This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

DOCUMENT NUMBER: SD-WM-DP-148

SECTION 3 OF 4

TITLE: 60 DAY WASTE COMPATIBILITY SAFETY ISSUE + FINAL RESULTS FOR TANK 241-AN-101 GRAB SAMPLES 1AN-95-1 + 1AN-95-2 + 1AN-95-3

DATE: 11/02/95

ORIGINATOR: ESCH RA

CO: WHC

RECIPIENT:

CO:

REFERENCES: EDT-613463

BLANK

# RADIOCHEMICAL ANALYSES

# LABCORE Data Entry Template for Worklist# 2520

**Analyst:** RG RAG **Instrument:** GEA00 3 **Book#** 144B52

**Method:** LA-548-121 Rev/Mod D-1

**Worklist Comment:** GEA AN-101; use 0.100-10-1.000 dilution of sample. R(0)-PPB

| S | Type | Sample# | R | A | Test | Matrix | Group# | Project |
|---|---|---|---|---|---|---|---|---|
| 1 | STD | | | | @GEA-01 | LIQUID | | |
| 2 | BLNK | | | | @GEA-01 | LIQUID | | |
| 3 | SAMPLE | S95T002411 | 0 | | @GEA-01 | LIQUID | 95000135 | AN-101 GRAB |
| | Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E | | | | | | | |
| 4 | DUP | S95T002411 | 0 | | @GEA-01 | LIQUID | | |
| 5 | SAMPLE | S95T002412 | 0 | | @GEA-01 | LIQUID | 95000135 | AN-101 GRAB |
| | Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E | | | | | | | |
| 6 | DUP | S95T002412 | 0 | | @GEA-01 | LIQUID | | |
| 7 | SAMPLE | S95T002413 | 0 | | @GEA-01 | LIQUID | 95000135 | AN-101 GRAB |
| | Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E | | | | | | | |
| 8 | DUP | S95T002413 | 0 | | @GEA-01 | LIQUID | | |

## Final page for worklist # 2520

Rae Ann Green 10-2-95
Analyst Signature Date

C.J. Grimm 10/3/95
Analyst Signature Date

S95T002413

OUT FOR RERUN

*Data Entry Comments:*

*S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.*

```
*****************************************************************************
* 222-S Laboratory Counting Room    2-OCT-1995 16:32:48.55                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2520
Sample ID:               WRKLST2520-STD
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             NI3AC:1.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:08.61 sec
Dead Time:               0.3%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       2-OCT-1995 06:07:51.59
Decayed to:              2-OCT-1995 06:07:51.59
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 MB
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*****************************************************************************
```

Removed by: Raymond

Verified by: B Machelor 10/3/95

**Post-NID Peak Search Report**

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/L |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 661.50* | 23213 | 1.53 | 1323.18 | 1316 | 16 | 1.4 | | CS-137 | 26.2 |
| 0 | 1172.99 | 13622 | 1.87 | 2346.25 | 2338 | 17 | 1.9 | | CO-60 | 21.5 |
| 0 | 1332.23 | 12257 | 1.92 | 2664.83 | 2655 | 20 | 1.9 | | CO-60 | 21.5 |

Summary of Nuclide Activity
Sample ID : WRKLST2520-STD



Acquisition date : 2-OCT-1995 06:07:51

| | | |
|---|---|---|
| Total number of lines in spectrum | 3 | |
| Number of unidentified lines | 0 | |
| Number of lines tentatively identified by NID | 3 | 100.00% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/L | Wtd Mean Decay Corr uCi/L | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CO-60 | 5.27Y | 1.000 | 2.147E+01 | 2.147E+01 | 0.028E+01 | 1.32 | |
| CS-137 | 30.00Y | 1.000 | 2.624E+01 | 2.624E+01 | 0.038E+01 | 1.44 | |
| | | Total Activity : | 4.770E+01 | 4.770E+01 | | | |
| | | Grand Total Activity : | 4.770E+01 | 4.770E+01 | | | |

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

µCi/ml

Co-60 2.147 E-2

Cs-137 2.624 E-2

Minimum Detectable Activity Report
Sample ID : WRKLST2520-STD



Acquisition date : 2-OCT-1995 06:07:51

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BE-7 | 1179. | 477.59 | 1.1311E+00 |
| NA-22 | 66. | 1274.53 | 6.3702E-02 |
| NA-24 | 25. | 1368.55 | 4.2590E-02 |
| K-40 | 143. | 1460.75 | 9.7927E-01 |
| SC-46 | 499. | 1120.55 | 1.5740E-01 |
| CR-51 | 1126. | 320.08 | 8.3183E-01 |
| MN-54 | 638. | 834.83 | 1.3807E-01 |
| CO-56 | 640. | 846.76 | 1.4012E-01 |
| CO-57 | 1235. | 122.06 | 6.0823E-02 |
| CO-58 | 554. | 810.78 | 1.2617E-01 |
| FE-59 | 645. | 1099.25 | 3.1143E-01 |
| ZN-65 | 587. | 1115.55 | 3.3535E-01 |
| SE-75 | 1306. | 264.66 | 1.3422E-01 |
| KR-85 | 837. | 514.00 | 2.4095E+01 |
| SR-85 | 837. | 514.01 | 1.0894E-01 |
| Y-88 | 12. | 1836.06 | 3.6311E-02 |
| Y-90 | 29. | 1760.70 | 1.9265E-01 |
| Y-91 | 175. | 1204.67 | 3.2990E+01 |
| NB-94 | 647. | 871.09 | 1.4429E-01 |
| NB-95 | 547. | 765.78 | 1.1900E-01 |
| ZR-95 | 530. | 756.73 | 2.1221E-01 |
| RU-103 | 870. | 497.08 | 1.1412E-01 |
| RURH-106 | 604. | 621.93 | 2.1067E+00 |
| AG-108m | 514. | 722.94 | 1.2069E-01 |
| CD-109 | 1058. | 88.03 | 1.8642E+00 |
| AG-110M | 1030. | 657.76 | 1.5116E-01 |
| SN-113 | 1027. | 391.69 | 1.4571E-01 |
| TE-123m | 1227. | 159.00 | 6.2375E-02 |
| SB-124 | 576. | 602.73 | 1.0159E-01 |
| SB-125 | 1208. | 427.89 | 3.6890E-01 |
| TE-125m | 1124. | 109.27 | 1.8892E+01 |
| I-129 | 1031. | 39.60 | 0.0000E+00 |
| I-131 | 1059. | 364.48 | 1.1060E-01 |
| XE-131m | 1274. | 163.93 | 2.7645E+00 |
| BA-133 | 1067. | 356.02 | 1.4258E-01 |
| CS-134 | 596. | 604.70 | 1.0380E-01 |
| CS-136 | 628. | 818.51 | 1.3524E-01 |
| CS-138 | 26. | 1435.86 | 9.4987E-02 |
| CE-139 | 1227. | 165.85 | 6.6868E-02 |
| BA-140 | 681. | 537.31 | 4.0161E-01 |
| LA-140 | 24. | 1596.21 | 4.8574E-02 |
| CE-141 | 1239. | 145.44 | 1.0639E-01 |
| CE-144 | 1207. | 133.51 | 4.5519E-01 |
| CEPR-144 | 1208. | 133.51 | 9.0960E-01 |
| EU-152 | 29. | 1408.01 | 2.2089E-01 |
| EU-154 | 66. | 1274.51 | 1.8479E-01 |
| EU-155 | 1045. | 86.54 | 2.1007E-01 |
| HF-181 | 967. | 482.18 | 1.3276E-01 |
| TA-182 | 959. | 67.75 | 3.0220E-01 |
| HG-203 | 1226. | 279.20 | 9.6967E-02 |
| BI-207 | 566. | 569.70 | 9.5938E-02 |

Sample ID : WRKLST2520-STD Acquisition date : 2-OCT-1995 06:07:51

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| TL-208 | 1243. | 277.36 | 1.2543E+00 |
| PB-210 | 964. | 46.50 | 0.0000E+00 |
| BI-212 | 509. | 727.18 | 1.6471E+00 |
| PB-212 | 1436. | 238.63 | 1.7502E-01 |
| BI-214 | 622. | 609.31 | 2.3253E-01 |
| PB-214 | 1043. | 351.92 | 4.3227E-01 |
| RA-224 | 1375. | 240.99 | 1.9016E+00 |
| RA-226 | 1408. | 186.10 | 1.7569E+00 |
| AC-228 | 783. | 911.21 | 6.1985E-01 |
| TH-228 | 1024. | 84.37 | 5.6485E+00 |
| TH-229 | 1066. | 88.47 | 2.7114E-01 |
| U-232 | 912. | 57.78 | 1.4137E+02 |
| PA-233 | 1202. | 312.17 | 2.2015E-01 |
| PA-234M | 640. | 1001.03 | 2.7406E-01 |
| TH-234 | 982. | 63.29 | 3.7251E+00 |
| U-235 | 1410. | 185.71 | 1.0687E-01 |
| NP-237 | 1045. | 86.48 | 5.5649E-01 |
| U-237 | 1020. | 59.54 | 6.9839E-01 |
| NP-238 | 724. | 984.45 | 6.1292E-01 |
| NP-239 | 1102. | 106.12 | 2.3730E-01 |
| PU-239 | 1154. | 129.30 | 7.7395E+02 |
| AM-241 | 1020. | 59.54 | 6.6989E-01 |
| AM-243 | 1018. | 74.67 | 1.5728E-01 |

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*****************************************************************************
* 222-S Laboratory Counting Room    2-OCT-1995 07:54:05.51                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2520
Sample ID:               WRKLST#2520-BLNK
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3353.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:00.51 sec
Dead Time:               0.0%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       2-OCT-1995 07:03:12.24
Decayed to:              2-OCT-1995 07:03:12.24
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 MB
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*****************************************************************************
```

Removed by:

Verified by:

Machelor 10/3/95

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/L |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 295.00 | 44 | 1.15 | 590.34 | 586 | 9 | 74.3 | | PB-214 | 21.8 |
| 0 | 351.67* | 43 | 1.48 | 703.64 | 698 | 12 | 96.5 | | PB-214 | 12.6 |
| 0 | 609.11* | 60 | 1.04 | 1218.41 | 1215 | 9 | 42.0 | | | |
| 0 | 661.67* | 75 | 2.16 | 1323.51 | 1318 | 14 | 43.4 | | CS-137 | 8.52 |

Summary of Nuclide Activity 
Sample ID : WRKLST#2520-BLNK Acquisition date : 2-OCT-1995 07:03:12

| | | |
|---|---|---|
| Total number of lines in spectrum | 4 | |
| Number of unidentified lines | 0 | |
| Number of lines tentatively identified by NID | 4 | 100.00% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/L | Wtd Mean Decay Corr uCi/L | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CS-137 | 30.00Y | 1.000 | 8.524E+00 | 8.524E+00 | 3.695E+00 | 43.35 | |
| ~~PB-214~~ | ~~26.80M~~ | ~~1.782~~ | ~~8.943E+00~~ | ~~1.594E+01~~ | ~~0.974E+01~~ | ~~61.09~~ | BKG 10/3/95 |
| Total Activity : | | | 1.747E+01 | 2.446E+01 | | | |

Grand Total Activity : 1.747E+01 2.446E+01

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

Co-60 < 3.1824 E-3

Cs 137 8.524 E-3

Minimum Detectable Activity Report
Sample ID : WRKLST#2520-BLNK


Acquisition date : 2-OCT-1995 07:03:12

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BE-7 | 40. | 477.59 | 2.0963E+01 |
| NA-22 | 16. | 1274.53 | 3.1870E+00 |
| NA-24 | 5. | 1368.55 | 1.9124E+00 |
| K-40 | 114. | 1460.75 | 8.8424E+01 |
| SC-46 | 36. | 1120.55 | 4.2409E+00 |
| CR-51 | 56. | 320.08 | 1.8685E+01 |
| MN-54 | 18. | 834.83 | 2.3454E+00 |
| CO-56 | 11. | 846.76 | 1.8163E+00 |
| CO-57 | 96. | 122.06 | 1.7146E+00 |
| CO-58 | 16. | 810.78 | 2.1728E+00 |
| FE-59 | 12. | 1099.25 | 4.2105E+00 |
| CO-60 | 15. | 1332.50 | 3.1824E+00 |
| ZN-65 | 14. | 1115.55 | 5.2162E+00 |
| SE-75 | 80. | 264.66 | 3.3475E+00 |
| KR-85 | 52. | 514.00 | 6.0927E+02 |
| SR-85 | 52. | 514.01 | 2.7468E+00 |
| Y-88 | 1. | 1836.06 | 1.0597E+00 |
| Y-90 | 11. | 1760.70 | 1.2043E+01 |
| Y-91 | 14. | 1204.67 | 9.3198E+02 |
| NB-94 | 21. | 871.09 | 2.6221E+00 |
| NB-95 | 28. | 765.78 | 2.7117E+00 |
| ZR-95 | 21. | 756.73 | 4.2203E+00 |
| RU-103 | 25. | 497.08 | 1.9692E+00 |
| RURH-106 | 25. | 621.93 | 4.2923E+01 |
| AG-108m | 24. | 722.94 | 2.6334E+00 |
| CD-109 | 82. | 88.03 | 5.2273E+01 |
| AG-110M | 29. | 657.76 | 2.5438E+00 |
| SN-113 | 47. | 391.69 | 3.1354E+00 |
| TE-123m | 76. | 159.00 | 1.5680E+00 |
| SB-124 | 31. | 602.73 | 2.3783E+00 |
| SB-125 | 37. | 427.89 | 6.5047E+00 |
| TE-125m | 87. | 109.27 | 5.3042E+02 |
| I-129 | 74. | 39.60 | 0.0000E+00 |
| I-131 | 49. | 364.48 | 2.4052E+00 |
| XE-131m | 82. | 163.93 | 7.0738E+01 |
| BA-133 | 49. | 356.02 | 3.0969E+00 |
| CS-134 | 33. | 604.70 | 2.4690E+00 |
| CS-136 | 11. | 818.51 | 1.8317E+00 |
| CS-138 | 10. | 1435.86 | 5.7694E+00 |
| CE-139 | 79. | 165.85 | 1.7172E+00 |
| BA-140 | 32. | 537.31 | 8.7852E+00 |
| LA-140 | 7. | 1596.21 | 2.6369E+00 |
| CE-141 | 88. | 145.44 | 2.8686E+00 |
| CE-144 | 82. | 133.51 | 1.2012E+01 |
| CEPR-144 | 82. | 133.51 | 2.3999E+01 |
| EU-152 | 12. | 1408.01 | 1.4032E+01 |
| EU-154 | 16. | 1274.51 | 9.2592E+00 |
| EU-155 | 79. | 86.54 | 5.8350E+00 |
| HF-181 | 40. | 482.18 | 2.7421E+00 |
| TA-182 | 62. | 67.75 | 7.7809E+00 |
| HG-203 | 66. | 279.20 | 2.2721E+00 |

Sample ID : WRKLST#2520-BLNK Acquisition date : 2-OCT-1995 07:03:12

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BI-207 | 27. | 569.70 | 2.1306E+00 |
| TL-208 | 70. | 277.36 | 3.0060E+01 |
| PB-210 | 46. | 46.50 | 0.0000E+00 |
| BI-212 | 29. | 727.18 | 3.9932E+01 |
| PB-212 | 83. | 238.63 | 4.2528E+00 |
| BI-214 | 107. | 609.31 | 9.7309E+00 |
| RA-224 | 102. | 240.99 | 5.2434E+01 |
| RA-226 | 94. | 186.10 | 4.5769E+01 |
| AC-228 | 33. | 911.21 | 1.2877E+01 |
| TH-228 | 84. | 84.37 | 1.6362E+02 |
| TH-229 | 83. | 88.47 | 7.6493E+00 |
| U-232 | 62. | 57.78 | 3.7123E+03 |
| PA-233 | 68. | 312.17 | 5.3034E+00 |
| PA-234M | 17. | 1001.03 | 4.4606E+00 |
| TH-234 | 57. | 63.29 | 9.0943E+01 |
| U-235 | 101. | 185.71 | 2.8875E+00 |
| NP-237 | 80. | 86.48 | 1.5543E+01 |
| U-237 | 70. | 59.54 | 1.8429E+01 |
| NP-238 | 15. | 984.45 | 8.9371E+00 |
| NP-239 | 65. | 106.12 | 5.8000E+00 |
| PU-239 | 68. | 129.30 | 1.8946E+04 |
| AM-241 | 70. | 59.54 | 1.7677E+01 |
| AM-243 | 83. | 74.67 | 4.5294E+00 |

```
*****************************************************************************
* 222-S Laboratory Counting Room    2-OCT-1995 10:11:08.98                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2520
Sample ID:               S95T2411-SAM
Sample Size:             1.00000E-03 LI
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3354.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:52:15.51 sec
Dead Time:               4.3%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       2-OCT-1995 09:17:56.05
Decayed to:              2-OCT-1995 09:17:56.05
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 ALJ
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*****************************************************************************
```

Removed by:

Verified by: 10/3/95

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/LI |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 661.49* | 1063895 | 1.54 | 1323.16 | 1315 | 17 | 0.2 | | CS-137 | 1.215E+05 |
| 0 | 1322.30 | 271 | 2.21 | 2644.96 | 2639 | 13 | 21.7 | | | |

Summary of Nuclide Activity
Sample ID : S95T2411-SAM  Acquisition date : 2-OCT-1995 09:17:56

| | | |
|---|---|---|
| Total number of lines in spectrum | 2 | |
| Number of unidentified lines | 1 | |
| Number of lines tentatively identified by NID | 1 | 50.00% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/LI | Wtd Mean Decay Corr uCi/LI | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CS-137 | 30.00Y | 1.000 | 1.215E+05 | 1.215E+05 | 0.002E+05 | 0.20 | |
| | Total Activity : | | 1.215E+05 | 1.215E+05 | | | |
| | Grand Total Activity : | | 1.215E+05 | 1.215E+05 | | | |

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

µCi/ml
Co-60 < 4.1014 E-3
Cs-137 1.215 E+2

Sample ID : S95T2411-SAM Acquisition date : 2-OCT-1995 09:17:56

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/LI) |
|---|---|---|---|
| BE-7 | 32569. | 477.59 | 6.0049E+02 |
| NA-22 | 105. | 1274.53 | 8.1221E+00 |
| NA-24 | 17. | 1368.55 | 3.4929E+00 |
| K-40 | 144. | 1460.75 | 9.9143E+01 |
| SC-46 | 224. | 1120.55 | 1.0637E+01 |
| CR-51 | 25390. | 320.08 | 3.9900E+02 |
| MN-54 | 660. | 834.83 | 1.4190E+01 |
| CO-56 | 593. | 846.76 | 1.3624E+01 |
| CO-57 | 25682. | 122.06 | 2.8012E+01 |
| CO-58 | 703. | 810.78 | 1.4360E+01 |
| FE-59 | 210. | 1099.25 | 1.7967E+01 |
| CO-60 | 25. | 1332.50 | 4.1014E+00 ← |
| ZN-65 | 220. | 1115.55 | 2.0752E+01 |
| SE-75 | 28014. | 264.66 | 6.2787E+01 |
| KR-85 | 16091. | 514.00 | 1.0672E+04 |
| SR-85 | 16089. | 514.01 | 4.8255E+01 |
| Y-88 | 1. | 1836.06 | 9.6362E-01 |
| Y-90 | 10. | 1760.70 | 1.1227E+01 |
| Y-91 | 111. | 1204.67 | 2.6547E+03 |
| NB-94 | 549. | 871.09 | 1.3423E+01 |
| NB-95 | 867. | 765.78 | 1.5131E+01 |
| ZR-95 | 872. | 756.73 | 2.7511E+01 |
| RU-103 | 20039. | 497.08 | 5.5308E+01 |
| RURH-106 | 5827. | 621.93 | 6.6066E+02 |
| AG-108m | 1078. | 722.94 | 1.7643E+01 |
| CD-109 | 22736. | 88.03 | 8.7274E+02 |
| AG-110M | 25873. | 657.76 | 7.6528E+01 |
| SN-113 | 27843. | 391.69 | 7.6618E+01 |
| TE-123m | 26854. | 159.00 | 2.9468E+01 |
| SB-124 | 6148. | 602.73 | 3.3519E+01 |
| SB-125 | 32750. | 427.89 | 1.9399E+02 |
| TE-125m | 23833. | 109.27 | 8.7857E+03 |
| I-129 | 20812. | 39.60 | 0.0000E+00 |
| I-131 | 26057. | 364.48 | 5.5423E+01 |
| XE-131m | 27211. | 163.93 | 1.2902E+03 |
| BA-133 | 25554. | 356.02 | 7.0467E+01 |
| CS-134 | 6046. | 604.70 | 3.3393E+01 |
| CS-136 | 668. | 818.51 | 1.4087E+01 |
| CS-138 | 11. | 1435.86 | 6.1842E+00 |
| CE-139 | 27205. | 165.85 | 3.1807E+01 |
| BA-140 | 11555. | 537.31 | 1.6713E+02 |
| LA-140 | 8. | 1596.21 | 2.7421E+00 |
| CE-141 | 26774. | 145.44 | 4.9959E+01 |
| CE-144 | 26716. | 133.51 | 2.1625E+02 |
| CEPR-144 | 26716. | 133.51 | 4.3211E+02 |
| EU-152 | 12. | 1408.01 | 1.4179E+01 |
| EU-154 | 104. | 1274.51 | 2.3543E+01 |
| EU-155 | 22511. | 86.54 | 9.8468E+01 |
| HF-181 | 25702. | 482.18 | 6.9112E+01 |
| TA-182 | 20905. | 67.75 | 1.4254E+02 |
| HG-203 | 26871. | 279.20 | 4.5856E+01 |

Sample ID : S95T2411-SAM Acquisition date : 2-OCT-1995 09:17:56

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/LI) |
|---|---|---|---|
| BI-207 | 7069. | 569.70 | 3.4238E+01 |
| TL-208 | 26956. | 277.36 | 5.9001E+02 |
| PB-210 | 20800. | 46.50 | 0.0000E+00 |
| BI-212 | 1005. | 727.18 | 2.3383E+02 |
| PB-212 | 30991. | 238.63 | 8.2132E+01 |
| BI-214 | 6009. | 609.31 | 7.2999E+01 |
| PB-214 | 25644. | 351.92 | 2.2120E+02 |
| RA-224 | 30371. | 240.99 | 9.0285E+02 |
| RA-226 | 36078. | 186.10 | 8.9824E+02 |
| AC-228 | 459. | 911.21 | 4.7935E+01 |
| TH-228 | 22291. | 84.37 | 2.6614E+03 |
| TH-229 | 22755. | 88.47 | 1.2654E+02 |
| U-232 | 20661. | 57.78 | 6.7957E+04 |
| PA-233 | 25335. | 312.17 | 1.0210E+02 |
| PA-234M | 309. | 1001.03 | 1.9243E+01 |
| TH-234 | 21022. | 63.29 | 1.7408E+03 |
| U-235 | 35753. | 185.71 | 5.4347E+01 |
| NP-237 | 22510. | 86.48 | 2.6081E+02 |
| U-237 | 20956. | 59.54 | 3.1978E+02 |
| NP-238 | 332. | 984.45 | 4.1930E+01 |
| NP-239 | 23600. | 106.12 | 1.1096E+02 |
| PU-239 | 26519. | 129.30 | 3.7467E+05 |
| AM-241 | 20956. | 59.54 | 3.0671E+02 |
| AM-243 | 21685. | 74.67 | 7.3332E+01 |

