EPA Region 5 Records Ctr.
379484

Fw: 211 E Grand - Gamma Spec Results

VERNETA SIMON to: Ernesto Manzon, Gordon Clarke, Phillip Brown 10/21/2010 09:24 AM

Sender	Date	Subject
VERNETA SIMON	10/21/2010 09:24 AM	Fw: 211 E Grand - Gamma Spec Results

See below!!!
----- Forwarded by VERNETA SIMON/R5/USEPA/US on 10/21/2010 09:23 AM -----

From: "Kornder, Steve" <Steve.Kornder@aecom.com>
To: VERNETA SIMON/R5/USEPA/US@EPA
Cc: EUGENE JABLONOWSKI/R5/USEPA/US@EPA
Date: 10/21/2010 09:23 AM
Subject: FW: 211 E Grand - Gamma Spec Results

HI Verneta:

Sorry about the typo below for the date, should be 2010, not 2001.

Sincerely,
Steve
From: Kornder, Steve
Sent: Thursday, October 21, 2010 9:02 AM
To: Ms. Verneta Simon (simon.verneta@epa.gov)
Cc: 'Jablonowski.Eugene@epamail.epa.gov'; 'Oleszkiewicz, Vincent S.'; 'Dave Gutierrez'; 'Doug Porter'; Kathleen Smith
Subject: 211 E Grand - Gamma Spec Results

Good Morning Verneta:

Attached is PDF copy of the gamma spec analysis of the sample collected at the site in September 16, 2001 during the test pitting. The sample was collected a foot below the surface at the location which exhibited the highest surface gamma readings. The Ludlum reading at the sample location was approximately 100,000 cpm. The gamma spec. results indicate a total radium (Ra226 and Ra228) concentration of about 44 pCi/g with the Ra228 isotope concentration at 39.5 pCi/g.

Please contact me if you have any questions.

Sincerely,
Steve Kornder, Ph.D.
Senior Project Geochemist
D 847.279.2448 C 847.343.6007

AECOM
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G100130 AECOM streeterville sample.pdf

Sample description
G100130 AECOM Streeterville sample ID 60157402-1

Spectrum Filename: H:\GammaVision\User\Spectra\G100130.An1

Acquisition information
Start time: 20-Oct-2010 09:52:27
Live time: 3600
Real time: 3652
Dead time: 1.42 %
Detector ID: 1

Detector system
USER-802B915354 MCB 9

Calibration
Filename: G100130.Spc
10_10_06 energy calibration

Energy Calibration
Created: 20-Oct-2010 09:49:08
Zero offset: -8.750 keV
Gain: 0.232 keV/channel
Quadratic: 3.423E-08 keV/channel^2

Efficiency Calibration
Created: 19-Aug-2010 11:00:19
Type: Polynomial
Uncertainty: 1.354 %
Coefficients: -0.387752 -4.534997 0.605475
-0.074624 0.003505 -0.000074

Library Files
Main analysis library: 1001a.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Npp32 G53W3.10
Start channel: 20 (-4.10keV)
Stop channel: 8144 (1885.90keV)
Peak rejection level: 100.000%
Peak search sensitivity: 3
Sample Size: 8.3300E+02
Activity scaling factor: 1.0000E+00/(1.0000E+00* 8.3300E+02) =
1.2005E-03
Detection limit method: Traditional ORTEC method
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00
Fraction Limit: 10.000%
Background width: best method (based on spectrum).
Half lives decay limit: 12.000

```
      Activity range factor:      2.000
      Min. step backg. energy     0.000
      Multiplet shift channel     2.000

Corrections                          Status          Comments
      Decay correct to date:          NO
      Decay during acquisition:       NO
      Decay during collection:        NO
      True coincidence correction:    NO
      Peaked background correction:   YES       10_09_13 48hr.Pbc
                                                13-Sep-2010 15:29:09
      Absorption (Internal):          NO
      Geometry correction:            NO
      Random summing:                 NO

      Energy Calibration
           Normalized diff:       0.0814
```

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity uCi/g	Uncertainty Counting	1 Sigma Total
PB-214	4.5294E-06	2.230E+00%	3.865E+00%
PB-212	3.5628E-05	4.107E-01%	3.371E+00%
BI-212	3.6708E-05	2.847E+00%	3.660E+00%
AC-228	3.9481E-05	8.413E-01%	2.456E+00%
Tl-210 <	4.2515E-08		
TL-208	1.0881E-05	9.557E-01%	2.529E+00%
K-40	9.2889E-06	6.796E+00%	7.157E+00%
BI-214	4.3682E-06	3.543E+00%	4.234E+00%

```
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded
----------------------------  S U M M A R Y  ----------------------------
Total Activity (   -4.1 to  1885.9 keV)     1.409E-04  uCi/g
```

