YANKEE NUCLEAR POWER STATION
FINAL STATUS SURVEY REPORT

REPORT NO.: YNPS-FSS-OOL-03-00

Prepared by: _____ Date: 12-26-06
Michael D. Rennhack, FSS Radiological Engineer

Reviewed by: _____ Date: 12/26/06
Robert Tozzie, FSS Radiological Engineer

Approved by: _____ Date: 12/26/06
Martin Erickson, FSS Manager

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List of Abbreviations and Acronyms

AL	Action Level
ALARA	As Low As Reasonably Achievable
c/d	Counts per Disintegration
DCGL	Derived Concentration Guideline Level
$DCGL_{EMC}$	DCGL for small areas of elevated activity
$DCGL_W$	DCGL for average concentration over a wide area, used with statistical tests
DQO	Data Quality Objectives
EMC	Elevated Measurement Comparison
ETD	Easy-to-Detect
FSS	Final Status Survey
FSSP	Final Status Survey Plan
GPS	Global Positioning System
H_o	Null Hypothesis
HSA	Historical Site Assessment
HTD	Hard-to-Detect
ISOCS	*In-situ* Object Counting System®
LBGR	Lower Bound of the Grey Region
LTP	License Termination Plan
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum Detectable Activity
MDC	Minimum Detectable Concentration
PAB	Primary Auxiliary Building
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCA	Radiological Controlled Area
RP	Radiation Protection
RSS	Reactor Support Structure
SFP	Spent Fuel Pool
VC	Vapor Container
VCC	Vertical Concrete Cask
VSP	Visual Sample Plan
YNPS	Yankee Nuclear Power Station

1.0 EXECUTIVE SUMMARY

A Final Status Survey (FSS) was performed of Survey Area OOL-03 in accordance with Yankee Nuclear Power Station's (YNPS) License Termination Plan (LTP). This FSS was conducted as an open land area FSS with soil DCGLs.

1.1 Identification of Survey Area and Units

The OOL-03 Survey Area is comprised of 3 Survey Units.

A map of the Survey Area and Survey Units in relation to the site is found in Attachment A.

1.2 Dates of Surveys

Table 1 Date of Surveys and DQOs

Survey Unit	Survey Start Date	Survey End Date	DQA Date
OOL-03-01	11/11/2005	11/11/2005	10/23/2006
OOL-03-02	8/9/2006	8/28/2006	10/25/2006
OOL-03-03	8/15/2006	8/15/2006	10/16/2006

1.3 Number and Types of Measurements Collected

Final Status Survey Plans were developed for these Survey Units in accordance with YNPS LTP and FSS procedures using the MARSSIM protocol. The planning and design of the survey plan employed the Data Quality Objective (DQO) process, ensuring that the type, quantity and quality of data gathered was appropriate for the decision making process and that the resultant decisions were technically sound and defensible. A total of 75 statistical soil samples were taken in the Survey Area, providing data for the non-parametric testing of the Survey Area. Where sample locations fell on asphalt surfaces, samples were obtained of both the asphalt and the underlying soil. In addition to the statistical soil samples, 5 biased samples were taken. 100% of the Class 1 area was scanned, approximately 10% of the Class 2 area was scanned and a judgmental scan of the Class 3 area was performed.

1.4 Summary of Survey Results

Following the survey, the data were reviewed against the survey design to confirm completeness and consistency, to verify that the results were valid, to ensure that the survey plan objectives were met and to verify Survey Unit classification. Soil sample surveys indicated that two of the systematic measurements sum-of-fractions exceeded unity and one of the three Survey Units contained an elevated area depicted in Attachment B. The sign test and DCGLemc were performed where applicable. Retrospective power curves were generated and demonstrated that an adequate number of samples were collected to support the Data Quality Objectives. Therefore, the null hypothesis (H_o) (that the Survey Unit exceeds the release criteria) is rejected.

1.5 Conclusions

Based upon the evaluation of the data acquired for the FSS, OOL-03 meets the release requirements set forth in the YNPS LTP. The Total Effective Dose Equivalent (TEDE) to the average member of the critical group does not exceed 25 mRem per year, including that from groundwater. 10CFR20 Subpart E ALARA requirements have been met as well as the site release criteria for the administrative level DCGLs that ensure that the Massachusetts Department of Public Health's 10 mRem per year limit will also be met.

2.0 FSS PROGRAM OVERVIEW

2.1 Survey Planning

The YNPS FSS Program employs a strategic planning approach for conducting final status surveys with the ultimate objective to demonstrate compliance with the DCGLs, in accordance with the YNPS LTP. The DQO process is used as a planning technique to ensure that the type, quantity, and quality of data gathered is appropriate for the decision-making process and that the resultant decisions are technically sound and defensible. Other key planning measures are the review of historical data for the Survey Area and the use of peer review for plan development.

2.2 Survey Design

In designing the FSS, the questions to be answered are: "Does the residual radioactivity, if present in the Survey Area, exceed the LTP release criteria?" and "Is the potential dose from this radioactivity ALARA?" In order to answer these questions, the radionuclides present in the Survey Area must be identified, and the Survey Units classified. Survey Units are classified with respect to the potential for contamination: the greater the potential for contamination, the more stringent the classification and the more rigorous the survey.

The survey design additionally includes the number, type and locations of soil samples (as well as any judgmental assessments required), scanning requirements,

and instrumentation selection with the required sensitivities or detection levels. DCGLs are developed relative to the surface/material of the Survey Unit and are used to determine the minimum sensitivity required for the survey. Determining the acceptable decision error rates, the lower bound of the gray region (LBGR), statistical test selection and the calculation of the standard deviation and relative shift allows for the development of a prospective power curve plotting the probability of the Survey Unit passing FSS.

2.3 Survey Implementation

Once the planning and development has been completed, the implementation phase of the FSS program begins. Upon completion of remediation and final characterization activities, a final walk down of the Survey Unit is performed. If the unit is determined to be acceptable (i.e. physical condition of the unit is suitable for FSS), it is turned over to the FSS team, and FSS isolation and control measures are established. After the Survey Unit isolation and controls are in place, grid points are identified for the soil samples, using Global Positioning System (GPS) coordinates whenever possible, consistent with the Massachusetts State Plane System, and the area scan grid is identified. Data is collected and any required investigations are performed.