```
*****************************************************************************
* 222-S Laboratory Counting Room    2-OCT-1995 11:10:31.16                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2520
Sample ID:               S95T2411-DUP                    Removed by:
Sample Size:             1.00000E-03 LI
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3                            Verified by:
File Number:             dka300:[spec.GEA3]3g3355.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:52:15.00 sec
Dead Time:               4.3%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       2-OCT-1995 10:17:20.32
Decayed to:              2-OCT-1995 10:17:20.32
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 ALJ
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:      11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:  15-MAR-1994 10:28:40.20
*****************************************************************************
```

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/LI |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 661.49* | 1061478 | 1.53 | 1323.16 | 1315 | 17 | 0.2 | | CS-137 | 1.212E+05 |
| 0 | 1321.96 | 271 | 2.87 | 2644.29 | 2636 | 20 | 27.9 | | | |
| 0 | 1376.35 | 16 | 3.34 | 2753.12 | 2743 | 20 | 126.9 | | | |

Summary of Nuclide Activity
Sample ID : S95T2411-DUP



Acquisition date : 2-OCT-1995 10:17:20

| | | |
|---|---|---|
| Total number of lines in spectrum | 3 | |
| Number of unidentified lines | 2 | |
| Number of lines tentatively identified by NID | 1 | 33.33% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/LI | Wtd Mean Decay Corr uCi/LI | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CS-137 | 30.00Y | 1.000 | 1.212E+05 | 1.212E+05 | 0.002E+05 | 0.20 | |
| | | Total Activity : | 1.212E+05 | 1.212E+05 | | | |
| | | Grand Total Activity : | 1.212E+05 | 1.212E+05 | | | |

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

µCi/ml.

Co 60 < 3.7388 E-3

Cs 137 1.212 E+2

Sample ID : S95T2411-DUP Acquisition date : 2-OCT-1995 10:17:20

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/LI) |
|---|---|---|---|
| BE-7 | 32165. | 477.59 | 5.9676E+02 |
| NA-22 | 116. | 1274.53 | 8.5399E+00 |
| NA-24 | 9. | 1368.55 | 2.6329E+00 |
| K-40 | 141. | 1460.75 | 9.8302E+01 |
| SC-46 | 239. | 1120.55 | 1.1006E+01 |
| CR-51 | 25071. | 320.08 | 3.9648E+02 |
| MN-54 | 661. | 834.83 | 1.4199E+01 |
| CO-56 | 613. | 846.76 | 1.3842E+01 |
| CO-57 | 25824. | 122.06 | 2.8089E+01 |
| CO-58 | 710. | 810.78 | 1.4427E+01 |
| FE-59 | 226. | 1099.25 | 1.8632E+01 |
| CO-60 | 21. | 1332.50 | 3.7388E+00 ← |
| ZN-65 | 223. | 1115.55 | 2.0852E+01 |
| SE-75 | 27795. | 264.66 | 6.2541E+01 |
| KR-85 | 16228. | 514.00 | 1.0718E+04 |
| SR-85 | 16229. | 514.01 | 4.8464E+01 |
| Y-88 | 5. | 1836.06 | 2.3227E+00 |
| Y-90 | 6. | 1760.70 | 8.5123E+00 |
| Y-91 | 101. | 1204.67 | 2.5378E+03 |
| NB-94 | 553. | 871.09 | 1.3480E+01 |
| NB-95 | 845. | 765.78 | 1.4937E+01 |
| ZR-95 | 870. | 756.73 | 2.7477E+01 |
| RU-103 | 19763. | 497.08 | 5.4925E+01 |
| RURH-106 | 5709. | 621.93 | 6.5393E+02 |
| AG-108m | 974. | 722.94 | 1.6771E+01 |
| CD-109 | 22389. | 88.03 | 8.6604E+02 |
| AG-110M | 25702. | 657.76 | 7.6275E+01 |
| SN-113 | 27760. | 391.69 | 7.6504E+01 |
| TE-123m | 26847. | 159.00 | 2.9464E+01 |
| SB-124 | 6035. | 602.73 | 3.3208E+01 |
| SB-125 | 32135. | 427.89 | 1.9216E+02 |
| TE-125m | 23754. | 109.27 | 8.7711E+03 |
| I-129 | 20940. | 39.60 | 0.0000E+00 |
| I-131 | 25873. | 364.48 | 5.5227E+01 |
| XE-131m | 26951. | 163.93 | 1.2841E+03 |
| BA-133 | 25598. | 356.02 | 7.0528E+01 |
| CS-134 | 5991. | 604.70 | 3.3242E+01 |
| CS-136 | 661. | 818.51 | 1.4013E+01 |
| CS-138 | 9. | 1435.86 | 5.6996E+00 |
| CE-139 | 27048. | 165.85 | 3.1715E+01 |
| BA-140 | 11633. | 537.31 | 1.6769E+02 |
| LA-140 | 8. | 1596.21 | 2.7835E+00 |
| CE-141 | 26663. | 145.44 | 4.9855E+01 |
| CE-144 | 26518. | 133.51 | 2.1545E+02 |
| CEPR-144 | 26518. | 133.51 | 4.3051E+02 |
| EU-152 | 14. | 1408.01 | 1.5231E+01 |
| EU-154 | 116. | 1274.51 | 2.4802E+01 |
| EU-155 | 22363. | 86.54 | 9.8144E+01 |
| HF-181 | 25894. | 482.18 | 6.9371E+01 |
| TA-182 | 21041. | 67.75 | 1.4300E+02 |
| HG-203 | 26870. | 279.20 | 4.5855E+01 |

Sample ID : S95T2411-DUP Acquisition date : 2-OCT-1995 10:17:20

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/LI) |
|---|---|---|---|
| BI-207 | 7126. | 569.70 | 3.4376E+01 |
| TL-208 | 26964. | 277.36 | 5.9010E+02 |
| PB-210 | 20687. | 46.50 | 0.0000E+00 |
| BI-212 | 948. | 727.18 | 2.2715E+02 |
| PB-212 | 30759. | 238.63 | 8.1824E+01 |
| BI-214 | 5931. | 609.31 | 7.2521E+01 |
| PB-214 | 25433. | 351.92 | 2.2026E+02 |
| RA-224 | 30543. | 240.99 | 9.0540E+02 |
| RA-226 | 36288. | 186.10 | 9.0087E+02 |
| AC-228 | 463. | 911.21 | 4.8147E+01 |
| TH-228 | 22255. | 84.37 | 2.6592E+03 |
| TH-229 | 22398. | 88.47 | 1.2555E+02 |
| U-232 | 20501. | 57.78 | 6.7693E+04 |
| PA-233 | 25159. | 312.17 | 1.0175E+02 |
| PA-234M | 306. | 1001.03 | 1.9133E+01 |
| TH-234 | 20718. | 63.29 | 1.7282E+03 |
| U-235 | 35880. | 185.71 | 5.4444E+01 |
| NP-237 | 22366. | 86.48 | 2.5998E+02 |
| U-237 | 20561. | 59.54 | 3.1676E+02 |
| NP-238 | 310. | 984.45 | 4.0560E+01 |
| NP-239 | 23385. | 106.12 | 1.1045E+02 |
| PU-239 | 26654. | 129.30 | 3.7561E+05 |
| AM-241 | 20561. | 59.54 | 3.0381E+02 |
| AM-243 | 21570. | 74.67 | 7.3138E+01 |

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*****************************************************************************
* 222-S Laboratory Counting Room    2-OCT-1995 12:05:19.61                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2520
Sample ID:               S95T2412                          Removed by:
Sample Size:             1.00000E-03 LI
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3                              Verified by:
File Number:             dka300:[spec.GEA3]3g3356.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:52:17.54 sec
Dead Time:               4.4%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       2-OCT-1995 11:12:04.97
Decayed to:              2-OCT-1995 11:12:04.97
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 ALJ
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*****************************************************************************
```

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/LI |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 661.48* | 1077744 | 1.54 | 1323.14 | 1315 | 17 | 0.2 | | CS-137 | 1.230E+05 |
| 0 | 1322.40 | 211 | 2.36 | 2645.17 | 2639 | 13 | 28.3 | | | |

Summary of Nuclide Activity
Sample ID : S95T2412



Acquisition date : 2-OCT-1995 11:12:04

| | | |
|---|---|---|
| Total number of lines in spectrum | 2 | |
| Number of unidentified lines | 1 | |
| Number of lines tentatively identified by NID | 1 | 50.00% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/LI | Wtd Mean Decay Corr uCi/LI | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CS-137 | 30.00Y | 1.000 | 1.230E+05 | 1.230E+05 | 0.002E+05 | 0.20 | |
| | | Total Activity : | 1.230E+05 | 1.230E+05 | | | |
| | | Grand Total Activity : | 1.230E+05 | 1.230E+05 | | | |

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

µCi/ml

Co-60 < 4.1829 E-3

Cs-137 1.230 E+2

Sample ID : S95T2412 Acquisition date : 2-OCT-1995 11:12:04

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/LI) |
|---|---|---|---|
| BE-7 | 32789. | 477.59 | 6.0252E+02 |
| NA-22 | 145. | 1274.53 | 9.5605E+00 |
| NA-24 | 11. | 1368.55 | 2.8989E+00 |
| K-40 | 134. | 1460.75 | 9.5676E+01 |
| SC-46 | 233. | 1120.55 | 1.0849E+01 |
| CR-51 | 25648. | 320.08 | 4.0102E+02 |
| MN-54 | 708. | 834.83 | 1.4691E+01 |
| CO-56 | 650. | 846.76 | 1.4261E+01 |
| CO-57 | 26510. | 122.06 | 2.8460E+01 |
| CO-58 | 644. | 810.78 | 1.3739E+01 |
| FE-59 | 218. | 1099.25 | 1.8297E+01 |
| CO-60 | 26. | 1332.50 | 4.1829E+00 |
| ZN-65 | 257. | 1115.55 | 2.2393E+01 |
| SE-75 | 28358. | 264.66 | 6.3172E+01 |
| KR-85 | 16549. | 514.00 | 1.0823E+04 |
| SR-85 | 16547. | 514.01 | 4.8937E+01 |
| Y-88 | 3. | 1836.06 | 1.8285E+00 |
| Y-90 | 9. | 1760.70 | 1.0765E+01 |
| Y-91 | 100. | 1204.67 | 2.5276E+03 |
| NB-94 | 578. | 871.09 | 1.3780E+01 |
| NB-95 | 834. | 765.78 | 1.4841E+01 |
| ZR-95 | 880. | 756.73 | 2.7622E+01 |
| RU-103 | 20324. | 497.08 | 5.5700E+01 |
| RURH-106 | 5928. | 621.93 | 6.6634E+02 |
| AG-108m | 992. | 722.94 | 1.6931E+01 |
| CD-109 | 23036. | 88.03 | 8.7847E+02 |
| AG-110M | 26419. | 657.76 | 7.7332E+01 |
| SN-113 | 28200. | 391.69 | 7.7108E+01 |
| TE-123m | 27253. | 159.00 | 2.9686E+01 |
| SB-124 | 6313. | 602.73 | 3.3966E+01 |
| SB-125 | 32987. | 427.89 | 1.9469E+02 |
| TE-125m | 24403. | 109.27 | 8.8901E+03 |
| I-129 | 21378. | 39.60 | 0.0000E+00 |
| I-131 | 26462. | 364.48 | 5.5852E+01 |
| XE-131m | 27323. | 163.93 | 1.2929E+03 |
| BA-133 | 25942. | 356.02 | 7.1001E+01 |
| CS-134 | 6303. | 604.70 | 3.4095E+01 |
| CS-136 | 731. | 818.51 | 1.4733E+01 |
| CS-138 | 10. | 1435.86 | 5.9020E+00 |
| CE-139 | 27363. | 165.85 | 3.1899E+01 |
| BA-140 | 11853. | 537.31 | 1.6927E+02 |
| LA-140 | 1. | 1596.21 | 7.4935E-01 |
| CE-141 | 27370. | 145.44 | 5.0512E+01 |
| CE-144 | 27304. | 133.51 | 2.1862E+02 |
| CEPR-144 | 27306. | 133.51 | 4.3686E+02 |
| EU-152 | 9. | 1408.01 | 1.2323E+01 |
| EU-154 | 146. | 1274.51 | 2.7788E+01 |
| EU-155 | 22950. | 86.54 | 9.9424E+01 |
| HF-181 | 26244. | 482.18 | 6.9838E+01 |
| TA-182 | 21672. | 67.75 | 1.4513E+02 |
| HG-203 | 27054. | 279.20 | 4.6012E+01 |

Sample ID : S95T2412 Acquisition date : 2-OCT-1995 11:12:04

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/LI) |
|---|---|---|---|
| BI-207 | 7109. | 569.70 | 3.4335E+01 |
| TL-208 | 27075. | 277.36 | 5.9131E+02 |
| PB-210 | 21064. | 46.50 | 0.0000E+00 |
| BI-212 | 1010. | 727.18 | 2.3437E+02 |
| PB-212 | 31576. | 238.63 | 8.2904E+01 |
| BI-214 | 6065. | 609.31 | 7.3333E+01 |
| PB-214 | 25891. | 351.92 | 2.2234E+02 |
| RA-224 | 31318. | 240.99 | 9.1682E+02 |
| RA-226 | 36485. | 186.10 | 9.0330E+02 |
| AC-228 | 496. | 911.21 | 4.9833E+01 |
| TH-228 | 22621. | 84.37 | 2.6810E+03 |
| TH-229 | 22954. | 88.47 | 1.2709E+02 |
| U-232 | 21005. | 57.78 | 6.8520E+04 |
| PA-233 | 25797. | 312.17 | 1.0303E+02 |
| PA-234M | 347. | 1001.03 | 2.0368E+01 |
| TH-234 | 21254. | 63.29 | 1.7504E+03 |
| U-235 | 36040. | 185.71 | 5.4565E+01 |
| NP-237 | 22951. | 86.48 | 2.6336E+02 |
| U-237 | 21137. | 59.54 | 3.2117E+02 |
| NP-238 | 354. | 984.45 | 4.3295E+01 |
| NP-239 | 24093. | 106.12 | 1.1211E+02 |
| PU-239 | 26943. | 129.30 | 3.7765E+05 |
| AM-241 | 21137. | 59.54 | 3.0803E+02 |
| AM-243 | 21755. | 74.67 | 7.3451E+01 |

```
*****************************************************************************
* 222-S Laboratory Counting Room    2-OCT-1995 13:22:51.67                  *
*****************************************************************************
     >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2520
Sample ID:               S95T2412-DUP
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02

     >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3357.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:52:18.04 sec
Dead Time:               4.4%

     >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       2-OCT-1995 12:29:54.80
Decayed to:              2-OCT-1995 12:29:54.80
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 ALJ
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

     >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*****************************************************************************
```

Removed by: [signature]

Verified by: [signature] 10/3/95

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/L |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 661.48* | 1084929 | 1.53 | 1323.15 | 1315 | 17 | 0.2 | | CS-137 | 1.239E+05 |
| 0 | 1321.79 | 351 | 3.43 | 2643.94 | 2636 | 18 | 20.9 | | | |

Summary of Nuclide Activity
Sample ID : S95T2412-DUP



Acquisition date : 2-OCT-1995 12:29:54

| | | |
|---|---|---|
| Total number of lines in spectrum | 2 | |
| Number of unidentified lines | 1 | |
| Number of lines tentatively identified by NID | 1 | 50.00% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/L | Wtd Mean Decay Corr uCi/L | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CS-137 | 30.00Y | 1.000 | 1.239E+05 | 1.239E+05 | 0.002E+05 | 0.20 | |
| | | Total Activity : | 1.239E+05 | 1.239E+05 | | | |
| | | Grand Total Activity : | 1.239E+05 | 1.239E+05 | | | |

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

uCi/ml
Co-60 < 4.3060 E-3
Cs137 1.239 E+2

WHC-SD-WM-DP-148, REV. 0

Minimum Detectable Activity Report
Sample ID : S95T2412-DUP


Acquisition date : 2-OCT-1995 12:29:54

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BE-7 | 32597. | 477.59 | 6.0075E+02 |
| NA-22 | 104. | 1274.53 | 8.0867E+00 |
| NA-24 | 9. | 1368.55 | 2.6075E+00 |
| K-40 | 145. | 1460.75 | 9.9477E+01 |
| SC-46 | 233. | 1120.55 | 1.0859E+01 |
| CR-51 | 25316. | 320.08 | 3.9842E+02 |
| MN-54 | 673. | 834.83 | 1.4330E+01 |
| CO-56 | 681. | 846.76 | 1.4590E+01 |
| CO-57 | 26325. | 122.06 | 2.8360E+01 |
| CO-58 | 726. | 810.78 | 1.4591E+01 |
| FE-59 | 271. | 1099.25 | 2.0379E+01 |
| CO-60 | 27. | 1332.50 | 4.3060E+00 ← |
| ZN-65 | 231. | 1115.55 | 2.1257E+01 |
| SE-75 | 28755. | 264.66 | 6.3612E+01 |
| KR-85 | 16595. | 514.00 | 1.0838E+04 |
| SR-85 | 16591. | 514.01 | 4.9002E+01 |
| Y-88 | 0. | 1836.06 | 0.0000E+00 |
| Y-90 | 11. | 1760.70 | 1.1786E+01 |
| Y-91 | 125. | 1204.67 | 2.8201E+03 |
| NB-94 | 580. | 871.09 | 1.3801E+01 |
| NB-95 | 819. | 765.78 | 1.4709E+01 |
| ZR-95 | 852. | 756.73 | 2.7194E+01 |
| RU-103 | 20049. | 497.08 | 5.5322E+01 |
| RURH-106 | 5939. | 621.93 | 6.6698E+02 |
| AG-108m | 1047. | 722.94 | 1.7387E+01 |
| CD-109 | 22723. | 88.03 | 8.7249E+02 |
| AG-110M | 26912. | 657.76 | 7.8051E+01 |
| SN-113 | 28282. | 391.69 | 7.7221E+01 |
| TE-123m | 27186. | 159.00 | 2.9650E+01 |
| SB-124 | 6214. | 602.73 | 3.3698E+01 |
| SB-125 | 32990. | 427.89 | 1.9470E+02 |
| TE-125m | 24211. | 109.27 | 8.8550E+03 |
| I-129 | 21450. | 39.60 | 0.0000E+00 |
| I-131 | 26407. | 364.48 | 5.5794E+01 |
| XE-131m | 27631. | 163.93 | 1.3002E+03 |
| BA-133 | 26130. | 356.02 | 7.1257E+01 |
| CS-134 | 6092. | 604.70 | 3.3521E+01 |
| CS-136 | 714. | 818.51 | 1.4557E+01 |
| CS-138 | 11. | 1435.86 | 6.1865E+00 |
| CE-139 | 27450. | 165.85 | 3.1950E+01 |
| BA-140 | 11821. | 537.31 | 1.6904E+02 |
| LA-140 | 7. | 1596.21 | 2.5544E+00 |
| CE-141 | 27540. | 145.44 | 5.0669E+01 |
| CE-144 | 27015. | 133.51 | 2.1746E+02 |
| CEPR-144 | 27015. | 133.51 | 4.3453E+02 |
| EU-152 | 15. | 1408.01 | 1.5687E+01 |
| EU-154 | 104. | 1274.51 | 2.3476E+01 |
| EU-155 | 22910. | 86.54 | 9.9337E+01 |
| HF-181 | 26488. | 482.18 | 7.0162E+01 |
| TA-182 | 21305. | 67.75 | 1.4390E+02 |
| HG-203 | 27375. | 279.20 | 4.6284E+01 |

