoAdd
8	105.33	120	AcTh-228	105	13 of 36	89.08	1.39	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
13	154.33	81	AcTh-228	54	13 of 36	87.72	1.38	
15	185.80	333	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	83.72	0.84	
17	205.30	60	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
18	209.20	268	AcTh-228	211	13 of 36	89.08	1.39	
			Np-239	. . . . .	0 of 0	. . .	0.00	Decay
19	238.58	2071	Pb-212	2827	5 of 6	100.00	1.00	
20	241.52	395	Pb-214	254	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
21	270.26	146	AcTh-228	144	13 of 36	93.41	1.43	
24	295.08	552	Pb-214	860	5 of 7	100.00	1.50	
25	300.13	98	Pb-212	130	5 of 6	100.00	1.50	
26	328.38	154	AcTh-228	108	13 of 36	89.08	1.39	
			Bi-212	2	2 of 13	59.32	1.09	
			La-140	14613	2 of 15	23.26	0.23	LowScore
27	338.31	409	AcTh-228	369	13 of 36	90.66	1.41	
28	351.86	875	Pb-214	1437	5 of 7	100.00	1.50	
29	409.28	77	AcTh-228	60	13 of 36	89.08	1.39	
30	462.79	87	AcTh-228	112	13 of 36	96.96	1.47	
			Sb-125	. . . . .	1 of 8	13.67	0.64	
32	510.99	147	Annil	. . . . .	1 of 1	100.00	1.50	
			Tl-208	162	6 of 9	97.04	1.47	
34	583.08	578	Tl-208	526	6 of 9	97.04	1.47	
35	609.24	781	Bi-214	728	4 of 33	80.37	1.30	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
			1120SEsc		0 of 0	. . . .	0.50	
37	661.65	64	Cs-137		1 of 1	100.00	1.50	
38	727.27	111	Bi-212	7025	2 of 13	100.00	1.50	
40	794.76	60	AcTh-228	73	13 of 36	93.41	1.43	
			Cs-134		1 of 9	46.67	0.97	
43	860.72	59	Tl-208	59	6 of 9	97.04	1.47	
44	911.08	339	AcTh-228	420	13 of 36	93.41	1.43	
46	964.67	72	AcTh-228	69	13 of 36	93.41	1.43	
47	968.89	235	AcTh-228	217	13 of 36	91.62	1.42	
			Sb-124		1 of 13	1.04	0.01	LowScore
50	1120.24	147	Bi-214	148	4 of 33	80.37	1.30	
51	1238.00	51	Bi-214	53	4 of 33	80.37	1.30	
53	1460.63	2322	K-40		1 of 1	100.00	1.50	
54	1592.11	25	2615DEsc		0 of 0	. . . .	0.50	
56	1764.27	94	Bi-214	105	4 of 33	80.37	1.30	
57	2104.16	30	2615SEsc		0 of 0	. . . .	0.50	
58	2614.71	168	Tl-208	184	6 of 9	97.04	1.47	

L5348-14 analyzed by emm1461 on 05/16/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-14

Sample ID: SOIL/SEDI Duratek Inc

Code: 1367104

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:09:02
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.23e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 70000 Sec
 Sample Size 1.50e-001 kg | Real Time 70027 Sec
 Collection Efficiency 1.0000 | Spectrum File 1367104.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 4 (Canberra sn 10923050 det#4)
 Efficiency File: WT1SS004.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[2.12E-02*En^-2.69E+00 + 1.61E+02*En^8.72E-01] 02/09/1998

 Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-14.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS
 =====

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	5.60E+02 +- 1.67E+01	. . . .		*	. . . . .
	74.81	I.D. . . . .	. . . .			. . . . .
	77.12	I.D. . . . .	. . . .			. . . . .
	87.30	I.D. . . . .	. . . .			. . . . .
	238.63	5.62E+02 +- 1.68E+01	3.82E+01		++	. . . . .
	300.09	4.18E+02 +- 1.59E+02	5.15E+02		+	. . . . .
Pb-214	Average:x	4.11E+02 +- 1.79E+01	. . . .		*	. . . . .
	77.11	I.D. . . . .	. . . .			. . . . .
	241.98	6.45E+02 +- 8.37E+01	2.58E+02		++	. . . . .
	295.21	4.14E+02 +- 3.16E+01	8.82E+01		++	. . . . .
	351.92	3.93E+02 +- 2.24E+01	6.06E+01		++	. . . . .
Tl-208	Average:x	4.79E+02 +- 2.90E+01	. . . .		*	. . . . .
	84.90	I.D. . . . .	. . . .			. . . . .
	583.14	4.94E+02 +- 3.56E+01	9.78E+01		++	. . . . .
	860.37	4.77E+02 +- 2.08E+02	6.74E+02		+	. . . . .
	2614.66	4.49E+02 +- 5.17E+01	1.34E+02		++	. . . . .
Cd-109	88.03	I.D. . . . .	. . . .			. . . . .
Th-234	92.59	4.78E+02 +- 2.02E+02	6.63E+02		+	. . . . .
AcTh-228	Average:x	5.33E+02 +- 2.82E+01	. . . .		*	. . . . .
	105.00	I.D. . . . .	. . . .			. . . . .
	154.20	8.03E+02 +- 4.68E+02	1.54E+03		+	. . . . .
	209.28	6.64E+02 +- 1.10E+02	3.43E+02		++	. . . . .
	270.23	5.43E+02 +- 1.73E+02	5.60E+02		++	. . . . .
	327.64	7.56E+02 +- 2.50E+02	8.10E+02		++	. . . . .
	338.32	5.79E+02 +- 6.20E+01	1.85E+02		++	. . . . .
	409.51	6.89E+02 +- 2.80E+02	9.09E+02		+	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	N Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	463.00	4.20E+02 +- 1.61E+02	5.22E+02		+	. . . . .
	794.70	4.38E+02 +- 2.00E+02	6.52E+02		+	. . . . .
	911.07	4.66E+02 +- 4.51E+01	1.26E+02		++	. . . . .
	964.60	5.57E+02 +- 1.36E+02	4.13E+02		++	. . . . .
	969.11	5.69E+02 +- 6.51E+01	1.83E+02		++	. . . . .
	93.35	I.D.	. . . . .			. . . . .
Ce-141	145.44	N 8.48E+00 +- 2.50E+01	8.35E+01		x	. . . . .
Ra-226	186.22	1.02E+03 +- 1.89E+02	6.04E+02		++	. . . . .
Annil	511.00	3.72E+01 +- 1.40E+01	4.58E+01		+	. . . . .
Bi-214	Average:x	4.47E+02 +- 2.34E+01	. . . . .		*	. . . . .
	609.31	4.53E+02 +- 2.58E+01	6.76E+01		++	. . . . .
	1120.29	4.43E+02 +- 8.61E+01	2.65E+02		++	. . . . .
	1238.11	4.28E+02 +- 2.39E+02	7.84E+02		+	. . . . .
	1764.49	4.04E+02 +- 7.77E+01	2.28E+02		++	. . . . .
Cs-137	661.65	2.19E+01 +- 9.32E+00	3.02E+01		+	. . . . .
Bi-212	727.17	2.95E+02 +- 8.70E+01	2.78E+02		++	. . . . .
K-40	1460.81	1.25E+04 +- 2.82E+02	3.73E+02		++	. . . . .
Am-241	59.54	N 3.56E+01 +- 1.91E+01	6.27E+01		x lbase	. . . . .
Co-57	122.06	N 2.90E-01 +- 4.63E+00	1.55E+01		x	. . . . .
Ce-144	133.54	N-2.57E+01 +- 3.68E+01	1.24E+02		x	. . . . .
Se-75	264.65	N-1.74E+01 +- 9.10E+00	3.17E+01		x	. . . . .
Cr-51	320.08	N-2.28E+01 +- 1.73E+02	5.85E+02		x	. . . . .
I-131	364.48	N-6.71E+02 +- 5.12E+02	1.77E+03		x	. . . . .
Sb-125	427.89	N-5.58E+00 +- 1.88E+01	6.41E+01		x	. . . . .
Ag-108m	433.93	N-4.23E+00 +- 5.68E+00	1.96E+01		x	. . . . .
Be-7	477.59	N-1.10E+02 +- 1.02E+02	3.52E+02		x	. . . . .
La-140	487.03	N 2.15E+02 +- 1.80E+02	5.99E+02		x	. . . . .
Ru-103	497.08	N-1.69E+01 +- 1.47E+01	5.12E+01		x	. . . . .
Ba-140	537.32	N 2.68E+02 +- 3.39E+02	1.14E+03		x	. . . . .
Cs-134	604.70	N 4.83E+01 +- 3.17E+01	1.04E+02P		x PIC	. . . . .
Ru-106	621.84	N-1.06E+02 +- 7.11E+01	2.50E+02		x	. . . . .
Zr-95	724.18	N-8.62E+03 +- 2.89E+03	9.53E+03P		x PIC	. . . . .
Nb-95	765.79	N 2.30E+01 +- 1.90E+01	6.31E+01		x	. . . . .
Co-58	810.76	N-2.19E+01 +- 1.01E+01	3.69E+01		x	. . . . .
Mn-54	834.83	N 8.31E+00 +- 7.67E+00	2.56E+01		x	. . . . .
Ag-110m	884.67	N 7.67E+00 +- 1.12E+01	3.79E+01		x	. . . . .
Fe-59	1099.22	N-2.30E+01 +- 3.13E+01	1.10E+02		x	. . . . .
Zn-65	1115.52	N 4.25E+01 +- 3.82E+01	1.26E+02P		x PIC	. . . . .
Co-60	1332.49	N 8.11E+00 +- 7.76E+00	2.61E+01		x Y.	. . . . .
Sb-124	1691.02	N-2.41E+01 +- 2.60E+01	9.57E+01		x	. . . . .

