65-16

File
NRC License

PARSONS

MEMORANDUM

TO: John Cleary, SEDA

DATE: May 7, 2002

Cc: Steve Absolom, SEDA
Kevin Healy, USACE, Huntsville
Marshall Green, USACE, Huntsville
Tom Enroth, USACE, NY District
Tom Sydelko, ANL (2 copies)

FROM: Jacqueline Travers, Katie Kadlubak, Parsons

COPIES: File

SUBJECT: NRC License Termination and License Release Work Plan

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Enclosed is the draft work plan for performing the NRC license termination and license release. Please note that copies of the draft appendices will follow next week. There are a few outstanding questions that we would like to discuss with you upon your review.

1. The License Termination Plan (LTP) created by Argonne National Laboratories (ANL) designates Building 123 as the background building. A less utilized building that is of more similar construction to a warehouse, such as Building 118, would be more appropriate.

2. The LTP mentions that we will do URSA sampling of gross gamma activity in soil "at selected locations to detect the presence of any activity that may have been carried outside" (See page 5-16, Section 5.5 in the LTP). Clarification is needed on the level of effort that is expected for exterior surveys. We currently have not planned, nor have we budgeted, for any type of outdoor survey. Being that all of the survey units are Class II and Class III and that residual radioactive contamination is not expected, it could be sufficient to perform a gamma scan with the FIDLER on the entranceways (doors and thresholds).

3. Section 5.5.1.1 of the LTP mentions that any fixtures or furniture that will be transferred along with the buildings will be scanned before release. Are any of the buildings currently furnished?

4. Do either of the parcels of SEDA that have been transferred contain sites included in existing NRC licenses?

Let us know if there is a convenient time next week to go over these and any other comments you may have.

Please call us if you have any questions.

Thanks.

U. S. NUCULAR REGULATORY COMMISSION
LICENSE TERMINATION AND LICENSE RELEASE WORK PLAN
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared For:

Seneca Army Depot Activity
Romulus, New York

and

U.S. Army Corps of Engineers
Huntsville Center

Prepared By:

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Contract DACA87-95-D-0031
741199 - Delivery Order 31

MAY 2002

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F. **Quality Assurance Project Plan**

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LIST OF ACRONYMS

Ac	Actinium
AEC	Atomic Energy Commission
AEHA	Army Environmental Hygiene Agency
ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute, Inc.
AOC	Areas of Concern
ARAR	Applicable or Relevant and Appropriate Requirements
ASTM	American Society for Testing and Materials
BRAC	Base Realignment and Closure
BRDC	U. S. Army Belvoir Research & Development Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
Ci	Curie
cm	Centimeters
cpm	counts per minute
DCGL	Derived Concentration Guideline Level
DLA	Defense Logistics Agency
DOA	Department of the Army
DOD	Department of Defense
DOE	Department of Energy
dpm	Disintegrations Per Minute
dps	Disintegrations Per Second
DQO	Data Quality Objective
EM	Electromagnetic
EMC	Elevated Measurement Comparison
EPA	US Environmental Protection Agency
ESI	Expanded Site Inspections
FIDLER	Field Instrument for the Detection of Low Energy Radiation
FB&DU	Ford Bacon & Davis Utah
FSS	Final Status Survey
ft	Feet
H-3	Tritium
HAZWOPPER	Hazardous Waste Operations and Emergency Response
HP	Health Physicist

HSA	Historic Site Assessment
MARSSIM	Multi-Agency Radiological Survey and Site Investigation Manual
MCA	Multi-channel Analyzer
MDA	Minimum Detection Amount
MDC	Minimum Detectable Concentration
mrem	milli-Roentgen equivalent man
mR	Milli-Roentgen
MSL	Mean Sea level
MW	Monitoring Well
NA	Not analyzed or not available
NaI	Sodium Iodide
NIST	National Institute of Standards
NBS	National Bureau of Standards
NRC	Nuclear Regulatory Commission
NPL	National Priority List
NRC	Nuclear Regulatory Commission
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOL	New York State Department of Labor
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
Pa	Protactinium
Pb	Lead
PIC	Pressure Ionization Chambers
QA/QC	Quality Assurance/ Quality Control
R&D	Research and Development
Ra	Radium
RADCON	Radiation Decontamination
Rn	Radon
RSO	Radiation Safety Officer
SEDA	Seneca Army Depot Activity
SEAD	Seneca Army Depot Activity

TAGM	Technical and Administrative Guidance Memorandum (published by State of New York)
TEDE	Total effective dose equivalent
Th	Thorium
U	Uranium
URSA	Universal Radiation Spectrum Analyzer
USACOE	United States Army Corps of Engineers
WRS	Wilcoxon Rank Sum

1 INTRODUCTION

1.1 PURPOSE OF REPORT

Parsons Engineering Science, Inc. (Parsons) is submitting this Work Plan for performing a Final Status Survey (FSS) at the Seneca Army Depot Activity (SEDA) in Romulus, New York. A FSS is required in order to close out the site and to successfully terminate Nuclear Regulatory Commission (NRC) license (Docket No. 040-08526) held by Seneca Army Depot.

Additional NRC licenses and permits that will be closed out under this FSS include:

a) License SUC-1380, Possession and Storage of depleted uranium as 25 mm, 105 mm, and 120 mm cartridge penetrators. These were issued to the U.S. Army, Operations Support Command (OSC);

b) Permit 45-16023-01NA, 20 mm and 25 mm cartridges were issued to the US Navy;

c) License SUB-834 held by the U.S. Army Combat Systems Test Activity for 7.62 mm and 0.50 caliber cartridges;

d) License BML 12-00722-07, possession of promethium 147 in the light anti-tank rocket system; and

e) STC-133, to store Columbite and tantalum (thorium) ore, managed by Defense Logistic Agency.

Additionally, to meet the Radiological Criteria for License Termination specified in 10 Code of Federal Regulations (CFR) 20.1402, the entire site will be evaluated. This assessment includes the buildings and igloos included directly under the specified NRC license #SUC-1275, as well as all other facilities within SEDA that have formerly been released for unrestricted use, or are currently undergoing clean-up.

The scope of work described in this work plan will be performed in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM – NRC, 2000). The MARSSIM classification system has been used to determine the status of each igloo and each building based on the previous investigations and historical information. With the igloos and buildings clearly classified, the Final Status Survey can be properly addressed. The procedure for this action is also included in this work plan.

The work proposed in this document will be performed as part of the United States Army Corps of Engineers (USACOE) remedial response activities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA – Title 42, US Code Chapter 103). It will follow the requirements from the Seneca Army Depot Activity License Termination and License

Release Plan (ANL, Jan 2002) that is pending approval from the Nuclear Regulatory Agency (NRC). This document is provided in **Appendix A**.

The overall site conditions and site history, along with descriptions of the historical information on the structures included in the NRC license termination are presented in **Section 1.0** of this work plan. **Section 2.0** presents the MARSSIM classifications of each of the survey units and a justification for the classification. A design for achieving NRC closeout at each of the structures along with completing a Final Status Survey is presented in **Section 3.0**. This includes sampling methods and procedures, field screening, visual inspections and laboratory analysis. The remaining sections discuss data assessment and reporting, staffing, and scheduling.

1.2 BACKGROUND

1.2.1 Site Description

Seneca Army Depot Activity (SEDA) is located about 40 miles south of Lake Ontario, near Romulus, Seneca County, New York (**Figure 1-1**). Seneca County is located in the center of the state, in the heart of the Finger Lakes Region. The facility is located in an uplands area, at an elevation of approximately 600 feet Mean Sea Level (MSL) that forms a divide separating two of the Finger Lakes; Cayuga Lake on the east and Seneca Lake on the west. New York State Highways 96 and 96A adjoin SEDA on the east and west boundaries, respectively. The surrounding area is sparsely populated farmland.

The 10,587-acre SEDA facility was constructed in 1941 and was owned by the U.S. Government and operated by the Department of the Army (DOA) in its entirety until September 2000. From its inception in 1941 until 1995, SEDA's primary mission was the receipt, storage, maintenance, and supply of military items, including munitions and equipment. The Depot's mission changed in 1995 when the Department of Defense (DOD) recommended closure of the SEDA under its Base Realignment and Closure (BRAC) process. Congress approved this recommendation in 1995, and the mission of SEDA was terminated in 1999. The DOA inactivated SEDA in July of 2000, and the first two parcels of the former Depot were transferred to outside parties in September of 2000. Neither of these parcels contain sites included in existing NRC licenses.

