

# Health Physics Sample Records

Sample ID: 142491

Type: RLSSS

Type Detail: SAND

Status: APPROVED

Rasterized: ☒

Description: 140605BD02 SOUTH LAY DOWN # 3

## Common

Resp Org: P4000 - PROJECT MANAGEMEN

Cross Ref Sample ID:

Priority: N

Contact: COOPER, TERRY L

Survey No:

Reference ID:

Accounting Subcode:

Unknown Mat: NO

Hazardous Mat: NO

Comments: COUNT TO MDA

Reviewed: DYNES, WILLIAM J

Date: 06/06/14 07:22

Comments:

## Origin

Mat. Size/Volume: 1918 GRAMS

Docmnt/MO/Act #:

Proposed Ship Date: 00/00/00 00:00

Description: SOUTH LAY DOWN # 3

## Collection

Sample Tech: DYNES, WILLIAM J

Sample Date: 06/05/14 13:20

Count Time: 900 (secs.)

Tritium Req: No

Sample Size/Volume: 1918 GRAMS

Instructions: COUNT TO MDA

Comments: COUNT TO MDA

## RLSSS

Exempt: No

Evaluated: No

Chem Notification: No

State Permit: No

Offsite Analysis: No

Effluent Permit: No

Container Surveyed: No

Cleared For Release: Yes

Container Evaluated: Yes

Form 212 Ready: ☒

## Location

Unit: NON-UNIT RE Area: MS

Elev: 100 Room:

Depth: (in.) Equip ID:

Stored By: ,

Date: 00/00/00 00:00

Sample Loc:

Other: COUNT TO MDA

Material Loc:

# Health Physics Sample Records

Sample ID: 142491

Type: RLSSS

Type Detail: SAND

Status: APPROVED

Rasterized: ☐

Description: 140605BD02 SOUTH LAY DOWN # 3

## Analysis

| Geometry             | MCA ID | Quant.     | Units            | Method                              | FP/AP    | Lab       | Analysis By  | Date           | Mod ID | Mod Date |
|----------------------|--------|------------|------------------|-------------------------------------|----------|-----------|--------------|----------------|--------|----------|
| C_1L_marinelli_sand_ | 30383  | 1918       | GR               |                                     | .000     |           | LYLE, OWEN M | 06/06/14 14:03 |        |          |
| Isotope              | Mode   | Activity   | Activity Uncert. | LLD/MDA                             | % Abund. | Atom. No. | Comments     |                | Mod Id | Mod Date |
| 0 K-40               | NT     | 0.00001389 | 1.37E-6          | <input type="checkbox"/>            | 74.332%  | 40        |              |                |        |          |
| 0 TL-208             | NT     | 1.898E-7   | 6.91E-8          | <input type="checkbox"/>            | 1.016%   | 208       |              |                |        |          |
| 0 PB-212             | NT     | 5.796E-7   | 9.27E-8          | <input type="checkbox"/>            | 3.102%   | 212       |              |                |        |          |
| 0 BI-214             | NT     | 4.617E-7   | 8.9E-8           | <input type="checkbox"/>            | 2.471%   | 214       |              |                |        |          |
| 0 PB-214             | NT     | 5.666E-7   | 1.719E-7         | <input type="checkbox"/>            | 3.032%   | 214       |              |                |        |          |
| 0 RA-226             | NT     | 2.824E-6   | 1.024E-6         | <input type="checkbox"/>            | 15.113%  | 226       |              |                |        |          |
| 0 U-235              | NT     | 1.748E-7   | 6.34E-8          | <input type="checkbox"/>            | 0.935%   | 235       |              |                |        |          |
| 0 BE-7               | AP     | 4.5886E-7  |                  | <input checked="" type="checkbox"/> | 0.000%   | 7         |              |                |        |          |
| 0 MN-54              | AP     | 1.4529E-7  |                  | <input checked="" type="checkbox"/> | 0.000%   | 54        |              |                |        |          |
| 0 MN-56              | AP     | 9.4588E-8  |                  | <input checked="" type="checkbox"/> | 0.000%   | 56        |              |                |        |          |
| 0 CO-57              | AP     | 7.4995E-8  |                  | <input checked="" type="checkbox"/> | 0.000%   | 57        |              |                |        |          |
| 0 CO-58              | AP     | 1.0045E-7  |                  | <input checked="" type="checkbox"/> | 0.000%   | 58        |              |                |        |          |
| 0 CO-60              | AP     | 1.1751E-7  |                  | <input checked="" type="checkbox"/> | 0.000%   | 60        |              |                |        |          |
| 0 SB-124             | AP     | 6.138E-8   |                  | <input checked="" type="checkbox"/> | 0.000%   | 124       |              |                |        |          |
| 0 SB-125             | FP     | 2.1472E-7  |                  | <input checked="" type="checkbox"/> | 0.000%   | 125       |              |                |        |          |
| 0 CS-134             | FP     | 9.5631E-8  |                  | <input checked="" type="checkbox"/> | 0.000%   | 134       |              |                |        |          |
| 0 CS-137             | FP     | 8.9946E-8  |                  | <input checked="" type="checkbox"/> | 0.000%   | 137       |              |                |        |          |

