

**ORISE**  
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

July 20, 2005

Mr. Thomas Dragoun  
NRR/DRIP  
U.S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

**SUBJECT: DOCUMENT REVIEW—FINAL STATUS SURVEY REPORTS, SAXTON NUCLEAR EXPERIMENTAL CORPORATION, SAXTON, PENNSYLVANIA (DOCKET NO. 50-146; TASK 1)**

Dear Mr. Dragoun:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) has reviewed Saxton Nuclear Experimental Corporation (SNEC) final status survey reports submitted to the U.S. Nuclear Regulatory Commission (NRC) on June 22 and July 8, 2005. These documents describe the final status survey results for the following SNEC-designated areas: Fences MA9; Open Land Areas OL4, OL8, OL11, and OL13; and, Penelec Switch Yard.

Comments identified are enclosed for your consideration. If you have any questions, please contact me at (865) 576-3356 or Alex J. Boerner at (865) 574-0951.

Sincerely,

*for Alex J. Boerner*

Timothy J. Bauer  
Health Physicist  
Environmental Survey and  
Site Assessment Program

TJB:ar

Enclosure

cc: A. Adams, NRC/NRR/OWFN 12G13      A. Boerner, ORISE/ESSAP  
S. Adams, NRC/NRR/OWFN O12E5      File/0968  
E. Abelquist, ORISE/ESSAP

| Distribution approval and concurrence: | Initials |
|--|----------|
| Technical Management Team Member       | EA       |

P. O. BOX 117, OAK RIDGE, TENNESSEE 37831-0117

Operated by Oak Ridge Associated Universities for the U.S. Department of Energy



*A001*  
*Rec'd 10/13/05*  
*Rec'd Per*  
*Al Adams*

**Comments on  
Final Status Survey Reports  
Saxton Nuclear Experimental Corporation  
Saxton, Pennsylvania**

**July 2005**

Saxton Nuclear Experimental Corporation (SNEC) submitted final status survey reports (FSSR) to the U.S. Nuclear Regulatory Commission (NRC) on June 22 and July 8, 2005. These documents described the final status survey (FSS) results for the following SNEC-designated areas: Fences MA9; Open Land Areas OL4, OL8, OL11, and OL13; and, Penelec Switch Yard. The FSSRs were reviewed for completeness and conformance to the SNEC License Termination Plan (LTP, GPU 2004) and the MARSSIM (NRC 2000). Comments noted during the reviews are identified below.

***General Comment***

In many cases, FSS results for scanning investigations and soil samples are compared to the derived concentration guideline value (DCGL<sub>w</sub>) rather than the Action Level (AL), which is 75% of the DCGL<sub>w</sub>. It is ESSAP's opinion that the FSS results should be compared to the AL because the AL, in part, accounts for delisted radionuclides. By comparing to only the DCGL<sub>w</sub>, SNEC could potentially exceed the 25 mrem/y release criterion by the dose consequence of the delisted radionuclides. The dose consequence listed in the FSSRs reviewed is 4.7% (e.g. Section 4.0, GPU 2005a). There is also inconsistency between FSSRs, e.g. the COMPASS input used the DCGL<sub>w</sub> in one case (GPU 2005a) but used the AL in another case (GPU 2005d). Also, text within a FSSR is inconsistent; for example, the COMPASS input uses the AL but in the text refers to the effective DCGL<sub>w</sub> (Section 5.0, GPU 2005d). This discussion also applies to the FSSRs reviewed and commented on in a previous letter (ORISE 2005).

***Fences MA9 (GPU 2005a)***

Section 7.4.2, Page 10 of 12—This section describes the fixed point Quality Control (QC) measurement results. SNEC noted that the results provided in Table 4 had good agreement. However, according to SNEC Procedure E900-IMP-4520.04, *Survey Methodology to Support SNEC License Termination* (GPU 2003), Section 4.6.2.4 indicates that for static measurements, QC measurements must have the same conclusion and must be within 20% of the original result. ESSAP recommends SNEC modify this section to indicate both data sets have the same conclusion. Also, fixed point "MA9-2 9" in Table 4 does not pass the 20% requirement—within 20% of the original result would necessitate a range of 286 cpm to 430 cpm. The QC result was 281 cpm.

***Open Land Area OL4 (GPU 2005b)***

1. Section 6.1.1, Page 6 of 17—This section compares the MDCscan to the DCGL<sub>w</sub> and states that since the MDCscan is less than the DCGL<sub>w</sub>, the scan sensitivity is adequate. However, the MDCscan is not less than the AL. Appendix A, Calculation E900-05-019,

Section 2.1.4 also includes this statement. The scan sensitivity should be compared to the AL (refer to General Comment).

2. Section 7.4.1, Page 15 of 17—This section describes the scan survey QC results. SNEC noted that the “QC rescans were consistent with the primary scans.” However, according to SNEC Procedure E900-IMP-4520.04, *Survey Methodology to Support SNEC License Termination* (GPU 2003), Section 4.6.2.4 indicates that for scan measurements, the same conclusion must be obtained for both measurements. ESSAP recommends SNEC modify this section to indicate the conclusion for each QC rescan was the same as the original scan.
3. Section 7.4.2, Page 15 of 17—This section describes the QC split gamma spectrometry analyses on soil samples. SNEC noted that the results provided in Table 8 had good agreement. However, according to SNEC Procedure E900-IMP-4520.04, *Survey Methodology to Support SNEC License Termination* (GPU 2003), Section 4.6.2.4 indicates that for samples, the same conclusion must be obtained for QC samples. ESSAP recommends SNEC modify this section to indicate the conclusion that all results were less than the AL, rather than in good agreement.