1.2.2 Site History

Included in the NRC license termination are 120 storage igloos and six buildings, all of which are located within the secured area of the ammunition storage area (**Figure 1-2** through **1-7**).

Table 1-1 lists the igloos that will be surveyed in this FSS. Ninety-three of the igloos are 20- meters in length and have an internal area of 150 square meters (m^2). Twenty-eight of the igloos are 25-meters in length, and have an internal area of 200 m^2. See **Figure 1-8** for a general schematic of the layout of the igloos.

The buildings that are included in the FSS are:

- Building 5;
- Building 306;
- Building 356
- Building 612;
- Building S-2084; and
- Building 2073.

Floor plans of the buildings and individual rooms to be surveyed (survey units) are provided in **Appendix B**.

It should be noted that Building 612 and Warehouse 356 have already undergone radiological surveys. Warehouse 356 was released for unrestricted use by the NRC (DLA, Jan. 1995). Consequently, no additional surveying or analysis is required for this building. Building 612 has also undergone a radiological survey, but has not been released by the NRC as of this time. To satisfy the guidelines in MARSSIM for performing a FSS, past survey data will be used to evaluate compliance with NRC regulations so that the license can be adequately terminated. This is more fully explained in **Section 3** of this work plan.

1.3 HISTORICAL INFORMATION

SEDA was used for storage and for maintenance of radioactive commodities, primarily depleted uranium (DU) munitions. These commodities were strong in design and contained a limited amount of radioactivity, generally in a non-dispersible form. These commodities were not expected to have released radioactive contamination. Argonne National Laboratory (ANL) recently conducted a review of all available records and files for the structures included in this work plan (ANL, January 2002). The following is information that ANL assembled regarding the use and the contents of the igloos and buildings included in this work plan.

Igloos E0801 and E0802: These igloos, which are also part of SEAD-48, were used during the 1940s to store pitchblende ore used in the Manhattan Project. These igloos were surveyed and released for unrestricted use (NRC, 1988). Historically, radiological surveys conducted at these two igloos have never demonstrated that there is any residual contamination present.

Igloos A0201, A0316, A0317, A0508: These igloos are four of the 64 special-weapons bunkers that were built and operated by the Atomic Energy Commission (AEC) in the early 1950s for storage and maintenance. The Army acquired these bunkers in 1956 and used them until 1993. These igloos were surveyed in 1992/1993 and were released for unrestricted use.

Igloo A0701: This igloo was used, under license BML 12-00722-07, for storage of anti-tank rockets that contained rocket sights that included promethium-147 as a constituent. The promethium-147 was

contained in ceramic microspheres, mixed with self-luminous paint, and laminated between plastic sheets to provide illumination of the 100- and 150-yard markings that are part of the front aiming sight. Unless the sight was subject to crushing, melting, or breaking across either of the markings, which is considered an unlikely scenario, the promethium-147 would not be able to escape according to information provided in the license application (U.S. Army, 1007).

Warehouse 356: This building was used to store 5,284 drums of Columbite and tantalum (thorium) ore. Amendment 16 to license STC-133 released the building for unrestricted use on December 22, 1994. Additional surveys conducted by the New York State Department of Health (NYSDOH) in 1993 of the warehouse reported no significant deviations from background. Consequently, the warehouse does not need additional radiological surveying.

Building 612: This building was used under license SEC-1275 mainly to unpackage, inspect, and repackage DU ammunition. Demilitarization of munitions, although never carried out in this building, was also permitted under the same license. Building 612 has previously undergone radiological surveys that were completed in 1999. A characterization survey and analysis report summarizing the radiation survey work performed in Building 612 by Army was submitted to the US Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) on March 28, 2000. Comments were received will be integrated into the evaluation of the data. The data will be evaluated using the current dose limits derive by ANL (ANL, January 2002) and presented to NRC as part of the license termination package.

Buildings 5, 306, S-2084, and 2073: These buildings were used as staging points to prepare the DU ammunition for shipment.

The 120 ammunition bunkers: These igloos, listed in **Table 1-1**, were used solely for storage of packaged DU ammunition. While these igloos were in use, periodic surveys were performed. Results from these surveys did not detect elevated residual radioactivity. Storage of the DU ammunitions was ended in September 1999.

Table 1-1
Storage Igloos Included in Radiological Survey
NRC License Termination Plan
Seneca Army Depot Activity

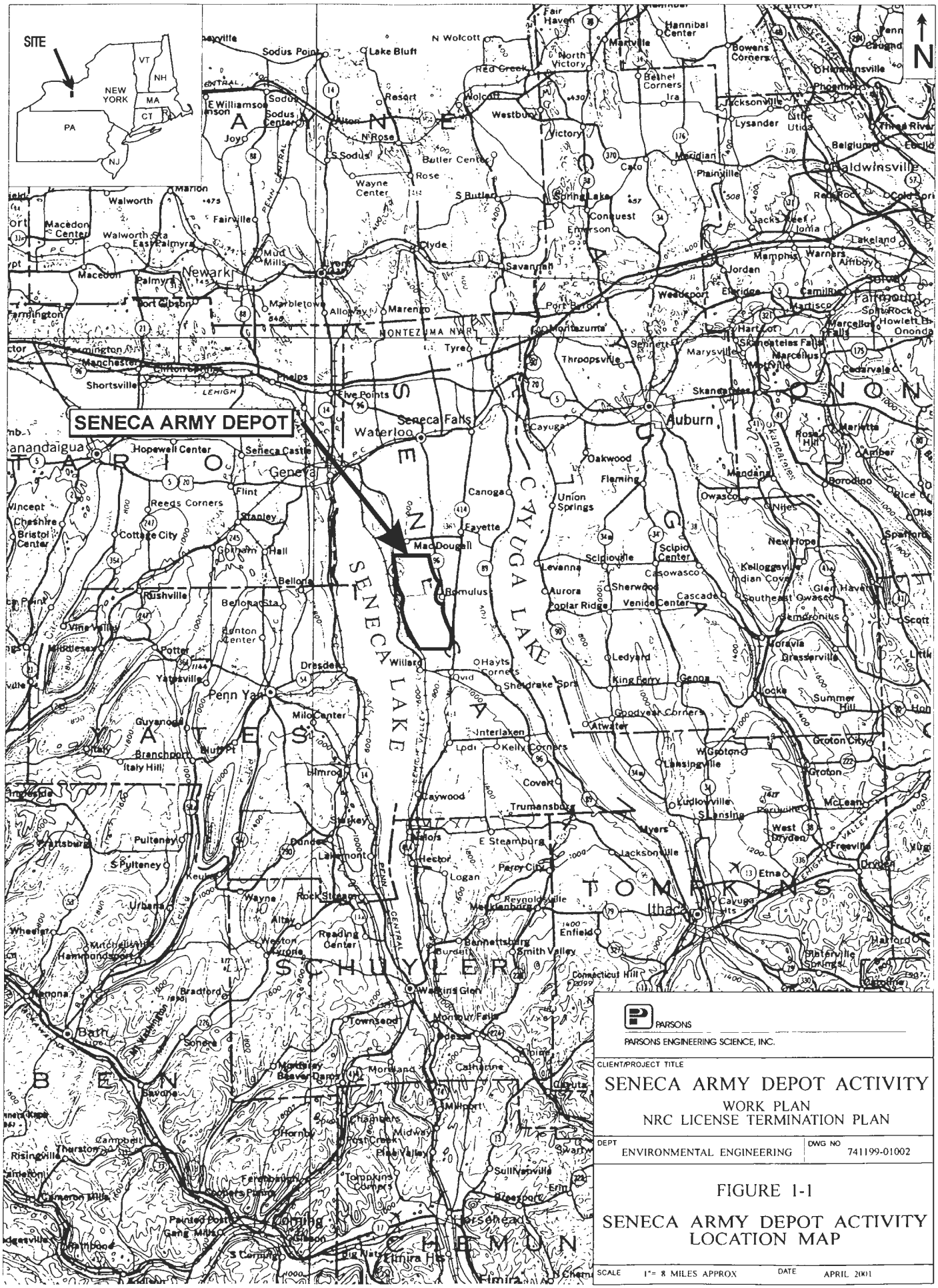
IGLOO NUMBER[a, b]				
A0901	B0709	C0510	D0107	E0112
A0316	B0711	C0511	D0108	E0211
A0317	B0801	C0513	D0110	E0301
A0508	B0802	C0603	D0113	E0302
A0701[c]	B0804	C0604	D0206	E0303
A0706	B0809	C0605	D0207	E0312
A0707	B0810	C0606	D0305	E0402
A0710	B0811	C0608	D0306	E0410
A0711	B0909	C0701	D0312	E0411
A0901	C0203	C0706	D0401	E0413
A0905	C0303	C0707	D0406	E0504
A1108	C0307	C0708	D0407	E0506
A1109	C0308	C0801	D0413	E0508
B0109	C0401	C0803	D0601	E0510
B0411	C0403	C0807	D0604	E0512
B0501	C0405	C0809	D0607	E0602
B0602	C0406	C0901	D0704	E0604
B0603	C0407	C0902	D0705	E0609
B0609	C0408	C0906	D0711	E0610
B0610	C0501	C0907	D0712	E0702
B0701	C0503	C0808	D0801	E0706
B0705	C0504	C0909	D0805	E0711
B0707	C0505	D0104	E0103	E0801
B0708	C0508	D0105	E0105	E0802