2.4 Survey Data Assessment

The final stage of the FSS program involves assessment of the data collected to ensure the validity of the results, to demonstrate achievement of the survey plan objectives, and to validate Survey Unit classification. During this phase, the DQOs and survey design are reviewed for consistency between DQO output, sampling design and other data collection documents. A preliminary data review is conducted to include: checking for problems or anomalies, calculation of statistical quantities and preparation of graphical representations for data comparison. Statistical tests are performed, if required, and the assumptions for the tests are verified. Conclusions are then drawn from the data, and any deficiencies or recommendations for improvement are documented.

2.5 Quality Assurance and Quality Control Measures

YNPS FSS activities are implemented and performed under approved procedures, and the YNPS Quality Assurance Project Plan (QAPP) assures plans, procedures and instructions have been followed during the course of FSS, as well as providing guidance for implementing quality control measures specified in the YNPS LTP.

3.0 SURVEY AREA INFORMATION

3.1 Survey Area Description

OOL-03 Survey Area is comprised of 3 Survey Units in the area of the site known as the Sherman Reservoir Dam & South Shoreline. Survey Area OOL-03 consists of the surface area of the Sherman Dam and the south shoreline of Sherman Reservoir, which is property owned by TransCanada. OOL-03 consists of soil, asphalt and vegetation. OOL-03 is bounded by OOL-01 (Sherman Reservoir) on the north, OOL-01 and OOL-02 on the east, OOL-02 on the south and OOL-04 on the west. A map of the Survey Area and Unit divisions are found in Attachment A.

3.1.1 OOL-03-01 Description

Survey Area OOL-03 consists of the surface area of Sherman Dam and the south shoreline of Sherman Reservoir. The open land area owned by TransCanada is comprised of soil, asphalt and vegetation. Survey Unit OOL-03-01 is a sub unit of survey area OOL-03 and constitutes approximately 8,743 square meters of surface area. OOL-03-01 is bounded on the east by the Sherman Reservoir and Survey Unit OOL-03-03, to the south by Survey Areas OOL-02 and OOL-04, to the west by Survey Area OOL-04 and to the north by off-site property.

3.1.2 OOL-03-02 Description

Survey Unit OOL-03-02 consists of the area excavated to remove the crib wall and east storm drain and where the east storm drain out-fall enters Sherman Reservoir. A surface water discharge point was located on the east bounds of OOL-03-02. The surface area of OOL-03-02 consists of some asphalt covered soil and loose soils in the excavated area. The slope running down to the water's edge is steep with assorted weeds, brush and rocks covering the un-excavated portions of the slope. There is extensive erosion control present in the area consisting of geo-tech fabric, silt fence and staked hay bales. It is bounded on the east by OOL-01-05, on the east and south by OOL-02-05 on the west and north by OOL-03-03. OOL-03-02 is approximately 570 square meters in size.

3.1.3 OOL-03-03 Description

Survey Unit OOL-03-03 is located adjacent to the Sherman Dam on the eastern side. The property is owned by TransCanada and is comprised of soils, vegetation and riprap (i.e. artificial shoreline comprised of rock). The Sherman Reservoir shoreline defines the northern and a portion of the

eastern boundary. OOL-03-02 delineates the eastern boundary. OOL-02-05 forms the southern boundary and OOL-03-01 forms the western boundary. Survey Unit OOL-03-03 has a total surface area of 4480 square meters.

3.2 History of Survey Area

Survey Area OOL-03 was not part of the RCA, as delineated in years 2004-2005, and was not used for storing radioactive material or packaging or processing radioactive waste. The Sherman Dam access road portion of OOL-03 was used as the primary access point for receiving and shipping radioactive waste via truck transport. Prior to the discontinuance of railroad access, spent fuel and high-level radioactive waste, such as irradiated control rods, were shipped using the railroad.

Contaminated systems present in the survey area include the east storm sewer system. Potential contamination may have resulted from transmigration of the low levels of radioactivity present on the RCA yard area surface due to surface water run-off, and/or personnel traffic, equipment and material transfer into the non-RCA portion of the site.

Events and activities that may have contaminated Survey Area OOL-03 include:

- AOR 66-7, Spent Fuel Pit Water Spill
- AOR 66-09, Hose Failure while draining the fuel transfer chute pump back line.
- PIR 81-09, Contamination of the Yard Area during Reactor Head Removal.
- Demolition and load out of the Spent Fuel Pit Building and Decontamination Facilities.

The first two events, which occurred in 1966, are similar because they both released radioactivity into the east storm drain. At that time, the east storm drain system terminated at a point just to the north of the railroad tracks. Previously, the east storm drain terminated at the same location as the west storm sewer in Survey Area NOL-06. Subsequently, the storm drain was extended to the northeast so that the discharge was closer to the edge of Sherman Reservoir. Subsequent management decision determined that the entire east storm drain was to be removed, which it was.

The demolition and load out activities are also likely to have contributed to the east storm drain contamination.

During the removal of the east storm drain, and ensuing characterization surveys, activity was found near the discharge point of the system in OOL-03. The region

impacted was subdivided from the original Class 3 unit and reclassified as a Class 1 unit.

3.3 Division of Survey Area into Survey Units

The OOL-03 Survey Area is divided into 3 Survey Units. OOL-03-01 is a Class 3 Survey Unit, OOL-03-02 is a Class 1 Survey Unit, and OOL-03-03 is a Class 2 Survey Unit. A map of the Survey Area and Unit divisions are found in Attachment A.

4.0 SURVEY UNIT INFORMATION

4.1 Summary of Radiological Data Since Historical Site Assessment (HSA)

4.1.1 Chronology and Description of Surveys Since HSA

The Table below provides a summary of surveys performed during the Final Status Survey of OOL-03.

Table 2 Dates of Surveys since HSA

Survey Unit	Survey Start Date	Survey End Date	Description
OOL-03-01	11/11/2005	11/11/2005	FSS Survey
OOL-03-02	8/9/2006	8/28/2006	FSS Survey
OOL-03-03	8/15/2006	8/15/2006	FSS Survey

4.1.2 Radionuclide Selection and Basis

4.1.2.1 OOL-03-01 Radionuclides of Concern

Thirty-three samples from FSS of Survey Unit OOL-04-01 and characterization of OOL-04-02 (the area designated OOL-04-02 was subsequently included in and surveyed as part of Survey Unit OOL-04-04) were used to provide the characterization data for Survey Unit OOL-03-01. The data was sufficient to support FSS planning of Survey Unit OOL-03-01 since the areas are similar in nature and contiguous with Survey Unit OOL-03-01. Based on a review of the data, Cs137 was the only plant-related radionuclide that was identified consistently (i.e. 76% of the time) in the thirty-three samples analyzed.

