



KERR-MCGEE CORPORATION

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September 22, 2005

Mr. Derek Widmayer
Office of Nuclear Materials Safety & Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Docket No. 70-3073; License No. SNM-1999
Response to Request for Additional Information
Final Status Survey Reports for Sectors 7 – 11 and Addendum for Sector 6

Dear Mr. Widmayer:

Kerr-McGee (KM) submitted final status survey reports for Sectors 7 through 11, as well as an addendum to the final status survey report for Sector 6 at the Cushing refinery site. Following NRC review of these documents, KM received NRC's request for additional information for five of the reports in a letter dated September 21, 2005.

Attached please find Nextep Environmental's Technical Memorandum 05-13, "Response to NRC Comments on Cushing Sectors 6 – 11 Final Status Survey Reports (FSSR), revision 0. This technical memo provides responses to NRC's comments, as well as corrected tables and figures.

If you have further questions or comments, please contact me at (405) 270-2694, or Mr. Terry Keane at (918) 223-2543.

Sincerely,

Jeff Lux
Project Manager

Cc: Blair Spitzberg, NRC Region IV

NMSSD1

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TECHNICAL MEMORANDUM 05-13

September 16, 2005

Originator: David C. Wilson

Subject: *Response to NRC Comments on Cushing Sectors 6-11 Final Status Survey Reports (FSSR)*

Revision: 0

ENDORSEMENT: This document contains the results of research and technical analysis which have been reviewed and approved for publication by the Technical Director, NEXTEP Environmental, Inc.


Harry J. Newman, CHP, Technical Director

9/16/2005
Date

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1 INTRODUCTION

- 1.1 The purpose of this paper is to document the responses to the Nuclear Regulatory Commission (NRC) request for additional information (RAI) on the Cushing Final Status Survey Reports (FSSR) for Sectors 6-11. These responses apply to the NRC comments on the FSSRs for Sectors 6-11 in order of the sector in question. The responses to the seven individual comments are as follows:

2 SECTOR 6 ADDENDUM

2.1 COMMENT

- 2.1.1 *Attachments E and F, pages 27 and 37, Tables 3 and 1: The U-235 concentration values in both tables exceed those reported for both the U-238 and U-234, indicating enriched uranium. However, it is likely that the data columns for U-235 and U-234 may have been transposed. Please review the data and correct if appropriate or otherwise address this discrepancy in isotopic abundances.*

2.2 RESPONSE

- 2.2.1 Table 3 in Attachment E, page 27 contains column headers that are transposed. Also in Table 1 of Attachment F, (page 37) two data points contain values that were transposed and recorded in the wrong columns. Both tables have been corrected and are included in Attachment A of this document. The entries that have been corrected are highlighted in yellow.

3 SECTOR 7

3.1 NO COMMENTS

4 SECTOR 8

4.1 COMMENT

- 4.1.1 *Section 4.1.3.3, page 21: The section discusses the identification of two soil samples exceeding the fraction of the maximum permissible concentration (FMPC). The document does not indicate whether these locations were identified for sampling as a result of surface scans—Sections 4.2.4 or 4.2.5 do not specifically provide this information—or from the systematic sampling. This is relevant to confirmation of the surface scan Minimum Detectable Concentrations (MDCs). Furthermore, the reviewer interprets that these samples were collected from Survey Unit 808 which is listed as an undesignated area in Table 2.1 on page 6. With the identification of residual activity in excess of the FMPC, was this survey unit, or portions thereof, reclassified as affected?*

4.2 RESPONSE

- 4.2.1 As part of the requirements for soil characterization, any samples taken in undesignated areas (UDA) which showed activity exceeding 0.25 FMPC were enclosed by a 5 meter grid of soil samples. In addition, they were rescanned by hand, and soil samples were collected at local maxima even when these did not exceed the scan threshold. By tightening the grid to 5 meters, areas containing soil samples exceeding 0.25 FMPC in UDAs were treated as affected areas although they were not specifically labeled as such. Soil samples above 0.25 FMPC in the northeast corner of Sector 8 are shown with decreased (5m) grid spacing in Attachment B as they were reported in the Sector 8 Characterization Report.
- 4.2.2 The Cushing Decommissioning Plan (SDP) states, "These (UDA) are areas with limited historical knowledge and/or previous survey information. There is no reason to believe that undesignated areas are contaminated, but due to location or topographic relation to contaminated areas, they cannot be classified as unaffected areas." No reclassification of these areas is called for in the SDP.
- 4.2.3 The soil samples at locations B072E29S21 and B072E31S16 were both identified by the rescan of these areas as mentioned above. The sample at location B072E29S21 was obtained on the surface, while the sample at B072E31S16 is a 0.5 – 1.0 ft depth sample. Two subsequent samples were collected at B072E29S21 on the surface which could not confirm the elevated surface reading obtained earlier at that location. No other samples or scans surrounding or below either of these locations showed any indication of elevated activity.