Notes:

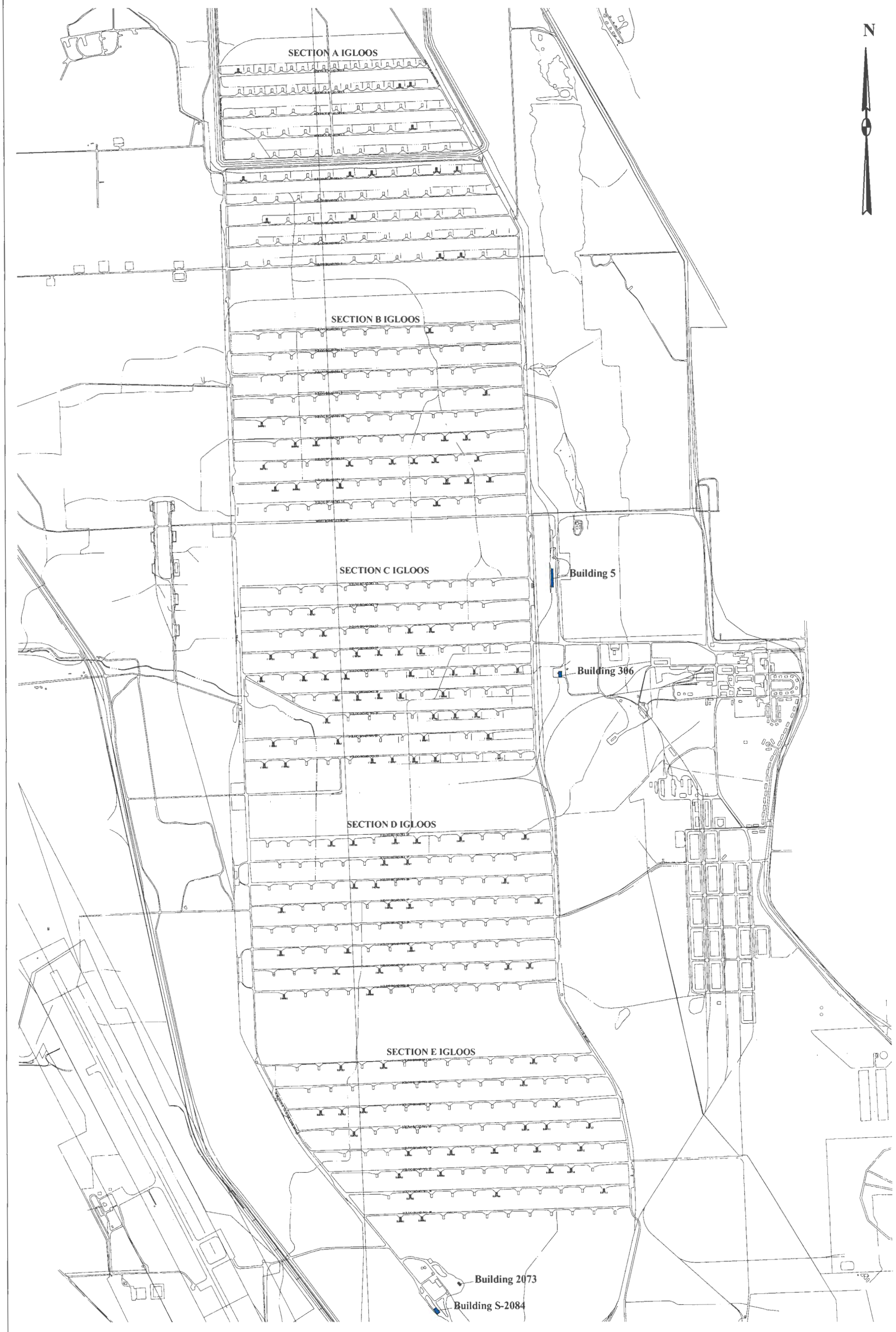
a) Unless otherwise noted, igloos were used for storage of packaged DU ammunition under NRC license SUC-1275.

b) The list of igloos requiring surveying under the SEDA NRC License Termination program was compiled from *Seneca Army Depot- License Termination and License Release Plan*, ANL, January 2002.

c) Igloo A0701 was used for the storage of light anti-tank rockets that contained promethium-147 under license BML 12-00722-07.



P:\PIT\PROJECTS\SENECA\NRCTERM\WORKPLAN\FIGURE1-1.CDR



LEGEND

- SEDA IGLOO- NOT INCLUDED IN RADIOLOGICAL SURVEY
- SEDA IGLOO- INCLUDED IN RADIOLOGICAL SURVEY
  A0201
- SEDA BACKGROUND IGLOO- FOR RADIOLOGICAL SURVEY
  C0912
- BUILDING INCLUDED IN RADIOLOGICAL SURVEY

NOTE:
PLEASE SEE FIGURES 1-3 THROUGH 1-7 FOR A LARGER VIEW OF THE IGLOOS TO BE INCLUDED IN THE RADIOLOGICAL SURVEY.

1900 0 1900
(feet)