The presence of all LTP-required radionuclides (gamma-emitters, HTD beta emitters, and TRUs) in the soil was evaluated under the survey plan. The YNPS Chemistry

Department analyzed each FSS soil sample for all LTP gamma-emitting nuclides, except Cm-243/244. In addition, QC split samples were sent to an independent laboratory for analysis of gamma-emitters, HTD beta-emitting nuclides and alpha-emitting nuclides, including Cm-243/244.

If multiple nuclides are identified in the analyses then the unity rule (i.e. sum-of-fractions) will be employed to show compliance with the release criteria.

4.1.2.2 OOL-03-02 Radionuclides of Concern

Twenty-seven Characterization Samples, collected during a survey regime from 10/04/05 to 08/02/06, were used to provide the characterization data for Survey Unit OOL-03-02. Based on a review of the data, Cs137 and Co-60 were identified as the radionuclides-of-concern.

The presence of all LTP-required radionuclides (gamma-emitters, HTD beta emitters, and TRUs) in the soil was evaluated under the survey plan. The YNPS Chemistry Department analyzed each FSS soil sample for all LTP gamma-emitting nuclides, except Cm-243/244. In addition, QC split samples were sent to an independent laboratory for analysis of gamma-emitters, HTD beta-emitting nuclides and alpha-emitting nuclides, including Cm-243/244.

Since multiple nuclides are identified in the analyses, the unity rule (i.e. sum-of-fractions) will be employed to show compliance with the release criteria.

4.1.2.3 OOL-03-03 Radionuclides of Concern

Thirty-Seven Characterization Samples collected during a sampling program, spanning a period from 05/20/93 to 07/08/98, were used to provide the characterization data for Survey Unit OOL-03-03. Based on a review of the data, Cs-137 and Co-60 were identified as the radionuclides-of-concern.

The presence of all LTP-required radionuclides (gamma-emitters, HTD beta emitters, and TRUs) in the soil was evaluated under the survey plan. The YNPS Chemistry Department analyzed each FSS soil sample for all LTP gamma-emitting nuclides, except Cm-243/244. In addition, QC

split samples were sent to an independent laboratory for analysis of gamma-emitters, HTD beta-emitting nuclides and alpha-emitting nuclides, including Cm-243/244.

Since multiple nuclides are identified in the analyses, the unity rule (i.e. sum-of-fractions) will be employed to show compliance with the release criteria.

4.1.3 Scoping & Characterization

OOL-03-01: Thirty-three samples from the FSS of Survey Unit OOL-04-01 and characterization of Survey Unit OOL-04-02 were used to provide the characterization data for Survey Unit OOL-03-01. The data was sufficient to support FSS planning of Survey Unit OOL-03-01 because the two areas used are similar in nature and contiguous with Survey Unit OOL-03-01. The average Cs-137 concentration was 0.18 pCi/g with a standard deviation of 0.14 pCi/g.

OOL-03-02: Twenty-seven Characterization Samples were collected during a survey regime from 10/04/05 to 08/02/06 and were used to provide the characterization data for Survey Unit OOL-03-02. The average concentration of Co-60 was 0.238 pCi/g with a standard deviation of 0.330 pCi/g. The average concentration of Cs-137 was 0.805 pCi/g with a standard deviation of 1.230 pCi/g.

OOL-03-03: Thirty-seven Characterization Samples collected during a sampling program spanning a period from 05/20/93 to 07/08/98 were used to provide the characterization data for Survey Unit OOL-03-03. The average Co-60 concentration was 0.01 pCi/g with a standard deviation of 0.05 pCi/g. The average concentration of Cs-137 was 0.12 pCi/g with a standard deviation of 0.166 pCi/g.

4.2 Basis for Classification

Based upon the historical use and radiological conditions associated with Survey Area OOL-03, the area was designated as MARSSIM Class 3. After review of data and information obtained during the course of demolition and interviews with personnel, it was determined that OOL-03-01 would remain a Class 3 unit. OOL-03-02 was reclassified to a Class 1 Unit due to potential of activity in excess of the $DCGL_W$. OOL-03-03 was reclassified to a Class 2 Survey Unit to act as a buffer around the Class 1 Survey Unit.

The YNPS LTP allows for different classifications of Survey Units within a Survey Area.

4.3 Remedial Actions and Further Investigations

4.3.1 OOL-03-01 Remedial Actions and Further Investigations

Two investigations were performed in OOL-03-01 in response to elevated scan readings. In both locations the elevated scan readings were attributed to the presence of rocks.

4.3.2 OOL-03-02 Remedial Actions and Further Investigations

An investigation was performed at fixed-point sample locations OOL-03-02-037-F (sum-of-fractions = 2.31) and OOL-03-02-038-F (sum-of-fractions = 1.08). Through the use of ISOCS scans and perimeter soil samples (gamma-specific boundary soil samples as identified in the Table 3); the boundaries of the elevated area were established resulting in a 20.2 m^2 area. The most likely source of the elevated area is radioactivity originating from the former east storm drain. Once the boundaries were established, investigative samples were taken within the area. The investigation samples contained sufficient radioactivity to warrant an elevated measurement comparison evaluation. The results of the analysis of the investigative samples were then averaged to give the average elevated concentration within the elevated area and a fractional $DCGL_{EMC}$ was determined for the Survey Unit. The following calculation and table demonstrate the elevated measurement comparison.

Note: The area was rounded up to $25m^2$ for the determination of the AF in Appendix 6Q of the LTP for conservatism.

Table 3 Inputs to *f*($DCGL_{EMC}$) Calculation

	Co^{60}	Cs^{137}	Sr^{90}
Average Elevated Area Concentration ($\overline{C}_{elevated}$)	0.951 pCi/g	3.59 pCi/g	0.754 pCi/g
$DCGL_W$	1.4	3.0	0.59
Area Factor for $25m^2$	1.8	3.7	54
Mean of OOL-01-05 (δ)	0.01 pCi/g	0.075 pCi/g	0.072 pCi/g

Note: The non-elevated area mean is identical to the mean of the Survey Unit outside of the elevated area (i.e. the mean of the OOL-03-02 FSS data for the samples outside of the elevated area).