MEASURED TOTAL: 1.68E+04 +- 8.99E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.23	94.71	-19	66	108	1683	0.72	Deleted
9	109.69	164.96	-12	44	73	832	0.77	Deleted
10	128.92	194.04	81	56	92	1428	0.61	Deleted

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
11	139.87	210.59	23	34	56	375	0.54	Deleted
14	176.08	265.36	-64	53	88	1161	2.20	Deleted
16	197.75	298.12	34	53	86	1096	1.05	Deleted
17	205.30	309.53	60	32	50	565	0.85	Unknown
22	277.09	418.09	21	35	57	603	0.53	Deleted
23	283.57	427.88	-5	46	76	855	0.12	Deleted
31	492.71	744.13	-18	32	52	405	2.24	Deleted
33	558.63	843.83	14	26	43	265	0.52	Deleted
36	642.00	969.90	-30	31	52	370	2.00	Deleted
39	767.45	1159.61	28	24	38	267	0.95	Deleted
41	820.74	1240.20	7	24	40	263	0.31	Deleted
42	835.68	1262.79	5	27	45	309	0.13	Deleted
45	934.07	1411.59	20	22	36	210	1.13	Deleted
48	989.35	1495.19	34	29	46	274	2.75	Deleted
49	1014.48	1533.18	11	22	35	204	0.66	Deleted
52	1376.73	2080.97	25	19	30	119	1.88	Deleted
54	1592.11	2406.62	25	15	24	103	3.09	2615DEsc
55	1729.59	2614.48	15	11	17	54	0.97	Deleted
57	2104.16	3180.68	30	11	17	49	1.42	2615SEsc

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	143.55	216.17	16N	47	76	938	1.01	b NET< CL
61	59.54	89.14	89N	48	77	1207	0.98	LBase
62	122.06	183.67	3N	42	70	983	1.04	NET< CL
63	133.54	201.03	-29N	42	69	973	1.05	NET< CL
64	264.65	399.28	-59N	31	52	546	1.17	NET< CL
65	320.08	483.10	-4N	30	50	461	1.21	NET< CL
66	364.49	550.24	-37N	28	48	418	1.25	NET< CL
67	427.90	646.13	-8N	27	45	367	1.30	NET< CL
68	433.94	655.27	-19N	26	43	335	1.30	NET< CL
69	477.60	721.29	-27N	25	42	325	1.34	NET< CL
70	487.04	735.57	27N	23	36	244	1.34	NET< CL
71	497.09	750.77	-27N	23	39	288	1.35	NET< CL
72	537.34	811.63	17N	21	35	222	1.38	NET< CL
73	604.73	913.53	169N	111	181	573	1.43	NET< CL
74	621.87	939.46	-35N	23	39	264	1.44	NET< CL
75	724.22	1094.24	-6912N	2320	3818	403	1.52	NET< CL
76	765.84	1157.18	25N	21	33	219	1.55	NET< CL
77	810.82	1225.20	-38N	18	31	187	1.58	NET< CL
78	834.77	1261.41	21N	19	31	189	1.60	NET< CL
79	884.62	1336.80	13N	19	31	175	1.64	NET< CL
80	1099.24	1661.37	-13N	18	30	163	1.79	NET< CL
81	1115.55	1686.03	41N	37	60	353	1.80	NET< CL
82	1332.50	2014.09	15N	14	23	90	1.95	NET< CL
83	1691.06	2556.22	-10N	11	18	63	2.20	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:09:02
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. . . . . 1.23E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 70000 Sec
Sample Size . . . . . 1.50E-01 kg | Real Time . . . . . 70027 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 1367104.spc
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Detector #: 4

Energy(keV)= 0.58 + 0.661*Ch + -1.23E-07*Ch^2 + -1.23E-07*Ch^3 05/16/2003

FWHM(keV) = 0.89 + 0.008*En + 5.93E-04*En^2 + 5.93E-04*En^3 02/24/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS004.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[2.12e-02*En^-2.69e+00 + 1.61e+02*En^ 8.72e-01] 02/09/1998

Library File: SOILA.LIB LSF File: L5348-14.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	5.60E+02	1.67E+01	< 3.82E+01	1.87E+01	9.99E-01	MEAS +	YES
Pb-214	4.11E+02	1.79E+01	< 6.06E+01	2.97E+01	1.00E+00	MEAS +	YES
Tl-208	4.79E+02	2.90E+01	< 9.78E+01	4.78E+01	1.00E+00	MEAS +	YES
Th-234	4.78E+02	2.02E+02	< 6.63E+02	3.30E+02	1.00E+00	MEAS +	YES
AcTh-228	5.33E+02	2.82E+01	< 1.26E+02	6.14E+01	1.00E+00	MEAS +	YES
Ce-141	8.48E+00	2.50E+01	< 8.35E+01	4.10E+01	3.33E-01	NET	YES
Ra-226	1.02E+03	1.90E+02	< 6.04E+02	2.98E+02	1.00E+00	MEAS +	YES
Annil	3.72E+01	1.40E+01	< 4.58E+01	2.25E+01	9.07E-01	MEAS +	YES
Bi-214	4.48E+02	2.34E+01	< 6.76E+01	3.30E+01	1.00E+00	MEAS +	YES
Cs-137	2.19E+01	9.32E+00	< 3.02E+01	1.46E+01	9.97E-01	MEAS +	YES
Bi-212	2.96E+02	8.70E+00	< 2.78E+02	1.36E+02	1.00E+00	MEAS +	YES
K-40	1.25E+04	2.82E+02	< 3.73E+02	1.79E+02	1.00E+00	MEAS +	YES
Am-241	3.56E+01	1.91E+01	< 6.27E+01	3.08E+01	1.00E+00	NET	YES
Co-57	2.90E-01	4.63E+00	< 1.55E+01	7.60E+00	8.76E-01	NET	YES
Ce-144	-2.58E+01	3.68E+01	< 1.24E+02	6.10E+01	8.82E-01	NET	YES
Se-75	-1.74E+01	9.10E+00	< 3.16E+01	1.54E+01	7.42E-01	NET	YES
Cr-51	-2.28E+01	1.73E+02	< 5.85E+02	2.85E+02	2.75E-01	NET	YES
I-131	-6.71E+02	5.12E+02	< 1.77E+03	8.62E+02	1.17E-02	NET	YES
Sb-125	-5.58E+00	1.88E+01	< 6.41E+01	3.11E+01	9.65E-01	NET	YES
Ag-108m	-4.23E+00	5.68E+00	< 1.95E+01	9.48E+00	9.99E-01	NET	YES
Be-7	-1.10E+02	1.02E+02	< 3.52E+02	1.71E+02	5.12E-01	NET	YES
La-140	2.15E+02	1.80E+02	< 5.99E+02	2.89E+02	6.10E-02	NET	YES
Ru-103	-1.69E+01	1.47E+01	< 5.12E+01	2.48E+01	4.03E-01	NET	YES
Ba-140	2.68E+02	3.39E+02	< 1.14E+03	5.47E+02	6.10E-02	NET	YES
Cs-134	4.83E+01	3.17E+01	< 1.04E+02	5.18E+01	9.54E-01	NET	YES
Ru-106	-1.06E+02	7.11E+01	< 2.50E+02	1.21E+02	9.07E-01	NET	YES
Zr-95	-8.62E+03	2.89E+03	< 9.53E+03	4.76E+03	5.72E-01	NET	YES
Nb-95	2.30E+01	1.90E+01	< 6.31E+01	3.03E+01	3.61E-01	NET	YES
Co-58	-2.19E+01	1.01E+01	< 3.69E+01	1.77E+01	6.03E-01	NET	YES
Mn-54	8.31E+00	7.67E+00	< 2.56E+01	1.23E+01	8.92E-01	NET	YES
Ag-110m	7.67E+00	1.12E+01	< 3.79E+01	1.82E+01	8.67E-01	NET	YES
Fe-59	-2.30E+01	3.13E+01	< 1.10E+02	5.26E+01	4.49E-01	NET	YES
Zn-65	4.25E+01	3.82E+01	< 1.26E+02	6.18E+01	8.64E-01	NET	YES