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SENECA ARMY DEPOT ACTIVITY

WORK PLAN
NRC LICENSE TERMINATION PLAN

FIGURE 1-2
LOCATION OF IGLOOS AND BUILDINGS

SCALE	DATE	REV
1:1900	MAR 2002	SHEET 1 OF 1

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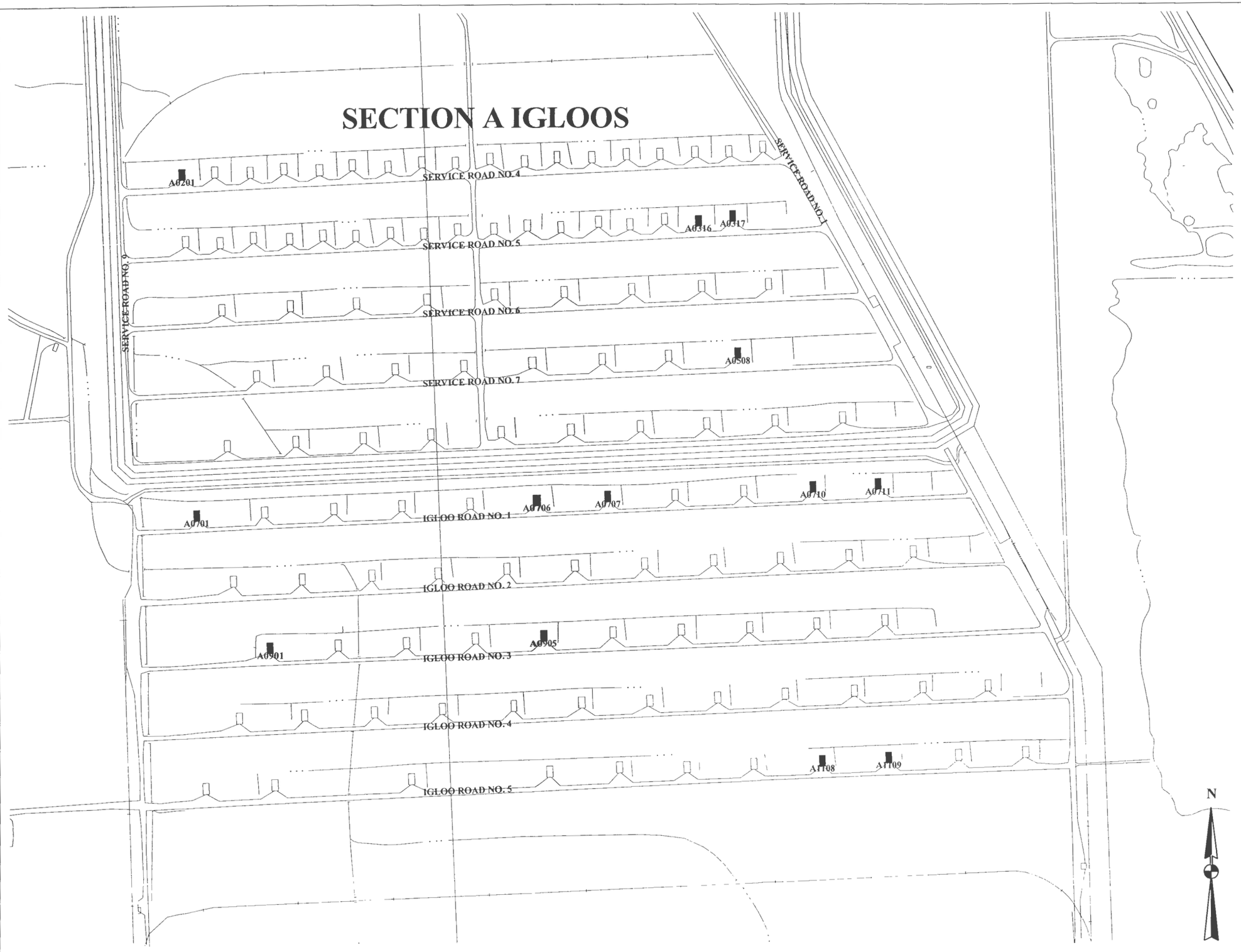
SECTION A IGLOOS



LEGEND

- SEDA IGLOO- NOT INCLUDED IN RADIOLOGICAL SURVEY
- A0201 SEDA IGLOO- INCLUDED IN RADIOLOGICAL SURVEY
- A0201 SEDA BACKGROUND IGLOO- FOR RADIOLOGICAL SURVEY
- BUILDING INCLUDED IN RADIOLOGICAL SURVEY

600 0 600
(feet)

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WORK PLAN
NRC LICENSE TERMINATION PLAN

FIGURE 1-3
LOCATION OF SECTION A IGLOOS

SCALE	DATE	REV
1:600	MAR 2002	SHEET 1 OF 1

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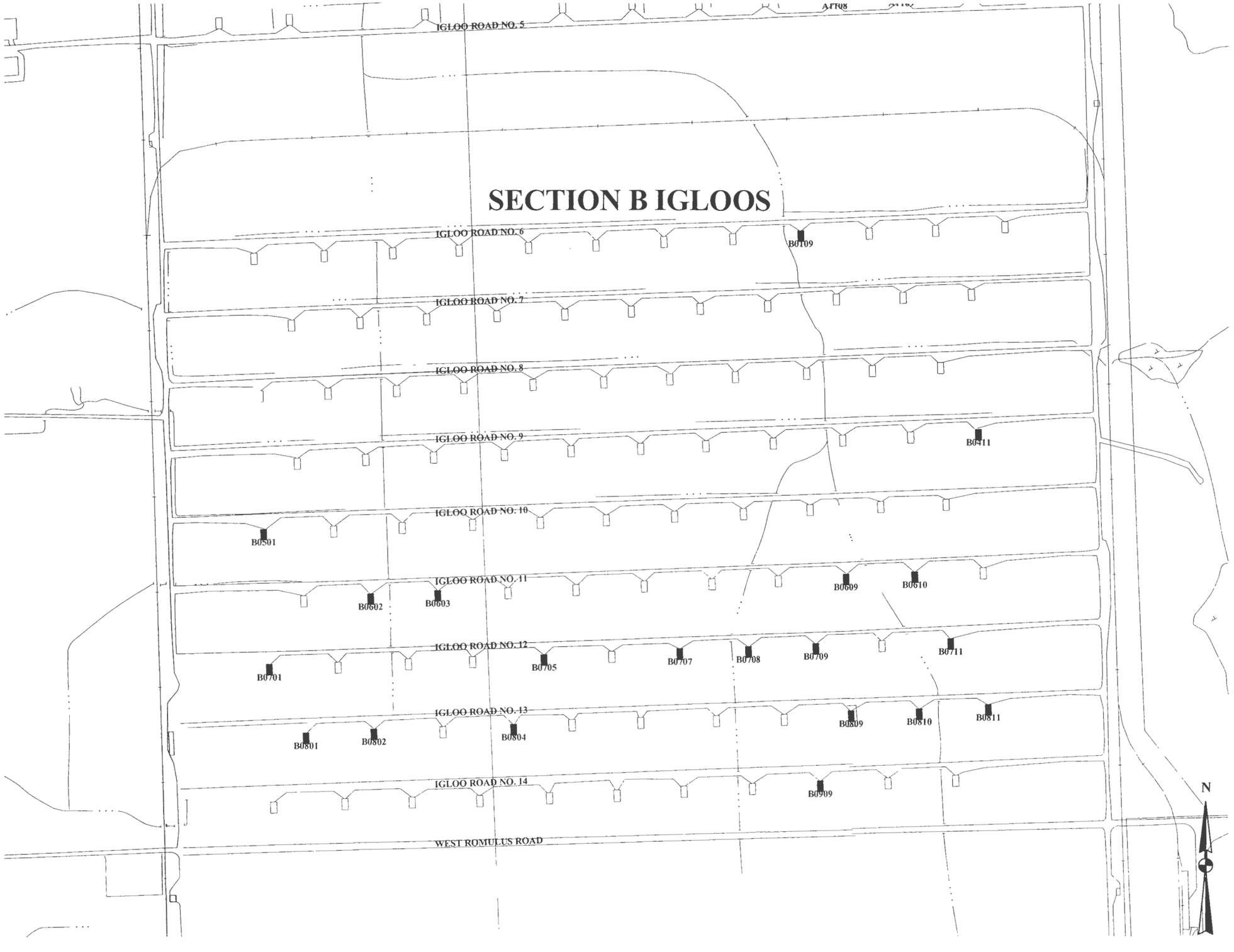

LEGEND

- SEDA IGLOO- NOT INCLUDED IN RADIOLOGICAL SURVEY
- A0201 SEDA IGLOO- INCLUDED IN RADIOLOGICAL SURVEY
- A0201 SEDA BACKGROUND IGLOO- FOR RADIOLOGICAL SURVEY
- BUILDING INCLUDED IN RADIOLOGICAL SURVEY

600 0 600
(feet)

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SENECA ARMY DEPOT ACTIVITY
WORK PLAN
NRC LICENSE TERMINATION PLAN

FIGURE 1-4
LOCATION OF SECTION B IGLOOS

SCALE	DATE	REV
1:600	MAR 2002	SHEET 1 OF 1

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SECTION C IGLOOS

IGLOO ROAD NO. 15

IGLOO ROAD NO. 16

C0203

IGLOO ROAD NO. 17

C0303 C0307 C0308

IGLOO ROAD NO. 18

C0401 C0403 C0405 C0406 C0407 C0408

IGLOO ROAD NO. 19

C0501 C0503 C0504 C0505 C0508 C0510 C0511 C0513

IGLOO ROAD NO. 20

C0603 C0604 C0605 C0606 C0608

IGLOO ROAD NO. 21

C0701 C0706 C0707 C0708

IGLOO ROAD NO. 22

C0801 C0803 C0807 C0809

IGLOO ROAD NO. 23

C0901 C0902 C0906 C0907 C0908 C0909 C0912

Building 5

Build

LEGEND

- SEDA IGLOO- NOT INCLUDED IN RADIOLOGICAL SURVEY
- A0201 SEDA IGLOO- INCLUDED IN RADIOLOGICAL SURVEY
- A0201 SEDA BACKGROUND IGLOO- FOR RADIOLOGICAL SURVEY
- BUILDING INCLUDED IN RADIOLOGICAL SURVEY