Sample ID : S95T2412-DUP Acquisition date : 2-OCT-1995 12:29:54

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BI-207 | 7471. | 569.70 | 3.5197E+01 |
| TL-208 | 27322. | 277.36 | 5.9400E+02 |
| PB-210 | 21025. | 46.50 | 0.0000E+00 |
| BI-212 | 1066. | 727.18 | 2.4083E+02 |
| PB-212 | 31689. | 238.63 | 8.3052E+01 |
| BI-214 | 6190. | 609.31 | 7.4087E+01 |
| PB-214 | 25884. | 351.92 | 2.2232E+02 |
| RA-224 | 31050. | 240.99 | 9.1289E+02 |
| RA-226 | 36599. | 186.10 | 9.0471E+02 |
| AC-228 | 500. | 911.21 | 5.0032E+01 |
| TH-228 | 22677. | 84.37 | 2.6843E+03 |
| TH-229 | 22731. | 88.47 | 1.2648E+02 |
| U-232 | 20881. | 57.78 | 6.8318E+04 |
| PA-233 | 25891. | 312.17 | 1.0322E+02 |
| PA-234M | 307. | 1001.03 | 1.9177E+01 |
| TH-234 | 21064. | 63.29 | 1.7425E+03 |
| U-235 | 36298. | 185.71 | 5.4760E+01 |
| NP-237 | 22918. | 86.48 | 2.6317E+02 |
| U-237 | 20979. | 59.54 | 3.1996E+02 |
| NP-238 | 354. | 984.45 | 4.3337E+01 |
| NP-239 | 23708. | 106.12 | 1.1121E+02 |
| PU-239 | 27113. | 129.30 | 3.7884E+05 |
| AM-241 | 20979. | 59.54 | 3.0688E+02 |
| AM-243 | 21947. | 74.67 | 7.3774E+01 |

```
*************************************************************************
* 222-S Laboratory Counting Room    2-OCT-1995 14:23:49.14              *
*************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2520
Sample ID:               S95T2413-SAM
Sample Size:             1.00000E-03 LI
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3358.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:52:10.63 sec
Dead Time:               4.2%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       2-OCT-1995 13:30:53.49
Decayed to:              2-OCT-1995 13:30:53.49
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 ALJ
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*************************************************************************
```

Removed by: [signature]

Verified by: B Machelor 10/3/95

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/LI |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 661.48* | 1029913 | 1.53 | 1323.13 | 1315 | 17 | 0.2 | | CS-137 | 1.176E+05 |
| 0 | 1322.29 | 195 | 1.91 | 2644.94 | 2639 | 13 | 29.4 | | | |

Summary of Nuclide Activity
Sample ID : S95T2413-SAM



Acquisition date : 2-OCT-1995 13:30:53

| | | |
|---|---|---|
| Total number of lines in spectrum | 2 | |
| Number of unidentified lines | 1 | |
| Number of lines tentatively identified by NID | 1 | 50.00% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/LI | Wtd Mean Decay Corr uCi/LI | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CS-137 | 30.00Y | 1.000 | 1.176E+05 | 1.176E+05 | 0.002E+05 | 0.20 | |
| | | Total Activity : | 1.176E+05 | 1.176E+05 | | | |
| | | Grand Total Activity : | 1.176E+05 | 1.176E+05 | | | |

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

uCi/ml
Co60 < 4.4602 E-3 10/3/95
Cs137 1.176 E+2

WHC-SD-WM-DP-148, REV. 0

Sample ID : S95T2413-SAM Acquisition date : 2-OCT-1995 13:30:53

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/LI) |
|---|---|---|---|
| BE-7 | 31237. | 477.59 | 5.8808E+02 |
| NA-22 | 94. | 1274.53 | 7.7052E+00 |
| NA-24 | 15. | 1368.55 | 3.2958E+00 |
| K-40 | 155. | 1460.75 | 1.0286E+02 |
| SC-46 | 200. | 1120.55 | 1.0052E+01 |
| CR-51 | 24265. | 320.08 | 3.9006E+02 |
| MN-54 | 592. | 834.83 | 1.3436E+01 |
| CO-56 | 547. | 846.76 | 1.3077E+01 |
| CO-57 | 24972. | 122.06 | 2.7622E+01 |
| CO-58 | 682. | 810.78 | 1.4137E+01 |
| FE-59 | 227. | 1099.25 | 1.8668E+01 |
| CO-60 | 29. | 1332.50 | 4.4602E+00 |
| ZN-65 | 204. | 1115.55 | 1.9948E+01 |
| SE-75 | 26950. | 264.66 | 6.1583E+01 |
| KR-85 | 15866. | 514.00 | 1.0597E+04 |
| SR-85 | 15863. | 514.01 | 4.7915E+01 |
| Y-88 | 1. | 1836.06 | 1.0597E+00 |
| Y-90 | 6. | 1760.70 | 8.8285E+00 |
| Y-91 | 98. | 1204.67 | 2.4922E+03 |
| NB-94 | 515. | 871.09 | 1.3007E+01 |
| NB-95 | 734. | 765.78 | 1.3926E+01 |
| ZR-95 | 814. | 756.73 | 2.6565E+01 |
| RU-103 | 19120. | 497.08 | 5.4025E+01 |
| RURH-106 | 5606. | 621.93 | 6.4803E+02 |
| AG-108m | 957. | 722.94 | 1.6630E+01 |
| CD-109 | 21760. | 88.03 | 8.5379E+02 |
| AG-110M | 26017. | 657.76 | 7.6741E+01 |
| SN-113 | 26896. | 391.69 | 7.5305E+01 |
| TE-123m | 26000. | 159.00 | 2.8996E+01 |
| SB-124 | 5989. | 602.73 | 3.3083E+01 |
| SB-125 | 31490. | 427.89 | 1.9022E+02 |
| TE-125m | 23283. | 109.27 | 8.6836E+03 |
| I-129 | 20310. | 39.60 | 0.0000E+00 |
| I-131 | 25037. | 364.48 | 5.4327E+01 |
| XE-131m | 25959. | 163.93 | 1.2602E+03 |
| BA-133 | 24820. | 356.02 | 6.9448E+01 |
| CS-134 | 5927. | 604.70 | 3.3062E+01 |
| CS-136 | 639. | 818.51 | 1.3776E+01 |
| CS-138 | 7. | 1435.86 | 5.1704E+00 |
| CE-139 | 26288. | 165.85 | 3.1266E+01 |
| BA-140 | 11140. | 537.31 | 1.6410E+02 |
| LA-140 | 6. | 1596.21 | 2.3729E+00 |
| CE-141 | 26023. | 145.44 | 4.9254E+01 |
| CE-144 | 25467. | 133.51 | 2.1114E+02 |
| CEPR-144 | 25466. | 133.51 | 4.2189E+02 |
| EU-152 | 6. | 1408.01 | 1.0062E+01 |
| EU-154 | 94. | 1274.51 | 2.2372E+01 |
| EU-155 | 21878. | 86.54 | 9.7074E+01 |
| HF-181 | 25038. | 482.18 | 6.8213E+01 |
| TA-182 | 20350. | 67.75 | 1.4064E+02 |
| HG-203 | 25876. | 279.20 | 4.4999E+01 |

Sample ID : S95T2413-SAM Acquisition date : 2-OCT-1995 13:30:53

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/LI) |
|---|---|---|---|
| BI-207 | 6870. | 569.70 | 3.3754E+01 |
| TL-208 | 25942. | 277.36 | 5.7881E+02 |
| PB-210 | 20013. | 46.50 | 0.0000E+00 |
| BI-212 | 916. | 727.18 | 2.2328E+02 |
| PB-212 | 30414. | 238.63 | 8.1364E+01 |
| BI-214 | 5862. | 609.31 | 7.2097E+01 |
| PB-214 | 24705. | 351.92 | 2.1693E+02 |
| RA-224 | 29956. | 240.99 | 8.9666E+02 |
| RA-226 | 34716. | 186.10 | 8.8113E+02 |
| AC-228 | 434. | 911.21 | 4.6596E+01 |
| TH-228 | 21700. | 84.37 | 2.6258E+03 |
| TH-229 | 21786. | 88.47 | 1.2382E+02 |
| U-232 | 20113. | 57.78 | 6.7050E+04 |
| PA-233 | 24501. | 312.17 | 1.0041E+02 |
| PA-234M | 317. | 1001.03 | 1.9468E+01 |
| TH-234 | 20056. | 63.29 | 1.7003E+03 |
| U-235 | 34336. | 185.71 | 5.3259E+01 |
| NP-237 | 21880. | 86.48 | 2.5714E+02 |
| U-237 | 19905. | 59.54 | 3.1166E+02 |
| NP-238 | 322. | 984.45 | 4.1281E+01 |
| NP-239 | 22752. | 106.12 | 1.0894E+02 |
| PU-239 | 25748. | 129.30 | 3.6918E+05 |
| AM-241 | 19905. | 59.54 | 2.9892E+02 |
| AM-243 | 20835. | 74.67 | 7.1881E+01 |

```
*****************************************************************************
* 222-S Laboratory Counting Room    3-OCT-1995 08:31:16.18                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2520
Sample ID:               S95T2413-DUP
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3370.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:53:45.19 sec
Dead Time:               7.0%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       3-OCT-1995 07:36:50.03
Decayed to:              3-OCT-1995 07:36:50.03
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 MB
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*****************************************************************************
```

Removed by: S E Hogan

Verified by: D Machelor 10/3/95

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/L |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 186.23* | 996 | 1.63 | 372.89 | 370 | 6 | 70.4 | | RA-226 | 1.013E+03 |
| 0 | 474.06 | 2105 | 1.58 | 948.35 | 945 | 8 | 38.9 | | | |
| 0 | 661.49* | 1717809 | 1.54 | 1323.15 | 1315 | 17 | 0.2 | | CS-137 | 1.961E+05 |
| 0 | 1321.86 | 830 | 2.25 | 2644.10 | 2636 | 16 | 12.9 | | | |

Summary of Nuclide Activity
Sample ID : S95T2413-DUP



Acquisition date : 3-OCT-1995 07:36:50

| | | |
|---|---|---|
| Total number of lines in spectrum | 4 | |
| Number of unidentified lines | 2 | |
| Number of lines tentatively identified by NID | 2 | 50.00% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/L | Wtd Mean Decay Corr uCi/L | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CS-137 | 30.00Y | 1.000 | 1.961E+05 | 1.961E+05 | 0.003E+05 | 0.16 | |
| ~~RA-226~~ | ~~1600.00Y~~ | ~~1.000~~ | ~~1.013E+03~~ | ~~1.013E+03~~ | ~~0.714E+03~~ | ~~70.41~~ | BKG 10/03/95 |
| Total Activity : | | | 1.971E+05 | 1.971E+05 | | | |
| Grand Total Activity : | | | 1.971E+05 | 1.971E+05 | | | |

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

µCi/ml

Co-60 < 5.9090 E-3

Cs 137 1.961 E+2

WHC-SD-WM-DP-148, REV. 0

Sample ID : S95T2413-DUP Acquisition date : 3-OCT-1995 07:36:50

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BE-7 | 52071. | 477.59 | 7.5929E+02 |
| NA-22 | 272. | 1274.53 | 1.3081E+01 |
| NA-24 | 18. | 1368.55 | 3.6259E+00 |
| K-40 | 129. | 1460.75 | 9.4030E+01 |
| SC-46 | 539. | 1120.55 | 1.6520E+01 |
| CR-51 | 41122. | 320.08 | 5.0779E+02 |
| MN-54 | 1723. | 834.83 | 2.2919E+01 |
| CO-56 | 1627. | 846.76 | 2.2559E+01 |
| CO-57 | 41745. | 122.06 | 3.5713E+01 |
| CO-58 | 1851. | 810.78 | 2.3298E+01 |
| FE-59 | 559. | 1099.25 | 2.9271E+01 |
| CO-60 | 52. | 1332.50 | 5.9090E+00 |
| ZN-65 | 539. | 1115.55 | 3.2441E+01 |
| SE-75 | 45179. | 264.66 | 7.9736E+01 |
| KR-85 | 26678. | 514.00 | 1.3742E+04 |
| SR-85 | 26674. | 514.01 | 6.2133E+01 |
| Y-88 | 1. | 1836.06 | 1.0597E+00 |
| Y-90 | 8. | 1760.70 | 1.0184E+01 |
| Y-91 | 283. | 1204.67 | 4.2417E+03 |
| NB-94 | 1512. | 871.09 | 2.2290E+01 |
| NB-95 | 2130. | 765.78 | 2.3720E+01 |
| ZR-95 | 2246. | 756.73 | 4.4139E+01 |
| RU-103 | 32681. | 497.08 | 7.0632E+01 |
| RURH-106 | 9734. | 621.93 | 8.5389E+02 |
| AG-108m | 2707. | 722.94 | 2.7964E+01 |
| CD-109 | 36251. | 88.03 | 1.1020E+03 |
| AG-110M | 43179. | 657.76 | 9.8864E+01 |
| SN-113 | 45465. | 391.69 | 9.7908E+01 |
| TE-123m | 43289. | 159.00 | 3.7414E+01 |
| SB-124 | 10491. | 602.73 | 4.3786E+01 |
| SB-125 | 52771. | 427.89 | 2.4625E+02 |
| TE-125m | 38529. | 109.27 | 1.1171E+04 |
| I-129 | 33794. | 39.60 | 0.0000E+00 |
| I-131 | 42463. | 364.48 | 7.0754E+01 |
| XE-131m | 44055. | 163.93 | 1.6418E+03 |
| BA-133 | 41817. | 356.02 | 9.0143E+01 |
| CS-134 | 10496. | 604.70 | 4.3998E+01 |
| CS-136 | 1818. | 818.51 | 2.3238E+01 |
| CS-138 | 21. | 1435.86 | 8.7841E+00 |
| CE-139 | 43993. | 165.85 | 4.0448E+01 |
| BA-140 | 19367. | 537.31 | 2.1637E+02 |
| LA-140 | 12. | 1596.21 | 3.4247E+00 |
| CE-141 | 43203. | 145.44 | 6.3463E+01 |
| CE-144 | 43182. | 133.51 | 2.7493E+02 |
| CEPR-144 | 43182. | 133.51 | 5.4937E+02 |
| EU-152 | 29. | 1408.01 | 2.1962E+01 |
| EU-154 | 272. | 1274.51 | 3.7968E+01 |
| EU-155 | 36207. | 86.54 | 1.2488E+02 |
| HF-181 | 42746. | 482.18 | 8.9130E+01 |
| TA-182 | 33718. | 67.75 | 1.8103E+02 |
| HG-203 | 43350. | 279.20 | 5.8244E+01 |

Sample ID : S95T2413-DUP Acquisition date : 3-OCT-1995 07:36:50

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BI-207 | 12271. | 569.70 | 4.5109E+01 |
| TL-208 | 43258. | 277.36 | 7.4742E+02 |
| PB-210 | 33580. | 46.50 | 0.0000E+00 |
| BI-212 | 2703. | 727.18 | 3.8344E+02 |
| PB-212 | 50837. | 238.63 | 1.0519E+02 |
| BI-214 | 10319. | 609.31 | 9.5657E+01 |
| PB-214 | 41622. | 351.92 | 2.8607E+02 |
| RA-224 | 50094. | 240.99 | 1.1596E+03 |
| AC-228 | 1171. | 911.21 | 7.6573E+01 |
| TH-228 | 35984. | 84.37 | 3.3814E+03 |
| TH-229 | 36285. | 88.47 | 1.5980E+02 |
| U-232 | 32983. | 57.78 | 8.5862E+04 |
| PA-233 | 41028. | 312.17 | 1.2993E+02 |
| PA-234M | 836. | 1001.03 | 3.1633E+01 |
| TH-234 | 32944. | 63.29 | 2.1792E+03 |
| U-235 | 57846. | 185.71 | 6.9129E+01 |
| NP-237 | 36187. | 86.48 | 3.3069E+02 |
| U-237 | 33353. | 59.54 | 4.0345E+02 |
| NP-238 | 880. | 984.45 | 6.8283E+01 |
| NP-239 | 37988. | 106.12 | 1.4079E+02 |
| PU-239 | 42788. | 129.30 | 4.7591E+05 |
| AM-241 | 33353. | 59.54 | 3.8694E+02 |
| AM-243 | 34712. | 74.67 | 9.2781E+01 |

# LABCORE Data Entry Template for Worklist# 2754

**Analyst:** SMF **Instrument:** GEA00 ~~W C38931~~ 3 **Book#** 144B52
RAL 10/30/95

**Method:** LA-548-121 Rev/Mod D-1

**Worklist Comment:** GEA AN-101; 0.100-10-1.0 dil. of sample. Re-run#1 (RPD).-PPB

| S | Type | Sample# | R | A | Test | Matrix | Group# | Project |
|---|---|---|---|---|---|---|---|---|
| 1 | STD | 1.0 ml | | | @GEA-01 | LIQUID | | |
| 2 | BLNK | | | | @GEA-01 | LIQUID | | |
| 3 | SAMPLE | S95T002413 | 0 | | @GEA-01 | LIQUID | 95000135 | AN-101 GRAB |
| | | Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E | | | | | | |
| 4 | DUP | S95T002413 | 0 | | @GEA-01 | LIQUID | | |

## Final page for worklist # 2754

SMFulton 10·13·95 1525
Analyst Signature Date

D.H. Mathias 10-16-95
Analyst Signature Date

*Data Entry Comments:*

Samples - .100ml → 10 ml → 1.0ml

*S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.*

```
*************************************************************************
* 222-S Laboratory Counting Room   13-OCT-1995 01:28:39.82             *
*************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2754
Sample ID:               WL2754-TD
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3660.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:08.47 sec
Dead Time:               0.3%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       13-OCT-1995 00:37:51.70
Decayed to:              13-OCT-1995 00:37:51.70
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 VR
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*************************************************************************
```

Removed by: Raymond

Verified by: RW Jones

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/L |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 661.56* | 22697 | 1.54 | 1323.29 | 1316 | 16 | 1.5 | | CS-137 | 25.7 |
| 0 | 1173.02 | 13321 | 1.92 | 2346.32 | 2338 | 19 | 2.0 | | CO-60 | 21.0 |
| 0 | 1332.24 | 12035 | 1.86 | 2664.85 | 2657 | 18 | 1.9 | | CO-60 | 21.1 |

Sample ID : WL2754-TD Acquisition date : 13-OCT-1995 00:37:51

Total number of lines in spectrum 3
Number of unidentified lines 0
Number of lines tentatively identified by NID 3 100.00%

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/L | Wtd Mean Decay Corr uCi/L | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CO-60 | 5.27Y | 1.000 | 2.104E+01 | 2.104E+01 | 0.028E+01 | 1.35 | |
| CS-137 | 30.00Y | 1.000 | 2.565E+01 | 2.565E+01 | 0.037E+01 | 1.46 | |
| | | Total Activity : | 4.669E+01 | 4.669E+01 | | | |
| | | Grand Total Activity : | 4.669E+01 | 4.669E+01 | | | |