$$f(DCGL_{EMC}) = \frac{\delta}{DCGL_W} + \frac{\overline{C}_{elevated} - \delta}{(AreaFactor) \times DCGL_W} < 1$$

$$\frac{0.010}{1.4}+\frac{0.951-0.010}{(1.8)\times 1.4}=0.38 \quad Co^{60} \qquad \frac{0.075}{3.0}+\frac{3.59-.075}{(3.7)\times 3.0}=0.34 \quad Cs^{137}$$

$$\frac{0.072}{0.59}+\frac{0.754-0.072}{(54)\times 0.59}=0.14 \quad Sr^{90}$$

Total $f(DCGL_{EMC}) = 0.86$

Table 4 Average Concentrations in Survey Unit OOL-03-02

Sample Number	Co^{60} pCi/g	Cs^{137} pCi/g	Sr^{90} pCi/g
OOL-03-02-041-F-I[1]	0.134	0.380	N/A[2]
OOL-03-02-042-F-I[1]	0.566	2.65	0.213
OOL-03-02-045-F-I[1]	0.016	0.003	0.054
OOL-03-02-046-F-I[1]	0.058	0.223	0.117
OOL-03-02-058-F-I[1]	0.404	1.37	N/A[2]
OOL-03-02-075-F-I[1]	0.151	0.288	N/A[2]
OOL-03-02-037-F	0.906	2.789	0.333
OOL-03-02-038-F	0.204	1.08	0.290
OOL-03-02-054-F-I	1.01	3.14	N/A[2]
OOL-03-02-057-F-I	0.612	2.03	N/A[2]
OOL-03-02-063-F-I	0.982	2.52	N/A[2]
OOL-03-02-064-F-I	1.16	3.97	N/A[2]
OOL-03-02-069-F-I	1.782	9.597	N/A[2]
OOL-03-02-003-C[3]	N/A[4]	N/A[4]	2.3
OOL-03-02-004-C[3]	N/A[4]	N/A[4]	0.8
OOL-03-02-005-C[3]	N/A[4]	N/A[4]	0.82
OOL-03-02-010-C[3]	N/A[4]	N/A[4]	0.363
OOL-03-02-011-C[3]	N/A[4]	N/A[4]	0.373
Average Concentration	0.951	3.59	0.754

[1] These samples are not used in determination of the average concentrations within the elevated area. They were used in determining the boundaries of the elevated area (20.2 m^2).
[2]Radionuclide Not Detected
[3]The highest concentrations from Characterization Samples were included in the development of the average concentration of Sr^{90} in the elevated area. This methodology is very conservative.
[4] Characterization Samples used for Sr^{90} determination only

Note: The FSS of OOL-03-02 employed the conservative DCGLw derived by adjusting the LTP DCGLs down to 8.73 mRem per year. The 8.73 mRem per year value was determined by subtracting the maximum dose contribution for subsurface partial structures (0.5 mRem per year) and the maximum dose contribution from groundwater (0.77 mRem per year)

from the Massachusetts Department of Public Health criteria of 10 mRem per year. Had the FSS been designed and performed to YNPS LTP 25 mRem per year DCGLs, the largest sum-of-fraction (i.e. statistical sample OOL-03-02-037-F) would have been 0.78 therefore not requiring investigation in a Class 1 Survey Unit and no statistical sample would have been greater than $DCGL_W$.

4.3.3 OOL-03-03 Remedial Actions and Further Investigations

No areas were identified for investigation in OOL-03-03.

4.4 Unique Features of Survey Area

Survey Area OOL-03 contained sections that were steep, heavily overgrown and filled with rip-rap (stones).

4.5 ALARA Practices and Evaluations

The generic ALARA evaluation for soils is documented in Appendix C, Technical Report YA-REPT-00-003-05, "Generic ALARA Review for Final Status Survey of Soil at YNPS". The report is augmented by individual evaluations which are found in Appendix D, which concludes that no further remediation of soil below the DCGL is warranted.

5.0 SURVEY UNIT FINAL STATUS SURVEY

5.1 Survey Planning

5.1.1 Final Status Survey Plan and Associated DQOs

The FSS for OOL-03 Survey Area was planned and developed in accordance with the LTP using the DQO process. Form DPF-8856.1, found in YNPS Procedure 8856, "*Preparation of Survey Plans*," was used to provide guidance and consistency during development of the FSS Plans. The FSS Plans can be found in Appendix A. The DQO process allows for systematic planning and is specifically designed to address problems that require a decision to be made in a complex survey design and, in turn, provides alternative actions.

The DQO process was used to develop an integrated survey plan providing the Survey Unit identification, sample size, selected analytical techniques, survey instrumentation, and scan coverage. The Sign Test was specified for non-parametric statistical testing for this Survey Unit, if required. The design parameters developed are presented below.

Table 5 Survey Area OOL-03 Design Parameters

Survey Unit	Design Parameter	Value	Basis
OOL-03-01	Survey Unit Area	8743 m^2	Class 3, Soil, no restrictions
	Number of Direct Measurements	15 (calculated) 0 (added) Total: 15	α (Type I) = 0.05 β (Type II) = 0.05 σ: 0.14 Relative Shift: 2 $DCGL_w$: 3 LBGR: 1.5
	Critical Value	11 for Sign test.	(15/2)+(1.645/2)*Square Root (15)
	Gridded Sample Area Size Factor	Class 3: N/A	No grid in Class 3 area
	Sample Grid Spacing:	No Grid	No grid in Class 3 area, random locations
	Direct Measurement Investigation Level	> 50% $DCGL_w$	Class 3 Area: > 50% $DCGL_w$
	Scanning Coverage Requirements	Judgmental	Class 3 Soil Area: Judgmental
	Scan Investigation Level	> Background	Class 3 Area: Detectable over background
OOL-03-02	Survey Unit Area	570 m^2	Class 1, Soil, ≤ 2,000 m^2
	Number of Direct Measurements	29 (calculated) + 11 (added) Total: 40	α (Type I) = 0.05 β (Type II) = 0.05 σ: 0.4715 Relative Shift: 1.06 $DCGL_w$ (Unity): 1 LBGR: 0.5
	Critical Value	25 for Sign test.	(40/2)+(1.645/2)*Square Root (40)
	Gridded Sample Area Size Factor	14.25m^2	Area / Number of Samples (570 m^2/40)
	Sample Grid Spacing:	Triangular: 4.1m	Square Root (570 m^2/(0.866*40))
	Direct Measurement Investigation Level	> $DCGL_{emc}$ or > DCGLw + 3 Sigma	Class 1 Area.
	Scanning Coverage Requirements	570 m^2	Class 1 Soil Area: 100%
	Scan Investigation Level	Co-60: 1.0pCi/gm, Cs-137 : 4.3pCi/gm, or SOF >1	Class 1 Area: > $DCGL_{emc}$ ISOCS 2m-90°
OOL-03-03	Survey Unit Area	4480 m^2	Class 2, Soil, > 2,000 m^2, ≤ 10,000 m^2
	Number of Direct Measurements	15 (calculated) + 5 (added) Total: 20	α (Type I) = 0.05 β (Type II) = 0.05 σ: 0.066 Relative Shift: 2 $DCGL_w$ (Unity): 1 LBGR: .868
	Critical Value	14 for Sign test.	(20/2)+(1.645/2)*Square Root (20)
	Gridded Sample Area Size Factor	224m^2	Area / Number of Samples (4480 m^2/20)