4.3 COMMENT

- 4.3.1 *Table 4.5, page 26: There are two data sets listed for the direct beta activity on Building A-5 Warehouse Pad. Please provide additional information to explain the two sets of beta data for this area.*

4.4 RESPONSE

- 4.4.1 Only one of the sets of beta measurements belongs to Building A-5 Warehouse Pad. The other set belongs in Miscellaneous Small Pads (S08-03). A corrected version of the affected page is included in Attachment C.

5 SECTOR 9

5.1 COMMENT

- 5.1.1 *Appendix D, Pages 44 and 45, Table 3: The beta activity listed for several of the Building A-9 surfaces is consistently reported as 194 dpm/100 cm². Is this the static measurement MDC for the instrument? If so, this is not consistent with the reporting of the actual measured activity shown for all remaining areas. Please clarify.*

5.2 RESPONSE

- 5.2.1 The data were taken from a survey when the lab was moved out of building A-9 in June of 1999. The survey procedure at that time did not specify recording of measured values on surveys used for statistical purposes. Consequently, the survey data were evaluated as “less than MDA” and the MDA was recorded in the tables (direct α : 17 dpm/100cm², direct β : 194 dpm/100cm², loose α : 5 dpm/100cm², loose β : 6 dpm/100cm²). Since routine surveys taken after the movement of the lab showed no increase or introduction of contamination into the area, the data were included in the FSSR for completeness.

6 SECTOR 10

6.1 COMMENT

- 6.1.1 *Section 4.1.2.4, page 21: The section discusses the identification of soil samples exceeding the FMPC. The document does not indicate whether these locations were identified for sampling as a result of surface scans—Sections 4.2.4 or 4.2.5 do not specifically provide this information—or from the systematic sampling. This is relevant to confirmation of the surface scan MDCs.*

6.2 RESPONSE

- 6.2.1 Eight of the elevated samples reported were located below grade in boreholes that were sampled as part of the regular surface grid¹. Their vertical position in the column of soil samples at each location is shown in the tables presented in Appendix B of the FSSR. These samples were not located by scans.
- 6.2.2 One of the nine samples (B104E75S15) was identified for sampling from local scan maxima observed during manual scans of the bottom surface of the excavations prior to backfill.

7 SECTOR 11

7.1 COMMENT

- 7.1.1 *Section 4.1.2.4, page 21: The section discusses the identification of soil samples exceeding the FMPC. The document does not indicate whether these locations were identified for sampling as a result of surface scans—Sections 4.2.4 or 4.2.5 do not specifically provide this information—or from the systematic sampling. This is relevant to confirmation of the surface scan MDCs.*

7.2 RESPONSE

- 7.2.1 The sample identified in the FSSR is located at the bottom of an excavation greater than ten feet deep and was identified for biased sampling as a result of manual scans performed on the bottom surface of the excavation prior to backfill.

¹ BLD30-120 was part of a special grid pattern taken within the footprint of BLD 30 at tighter spacing than the standard 5m.