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

Sample ID : WL2754-TD Acquisition date : 13-OCT-1995 00:37:51

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BE-7 | 1114. | 477.59 | 1.0998E+00 |
| NA-22 | 83. | 1274.53 | 7.1563E-02 |
| NA-24 | 31. | 1368.55 | 4.7090E-02 |
| K-40 | 140. | 1460.75 | 9.6757E-01 |
| SC-46 | 461. | 1120.55 | 1.5126E-01 |
| CR-51 | 1091. | 320.08 | 8.1902E-01 |
| MN-54 | 633. | 834.83 | 1.3756E-01 |
| CO-56 | 610. | 846.76 | 1.3679E-01 |
| CO-57 | 1154. | 122.06 | 5.8783E-02 |
| CO-58 | 603. | 810.78 | 1.3164E-01 |
| FE-59 | 635. | 1099.25 | 3.0896E-01 |
| ZN-65 | 557. | 1115.55 | 3.2646E-01 |
| SE-75 | 1268. | 264.66 | 1.3228E-01 |
| KR-85 | 811. | 514.00 | 2.3721E+01 |
| SR-85 | 811. | 514.01 | 1.0724E-01 |
| Y-88 | 7. | 1836.06 | 2.7414E-02 |
| Y-90 | 17. | 1760.70 | 1.4784E-01 |
| Y-91 | 147. | 1204.67 | 3.0264E+01 |
| NB-94 | 670. | 871.09 | 1.4689E-01 |
| NB-95 | 542. | 765.78 | 1.1849E-01 |
| ZR-95 | 529. | 756.73 | 2.1219E-01 |
| RU-103 | 837. | 497.08 | 1.1189E-01 |
| RURH-106 | 569. | 621.93 | 2.0435E+00 |
| AG-108m | 477. | 722.94 | 1.1626E-01 |
| CD-109 | 1019. | 88.03 | 1.8289E+00 |
| AG-110M | 971. | 657.76 | 1.4675E-01 |
| SN-113 | 1080. | 391.69 | 1.4940E-01 |
| TE-123m | 1227. | 159.00 | 6.2368E-02 |
| SB-124 | 540. | 602.73 | 9.8381E-02 |
| SB-125 | 1121. | 427.89 | 3.5527E-01 |
| TE-125m | 1110. | 109.27 | 1.8776E+01 |
| I-129 | 1003. | 39.60 | 0.0000E+00 |
| I-131 | 1076. | 364.48 | 1.1152E-01 |
| XE-131m | 1197. | 163.93 | 2.6794E+00 |
| BA-133 | 1007. | 356.02 | 1.3849E-01 |
| CS-134 | 560. | 604.70 | 1.0062E-01 |
| CS-136 | 582. | 818.51 | 1.3015E-01 |
| CS-138 | 18. | 1435.86 | 7.7643E-02 |
| CE-139 | 1189. | 165.85 | 6.5828E-02 |
| BA-140 | 683. | 537.31 | 4.0239E-01 |
| LA-140 | 23. | 1596.21 | 4.7796E-02 |
| CE-141 | 1191. | 145.44 | 1.0434E-01 |
| CE-144 | 1186. | 133.51 | 4.5104E-01 |
| CEPR-144 | 1186. | 133.51 | 9.0129E-01 |
| EU-152 | 22. | 1408.01 | 1.9289E-01 |
| EU-154 | 83. | 1274.51 | 2.0796E-01 |
| EU-155 | 1010. | 86.54 | 2.0651E-01 |
| HF-181 | 939. | 482.18 | 1.3081E-01 |
| TA-182 | 995. | 67.75 | 3.0792E-01 |
| HG-203 | 1214. | 279.20 | 9.6499E-02 |
| BI-207 | 595. | 569.70 | 9.8318E-02 |

Sample ID : WL2754-TD Acquisition date : 13-OCT-1995 00:37:51

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| TL-208 | 1190. | 277.36 | 1.2275E+00 |
| PB-210 | 915. | 46.50 | 0.0000E+00 |
| BI-212 | 539. | 727.18 | 1.6949E+00 |
| PB-212 | 1430. | 238.63 | 1.7469E-01 |
| BI-214 | 564. | 609.31 | 2.2145E-01 |
| PB-214 | 1052. | 351.92 | 4.3407E-01 |
| RA-224 | 1386. | 240.99 | 1.9097E+00 |
| RA-226 | 1337. | 186.10 | 1.7120E+00 |
| AC-228 | 790. | 911.21 | 6.2253E-01 |
| TH-228 | 1026. | 84.37 | 5.6536E+00 |
| TH-229 | 1027. | 88.47 | 2.6622E-01 |
| U-232 | 898. | 57.78 | 1.4025E+02 |
| PA-233 | 1069. | 312.17 | 2.0767E-01 |
| PA-234M | 626. | 1001.03 | 2.7099E-01 |
| TH-234 | 955. | 63.29 | 3.6739E+00 |
| U-235 | 1333. | 185.71 | 1.0389E-01 |
| NP-237 | 1013. | 86.48 | 5.4772E-01 |
| U-237 | 938. | 59.54 | 6.6966E-01 |
| NP-238 | 703. | 984.45 | 6.0419E-01 |
| NP-239 | 1096. | 106.12 | 2.3674E-01 |
| PU-239 | 1171. | 129.30 | 7.7953E+02 |
| AM-241 | 938. | 59.54 | 6.4235E-01 |
| AM-243 | 978. | 74.67 | 1.5420E-01 |

```
*****************************************************************************
* 222-S Laboratory Counting Room   13-OCT-1995 09:18:08.94                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2754
Sample ID:               WORKLIST2754-BLK                Removed by:
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02                     D.A.M. Villicia

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3                            Verified by:
File Number:             dka300:[spec.GEA3]3g3666.cnf
Geometry:                42                              R.A. Jones
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:00.48 sec
Dead Time:               0.0%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       13-OCT-1995 08:27:28.16
Decayed to:              13-OCT-1995 08:27:28.16
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 DM
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*****************************************************************************
```

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/L |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 661.58* | 90 | 1.59 | 1323.33 | 1318 | 12 | 35.4 | | CS-137 | 10.2 |
| 0 | 687.34 | 15 | 1.23 | 1374.84 | 1372 | 6 | 79.5 | | | |

Sample ID : WORKLIST2754-BLK Acquisition date : 13-OCT-1995 08:27:28

| | | |
|---|---|---|
| Total number of lines in spectrum | 2 | |
| Number of unidentified lines | 1 | |
| Number of lines tentatively identified by NID | 1 | 50.00% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/L | Wtd Mean Decay Corr uCi/L | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CS-137 | 30.00Y | 1.000 | 1.022E+01 | 1.022E+01 | 0.362E+01 | 35.37 | |
| | | Total Activity : | 1.022E+01 | 1.022E+01 | | | |
| | | Grand Total Activity : | 1.022E+01 | 1.022E+01 | | | |

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

Minimum Detectable Activity Report
Sample ID : WORKLIST2754-BLK


Acquisition date : 13-OCT-1995 08:27:28

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BE-7 | 40. | 477.59 | 2.1087E+01 |
| NA-22 | 6. | 1274.53 | 2.0035E+00 |
| NA-24 | 6. | 1368.55 | 2.0949E+00 |
| K-40 | 121. | 1460.75 | 9.1078E+01 |
| SC-46 | 19. | 1120.55 | 3.1260E+00 |
| CR-51 | 63. | 320.08 | 1.9844E+01 |
| MN-54 | 15. | 834.83 | 2.1415E+00 |
| CO-56 | 19. | 846.76 | 2.4179E+00 |
| CO-57 | 83. | 122.06 | 1.5947E+00 |
| CO-58 | 12. | 810.78 | 1.9130E+00 |
| FE-59 | 13. | 1099.25 | 4.3888E+00 |
| CO-60 | 9. | 1332.50 | 2.4030E+00 |
| ZN-65 | 17. | 1115.55 | 5.6879E+00 |
| SE-75 | 51. | 264.66 | 2.6843E+00 |
| KR-85 | 50. | 514.00 | 5.9332E+02 |
| SR-85 | 50. | 514.01 | 2.6787E+00 |
| Y-88 | 5. | 1836.06 | 2.3695E+00 |
| Y-90 | 3. | 1760.70 | 6.3790E+00 |
| Y-91 | 13. | 1204.67 | 9.1507E+02 |
| NB-94 | 12. | 871.09 | 1.9683E+00 |
| NB-95 | 27. | 765.78 | 2.6666E+00 |
| ZR-95 | 19. | 756.73 | 4.0089E+00 |
| RU-103 | 32. | 497.08 | 2.2094E+00 |
| RURH-106 | 22. | 621.93 | 4.0670E+01 |
| AG-108m | 17. | 722.94 | 2.2398E+00 |
| CD-109 | 63. | 88.03 | 4.6083E+01 |
| AG-110M | 23. | 657.76 | 2.2712E+00 |
| SN-113 | 35. | 391.69 | 2.7173E+00 |
| TE-123m | 80. | 159.00 | 1.6109E+00 |
| SB-124 | 20. | 602.73 | 1.9269E+00 |
| SB-125 | 38. | 427.89 | 6.6478E+00 |
| TE-125m | 77. | 109.27 | 4.9928E+02 |
| I-129 | 47. | 39.60 | 0.0000E+00 |
| I-131 | 43. | 364.48 | 2.2556E+00 |
| XE-131m | 67. | 163.93 | 6.4103E+01 |
| BA-133 | 48. | 356.02 | 3.0409E+00 |
| CS-134 | 22. | 604.70 | 2.0087E+00 |
| CS-136 | 12. | 818.51 | 1.9164E+00 |
| CS-138 | 9. | 1435.86 | 5.5879E+00 |
| CE-139 | 72. | 165.85 | 1.6327E+00 |
| BA-140 | 38. | 537.31 | 9.5927E+00 |
| LA-140 | 2. | 1596.21 | 1.4095E+00 |
| CE-141 | 92. | 145.44 | 2.9312E+00 |
| CE-144 | 79. | 133.51 | 1.1737E+01 |
| CEPR-144 | 79. | 133.51 | 2.3463E+01 |
| EU-152 | 8. | 1408.01 | 1.1435E+01 |
| EU-154 | 6. | 1274.51 | 5.8209E+00 |
| EU-155 | 71. | 86.54 | 5.5279E+00 |
| HF-181 | 51. | 482.18 | 3.0682E+00 |
| TA-182 | 61. | 67.75 | 7.6994E+00 |
| HG-203 | 59. | 279.20 | 2.1553E+00 |

Sample ID : WORKLIST2754-BLK Acquisition date : 13-OCT-1995 08:27:28

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BI-207 | 26. | 569.70 | 2.0798E+00 |
| TL-208 | 63. | 277.36 | 2.8500E+01 |
| PB-210 | 52. | 46.50 | 0.0000E+00 |
| BI-212 | 26. | 727.18 | 3.7253E+01 |
| PB-212 | 102. | 238.63 | 4.7039E+00 |
| BI-214 | 71. | 609.31 | 7.9430E+00 |
| PB-214 | 77. | 351.92 | 1.1840E+01 |
| RA-224 | 77. | 240.99 | 4.5438E+01 |
| RA-226 | 77. | 186.10 | 4.1393E+01 |
| AC-228 | 37. | 911.21 | 1.3579E+01 |
| TH-228 | 77. | 84.37 | 1.5623E+02 |
| TH-229 | 61. | 88.47 | 6.5389E+00 |
| U-232 | 71. | 57.78 | 3.9877E+03 |
| PA-233 | 52. | 312.17 | 4.6169E+00 |
| PA-234M | 18. | 1001.03 | 4.6559E+00 |
| TH-234 | 55. | 63.29 | 8.9294E+01 |
| U-235 | 75. | 185.71 | 2.4839E+00 |
| NP-237 | 71. | 86.48 | 1.4688E+01 |
| U-237 | 57. | 59.54 | 1.6748E+01 |
| NP-238 | 9. | 984.45 | 7.0505E+00 |
| NP-239 | 56. | 106.12 | 5.4096E+00 |
| PU-239 | 57. | 129.30 | 1.7403E+04 |
| AM-241 | 57. | 59.54 | 1.6062E+01 |
| AM-243 | 83. | 74.67 | 4.5460E+00 |

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*************************************************************************
* 222-S Laboratory Counting Room   13-OCT-1995 08:11:39.53             *
*************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2754
Sample ID:               S95T2413-SAM                    Removed by:
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02                     D Hamilton

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3                            Verified by:
File Number:             NI3AC:1.cnf  spectrum# 3662     R K Jones
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:52:15.65 sec
Dead Time:               4.3%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       13-OCT-1995 03:50:49.89
Decayed to:              13-OCT-1995 03:50:49.89
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 DM
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*************************************************************************
```

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/L |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 661.53* | 1066528 | 1.57 | 1323.24 | 1315 | 17 | 0.2 | | CS-137 | 1.218E+05 |
| 0 | 1322.24 | 254 | 2.51 | 2644.85 | 2639 | 12 | 21.6 | | | |
| 0 | 1415.94 | 18 | 3.13 | 2832.32 | 2823 | 19 | 74.9 | | | |

Sample ID : S95T2413-SAM
Acquisition date : 13-OCT-1995 03:50:49

| | | |
|---|---|---|
| Total number of lines in spectrum | 3 | |
| Number of unidentified lines | 2 | |
| Number of lines tentatively identified by NID | 1 | 33.33% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/L | Wtd Mean Decay Corr uCi/L | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CS-137 | 30.00Y | 1.000 | 1.218E+05 | 1.218E+05 | 0.002E+05 | 0.20 | |
| | | Total Activity : | 1.218E+05 | 1.218E+05 | | | |
| | | Grand Total Activity : | 1.218E+05 | 1.218E+05 | | | |

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

Sample ID : S95T2413-SAM
Acquisition date : 13-OCT-1995 03:50:49

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BE-7 | 32207. | 477.59 | 5.9714E+02 |
| NA-22 | 115. | 1274.53 | 8.4871E+00 |
| NA-24 | 12. | 1368.55 | 2.9652E+00 |
| K-40 | 123. | 1460.75 | 9.1665E+01 |
| SC-46 | 214. | 1120.55 | 1.0412E+01 |
| CR-51 | 25659. | 320.08 | 4.0110E+02 |
| MN-54 | 678. | 834.83 | 1.4377E+01 |
| CO-56 | 657. | 846.76 | 1.4335E+01 |
| CO-57 | 25901. | 122.06 | 2.8131E+01 |
| CO-58 | 719. | 810.78 | 1.4520E+01 |
| FE-59 | 235. | 1099.25 | 1.8994E+01 |
| CO-60 | 22. | 1332.50 | 3.8636E+00 |
| ZN-65 | 196. | 1115.55 | 1.9589E+01 |
| SE-75 | 28035. | 264.66 | 6.2810E+01 |
| KR-85 | 16253. | 514.00 | 1.0726E+04 |
| SR-85 | 16249. | 514.01 | 4.8495E+01 |
| Y-88 | 4. | 1836.06 | 2.1194E+00 |
| Y-90 | 14. | 1760.70 | 1.3529E+01 |
| Y-91 | 103. | 1204.67 | 2.5627E+03 |
| NB-94 | 557. | 871.09 | 1.3525E+01 |
| NB-95 | 843. | 765.78 | 1.4920E+01 |
| ZR-95 | 877. | 756.73 | 2.7583E+01 |
| RU-103 | 19945. | 497.08 | 5.5178E+01 |
| RURH-106 | 5870. | 621.93 | 6.6309E+02 |
| AG-108m | 1017. | 722.94 | 1.7137E+01 |
| CD-109 | 22390. | 88.03 | 8.6607E+02 |
| AG-110M | 25653. | 657.76 | 7.6202E+01 |
| SN-113 | 27576. | 391.69 | 7.6250E+01 |
| TE-123m | 26968. | 159.00 | 2.9530E+01 |
| SB-124 | 6018. | 602.73 | 3.3161E+01 |
| SB-125 | 32356. | 427.89 | 1.9282E+02 |
| TE-125m | 23880. | 109.27 | 8.7943E+03 |
| I-129 | 21239. | 39.60 | 0.0000E+00 |
| I-131 | 26181. | 364.48 | 5.5555E+01 |
| XE-131m | 27178. | 163.93 | 1.2895E+03 |
| BA-133 | 25948. | 356.02 | 7.1009E+01 |
| CS-134 | 6088. | 604.70 | 3.3509E+01 |
| CS-136 | 721. | 818.51 | 1.4633E+01 |
| CS-138 | 14. | 1435.86 | 7.1093E+00 |
| CE-139 | 26844. | 165.85 | 3.1595E+01 |
| BA-140 | 11752. | 537.31 | 1.6855E+02 |
| LA-140 | 10. | 1596.21 | 3.1887E+00 |
| CE-141 | 26824. | 145.44 | 5.0006E+01 |
| CE-144 | 26924. | 133.51 | 2.1709E+02 |
| CEPR-144 | 26925. | 133.51 | 4.3380E+02 |
| EU-152 | 20. | 1408.01 | 1.8255E+01 |
| EU-154 | 114. | 1274.51 | 2.4632E+01 |
| EU-155 | 22460. | 86.54 | 9.8357E+01 |
| HF-181 | 25962. | 482.18 | 6.9462E+01 |
| TA-182 | 21068. | 67.75 | 1.4310E+02 |
| HG-203 | 26886. | 279.20 | 4.5869E+01 |

Sample ID : S95T2413-SAM Acquisition date : 13-OCT-1995 03:50:49

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BI-207 | 7335. | 569.70 | 3.4877E+01 |
| TL-208 | 26846. | 277.36 | 5.8880E+02 |
| PB-210 | 20690. | 46.50 | 0.0000E+00 |
| BI-212 | 1069. | 727.18 | 2.4120E+02 |
| PB-212 | 30908. | 238.63 | 8.2022E+01 |
| BI-214 | 6031. | 609.31 | 7.3130E+01 |
| PB-214 | 25515. | 351.92 | 2.2064E+02 |
| RA-224 | 30657. | 240.99 | 9.0709E+02 |
| RA-226 | 36518. | 186.10 | 9.0371E+02 |
| AC-228 | 457. | 911.21 | 4.7822E+01 |
| TH-228 | 22438. | 84.37 | 2.6701E+03 |
| TH-229 | 22413. | 88.47 | 1.2559E+02 |
| U-232 | 20631. | 57.78 | 6.7907E+04 |
| PA-233 | 25385. | 312.17 | 1.0220E+02 |
| PA-234M | 323. | 1001.03 | 1.9660E+01 |
| TH-234 | 20600. | 63.29 | 1.7232E+03 |
| U-235 | 36176. | 185.71 | 5.4667E+01 |
| NP-237 | 22471. | 86.48 | 2.6059E+02 |
| U-237 | 20733. | 59.54 | 3.1808E+02 |
| NP-238 | 330. | 984.45 | 4.1809E+01 |
| NP-239 | 23474. | 106.12 | 1.1066E+02 |
| PU-239 | 26595. | 129.30 | 3.7520E+05 |
| AM-241 | 20733. | 59.54 | 3.0507E+02 |
| AM-243 | 21764. | 74.67 | 7.3465E+01 |

```
*************************************************************************
* 222-S Laboratory Counting Room   13-OCT-1995 08:13:27.57             *
*************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              2754
Sample ID:               S95T2413-DUP                    Removed by:
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02                     D H Mitchia