L5348-14 analyzed by emml461 on 05/16/2003
Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	8.11E+00	7.76E+00	< 2.61E+01	1.23E+01	9.82E-01	NET	YES
Sb-124	-2.41E+01	2.60E+01	< 9.57E+01	4.46E+01	5.52E-01	NET	YES

PERFORMED BY: *Luke R. Heston*

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-15 Count by Date: _____
(if required)
Client: Duratek Inc Delay Date: _____
(if required)
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-693 REF-X19584
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s) Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required)
Total Sample Weight: _____ g
(if required)
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g
Sample Geometry: _____

Work Group ID: WG5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required)
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 154.7 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/22/03 Det No.: 6 Spectrum No.: 1426606
Counted by: QW
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id : L5348-15 Product : GAMMA SPECTROMETRY
Client Id : BMA-E0200-693 Matrix : S001 Soil
Site : REF-X19584
Comments :
Client : 00435 Duratek Inc
Project : OTHER ENVIRON-DUR
Start Date :
Collect Date : 03/26/03 12:00

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	154.7		
Sample Weight-Dry	g			
Aliquot Weight	g	157.7		
FINAL WEIGHT	kg	.1577		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-15 analyzed by emml461 on 05/23/2003
 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-15

Sample ID: SOIL/SEDI Duratek Inc

Code: 1426606

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/22/2003 16:02:45
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.37E+003 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time: 50000 Sec
 Sample Size: 1.55E-001 kg | Real Time: 50034 Sec
 Collection Efficiency: 1.0000 | Spc. File: 1426606.spc

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)

Energy(keV) = $0.03 + 0.662 \cdot \text{Ch} + 0.00\text{E}+00 \cdot \text{Ch}^2 + 0.00\text{E}+00 \cdot \text{Ch}^3$ 05/22/2003

FWHM(keV) = $1.40 + -0.060 \cdot \text{En} + 3.59\text{E}-03 \cdot \text{En}^2 + -3.97\text{E}-05 \cdot \text{En}^3$ 03/04/2003

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.07	95.28	528	63	96	1563	1.09	
2	74.62	112.74	575	58	87	1392	1.26	a
3	76.93	116.24	774	54	76	1160	1.15	b
4	84.20	127.23	243	57	90	1396	1.54	a
5	87.03	131.51	337	47	70	998	1.15	b
6	89.72	135.58	260	52	80	1197	1.37	c
7	92.52	139.80	1648	64	80	1197	1.31	d
8	98.67	149.11	79	50	80	1197	1.24	e
9	112.38	169.83	-10	48	79	1143	0.18	NET< CL
10	128.79	194.63	29	41	67	893	0.45	NET< CL
11	139.71	211.14	79	34	55	662	0.96	a
12	143.63	217.06	185	41	64	828	1.01	b
13	163.31	246.82	79	49	79	1051	2.05	Wide Pk
14	185.62	280.54	939	60	85	1143	1.54	
15	197.05	297.81	123	62	101	1417	1.49	
16	205.31	310.30	66	36	58	686	1.00	a
17	209.16	316.12	147	37	58	686	1.01	b
18	238.44	360.38	1586	52	56	627	1.11	a
19	241.40	364.86	304	47	72	877	1.59	b
20	270.16	408.32	106	45	72	831	1.11	
21	277.88	420.00	-4	43	71	799	0.07	NET< CL
22	294.97	445.84	441	35	46	436	1.12	a
23	299.94	453.34	125	30	46	436	1.17	b
24	327.96	495.70	32	36	59	584	0.55	NET< CL
25	338.10	511.03	305	38	56	534	1.05	
26	351.71	531.60	808	47	61	592	1.41	
27	385.11	582.09	-31	38	63	579	1.06	NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
28	462.94	699.74	96	32	51	409	1.27	
29	510.84	772.14	1314	51	59	520	2.41	Wide Pk
30	558.10	843.58	59	29	45	325	1.18	
31	583.14	881.43	526	36	46	331	1.58	
32	609.05	920.59	609	41	54	429	1.55	
33	661.38	999.70	98	20	28	194	1.39	a MANUAL
34	726.94	1098.80	141	29	43	309	1.72	
35	766.26	1158.24	38	19	30	185	1.37	a
36	768.15	1161.10	50	17	26	154	1.02	b
37	785.88	1187.90	32	22	36	235	1.00	NET< CL
38	794.47	1200.88	94	23	35	226	1.64	a
39	803.00	1213.77	47	22	35	226	1.83	b
40	911.06	1377.12	377	31	40	260	1.86	
41	934.15	1412.02	36	23	37	233	1.50	NET< CL
42	968.88	1464.52	149	31	47	340	1.28	
43	1001.04	1513.14	56	25	40	258	1.01	
44	1119.81	1692.67	100	28	42	276	1.85	
45	1460.85	2208.18	4225	67	25	104	2.23	
46	1764.64	2667.39	153	17	19	57	2.23	
47	2102.76	3178.50	31	10	13	35	1.88	a
48	2105.55	3182.72	11	7	10	23	1.20	b
49	2614.58	3952.17	232	18	15	39	2.86	
50	661.61	1000.04	82	27	42	312	1.37	DELETED

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY06.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.07	528	63	96	-87	67	111	NET<CL
2	74.62	575	58	87	457	61	94	
3	76.93	774	54	76	683	56	82	
4	84.20	243	57	90	53	63	102	NET<CL
5	87.03	337	47	70	268	49	75	
6	89.72	260	52	80	177	55	87	
7	92.52	1648	64	80	183	69	111	
8	98.67	79	50	80	23	51	84	NET<CL
9	112.38	-10	48	79	-78	50	84	NET<CL
11	139.71	79	34	55	8	38	63	NET<CL
12	143.63	185	41	64	18	44	72	NET<CL
13	163.31	79	49	79	5	53	87	NET<CL
14	185.62	939	60	85	116	65	105	
15	197.05	123	62	101	47	63	104	NET<CL
16	205.31	66	36	58	52	41	66	NET<CL
18	238.44	1586	52	56	1340	55	67	
19	241.40	304	47	72	259	49	76	
20	270.16	106	45	72	69	47	77	NET<CL
21	277.88	-4	43	71	-31	46	77	NET<CL
22	294.97	441	35	47	338	39	57	
25	338.10	305	38	56	271	41	62	
26	351.71	808	47	61	675	49	69	
29	510.84	1315	51	59	143	56	90	
30	558.10	59	29	45	22	31	51	NET<CL
31	583.14	526	36	46	426	38	53	
32	609.05	609	41	54	484	44	62	
34	726.94	141	29	43	119	30	46	
35	766.26	38	19	30	-2	22	36	NET<CL
39	803.00	47	22	35	-4	24	40	NET<CL
40	911.06	377	31	40	317	32	45	
42	968.88	149	31	47	133	32	50	
43	1001.04	56	25	40	-19	27	46	NET<CL
44	1119.81	100	28	42	80	29	45	
45	1460.85	4225	67	25	4105	67	35	
46	1764.64	153	17	19	131	18	23	
49	2614.58	232	18	15	146	19	24	

 SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

 Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
 Minimum Score 0.65 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	74.62	457	Pb-212	292	5 of 6	100.00	1.50	
			Tl-208	15	5 of 9	90.39	0.90	
			Pb-214	125	5 of 7	98.65	0.99	
			Tl-208	27	5 of 9	90.39	0.90	
3	76.93	683	Pb-212	509	5 of 6	100.00	1.50	
			Tl-208	27	5 of 9	90.39	0.90	
			Pb-214	223	5 of 7	100.00	1.00	
5	87.03	268	Pb-212	282	5 of 6	100.00	1.50	
			Cd-109	. . . . .	1 of 1	100.00	1.50	
6	89.72	177	Cd-109	. . . . .	1 of 1	100.00	1.50	
7	92.52	60	Th-234	. . . . .	1 of 2	100.00	1.50	Split
53	92.52	123	AcTh-228	123	7 of 36	75.24	1.25	AutoAdd
14	185.62	116	U-235	. . . . .	1 of 3	100.00	1.50	
			Ra-226	. . . . .	1 of 1	100.00	1.50	
17	209.16	147	AcTh-228	143	7 of 36	79.87	1.30	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
18	238.44	1340	Pb-212	1796	5 of 6	100.00	1.00	
19	241.40	259	Pb-214	168	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
22	294.97	338	Pb-214	407	5 of 7	100.00	1.50	
23	299.94	125	Pb-212	93	5 of 6	100.00	1.50	
25	338.10	271	AcTh-228	266	7 of 36	79.87	1.30	
26	351.71	675	Pb-214	987	5 of 7	100.00	1.50	
28	462.94	96	AcTh-228	82	7 of 36	76.72	1.27	
			Sb-125	. . . . .	1 of 8	13.67	0.64	LowScore
29	510.84	28	Annul	. . . . .	1 of 1	100.00	1.50	Split
52	510.84	115	Tl-208	115	5 of 9	91.63	1.42	AutoAdd
31	583.14	426	Tl-208	381	5 of 9	91.63	1.42	
32	609.05	484	Bi-214	637	4 of 33	94.29	1.44	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
33	661.38	98	Cs-137	. . . . .	1 of 1	100.00	1.50	
34	726.94	119	Bi-212	. . . . .	1 of 13	100.00	1.00	
36	768.15	3	Pa-234	. . . . .	1 of 2	26.32	0.76	Split
51	768.15	47	Bi-214	47	4 of 33	84.55	1.35	AutoAdd
38	794.47	94	AcTh-228	56	7 of 36	75.24	1.25	
			Cs-134	. . . . .	1 of 9	46.67	0.47	LowScore
40	911.06	317	AcTh-228	312	7 of 36	79.87	1.30	
42	968.88	133	AcTh-228	189	7 of 36	88.32	1.38	
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
44	1119.81	80	Bi-214	110	4 of 33	100.00	1.50	
45	1460.85	4105	K-40	. . . . .	1 of 1	100.00	1.50	
46	1764.64	131	Bi-214	75	4 of 33	76.04	1.26	
47	2102.76	31	2615SEsc	. . . . .	0 of 0	. . .	0.65	
48	2105.55	11	2615SEsc	. . . . .	0 of 0	. . .	0.65	
49	2614.58	146	Tl-208	168	5 of 9	94.42	1.44	