Attachment A
Sector 6 Corrected Tables

Attachment A

**Sector 6 Attachment E
Table 3**

| Location | Interval | Gross Activity pCi/g | | | | Error (± 2 Sigma) | | | Net Activity | | Total Uncertainty | | FMPC |
|------------|-----------|----------------------|-------|-------|-------|------------------------|-------|-------|--------------|---------|-------------------|------|------|
| | | Below Impact | U-235 | U-238 | U-234 | Th-232 | U-235 | U-238 | Th-232 | Total U | Total Th | U | |
| B034E69S77 | 0 - 6" | 0.08 | 1.75 | 1.75 | 1.30 | 0.19 | 1.81 | 0.38 | 0.82 | 0.69 | 1.82 | 0.54 | 0.10 |
| | 6" - 12" | -0.03 | 3.16 | 0.00 | 0.96 | 0.22 | 2.17 | 0.42 | 0.36 | 0.00 | 2.18 | 0.60 | 0.01 |
| | 12" - 18" | 0.01 | 1.47 | 0.00 | 0.96 | 0.18 | 1.81 | 0.36 | 0.00 | 0.01 | 1.82 | 0.51 | 0.00 |
| | 18" - 24" | -0.02 | 3.66 | 0.00 | 0.94 | 0.16 | 1.69 | 0.32 | 0.87 | 0.00 | 1.70 | 0.45 | 0.03 |
| | 24" - 30" | 0.16 | 2.77 | 2.77 | 1.27 | 0.21 | 2.15 | 0.41 | 2.94 | 0.63 | 2.16 | 0.57 | 0.16 |

NOTES:

Data represents activity per dry mass
 Activity numbers are in pCi/g
 Net negative values have been set to zero
 U-234 is calculated