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3                            Verified by:
File Number:             NI3AC:1.cnf   Spectrum # 3663
Geometry:                42                              R H Jensen
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:52:18.57 sec
Dead Time:               4.4%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       13-OCT-1995 05:33:20.32
Decayed to:              13-OCT-1995 05:33:20.32
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 DM
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*************************************************************************
```

Post-NID Peak Search Report

| It | Energy | Area | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides | Activity uCi/L |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 661.53* | 1091282 | 1.57 | 1323.24 | 1315 | 17 | 0.2 | | CS-137 | 1.246E+05 |
| 0 | 1322.00 | 290 | 2.51 | 2644.37 | 2638 | 14 | 21.9 | | | |

Sample ID : S95T2413-DUP
Acquisition date : 13-OCT-1995 05:33:20

| | | |
|---|---|---|
| Total number of lines in spectrum | 2 | |
| Number of unidentified lines | 1 | |
| Number of lines tentatively identified by NID | 1 | 50.00% |

Nuclide Type :

| Nuclide | Hlife | Decay | Wtd Mean Uncorrected uCi/L | Wtd Mean Decay Corr uCi/L | Decay Corr 2-Sigma Error | 2-Sigma %Error | Flags |
|---|---|---|---|---|---|---|---|
| CS-137 | 30.00Y | 1.000 | 1.246E+05 | 1.246E+05 | 0.002E+05 | 0.20 | |
| | | Total Activity : | 1.246E+05 | 1.246E+05 | | | |
| | | Grand Total Activity : | 1.246E+05 | 1.246E+05 | | | |

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

Sample ID : S95T2413-DUP Acquisition date : 13-OCT-1995 05:33:20

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BE-7 | 33131. | 477.59 | 6.0566E+02 |
| NA-22 | 129. | 1274.53 | 9.0077E+00 |
| NA-24 | 8. | 1368.55 | 2.3934E+00 |
| K-40 | 128. | 1460.75 | 9.3478E+01 |
| SC-46 | 219. | 1120.55 | 1.0533E+01 |
| CR-51 | 25463. | 320.08 | 3.9957E+02 |
| MN-54 | 707. | 834.83 | 1.4684E+01 |
| CO-56 | 660. | 846.76 | 1.4369E+01 |
| CO-57 | 26639. | 122.06 | 2.8529E+01 |
| CO-58 | 739. | 810.78 | 1.4723E+01 |
| FE-59 | 247. | 1099.25 | 1.9446E+01 |
| CO-60 | 31. | 1332.50 | 4.5613E+00 |
| ZN-65 | 217. | 1115.55 | 2.0567E+01 |
| SE-75 | 28544. | 264.66 | 6.3378E+01 |
| KR-85 | 16931. | 514.00 | 1.0947E+04 |
| SR-85 | 16928. | 514.01 | 4.9497E+01 |
| Y-88 | 3. | 1836.06 | 1.8354E+00 |
| Y-90 | 6. | 1760.70 | 9.0232E+00 |
| Y-91 | 110. | 1204.67 | 2.6472E+03 |
| NB-94 | 550. | 871.09 | 1.3438E+01 |
| NB-95 | 803. | 765.78 | 1.4560E+01 |
| ZR-95 | 876. | 756.73 | 2.7561E+01 |
| RU-103 | 20494. | 497.08 | 5.5932E+01 |
| RURH-106 | 6131. | 621.93 | 6.7766E+02 |
| AG-108m | 1099. | 722.94 | 1.7821E+01 |
| CD-109 | 22864. | 88.03 | 8.7518E+02 |
| AG-110M | 26768. | 657.76 | 7.7841E+01 |
| SN-113 | 28311. | 391.69 | 7.7260E+01 |
| TE-123m | 27629. | 159.00 | 2.9890E+01 |
| SB-124 | 6321. | 602.73 | 3.3986E+01 |
| SB-125 | 33401. | 427.89 | 1.9591E+02 |
| TE-125m | 24490. | 109.27 | 8.9059E+03 |
| I-129 | 21648. | 39.60 | 0.0000E+00 |
| I-131 | 26810. | 364.48 | 5.6218E+01 |
| XE-131m | 27322. | 163.93 | 1.2929E+03 |
| BA-133 | 26416. | 356.02 | 7.1646E+01 |
| CS-134 | 6373. | 604.70 | 3.4286E+01 |
| CS-136 | 688. | 818.51 | 1.4290E+01 |
| CS-138 | 4. | 1435.86 | 3.9085E+00 |
| CE-139 | 27377. | 165.85 | 3.1907E+01 |
| BA-140 | 11852. | 537.31 | 1.6926E+02 |
| LA-140 | 4. | 1596.21 | 2.0261E+00 |
| CE-141 | 27254. | 145.44 | 5.0405E+01 |
| CE-144 | 26943. | 133.51 | 2.1717E+02 |
| CEPR-144 | 26943. | 133.51 | 4.3395E+02 |
| EU-152 | 10. | 1408.01 | 1.2934E+01 |
| EU-154 | 129. | 1274.51 | 2.6190E+01 |
| EU-155 | 22765. | 86.54 | 9.9022E+01 |
| HF-181 | 26510. | 482.18 | 7.0191E+01 |
| TA-182 | 21401. | 67.75 | 1.4422E+02 |
| HG-203 | 27152. | 279.20 | 4.6095E+01 |

Sample ID : S95T2413-DUP Acquisition date : 13-OCT-1995 05:33:20

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/L) |
|---|---|---|---|
| BI-207 | 7247. | 569.70 | 3.4667E+01 |
| TL-208 | 27134. | 277.36 | 5.9196E+02 |
| PB-210 | 20958. | 46.50 | 0.0000E+00 |
| BI-212 | 1140. | 727.18 | 2.4901E+02 |
| PB-212 | 31879. | 238.63 | 8.3300E+01 |
| BI-214 | 6177. | 609.31 | 7.4011E+01 |
| PB-214 | 26131. | 351.92 | 2.2340E+02 |
| RA-224 | 31268. | 240.99 | 9.1610E+02 |
| RA-226 | 36348. | 186.10 | 9.0160E+02 |
| AC-228 | 516. | 911.21 | 5.0844E+01 |
| TH-228 | 22845. | 84.37 | 2.6943E+03 |
| TH-229 | 22954. | 88.47 | 1.2710E+02 |
| U-232 | 21045. | 57.78 | 6.8585E+04 |
| PA-233 | 26189. | 312.17 | 1.0381E+02 |
| PA-234M | 354. | 1001.03 | 2.0581E+01 |
| TH-234 | 21184. | 63.29 | 1.7475E+03 |
| U-235 | 35991. | 185.71 | 5.4527E+01 |
| NP-237 | 22745. | 86.48 | 2.6217E+02 |
| U-237 | 21025. | 59.54 | 3.2031E+02 |
| NP-238 | 345. | 984.45 | 4.2787E+01 |
| NP-239 | 23994. | 106.12 | 1.1188E+02 |
| PU-239 | 26986. | 129.30 | 3.7795E+05 |
| AM-241 | 21025. | 59.54 | 3.0721E+02 |
| AM-243 | 21757. | 74.67 | 7.3454E+01 |

# LABCORE Data Entry Template for Worklist# 2933

**Analyst:** RK **Instrument:** AB00 12 **Book #** 51B52

**Method:** LA-220-101 Rev/Mod D-1

**Worklist Comment:** RUSH SAMPLE!! Use .100-10-1.00 mL sample size. SLF

| GROUP | PROJECT | S | TYPE | SAMPLE# | R | A | -------TEST------ | MATRIX | ACTUAL | FOUND | DL | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | STD | | | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| | | 1 | STD | | | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |
| | | 1 | STD | | | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |
| | | 2 | BLNK-PREP | | | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| | | 2 | BLNK-PREP | | | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |
| | | 2 | BLNK-PREP | | | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |
| | | 3 | BLNK/BKG | | | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| 95000135 | AN-101 GRAB | 4 | SAMPLE | S95T002411 | 0 | | @SR90-01 SR90-01 | LIQUID | N/A | | | uCi/mL |
| 95000135 | AN-101 GRAB | 4 | SAMPLE | S95T002411 | 0 | | @SR90-01 SR90-01C | LIQUID | N/A | | | % Recovery |
| 95000135 | AN-101 GRAB | 4 | SAMPLE | S95T002411 | 0 | | @SR90-01 SR90-01E | LIQUID | N/A | | | % Ct. Error |
| 95000135 | AN-101 GRAB | 5 | DUP | S95T002411 | 0 | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| 95000135 | AN-101 GRAB | 5 | DUP | S95T002411 | 0 | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |
| 95000135 | AN-101 GRAB | 5 | DUP | S95T002411 | 0 | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |
| 95000135 | AN-101 GRAB | 6 | SAMPLE | S95T002412 | 0 | | @SR90-01 SR90-01 | LIQUID | N/A | | | uCi/mL |
| 95000135 | AN-101 GRAB | 6 | SAMPLE | S95T002412 | 0 | | @SR90-01 SR90-01C | LIQUID | N/A | | | % Recovery |
| 95000135 | AN-101 GRAB | 6 | SAMPLE | S95T002412 | 0 | | @SR90-01 SR90-01E | LIQUID | N/A | | | % Ct. Error |
| 95000135 | AN-101 GRAB | 7 | DUP | S95T002412 | 0 | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| 95000135 | AN-101 GRAB | 7 | DUP | S95T002412 | 0 | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |

*Data Entry Comments:*

*Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.*

# LABCORE Data Entry Template for Worklist# 2933

| GROUP | PROJECT | S TYPE | SAMPLE# | R | A | -------TEST------ | MATRIX | ACTUAL | FOUND | DL | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 95000135 | AN-101 GRAB | 7 DUP | S95T002412 | 0 | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |

## Final page for worklist # 2933

Analyst Signature 10/16/95 Date

Analyst Signature 10/17/95 Date

*Data Entry Comments:*

*Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.*

WORKBOOK PAGE: STD1

**Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS**

| | | | | | | STANDARD |
|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | 1.000 |
| STD | TOTAL COUNTS | (TC) | 10200 | GROSS WEIGHT | (W2) | 7.9794 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | 7.8866 |
| 2933 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | 0.0928 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | 4.85 |
| @SR90-01 | DILUTION FACTOR | (DF) | 1 | | | |
| Matrix | DIGEST DILUTION FACTOR | DDF | 1 | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 1018.40 | SR-90 EFFICIENCY FACTO | (C1) | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | 0.4660 |
| 95003205 | TIME OF SEPARATION | (ST) | 20:04 | Rmax | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/16/95 | DETECTION LIMIT | (Ld) | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 00:55 | Sr-89/90 CONC. in µCi/L | | 1.1190E+00 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/17/95 | | | |
| N/A | STANDARD BOOK # | | 51B52 | | | |
| Sample # | STANDARD VALUE in µCi/mL | | 1.0909E-03 | | | |
| WRKLST#2399 | | | | | | |
| Instrument Code | | | | | | |
| WB27811 | | | | | | |
| Prepared By | | | | | | |
| MCB | | | | | | |
| Chemist | | | | | | |
| SLF | | | | | | |
| Analyst | | | | | | |
| RWK | | | | | | |
| Date Complete | | | | | | |
| 10/17/95 | | | | | | |
| Analysis Date | | | | | | |
| 10/16/95 | | | | | | |
| Analysis Time | | | | | | |
| 10:00 PM | | | | | | |
| Sample Point | | | | | | |
| AN-101 GRAB | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 1.12E-03 | µCi/mL | DETECTION LEVEL |
| RELATIVE COUNTING ERROR | 1.9% | | 1.77E-06 µCi/L |
| PERCENT CARRIER RECOVERY | 92.8% | | |

| | | | |
|---|---|---|---|
| Analyst: | RWK | Date: | 17-Oct-95 |
| Signature of Chemist: | SLF | Date: | 10/17/95 |

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WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | | BLNK-PREP |
|---|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | | 1.000 |
| BLNK-PREP | TOTAL COUNTS | (TC) | 33 | GROSS WEIGHT | (W2) | | 7.9094 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | | 7.8267 |
| 2933 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | | 0.0827 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | | 5.13 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 1.70 | SR-90 EFFICIENCY FACTOR | (C1) | | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | | 0.4660 |
| 95003205 | TIME OF SEPARATION | (ST) | 19:59 | Rmax | | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/16/95 | DETECTION LIMIT | (Ld) | | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 01:07 | Sr-89/90 CONC in µCi/L | | | 2.1105E-01 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/17/95 | | | | |
| N/A | | | | | | | |
| Sample # | | | | | | | |
| S95T2411 | | | | | | | |
| Instrument Code | Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG) | | | | | | |
| WB27811 | Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0 | | | | | | |
| Prepared By | RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000) | | | | | | |
| MCB | NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000)) | | | | | | |
| Chemist | Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96) | | | | | | |
| SLF | Percent Carrier Recovery = (Net Weight / Expected weight) * 100 | | | | | | |
| Analyst | NOTE: Expected weight = CVA * 0.1 | | | | | | |
| RWK | Detection Levels and Less Than Values are determined from Procedure LA-508-002. | | | | | | |
| Date Complete | Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100 | | | | | | |
| 10/17/95 | | | | | | | |
| Analysis Date | | | | | | | DETECTION LEVEL |
| 10/16/95 | Sr-89/90 CONCENTRATION | | | 2.11E-04 | | µCi/m | |
| Analysis Time | | | | | | | |
| 10:00 PM | RELATIVE COUNTING ERROR | | | 80.7% | | | 2.00E-04 µCi/mL |
| Sample Point | | | | | | | |
| AN-101 GRAB | PERCENT CARRIER RECOVERY | | | 82.7% | | | |

| | | | | |
|---|---|---|---|---|
| Analyst: | | RWK | Date: | 17-Oct-95 |
| Signature of Chemist: | | SLF | Date: | 10/17/95 |

BLANK.WB1 REV 1.2 22010NML

WHC-SD-WM-DP-148, REV. 0

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | | SAMPLE |
|---|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | 1.000 |
| SAMPLE | TOTAL COUNTS | (TC) | 51656 | GROSS WEIGHT | (W2) | 7.9990 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | 7.9094 |
| 2933 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | 0.0896 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | 5.35 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 5164.00 | SR-90 EFFICIENCY FACTOR | (C1) | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | 0.4660 |
| 95003205 | TIME OF SEPARATION | (ST) | 19:59 | Rmax | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/16/95 | DETECTION LIMIT | (Ld) | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 01:20 | Sr-89/90 CONC in µCi/L | | 5.9035E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/17/95 | | | |
| N/A | | | | | | |
| Sample # | | | | | | |
| S95T002411 | | | | | | |
| Instrument Code | Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG) | | | | | |
| WB27811 | Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0 | | | | | |
| Prepared By | RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000) | | | | | |
| MCB | NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000)) | | | | | |
| Chemist | Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96) | | | | | |
| SLF | Percent Carrier Recovery = (Net Weight / Expected weight) * 100 | | | | | |
| Analyst | NOTE: Expected weight = CVA * 0.1 | | | | | |
| RWK | Detection Levels and Less Than Values are determined from Procedure LA-508-002. | | | | | |
| Date Complete | Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100 | | | | | |
| 10/17/95 | | | | | | |
| Analysis Date | | | | | | DETECTION LEVEL |
| 10/16/95 | Sr-89/90 CONCENTRATION | | 5.90E-01 | µCi/mL | | |
| Analysis Time | | | | | | |
| 10:00 PM | RELATIVE COUNTING ERROR | | 0.9% | | | 1.85E-04 µCi/mL |
| Sample Point | | | | | | |
| AN-101 GRAB | PERCENT CARRIER RECOVERY | | 89.6% | | | |

| | | | | |
|---|---|---|---|---|
| Analyst: | | RWK | Date: | 17-Oct-95 |
| Signature of Chemist: | | SLF | Date: | 10/17/95 |

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WORKBOOK PAGE: DUP5

WHC-SD-WM-DP-148, REV. 0

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | DUP |
|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | 1.000 |
| DUP | TOTAL COUNTS | (TC) | 52400 | GROSS WEIGHT | (W2) | 8.0121 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | 7.9218 |
| 2933 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | 0.0903 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | 5.52 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 5238.40 | SR-90 EFFICIENCY FACTOR | (C1) | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | 0.4660 |
| 95003205 | TIME OF SEPARATION | (ST) | 19:59 | Rmax | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/16/95 | DETECTION LIMIT | (Ld) | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 01:30 | Sr-89/90 CONC in µCi/L | | 5.9316E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/17/95 | | | |
| N/A | | | | | | |
| Sample # | | | | | | |
| S95T002411 | | | | | | |
| Instrument Code | | | | | | |
| WB27811 | | | | | | |
| Prepared By | | | | | | |
| MCB | | | | | | |
| Chemist | | | | | | |
| SLF | | | | | | |
| Analyst | | | | | | |
| RWK | | | | | | |
| Date Complete | | | | | | |
| 10/17/95 | | | | | | |
| Analysis Date | | | | | | |
| 10/16/95 | | | | | | |
| Analysis Time | | | | | | |
| 10:00 PM | | | | | | |
| Sample Point | | | | | | |
| AN-101 GRAB | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | | DETECTION LEVEL |
|---|---|---|---|---|
| Sr-89/90 CONCENTRATION | 5.93E-01 | µCi/mL | | |
| RELATIVE COUNTING ERROR | 0.9% | | | 1.83E-04 µCi/mL |
| PERCENT CARRIER RECOVERY | 90.3% | | | |

| | | | | |
|---|---|---|---|---|
| Analyst: | RWK | Date: | 17-Oct-95 | |
| Signature of Chemist: | SLF | Date: | 10/17/95 | |

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM6

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | SAMPLE |
|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | 1.000 |
| SAMPLE | TOTAL COUNTS | (TC) | 23419 | GROSS WEIGHT | (W2) | 8.0105 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | 7.9213 |
| 2933 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | 0.0892 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | 5.77 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 2340.30 | SR-90 EFFICIENCY FACTOR | (C1) | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | 0.4660 |
| 95003205 | TIME OF SEPARATION | (ST) | 19:59 | Rmax | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/16/95 | DETECTION LIMIT | (Ld) | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 01:45 | Sr-89/90 CONC in µCi/L | | 2.6756E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/17/95 | | | |
| N/A | | | | | | |
| Sample # | | | | | | |
| S95T002412 | | | | | | |

| | |
|---|---|
| Instrument Code | Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG) |
| WB27811 | Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0 |
| Prepared By | RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000) |
| MCB | NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000)) |
| Chemist | Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96) |
| SLF | Percent Carrier Recovery = (Net Weight / Expected weight) * 100 |
| Analyst | NOTE: Expected weight = CVA * 0.1 |
| RWK | Detection Levels and Less Than Values are determined from Procedure LA-508-002. |
| Date Complete | Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100 |
| 10/17/95 | |
| Analysis Date | |
| 10/16/95 | |
| Analysis Time | |
| 10:00 PM | |
| Sample Point | |
| AN-101 GRAB | |

| | | | |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 2.68E-01 | µCi/mL | DETECTION LEVEL |
| RELATIVE COUNTING ERROR | 1.3% | | 1.85E-04 µCi/mL |
| PERCENT CARRIER RECOVERY | 89.2% | | |

| | | | |
|---|---|---|---|
| Analyst: | RWK | Date: | 17-Oct-95 |
| Signature of Chemist: | SLF | Date: | 10/17/95 |

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP7