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-15

Sample ID: SOIL/SEDI Duratek Inc

Code: 1426606

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/22/2003 16:02:45
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.37e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 50000 Sec
 Sample Size 1.55e-001 kg | Real Time 50034 Sec
 Collection Efficiency 1.0000 | Spectrum File 1426606.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 6 (Canberra SN 6953542 Inst-1 det#6)
 Efficiency File: WT1SS006.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)
 Eff.=1/[4.58E-03*En^-3.34E+00 + 1.01E+02*En^7.37E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-15.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS
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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Pb-212	Average:x	3.76E+02 +- 1.52E+01		*
	74.81	I.D.	. . . .			. . . . .
	77.12	I.D.	. . . .			. . . . .
	87.30	I.D.	. . . .			. . . . .
	238.63	3.74E+02 +- 1.53E+01	3.83E+01		++	. . . . .
	300.09	5.34E+02 +- 1.30E+02	4.10E+02		++	. . . . .
Cd-109	88.03	I.D.	. . . .			. . . . .
Th-234	92.59	1.17E+02 +- 2.33E+02	7.72E+02		+	. . . . .
Ce-141	145.44	1.21E+01 +- 2.95E+01	9.85E+01		x	. . . . .
U-235	185.72	2.28E+01 +- 1.28E+01	4.19E+01		+	. . . . .
AcTh-228	Average:x	3.70E+02 +- 2.68E+01	. . . .		*	. . . . .
	209.28	3.83E+02 +- 9.74E+01	3.10E+02		++	. . . . .
	338.32	3.78E+02 +- 5.78E+01	1.78E+02		++	. . . . .
	463.00	4.35E+02 +- 1.47E+02	4.75E+02		+	. . . . .
	794.70	6.07E+02 +- 1.51E+02	4.70E+02		++	. . . . .
	911.07	3.76E+02 +- 3.86E+01	1.09E+02		++	. . . . .
	969.11	2.75E+02 +- 6.70E+01	2.12E+02		++	. . . . .
	93.35	I.D.	. . . .			. . . . .
Pb-214	Average:x	2.89E+02 +- 1.71E+01	. . . .		*	. . . . .
	241.98	4.35E+02 +- 8.18E+01	2.59E+02		++	. . . . .
	295.21	2.54E+02 +- 2.94E+01	8.73E+01		++	. . . . .
	351.92	2.97E+02 +- 2.17E+01	6.20E+01		++	. . . . .
Annul	511.00	6.76E+00 +- 2.32E+01	7.70E+01		+	. . . . .
Tl-208	Average:x	3.18E+02 +- 2.35E+01	. . . .		*	. . . . .
	583.14	3.34E+02 +- 2.99E+01	8.51E+01		++	. . . . .
	2614.66	2.93E+02 +- 3.80E+01	1.02E+02		++	. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
	510.84	I.D.				
Bi-214	Average:	2.73E+02 +- 2.04E+01		*		
	609.31	2.56E+02 +- 2.30E+01	6.67E+01	+		
	768.36	2.73E+02 +- 1.43E+02	4.67E+02	+		
	1120.29	2.02E+02 +- 7.24E+01	2.33E+02	+		
	1764.49	4.43E+02 +- 6.08E+01	1.63E+02	+		
Cs-137	661.65	3.00E+01 +- 6.11E+00	1.83E+01	+		
Bi-212	727.17	2.82E+02 +- 7.16E+01	2.26E+02	+		
Nb-95	765.79	N-1.77E+00 +- 1.99E+01	6.81E+01	x		
Pa-234	766.40	2.58E+02 +- 2.92E+03	9.86E+03	+		
K-40	1460.81	1.79E+04 +- 2.94E+02	3.13E+02	+		
Am-241	59.54	N 5.56E+00 +- 2.86E+01	9.56E+01	x	lbase	
Co-57	122.06	N 1.82E+00 +- 4.95E+00	1.66E+01	x		
Ce-144	133.54	N-4.71E+01 +- 3.87E+01	1.32E+02	x		
Ra-226	186.22	N 2.90E+03 +- 1.54E+02	4.02E+02	x*		
Se-75	264.65	N-7.79E+00 +- 1.09E+01	3.72E+01	x	lbase	
Cr-51	320.08	N 2.62E+02 +- 2.03E+02	6.71E+02	x		
I-131	364.48	N-2.64E+02 +- 8.17E+02	2.78E+03	x		
Sb-125	427.89	N-3.85E+00 +- 1.85E+01	6.29E+01	x		
Ag-108m	433.93	N 0.00E+00 +- 5.46E+00	1.85E+01	x		
Be-7	477.59	N-2.07E+01 +- 1.00E+02	3.42E+02	x		
La-140	487.03	N 2.46E+02 +- 2.32E+02	7.74E+02	x		
Ru-103	497.08	N 1.60E+01 +- 1.81E+01	6.05E+01	x		
Ba-140	537.32	N 9.39E+02 +- 5.32E+02	1.74E+03	x		
Cs-134	604.70	N-4.66E+00 +- 2.65E+01	8.79E+01	x	PIC	
Ru-106	621.84	N-1.41E+00 +- 7.00E+01	2.38E+02	x		
Zr-95	724.18	N-5.80E+01 +- 3.90E+01	1.37E+02	x	LHROI	
Co-58	810.76	N-1.71E+01 +- 1.14E+01	4.04E+01	x		
Mn-54	834.83	N 9.82E+00 +- 7.98E+00	2.65E+01	x		
Ag-110m	884.67	N-5.20E-01 +- 1.07E+01	3.67E+01	x		
Fe-59	1099.22	N 2.73E+01 +- 3.51E+01	1.18E+02	x		
Zn-65	1115.52	N-3.04E+01 +- 3.28E+01	1.12E+02	x	PIC	
Co-60	1332.49	N 1.51E+01 +- 8.00E+00	2.61E+01	x	Y.	
Sb-124	1691.02	N 1.85E+01 +- 2.02E+01	6.89E+01	x		