600 0 600
(feet)

N

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WORK PLAN
NRC LICENSE TERMINATION PLAN

FIGURE 1-5
LOCATION OF SECTION C IGLOOS

SCALE	DATE	REV
1:600	MAR 2002	SHEET 1 OF 1

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SECTION D IGLOOS

C0901 C0902

IGLOO ROAD NO. 24

D0104 D0105 D0107 D0108 D0110 D0113

IGLOO ROAD NO. 25

D0206 D0207

IGLOO ROAD NO. 26

D0305 D0306 D0312

IGLOO ROAD NO. 27

D0401 D0406 D0407 D0413

IGLOO ROAD NO. 28

IGLOO ROAD NO. 29

D0601 D0604 D0607

IGLOO ROAD NO. 30

D0704 D0705 D0711 D0712

IGLOO ROAD NO. 31

D0801 D0805

FAYETTE ROAD

N

LEGEND

SEDA IGLOO- NOT INCLUDED IN RADIOLOGICAL SURVEY

A0201 SEDA IGLOO- INCLUDED IN RADIOLOGICAL SURVEY

A0201 SEDA BACKGROUND IGLOO- FOR RADIOLOGICAL SURVEY

BUILDING INCLUDED IN RADIOLOGICAL SURVEY

600 0 600
(feet)

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SENECA ARMY DEPOT ACTIVITY
WORK PLAN
NRC LICENSE TERMINATION PLAN

FIGURE 1-6
LOCATION OF SECTION D IGLOOS

SCALE	DATE	REV
1:600	MAR 2002	SHEET 1 OF 1

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SECTION E IGLOOS

IGLOO ROAD NO. 31

IGLOO ROAD NO. 32

IGLOO ROAD NO. 33

IGLOO ROAD NO. 34

IGLOO ROAD NO. 35

IGLOO ROAD NO. 36

IGLOO ROAD NO. 37

IGLOO ROAD NO. 38

IGLOO ROAD NO. 39

FAYETTE ROAD

NORTH-SOUTH BASELINE ROAD

D0801 D0805

E0103 E0105 E0112

E0210

E0301 E0302 E0303 E0312

E0402 E0410 E0411 E0413

E0504 E0506 E0508 E0510 E0512

E0602 E0604 E0609 E0610

E0702 E0706 E0711

E0801 E0802

N

600 0 600
(feet)

LEGEND

- SEDA IGLOO- NOT INCLUDED IN RADIOLOGICAL SURVEY
- A0201 SEDA IGLOO- INCLUDED IN RADIOLOGICAL SURVEY
- A0201 SEDA BACKGROUND IGLOO- FOR RADIOLOGICAL SURVEY
- BUILDING INCLUDED IN RADIOLOGICAL SURVEY

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SENECA ARMY DEPOT ACTIVITY
WORK PLAN
NRC LICENSE TERMINATION PLAN

FIGURE 1-7
LOCATION OF SECTION E IGLOOS

SCALE	DATE	REV
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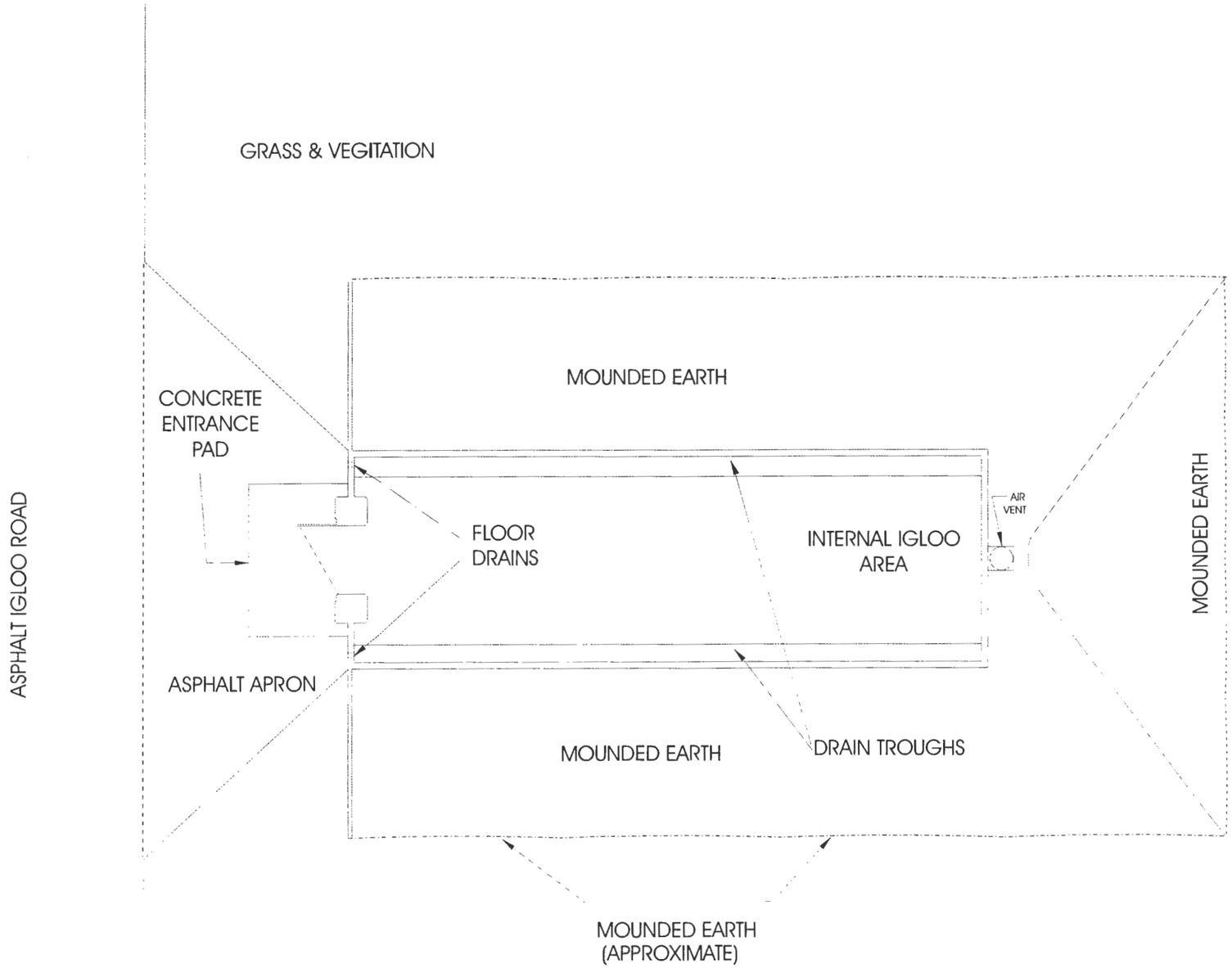

NOTES:
-THE IGLOOS INCLUDED IN THE NRC LICENSE TERMINATION ARE EITHER 20-METERS IN LENGTH WITH AN AREA OF 150 SQUARE METERS OR 25 METERS IN LENGTH WITH AN AREA OF 200 SQUARE METERS.

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CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
WORK PLAN
NRC LICENSE TERMINATION PLAN

DEPT ENVIRONMENTAL ENGINEERING DWG NO 741199-01002

FIGURE 1-8
SCHEMATIC DRAWING OF TYPICAL IGLOO STRUCTURE

SCALE 1 INCH = 20 FEET DATE APRIL 2002

P:\PIT\PROJECTS\SENECA\NRCTERM\WORKPLAN\FIGURE1-4.CDR

2 BUILDING/IGLOO CLASSIFICATIONS

As part of the implementation of the MARSSIM process, the 120 storage igloos and the four buildings must be classified as Class I, Class II, or Class III survey units. Building 612 and Warehouse 356 have been excluded from this discussion, since the field surveys have already been completed. Classification is completed based upon historic information and an assessment of the likely threat of residual radioactive contamination. MARSSIM, which is the basis for the classification system employed in this program, provides guidance on the classification of buildings and land based upon past activities. To ensure that potential residual radiation is detected, the percentage of building surfaces surveyed will be dependant on the classification of the survey area. The lower the classification number, (Class I having the greatest potential for residual radiation), the greater the survey coverage.