## Analysis Review

Re-Analyze: No

Lic Rad Mat Present: No

Reviewed: COOPER, TERRY L

Date: 06/11/14 06:26

Hp Eng Rvw Req'd: Yes

Rad Mat Present: Yes

HP Notified Name:

Comments:

## Health Physics Sample Records

Sample ID: 142491

Type: RLSSS

Type Detail: SAND

Status: APPROVED

Rasterized: 

Description: 140605BD02 SOUTH LAY DOWN # 3

Review/Approve

### HP Eng Review

Reviewed: COOPER, TERRY L

Date: 06/11/14 06:38

Comments: U-235 is likely a mis-ID off the Ra-226 energy peak; the 338 keV peak is Ac-228

### Disposition

Disposition: OTHER

Result: Sample contains only natural isotopes

Remarks:

### Final Approval

Approved: COOPER, TERRY L

Date: 06/11/14 06:38

Comments:

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*****
*          SONGS                      HEALTH PHYSICS REPORT          6-JUN-2014 13:58      *
*-----*
*          >>>> SAMPLE  PARAMETERS <<<<          *
*
* Title      : 140605BD02 SOUTH LAY DOWN # 3          *
*
* ID         : 30383                      Acquisition date: 6-JUN-2014 13:55:49. *
* Start Time: 6-JUN-2014 13:55:00.          *
* Stop Time: 6-JUN-2014 13:55:00.          Counting System   : U2GSP          *
* Quantity   : 1.91800E+03 GR              IHPS Sample Number: 142491          *
* Geometry    : C_1L_marinelli_sand_1      Analysis Library  : HP_NATURAL          *
*                               Operator: OWEN LYLE          *
*-----*
*          >>>> C #41-TP11750A  PARAMETERS <<<<          *
*
* Elapsed Live Time : 0 00:03:00.42      Calibration       : 5-JUN-2014 19:42:          *
* Elapsed Real Time  : 0 00:03:00.46      Energy Offset    : -1.03481E-01          *
* Deadtime           : 0.0%               Energy Slope     : 4.99812E-01          *
* Activity Mult Factor: 1.00000E+00        Energy Tolerance: 1.00000          *
* Half Life Ratio    : 8.00000            Sensitivity      : 5.00000          *
*
*****