MEASURED TOTAL: 2.32E+04 +- 3.82E+03 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.07	95.28	-87	67	111	1563	1.09	Deleted
4	84.20	127.23	53	63	102	1397	1.54	Deleted
8	98.67	149.11	23	51	84	1197	1.24	Deleted
9	112.38	169.83	-78	50	84	1143	0.18	Deleted
10	128.79	194.63	29	41	67	893	0.45	Deleted
11	139.71	211.14	8	38	63	662	0.96	Deleted
13	163.31	246.82	5	53	87	1051	2.05	Deleted
15	197.05	297.81	47	63	104	1417	1.49	Deleted
16	205.31	310.30	52	41	66	686	1.00	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
20	270.16	408.32	69	47	77	831	1.11	Deleted
21	277.88	420.00	-31	46	77	799	0.07	Deleted
24	327.96	495.70	32	36	59	585	0.55	Deleted
27	385.11	582.09	-31	38	63	579	1.06	Deleted
30	558.10	843.58	22	31	51	325	1.18	Deleted
37	785.88	1187.90	32	22	36	235	1.00	Deleted
39	803.00	1213.77	-4	24	40	226	1.83	Deleted
41	934.15	1412.02	36	23	37	233	1.50	Deleted
43	1001.04	1513.14	-19	27	46	258	1.01	Deleted
47	2102.76	3178.50	31	10	13	35	1.88	2615SEsc
48	2105.55	3182.72	11	7	10	23	1.20	2615SEsc
50	661.61	1000.04	82	27	42	312	1.37	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	143.63	217.06	18N	44	72	828	1.01	b NET< CL
35	766.26	1158.24	-2N	22	36	185	1.37	a NET< CL
54	59.54	89.95	8N	43	70	997	1.13	NET< CL
								LBase
55	122.06	184.46	15N	39	65	843	1.12	NET< CL
56	133.54	201.81	-48N	39	65	858	1.13	NET< CL
57	186.22	281.44	894N	47	60	738	1.15	
58	264.65	400.00	-25N	35	58	627	1.21	NET< CL
								LBase
59	320.08	483.79	40N	31	50	459	1.25	NET< CL
60	364.48	550.90	-9N	28	46	394	1.29	NET< CL
61	427.89	646.75	-6N	28	46	328	1.35	NET< CL
62	433.93	655.88	0N	26	42	330	1.36	NET< CL
63	477.59	721.88	-5N	24	40	296	1.40	NET< CL
64	487.03	736.15	24N	23	36	245	1.40	NET< CL
65	497.08	751.34	25N	28	45	347	1.41	NET< CL
66	537.32	812.17	47N	26	42	250	1.45	
67	604.70	914.02	-18N	101	166	718	1.51	NET< CL
								PIC
68	621.84	939.93	-1N	25	41	284	1.53	NET< CL
69	724.18	1094.63	-49N	33	57	295	1.62	NET< CL
								LHRoi
70	810.76	1225.50	-32N	21	36	246	1.70	NET< CL
71	834.83	1261.89	28N	23	36	245	1.72	NET< CL
72	884.67	1337.23	-1N	21	34	213	1.76	NET< CL
73	1099.22	1661.54	17N	21	35	209	1.92	NET< CL
74	1115.52	1686.18	-34N	37	62	408	1.93	NET< CL
								PIC
75	1332.49	2014.15	34N	18	28	145	2.08	
76	1691.02	2556.11	9N	10	15	44	2.26	NET< CL

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

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Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/22/2003 16:02:45
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. . . . . 1.37E+03 Hrs
Buildup Time. . . . . 0.00E+00 Hrs | Live Time . . . . . 50000 Sec
Sample Size . . . . . 1.55E-01 kg | Real Time . . . . . 50034 Sec
Collection Efficiency . . . . 1.0000 | Spectrum File . . . . . 1426606.spc
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Detector #: 6

Energy(keV)= 0.03 + 0.662*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/22/2003

FWHM(keV) = 1.40 + -0.060*En + 3.59E-03*En^2 + 3.59E-03*En^3 03/04/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS006.EFF (Sand in 4 oz Poly Jar: 1.6 g/cc)

Eff.=1/[4.58e-03*En^-3.34e+00 + 1.01e+02*En^ 7.37e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-15.LSF

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Pb-212	3.76E+02	1.52E+01	< 3.83E+01	1.88E+01	1.00E+00	MEAS +	YES
Th-234	1.17E+02	2.34E+02	< 7.72E+02	3.83E+02	1.00E+00	MEAS +	YES
Ce-141	1.21E+01	2.95E+01	< 9.85E+01	4.84E+01	2.94E-01	NET	YES
U-235	2.28E+01	1.28E+01	< 4.19E+01	2.07E+01	1.00E+00	MEAS +	YES
AcTh-228	3.70E+02	2.68E+01	< 1.09E+02	5.30E+01	9.99E-01	MEAS +	YES
Pb-214	2.89E+02	1.71E+01	< 6.20E+01	3.04E+01	1.00E+00	MEAS +	YES
Annil	6.76E+00	2.32E+01	< 7.70E+01	3.82E+01	8.97E-01	MEAS +	YES
Tl-208	3.18E+02	2.35E+01	< 8.51E+01	4.15E+01	9.99E-01	MEAS +	YES
Bi-214	2.73E+02	2.04E+01	< 6.67E+01	3.27E+01	1.00E+00	MEAS +	YES
Cs-137	3.00E+01	6.11E+00	< 1.83E+01	8.73E+00	9.96E-01	MEAS +	YES
Bi-212	2.82E+02	7.16E+01	< 2.26E+02	1.10E+02	9.99E-01	MEAS +	YES
Nb-95	-1.77E+00	1.99E+01	< 6.81E+01	3.28E+01	3.21E-01	NET	YES
Pa-234	2.58E+02	2.92E+03	< 9.86E+03	4.80E+03	1.00E+00	MEAS +	YES
K-40	1.79E+04	2.94E+02	< 3.13E+02	1.51E+02	1.00E+00	MEAS +	YES
Am-241	5.56E+00	2.86E+01	< 9.56E+01	4.69E+01	1.00E+00	NET	YES
Co-57	1.82E+00	4.95E+00	< 1.66E+01	8.11E+00	8.63E-01	NET	YES
Ce-144	-4.71E+01	3.87E+01	< 1.32E+02	6.47E+01	8.69E-01	NET	YES
Ra-226	2.90E+03	1.54E+02	< 4.02E+02	1.96E+02	1.00E+00	NET	YES
Se-75	-7.79E+00	1.09E+01	< 3.72E+01	1.82E+01	7.17E-01	NET	YES
Cr-51	2.62E+02	2.03E+02	< 6.70E+02	3.26E+02	2.38E-01	NET	YES
I-131	-2.64E+02	8.17E+02	< 2.78E+03	1.35E+03	7.07E-03	NET	YES
Sb-125	-3.85E+00	1.85E+01	< 6.28E+01	3.05E+01	9.61E-01	NET	YES
Ag-108m	0.00E+00	5.46E+00	< 1.85E+01	8.98E+00	9.99E-01	NET	YES
Be-7	-2.07E+01	1.00E+02	< 3.42E+02	1.66E+02	4.75E-01	NET	YES
La-140	2.46E+02	2.32E+02	< 7.74E+02	3.73E+02	4.44E-02	NET	YES
Ru-103	1.60E+01	1.81E+01	< 6.05E+01	2.94E+01	3.63E-01	NET	YES
Ba-140	9.39E+02	5.32E+02	< 1.74E+03	8.45E+02	4.44E-02	NET	YES
Cs-134	-4.66E+00	2.65E+01	< 8.79E+01	4.36E+01	9.48E-01	NET	YES
Ru-106	-1.41E+00	7.00E+01	< 2.38E+02	1.15E+02	8.97E-01	NET	YES
Zr-95	-5.80E+01	3.90E+01	< 1.37E+02	6.69E+01	5.37E-01	NET	YES
Co-58	-1.71E+01	1.14E+01	< 4.03E+01	1.95E+01	5.70E-01	NET	YES
Mn-54	9.82E+00	7.98E+00	< 2.65E+01	1.28E+01	8.80E-01	NET	YES
Ag-110m	-5.20E-01	1.07E+01	< 3.67E+01	1.77E+01	8.53E-01	NET	YES

L5348-15 analyzed by emml461 on 05/23/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Fe-59	2.73E+01	3.51E+01	< 1.18E+02	5.66E+01	4.10E-01	NET	YES
Zn-65	-3.04E+01	3.28E+01	< 1.12E+02	5.46E+01	8.50E-01	NET	YES
Co-60	1.51E+01	8.00E+00	< 2.61E+01	1.24E+01	9.79E-01	NET	YES
Sb-124	1.85E+01	2.02E+01	< 6.89E+01	3.17E+01	5.16E-01	NET	YES

PERFORMED BY: _____

REVIEWED BY: _____

GAMMA SPECTROMETRY ANALYSIS WORKSHEET

CLIENT INFORMATION

Lab Sample Number: L5348-16 Count by Date: _____
(if required) _____
Client: Duratek Inc Delay Date: _____
(if required) _____
Project: OTHER ENVIRON-DUR
Sample Matrix: Soil
Sample Description: BMA-E0200-726 REF-X19585
Collect Start Date/Time: _____
Collect Stop Date/Time: 03-26-03 12:00
Product: GAMMA SPECTROMETRY
Required MDC(s): Cs-137,1100; Co-60, 38

CHEMISTRY INFORMATION

Liquid Data

Density: _____ g/mL
(if required) _____
Total Sample Weight: _____ g
(if required) _____
Aliquot Weight: _____ g

Vegetation/Dried Aquatic Animals Data

Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: _____ g

Sample Geometry: _____

Work Group ID: WG5268

Solid/Sediment/Soil

Total Sample Weight: _____ g
(if required) _____
Wet Weight: _____ g
Dry Weight: _____ g
Aliquot Weight: 152.1 g

Filter/Smear Data

Volume: _____
Units: _____

Run ID: R9226

COUNTING INFORMATION

Gamma Spectrometry Counting

Count Date/Time: 5/16/03 1705 Det No.: 2 Spectrum No.: 1367102
Counted by: GH
Recount Date/Time: _____ Det No.: _____ Spectrum No.: _____
Counted by: _____

Framatome ANP
Results Data Report

Required MDC(s): Co-60,38;Cs-137,1100;

Sample Id	: L5348-16	Product	: GAMMA SPECTROMETRY
Client Id	: BMA-E0200-726	Matrix	: S001 Soil
Site	: REF-X19585		
Comments	:		
Client	: 00435 Duratek Inc		
Project	: OTHER ENVIRON-DUR		
Start Date	:		
Collect Date	: 03/26/03 12:00		

Parameter	Units	Numvalue	Textvalue	Datevalue
Sample Weight	g	152.1		
Sample Weight-Dry	g			
Aliquot Weight	g	152.1		
FINAL WEIGHT	kg	.1521		
Container			WT1S	
LIBRARY			SOILA.LIB	
BACKGROUND			EMPTY	
ACTIVITY UNITS	pCi			

L5348-16 analyzed by emml461 on 05/16/2003

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.7.9.