Survey Unit	Design Parameter	Value	Basis
	Sample Grid Spacing:	Triangular: 16.1m	Square Root (4480 m2/(0.866*20))
	Direct Measurement Investigation Level	> $DCGL_w$	Class 2 Area.
	Scanning Coverage Requirements	448 m^2	Class 2 Soil Area: 10-100% systematic & judgmental
	Scan Investigation Level	Any Detectable Facility Related Nuclides	Class 2 Area: > $DCGL_w$ or > MDC

5.1.2 Deviations from the FSS Plan as Written in the LTP

The FSSP design was performed to the criteria of the LTP; therefore, no LTP deviations with potential impact to this Survey Area need to be evaluated.

5.1.3 DCGL Selection and Use

For the final evaluation of the OOL-03 Survey Area and throughout this report, the administrative acceptance criterion of 8.73 mRem per year has been set for Soil LTP-listed radionuclides.

Table 6 Soil DCGL Values

Nuclide	Soil 8.73 mRem per year (pCi/g)	Nuclide	Soil 8.73 mRem per year (pCi/g)
Co-60	1.4E+00	H-3	1.3E+02
Nb-94	2.5E+00	C-14	1.9E+00
Ag-108m	2.5E+00	Fe-55	1.0E+04
Sb-125	1.1E+01	Ni-63	2.8E+02
Cs-134	1.7E+00	Sr-90	6.0E-01
Cs-137	3.0E+00	Tc-99	5.0E+00
Eu-152	3.6E+00	Pu-238	1.2E+01
Eu-154	3.3E+00	Pu-239	1.1E+01
Eu-155	1.4E+02	Pu-240/241	3.4E+02
Am-241	1.0E+01	Cm-243/244	1.1E+01

5.1.4 Measurements

Error tolerances and characterization sample population statistics drove the selection of the number of statistical measurements. The quantity of statistical measurements collected for each unit is listed above in Table 4 "Survey Area OOL-03 Design Parameters." Split samples and recounts are addressed under the quality control section 6.2. The OOL-03-02 and OOL-03-03 soil sampling grid was developed as a systematic grid with spacing consisting of a triangular pitch pattern with a random starting point. The OOL-03-01 sample locations were randomly determined. Sample measurement locations are provided in Attachment A.

The Class 1 area; OOL-03-02 was scanned 100% with ISOCS. The Class 2 area; OOL-03-03 was scanned approximately 10% with ISOCS. The results are listed in the table below titled "ISOCS Scan Summary". The Class 3 area; OOL-03-01 was scanned with SPA-3 at judgmental locations.

5.2 Survey Implementation Activities

The Table below provides a summary of daily activities performed during the Final Status Survey of OOL-03.

Table 7 FSS Activity Summary for OOL-03

Survey Unit	Date	Activity
OOL-03-01	11/8/2005	Performed walk-down of Survey Unit
	11/9/2005	Established Isolation and Controls
	11/9/2005	Performed Job Hazard Analysis
	11/1/2005	Performed Unit Classification
	10/28/2005	Performed Sample Quantity Calculations, established DQOs
	11/9/2005	Generated FFS Sample Plans
	11/11/2005 to 11/11/2006	Performed Scans, and Direct measurements.
	10/23/06	Performed DQA, FSS Complete
OOL-03-02	8/8/2006	Performed walk-down of Survey Unit
	8/9/2006	Established Isolation and Controls
	8/9/2006	Performed Job Hazard Analysis
	8/7/2006	Performed Unit Classification
	8/9/2006	Performed Sample Quantity Calculations, established DQOs
	8/9/2006	Generated FFS Sample Plans
	8/9/2006 to 8/28/2006	Performed Scans, and Direct measurements.
	10/25/2006	Performed DQA, FSS Complete
OOL-03-03	8/11/2006	Performed walk-down of Survey Unit
	8/9/2006	Established Isolation and Controls
	8/10/2006	Performed Job Hazard Analysis
	8/11/2006	Performed Unit Classification
	8/10/2006	Performed Sample Quantity Calculations, established DQOs
	8/10/2006	Generated FFS Sample Plans
	8/15/2006	Performed Scans, and Direct measurements.
	10/16/2006	Performed DQA, FSS Complete

5.3 Surveillance Surveys

5.3.1 Periodic Surveillance Surveys

Upon completion of the FSS of Survey Area OOL-03, the Survey Area was placed into the program for periodic surveillance surveys on a quarterly basis in accordance with YNPS procedure DP-8860, "*Area Surveillance Following Final Status Survey*." These surveys provide

assurance that areas with successful FSS remain unchanged until license termination.

On 08/16/06 a quarterly surveillance was performed in Survey Unit OOL-03-01. The results of the samples were below the $DCGL_W$ and the mean was within three standard deviations of the original FSS thus satisfying the criteria of the surveillance.

5.3.2 Resurveys

No resurveys were performed in OOL-03.

5.3.3 Investigations

No additional investigations were required for this Survey Area due to surveillance surveys.

5.4 Survey Results

Soil sample surveys in OOL-03-01 and OOL-03-03 had no systematic measurements that exceeded the $DCGL_W$; depicted in Attachment B. OOL-03-02 had two samples where the unity was exceeded for the sum of fractions (SOF) calculations of multiple nuclides therefore prompting the use of the sign test as the statistical test, depicted in Attachment B. OOL-03-02 passed the sign test. Retrospective power curves were generated and demonstrated that an adequate number of samples were collected to support the Data Quality Objectives. Therefore, the null hypothesis (H_o) (that the Survey Unit exceeds the release criteria) is rejected.