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Post-NID Peak Search Report

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | %Err | Fit      | Nuclides        |
|----|---------|------|-------|------|---------|------|----|------|----------|-----------------|
| 1  | 186.10  | 27   | 20    | 1.43 | 372.54  | 368  | 9  | 36.3 | 1.28E+00 | U-235<br>RA-226 |
| 1  | 238.63  | 66   | 18    | 1.15 | 477.62  | 472  | 9  | 16.0 | 1.99E+00 | PB-212          |
| 1  | 241.80  | 24   | 10    | 1.33 | 483.97  | 482  | 5  | 28.5 | 1.84E+00 | PB-214          |
| 1  | 295.11  | 24   | 8     | 1.92 | 590.61  | 585  | 11 | 30.3 | 3.34E-01 | PB-214          |
| 1  | 338.28  | 29   | 11    | 2.13 | 676.97  | 671  | 11 | 28.7 | 4.26E-01 |                 |
| 1  | 352.00  | 38   | 6     | 1.23 | 704.43  | 700  | 8  | 19.5 | 6.69E-01 | PB-214          |
| 1  | 583.28  | 15   | 6     | 2.18 | 1167.08 | 1163 | 8  | 36.4 | 7.11E-01 | TL-208          |
| 1  | 609.49  | 28   | 0     | 1.94 | 1219.50 | 1215 | 8  | 19.3 | 1.50E+00 | BI-214          |
| 1  | 1460.84 | 106  | 0     | 2.12 | 2922.19 | 2914 | 14 | 9.8  | 9.19E-01 | K-40            |

Summary of Nuclide Activity  
Sample ID : 30383

Page : 2  
Acquisition date : 6-JUN-2014 13:55:49

Total number of lines in spectrum 9  
Number of unidentified lines 0  
Number of lines tentatively identified by NID 9 100.00%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>uCi/GR | Decay Corr<br>uCi/GR | Decay Corr<br>1-Sigma Error | 1-Sigma<br>%Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 1.389E-05             | 1.389E-05            | 0.137E-05                   | 9.85              | A     |
| TL-208           | 3.05M     | 1.66  | 1.141E-07             | 1.898E-07            | 0.691E-07                   | 36.39             | A     |
| PB-212           | 10.64H    | 1.00  | 5.781E-07             | 5.796E-07            | 0.927E-07                   | 15.99             | A     |
| BI-214           | 19.90M    | 1.08  | 4.259E-07             | 4.617E-07            | 0.890E-07                   | 19.27             | A     |
| PB-214           | 26.80M    | 1.06  | 5.336E-07             | 5.666E-07            | 1.719E-07                   | 30.33             | A     |
| RA-226           | 1600.00Y  | 1.00  | 2.824E-06             | 2.824E-06            | 1.024E-06                   | 36.26             | A     |
| U-235            | 7.04E+08Y | 1.00  | 1.748E-07             | 1.748E-07            | 0.634E-07                   | 36.26             | A     |
| Total Activity : |           |       | 1.854E-05             | 1.869E-05            |                             |                   |       |

Grand Total Activity : 1.854E-05 1.869E-05

Flags: "K" = Keyline not found "M" = Manually accepted  
"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 30383

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Acquisition date : 6-JUN-2014 13:55:49

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 338.28 | 29   | 11    | 2.13 | 676.97  | 671  | 11 | 1.59E-01 | 28.7 | 1.73E+00 | T     |

Flags: "T" = Tentatively associated

Interference Report  
Sample ID : 30383

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Acquisition date : 6-JUN-2014 13:55:49