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-16

Sample ID: SOIL/SEDI Duratek Inc

Code: 1367102

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:05:40
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.23E+003 Hrs
 Buildup Time: 0.00E+000 Hrs | Live Time 70000 Sec
 Sample Size 1.52E-001 kg | Real Time 70027 Sec
 Collection Efficiency 1.0000 | Spc. File 1367102.spc

Detector #: 2 (Canberra sn 9923043 det# 2)
 Energy(keV)= 1.01 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/16/2003
 FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 0.00E+00*En^3 02/18/2003
 Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 1.00 | Search Start/End: 75/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	60.38	89.87	41	36	58	827	0.54	a NET< CL
2	63.09	93.97	522	49	71	1103	0.96	b
3	74.66	111.49	815	66	98	1786	1.24	a
4	76.91	114.89	1032	61	86	1488	1.01	b
5	83.99	125.61	129	39	61	923	0.56	a
6	87.06	130.26	248	48	75	1231	0.89	b
7	92.41	138.36	418	62	96	1717	1.31	a HiResid
8	98.71	147.90	0	66	108	2003	1.57	b NET< CL HiResid Wide Pk
9	104.83	157.16	22	51	84	1431	1.04	c NET< CL HiResid
10	128.62	193.16	50	51	83	1270	0.57	NET< CL
11	139.79	210.07	89	43	69	952	1.14	a
12	143.70	216.00	111	31	48	572	0.64	b
13	148.59	223.40	79	31	48	572	0.58	c
14	153.95	231.51	86	31	48	572	0.61	d
15	185.72	279.60	710	62	92	1332	1.38	
16	196.85	296.45	85	35	55	674	0.80	a
17	198.25	298.57	109	41	65	842	1.13	b
18	205.30	309.24	55	27	43	464	0.60	a
19	209.14	315.06	156	40	62	772	1.06	b
20	238.45	359.42	1708	55	59	712	1.08	a
21	241.37	363.85	372	55	85	1139	1.65	b
22	258.66	390.01	31	39	64	747	0.62	NET< CL
23	270.08	407.30	195	51	82	982	1.91	a Wide Pk
24	277.00	417.78	107	38	60	655	1.36	b

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	293.56	442.85	16	81	132	1692	3.67	a NET< CL Wide Pk
26	295.02	445.06	525	45	64	696	1.41	b
27	328.00	494.98	60	42	69	747	0.97	NET< CL
28	338.09	510.26	422	44	64	659	1.69	
29	351.78	530.98	824	46	59	586	1.27	
30	462.91	699.20	94	33	53	440	1.11	
31	510.76	771.63	1456	54	63	545	2.60	Wide Pk
32	562.15	849.42	-18	31	51	412	0.96	NET< CL
33	582.90	880.84	638	40	51	384	1.61	
34	609.16	920.59	677	40	50	395	1.67	
35	661.51	999.83	38	28	45	321	0.92	NET< CL
36	727.19	1099.26	106	28	43	322	1.87	
37	794.13	1200.58	40	27	44	318	0.84	NET< CL
38	802.86	1213.81	52	22	33	220	1.03	
39	860.01	1300.31	50	29	45	339	1.35	
40	911.04	1377.55	352	32	43	308	1.79	
41	964.55	1458.57	68	21	31	191	1.46	a
42	968.95	1465.22	232	24	31	191	1.57	b
43	994.59	1504.04	6	24	39	252	0.58	NET< CL
44	1120.26	1694.26	110	28	42	292	1.16	
45	1302.47	1970.09	4	24	39	224	0.20	NET< CL
46	1377.91	2084.28	20	16	26	121	0.96	NET< CL
47	1460.74	2209.68	4372	68	26	110	2.13	
48	1631.14	2467.62	21	15	24	88	1.03	NET< CL
49	1764.85	2670.02	109	17	22	79	2.66	
50	2614.37	3955.98	256	18	14	31	3.00	

L5348-16 analyzed by emml461 on 05/16/2003

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

Background File: EMPTY02.BKG (BKG Framatome ANP)

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	63.09	522	49	71	164	57	91	
3	74.66	815	66	98	617	71	109	
4	76.91	1032	61	86	842	64	95	
5	83.99	129	39	61	15	45	75	NET<CL
6	87.06	248	48	75	126	52	84	
7	92.41	418	62	96	-559	69	119	NET<CL
8	98.71	0	66	108	-49	69	114	NET<CL
11	139.79	89	43	69	53	45	73	NET<CL
12	143.70	111	31	48	13	37	61	NET<CL
14	153.95	86	31	48	42	41	66	NET<CL
15	185.72	710	62	92	238	68	110	
16	196.85	85	35	55	-101	44	74	NET<CL
20	238.45	1708	55	59	1342	58	75	
21	241.37	372	55	85	300	59	93	
23	270.08	195	51	82	175	55	88	
25	293.56	16	81	132	-128	83	138	NET<CL
28	338.09	422	44	64	367	48	73	
29	351.78	824	46	59	590	50	71	
31	510.76	1456	54	63	226	61	97	
33	582.90	638	40	51	535	43	60	
34	609.16	677	40	50	520	44	61	
36	727.19	106	28	43	88	30	46	
37	794.13	40	27	44	16	29	48	NET<CL
38	802.86	53	22	33	20	26	42	NET<CL
40	911.04	352	32	43	267	35	50	
42	968.95	232	24	31	191	27	38	
44	1120.26	110	28	42	63	30	47	
47	1460.74	4372	68	26	4246	69	36	
49	1764.85	109	17	22	59	19	28	
50	2614.37	256	18	14	161	20	25	

L5348-16 analyzed by emml461 on 05/16/2003

SEEKER LIBRARY SEARCH RESULTS Version 1.9.2

Environmental Laboratory
Environmental Gamma Isotopic Analysis

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))

Library Match Resolution. . . . 2.00 | Decay Limit (Halflives) 8.0
Minimum Score 0.50 | Decay Correction. ON

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LIBRARY SEARCH RESULTS

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Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
2	63.09	164	Th-234	. . . . .	1 of 2	41.26	0.91	
3	74.66	617	Tl-208	47	7 of 9	98.64	0.99	
			Tl-208	27	7 of 9	98.64	0.99	
			Pb-214	229	5 of 7	97.33	0.97	
			Pb-212	379	4 of 6	95.97	0.96	
4	76.91	842	Pb-214	306	5 of 7	100.00	1.00	
			Tl-208	47	7 of 9	98.64	0.99	
			Pb-212	628	4 of 6	95.97	0.96	
6	87.06	126	Cd-109	. . . . .	1 of 1	100.00	1.50	
			Pb-212	331	4 of 6	100.00	1.00	
13	148.59	79	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
15	185.72	238	Ra-226	. . . . .	1 of 1	100.00	1.50	
			U-235	. . . . .	1 of 3	100.00	1.00	
17	198.25	109	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
18	205.30	55	Unknown	. . . . .	. . . . .	. . . . .	. . . . .
19	209.14	156	AcTh-228	163	7 of 36	79.24	1.29	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
20	238.45	1342	Pb-212	1905	4 of 6	95.97	0.96	
21	241.37	300	Pb-214	238	5 of 7	100.00	1.50	
			La-140	. . . . .	1 of 15	0.40	0.00	LowScore
23	270.08	175	AcTh-228	109	7 of 36	75.16	1.25	
24	277.00	107	Tl-208	74	7 of 9	100.00	1.50	
			Ba-133	. . . . .	1 of 5	5.46	0.55	
			Np-239	. . . . .	0 of 0	. . . . .	0.00	Decay
26	295.02	525	Pb-214	364	5 of 7	100.00	1.00	
28	338.09	367	AcTh-228	276	7 of 36	75.97	1.26	
29	351.78	590	Pb-214	911	5 of 7	100.00	1.00	
30	462.91	6	Sb-125	. . . . .	1 of 8	13.67	0.64	Split
52	462.91	88	AcTh-228	88	7 of 36	77.46	1.27	AutoAdd
31	510.76	80	Annul	. . . . .	1 of 1	100.00	1.50	Split
51	510.76	145	Tl-208	145	7 of 9	100.00	1.50	AutoAdd
33	582.90	535	Tl-208	489	7 of 9	100.00	1.50	
34	609.16	520	Bi-214	366	3 of 33	84.53	1.35	
			Ru-103	. . . . .	1 of 2	5.92	0.06	LowScore
36	727.19	88	Bi-212	. . . . .	1 of 13	100.00	1.00	
39	860.01	50	Tl-208	56	7 of 9	100.00	1.50	
40	911.04	267	AcTh-228	362	7 of 36	83.87	1.34	
41	964.55	68	AcTh-228	57	7 of 36	77.46	1.27	
42	968.95	191	AcTh-228	181	7 of 36	79.24	1.29	