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | DUP |
|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | 1.000 |
| DUP | TOTAL COUNTS | (TC) | 22476 | GROSS WEIGHT | (W2) | 7.9385 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | 7.8503 |
| 2933 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | 0.0882 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | 5.93 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 2246.00 | SR-90 EFFICIENCY FACTOR | (C1) | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | 0.4660 |
| 95003205 | TIME OF SEPARATION | (ST) | 20:04 | Rmax | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/16/95 | DETECTION LIMIT | (Ld) | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 02:00 | Sr-89/90 CONC in µCi/L | | 2.5923E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/17/95 | | | |
| N/A | | | | | | |
| Sample # | | | | | | |
| S95T002412 | | | | | | |
| Instrument Code | | | | | | |
| WB27811 | | | | | | |
| Prepared By | | | | | | |
| MCB | | | | | | |
| Chemist | | | | | | |
| SLF | | | | | | |
| Analyst | | | | | | |
| RWK | | | | | | |
| Date Complete | | | | | | |
| 10/17/95 | | | | | | |
| Analysis Date | | | | | | |
| 10/16/95 | | | | | | |
| Analysis Time | | | | | | |
| 10:00 PM | | | | | | |
| Sample Point | | | | | | |
| AN-101 GRAB | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | DETECTION LEVEL |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 2.59E-01 | µCi/mL | 1.86E-04 µCi/mL |
| RELATIVE COUNTING ERROR | 1.3% | | |
| PERCENT CARRIER RECOVERY | 88.2% | | |

| | | | | |
|---|---|---|---|---|
| Analyst: | | RWK | Date: | 17-Oct-95 |
| Signature of Chemist: | | SLF | Date: | 10/17/95 |

SAMPLE.WB1 REV 1.2 22010NML

# LABCORE Data Entry Template for Worklist# 3122

**Analyst:** EAL **Instrument:** AB00 10 **Book #** 51B52

**Method:** LA-220-101 Rev/Mod D-1

**Worklist Comment:** Rerun #1. SLF

| GROUP | PROJECT | S | TYPE | SAMPLE# | R | A | -------TEST------ | MATRIX | ACTUAL | FOUND | DL | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | STD | | | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| | | 1 | STD | | | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |
| | | 1 | STD | | | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |
| | | 2 | BLNK-PREP | | | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| | | 2 | BLNK-PREP | | | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |
| | | 2 | BLNK-PREP | | | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |
| | | 3 | BLNK/BKG | | | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| 95000135 | AN-101 GRAB | 4 | SAMPLE | S95T002413 | 0 | | @SR90-01 SR90-01 | LIQUID | N/A | | | uCi/mL |
| 95000135 | AN-101 GRAB | 4 | SAMPLE | S95T002413 | 0 | | @SR90-01 SR90-01C | LIQUID | N/A | | | % Recovery |
| 95000135 | AN-101 GRAB | 4 | SAMPLE | S95T002413 | 0 | | @SR90-01 SR90-01E | LIQUID | N/A | | | % Ct. Error |
| 95000135 | AN-101 GRAB | 5 | DUP | S95T002413 | 0 | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| 95000135 | AN-101 GRAB | 5 | DUP | S95T002413 | 0 | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |
| 95000135 | AN-101 GRAB | 5 | DUP | S95T002413 | 0 | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |

## Final page for worklist # 3122

Ann Lambert 10/30/95
**Analyst Signature** **Date**

M S Brunner 10/31/95
**Analyst Signature** **Date**

*Data Entry Comments:*

*Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.*

WORKBOOK PAGE: STD1

WHC-SD-WM-DP-148, REV. 0

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

| | | | | | | | STANDARD |
|---|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 10 | CARRIER ADDED in mL | (CVA) | | 1.000 |
| STD | TOTAL COUNTS | (TC) | 10054 | GROSS WEIGHT | (W2) | | 8.0247 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | | 7.9296 |
| 3122 | BACKGROUND in cpm | (BKG) | 9.3 | NET WEIGHT | (W3) | | 0.0951 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | | 0.63 |
| @SR90-01 | DILUTION FACTOR | (DF) | 1 | | | | |
| Matrix | DIGEST DILUTION FACTOR | DDF | 1 | | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 996.10 | SR-90 EFFICIENCY FACTO | (C1) | | 0.4051 |
| Batch Number | CRITICAL LEVEL | (Lc) | 1.84 | Y-90 EFFICIENCY FACTOR | (C2) | | 0.4503 |
| 95003464 | TIME OF SEPARATION | (ST) | 21:52 | Rmax | | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/30/95 | DETECTION LIMIT | (Ld) | | 3.77 |
| 0 | TIME OF COUNT | (TOC) | 22:30 | Sr-89/90 CONC. in µCi/L | | | 1.1559E+00 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/30/95 | | | | |
| N/A | STANDARD BOOK # | | 51B52 | | | | |
| Sample # | STANDARD VALUE in µCi/mL | | 1.0899E-03 | | | | |
| WRKLST#3122 | | | | | | | |
| Instrument Code | | | | | | | |
| WB26870 | | | | | | | |
| Prepared By | | | | | | | |
| MCB | | | | | | | |
| Chemist | | | | | | | |
| SLF | | | | | | | |
| Analyst | | | | | | | |
| EAL | | | | | | | |
| Date Complete | | | | | | | |
| 10/31/95 | | | | | | | |
| Analysis Date | | | | | | | |
| 10/30/95 | | | | | | | |
| Analysis Time | | | | | | | |
| 10:15 PM | | | | | | | |
| Sample Point | | | | | | | |
| AN-101 GRAB | | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | | |
|---|---|---|---|---|
| Sr-89/90 CONCENTRATION | 1.16E-03 | µCi/mL | DETECTION LEVEL | |
| RELATIVE COUNTING ERROR | 2.0% | | 4.37E-06 µCi/L | |
| PERCENT CARRIER RECOVERY | 95.1% | | | |

| | | | |
|---|---|---|---|
| Analyst: | EAL | Date: | 31-Oct-95 |
| Signature of Chemist: | SLF | Date: | OCT 31 |

STANDARD.WB1 REV 1.2 22010NML

WORKBOOK PAGE: BLANK2 WHC-SD-WM-DP-148, REV. 0

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | BLNK-PREP |
|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 10 | CARRIER ADDED in mL | (CVA) | 1.000 |
| BLNK-PREP | TOTAL COUNTS | (TC) | 112 | GROSS WEIGHT | (W2) | 8.0262 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | 7.9329 |
| 3122 | BACKGROUND in cpm | (BKG) | 9.3 | NET WEIGHT | (W3) | 0.0933 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | 0.83 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 1.90 | SR-90 EFFICIENCY FACTOR | (C1) | 0.4051 |
| Batch Number | CRITICAL LEVEL | (Lc) | 1.84 | Y-90 EFFICIENCY FACTOR | (C2) | 0.4503 |
| 95003464 | TIME OF SEPARATION | (ST) | 21:52 | Rmax | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/30/95 | DETECTION LIMIT | (Ld) | 3.77 |
| 0 | TIME OF COUNT | (TOC) | 22:42 | Sr-89/90 CONC in µCi/L | | 2.2645E-01 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/30/95 | | | |
| N/A | | | | | | |
| Sample # | | | | | | |
| WRKLST#3122 | | | | | | |
| Instrument Code | | | | | | |
| WB26870 | | | | | | |
| Prepared By | | | | | | |
| MCB | | | | | | |
| Chemist | | | | | | |
| SLF | | | | | | |
| Analyst | | | | | | |
| EAL | | | | | | |
| Date Complete | | | | | | |
| 10/31/95 | | | | | | |
| Analysis Date | | | | | | |
| 10/30/95 | | | | | | |
| Analysis Time | | | | | | |
| 10:15 PM | | | | | | |
| Sample Point | | | | | | |
| AN-101 GRAB | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 2.26E-04 | µCi/m | DETECTION LEVEL |
| RELATIVE COUNTING ERROR | 147.7% | | 4.49E-04 µCi/mL |
| PERCENT CARRIER RECOVERY | 93.3% | | |

| | | | |
|---|---|---|---|
| Analyst: | EAL | Date: | 31-Oct-95 |
| Signature of Chemist: | SLF | Date: | OCT 31 1995 |

BLANK.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM4

WHC-SD-WM-DP-148, REV. 0

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | | SAMPLE |
|---|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 10 | CARRIER ADDED in mL | (CVA) | | 1.000 |
| SAMPLE | TOTAL COUNTS | (TC) | 23901 | GROSS WEIGHT | (W2) | | 7.9921 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | | 7.9008 |
| 3122 | BACKGROUND in cpm | (BKG) | 9.3 | NET WEIGHT | (W3) | | 0.0913 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | | 1.02 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 2380.80 | SR-90 EFFICIENCY FACTOR | (C1) | | 0.4051 |
| Batch Number | CRITICAL LEVEL | (Lc) | 1.84 | Y-90 EFFICIENCY FACTOR | (C2) | | 0.4503 |
| 95003464 | TIME OF SEPARATION | (ST) | 21:52 | Rmax | | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/30/95 | DETECTION LIMIT | (Ld) | | 3.77 |
| 0 | TIME OF COUNT | (TOC) | 22:53 | Sr-89/90 CONC in µCi/L | | | 2.8935E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/30/95 | | | | |
| N/A | | | | | | | |
| Sample # | | | | | | | |
| S95T002413 | | | | | | | |
| Instrument Code | Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG) | | | | | | |
| WB26870 | Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0 | | | | | | |
| Prepared By | RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000) | | | | | | |
| MCB | NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000)) | | | | | | |
| Chemist | Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96) | | | | | | |
| SLF | Percent Carrier Recovery = (Net Weight / Expected weight) * 100 | | | | | | |
| Analyst | NOTE: Expected weight = CVA * 0.1 | | | | | | |
| EAL | Detection Levels and Less Than Values are determined from Procedure LA-508-002. | | | | | | |
| Date Complete | Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100 | | | | | | |
| 10/31/95 | | | | | | | |
| Analysis Date | | | | | | | DETECTION LEVEL |
| 10/30/95 | Sr-89/90 CONCENTRATION | | | 2.89E-01 | | µCi/mL | |
| Analysis Time | | | | | | | |
| 10:15 PM | RELATIVE COUNTING ERROR | | | 1.3% | | | 4.58E-04 µCi/mL |
| Sample Point | | | | | | | |
| AN-101 GRAB | PERCENT CARRIER RECOVERY | | | 91.3% | | | |

| | | | |
|---|---|---|---|
| Analyst: | EAL | Date: | 31-Oct-95 |
| Signature of Chemist: | SLF | Date: | OCT 31 |

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP5

WHC-SD-WM-DP-148, REV. 0

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | | DUP |
|---|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 10 | CARRIER ADDED in mL | (CVA) | | 1.000 |
| DUP | TOTAL COUNTS | (TC) | 24608 | GROSS WEIGHT | (W2) | | 8.0599 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | | 7.9591 |
| 3122 | BACKGROUND in cpm | (BKG) | 9.3 | NET WEIGHT | (W3) | | 0.1008 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | | 1.75 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 2451.50 | SR-90 EFFICIENCY FACTOR | (C1) | | 0.4051 |
| Batch Number | CRITICAL LEVEL | (Lc) | 1.84 | Y-90 EFFICIENCY FACTOR | (C2) | | 0.4503 |
| 95003464 | TIME OF SEPARATION | (ST) | 21:52 | Rmax | | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/30/95 | DETECTION LIMIT | (Ld) | | 3.77 |
| 0 | TIME OF COUNT | (TOC) | 23:37 | Sr-89/90 CONC in µCi/L | | | 2.6757E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/30/95 | | | | |
| N/A | | | | | | | |
| Sample # | | | | | | | |
| S95T002413 | | | | | | | |
| Instrument Code | | | | | | | |
| WB26870 | | | | | | | |
| Prepared By | | | | | | | |
| MCB | | | | | | | |
| Chemist | | | | | | | |
| SLF | | | | | | | |
| Analyst | | | | | | | |
| EAL | | | | | | | |
| Date Complete | | | | | | | |
| 10/31/95 | | | | | | | |
| Analysis Date | | | | | | | |
| 10/30/95 | | | | | | | |
| Analysis Time | | | | | | | |
| 10:15 PM | | | | | | | |
| Sample Point | | | | | | | |
| AN-101 GRAB | | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | |
|---|---|---|
| Sr-89/90 CONCENTRATION | 2.68E-01 | µCi/mL |
| RELATIVE COUNTING ERROR | 1.3% | |
| PERCENT CARRIER RECOVERY | 100.8% | |

DETECTION LEVEL

4.11E-04 µCi/mL

| | | | |
|---|---|---|---|
| Analyst: | EAL | Date: | 31-Oct-95 |
| Signature of Chemist: | SLF | Date: | OCT 31 1995 |

SAMPLE.WB1 REV 1.2 22010NML

THE FOLLOWING ANALYSES ARE INCLUDED IN THE DATA PACKAGE BUT THE RESULTS HAVE NOT BEEN REPORTED IN THE FINAL SUMMARY REPORTS.

# LABCORE Data Entry Template for Worklist# 2492

**Analyst:** Sue C Lai **Instrument:** AB00 12 **Book #** 51 BJ 2

**Method:** LA-220-101 Rev/Mod D-1

**Worklist Comment:** Determine sample size using Ludlum. SLF

DATA NOT USED IN PACKAGE

Stamped in error 10/30/95

DATA NOT USED IN PACKAGE

| GROUP | PROJECT | S | TYPE | SAMPLE# | R | A | -------TEST------ | MATRIX | ACTUAL | FOUND | DL | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | STD | | | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| | | 1 | STD | | | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |
| | | 1 | STD | | | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |
| | | 2 | BLNK-PREP | | | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| | | 2 | BLNK-PREP | | | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |
| | | 2 | BLNK-PREP | | | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |
| | | 3 | BLNK/BKG | | | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| 95000135 | AN-101 GRAB | 4 | SAMPLE | S95T002411 | 0 | | @SR90-01 SR90-01 | LIQUID | N/A | | | uCi/mL |
| 95000135 | AN-101 GRAB | 4 | SAMPLE | S95T002411 | 0 | | @SR90-01 SR90-01C | LIQUID | N/A | | | % Recovery |
| 95000135 | AN-101 GRAB | 4 | SAMPLE | S95T002411 | 0 | | @SR90-01 SR90-01E | LIQUID | N/A | | | % Ct. Erro |
| 95000135 | AN-101 GRAB | 5 | DUP | S95T002411 | 0 | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| 95000135 | AN-101 GRAB | 5 | DUP | S95T002411 | 0 | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |
| 95000135 | AN-101 GRAB | 5 | DUP | S95T002411 | 0 | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |
| 95000135 | AN-101 GRAB | 6 | SAMPLE | S95T002412 | 0 | | @SR90-01 SR90-01 | LIQUID | N/A | | | uCi/mL |
| 95000135 | AN-101 GRAB | 6 | SAMPLE | S95T002412 | 0 | | @SR90-01 SR90-01C | LIQUID | N/A | | | % Recovery |
| 95000135 | AN-101 GRAB | 6 | SAMPLE | S95T002412 | 0 | | @SR90-01 SR90-01E | LIQUID | N/A | | | % Ct. Error |
| 95000135 | AN-101 GRAB | 7 | DUP | S95T002412 | 0 | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| 95000135 | AN-101 GRAB | 7 | DUP | S95T002412 | 0 | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |

*Data Entry Comments:* Results from S95T002413 used from this worklist. RAE
Results from S95T002413 put out for rerun 10/31/95 RAE 10/30/95
Blnk value indicates possible contamination
also The RPD for 2411 + 2412 is out of control limits.
Batch will be rerun.

*Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.*

# LABCORE Data Entry Template for Worklist# 2492

| GROUP | PROJECT | S | TYPE | SAMPLE# | R | A | -------TEST------ | MATRIX | ACTUAL | FOUND | DL | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95000135 | AN-101 GRAB | 7 | DUP | S95T002412 | 0 | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |
| 95000135 | AN-101 GRAB | 8 | SAMPLE | S95T002413 | 0 | | @SR90-01 SR90-01 | LIQUID | N/A | | | uCi/mL |
| 95000135 | AN-101 GRAB | 8 | SAMPLE | S95T002413 | 0 | | @SR90-01 SR90-01C | LIQUID | N/A | | | % Recovery |
| 95000135 | AN-101 GRAB | 8 | SAMPLE | S95T002413 | 0 | | @SR90-01 SR90-01E | LIQUID | N/A | | | % Ct. Error |
| 95000135 | AN-101 GRAB | 9 | DUP | S95T002413 | 0 | | @SR90-01 SR90-01 | LIQUID | | | N/A | uCi/mL |
| 95000135 | AN-101 GRAB | 9 | DUP | S95T002413 | 0 | | @SR90-01 SR90-01C | LIQUID | | | N/A | % Recovery |
| 95000135 | AN-101 GRAB | 9 | DUP | S95T002413 | 0 | | @SR90-01 SR90-01E | LIQUID | | | N/A | % Ct. Error |

## Final page for worklist # 2492

Sue C Lai 10-5-95
Analyst Signature Date

S E Hogan 10/6/95
Analyst Signature Date

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*Data Entry Comments:*

*Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.*

WORKBOOK PAGE: STD1

**Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS**

| | | | | | | STANDARD |
|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | 1.000 |
| STD | TOTAL COUNTS | (TC) | 9559 | GROSS WEIGHT | (W2) | 7.9982 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | 7.9070 |
| 2492 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | 0.0912 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 1.000 | DELTA TIME (HOURS) | (DT) | 5.38 |
| @SR90-01 | DILUTION FACTOR | (DF) | 1 | | | |
| Matrix | DIGEST DILUTION FACTOR | DDF | 1 | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 954.30 | SR-90 EFFICIENCY FACTO | (C1) | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | 0.4660 |
| 95002637 | TIME OF SEPARATION | (ST) | 11:15 | Rmax | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/05/95 | DETECTION LIMIT | (Ld) | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 16:38 | Sr-89/90 CONC. in µCi/L | | 1.0608E+00 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/05/95 | | | |
| N/A | STANDARD BOOK # | | 51B52 | | | |
| Sample # | STANDARD VALUE in µCi/mL | | 1.0916E-03 | | | |
| WORKLIST 2492-ST | | | | | | |
| Instrument Code | | | | | | |
| WB27811 | | | | | | |
| Prepared By | | | | | | |
| SEH | | | | | | |
| Chemist | | | | | | |
| SLF | | | | | | |
| Analyst | | | | | | |
| SCL | | | | | | |
| Date Complete | | | | | | |
| 10/06/95 | | | | | | |
| Analysis Date | | | | | | |
| 10/05/95 | | | | | | |
| Analysis Time | | | | | | |
| 11:15 AM | | | | | | |
| Sample Point | | | | | | |
| AN-101 | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 1.06E-03 | µCi/mL | DETECTION LEVEL |
| RELATIVE COUNTING ERROR | 2.0% | | 1.80E-06 µCi/L |
| PERCENT CARRIER RECOVERY | 91.2% | | |

| | | | |
|---|---|---|---|
| Analyst: | SCL | Date: | 06-Oct-95 |
| Signature of Chemist: | SLF | Date: | 10/10/95 |

STANDARD.WB1 REV 1.2 22010NML

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LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | | BLNK-PREP |
|---|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | | 1.000 |
| BLNK-PREP | TOTAL COUNTS | (TC) | 114 | GROSS WEIGHT | (W2) | | 8.1212 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | | 8.0291 |
| 2492 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | | 0.0921 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 0.100 | DELTA TIME (HOURS) | (DT) | | 5.55 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 9.80 | SR-90 EFFICIENCY FACTOR | (C1) | | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | | 0.4660 |