2.1 MARSSIM AREA CLASSIFICATIONS

Impacted areas are defined as areas that have some potential for containing radioactive material. The interior of the storage igloos and buildings will be placed in one of the following three survey unit classes in accordance with MARSSIM guidelines:

- Class I Areas: Areas that have, or had prior to remediation, a potential for radioactive contamination (based on site operating history) or known contamination (based on previous radiological surveys). Examples of Class 1 areas include: 1) site areas previously subjected to remedial actions, 2) locations where leaks or spills are known to have occurred, 3) former burial or disposal sites, 4) waste storage sites, and 5) areas with contaminants in discrete solid pieces of material with high specific activity. Past radiological surveys and historic information would support a high probability of the area may contain measurement that would exceed the Derived Concentration Guideline Levels (DCGLs), as defined by MARSSIM. DCGLs are defined in MARSSIM as residual levels of radioactive material that corresponds to allowable radiation dose standards. The recommended area for a Class I survey unit is 100 m^2 of floor area for a structure and up to 2,000 m^2 for land areas (NRC, 2000).

- Class II Areas: These areas have, or had prior to remediation, a potential for radioactive contamination or known contamination, but are not expected to exceed the DCGL. To justify changing an area's classification from Class I to Class II, the exiting data (from the Historic Site Assessment (HSA), scoping surveys, or characterization surveys) should provide a high degree of confidence that no individual measurement would exceed the DCGLs. Other justifications for this change in an area's classification may be appropriate based on the outcome of the Data Quality Objectives (DQO) process. Examples of areas that might be classified as Class II for the final status survey include: 1) locations where radioactive materials were present in an unsealed form (e.g., process facilities), 2) potentially

contaminated transport routes, 3) areas downwind from stack release points, 4) upper walls and ceilings of some buildings or rooms subjected to airborne radioactivity, 5) areas where low concentrations of radioactive materials were handled, and 6) areas on the perimeter of former contamination control areas. The recommended area for a Class II survey unit is 100 m^2 too 1,000 m^2 of floor area for a structure and 2,000 m^2 to 10,000 m^2 for a land area (NRC, 2000).

- Class III Areas: Any impacted areas that are not expected to contain any residual radioactivity, or are expected to contain levels of residual radioactivity at a small fraction of the DCGL, based on site operating history and previous radiological surveys. Examples of areas that might be classified as Class III include buffer zones around Class I or Class II areas, and areas with very low potential for residual contamination but insufficient information to justify a non-impacted classification. There are no limits recommended for the area of a Class III survey unit (NRC, 2000).

2.2 CLASSIFICATION OF AREAS

In accordance with MARSSIM, the areas included in the survey have been classified either as Class I, II, or III survey units. These survey units along the classification rationale are identified in **Table 2-1**.

Based on observations from past radiological surveys and historic uses of the buildings, all of the 120 igloos to be surveyed are Class III survey units. Building 5 and Building 306 contain both Class II survey units, as well as Class III survey units. The office areas in both buildings have been designated Class III survey units because they are not expected to contain any residual radioactivity, or are expected to contain levels of residual radioactivity at a small fraction of the DCGL. The remaining areas of the buildings are Class II survey areas. The entirety of Building S-2084 and Building 2073 are designated Class II survey areas.

Table 2-1

Classification and Justification of Igloos and Buildings[a]
NRC License Termination
Seneca Army Depot Activity

Building/Igloo	Operations Performed	Summary of Past Radiological Surveys	Radionuclides of Concern	Affected Licenses	Classification
Building 5	Staging Point to prepare DU ammunitions for shipment	During operations, periodic surveys were conducted and no elevated levels of radioactivity were ever detected. The last of the DU ammunition was shipped off-site in September, 1999.	U-234, U-235, U-238 (DU)	SUC-1275; SUC-1380	Class II/ Class III
Building 306					Class II/ Class III
Building S-2084					Class II
Building 2073					Class II
Igloo A0701	Stored anti-tank rocket systems that contained Pm-147	N/A	Pm-147	SUC-1275; BML 12-00722-07 (managed by TACOM Rock Island)	Class III
Igloos E0801 & E0802	Stored barrels of pitchblende ore	Several surveys performed. Igloos release for unrestricted use in 1985.	Ra-226, U-234, U-235, U-238 (pitchblende ore)	SUC-1275; SUC-1380	Class III
Igloos A0201, A0316, A0317, A0508	Stored special weapons	Were surveyed in 1992 and 1993 and release for unrestricted use.	Pu-239, U-234, U-235, U-238, and H-3	SUC-1275; SUC-1380	Class III
Ammunition Bunkers (See **Table 1-1**)	Stored packaged DU ammunition	During operations, periodic surveys were conducted and no elevated levels of radioactivity were ever detected. The last of the DU ammunition was shipped off-site in September, 1999.	U-234, U-235, U-238 (DU)	SUC-1275; SUC-1380	Class III
Warehouse 356[b]	Stored Columbite and Tantalum (thorium) ore	NRC released building for unrestricted use in Amendment 16 to SUC-133 in December 1994.	Natural Thorium	SUC-1275; STC-133 (managed by Defense Logistic Agency)	Class III
Building 612[c]	Unpackaged, inspected, and repackaged DU ammunition.	Building was surveyed in 1999.	U-234, U-235, U-238 (DU)	SUC-1275; SUC-1380	Class I

a) This table is adapted from Table 2-2 of the *Seneca Army Depot Activity- License Termination and License Release Plan*, Argonne National Laboratories.
b) Warehouse 356 is no longer included in the NRC License Termination as it has already been release by the NRC.
c) Building 612, since it has already been surveyed, will not be part of the radiological survey. However, the data already collected will be analyzed and evaluated in accordance with MARSSIM guidance.

3 FIELD METHODOLOGY

3.1 RADIONUCLIDES OF CONCERN

Several types of radioactive materials were licensed by the NRC for receipt, storage, and maintenance at SEDA. The radionuclides of concern (ROC) addressed in this work plan for the NRC license termination are uranium-234, -235, -238 (U-234, U-235, U-238, respectively), promethium-147 (Pm-147), radium-226 (Ra-226), plutonium-239 (Pu-239), and tritium (H-3).

3.2 DERIVED CONCENTRATION GUIDELINE LEVEL

A derived concentration guideline level (DCGL) is defined as the concentration of residual radioactivity distinguishable from background that, if uniformly distributed throughout a survey unit, would result in a defined total effective dose equivalent (TEDE) to an average member of a critical group. The TEDE selected for development of DCGLs at SEDA is the New York State Department of Environmental Conservation (NYSDEC) TAGM-4003 level of 10 milli-millirem per year (mrem/year). Although the US Environmental Protection Agency (EPA) allows a TEDE of 15 mrem/year and the NRC allows a TEDE of 25 mrem/year, the TEDE of 10 mrem/year was selected since it is the most conservative dose limit. ANL, using the process described in MARSSIM, has derived the DCGL values (ANL, 2002) that correspond to a TEDE of 10 mrem/year. These DCGLs will be compared to the data from the surveys discussed in this work plan in order to determine if a survey area meets the release criteria. The building surface DCGLs derived by ANL are listed in **Table 3-1**. The DCGLs considered to be most appropriate for the survey areas addressed in this work plan are listed in bold in **Table 3.1**.

Because depleted uranium (DU) is a ROC at all of the survey areas associated with the license termination, a gross activity DCGL for DU was calculated. It was assumed that the isotopic composition of the DU present at SEDA has the common activity fractions for DU: 0.13 – U-234, 0.01 – U-235, and 0.86 – U-238. The gross DCGL was calculated per the following MARSSIM equation:

$$Gross\ DCGL = \frac{1}{\frac{f_{U-234}}{DCGL_{U-234}} + \frac{f_{U-235}}{DCGL_{U-235}} + \frac{f_{U-238}}{DCGL_{U-238}}} \qquad \text{Equation 3-1}$$

where f is the isotopic activity fraction and $DCGL$ is the isotopic DCGL listed in **Table 3-1**. Because DU is the most likely form of contamination expected in the license termination survey areas, the instrument minimum detectable amounts (MDA) and field flag values will be based on the gross DCGL for DU (**Tables 3-3** and **3-4**).

Comparison to the DCGL values will be used to determine where guidelines are exceeded and if remediation is necessary. Remediation work, although not expected to be necessary, could include

sandblasting, grinding, scabbling, scrubbing walls and floors, cleaning and replacing the floor drains, and/or removal of parts of the igloo or building that prove contaminated.