LIBRARY SEARCH RESULTS

Pk. No.	Energy (keV)	Net Counts	Nuclide	Expected Net Counts	Peaks Found	% Abn. Found	SCORE	FLAG
			Sb-124	. . . . .	1 of 13	1.04	0.01	LowScore
44	1120.26	63	Bi-214	101	3 of 33	100.00	1.50	
47	1460.74	4246	K-40	. . . . .	1 of 1	100.00	1.50	
49	1764.85	59	Bi-214	73	3 of 33	93.87	1.44	
50	2614.37	161	Tl-208	193	7 of 9	100.00	1.50	

L5348-16 analyzed by emml461 on 05/16/2003

 SEEKER FINAL ACTIVITY REPORT Version 1.9.2

Environmental Laboratory
 Environmental Gamma Isotopic Analysis

LSN: L5348-16

Sample ID: SOIL/SEDI Duratek Inc

Code: 1367102

 Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:05:40
 Sampling Stop: 03/26/2003 12:00:00 | Decay Time: 1.23e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 70000 Sec
 Sample Size 1.52e-001 kg | Real Time 70027 Sec
 Collection Efficiency 1.0000 | Spectrum File 1367102.spc
 Type I | Type I & II
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 2 (Canberra sn 9923043 det# 2)
 Efficiency File: WT1SS002.EFF (Sand in a 4 oz. Jar: 1.6 g/cc)
 Eff.=1/[1.49E-02*En^-2.83E+00 + 1.39E+02*En^8.08E-01] 02/06/1998

Library File: SOILA.LIB (Soil/Sediment Library (Kocher 04/08/94))
 LSF File: L5348-16.LSF (SOIL/SEDI: Duratek Inc)
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MEASURED or MDA CONCENTRATIONS
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Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Th-234	63.29	5.65E+02 +- 1.96E+02	6.37E+02		+
Tl-208	Average:x	3.85E+02 +- 2.55E+01	. . . . .		*	. . . . .
	74.97	I.D. . . . .	. . . . .			. . . . .
	277.35	5.59E+02 +- 1.96E+02	6.33E+02		+	. . . . .
	510.84	I.D. . . . .	. . . . .			. . . . .
	583.14	4.05E+02 +- 3.28E+01	9.32E+01		+	. . . . .
	860.37	3.51E+02 +- 1.99E+02	6.54E+02		+	. . . . .
	2614.66	3.46E+02 +- 4.25E+01	1.13E+02		+	. . . . .
Pb-214	Average:x	2.85E+02 +- 1.68E+01	. . . . .		*	. . . . .
	77.11	I.D. . . . .	. . . . .			. . . . .
	241.98	4.58E+02 +- 9.06E+01	2.89E+02		+	. . . . .
	295.21	3.64E+02 +- 3.13E+01	9.05E+01		+	. . . . .
	351.92	2.42E+02 +- 2.04E+01	5.98E+01		+	. . . . .
Cd-109	88.03	I.D. . . . .	. . . . .			. . . . .
Ce-141	145.44	6.67E+00 +- 1.92E+01	6.42E+01		x	. . . . .
Ra-226	186.22	6.90E+02 +- 1.99E+02	6.45E+02		+	. . . . .
AcTh-228	Average:x	3.80E+02 +- 2.68E+01	. . . . .		*	. . . . .
	209.28	3.65E+02 +- 9.29E+01	2.96E+02		+	. . . . .
	270.23	6.04E+02 +- 1.91E+02	6.19E+02		+	. . . . .
	338.32	4.77E+02 +- 6.25E+01	1.92E+02		+	. . . . .
	463.00	3.80E+02 +- 2.06E+02	6.77E+02		+	. . . . .
	911.07	3.16E+02 +- 4.09E+01	1.22E+02		+	. . . . .
	964.60	4.46E+02 +- 1.36E+02	4.29E+02		+	. . . . .
	969.11	3.97E+02 +- 5.61E+01	1.64E+02		+	. . . . .
Pb-212	238.63	3.41E+02 +- 1.49E+01	3.88E+01		+	. . . . .
Sb-125	Average:x	5.82E+00 +- 1.73E+01	. . . . .			. . . . .

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/kg)	MDA	Flags	Notes	MDC
Annul	463.38	1.16E+01 +- 1.11E+02	3.70E+02	MDL ✓	⊕ AC	. . . . .
	427.89 N	5.67E+00 +- 1.75E+01	5.89E+01		x	. . . . .
Bi-214	511.00	1.82E+01 +- 2.40E+01	7.94E+01		+	. . . . .
	Average:x	2.53E+02 +- 2.04E+01	. . . . .		*	. . . . .
	609.31	2.66E+02 +- 2.23E+01	6.40E+01		++	. . . . .
	1120.29	1.62E+02 +- 7.64E+01	2.49E+02		+	. . . . .
	1764.49	2.07E+02 +- 6.70E+01	2.11E+02		++	. . . . .
Bi-212	727.17	2.04E+02 +- 6.87E+01	2.21E+02		+	. . . . .
K-40	1460.81	1.91E+04 +- 3.09E+02	3.35E+02		++	. . . . .
Am-241	59.54 N	6.49E+01 +- 1.97E+01	6.35E+011		x* lbase	. . . . .
Co-57	122.06 N	8.01E+00 +- 4.53E+00	1.55E+01		x	. . . . .
Ce-144	133.54 N	1.72E+01 +- 3.62E+01	1.22E+02		x	. . . . .
Se-75	264.65 N	1.71E+01 +- 1.05E+01	3.59E+011		x lbase	. . . . .
Cr-51	320.08 N	3.15E+01 +- 1.73E+02	5.84E+02		x	. . . . .
I-131	364.48 N	9.93E+01 +- 5.08E+02	1.71E+03		x	. . . . .
Ag-108m	433.93 N	6.83E+00 +- 5.45E+00	1.89E+01		x	. . . . .
Be-7	477.59 N	1.61E+02 +- 9.44E+01	3.10E+02		x	. . . . .
La-140	487.03 N	2.71E+02 +- 1.86E+02	6.13E+02		x	. . . . .
Ru-103	497.08 N	1.68E+00 +- 1.38E+01	4.71E+01		x	. . . . .
Ba-140	537.32 N	4.68E+01 +- 3.87E+02	1.32E+03		x	. . . . .
Cs-134	604.70 N	9.41E+00 +- 7.49E+00	2.58E+011		x lbase	. . . . .
Ru-106	621.84 N	4.52E-01 +- 6.77E+01	2.30E+02		x	. . . . .
Cs-137	661.65 N	1.92E+01 +- 7.54E+00	2.43E+01		x Y.	. . . . .
Zr-95	724.18 N	3.27E+01 +- 3.69E+01	1.28E+02L		x LHROI	. . . . .
Nb-95	765.79 N	2.17E+01 +- 2.00E+01	6.94E+01		x	. . . . .
Co-58	810.76 N	1.31E+01 +- 9.81E+00	3.47E+01		x	. . . . .
Mn-54	834.83 N	6.17E+00 +- 8.14E+00	2.73E+01		x	. . . . .
Ag-110m	884.67 N	1.02E+00 +- 1.15E+01	3.94E+01		x	. . . . .
Fe-59	1099.22 N	2.71E+01 +- 3.24E+01	1.09E+02		x	. . . . .
Zn-65	1115.52 N	1.82E+01 +- 3.66E+01	1.22E+02P		x PIC	. . . . .
Co-60	1332.49 N	2.16E+00 +- 8.07E+00	2.80E+01		x Y.	. . . . .
Sb-124	1691.02 N	3.40E+01 +- 2.09E+01	6.84E+01		x	. . . . .