| 95002637 | TIME OF SEPARATION | (ST) | 11:15 | Rmax | | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/05/95 | DETECTION LIMIT | (Ld) | | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 16:48 | Sr-89/90 CONC in µCi/L | | | 1.0876E+01 |
| Sample Preq | DATE OF COUNT | (DOC) | 10/05/95 | | | | |
| N/A | | | | | | | |
| Sample # | | | | | | | |
| WORKLIST 2492-BL | | | | | | | |
| Instrument Code | | | | | | | |
| WB27811 | | | | | | | |
| Prepared By | | | | | | | |
| SEH | | | | | | | |
| Chemist | | | | | | | |
| SLF | | | | | | | |
| Analyst | | | | | | | |
| SCL | | | | | | | |
| Date Complete | | | | | | | |
| 10/06/95 | | | | | | | |
| Analysis Date | | | | | | | |
| 10/05/95 | | | | | | | |
| Analysis Time | | | | | | | |
| 11:15 AM | | | | | | | |
| Sample Point | | | | | | | |
| AN-101 | | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L  Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 1.09E-02 | µCi/m | DETECTION LEVEL |
| RELATIVE COUNTING ERROR | 22.8% | | 1.79E-03 µCi/mL |
| PERCENT CARRIER RECOVERY | 92.1% | | |

| | | | | |
|---|---|---|---|---|
| Analyst: | | SCL | Date: | 06-Oct-95 |
| Signature of Chemist: | | SLF | Date: | 10/10/95 |

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WORKBOOK PAGE: SAM4

WHC-SD-WM-DP-148, REV. 0

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | | SAMPLE |
|---|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | | 1.000 |
| SAMPLE | TOTAL COUNTS | (TC) | 3762 | GROSS WEIGHT | (W2) | | 8.0035 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | | 7.9133 |
| 2492 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | | 0.0902 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 0.100 | DELTA TIME (HOURS) | (DT) | | 5.75 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 374.60 | SR-90 EFFICIENCY FACTOR | (C1) | | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | | 0.4660 |
| 95002637 | TIME OF SEPARATION | (ST) | 11:15 | Rmax | | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/05/95 | DETECTION LIMIT | (Ld) | | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 17:00 | Sr-89/90 CONC in µCi/L | | | 4.2359E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/05/95 | | | | |
| N/A | | | | | | | |
| Sample # | | | | | | | |
| S95T002411 | | | | | | | |
| Instrument Code | Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG) | | | | | | |
| WB27811 | Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0 | | | | | | |
| Prepared By | RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000) | | | | | | |
| SEH | NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000)) | | | | | | |
| Chemist | Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96) | | | | | | |
| SLF | Percent Carrier Recovery = (Net Weight / Expected weight) * 100 | | | | | | |
| Analyst | NOTE: Expected weight = CVA * 0.1 | | | | | | |
| SCL | Detection Levels and Less Than Values are determined from Procedure LA-508-002. | | | | | | |
| Date Complete | Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100 | | | | | | |
| 10/06/95 | | | | | | | |
| Analysis Date | | | | | | | DETECTION LEVEL |
| 10/05/95 | Sr-89/90 CONCENTRATION | | 4.24E-01 | | µCi/mL | | |
| Analysis Time | | | | | | | |
| 11:15 AM | RELATIVE COUNTING ERROR | | 3.2% | | | | 1.83E-03 µCi/mL |
| Sample Point | | | | | | | |
| AN-101 | PERCENT CARRIER RECOVERY | | 90.2% | | | | |

| | | | |
|---|---|---|---|
| Analyst: | SCL | Date: | 06-Oct-95 |
| Signature of Chemist: | SLF | Date: | 10/10/95 |

SAMPLE.WB1 REV 1.2 22010NML

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188.1

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | DUP |
|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | 1.000 |
| DUP | TOTAL COUNTS | (TC) | 4489 | GROSS WEIGHT | (W2) | 8.0514 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | 7.9610 |
| 2492 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | 0.0904 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 0.100 | DELTA TIME (HOURS) | (DT) | 6.25 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 447.30 | SR-90 EFFICIENCY FACTOR | (C1) | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | 0.4660 |
| 95002637 | TIME OF SEPARATION | (ST) | 11:15 | Rmax | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/05/95 | DETECTION LIMIT | (Ld) | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 17:30 | Sr-89/90 CONC in µCi/L | | 5.0203E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/05/95 | | | |
| N/A | | | | | | |
| Sample # | | | | | | |
| S95T002411 | | | | | | |
| Instrument Code | | | | | | |
| WB27811 | | | | | | |
| Prepared By | | | | | | |
| SEH | | | | | | |
| Chemist | | | | | | |
| SLF | | | | | | |
| Analyst | | | | | | |
| SCL | | | | | | |
| Date Complete | | | | | | |
| 10/06/95 | | | | | | |
| Analysis Date | | | | | | |
| 10/05/95 | | | | | | |
| Analysis Time | | | | | | |
| 11:15 AM | | | | | | |
| Sample Point | | | | | | |
| AN-101 | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 5.02E-01 | µCi/mL | DETECTION LEVEL |
| RELATIVE COUNTING ERROR | 2.9% | | 1.81E-03 µCi/mL |
| PERCENT CARRIER RECOVERY | 90.4% | | |

| | | | |
|---|---|---|---|
| Analyst: | SCL | Date: | 06-Oct-95 |
| Signature of Chemist: | SLF | Date: | 10/16/95 |

SAMPLE.WB1 REV 1.2 22010NML

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188.2

WORKBOOK PAGE: SAM6 WHC-SD-WM-DP-148, REV. 0

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | SAMPLE |
|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | 1.000 |
| SAMPLE | TOTAL COUNTS | (TC) | 1519 | GROSS WEIGHT | (W2) | 8.0579 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | 7.9694 |
| 2492 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | 0.0885 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 0.100 | DELTA TIME (HOURS) | (DT) | 6.75 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 150.30 | SR-90 EFFICIENCY FACTOR | (C1) | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | 0.4660 |
| 95002637 | TIME OF SEPARATION | (ST) | 11:15 | Rmax | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/05/95 | DETECTION LIMIT | (Ld) | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 18:00 | Sr-89/90 CONC in µCi/L | | 1.7141E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/05/95 | | | |
| N/A | | | | | | |
| Sample # | | | | | | |
| S95T002412 | | | | | | |
| Instrument Code | | | | | | |
| WB27811 | | | | | | |
| Prepared By | | | | | | |
| SEH | | | | | | |
| Chemist | | | | | | |
| SLF | | | | | | |
| Analyst | | | | | | |
| SCL | | | | | | |
| Date Complete | | | | | | |
| 10/06/95 | | | | | | |
| Analysis Date | | | | | | |
| 10/05/95 | | | | | | |
| Analysis Time | | | | | | |
| 11:15 AM | | | | | | |
| Sample Point | | | | | | |
| AN-101 | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 1.71E-01 | µCi/mL | DETECTION LEVEL |
| RELATIVE COUNTING ERROR | 5.1% | | 1.84E-03 µCi/mL |
| PERCENT CARRIER RECOVERY | 88.5% | | |

| | | | |
|---|---|---|---|
| Analyst: | SCL | Date: | 06-Oct-95 |
| Signature of Chemist: | SLF | Date: | 10/16/95 |

SAMPLE.WB1 REV 1.2 22010NML

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WORKBOOK PAGE: DUP7

WHC-SD-WM-DP-148, REV. 0

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | | DUP |
|---|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | | 1.000 |
| DUP | TOTAL COUNTS | (TC) | 1958 | GROSS WEIGHT | (W2) | | 7.9275 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | | 7.8389 |
| 2492 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | | 0.0886 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 0.100 | DELTA TIME (HOURS) | (DT) | | 7.42 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 194.20 | SR-90 EFFICIENCY FACTOR | (C1) | | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | | 0.4660 |
| 95002637 | TIME OF SEPARATION | (ST) | 11:15 | Rmax | | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/05/95 | DETECTION LIMIT | (Ld) | | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 18:40 | Sr-89/90 CONC in µCi/L | | | 2.1972E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/05/95 | | | | |
| N/A | | | | | | | |
| Sample # | | | | | | | |
| S95T002412 | | | | | | | |
| Instrument Code | | | | | | | |
| WB27811 | | | | | | | |
| Prepared By | | | | | | | |
| SEH | | | | | | | |
| Chemist | | | | | | | |
| SLF | | | | | | | |
| Analyst | | | | | | | |
| SCL | | | | | | | |
| Date Complete | | | | | | | |
| 10/06/95 | | | | | | | |
| Analysis Date | | | | | | | |
| 10/05/95 | | | | | | | |
| Analysis Time | | | | | | | |
| 11:15 AM | | | | | | | |
| Sample Point | | | | | | | |
| AN-101 | | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | DETECTION LEVEL |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 2.20E-01 | µCi/mL | 1.83E-03 µCi/mL |
| RELATIVE COUNTING ERROR | 4.5% | | |
| PERCENT CARRIER RECOVERY | 88.6% | | |

| | | | |
|---|---|---|---|
| Analyst: | SCL | Date: | 06-Oct-95 |
| Signature of Chemist: | SLF | Date: | 10/16/95 |

SAMPLE.WB1 REV 1.2 22010NML

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188.4

WORKBOOK PAGE: SAM8

# WHC-SD-WM-DP-148, REV. 0

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | SAMPLE |
|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | 1.000 |
| SAMPLE | TOTAL COUNTS | (TC) | 1765 | GROSS WEIGHT | (W2) | 8.0750 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | 7.9852 |
| 2492 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | 0.0898 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 0.100 | DELTA TIME (HOURS) | (DT) | 8.17 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 174.90 | SR-90 EFFICIENCY FACTOR | (C1) | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | 0.4660 |
| 95002637 | TIME OF SEPARATION | (ST) | 11:15 | Rmax | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/05/95 | DETECTION LIMIT | (Ld) | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 19:25 | Sr-89/90 CONC in µCi/L | | 1.9376E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/05/95 | | | |
| N/A | | | | | | |
| Sample # | | | | | | |
| S95T002413 | | | | | | |
| Instrument Code | | | | | | |
| WB27811 | | | | | | |
| Prepared By | | | | | | |
| SEH | | | | | | |
| Chemist | | | | | | |
| SLF | | | | | | |
| Analyst | | | | | | |
| SCL | | | | | | |
| Date Complete | | | | | | |
| 10/06/95 | | | | | | |
| Analysis Date | | | | | | |
| 10/05/95 | | | | | | |
| Analysis Time | | | | | | |
| 11:15 AM | | | | | | |
| Sample Point | | | | | | |
| AN-101 | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | DETECTION LEVEL |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 1.94E-01 | µCi/mL | 1.79E-03 µCi/mL |
| RELATIVE COUNTING ERROR | 4.7% | | |
| PERCENT CARRIER RECOVERY | 89.8% | | |

| | | | | |
|---|---|---|---|---|
| Analyst: | | SCL | Date: | 06-Oct-95 |
| Signature of Chemist: | [signature] | SLF | Date: | 10/6/95 |

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE [signature] 10/31/95

~~DATA NOT USED IN PACKAGE~~ stamped in error [signature] 10/30/96

188.5

WORKBOOK PAGE: DUP9

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

| | | | | | | | DUP |
|---|---|---|---|---|---|---|---|
| Type | DETECTOR NUMBER | | 12 | CARRIER ADDED in mL | (CVA) | | 1.000 |
| DUP | TOTAL COUNTS | (TC) | 1795 | GROSS WEIGHT | (W2) | | 8.0401 |
| Work List | COUNT TIME in MINUTES | (CT) | 10 | TARE WEIGHT | (W1) | | 7.9531 |
| 2492 | BACKGROUND in cpm | (BKG) | 1.6 | NET WEIGHT | (W3) | | 0.0870 |
| Test Code | SAMPLE VOLUME in mL | (SS) | 0.100 | DELTA TIME (HOURS) | (DT) | | 8.33 |
| @SR90-01 | DILUTION FACTOR | (DF) | 101 | | | | |
| Matrix | DIGEST DILUTION FACTOR | (DDF) | 1 | | | | |
| LIQUID | SAMPLE COUNT RATE | (Rs) | 177.90 | SR-90 EFFICIENCY FACTOR | (C1) | | 0.4180 |
| Batch Number | CRITICAL LEVEL | (Lc) | 0.76 | Y-90 EFFICIENCY FACTOR | (C2) | | 0.4660 |
| 95002637 | TIME OF SEPARATION | (ST) | 11:15 | Rmax | | | N/A |
| Rerun | DATE OF SEPARATION | (SD) | 10/05/95 | DETECTION LIMIT | (Ld) | | 1.61 |
| 0 | TIME OF COUNT | (TOC) | 19:35 | Sr-89/90 CONC in µCi/L | | | 2.0308E+02 |
| Sample Prep | DATE OF COUNT | (DOC) | 10/05/95 | | | | |
| N/A | | | | | | | |
| Sample # | | | | | | | |
| S95T002413 | | | | | | | |
| Instrument Code | | | | | | | |
| WB27811 | | | | | | | |
| Prepared By | | | | | | | |
| SEH | | | | | | | |
| Chemist | | | | | | | |
| SLF | | | | | | | |
| Analyst | | | | | | | |
| SCL | | | | | | | |
| Date Complete | | | | | | | |
| 10/06/95 | | | | | | | |
| Analysis Date | | | | | | | |
| 10/05/95 | | | | | | | |
| Analysis Time | | | | | | | |
| 11:15 AM | | | | | | | |
| Sample Point | | | | | | | |
| AN-101 | | | | | | | |

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

| | | | DETECTION LEVEL |
|---|---|---|---|
| Sr-89/90 CONCENTRATION | 2.03E-01 | µCi/mL | |
| RELATIVE COUNTING ERROR | 4.7% | | 1.84E-03 µCi/mL |
| PERCENT CARRIER RECOVERY | 87.0% | | |

| | | | |
|---|---|---|---|
| Analyst: | SCL | Date: | 06-Oct-95 |
| Signature of Chemist: | SLF | Date: | 10/16/95 |

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE esc 10/31/95

DATA NOT USED IN PACKAGE

Stamped in error; 10/30/95

188.6

# LABCORE Completed Worklist Report for Worklist# 2650

**Analyst:** akl **Instrument:** AM01 **Book#** 104843

**Method:** LA-953-103 Rev/Mod A-4

**Worklist Comment:** Use a 1.0 mL sample size. --LLF

| Seq | Type | Sample# | R | A | Test | | Matrix | Actual | Found | DL or Yield | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | STD | | | 0 | @AM24101 | AM24101 | LIQUID | 3.07E-02 | 2.76E-2 | 89.900 | % Recovery |
| 1 | STD | | | 0 | @AM24101 | AM24101E | LIQUID | 1.00 | 1.33E+00 | 1.330 | % Ct. Error |
| 1 | STD | | | 0 | @AM24101 | AM24101T | LIQUID | 100 | 8.12E+01 | 81.200 | % Recovery |
| 2 | BLNK | | | 0 | @AM24101 | AM24101 | LIQUID | 1 | <1.24E-5 | | uCi/mL |
| 2 | BLNK | | | 0 | @AM24101 | AM24101E | LIQUID | 1.00 | 1.00E+02 | 100.000 | % Ct. Error |
| 2 | BLNK | | | 0 | @AM24101 | AM24101T | LIQUID | 100 | 8.99E+01 | 89.900 | % Recovery |
| 3 | SAMPLE | S95T002411 | | 0 | @AM24101 | AM24101 | LIQUID | N/A | 1.31E-05 | 1.310e-005 | uCi/mL |
| 3 | SAMPLE | S95T002411 | | 0 | @AM24101 | AM24101E | LIQUID | N/A | 4.84E+00 | 0.000 | % Ct. Error |
| 3 | SAMPLE | S95T002411 | | 0 | @AM24101 | AM24101T | LIQUID | N/A | 9.18E+01 | 1.000e-007 | % Recovery |
| 4 | DUP | S95T002411 | | 0 | @AM24101 | AM24101 | LIQUID | <1.31E-5 | 2.28E-5 | | RPD |
| 4 | DUP | S95T002411 | | 0 | @AM24101 | AM24101E | LIQUID | 1.00 | 2.91E+00 | 2.910 | % Ct. Error |
| 4 | DUP | S95T002411 | | 0 | @AM24101 | AM24101T | LIQUID | 100 | 9.35E+01 | 93.500 | % Recovery |
| 5 | SAMPLE | S95T002412 | | 0 | @AM24101 | AM24101 | LIQUID | N/A | 6.90E-05 | 2.240e-005 | uCi/mL |
| 5 | SAMPLE | S95T002412 | | 0 | @AM24101 | AM24101E | LIQUID | N/A | 1.77E+00 | 0.000 | % Ct. Error |
| 5 | SAMPLE | S95T002412 | | 0 | @AM24101 | AM24101T | LIQUID | N/A | 6.44E+01 | 1.000e-007 | % Recovery |
| 6 | DUP | S95T002412 | | 0 | @AM24101 | AM24101 | LIQUID | 6.90E-5 | 7.28E-5 | 5.360 | RPD |
| 6 | DUP | S95T002412 | | 0 | @AM24101 | AM24101E | LIQUID | 1.00 | 2.28E+00 | 2.280 | % Ct. Error |
| 6 | DUP | S95T002412 | | 0 | @AM24101 | AM24101T | LIQUID | 100 | 1.00E+02 | 100.000 | % Recovery |
| 7 | SAMPLE | S95T002413 | | 0 | @AM24101 | AM24101 | LIQUID | N/A | 6.52E-05 | 1.570e-005 | uCi/mL |
| 7 | SAMPLE | S95T002413 | | 0 | @AM24101 | AM24101E | LIQUID | N/A | 1.95E+00 | 0.000 | % Ct. Error |
| 7 | SAMPLE | S95T002413 | | 0 | @AM24101 | AM24101T | LIQUID | N/A | 9.12E+01 | 1.000e-007 | % Recovery |
| 8 | DUP | S95T002413 | | 0 | @AM24101 | AM24101 | LIQUID | 6.52E-5 | 6.59E-5 | 1.070 | RPD |
| 8 | DUP | S95T002413 | | 0 | @AM24101 | AM24101E | LIQUID | 1.00 | 1.87E+00 | 1.870 | % Ct. Error |
| 8 | DUP | S95T002413 | | 0 | @AM24101 | AM24101T | LIQUID | 100 | 9.04E+01 | 90.400 | % Recovery |

## Final page for worklist# 2650

Analyst Signature Date Analyst Signature Date

6 Oct 95
Reviewer Signature Date

S95T2412 and S95T2413 show Cm-243/244 activity at levels that are too low for quantification. 10/6/95

S95T2411 sample and dup are close to detection level; smearing on planchet may be responsible for "Actual" result on dup -- rerun not requested.

*Units shown for QC (BLK/BKG) may not reflect the actual units.*

# LABCORE Data Entry Template for Worklist# 2650

**Analyst:** GKL **Instrument:** AM01 _____ **Book#** 104B43

**Method:** LA-953-103 Rev/Mod _____

**Worklist Comment:** Use a 1.0 mL sample size. --LLF

| S | Type | Sample# | R | A | Test | Matrix | Group# | Project |
|---|---|---|---|---|---|---|---|---|
| 1 | STD | | | | @AM24101 | LIQUID | | |
| 2 | BLNK | | | | @AM24101 | LIQUID | | |
| 3 | SAMPLE | S95T002411 | 0 | | @AM24101 | LIQUID | 95000135 | AN-101 GRAB |
| | Analytes Requested: AM24101 , AM24101E, AM24101T | | | | | | | |
| 4 | DUP | S95T002411 | 0 | | @AM24101 | LIQUID | | |
| 5 | SAMPLE | S95T002412 | 0 | | @AM24101 | LIQUID | 95000135 | AN-101 GRAB |
| | Analytes Requested: AM24101 , AM24101E, AM24101T | | | | | | | |
| 6 | DUP | S95T002412 | 0 | | @AM24101 | LIQUID | | |
| 7 | SAMPLE | S95T002413 | 0 | | @AM24101 | LIQUID | 95000135 | AN-101 GRAB |
| | Analytes Requested: AM24101 , AM24101E, AM24101T | | | | | | | |
| 8 | DUP | S95T002413 | 0 | | @AM24101 | LIQUID | | |

## Final page for worklist # 2650

GLewis 10/5/95
**Analyst Signature** **Date**

C. Ojima 10/6/95
**Analyst Signature** **Date**

*Data Entry Comments:*

*S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.*

WORKBOOK PAGE: STD1

## Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID

| | | | | | | | STD |
|---|---|---|---|---|---|---|---|
| Type | Date Counted | | OCT-05-95 | Am 241 AEA Frac. | (C241) | | 0.558 |