If the initial survey data indicates that the survey area does not satisfy the release criteria, the appropriate level of remediation will be performed, under a separate work plan, and the area of concern will be re-surveyed to verify that the release criteria have been met. However, as previously stated, it is not anticipated that any survey areas will require remediation in order to achieve "close-out" status.

3.3 INSTRUMENTATION

This section describes the instrumentation that will be used to conduct the surveys. Field instrument efficiencies and Minimum Detection Amounts (MDAs) are presented in **Table 3-2**. Field instrument flag values for direct and scanning measurements are listed in **Tables 3-3** and **3-4**. Instrument procedures describing the use of each instrument can be found in **Appendix C**. The calculations used to derive the field instrument flag values are presented in **Appendix E**.

3.3.1 Alpha and Beta Radiation Surveys

A Ludlum model 43-1-1 plastic scintillation probe (phoswich) will be used to perform the alpha and beta scanning and direct measurements on wall and ceiling survey locations. A Ludlum model 43-37 large-area gas proportional probe (floor monitor) will be used to collect scanning and direct measurements on the interior floor locations. These instruments have probe areas of 86 square centimeters (cm^2) and 425 cm^2, respectively, and approximate efficiencies of 0.15 counts per minute per disintegrations per minute (cpm/dpm). The selection of these instruments is supported by MARSSIM in Table 6.4 (NRC, 2000). The MDA is below the DCGL, as is shown in **Table 3-2**.

3.3.2 Gamma Radiation Surveys

A Bicron G5 fidler Probe (FIDLER) coupled with a Bicron Analyst portable count-rate meter will be used for the low energy gamma surveys for all survey units. A 3"x 3" sodium-iodide (NaI) detector, which is more efficient at detecting higher-energy gamma radiation than a FIDLER, will also be available. **Table 3-2** compares the MDAs to the DCGLs for the FIDLER at different count times. When collecting direct measurements with the FIDLER coupled with a Bicron Analyst portable count-rate meter, one-minute readings will be collected. Since it is not achievable with the FIDLER coupled with a Bicron Analyst portable count-rate meter to have a scanning MDA below the $DCGL_w$, igloos that are elevated above background based on Wilcoxon Rank Sum (WRS) test results or are above a conservative flag value that is set in the field, will be further investigated with the Universal Radiation Spectrum Analyzer (URSA), as described below.

Exposure Rate Surveys

Exposure rate surveys will be conducted using a Bicron MicroRem meter. Exposure rate surveys will be performed for health and safety purposes. Maximum readings of twice the average background will be set as the limit for an acceptable working area for health and safety readings.

3.3.4 In-situ Gamma Spectroscopy Surveys

A NaI based gamma spectroscopy system will be used to identify and quantify sources of radiation during the NRC license termination surveys. The system utilizes the URSA software, developed by Radiation Safety Associates, Inc. (RSA), to analyze and identify energy peaks associated with photon emissions. Gamma spectroscopy measurements will be taken to determine in real time the extent of contamination and the need for remediation. The system will be used with either a FIDLER or 3"x 3" NaI detector.

For sample locations evaluated using in-situ gamma spectroscopy, approximately 5% of these samples will be sent to an approved off-site laboratory for U-238, U-235, and Ra-226 isotopic analyses. These data will be used to confirm and perform a correlation, if appropriate, between the in-situ results and the laboratory results. General Engineering Laboratories, Inc. (GEL) has been selected to perform the isotopic analysis. A justification for the use of GEL is explained in letters to the EPA and to NYSDEC dated November 19, 1999 and November 22, 1999. GEL is MRD certified for radiological analyses and NYSDOH ELAP certified for Radiological Analysis in Water.

3.3.5 Instrument Function Check Procedure

To insure that the highest quality data possible are collected during the survey program, all radiation survey data will be collected using laboratory-calibrated radiation survey instruments. All survey instruments are to be calibrated every 12 months, with the exception of the MicroRem exposure rate instrument, which is calibrated every 6 months.

The gamma spectroscopy system will be calibrated in the field by qualified personnel using National Institute of Standards (NIST) traceable calibration sources at the site, consistent with the manufacturer's recommendations. **Table 3-3** indicates which sources are used with which instruments for the source checks.

In addition to the periodic laboratory calibrations, function checks will be completed over the duration of the survey period to demonstrate that the instrument is operating properly. This will be done by collecting a background and source reading each morning, afternoon, and evening that the instrument is being used. The reading will be input into a control chart that will plot the distribution of the data. Tracking the distribution using this method will allow for the identification of an improperly operating instrument. For the first five days that the instrument is being used, the instruments will be considered to be properly operating if their readings are within +/- 20%; after 5 days, there will be enough data to produce an accurate distribution curve to identify uncertainty

within a 2-sigma range. This function check procedure will account for the variability associated with temperature, pressure, background, electronics, etc., in assessing the status of the equipment. All checks will be done using NIST-traceable radioactive sources that are on a two-year calibration cycle. The calibration checks are completed to ensure that the emission rates, which are used to determine the field efficiencies of the instruments, are accurately known.

3.3.6 Quality Assurance/Quality Control Testing

Quality assurance and quality control (QA/QC) measures will be used throughout the program to insure the certainty of the data collected for the surveys. Standardized survey techniques and procedures will be use to assure the consistency of the sampling methods.

All measurements collected will be properly documented. The instrument serial number, the measurement location, the output, the surveyor, and the date the measurement was collected will all be recorded. See **Appendix C** for representative field survey forms. **Appendix F** contains the Quality Assurance Project Plan (QAPP) for performing the FSS at the NRC sites.

CLASS I SURVEYS

The only Class I building addressed in the NRC license termination is Building 612. Radiological surveys of Building 612 were completed in 1999. Additional fieldwork to support the release of Building 612 is not expected at this time.

3.4 CLASS II SURVEYS

Four buildings addressed in the NRC license termination contain Class II survey areas: Building 5, Building 306, Building S-2084, and Building 2073. The Class II radiological surveys will be conducted in the manner indicated below.

3.5.1 Interior Surveys

1. 50% of the following surfaces, conducted in 2-meter by 2-meter grids:
   - Lower walls (less than two meters above ground level);
   - Floors; and
   - Other horizontal surfaces at heights less than 2 meters.

2. 10% of the following surfaces, conducted in 1-meter by 1-meter grids:
   - Upper walls (greater than two meters above ground level);
   - Ceilings; and
   - Other horizontal surfaces at heights above 2 meters.

Each survey will consist of both scanning and direct measurements for alpha, beta, and gamma radiation using the instrumentation defined above. A minimum of 10 samples will be collected from each survey area. In addition, exposure rate measurements and gross alpha/beta/gamma smear samples will be collected at each survey location.

Residual radioactivity levels in Class II survey areas are not expected to be above the $DCGL_W$s. As such, the field flag-values for both the direct and scanning measurements of the Class II survey areas are based on the $DCGL_W$s, as listed in **Table 3-4**. Survey locations with measurements that exceed these flag values will be subject to additional investigation. These potentially elevated locations will be clearly defined and documented so that, if necessary, the location can be easily located again.

3.5.2 In-situ Gamma Spectroscopy

As identified above, in-situ gamma spectroscopy measurements will be collected using the URSA system. There will be a minimum of four gamma spectroscopy measurements taken from each building with Class II survey areas (16 total measurements). Gamma spectra will be collected at the four highest gamma measurement locations within each of the four buildings containing Class II survey areas. Additional gamma spectroscopy may be performed to investigate potentially elevated survey locations, if necessary. A sampling summary is provided in **Table 3-6**.

3.5.3 Material Sampling

Eight material samples will be collected from the Class II survey areas. Material samples will be collected at the two highest gamma measurement locations within each building containing Class II survey areas. Samples will be co-located with two gamma spectroscopy measurements for each Class II building in order to provide confirmation of in-situ measurements and to build a correlation data set between field and laboratory data. These samples will be sent to an off-site laboratory for isotopic analyses of U-235, U-238, and Ra-226. Additional material samples may be collected, if necessary. A sampling summary is provided in **Table 3-6**.