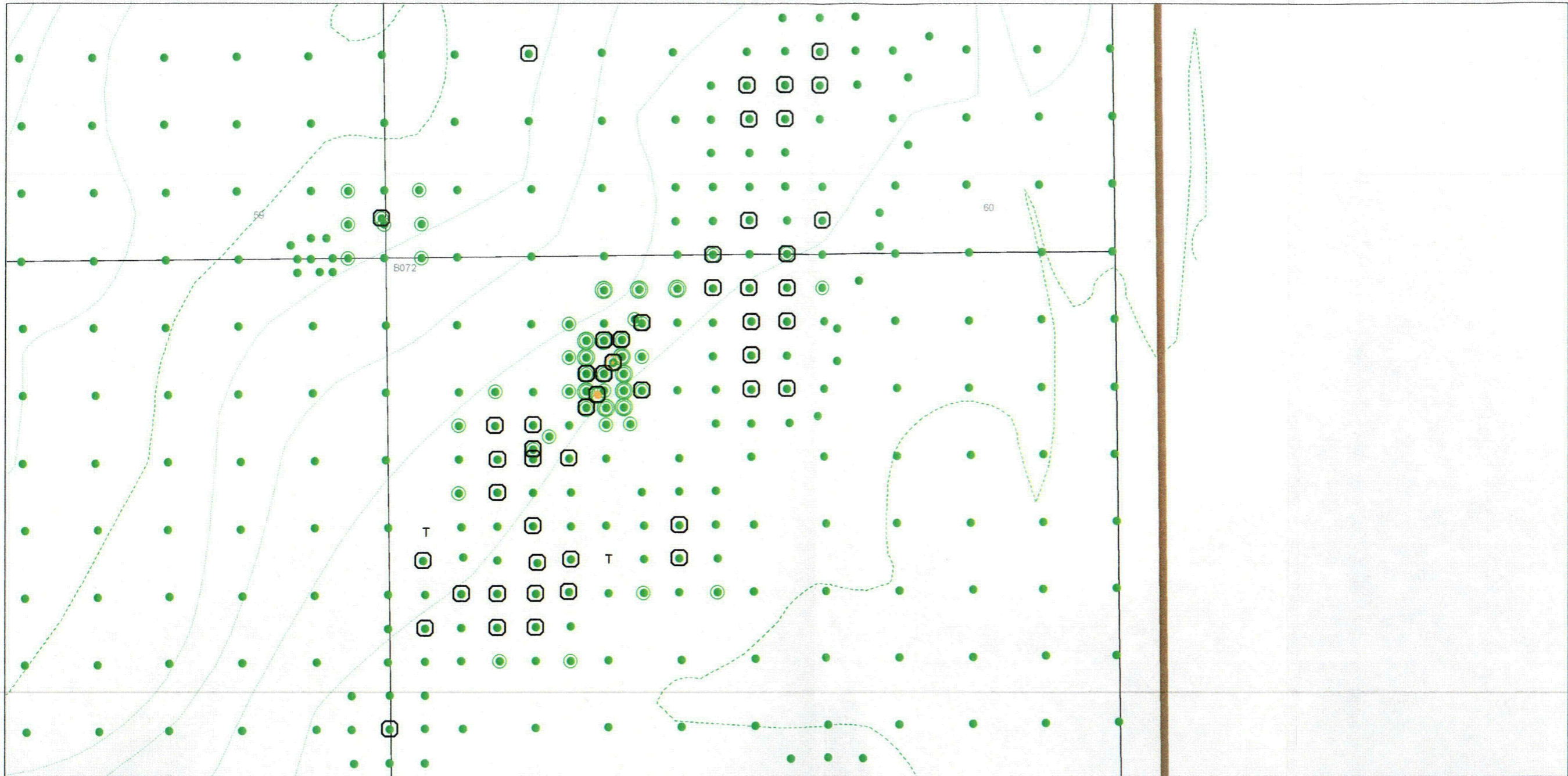
Sector 6 Attachment F
Table 1

| Location | Gross Activity pCi/g | | | | Error (± 2 Sigma) | | | Net Activity | | Total Uncertainty | | FMPC |
|----------------|----------------------|-------|-------|--------|------------------------|-------|--------|--------------|----------|-------------------|------|------|
| | U-235 | U-238 | U-234 | Th-232 | U-235 | U-238 | Th-232 | Total U | Total Th | U | Th | |
| B052E75S05 | 0.01 | 2.35 | 0.00 | 0.97 | 0.17 | 1.80 | 0.35 | 0.00 | 0.02 | 1.81 | 0.49 | 0.00 |
| B052E75S05 | 0.07 | 1.08 | 1.08 | 1.08 | 0.17 | 1.61 | 0.33 | 0.00 | 0.24 | 1.62 | 0.46 | 0.02 |
| B052E75S10 | 0.11 | 2.72 | 2.36 | 1.25 | 0.20 | 1.91 | 0.38 | 2.43 | 0.59 | 1.92 | 0.54 | 0.14 |
| B052E75S15 | 0.10 | -0.26 | -0.26 | 1.24 | 0.19 | 1.67 | 0.37 | 0.00 | 0.55 | 1.68 | 0.52 | 0.06 |
| B052E80S05 | 0.20 | 0.33 | 0.33 | 2.54 | 0.16 | 1.51 | 0.34 | 0.00 | 3.17 | 1.52 | 0.48 | 0.32 |
| B052E80S10 | 0.20 | 0.00 | 0.00 | 0.90 | 0.18 | 1.59 | 0.33 | 0.00 | 0.00 | 1.60 | 0.46 | 0.00 |
| B052E80S15 | 0.08 | -0.10 | -0.10 | 1.83 | 0.20 | 1.86 | 0.41 | 0.00 | 1.74 | 1.87 | 0.58 | 0.17 |
| B052E85S05 | 0.08 | 1.23 | 1.23 | 1.60 | 0.18 | 1.69 | 0.36 | 0.00 | 1.29 | 1.70 | 0.51 | 0.13 |
| B052E85S10 | 0.13 | 0.18 | 0.18 | 1.22 | 0.20 | 1.68 | 0.37 | 0.00 | 0.51 | 1.70 | 0.52 | 0.05 |
| B052E85S15 | 0.29 | 0.86 | 0.86 | 1.24 | 0.19 | 1.61 | 0.34 | 0.00 | 0.56 | 1.62 | 0.48 | 0.06 |
| RMA-15 B-1 | 0.00 | 1.86 | 0.00 | 1.51 | 0.25 | 2.63 | 0.51 | 0.00 | 1.10 | 2.64 | 0.72 | 0.11 |
| RMA-15 B-2 | 0.25 | 0.63 | 0.63 | 4.99 | 0.45 | 4.42 | 1.00 | 0.00 | 8.06 | 4.44 | 1.41 | 0.81 |
| B052E81S07-N-4 | 0.20 | 1.60 | 1.60 | 7.30 | 0.45 | 4.75 | 1.10 | 0.63 | 12.68 | 4.77 | 1.56 | 1.29 |
| B052E83S06-N-5 | 0.10 | 0.30 | 0.30 | 5.10 | 0.27 | 2.80 | 0.65 | 0.00 | 8.28 | 2.81 | 0.92 | 0.83 |
| B052E77S14-N-6 | 0.20 | 4.00 | 4.00 | 1.90 | 0.20 | 2.15 | 0.43 | 5.43 | 1.88 | 2.16 | 0.60 | 0.37 |