No interference correction performed

Nuclide Type: natural

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>uCi/GR | Decay Corr<br>uCi/GR | 1-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|-----------------------|----------------------|-------------------|
| K-40    | 1460.83 | 106   | 10.67* | 5.560E-01 | 1.389E-05             | 1.389E-05            | 9.85              |
| TL-208  | 72.80   | ----- | 2.14   | 1.486E+00 | -----                 | Line Not Found       | -----             |
|         | 74.97   | ----- | 3.60   | 1.577E+00 | -----                 | Line Not Found       | -----             |
|         | 84.79   | ----- | 1.27   | 1.917E+00 | -----                 | Line Not Found       | -----             |
|         | 252.45  | ----- | 0.80   | 2.004E+00 | -----                 | Line Not Found       | -----             |
|         | 277.28  | ----- | 6.80   | 1.917E+00 | -----                 | Line Not Found       | -----             |
|         | 510.61  | ----- | 21.60  | 1.298E+00 | -----                 | Line Not Found       | -----             |
|         | 583.02  | 15    | 86.00* | 1.157E+00 | 1.141E-07             | 1.898E-07            | 36.39             |
|         | 763.06  | ----- | 1.64   | 8.934E-01 | -----                 | Line Not Found       | -----             |
|         | 860.30  | ----- | 12.00  | 7.922E-01 | -----                 | Line Not Found       | -----             |
| PB-212  | 74.81   | ----- | 10.50  | 1.570E+00 | -----                 | Line Not Found       | -----             |
|         | 77.11   | ----- | 17.70  | 1.661E+00 | -----                 | Line Not Found       | -----             |
|         | 87.19   | ----- | 6.27   | 1.983E+00 | -----                 | Line Not Found       | -----             |
|         | 90.13   | ----- | 1.86   | 2.055E+00 | -----                 | Line Not Found       | -----             |
|         | 115.12  | ----- | 0.59   | 2.376E+00 | -----                 | Line Not Found       | -----             |
|         | 238.58  | 66    | 43.60* | 2.055E+00 | 5.781E-07             | 5.796E-07            | 15.99             |
|         | 300.03  | ----- | 3.34   | 1.843E+00 | -----                 | Line Not Found       | -----             |
| BI-214  | 76.86   | ----- | 0.58   | 1.651E+00 | -----                 | Line Not Found       | -----             |
|         | 79.29   | ----- | 0.97   | 1.741E+00 | -----                 | Line Not Found       | -----             |
|         | 609.31  | 28    | 46.10* | 1.112E+00 | 4.259E-07             | 4.617E-07            | 19.27             |
|         | 665.44  | ----- | 1.56   | 1.023E+00 | -----                 | Line Not Found       | -----             |
|         | 768.35  | ----- | 4.88   | 8.873E-01 | -----                 | Line Not Found       | -----             |
|         | 806.16  | ----- | 1.23   | 8.454E-01 | -----                 | Line Not Found       | -----             |
|         | 934.04  | ----- | 3.16   | 7.310E-01 | -----                 | Line Not Found       | -----             |
|         | 1120.27 | ----- | 15.00  | 6.242E-01 | -----                 | Line Not Found       | -----             |
|         | 1155.18 | ----- | 1.69   | 6.105E-01 | -----                 | Line Not Found       | -----             |
|         | 1238.11 | ----- | 5.92   | 5.846E-01 | -----                 | Line Not Found       | -----             |
|         | 1280.95 | ----- | 1.47   | 5.747E-01 | -----                 | Line Not Found       | -----             |
|         | 1377.66 | ----- | 4.02   | 5.602E-01 | -----                 | Line Not Found       | -----             |
|         | 1385.30 | ----- | 0.78   | 5.595E-01 | -----                 | Line Not Found       | -----             |
|         | 1401.48 | ----- | 1.39   | 5.583E-01 | -----                 | Line Not Found       | -----             |
|         | 1407.97 | ----- | 2.48   | 5.578E-01 | -----                 | Line Not Found       | -----             |
|         | 1509.22 | ----- | 2.19   | 5.568E-01 | -----                 | Line Not Found       | -----             |
|         | 1583.22 | ----- | 0.72   | 5.628E-01 | -----                 | Line Not Found       | -----             |
|         | 1661.26 | ----- | 1.15   | 5.753E-01 | -----                 | Line Not Found       | -----             |
|         | 1729.58 | ----- | 3.05   | 5.918E-01 | -----                 | Line Not Found       | -----             |
|         | 1764.49 | ----- | 15.90  | 6.023E-01 | -----                 | Line Not Found       | -----             |
|         | 1847.41 | ----- | 2.12   | 6.331E-01 | -----                 | Line Not Found       | -----             |
| PB-214  | 53.17   | ----- | 1.10   | 5.203E-01 | -----                 | Line Not Found       | -----             |
|         | 74.81   | ----- | 6.52   | 1.570E+00 | -----                 | Line Not Found       | -----             |
|         | 77.11   | ----- | 11.00  | 1.661E+00 | -----                 | Line Not Found       | -----             |
|         | 87.19   | ----- | 3.88   | 1.983E+00 | -----                 | Line Not Found       | -----             |
|         | 90.13   | ----- | 1.15   | 2.055E+00 | -----                 | Line Not Found       | -----             |
|         | 241.92  | 24    | 7.46   | 2.043E+00 | 1.248E-06             | 1.325E-06            | 28.46             |
|         | 258.94  | ----- | 0.55   | 1.981E+00 | -----                 | Line Not Found       | -----             |
|         | 295.09  | 24    | 19.20* | 1.858E+00 | 5.336E-07             | 5.666E-07            | 30.33             |
|         | 351.87  | 38    | 37.10  | 1.686E+00 | 4.758E-07             | 5.052E-07            | 19.47             |
|         | 785.83  | ----- | 1.09   | 8.674E-01 | -----                 | Line Not Found       | -----             |
|         | 839.00  | ----- | 0.59   | 8.122E-01 | -----                 | Line Not Found       | -----             |