Table 8 Soil Sample Summary

Sample Description	SOF	Sample Description	SOF	Sample Description	SOF
OOL-03-01-001-F	0.17	OOL-03-02-001-F	0.04	OOL-03-03-001-F	0.05
OOL-03-01-002-F	0.11	OOL-03-02-002-F	0.03	OOL-03-03-002-F	0.09
OOL-03-01-003-F	0.10	OOL-03-02-003-F	0.06	OOL-03-03-003-F	0.06
OOL-03-01-004-F	0.07	OOL-03-02-004-F	0.04	OOL-03-03-004-F	0.10
OOL-03-01-005-F	0.04	OOL-03-02-005-F	0.08	OOL-03-03-005-F	0.05
OOL-03-01-006-F	0.10	OOL-03-02-006-F	0.05	OOL-03-03-006-F	0.05
OOL-03-01-007-F	0.14	OOL-03-02-007-F	0.07	OOL-03-03-007-F	0.08
OOL-03-01-008-F-A	0.03	OOL-03-02-008-F	0.05	OOL-03-03-008-F	0.07
OOL-03-01-009-F	0.11	OOL-03-02-009-F	0.07	OOL-03-03-009-F	0.09
OOL-03-01-010-F	0.07	OOL-03-02-010-F	0.04	OOL-03-03-010-F	0.06
OOL-03-01-011-F	0.09	OOL-03-02-011-F	0.04	OOL-03-03-011-F	0.58
OOL-03-01-012-F	0.17	OOL-03-02-012-F	0.07	OOL-03-03-012-F	0.09
OOL-03-01-013-F	0.13	OOL-03-02-013-F	0.06	OOL-03-03-013-F	0.10
OOL-03-01-014-F-A	0.02	OOL-03-02-014-F	0.06	OOL-03-03-014-F	0.10
OOL-03-01-015-F-A	0.03	OOL-03-02-015-F	0.05	OOL-03-03-015-F	0.17
		OOL-03-02-016-F	0.08	OOL-03-03-016-F	0.11
		OOL-03-02-017-F	0.08	OOL-03-03-017-F	0.07

Sample Description	SOF	Sample Description	SOF	Sample Description	SOF
		OOL-03-02-018-F	0.06	OOL-03-03-018-F	0.25
		OOL-03-02-019-F	0.06	OOL-03-03-019-F	0.13
		OOL-03-02-020-F	0.03	OOL-03-03-020-F	0.08
		OOL-03-02-021-F	0.07		
		OOL-03-02-022-F	0.05		
		OOL-03-02-023-F	0.04		
		OOL-03-02-024-F	0.06		
		OOL-03-02-025-F	0.16		
		OOL-03-02-026-F	0.12		
		OOL-03-02-027-F	0.12		
		OOL-03-02-028-F	0.07		
		OOL-03-02-029-F	0.08		
		OOL-03-02-030-F	0.05		
		OOL-03-02-031-F	0.10		
		OOL-03-02-032-F	0.12		
		OOL-03-02-033-F	0.04		
		OOL-03-02-034-F	0.12		
		OOL-03-02-035-F	0.05		
		OOL-03-02-036-F	0.21		
		OOL-03-02-037-F	**2.31**		
		OOL-03-02-038-F	**1.08**		
		OOL-03-02-039-F	0.11		
		OOL-03-02-040-F	0.18		
Max	0.17	Max	2.31	Max	0.58
Average	0.09	Average	0.16	Average	0.12
Standard Deviation	0.05	Standard Deviation	0.39	Standard Deviation	0.12
Count	15	Count	40	Count	20

Note: Subsurface samples were taken at every statistical sample point, in OOL-03-01, that fell on an asphalt surface. All subsurface samples were less than DCGLW and no sum-of-fraction was equal to or greater than one, therefore the surface asphalt samples were deemed appropriate to be treated as statistical surface soils in accordance with YNPS LTP 5.6.2.3.

SPA-3s were used for the scan survey of OOL-03-01. No activity greater than background or DCGLw, attributable to plant radionuclides was present in OOL-03-01. ISOCS systems were used to perform scan surveys for the remainder of the units. No ISOCS scan in OOL-03-03 indicated the presence of any LTP plant related nuclide, therefore no investigations were warranted. OOL-03-02 measurement results listed below are reported in sum of fraction of the investigation levels. A number less than one indicates that no investigation was warranted.

$$Investigation\ level\ (I_{LV}) = {}^{1}DCGL_W \times {}^{2}AF \times {}^{3}AdjustmentFactor$$

[1] Soil $DCGL_W$ from Appendix 6E of YNPS LTP, scaled to 8.73 mRem/yr DCGLs
[2] Area Factor for 1 m^2 taken from Appendix 6Q of YNPS LTP

[3] The offset geometry adjustment factor derived by taking the ratios of the MDC values for the 12.6 m^2 field-of-view vs. the 1 m^2 at the edge of the field-of-view .The nuclide specific adjustment factors for 1 m 90 degree ISOCS are found in YA-REPT-01-018-05.

$$\frac{C_1}{I_{LV_1}} + \frac{C_2}{I_{LV_2}} + ... + \frac{C_n}{I_{LV_n}} \leq 1$$

where:
C_n = Concentration of radionuclide n
I_{LV} = Investigation level for radionuclide n

Table 9 ISOCS Scan Summary

Sample Title	SOF	Sample Title	SOF
OOL-03-02-101-F-G	0.00	OOL-03-03-101-F-G	0.00
OOL-03-02-102-F-G	0.00	OOL-03-03-102-F-G	0.00
OOL-03-02-103-F-G	0.00	OOL-03-03-103-F-G	0.00
OOL-03-02-104-F-G	0.00	OOL-03-03-104-F-G	0.00
OOL-03-02-105-F-G	0.00	OOL-03-03-105-F-G	0.00
OOL-03-02-106-F-G	0.00	OOL-03-03-106-F-G	0.00
OOL-03-02-107-F-G	0.00	OOL-03-03-107-F-G	0.00
OOL-03-02-108-F-G	0.00	OOL-03-03-108-F-G	0.00
OOL-03-02-109-F-G	0.00	OOL-03-03-109-F-G	0.00
OOL-03-02-110-F-G	0.00	OOL-03-03-110-F-G	0.00
OOL-03-02-111-F-G	0.00	OOL-03-03-111-F-G	0.00
OOL-03-02-112-F-G	0.00	OOL-03-03-112-F-G	0.00
OOL-03-02-113-F-G	0.00	OOL-03-03-113-F-G	0.00
OOL-03-02-114-F-G	0.00	OOL-03-03-114-F-G	0.00
OOL-03-02-115-F-G	0.00	OOL-03-03-115-F-G	0.00
OOL-03-02-116-F-G	0.00	OOL-03-03-116-F-G	0.00
OOL-03-02-117-F-G	0.00	OOL-03-03-117-F-G	0.00
OOL-03-02-118-F-G	0.00	OOL-03-03-118-F-G	0.00
OOL-03-02-119-F-G	0.00	OOL-03-03-119-F-G	0.00
OOL-03-02-120-F-G	0.00	OOL-03-03-120-F-G	0.00
OOL-03-02-121-F-G	0.00	OOL-03-03-121-F-G	0.00
OOL-03-02-122-G-F	0.00	OOL-03-03-122-F-G	0.00
OOL-03-02-123-F-G	0.00	OOL-03-03-123-F-G	0.00
OOL-03-02-124-F-G	0.00	OOL-03-03-124-F-G	0.00
OOL-03-02-125-F-G	0.00	OOL-03-03-125-F-G	0.00
OOL-03-02-126-F-G	0.00	OOL-03-03-126-F-G	0.00
OOL-03-02-127-F-G	0.00	OOL-03-03-127-F-G	0.00
OOL-03-02-128-F-G	0.00	OOL-03-03-128-F-G	0.00
OOL-03-02-129-F-G	0.00	OOL-03-03-129-F-G	0.00
OOL-03-02-130-F-G	0.00	OOL-03-03-130-F-G	0.00
OOL-03-02-131-F-G	0.00	OOL-03-03-131-F-G	0.00
OOL-03-02-132-F-G	0.00	OOL-03-03-132-F-G	0.00
OOL-03-02-133-F-G	0.00	OOL-03-03-133-F-G-R	0.00
OOL-03-02-134-F-G	0.00	OOL-03-03-134-F-G-R	0.00
OOL-03-02-135-G-F	0.00	OOL-03-03-135-F-G-R	0.00
OOL-03-02-136-F-G	0.00	OOL-03-03-136-F-G-R	0.00