Attachment B

Sector 8 UDA Expansion Grid

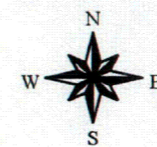
Attachment B



NEXTEP

| Soil Samples | | | | |
|--------------|------------|--------------|------------|------------------|
| > 0.25 FMPC | < 1.0 FMPC | 1.0-3.0 FMPC | > 3.0 FMPC | T - Tree / Brush |
| ○ | ● 0-0.5 | ● 0-0.5 | ● 0-0.5 | |
| | ⊕ 0.5-1 | ⊕ 0.5-1 | ⊕ 0.5-1 | |
| | ⊕ 1-2 | ⊕ 1-2 | ⊕ 1-2 | |
| | ⊕ 2-3 | ⊕ 2-3 | ⊕ 2-3 | |

Depths in feet increase with ring diameter.



5 0 5 10 Meters

Cushing Site Decommissioning
Project Sector 8 NRC RAI

UDA Expansion Grids Near B072E29S21

| | |
|--------------|----------------|
| Cushing Site | Drawn by: DCW |
| Revision: 0 | Date: 9/9/2005 |

Attachment C

Sector 8 Corrected Table 4.5

Attachment C

Table 4.5
Sector 8 Concrete Pads
Alpha/Beta-Gamma and Exposure Rate Measurements Summary

| ID | Area Surveyed | Points | Contamination Component | Net Activity (dpm/100cm ²) | | | Max Net Exp Rate |
|--------------|--------------------------------|--------|-------------------------|--|-----|-----|----------------------------|
| | | | | Min | Max | Avg | (μ R/hr) ^a |
| S08-01 | Building 53 Warehouse Pad | 144 | Direct α | -13 | 67 | 19 | 0 |
| | | | Direct β | -584 | 563 | -48 | |
| S08-02 | Building A-4 Pad | 106 | Direct α | -67 | 267 | 23 | 0 |
| | | | Direct β | -421 | 468 | 39 | |
| S08-03 | Miscellaneous Small Pads | 6 | Direct α | 0 | 20 | 5 | 0 |
| | | | Direct β | -25 | 126 | 12 | |
| S08-04 | Building A-1 Control House Pad | 142 | Direct α | -7 | 113 | 18 | 0 |
| | | | Direct β | -435 | 460 | -12 | |
| S08-05 | Building A-3 Pump House Pad | 280 | Direct α | -20 | 127 | 22 | 0 |
| | | | Direct β | -274 | 882 | 264 | |
| S08-06 | Building A-2 Blower House Pad | 147 | Direct α | -27 | 53 | 15 | 0 |
| | | | Direct β | -526 | 892 | 129 | |
| S08-07 | Building 74 Pads | 372 | Direct α | -13 | 107 | 27 | 0 |
| | | | Direct β | -400 | 455 | 43 | |
| S08-08 | TSP D Pad | 9 | Direct α | 13 | 40 | 27 | 0 |
| | | | Direct β | -155 | 195 | 31 | |
| S08-09 | Building 57 Oil Pump House Pad | 150 | Direct α | -13 | 40 | 1 | 0 |
| | | | Direct β | -584 | 770 | -2 | |
| S08-10 | VB Furnace Pad | 80 | Direct α | -27 | 87 | 9 | 0 |
| | | | Direct β | -170 | 380 | 36 | |
| S08-11 | Building 51 Warehouse Pad | 149 | Direct α | -53 | 40 | 1 | 0 |
| | | | Direct β | -500 | 770 | -2 | |
| S08-12 | Building A-5 Warehouse Pad | 183 | Direct α | -27 | 133 | 38 | 0 |
| | | | Direct β | -465 | 485 | 162 | |
| S08-13,14,15 | 3 Monitor Well Pads | 3 | Direct α | 3 | 13 | 8 | 2 |
| | | | Direct β | 320 | 362 | 335 | |

^a Expressed in PIC-equivalent μ R/hr net of background.

^b Fixed Air Monitor Pad