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

```
- Nuclide -  Average     ------------- Peak --------------
Name   Code  Activity     Energy   Activity Code MDA Value
             uCi/g         keV     uCi/g         uCi/g          COMMENTS

PB-214   N   4.5294E-06
                          351.93 4.466E-06  (P 7.823E-08 2.97E+00 G
                          295.22 4.651E-06  (P 1.322E-07 3.27E+00 G
                                                          Energy duplication
                           77.11 4.529E-06 } P 1.016E-06 5.27E+00 XA
                          241.99 5.528E-06 + P 6.296E-07 1.10E+01 G
                                                          Energy duplication
                           74.82 4.044E-06 } P 1.492E-06 3.64E+01 XA
                             5 of   5 peaks found
```

```
Nuclide     Ave activity   Energy  Activity  Code  MDA    Comments

PB-212   N   3.5628E-05
                           238.63 3.563E-05  (P 6.319E-08 4.10E-01 G
                                                          Energy duplication
                            77.11 3.067E-05 } P 4.302E-07 1.34E+00 XA
                                                          Energy duplication
                            74.82 3.563E-05 } P 1.013E-06 2.10E+00 XA
                           300.09 3.355E-05 - P 1.031E-06 2.65E+00 G
                              4 of   4 peaks found

BI-212   N   3.6708E-05
                           727.33 3.651E-05  (P 4.688E-07 2.84E+00 G
                          1620.50 5.332E-05 + P 3.470E-06 8.49E+00 G
                           785.37 3.793E-05  (P 2.608E-06 1.05E+01 G
                           893.41 5.379E-05 + P 8.323E-06 2.17E+01 G
                              4 of   4 peaks found

AC-228   N   3.9481E-05
                           911.20 3.948E-05  (P 9.032E-08 8.40E-01 G
                           968.97 3.967E-05  (P 1.383E-07 1.11E+00 G
                           338.32 3.262E-05 - P 4.924E-07 2.70E+00 G
                           964.77 3.891E-05  (P 7.250E-07 2.64E+00 G
                           463.00 3.145E-05 - P 9.380E-07 3.09E+00 G
                              5 of   5 peaks found

TL-208   N   1.0881E-05
                           583.19 1.089E-05  (P 3.970E-08 9.53E-01 G
                           510.77 1.215E-05 + P 2.558E-07 2.52E+00 G
                           860.58 1.322E-05 + P 4.497E-07 4.03E+00 G
                           277.37 1.081E-05 @(P 4.138E-07 6.66E+00 G
                           763.13 1.358E-05 + P 1.946E-06 1.32E+01 G
                              5 of   5 peaks found

K-40     N   9.2889E-06
                          1460.82 9.289E-06  (P 3.415E-07 5.72E+00 G
                              1 of   1 peaks found

BI-214   N   4.3682E-06
                           609.32 4.376E-06  (P 7.409E-08 3.50E+00 G
                          1764.49 6.290E-06 + P 3.803E-07 7.54E+00 G
                          1120.29 5.089E-06 + P 3.085E-07 7.67E+00 G
                          1238.12 3.495E-06 - P 5.926E-07 2.39E+01 G
                           768.36 4.299E-06  (P 6.466E-07 1.54E+01 G
                              5 of   5 peaks found
```

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.

& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma%	FWHM keV		Suspected Nuclide
206.07	39.14	5581.	3285.	0.913	4.74	1.301	-	sM
400.77	84.39	14747.	2612.	0.725	6.86	1.562	-	D
413.00	87.23	16181.	7515.	2.087	2.66	1.564	-	D
425.05	90.03	16945.	5480.	1.522	3.62	1.565	-	D
439.48	93.38	12858.	5779.	1.605	3.07	1.567	-	D
465.20	99.35	15424.	1793.	0.498	14.47	1.309	-	
491.15	105.38	13596.	2047.	0.569	12.50	1.240	-	
522.45	112.69	12184.	360.	0.100	43.71	1.577	-	D
533.75	115.32	11246.	1248.	0.347	12.35	1.578	-	D
592.84	129.02	16141.	3347.	0.930	7.01	1.312	-	s
700.96	154.14	15738.	1528.	0.424	18.84	1.309	-	
837.77	185.94	11560.	1432.	0.398	18.96	1.133	-	s
896.02	199.48	10041.	568.	0.158	33.25	1.003	-	s
938.51	209.36	11090.	5450.	1.514	4.39	1.291	-	s
967.20	216.03	10599.	537.	0.149	38.00	0.880	-	s
1041.36	233.21	9575.	491.	0.137	28.51	1.642	-	D
1072.75	240.56	11661.	603.	0.168	25.63	1.646	-	D
1075.16	241.07	55044.	5079.	1.411	6.68	1.646	-	D
1124.76	252.65	6268.	512.	0.142	34.25	0.769	-	s
1200.74	270.31	7519.	4394.	1.221	4.61	1.337	-	
1277.71	288.20	4867.	589.	0.164	21.90	0.821	-	s
1418.61	320.95	4097.	662.	0.184	21.96	0.916	-	s
1448.58	327.92	5669.	3655.	1.015	4.84	1.382	-	
1798.24	409.21	3339.	1844.	0.512	9.03	1.271	-	s
1852.61	421.85	2248.	160.	0.044	51.93	0.567	-	s
2310.89	528.40	2677.	298.	0.083	44.13	0.270	-	s
2457.67	562.53	1736.	830.	0.230	11.58	1.608	-	
2504.92	573.52	482.	44.	0.012	72.16	0.431	-	c
2885.68	662.07	1089.	130.	0.036	44.67	0.254	-	s
3286.84	755.37	1600.	816.	0.227	15.31	1.946	-	M
3359.28	772.38	1226.	941.	0.261	6.19	2.003	-	D
3403.12	782.41	1686.	246.	0.068	24.44	2.011	-	D
3456.75	794.89	1051.	2286.	0.635	3.73	1.675	-	M
3610.94	830.68	976.	275.	0.076	17.15	2.049	-	D
3631.49	835.46	1044.	798.	0.222	6.73	2.053	-	D
3808.04	876.60	468.	240.	0.067	21.51	0.492	-	s

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma%	FWHM keV		Suspected Nuclide
3925.24	903.96	691.	510.	0.142	8.54	2.109	-	D
4054.09	933.84	679.	342.	0.095	18.47	1.331	-	s
5572.93	1287.27	473.	154.	0.043	40.02	0.517	-	sM
6885.43	1592.80	370.	582.	0.162	10.49	1.465	-	s
7083.32	1638.88	282.	249.	0.069	21.02	0.451	-	s
7255.49	1678.97	160.	128.	0.035	25.51	0.429	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: 1001a.Lib

The library has energies which are not separable.

Laboratory: RSSI