Sample Title	SOF	Sample Title	SOF
OOL-03-02-137-F-G	0.00	OOL-03-03-137-F-G	0.00
OOL-03-02-138-F-G	0.00	OOL-03-03-138-F-G	0.00
OOL-03-02-139-F-G	0.00	OOL-03-03-139-F-G	0.00
OOL-03-02-140-F-G	0.00	OOL-03-03-140-F-G	0.00
OOL-03-02-141-F-G	0.00	OOL-03-03-141-F-G	0.00
OOL-03-02-142-F-G-R	0.00	OOL-03-03-142-F-G	0.00
OOL-03-02-143-G-F	0.00		
OOL-03-02-144-F-G	0.00		
OOL-03-02-145-F-G-R	0.00		
OOL-03-02-146-F-G-R	0.00		
OOL-03-02-147-F-G	0.00		
OOL-03-02-148-F-G	0.00		
OOL-03-02-149-F-G	0.00		
OOL-03-02-150-F-G	0.00		
OOL-03-02-151-F-G	0.00		
OOL-03-02-152-F-G	0.00		
OOL-03-02-153-F-G-R	0.00		
OOL-03-02-154-F-G	0.00		
OOL-03-02-155-F-G	0.00		
OOL-03-02-156-F-G	0.00		
OOL-03-02-157-F-G	0.00		
OOL-03-02-158-F-G	0.00		
OOL-03-02-159-F-G	0.00		
OOL-03-02-160-F-G	0.00		
OOL-03-02-161-F-G	0.00		
OOL-03-02-162-F-G	0.00		
OOL-03-02-163-F-G	0.00		
OOL-03-02-164-F-G	0.00		
OOL-03-02-165-F-G	0.00		
OOL-03-02-166-F-G	0.06		
OOL-03-02-167-F-G	0.00		
OOL-03-02-168-F-G	0.00		
OOL-03-02-169-F-G	0.00		
OOL-03-02-170-F-G	0.00		
OOL-03-02-171-F-G	0.00		
OOL-03-02-172-F-G	0.00		
OOL-03-02-173-F-G	0.00		
OOL-03-02-174-F-G-R	0.00		
OOL-03-02-175-F-G	0.14		
OOL-03-02-176-F-G	0.00		
OOL-03-02-177-F-G-R	0.00		
OOL-03-02-178-F-G	0.00		
OOL-03-02-179-F-G	0.00		
OOL-03-02-180-F-G	0.00		
OOL-03-02-181-F-G	0.00		
OOL-03-02-182-F-G	0.00		
OOL-03-02-183-F-G	0.00		

Sample Title	SOF	Sample Title	SOF
OOL-03-02-184-F-G	0.00		
OOL-03-02-185-F-G	0.00		
OOL-03-02-186-F-G	0.00		
OOL-03-02-187-F-G	0.00		
OOL-03-02-188-F-G	0.04		
OOL-03-02-189-F-G	0.88		
OOL-03-02-190-F-G	0.74		
OOL-03-02-191-F-G	0.09		
Max	0.88	Max	0.00
Average	0.02	Average	0.00
Standard Deviation	0.12	Standard Deviation	0.00

*OOL-03-02-140-F-G, OOL-03-02-142-F-G, OOL-03-02-145-F-G, OOL-03-02-146-F-G, OOL-03-02-153-F-G, OOL-03-02-160-F-G, OOL-03-02-174-F-G, OOL-03-02-177-F-G, OOL-03-03-133-F-G, OOL-03-03-134-F-G, OOL-03-03-135-F-G and OOL-03-03-136-F-G were recounted.

5.5 Data Quality Assessment

The Data Quality Assessment phase is the part of the FSS where survey design and data are reviewed for completeness and consistency, ensuring the validity of the results, verifying that the survey plan objectives were met, and validating the classification of the Survey Unit.

The sample design and the data acquired were reviewed and found to be in accordance with applicable YNPS procedures DP-8861, "*Data Quality Assessment*"; DP-8856, "*Preparation of Survey Plans*"; DP-8853, "*Determination of the Number and Locations of FSS Samples and Measurements*"; DP-8857, "*Statistical Tests*"; DP-8865, "*Computer Determination of the Number of FSS Samples and Measurements*" and DP-8852, "*Final Status Survey Quality Assurance Project Plan*".

The Data Quality Assessment power curves, scatter, quantile and frequency plots are found in Attachment B. Posting Plots are found in Attachment A.

5.5.1 OOL-03-01 Data Quality Assessment

The biased soil sample results were below the DCGLw. Fixed point sample concentrations were below the DCGLw and no sum-of-fractions were equal to or greater than one. The data set was within approximately two standard deviations with normal dispersion about the arithmetic mean. The data posting plot does not clearly reveal any systematic spatial trends. The quantile plot exhibits some asymmetry in the inner quartile and the frequency plot demonstrates a slight skew to the left. The survey maintained sufficient power to pass the unit and the data set verified the assumptions of the statistical test.