Nuclide Type: natural

| Nuclide | Energy | Area  | %Abn   | %Eff      | Uncorrected<br>uCi/GR | Decay Corr<br>uCi/GR | 1-Sigma<br>%Error |
|---------|--------|-------|--------|-----------|-----------------------|----------------------|-------------------|
| RA-226  | 81.07  | ----- | 0.18   | 1.802E+00 | -----                 | Line Not Found       | -----             |
|         | 186.11 | 27    | 3.28*  | 2.261E+00 | 2.824E-06             | 2.824E-06            | 36.26             |
| U-235   | 89.96  | ----- | 3.36   | 2.051E+00 | -----                 | Line Not Found       | -----             |
|         | 93.35  | ----- | 5.50   | 2.124E+00 | -----                 | Line Not Found       | -----             |
|         | 105.36 | ----- | 1.98   | 2.301E+00 | -----                 | Line Not Found       | -----             |
|         | 109.18 | ----- | 1.50   | 2.336E+00 | -----                 | Line Not Found       | -----             |
|         | 143.79 | ----- | 10.50  | 2.402E+00 | -----                 | Line Not Found       | -----             |
|         | 163.38 | ----- | 4.70   | 2.347E+00 | -----                 | Line Not Found       | -----             |
|         | 185.74 | 27    | 53.00* | 2.261E+00 | 1.748E-07             | 1.748E-07            | 36.26             |
|         | 194.96 | ----- | 0.59   | 2.226E+00 | -----                 | Line Not Found       | -----             |
|         | 202.13 | ----- | 1.00   | 2.197E+00 | -----                 | Line Not Found       | -----             |
|         | 205.33 | ----- | 4.70   | 2.184E+00 | -----                 | Line Not Found       | -----             |

Flag: "\*" = Keyline

Minimum Detectable Activity Report  
Sample ID : 30383

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Acquisition date : 6-JUN-2014 13:55:49

| Nuclide | Bckgnd<br>Sum | Energy<br>(keV) | MDA<br>(uCi/GR) |
|---------|---------------|-----------------|-----------------|
| BE-7    | 1.            | 477.61          | 4.5886E-07      |
| MN-54   | 7.            | 834.83          | 1.4529E-07      |
| MN-56   | 2.            | 846.81          | 9.4588E-08      |
| CO-57   | 13.           | 122.06          | 7.4995E-08      |
| CO-58   | 3.            | 810.79          | 1.0045E-07      |
| CO-60   | 2.            | 1332.50         | 1.1751E-07      |
| SB-124  | 2.            | 602.73          | 6.1380E-08      |
| SB-125  | 4.            | 427.88          | 2.1472E-07      |
| CS-134  | 5.            | 604.71          | 9.5631E-08      |
| CS-137  | 3.            | 661.66          | 8.9946E-08      |