| STD | Sample Volume in mL | (SS) | 1.000 | Am 243 AEA Frac. | (C243) | | 0.424 |
| Work List | Sample D.F. | (DF) | 101 | Cm 243/244 AEA Frac. | (Cm) | | 0 |
| 2650 | Tracer Volume in mL | (SPKV) | 0.050 | Total AT Counts | | | 13413 |
| Test Code | Digest D.F. | (DDF) | 1.000 | AT Count Time (min) | (TC) | | 30 |
| @AM24101 | Tracer Book No. | | 114B43 | Background in cpm | (Bkg) | | 6 |
| Matrix | Am-243 Tracer Value | (dpm/mL) | 9214 | Am 241 cpm | | | 104.45 |
| LIQUID | Detector Number | | 1 | Am 243 cpm | | | 79.3 |
| Batch Number | Detector Efficiency | (DetEff) | 0.5000 | Cm 243/244 cpm | | | 0 |
| 95002844 | Standard Book No | | 104B43 | AEA Count Time | (min) | | 480 |
| Rerun | Standard Value in µCi/mL | | 0.03067 | Am 241 µCi/L = | | | 2.7584E+01 |
| 0 | | | | Cm 243/244 µCi/L = | | < | 3.0442E+00 |
| Sample Prep | | | | | | | |
| N/A | | | | | | | |
| Sample Number | | | | | | | |
| WORKLIST#2650 | | | | | | | |
| Instrument Code | | | | | | | |
| AL10539 | | | | | | | |
| Prepared By | | | | | | | |
| CJO | | | | | | | |
| Chemist | | | | | | | |
| LLF | | | | | | | |
| Analyst | | | | | | | |
| AKL | | | | | | | |
| Date Complete | | | | | | | |
| 10/06/95 | | | | | | | |
| Analysis Date | | | | | | | |
| 10/05/95 | | | | | | | |
| Analysis Time | | | | | | | |
| 02:00 PM | | | | | | | |
| Sample Point | | | | | | | |
| AN-101 | | | | | | | |

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

| | | | |
|---|---|---|---|
| Am 241 µCi/mL | = | 2.76E-02 | DETECTION LEVELS in µCi/mL |
| Relative Counting Error | = | 1.3% | |
| NOTE: Cm-243/244 Result is a LESS THAN Value. | | | Am 241 |
| Cm 243/244 µCi/mL | | < 3.04E-03 | 3.04E-03 |
| Relative Counting Error | = | 100.0% | Cm 243/244 |
| Am 243 Tracer Recovery | = | 81.2% | 3.04E-03 |

| | | | |
|---|---|---|---|
| Analyst: | AKL | Date: | 10/06/95 |
| Signature of Chemist: | LLF | Date: | 6 Oct 95 |

STANDARD.WB1 REV 1.2 953103ML

WORKBOOK PAGE: BLANK2

## Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

| | | | | | | | BLNK |
|---|---|---|---|---|---|---|---|
| Type | Date Counted | | OCT-05-95 | Am 241 AEA Frac. | (C241) | | 0 |
| BLNK | Sample Volume in mL | (SS) | 1.000 | Am 243 AEA Frac. | (C243) | | 0.928 |
| Work List | Sample D.F. | (DF) | 1 | Cm 243/244 AEA Frac. | (Cm) | | 0 |
| 2650 | Tracer Volume in mL | (SPKV) | 0.050 | Total AT Counts | | | 6785 |
| Test Code | Digest D.F. | (DDF) | 1.000 | AT Count Time (min) | (TC) | | 30 |
| @AM24101 | Tracer Book No. | | 114B43 | Background in cpm | (Bkg) | | 3 |
| Matrix | Am-243 Tracer Value | (dpm/mL) | 9214 | Am 241 cpm | | | 0 |
| LIQUID | Detector Number | | 2 | Am 243 cpm | | | 100.8 |
| Batch Number | Detector Efficiency | (DetEff) | 0.5000 | Cm 243/244 cpm | | | 0 |
| 95002844 | | | | AEA Count Time | (min) | | 480 |
| Rerun | | | | Am 241 µCi/L = | | < | 1.2437E-02 |
| 0 | | | | Cm 243/244 µCi/L = | | < | 1.2437E-02 |
| Sample Prep | | | | | | | |
| N/A | | | | | | | |
| Sample Number | | | | | | | |
| S95T2411-BLANK | | | | | | | |
| Instrument Code | | | | | | | |
| AL10540 | | | | | | | |
| Prepared By | | | | | | | |
| CJO | | | | | | | |
| Chemist | | | | | | | |
| LLF | | | | | | | |
| Analyst | | | | | | | |
| AKL | | | | | | | |
| Date Completed | | | | | | | |
| 10/06/95 | | | | | | | |
| Analysis Date | | | | | | | |
| 10/05/95 | | | | | | | |
| Analysis Time | | | | | | | |
| 02:00 PM | | | | | | | |
| Sample Point | | | | | | | |
| AN-101 | | | | | | | |

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

NOTE: Am-241 Result is a LESS THAN Value.

| | | | |
|---|---|---|---|
| Am 241 µCi/mL | = | < 1.24E-05 | DETECTION LEVELS in µCi/mL |
| Relative Counting Error | = | 100.0% | |
| NOTE: Cm-243/244 Result is a LESS THAN Value. | | | Am 241 1.24E-05 |
| Cm 243/244 µCi/mL | | < 1.24E-05 | |
| Relative Counting Error | = | 100.0% | Cm 243/244 1.24E-05 |
| Am 243 Tracer Recovery | = | 89.9% | |

| | | | |
|---|---|---|---|
| Analyst: | AKL | Date: | 10/06/95 |
| Signature of Chemist: | LLF | Date: | 6 Oct 95 |

BLANK.WB1 REV 1.2 953103ML

WORKBOOK PAGE: SAM3

## Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

| | | | | | | | SAMPLE |
|---|---|---|---|---|---|---|---|
| Type | Date Counted | | OCT-05-95 | Am 241 AEA Frac. | (C241) | | 0.052 |
| SAMPLE | Sample Volume in mL | (SS) | 1.000 | Am 243 AEA Frac. | (C243) | | 0.86 |
| Work List | Sample D.F. | (DF) | 1 | Cm 243/244 AEA Frac. | (Cm) | | 0 |
| 2650 | Tracer Volume in mL | (SPKV) | 0.050 | Total AT Counts | | | 7524 |
| Test Code | Digest D.F. | (DDF) | 1.000 | AT Count Time (min) | (TC) | | 30 |
| @AM24101 | Tracer Book No. | | 114B43 | Background in cpm | (Bkg) | | 5 |
| Matrix | Am-243 Tracer Value | (dpm/mL) | 9214 | Am 241 cpm | | | 3.62 |
| LIQUID | Detector Number | | 3 | Am 243 cpm | | | 59.99 |
| Batch Number | Detector Efficiency | (DetEff) | 0.5000 | Cm 243/244 cpm | | | 0 |
| 95002844 | | | | AEA Count Time | (min) | | 480 |
| Rerun | | | | Am 241 µCi/L = | | < | 1.3148E-02 |
| 0 | | | | Cm 243/244 µCi/L = | | < | 1.3148E-02 |
| Sample Prep | | | | | | | |
| N/A | | | | | | | |

Sample Number: S95T002411

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Instrument Code: AL10541

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Prepared By: C.JO

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

Chemist: LLF

NOTE: Am-241 Result is a LESS THAN Value.

| | | | |
|---|---|---|---|
| Am 241 µCi/mL | = | < 1.31E-05 | DETECTION LEVELS in µCi/mL |
| Relative Counting Error | = | 4.8% | |

Analyst: AKL

NOTE: Cm-243/244 Result is a LESS THAN Value.

| | | | |
|---|---|---|---|
| Cm 243/244 µCi/mL | | < 1.31E-05 | Am 241 1.31E-05 |
| Relative Counting Error | = | 100.0% | Cm 243/244 1.31E-05 |
| Am 243 Tracer Recovery | = | 91.8% | |

Date Complete: 10/06/95

Analysis Date: 10/05/95

Analysis Time: 02:00 PM

Sample Point: AN-101

| | | | |
|---|---|---|---|
| Analyst: | AKL | Date: | 10/06/95 |
| Signature of Chemist: | LLF | Date: | 6 Oct 95 |

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: DUP4

## Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

| | | | | | | | DUP |
|---|---|---|---|---|---|---|---|
| Type | Date Counted | | OCT-05-95 | Am 241 AEA Frac. | (C241) | | 0.098 |
| DUP | Sample Volume in mL | (SS) | 1.000 | Am 243 AEA Frac. | (C243) | | 0.891 |
| Work List | Sample D.F. | (DF) | 1 | Cm 243/244 AEA Frac. | (Cm) | | 0 |
| 2650 | Tracer Volume in mL | (SPKV) | 0.050 | Total AT Counts | | | 7428 |
| Test Code | Digest D.F. | (DDF) | 1.000 | AT Count Time (min) | (TC) | | 30 |
| @AM24101 | Tracer Book No. | | 114B43 | Background in cpm | (Bkg) | | 6 |
| Matrix | Am-243 Tracer Value | (dpm/mL) | 9214 | Am 241 cpm | | | 10.47 |
| LIQUID | Detector Number | | 1 | Am 243 cpm | | | 95.01 |
| Batch Number | Detector Efficiency | (DetEff) | 0.5000 | Cm 243/244 cpm | | | 0 |
| 95002844 | | | | AEA Count Time | (min) | | 480 |
| Rerun | | | | Am 241 µCi/L = | | | 2.2825E-02 |
| 0 | | | | Cm 243/244 µCi/L = | | < | 1.2462E-02 |
| Sample Prep | | | | | | | |
| N/A | | | | | | | |

Sample Number: S95T002411

Instrument Code: AL10539

Prepared By: CJO

Chemist: LLF

Analyst: AKL

Date Complete: 10/06/95

Analysis Date: 10/05/95

Analysis Time: 02:00 PM

Sample Point: AN-101

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

| | | | |
|---|---|---|---|
| Am 241 µCi/mL | = | 2.28E-05 | DETECTION LEVELS in µCi/mL |
| Relative Counting Error | = | 2.9% | |
| NOTE: Cm-243/244 Result is a LESS THAN Value. | | | Am 241 |
| Cm 243/244 µCi/mL | | < 1.25E-05 | 1.25E-05 |
| Relative Counting Error | = | 100.0% | Cm 243/244 |
| Am 243 Tracer Recovery | = | 93.5% | 1.25E-05 |

| | | | |
|---|---|---|---|
| Analyst: | AKL | Date: | 10/06/95 |
| Signature of Chemist: | LLF | Date: | 6 Oct 95 |

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: SAM5

## Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

| | | | | | | | SAMPLE |
|---|---|---|---|---|---|---|---|
| Type | Date Counted | | OCT-05-95 | Am 241 AEA Frac. | (C241) | | 0.239 |
| SAMPLE | Sample Volume in mL | (SS) | 1.000 | Am 243 AEA Frac. | (C243) | | 0.719 |
| Work List | Sample D.F. | (DF) | 1 | Cm 243/244 AEA Frac. | (Cm) | | 0.011 |
| 2650 | Tracer Volume in mL | (SPKV) | 0.050 | Total AT Counts | | | 6284 |
| Test Code | Digest D.F. | (DDF) | 1.000 | AT Count Time (min) | (TC) | | 30 |
| @AM24101 | Tracer Book No. | | 114B43 | Background in cpm | (Bkg) | | 3 |
| Matrix | Am-243 Tracer Value | (dpm/mL) | 9214 | Am 241 cpm | | | 33.85 |
| LIQUID | Detector Number | | 2 | Am 243 cpm | | | 102.06 |
| Batch Number | Detector Efficiency | (DetEff) | 0.5000 | Cm 243/244 cpm | | | 1.58 |
| 95002844 | | | | AEA Count Time | (min) | | 480 |
| Rerun | | | | Am 241 µCi/L = | | | 6.8982E-02 |
| 0 | | | | Cm 243/244 µCi/L = | | < | 2.2393E-02 |
| Sample Prep | | | | | | | |
| N/A | | | | | | | |
| Sample Number | | | | | | | |
| S95T002412 | | | | | | | |
| Instrument Code | | | | | | | |
| AL10540 | | | | | | | |
| Prepared By | | | | | | | |
| CJO | | | | | | | |
| Chemist | | | | | | | |
| LLF | | | | | | | |
| Analyst | | | | | | | |
| AKL | | | | | | | |
| Date Complete | | | | | | | |
| 10/06/95 | | | | | | | |
| Analysis Date | | | | | | | |
| 10/05/95 | | | | | | | |
| Analysis Time | | | | | | | |
| 02:00 PM | | | | | | | |
| Sample Point | | | | | | | |
| AN-101 | | | | | | | |

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

| | | | |
|---|---|---|---|
| Am 241 µCi/mL | = | 6.90E-05 | DETECTION LEVELS in µCi/mL |
| Relative Counting Error | = | 1.8% | |
| NOTE: Cm-243/244 Result is a LESS THAN Value. | | | Am 241 |
| Cm 243/244 µCi/mL | | < 2.24E-05 | 2.24E-05 |
| Relative Counting Error | = | 7.2% | Cm 243/244 |
| Am 243 Tracer Recovery | = | 64.4% | 2.24E-05 |

| | | | |
|---|---|---|---|
| Analyst: | AKL | Date: | 10/06/95 |
| Signature of Chemist: [signature] | LLF | Date: | 6 Oct 95 |

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: DUP6

## Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

| | | | | | | | DUP |
|---|---|---|---|---|---|---|---|
| Type | Date Counted | | OCT-05-95 | Am 241 AEA Frac. | (C241) | | 0.255 |
| DUP | Sample Volume in mL | (SS) | 1.000 | Am 243 AEA Frac. | (C243) | | 0.727 |
| Work List | Sample D.F. | (DF) | 1 | Cm 243/244 AEA Frac. | (Cm) | | 0.012 |
| 2650 | Tracer Volume in mL | (SPKV) | 0.050 | Total AT Counts | | | 9668 |
| Test Code | Digest D.F. | (DDF) | 1.000 | AT Count Time (min) | (TC) | | 30 |
| @AM24101 | Tracer Book No. | | 114B43 | Background in cpm | (Bkg) | | 5 |
| Matrix | Am-243 Tracer Value | (dpm/mL) | 9214 | Am 241 cpm | | | 20.76 |
| LIQUID | Detector Number | | 3 | Am 243 cpm | | | 59.29 |
| Batch Number | Detector Efficiency | (DetEff) | 0.5000 | Cm 243/244 cpm | | | 1.02 |
| 95002844 | | | | AEA Count Time | (min) | | 480 |
| Rerun | | | | Am 241 µCi/L = | | | 7.2790E-02 |
| 0 | | | | Cm 243/244 µCi/L = | | < | 1.4273E-02 |
| Sample Prep | | | | | | | |
| N/A | | | | | | | |
| Sample Number | | | | | | | |
| S95T002412 | | | | | | | |
| Instrument Code | | | | | | | |
| AL10541 | | | | | | | |
| Prepared By | | | | | | | |
| CJO | | | | | | | |
| Chemist | | | | | | | |
| LLF | | | | | | | |
| Analyst | | | | | | | |
| AKL | | | | | | | |
| Date Complete | | | | | | | |
| 10/06/95 | | | | | | | |
| Analysis Date | | | | | | | |
| 10/05/95 | | | | | | | |
| Analysis Time | | | | | | | |
| 02:00 PM | | | | | | | |
| Sample Point | | | | | | | |
| AN-101 | | | | | | | |

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

| | | | |
|---|---|---|---|
| Am 241 µCi/mL | = | 7.28E-05 | DETECTION LEVELS in µCi/mL |
| Relative Counting Error | = | 2.3% | |
| NOTE: Cm-243/244 Result is a LESS THAN Value. | | | Am 241 |
| Cm 243/244 µCi/mL | | < 1.43E-05 | 1.43E-05 |
| Relative Counting Error | = | 8.9% | Cm 243/244 |
| Am 243 Tracer Recovery | = | 100.1% | 1.43E-05 |

| | | | |
|---|---|---|---|
| Analyst: | AKL | Date: | 10/06/95 |
| Signature of Chemist: | LLF | Date: | 6 Oct 95 |

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: SAM7

## Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

| | | | | | | SAMPLE |
|---|---|---|---|---|---|---|
| Type | Date Counted | | OCT-05-95 | Am 241 AEA Frac. | (C241) | 0.227 |
| SAMPLE | Sample Volume in mL | (SS) | 1.000 | Am 243 AEA Frac. | (C243) | 0.723 |
| Work List | Sample D.F. | (DF) | 1 | Cm 243/244 AEA Frac. | (Cm) | 0.011 |
| 2650 | Tracer Volume in mL | (SPKV) | 0.050 | Total AT Counts | | 8898 |
| Test Code | Digest D.F. | (DDF) | 1.000 | AT Count Time (min) | (TC) | 30 |
| @AM24101 | Tracer Book No. | | 114B43 | Background in cpm | (Bkg) | 6 |
| Matrix | Am-243 Tracer Value | (dpm/mL) | 9214 | Am 241 cpm | | 27.73 |
| LIQUID | Detector Number | | 1 | Am 243 cpm | | 88.45 |
| Batch Number | Detector Efficiency | (DetEff) | 0.5000 | Cm 243/244 cpm | | 1.29 |
| 95002844 | | | | AEA Count Time | (min) | 480 |
| Rerun | | | | Am 241 µCi/L = | | 6.5156E-02 |
| 0 | | | | Cm 243/244 µCi/L = | < | 1.5734E-02 |
| Sample Prep | | | | | | |
| N/A | | | | | | |
| Sample Number | | | | | | |
| S95T002413 | | | | | | |
| Instrument Code | | | | | | |
| AL10539 | | | | | | |
| Prepared By | | | | | | |
| CJO | | | | | | |
| Chemist | | | | | | |
| LLF | | | | | | |
| Analyst | | | | | | |
| AKL | | | | | | |
| Date Complete | | | | | | |
| 10/06/95 | | | | | | |
| Analysis Date | | | | | | |
| 10/05/95 | | | | | | |
| Analysis Time | | | | | | |
| 02:00 PM | | | | | | |
| Sample Point | | | | | | |
| AN-101 | | | | | | |

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

| | | | |
|---|---|---|---|
| Am 241 µCi/mL | = | 6.52E-05 | DETECTION LEVELS in µCi/mL |
| Relative Counting Error | = | 1.9% | |
| NOTE: Cm-243/244 Result is a LESS THAN Value. | | | Am 241 |
| Cm 243/244 µCi/mL | | < 1.57E-05 | 1.57E-05 |
| Relative Counting Error | = | 7.9% | Cm 243/244 |
| Am 243 Tracer Recovery | = | 91.2% | 1.57E-05 |

| | | | |
|---|---|---|---|
| Analyst: | AKL | Date: | 10/06/95 |
| Signature of Chemist: | LLF | Date: | 6 Oct 95 |

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: DUP8

## Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

| | | | | | | | DUP |
|---|---|---|---|---|---|---|---|
| Type | Date Counted | | OCT-05-95 | Am 241 AEA Frac. | (C241) | | 0.221 |
| DUP | Sample Volume in mL | (SS) | 1.000 | Am 243 AEA Frac. | (C243) | | 0.696 |
| Work List | Sample D.F. | (DF) | 1 | Cm 243/244 AEA Frac. | (Cm) | | 0.01 |
| 2650 | Tracer Volume in mL | (SPKV) | 0.050 | Total AT Counts | | | 9070 |
| Test Code | Digest D.F. | (DDF) | 1.000 | AT Count Time (min) | (TC) | | 30 |
| @AM24101 | Tracer Book No. | | 114B43 | Background in cpm | (Bkg) | | 3 |
| Matrix | Am-243 Tracer Value | (dpm/mL) | 9214 | Am 241 cpm | | | 30.27 |
| LIQUID | Detector Number | | 2 | Am 243 cpm | | | 95.34 |
| Batch Number | Detector Efficiency | (DetEff) | 0.5000 | Cm 243/244 cpm | | | 1.39 |
| 95002844 | | | | AEA Count Time | (min) | | 480 |
| Rerun | | | | Am 241 µCi/L = | | | 6.5894E-02 |
| 0 | | | | Cm 243/244 µCi/L = | | < | 1.6484E-02 |
| Sample Prep | | | | | | | |
| N/A | | | | | | | |
| Sample Number | | | | | | | |
| S95T002413 | | | | | | | |
| Instrument Code | | | | | | | |
| AL10540 | | | | | | | |
| Prepared By | | | | | | | |
| CJO | | | | | | | |
| Chemist | | | | | | | |
| LLF | | | | | | | |
| Analyst | | | | | | | |
| AKL | | | | | | | |
| Date Complete | | | | | | | |
| 10/06/95 | | | | | | | |
| Analysis Date | | | | | | | |
| 10/05/95 | | | | | | | |
| Analysis Time | | | | | | | |
| 02:00 PM | | | | | | | |
| Sample Point | | | | | | | |
| AN-101 | | | | | | | |

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

| | | | |
|---|---|---|---|
| Am 241 µCi/mL | = | 6.59E-05 | DETECTION LEVELS in µCi/mL |
| Relative Counting Error | = | 1.9% | |
| NOTE: Cm-243/244 Result is a LESS THAN Value. | | | Am 241 |
| Cm 243/244 µCi/mL | | < 1.65E-05 | 1.65E-05 |
| Relative Counting Error | = | 7.6% | Cm 243/244 |
| Am 243 Tracer Recovery | = | 90.4% | 1.65E-05 |

| | | | |
|---|---|---|---|
| Analyst: | AKL | Date: | 10/06/95 |
| Signature of Chemist: | LLF | Date: | 6 Oct 95 |

SAMPLE.WB1 REV 1.2 953103ML

Westinghouse Hanford Co.

# G E N E R A L  A L P H A  E N E R G Y  A N A L Y S I S
**Rev. 2.01**

## DATA REDUCTION REPORT

SAMPLE
WORKLIST#2650-ST
File ID: 2a2943.CNF

Counted on: 10/ 5/95 @19: 8
Detector: AEA2
Geometry number: 1
Count time: 28805. Sec

### PEAK ANALYSIS

| Peak ID | Peak height Initial | Peak height Final | Peak center Initial | Peak center Final | FWHM Initial | FWHM Final | Tau Initial | Tau Final |
|---|---|---|---|---|---|---|---|---|
| 1 | 1840.1 | 1840.1 | 303.277 | 303.277 | 20.000 | 19.597 | 10.000 | 4.975 |
| 2 | 1428.6 | 1428.6 | 257.034 | 256.741 | 24.000 | 18.599 | 12.000 | 4.805 |
| 3? | 10.6 | 10.6 | 148.448 | 148.202 | 124.000 | 1.000 | 62.000 | 0.100 |

### PEAK RESULTS
**Peak Error Limit: 30%**

| Peak ID | Isotope | AEA Frac | Peak Centroid Exp. | Obs. | Diff. | FWHM | Count Rate c/m | %err @95 | d/m | Activity uCi/ea |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Am241 | 0.558 | 5.479 | 5.480 | -.001 | 0.09 | 104.45 | 0.9 | 392.3 | 0.177E-03 |
| | Pu238 | | 5.487 | 5.480 | 0.007 | | | | 512.2 | 0.231E-03 |
| 2 | Pu239 | 0.424 | 5.147 | 5.266 | -.119 | 0.09 | 79.30 | 1.1 | 280.0 | 0.126E-03 |
| | Am243 | | 5.270 | 5.266 | 0.004 | | | | 282.8 | 0.127E-03 |
| 3 | | ???? | | 4.767 | | | 0.84 | 10.0 | | |
| Totals: | | 0.982 | <--valid peaks only--> | | | | 183.74 | | | |

DETECTOR CALIBRATION
Energy(MEV) = 4.085 + (0.0046)*Channel
Energy range (MeV): 4.085 TO 6.440
Efficiency = 0.2832 CPM/DPM

**TOTAL COUNT DATA:**

| Item | Total | % Recovery |
|---|---|---|
| Raw spectrum | 89786.0 | 100.000 |
| Smoothed | 89786.0 | 100.000 |
| Composite fit | 88613.5 | 98.694 |
| Residuals | 1172.5 | 1.306 |

Analyzed by: ALJ 10-6-95