5.5.2 OOL-03-02 Data Quality Assessment

Fixed point sample concentrations were below the $DCGL_w$ however two of the sum-of-fractions were greater than one. HTD sample results were $<DCGL_w$. The sign test was applied to the statistical data and the Unit passed the sign test. The data set was within approximately three standard deviations with the exception of two data points that were greater than unity (i.e. the sum-of-fractions were greater than one) however the two data points were less than the $DCGL_{EMC}$. With the exception of the above mentioned sample points, the scatter plot graphically illustrates that the data vary about the arithmetic mean. The data posting plot reveals a systematic spatial trend which was identified and bounded as an elevated area. The quantile plot exhibits some asymmetry in the lower quartile and the frequency plot demonstrates a normal distribution with the exception of the above mentioned two data points. A fractional $DCGL_{EMC}$ assessment was performed in the elevated area identified, with the results demonstrating the $f DCGL_{EMC}$ to be less than one (unity). The survey maintained sufficient power to pass the unit and the data set verified the assumptions of the statistical test. The Data Quality Assessment power curves, scatter, quantile and frequency plots are found in Attachment B. Posting Plots are found in Attachment A.

5.5.3 OOL-03-03 Data Quality Assessment

Fixed point sample concentrations were below the DCGLw and no sum-of-fractions were equal to or greater than one. HTD sample results were <DCGLw. The data set was within approximately three standard deviations, with the exception of one data point that was slightly over three standard deviations, with normal dispersion about the arithmetic mean. The quantile plot exhibits a slight asymmetry in the lower quartile and the frequency plot demonstrates a slight skew to the right. The retrospective standard deviation was higher that the prospective standard deviation, however, the data posting plot does not clearly reveal any systematic spatial trends. The survey maintained sufficient power to pass the unit and the data set verified the assumptions of the statistical test.

6.0 QUALITY ASSURANCE AND QUALITY CONTROL

6.1 Instrument QC Checks

Operation of the portable ISOCS was in accordance with DP-8871,"*Operation of the Canberra Portable ISOCS System,*" with QC checks performed in accordance with DP-8869,"*In-situ (ISOCS) Gamma Spectrum Assay System Calibration Procedure*" and DP-8871, "*Operation of the Canberra Portable ISOCS System.*" Operation of the E-600 w/SPA-3 was in accordance with DP-8535, "*Setup and Operation of the*

Eberline E-600 Digital Survey Instrument," with QC checks preformed in accordance with DP-8540, "*Operation and Source Checks of Portable Friskers.*" Instrument response checks were performed prior to and after use for the E-600 w/SPA-3 and once per shift for the Portable ISOCS. Any flags (i.e. anomalies in the QC results) encountered during the ISOCS QC Source Count were corrected/ resolved prior to surveying. All instrumentation involved with the FSS of OOL-03 satisfied the above criteria for the survey. QC records are found in Attachment C.

6.2 Split Samples and Recounts

6.2.1 OOL-03-01 Split Samples and Recounts

One split and one recount 'QC" samples were gathered and within tolerable limits in accordance with DP-8864, "*Split Sample Assessment for Final Status Survey*".

6.2.2 OOL-03-02 Split Samples and Recounts

Three split and one recount "QC" samples were gathered and within tolerable limits in accordance with DP-8864,"*Split Sample Assessment for Final Status Survey*". FSS procedure AP-8852, "Final Status Survey Quality Assurance Project Plan (QAPP)" requires that 5% or the original samples but no less than one be recounted. 40 samples were planned for this Survey Unit but only one sample was recounted (instead of the minimum of 2 required). While the YNPS LTP does not address this requirement, recounting only one sample, for this FSSP, is a deviation from procedure and is addressed in Attachment F "*YNPS Condition Report 06-414"*. Although the programmatic requirement of recounting 5% of the original samples was not followed for this Survey Unit, sample recounts from several other Survey Units were performed during this time period providing satisfactory results proving data quality and therefore not impacting the FSS results of OOL-03-02.

6.2.3 OOL-03-03 Split Samples and Recounts

One split and one recount "QC" sample was gathered and within tolerable limits in accordance with DP-8864, "*Split Sample Assessment for Final Status Survey*".

6.3 Self-Assessments

No self-assessments were required during the FSS of OOL-03.

7.0 CONCLUSION

The FSS of OOL-03 has been performed in accordance with YNPS LTP and applicable FSS procedures. Evaluation of the soil sample data has shown none of the systematic soil samples exceeded the $DCGL_W$ in Survey Units OOL-03-01 and OOL-03-03. The sign test was applied to OOL-03-02 as the statistical test with the Survey Unit passing the test. An Elevated Measurement Comparison was performed on OOL-03-02 resulting with a $f DCGL_{EMC}$ sum-of-fractions (unity) less than one. Sample results for OOL-03 are depicted in Attachment B. Retrospective power curves were generated and demonstrated that an adequate number of samples were collected to support the Data Quality Objectives. Therefore, the null hypothesis (H_o) is rejected.

OOL-03 meets the objectives of the Final Status Survey.

Based upon the evaluation of the data acquired for the FSS, OOL-03 meets the release requirements set forth in the YNPS LTP. The Total Effective Dose Equivalent (TEDE) to the average member of the critical group does not exceed 25 mRem per year, including that from groundwater. 10CFR20 Subpart E ALARA requirements have been met as well as the site release criteria for the administrative level DCGLs that ensure that the Massachusetts Department of Public Health's 10 mRem per year limit will also be met.

List of Appendices

Appendix A – YNPS-FSSP-OOL-03, *"Final Status Survey Planning Worksheets"*

Appendix B – YA-REPT-00-015-04, "*Instrument Efficiency Determination for Use in Minimum Detectable Concentration Calculations in Support of the Final Status Survey at Yankee Rowe"*

Appendix C – YA-REPT-00-003-05, "*Generic ALARA Review for Final Status Survey of Soil at YNPS*"

Appendix D – ALARA Evaluations, OOL-03

Appendix E – YA-REPT-01-018-05, "*Use of In-situ Gamma Spectrum Analysis to Perform Elevated Measurement Comparison in Support of Final Status Surveys*"

List of Attachments

Attachment A – Maps and Posting Plots

Attachment B – Data Quality Assessment Plots and Curves

Attachment C – Instrument QC Records

Attachment D – ORTEC Direct Measurement Data

Attachment E – ISOCS Scan Data

Attachment F – YNPS Condition Report 06-414

(In the electronic version, every Table of Contents, Figures, Appendices and Attachments, as well as every mention of a Figure, Appendix or Attachment is a hyperlink to the actual location or document.)