MEASURED TOTAL: 2.23E+04 +- 9.38E+02 pCi/kg 0.00E+00

NOTE: *: N/S>3 #: Net<-3R

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	60.38	89.87	41	36	58	827	0.54	Deleted
5	83.99	125.61	15	45	75	924	0.56	Deleted
7	92.41	138.36	-559	69	119	1717	1.31	Deleted
8	98.71	147.90	-49	69	114	2003	1.57	Deleted
9	104.83	157.16	22	51	84	1431	1.04	Deleted
10	128.62	193.16	50	51	83	1270	0.57	Deleted
11	139.79	210.07	53	45	73	953	1.14	Deleted
13	148.59	223.40	79	31	48	572	0.58	Unknown
14	153.95	231.51	42	41	66	572	0.61	Deleted
16	196.85	296.45	-101	44	74	674	0.80	Deleted
17	198.25	298.57	109	41	65	843	1.13	Unknown

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
18	205.30	309.24	55	27	43	464	0.60	Unknown
22	258.66	390.01	31	39	64	747	0.62	Deleted
25	293.56	442.85	-128	83	138	1692	3.67	Deleted
27	328.00	494.98	60	42	69	747	0.97	Deleted
32	562.15	849.42	-18	31	51	412	0.96	Deleted
35	661.51	999.83	38	28	45	321	0.92	Deleted
37	794.13	1200.58	16	29	48	318	0.84	Deleted
38	802.86	1213.81	20	26	42	221	1.03	Deleted
43	994.59	1504.04	6	24	39	253	0.58	Deleted
45	1302.47	1970.09	5	24	39	224	0.20	Deleted
46	1377.91	2084.28	20	16	26	121	0.96	Deleted
48	1631.14	2467.62	21	15	24	88	1.03	Deleted

NET/MDA PEAK RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	143.70	216.00	13N	37	61	572	0.64	b NET< CL
53	59.54	88.60	159N	48	77	1180	1.08	LBase
54	122.06	183.24	-76N	43	72	1046	1.13	NET< CL
55	133.54	200.62	-20N	43	71	1003	1.14	NET< CL
56	264.65	399.09	-62N	38	64	751	1.23	NET< CL
								LBase
57	320.08	482.99	-6N	33	54	544	1.27	NET< CL
58	364.48	550.20	6N	31	50	469	1.30	NET< CL
59	427.89	646.19	9N	28	45	380	1.35	NET< CL
60	433.93	655.33	-34N	27	46	385	1.35	NET< CL
61	477.59	721.42	44N	26	41	312	1.38	
62	487.03	735.71	38N	26	42	321	1.39	NET< CL
63	497.08	750.93	-3N	25	41	305	1.39	NET< CL
64	537.32	811.84	-3N	28	45	352	1.42	NET< CL
65	604.70	913.84	-37N	30	50	421	1.47	NET< CL
								LBase
66	621.84	939.78	-0N	25	41	288	1.48	NET< CL
67	661.65	1000.05	64N	25	39	265	1.51	
68	724.18	1094.70	-30N	34	57	302	1.55	NET< CL
								LHRoi
69	765.79	1157.69	-27N	25	42	263	1.58	NET< CL
70	810.76	1225.76	-26N	20	34	221	1.61	NET< CL
71	834.83	1262.20	18N	24	38	273	1.63	NET< CL
72	884.67	1337.64	-2N	23	37	258	1.66	NET< CL
73	1099.22	1662.42	18N	22	35	223	1.80	NET< CL
74	1115.52	1687.09	21N	42	68	491	1.82	NET< CL
								PIC
75	1332.49	2015.53	-5N	18	29	151	1.96	NET< CL
76	1691.02	2558.26	17N	10	16	46	2.21	

L5348-16 analyzed by emml461 on 05/16/2003

S E E K E R A N A L Y S I S S U M M A R Y

Environmental Laboratory

Environmental Gamma Isotopic Analysis

Sample ID : SOIL/SEDI Duratek Inc

Sampling Start: 03/26/2003 12:00:00 | Counting Start: 05/16/2003 17:05:40
Sampling Stop: 03/26/2003 12:00:00 | Decay Time. 1.23E+03 Hrs
Buildup Time. 0.00E+00 Hrs | Live Time 70000 Sec
Sample Size 1.52E-01 kg | Real Time 70027 Sec
Collection Efficiency 1.0000 | Spectrum File 1367102.spc

Detector #: 2

Energy(keV)= 1.01 + 0.661*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/16/2003

FWHM(keV) = 1.03 + 0.002*En + 6.55E-04*En^2 + 6.55E-04*En^3 02/18/2003

Where En = Sqrt(Energy in keV)

Efficiency File:WT1SS002.EFF (Sand in a 4 oz. Jar: 1.6 g/cc)
Eff.=1/[1.49e-02*En^-2.83e+00 + 1.39e+02*En^ 8.08e-01] 02/06/1998

Library File: SOILA.LIB LSF File: L5348-16.LSF

Activity Units: pCi/kg

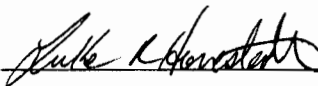
Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
=====							
Th-234	5.65E+02	1.96E+02	< 6.37E+02	3.14E+02	1.00E+00	MEAS +	YES
Tl-208	3.85E+02	2.55E+01	< 9.32E+01	4.56E+01	1.00E+00	MEAS +	YES
Pb-214	2.85E+02	1.68E+01	< 5.98E+01	2.93E+01	1.00E+00	MEAS +	YES
Ce-141	6.67E+00	1.92E+01	< 6.42E+01	3.14E+01	3.33E-01	NET	YES
Ra-226	6.90E+02	1.99E+02	< 6.45E+02	3.18E+02	1.00E+00	MEAS +	YES
AcTh-228	3.80E+02	2.68E+01	< 1.22E+02	5.93E+01	1.00E+00	MEAS +	YES
Pb-212	3.41E+02	1.49E+01	< 3.88E+01	1.91E+01	9.99E-01	MEAS +	YES
Sb-125	5.82E+00	1.73E+01	< 5.89E+01	2.86E+01	9.65E-01	MEAS +	YES
Annil	1.82E+01	2.40E+01	< 7.94E+01	3.94E+01	9.07E-01	MEAS +	YES
Bi-214	2.53E+02	2.04E+01	< 6.40E+01	3.13E+01	1.00E+00	MEAS +	YES
Bi-212	2.04E+02	6.88E+01	< 2.21E+02	1.07E+02	1.00E+00	MEAS +	YES
K-40	1.91E+04	3.09E+02	< 3.35E+02	1.61E+02	1.00E+00	MEAS +	YES
Am-241	6.48E+01	1.97E+01	< 6.35E+01	3.12E+01	1.00E+00	NET	YES
Co-57	-8.01E+00	4.53E+00	< 1.55E+01	7.61E+00	8.76E-01	NET	YES
Ce-144	-1.72E+01	3.62E+01	< 1.22E+02	5.98E+01	8.82E-01	NET	YES
Se-75	-1.71E+01	1.05E+01	< 3.59E+01	1.76E+01	7.42E-01	NET	YES
Cr-51	-3.15E+01	1.73E+02	< 5.84E+02	2.85E+02	2.75E-01	NET	YES
I-131	9.93E+01	5.08E+02	< 1.71E+03	8.34E+02	1.17E-02	NET	YES
Ag-108m	-6.83E+00	5.45E+00	< 1.89E+01	9.17E+00	9.99E-01	NET	YES
Be-7	1.61E+02	9.44E+01	< 3.10E+02	1.50E+02	5.12E-01	NET	YES
La-140	2.71E+02	1.86E+02	< 6.13E+02	2.97E+02	6.10E-02	NET	YES
Ru-103	-1.68E+00	1.38E+01	< 4.71E+01	2.28E+01	4.03E-01	NET	YES
Ba-140	-4.68E+01	3.87E+02	< 1.32E+03	6.39E+02	6.10E-02	NET	YES
Cs-134	-9.41E+00	7.49E+00	< 2.58E+01	1.26E+01	9.54E-01	NET	YES
Ru-106	-4.52E-01	6.77E+01	< 2.30E+02	1.11E+02	9.07E-01	NET	YES
Cs-137	1.92E+01	7.54E+00	< 2.43E+01	1.18E+01	9.97E-01	NET	YES
Zr-95	-3.27E+01	3.69E+01	< 1.28E+02	6.23E+01	5.72E-01	NET	YES
Nb-95	-2.17E+01	2.00E+01	< 6.94E+01	3.36E+01	3.61E-01	NET	YES
Co-58	-1.31E+01	9.81E+00	< 3.47E+01	1.67E+01	6.03E-01	NET	YES
Mn-54	6.17E+00	8.14E+00	< 2.73E+01	1.32E+01	8.92E-01	NET	YES
Ag-110m	-1.02E+00	1.15E+01	< 3.94E+01	1.90E+01	8.67E-01	NET	YES
Fe-59	2.71E+01	3.24E+01	< 1.09E+02	5.23E+01	4.49E-01	NET	YES
Zn-65	1.82E+01	3.66E+01	< 1.22E+02	5.98E+01	8.64E-01	NET	YES

L5348-16 analyzed by emm1461 on 05/16/2003

Activity Units: pCi/kg

Nuclide	Activity	Uncertainty	MDA	CL ACT	DECAY	FLAG	SEN MET
Co-60	-2.16E+00	8.07E+00	< 2.80E+01	1.34E+01	9.82E-01	NET	YES
Sb-124	3.40E+01	2.09E+01	< 6.84E+01	3.15E+01	5.52E-01	NET	YES

PERFORMED BY:



REVIEWED BY: