Final Status Survey Report

For

Saxton Nuclear Experimental Corporation
OL3 Paved Surfaces and Concrete

Prepared by GPU Nuclear, Inc.

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Executive Summary

This report presents the results and conclusions of the final status survey (FSS) of the Class 2 paved surfaces and Class 3 concrete structures around the south and south central portion of the Saxton Nuclear Experimental Corporation (SNEC) facility designated as OL3. This FSS survey was conducted in June of 2005.

The FSS was performed in accordance with the SNEC License Termination Plan (LTP). The survey area (OL3) was divided into six survey units, three of which contained asphalt paving and one with both asphalt paving and concrete structures. Soils will be covered in a separate OL3 FSS Report.

Data were collected from each of the four survey units in accordance with the specific survey design data collection requirements. The following is a summary of the asphalt-paved surface measurements:

1) Direct Gas Flow Proportional Counter (GFPC) scan of all or part of three 100-square meter grids, covering about 39% of the paved area
2) 11 static GFPC measurements collected

The following is a summary of the concrete structure measurements:

1) Direct Gas Flow Proportional Counter (GFPC) scan of all or parts of seven 100-square meter grids, covering about 34% of the concrete structures
2) 22 static GFPC measurements collected

The collected FSS survey data demonstrate that the 1,216 square meters of paved surfaces and concrete in the OL3 survey area meets the radiological release criteria for unrestricted use specified in 10CFR20.1402. Therefore, GPU Nuclear, Inc. concludes that the paved surfaces and concrete portions of the survey area meet the NRC requirements and may be released for unrestricted use.

1.0 Purpose and Scope

This report presents the results and conclusions of the final status survey of the asphalt paving and concrete structures designated OL3 of the SNEC facility. It provides the information required by 10CFR50.82(a)(11) and the SNEC license termination plan (LTP) to demonstrate that this area meets the radiological criteria for unrestricted use specified in 10CFR20.1402.

This report describes the radiological data collected in one Class 2 survey unit of asphalt paving and two Class 3 survey units of concrete structures. This report only addresses the FSS performed on the specific area designated as OL3 on reference 9.1. The format of this report follows the guidance contained in reference 9.2.

2.0 Survey Area Description

Survey Area OL3 is an impacted Class 1 area encompassing the south-central portion of the SNEC Site. The original survey area contained about 8,900 square meters of surface area: divided into open land and paved surfaces and concrete. Because it exceeded the size guidance in the SNEC LTP for Class 1 survey areas (2000 square meters recommended maximum), the survey area was divided into five smaller survey units. Subsequent to OL9-2 (impacted Class 2) data analysis, five additional grids were included as a sixth survey unit in OL3, bringing the total surface area to 9,400 square meters. Layout of the survey area and individual units, relative to the site layout, are shown in Attachment 1-1 of Appendix A. The six survey units are discussed below. The OL3 designation is taken from the drawing, reference 9.1.

Survey Unit OL3-1 is located such that OL3-6 is to the north, OL9 to the west and south, and OL3-2 to the east. The survey unit is approximately 2,000 square meters: all of it soil. Since neither asphalt nor concrete structures is present, this survey unit is not addressed further in this FSS Report.

Survey Unit OL3-2 is located such that OL1 is to the north, OL3-1 to the west, OL7-1 to the south, and OL3-3 to the east. The survey unit is approximately 1,800 square meters of which 654 square meters is soil, 921 square meters is concrete, and 225 square meters is asphalt. The concrete and asphalt are given the miscellaneous area designations MA8-22 and MA8-23, respectively.

Survey Unit OL3-3 is located such that OL1 is to the north, both OL3-2 and OL7-1 are to the west, OL3-4 to the south, and OL3-5 to the east. The survey unit is approximately 1,800 square meters: all of it soil. Since neither asphalt nor concrete structures is present, this survey unit is not addressed further in this FSS Report.

Survey Unit OL3-4 is located such that both OL3-3 and OL3-5 are to the north and OL7-1 surrounds the remainder. The survey unit is approximately 1,300 square meters of which 1,294 square meters is soil and 6 square meters is concrete. There is no asphalt in this survey unit.

Survey Unit OL3-5 is located such that OL1 is to the north, OL3-3 to the west, OL3-4 to the south, and OL7-1 to the east. The survey unit is approximately 2,000 square meters of which 1,972 square meters is soil and 28 square meters is concrete. There is no asphalt in this survey unit.

Survey Unit OL3-6 is located such that OL9 is to the north and west, OL3-1 to the south, and OL1 to the east. The survey unit is approximately 500 square meters of which 464 square meters is soil and 36 square meters is concrete. There is no asphalt in this survey unit.

Since OL3-4, OL3-5, and OL3-6 comprise only 70 square meters of concrete, they are combined into one unit survey unit MA8-24.

3.0 Operating History

3.1 Plant Operation

The Saxton Nuclear Experimental Corporation (SNEC) facility included a pressurized water reactor (PWR), which was licensed to operate at 23.5 megawatts thermal (23.5 MWTh). The facility is owned by the Saxton Nuclear Experimental Corporation and is licensed by GPU Nuclear, Inc. The SNEC facility is maintained under a Title 10 Part 50 license and associated Technical Specifications. In 1972, the license was amended to possess but not operate the SNEC reactor.

The facility was built from 1960 to 1962 and operated from 1962 to 1972 primarily as a research and training reactor. After shutdown in 1972, the facility was placed in a condition equivalent to the current SAFSTOR status. Since then, it has been maintained in a monitored condition. The fuel was removed in 1972 and shipped to a (now DOE) facility at Savannah River, SC, who is now the owner of the fuel. As a result of this action, neither SNEC nor GPU Nuclear, Inc. has any further responsibility for the spent fuel from the SNEC facility. The building and structures that supported reactor operation were partially decontaminated by 1974.

In the late 1980s and through the 1990s, additional decontamination and disassembly of the containment vessel and support buildings and final equipment and large component removal was completed. Final decontamination and dismantlement of the reactor support structures and buildings was completed in

1992. Large component structures, pressurizer, steam generator, and reactor vessel were removed in late 1998. Containment vessel removal (to below grade) and backfill was completed in late 2003. Decontamination, disassembly, and demolition of the SNEC facility buildings and equipment have been completed and the facility is in the process of Final Status Survey for unrestricted release and license termination.

3.2 Survey Area Remediation Status

OL3 has been subjected to extensive remediation. Contamination was detected in the "burn area" in the eastern portion of OL3-4 and southern portion of OL3-5. Subsequently soil was removed, the area was rescanned, and additional soil samples were taken. Neither scans nor samples exhibited activity greater than the DCGL.

Soil from the northernmost portion of OL3-5 was removed during the 1994 Saxton Soil Remediation Project. Soil activity as high as 38 pCi/g was removed with subsequent scans and sampling producing no activity greater than the DCGL.

One grid adjacent to the former SSGS cooling water intake, currently in OL3-6, was subject to recent remediation when activity was found during an FSS survey of OL9-2. Because remediation of OL9-2 (an impacted Class 2 area unit) was required, the grids were transferred to an adjacent impacted Class 1 area, namely OL3. The highest activity found was 14.4 pCi/g. Sampling, following removal of approximately 18 inches of soil, produced no activity greater than the DCGL.

4.0 Site Release Criteria

The site release criteria applied to the open land areas in OL3 correspond to the radiological dose criteria for unrestricted use per 10CFR20.1402. The dose criteria is met "if the residual radioactivity that is distinguishable from background radiation results in a Total Effective Dose Equivalent (TEDE) to an average member of the critical group that does not exceed 25 mrem/yr, including that from groundwater sources of drinking water, and that the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA)".

Levels of residual radioactivity that correspond to the allowable dose to meet the site or survey unit release criteria were derived by analyses using a resident farmer family scenario. The dose modeling for this scenario is explained in the SNEC LTP (reference 9.3). The derived concentration guideline levels (DCGL) shown in Table 5-1 of the SNEC LTP form the basis for satisfying the site release criteria.

Residual radioactivity sample results for soils were used to calculate a surrogate Cs-137 DCGL. The adjusted surrogate DCGL was developed using the methodology described in the SNEC LTP section 5.2.3.2.3 based on nuclide specific DCGLs from Table 5-1 of the LTP.

An adjustment was made to the surrogate Cs-137 DCGL to address the de-listed radionuclides as described in the LTP section 6.2.2.3. SNEC has instituted an Administrative Limit of 75% of the DCGL for all measurement results. The de-listed radionuclides are conservatively accounted for in this 25% reduction since the de-listed radionuclides were only 4.7% of the dose contribution. These adjustment factors are discussed in section 6 of the SNEC LTP.

5.0 Final Status Survey Design / DQO Process

The SNEC calculation providing the design of the survey for these survey units is provided in Appendix A. The asphalt-paved survey unit is Class 2 so scan measurements were conducted over 10% to 100% of the surface. The concrete is Class 3 so scan measurements up to 10% of the surface are acceptable. For both concrete structures and asphalt-paved surfaces, scans were conducted using a GFPC (gas flow proportional counter)(Ludlum 43-68B probe). The large area GFPC (Ludlum 43-37 probe) was available for use; however, the surfaces were considered too rough and the smaller probes were used along with a correspondingly slower scan speed.

The number of fixed point measurements was determined by using the COMPASS computer program (reference 9.6, attachment 7 of appendix A). These points were located on survey maps using the Visual Sample Plan program (reference 9.7, attachment 6 of appendix A). Static sample measurements are averaged over a minimum 30-second count time to match the site surface dose model used in the SNEC LTP (reference 9.3).

The survey design uses a surrogate Cs-137 effective DCGL from a radionuclide mix analysis developed from soil samples collected before the Final Status Survey taken in the vicinity of the survey unit. The radionuclide mix (including the hard-to-detects listed in Table 5-1 of the LTP) for all survey units was based on the CV Yard Soil data (attachment 2 of appendix A). CV Yard Soil data were chosen because they were generally greater than MDA and, by virtue of their close proximity to OL3, would be representative of the nuclide mix expected to be found in OL3.

Cs-137, Co-60, H-3, and Sr-90 were positively detected in one or more of these samples and are accounted for in the adjusted surrogate DCGL. Table 1 (below) presents the Data Quality Objectives (DQO) and other relevant information from the survey design package.

Table 1 – DQO/Design

DQO/Design Parameter	OL3-2	OL3-2	OL3-4	OL3-5	OL3-6
Sub-Unit	MA8-22 ***	MA8-23	MA8-24 ***		
SNEC Design Calc. #	E900-05-032	E900-05-032	E900-05-032		
MARSSIM Classification	3	2	3		
Survey Unit Area (m^2)	1800 total 921 concrete *	1800 total 225 asphalt *	1300 total 6 concrete *	2000 total 28 concrete *	500 total 36 concrete *
Statistical Test	Sign	Sign	Sign		
Type 1 decision error (α)	0.05	0.05	0.05		
Type 2 decision error (β)	0.1	0.1	0.1		
LBGR (cpm)	1100	1175 (1150) **	1100		
Estimated σ (cpm)	54.9	25.3 (34.5) **	54.9		
Relative Shift (Δ/σ)	2.73	2.96 (2.90) **	2.73		
Number of static points	11	11	11		
DCGLw (Cs-137 dpm/100 cm^2)	26,445	26,445	26,445		
Action Level (Cs-137 dpm/100 cm^2)	19,834	19,834	19,834		
Scan MDC (dpm/100 cm^2)	5077 w/43-68B 7884 w/43-37	4405 w/43-68B 7884 w/43-37	5077 w/43-68B		
SNEC Survey Request #	SR253	SR253	SR253		
Scan Survey Instrument	L2350-1 w/ 43-68B or 43-37	L2350-1 w/ 43-68B or 43-37	L2350-1 w/ 43-68B		

* The remaining non-soil surface areas are described in the OL3 Soils FSS Report
** Incorrect background data was used to generate the COMPASS input. The values in parenthesis should have been used instead. See Section 7.3.2 for further explanation.
*** MA8-22 is actually part of SS12 listed in the LTP and MA8-24 is part of SS24 in the LTP.

6.0 Final Status Survey Results

The following sections provide the survey summary results for each survey unit as required by the respective design. Summary data was taken from reference 9.10 which is filed in the SNEC history files.

6.1 Summary for Survey Unit MA8-22 (OL3-2 Concrete)

6.1.1 Scan survey

Scan measurements were made in four grids using a Ludlum 43-68B Gas Flow Proportional Counter (GFPC) with an MDCscan of either 5,077 dpm/100 cm^2 (Table 2 on page 3 of appendix A). Only the 43-68B probe was used because the concrete was not smooth. The Administrative Limit was 19,834 dpm/100 cm^2 (Table 1 on page 2 of appendix A) and the adjusted surrogate Cs-137 DCGLw for this survey unit was 26,445 dpm/100 cm^2 (Table 1 on page 2 of appendix A). Since this is a Class 3 impacted survey unit, the EMC does not apply.

All grids or portions thereof were accessible. Of the four full or partial grids, approximately 298.7 square meters were scanned out of a possible 921 square meters of concrete in the survey unit. This is slightly more than 32 percent of the unit surface area.

The scans conducted in all four grids did not identify any activity on the concrete greater than the MDCscan. The Administrative Limit was >1190 ncpm. No area greater than 1190 ncpm was found on the MA8-22 concrete located in OL3-2.

6.1.2 Fixed Point Measurements

A total of 11 random start, triangular grid, systematic static sample locations were defined for the survey unit based on a conservative relative shift of about 2.73. Keeping the relative shift between 1 and 3 per the LTP, an LBGR of 88% of the DCGL (as compared to 50% normally) was chosen producing a requirement for 11 measurements including a 20% adjustment. Each fixed point measurement was obtained using a Ludlum 43-68B GFPC.

None of the design fixed point measurements on OL3-2 concrete showed activity in excess of the Administrative Limit. Table 2 below shows the GFPC results for each fixed point measurement along with the mean, standard deviation, and range of the fixed point measurement data. From Attachment 4-1 of Appendix A, the overall efficiency of the GFPC is 4.78% which is the product of the meter response (0.478), 2 pi source efficiency (0.5), and surface roughness efficiency correction factor (0.2). For conservative comparison reasons, the dpm/100 cm^2 column is calculated by converting gross cpm to dpm/100cm^2, without taking credit for background.

The gross counts per minute (cpm) mean and variability obtained during the FSS survey were both greater than those used for the survey design: 405 +/- 57.9 (MA8-22 concrete) versus 365 +/- 42.7 (OL1 concrete) and 306 +/- 34.5 (Williamsburg Station concrete). In spite of not taking background into account, one can see from Table 2 that the activities generated are about half the

Administrative Limit of 19,834 dpm/100 cm^2, hence the survey unit passes, the LBGR used was conservative, and neither biased samples nor changes to the survey design are required.

Table 2 – Fixed Point Measurements for MA8-22 (OL3-2 Concrete)

Fixed Point	GFPC gross cpm	* GFPC dpm/100cm^2
1	362	7,570
2	356	7,450
3	367	7,680
4	351	7,340
5	412	8,620
6	424	8,870
7	528	11,050
8	469	9,810
9	438	9,160
10	340	7,110
11	409	8,560
Mean	405	8,470
Std Dev	57.9	1,210
Min	340	7,110
Max	528	11,050

* Values in this column are calculated without regard for background. They are divided by the efficiency (0.0478) directly. It is like a "gross dpm/100cm^2". In this way, since the gross dpm value is less than the Administrative Limit, then surely the net dpm values would be less than the DCGL.

6.2 Summary for Survey Unit MA8-23 (OL3-2 Asphalt)

6.2.1 Scan survey

Scan measurements were made in three grids using a Ludlum 43-68B Gas Flow Proportional Counter (GFPC) with an MDCscan of either 4,405 dpm/100 cm^2 (Table 2 on page 3 of appendix A). Only the 43-68B probe was used because the asphalt was not smooth. The Administrative Limit was 19,834 dpm/100 cm^2 (Table 1 on page 2 of appendix A) and the adjusted surrogate Cs-137 DCGLw for this survey unit was 26,445 dpm/100 cm^2 (Table 1 on page 2 of appendix A). Since this is a Class 2 impacted survey unit, the EMC does not apply.

All grids or portions thereof were accessible. Of the three full or partial grids, approximately 87.7 square meters were scanned out of a possible 225 square meters of asphalt in the survey unit. This is slightly less than 39 percent of the unit surface area.

The scans conducted in all three grids did not identify any activity on the asphalt greater than the MDCscan. The Administrative Limit was >1190 ncpm. No area greater than 1190 ncpm was found on the MA8-23 asphalt located in OL3-2.

6.2.2 Fixed Point Measurements

A total of 11 random start, triangular grid, systematic static sample locations were defined for the survey unit based on a conservative relative shift of about 2.96. Keeping the relative shift between 1 and 3 per the LTP, an LBGR of 94% of the DCGL (as compared to 50% normally) was chosen producing a requirement for 11 measurements including a 20% adjustment. Each fixed point measurement was obtained using a Ludlum 43-68B GFPC.

None of the design fixed point measurements on OL3-2 asphalt showed activity in excess of the Administrative Limit. Table 3 below shows the GFPC results for each fixed point measurement along with the mean, standard deviation, and range of the fixed point measurement data. From Attachment 4-2 of Appendix A, the overall efficiency of the GFPC is 4.78% which is the product of the meter response (0.478), 2 pi source efficiency (0.5), and surface roughness efficiency correction factor (0.2). For conservative comparison reasons, the dpm/100 cm^2 column is calculated by converting gross cpm to dpm/100cm^2, without taking credit for background.

The gross counts per minute (cpm) mean and variability obtained during the FSS survey were both greater than those used for the survey design: 314 +/- 72.1 (MA8-23 asphalt) versus 271 +/- 7.18 (OL1 SSGS parking lot asphalt). In spite of not taking background into account, one can see from Table 3 that the activities generated are less than half the Administrative Limit of 19,834 dpm/100 cm^2, hence the survey unit passes, the LBGR used was conservative, and neither biased samples nor changes to the survey design are required.

With respect to data used in the calculation of the number of fixed point measurements required, three numerical errors were noted in Table 1. These incorrect values were used as input to the COMPASS code. As discussed in Section 7.3.2, these values had no effect on either the number of required fixed point measurements or the outcome of the survey unit.

Table 3 – Fixed Point Measurements for MA8-23 (OL3-2 Asphalt)

Fixed Point	GFPC gross cpm	* GFPC dpm/100cm^2
1	353	7,380
2	412	8,620
3	199	4,160
4	276	5,770
5	354	7,410

6	336	7,030
7	288	6,030
8	342	7,150
9	382	7,990
10	181	3,790
11	332	6,950
Mean	314	6,570
Std Dev	72.1	1,510
Min	181	3,790
Max	412	8,620

* Values in this column are calculated without regard for background. They are divided by the efficiency (0.0478) directly. It is like a "gross dpm/100cm^2". In this way, since the gross dpm value is less than the Administrative Limit, then surely the net dpm values would be less than the DCGL.

6.3 Summary for Survey Unit MA8-24 (OL3-4, OL3-5, and OL3-6 Concrete)

6.3.1 Scan survey

Scan measurements were made in four grids using a Ludlum 43-68B Gas Flow Proportional Counter (GFPC) with an MDCscan of either 5,077 dpm/100 cm^2 (Table 2 on page 3 of appendix A). Only the 43-68B probe was used because the concrete was not smooth. The Administrative Limit was 19,834 dpm/100 cm^2 (Table 1 on page 2 of appendix A) and the adjusted surrogate Cs-137 DCGLw for this survey unit was 26,445 dpm/100 cm^2 (Table 1 on page 2 of appendix A). Since this is a Class 3 impacted survey unit, the EMC does not apply.

All grids or portions thereof were accessible. Of the four full or partial grids, approximately 40 square meters were scanned out of a possible 70 square meters of concrete in the survey unit. This is slightly more than 57 percent of the unit surface area.

The scans conducted in all four grids did not identify any activity on the concrete greater than the MDCscan. The Administrative Limit was >1190 ncpm. No area greater than 1190 ncpm was found on the MA8-24 concrete representing OL3-4, OL3-5, and OL3-6.

6.3.2 Fixed Point Measurements

A total of 11 random start, triangular grid, systematic static sample locations were defined for the survey unit based on a conservative relative shift of about 2.73. Keeping the relative shift between 1 and 3 per the LTP, an LBGR of 88% of the DCGL (as compared to 50% normally) was chosen producing a requirement for 11 measurements including a 20% adjustment. Each fixed point measurement was obtained using a Ludlum 43-68B GFPC.

None of the design fixed point measurements on MA8-24 concrete showed activity in excess of the Administrative Limit. Table 4 below shows the GFPC results for each fixed point measurement along with the mean, standard deviation, and range of the fixed point measurement data. From Attachment 4-1 of Appendix A, the overall efficiency of the GFPC is 4.78% which is the product of the meter response (0.478), 2 pi source efficiency (0.5), and surface roughness efficiency correction factor (0.2). For conservative comparison reasons, the dpm/100 cm^2 column is calculated by converting gross cpm to dpm/100cm^2, without taking credit for background.

The gross counts per minute (cpm) mean and variability obtained during the FSS survey were both greater than those used for the survey design: 384 +/- 46.2 (MA8-24 concrete) versus 365 +/- 42.7 (OL1 concrete) and 306 +/- 34.5 (Williamsburg Station concrete). In spite of not taking background into account, one can see from Table 4 that the activities generated are about half the Administrative Limit of 19,834 dpm/100 cm^2, hence the survey unit passes, the LBGR used was conservative, and neither biased samples nor changes to the survey design are required.

Table 4 – Fixed Point Measurements for MA8-24 (OL3-4, OL3-5, and OL3-6 Concrete)

Fixed Point	GFPC gross cpm	* GFPC dpm/100cm^2
1	480	10,040
2	386	8,080
3	387	8,100
4	407	8,510
5	401	8,390
6	357	7,470
7	305	6,380
8	338	7,070
9	348	7,280
10	405	8,470
11	405	8,470
Mean	384	8,030
Std Dev	46.2	967
Min	305	6,380
Max	387	8,100

* Values in this column are calculated without regard for background. They are divided by the efficiency (0.0478) directly. It is like a "gross dpm/100cm^2". In this way, since the gross dpm value is less than the Administrative Limit, then surely the net dpm values would be less than the DCGL.

7.0 Data Assessment

7.1 Assessment Criteria

The final status survey data has been reviewed to verify authenticity, appropriate documentation, quality, and technical acceptability. The review criteria for data acceptability are:

1) The instruments used to collect the data were capable of detecting the radiation of the radionuclide of interest at or below the investigation levels.

2) The calibration of the instruments used to collect the data was current and radioactive sources used for calibration were traceable to recognized standards or calibration organizations.

3) Instrument response was checked before and, when required, after instrument use each day data was collected.

4) Survey team personnel were properly trained in the applicable survey techniques and training was documented.

5) The MDCs and the assumptions used to develop them were appropriate for the instruments and the survey methods used to collect the data.

6) The survey methods used to collect the data were appropriate for the media and types of radiation being measured.

7) Special instrument methods used to collect data were applied as warranted by survey conditions, and were documented in accordance with an approved site Survey Request procedure.

8) The custody of samples that were sent for off-site analysis were tracked from the point of collection until final results were provided.

9) The final status survey data consists of qualified measurement results representative of current facility status and were collected in accordance with the applicable survey design package.

If a discrepancy existed where one or more criteria were not met, the discrepancy was reviewed and corrective action taken (as appropriate) in accordance with site procedures.

The statistical test does not need to be performed for this final status survey since the data clearly show that the survey unit meets the release criteria because all measurements in the survey units are less than or equal to the DCGLw.

7.2 Summary of Overall Results

MA8-22 (OL3-2 Concrete) had no alarm points during scan surveys of slightly more than 32% of the surface. Scan MDCs were adequate. Eleven fixed point measurements were all less than the DCGLw. Both the scan fraction and number of fixed point measurements meet the LTP and MARSSIM requirements.

MA8-23 (OL3-2 Asphalt) had no alarm points during scan surveys of slightly less than 39% of the surface. Scan MDCs were adequate. Eleven fixed point measurements were all less than the DCGLw. Both the scan fraction and number of fixed point measurements meet the LTP and MARSSIM requirements.

MA8-24 (OL3-4, OL3-5, and OL3-6 Concrete) had no alarm points during scan surveys of slightly more than 57% of the surfaces. Scan MDCs were adequate. Eleven fixed point measurements were all less than the DCGLw. Both the scan fraction and number of fixed point measurements the LTP and MARSSIM requirements.

7.3 Survey Variations (Design, survey request, LTP)

7.3.1 Per the FSS design, MA8-22 (OL3-2 concrete) is comprised of the SSGS Boiler Pad concrete slab. The LTP lists SS12 as the SSGS Boiler Pad (811' El.) with a surface area of 1800 square meters. The SSGS Boiler Pad concrete slab extends from OL1 (approximately 800 square meters) through OL3-2 (921 square meters) to OL7-1 (441 square meters).

7.3.2 The LTP makes reference to roadway classification of Class 2 in survey area OL5. As it turns out, the roadways were in survey area OL5 when the LTP was written. Subsequent renumbering of survey areas resulted in the roadways being put into both OL3 and OL7 and retaining their Class 2 designation.

With respect to Table 1 in Section 5.0 of this report, a close inspection of Appendix A, Attachment 8-3, revealed that the CW (closed window) background readings, 271 +/- 7.18 cpm, were used to generate the COMPASS output rather than the OW (open window) background readings, 383 +/- 24.4 cpm. Appendix B shows the COMPASS output using the correct background. The only differences were to the LBGR, estimated sigma, and relative shift which were noted in Table 1. The number of fixed point measurements was still 11 and all the measurements were less than the DCGL.

On Attachment 6-4 of Appendix A, grid identifiers for the scan locations listed at the bottom of the page should have been AQ131, AR130, and AS131 rather than AQ135 AR134, and AS135.

There were no other anomalies, inconsistencies, or variations with regard to MA8-23, the asphalt paving in OL3-2.

7.3.3 Per the FSS design, MA8-24 is comprised of SSGS concrete. The LTP lists SS24 as Miscellaneous SSGS Area Concrete Slabs with a surface area of <400 square meters. The 70 square meters of concrete in this survey unit represents a small portion of SS24.

With respect to the OL3-5 SSGS coal tipple concrete, fixed point number four was moved approximately 1.5 feet to the north. The concrete slab was broken and a piece removed where fixed point four was originally located.

There were no other anomalies, inconsistencies, or variations with regard to MA8-24 representing OL3-4, OL3-5, and OL3-6 concrete.

7.4 QC comparisons

7.4.1 Scan surveys

Numerous grids were partially rescanned as QC duplicates. The QC rescans did not identify any activity above alarm points and so are in agreement with the primary scans. QC scans were conducted on 36 square meters, 12 square meters, 2 square meters representing about 12.1, 13.7, and 5.0 percent of survey units MA8-22, MA8-23, and MA8-24, respectively, and meets or exceeds the minimum 5% required.

7.4.2 Fixed Point Measurments

One fixed point measurement from MA8-22 and MA8-23 and two fixed point measurements from MA8-24 received QC measurements. These duplicates had good agreement as shown in Table 5 below. Four QC measurements out of 33 samples meets the 5% minimum criterion.

Table 5 – OL3 QC Comparison

Sample Point	Measurement Result (gross cpm)	QC Result (gross cpm)
MA8-22, FP2	356	375
MA8-23, FP1	353	324
MA8-24, FP3	387	383
MA8-24, FP4	407	393

8.0 Final Survey Conclusions

The paved and concrete surfaces in the OL3-2, OL3-4, OL3-5, and OL3-6 final status surveys were performed in accordance with the LTP, site procedures, design calculations, and Survey Request requirements. FSS data was collected to meet and/or exceed the quantity specified or required for each survey unit design. The survey data for each survey unit meets the following conditions:

1) The average residual radioactivity in the asphalt and concrete surfaces is less than the derived surrogate DCGLw in both survey units.

2) All measurements in both survey units were less than the DCGLw.

These conditions satisfy the release criteria established in the SNEC LTP and the radiological criteria for unrestricted use given in 10CFR20.1402. Therefore it is concluded that the SNEC Open Land Area designated OL8 is suitable for unrestricted release.

9.0 References

9.1 SNEC Facility Site area grid map Drawing number SNECRM-020
9.2 SNEC procedure E900-ADM-4500.60 "Final Status Survey Report"
9.3 SNEC License Termination Plan
9.4 NUREG 1575 "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM), revision 1 August 2000
9.5 SNEC Calculation E900-05-022, "Open Land FSS Design – OL7 Soils"
9.6 COMPASS computer program, Version 1.0.0, Oak Ridge Institute for Science and Education
9.7 VISUAL SAMPLE PLAN computer program, Version 3.0, Battelle Memorial Institute
9.8 SNEC procedure E900-IMP-4500.59, "Final Site Survey Planning and DQA"
9.9 SNEC procedure E900-IMP-4520.04, "Survey Methodology to Support SNEC License Termination"
9.10 SNEC SR253 for FSS of OL3 Paved Surfaces and Concrete

10.0 Appendices

Appendix A - SNEC Calculation E900-05-032, "Open Land FSS Design – OL3 Paved Surfaces and Concrete" (11 pages plus numerous attachments)
Appendix B - COMPASS Building Surface Survey Plan [OL3-2 asphalt (MA8-23) FSS Report Section 7.3.2] (2 pages)