***Open Land Area OL8 (GPU 2005c)***

1. Section 7.4.2, Page 17 of 19—This section describes the QC split gamma spectrometry analyses on soil samples. SNEC noted that the results provided in Tables 8 and 9 had good agreement. However, according to SNEC Procedure E900-IMP-4520.04, *Survey Methodology to Support SNEC License Termination* (GPU 2003), Section 4.6.2.4 indicates that for samples, the same conclusion must be obtained for QC samples. ESSAP recommends SNEC modify this section to indicate the conclusion that all results were less than the AL, rather than in good agreement.
2. Appendix A, Attachments 6-2, 6-4, 6-6, 6-8, and 6-10—The references to the COMPASS computer program should likely be changed to reference the VSP computer program.

***Open Land Area OL11 (GPU 2005d)***

No specific comments (refer to General Comment).

***Open Land Area OL13 (GPU 2005e)***

1. Section 7.4.2, Page 12 of 13—This section describes the QC split gamma spectrometry analyses on soil samples. SNEC noted that the results provided in Table 5 had good agreement. However, according to SNEC Procedure E900-IMP-4520.04, *Survey Methodology to Support SNEC License Termination* (GPU 2003), Section 4.6.2.4 indicates that for samples, the same conclusion must be obtained for QC samples. ESSAP recommends SNEC modify this section to indicate the conclusion that all results were less than the AL, rather than in good agreement.

2. Appendix D—The reproduction of this appendix was in error as the second page was not included. This is also the case for the electronic version provided on CD.

***Penelec Switch Yard (GPU 2005)***

1. Table 4, Page 13—The “Applicable Statistical Test” noted for structure surfaces in the Penelec Switch Yard is the WRS Test. During the in-process inspection of the intake and discharge tunnels, SNEC did not correct surface activity measurements for background contributions because the suitable off-site area originally identified as the background reference area was no longer available. Calculation E900-05-003 (Appendix C-1) does not identify the source of the concrete background data. ESSAP recommends that SNEC clarify the source of the background reference area data for use in the WRS Test.
2. Section 6.2, Page 20, Last Bullet—When an elevated area that exceeds the  $DCGL_w$  is identified, the Elevated Measurement Comparison (EMC) is performed. Equation 8-2 from MARSSIM is used for this evaluation and is shown below.

$$\frac{\delta}{DCGL_w} + \frac{(\text{average concentration in elevated area} - \delta)}{(\text{area factor for elevated area})(DCGL_w)} < 1$$

The FSSR indicates the application of an area factor (AF) for the 1,613 m<sup>2</sup> area that is equal to the size of the survey unit (SU). ESSAP confirmed this AF was used in the calculation shown in Table 8 (Page 21), which is the application of MARSSIM Equation 8-2. The average residual contamination must meet the  $DCGL_w$  for the SU, even when the SU size is less than 10,000 m<sup>2</sup>. For example, Class 1 SUs are generally limited to 2,000 m<sup>2</sup>. If five Class 1 SUs, or 10,000 m<sup>2</sup>, were allowed to have a level of residual contamination equal to the  $DCGL_w$  times the 2,000 m<sup>2</sup> AF, the 10,000 m<sup>2</sup> area would exceed 25 mrem/y by a factor equal to the 2,000 m<sup>2</sup> AF. The appropriate evaluation of MARSSIM Equation 8-2 is shown below.

$$\frac{0.62}{4.3} + \frac{(11.31 - 0.62)}{(28.2)(4.3)} = 0.23$$

Because the evaluation of MARSSIM Equation 8-2 is less than one, the SU passes the EMC. In this case, the conclusion reached by SNEC is not changed by the above result.

3. Appendix A-1, Attachment 2-1—The “DCGL Calculation Logic” for Open Land Area OL11 was determined using three representative samples. It is ESSAP’s opinion that under normal circumstances, this is an inadequate sample size for the intended use of the data. ESSAP recommends that SNEC provide a technical justification for the low number of samples used to modify the volumetric Cs-137  $DCGL_w$ .

## REFERENCES

GPU Nuclear, Inc. (GPU). SNEC Procedure E900-IMP-4520.04, *Survey Methodology to Support SNEC License Termination*, Revision 6. Saxton, Pennsylvania; December 17, 2003.

GPU Nuclear, Inc. Saxton Nuclear Experimental Corporation Facility License Termination Plan. Saxton, Pennsylvania; Revision 3, February 2004.

GPU Nuclear, Inc. FSS Report for Fences MA9. Saxton, Pennsylvania; June 22, 2005a.

GPU Nuclear, Inc. FSS Report for Open Land Area OL4. Saxton, Pennsylvania; June 22, 2005b.

GPU Nuclear, Inc. FSS Report – Open Land Area OL8. Saxton, Pennsylvania; July 8, 2005c.

GPU Nuclear, Inc. FSS Report for Open Land Area OL11. Saxton, Pennsylvania; June 22, 2005d.

GPU Nuclear, Inc. FSS Report for Open Land Area OL13. Saxton, Pennsylvania; June 22, 2005e.

GPU Nuclear, Inc. FSS Report – Penelec Switch Yard. Saxton, Pennsylvania; July 8, 2005f.

Oak Ridge Institute for Science and Education (ORISE). Document Review—Final Status Survey Reports, Saxton Nuclear Experimental Corporation, Saxton, Pennsylvania (Docket No. 50-146; Task 1). Oak Ridge, Tennessee; June 22, 2005.

U.S. Nuclear Regulatory Commission (NRC). Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). Washington, DC; NUREG-1575; Revision 1, August 2000.