3.6 CLASS III SURVEYS

The 120 munitions storage igloos included in this license termination are all Class III survey units. Additionally, Building 5 and Building 306 contain office areas that have been classified as Class III survey units. The Class III radiological surveys will be conducted in the manner indicated below.

3.6.1 Interior Surveys

A minimum of thirty samples will be collected from the Class III survey areas. These samples will consist of a combination of direct and scanning measurements, and will be biased to areas with the highest potential for contamination, such as the air vents, drains, corners, light switches, and door handles. For areas within Class III survey areas that are scanned, the direct measurements will be

taken at the location with the highest alpha/beta scanning measurement. At each direct measurement location, an exposure rate reading and gross alpha/beta/gamma smear will be collected.

Due to the large number of Class III storage igloos that are addressed in this license termination, a standard sampling plan was developed for the igloos, shown in **Figure 3-1**. The figure identifies the areas that will need to be scanned and where direct measurements should be taken.

With Class III survey areas, residual radioactivity levels are not expected to be above background. Accordingly, the field flag values for both the direct and scanning measurements of the Class III survey areas are based on the 95% upper threshold limit of the appropriate background data set, as listed in **Table 3-5**. See **Section 3.7** for the discussion on background reference area.

3.6.2 In-situ Gamma Spectroscopy

As identified above, in-situ gamma spectroscopy measurements will be collected using the URSA system. A minimum of three gamma spectroscopy measurements will be taken from the Class III storage igloos. Gamma spectra will be collected at the three highest gamma measurement locations within the Class III igloos. The area identified as having the highest gamma reading within the three highest grids identified in the gamma scanning surveys will be the location of the URSA measurements. Within the two buildings with Class III survey areas, one gamma spectra will be collected at the location with the highest gamma measurement. Additional gamma spectroscopy may be performed as necessary in the Class III survey areas to investigate potentially elevated survey locations.

3.6.3 Material Sampling

A minimum of two material samples will be collected from the Class III survey areas. Samples will be collected at the locations with the two highest gamma measurements. These samples will be sent to an off-site laboratory for isotopic analyses of U-235, U-238, and Ra-226. The analytical results will be used to confirm gamma spectroscopy measurements taken at the same locations and to establish a correlation between field and laboratory results. Additional material samples may be collected, if necessary.

3.6.4 Tritium Smear Sampling

Tritium (H-3) is a ROC for the following four Class III storage igloos:

1. Igloo A0201;
2. Igloo A0316;
3. Igloo A0317; and
4. Igloo A0508.

To address this radionuclide, tritium smears will be collected at all 30 direct measurement locations for these igloos. These smear samples will be analyzed for beta radiation associated with H-3 at a MARSSIM-approved off-site laboratory.

3.7 EXTERIOR SURVEYS

Extensive exterior surveys are not anticipated to be necessary for the survey areas addressed in this work plan. Given the non-dispersible nature of the materials that may have been present within the survey areas, it is unlikely that residual contamination would have been tracked or otherwise transported to outdoor locations. Alpha/beta and gamma scanning will be conducted at all doors and building or igloo entryways. If scanning measurements are elevated above flag values at these locations, additional surveys will be conducted outside of the doorways to determine the extent of contamination.

3.8 BACKGROUND REFERENCE AREAS

To represent background radiological conditions at the site and to provide reference areas for conducting statistical comparisons of study areas, measurements will be made in reference areas that have not been affected by site operations. Igloo C0912 will be used as the background reference area for the igloos that are included in the NRC License Termination. This igloo has not been used for any radiological storage and has been used as a reference area in past radiological surveys at SEDA. Prior to the surveys of the Class III igloos, igloo C0912 will be resurveyed according to the Class III igloo sampling plan mentioned above. For comparison against the survey areas that are within the buildings, building 118 is proposed for the background reference area due to it being of similar construction, containing similar materials, it was built at approximately the same time as the buildings in question, and it has not been used for storage of radioactive materials. After additional background measurements are taken, the field flag values for the Class III survey areas, which are based on background data, will be adjusted if required.

Table 3-1
Building Surface $DCGL_w$s ($dpm/100cm^2$)
NRC License Termination Workplan
Seneca Army Depot Activity

	Guideline Levels for Different Room Areas				
	Room Height = 2.5 m				
Radionuclide	**10 m^2**	**36 m^2**	**200 m^2 1/**	**600 m^2**	**2,000 m^2**
H-3	3.58E+09	3.58E+09	3.58E+09	3.58E+09	3.58E+09
Pm-147	4.27E+07	4.11E+07	3.83E+07	3.70E+07	3.47E+07
Ra-226	8.88E+03	5.84E+03	3.83E+03	3.13E+03	2.61E+03
U-234	6.53E+03	6.53E+03	6.53E+03	6.53E+03	6.53E+03
U-235	6.73E+03	6.53E+03	6.17E+03	6.00E+03	5.69E+03
U-238	7.16E+03	7.16E+03	7.16E+03	7.16E+03	6.94E+03
Pu-239	2.02E+03	2.02E+03	2.02E+03	2.02E+03	2.02E+03
	Room Height = 3.0 m				
Radionuclide	**10 m^2**	**36 m^2**	**200 m^2**	**600 m^2**	**2,000 m^2**
H-3	4.27E+09	4.27E+09	4.27E+09	4.27E+09	4.27E+09
Pm-147	4.83E+07	4.63E+07	4.35E+07	4.11E+07	3.89E+07
Ra-226	9.25E+03	6.00E+03	3.89E+03	3.17E+03	2.61E+03
U-234	7.93E+03	7.93E+03	7.93E+03	7.93E+03	7.93E+03
U-235	7.93E+03	7.66E+03	7.16E+03	6.94E+03	6.53E+03
U-238	8.54E+03	8.54E+03	8.54E+03	8.54E+03	8.22E+03
Pu-239	2.39E+03	2.39E+03	2.39E+03	2.39E+03	2.39E+03
	Room Height = 4.0 m				
Radionuclide	**10 m^2**	**36 m^2**	**200 m^2**	**600 m^2**	**2,000 m^2**
H-3	5.55E+09	5.55E+09	5.55E+09	5.55E+09	5.55E+09
Pm-147	6.00E+07	5.69E+07	5.29E+07	4.93E+07	4.63E+07
Ra-226	9.65E+03	6.17E+03	3.96E+03	3.22E+03	2.64E+03
U-234	1.06E+04	1.06E+04	1.06E+04	1.06E+04	1.06E+04
U-235	1.06E+04	9.65E+03	9.25E+03	8.54E+03	8.22E+03
U-238	1.17E+04	1.17E+04	1.11E+04	1.11E+04	1.11E+04
Pu-239	3.17E+03	3.17E+03	3.17E+03	3.17E+03	3.17E+03

Source of DCGLs: *Seneca Army Depot Activity License Termination and License Release Plan,* Argonne National Laboratory - Environmental Assessment Division, 2002, page 6-20,21.

1/ The bolded area indicates the most representative room area and height for the survey areas addressed in this work plan.

Table 3-2
Field Instrument Efficiencies and Minimum Detection Amounts
NRC License Termination Workplan
Seneca Army Depot Activity

Probe Type/ Instrument	Radionuclide	Detection Efficiency [1/]	Probe Area (cm^2)	Static MDA (dpm/100 cm^2) [2,11/]	Scanning MDA (dpm/100 cm^2) [3,11/]	$DCGL_W$ (dpm/100 cm^2) [4/]
Alpha Phoswich	Depleted Uranium	0.15	86	7	1783	7060
Beta Phoswich		0.20	86	523 [5/]		7060
Alpha Floor Monitor		0.15	425	1	2402	7060
Beta Floor Monitor		0.20	425	5		7060
Gamma FIDLER		0.15 [6/]	126	4474 [7/]	18915	7060
Gamma FIDLER		0.15	126	1406 [8/]	NA [9/]	7060
Gamma FIDLER		0.15	126	662 [10/]	NA	7060

[1/] Detection efficiency, unless otherwise noted, from MARSSIM, Table 6-4.

[2/] MDA = minimum detectable amount; dpm/100cm^2 = disintegrations per minute per 100 square centimeters. Unless otherwise noted, the static MDA is based on MARSSIM, Table 6-4, for a count time of one minute.

[3/] Scanning MDAs calculated per MARSSIM and NUREG-1507. The MDAs for the phoswich and floor monitor were calculated for gross alpha/beta activity.

[4/] The gross DCGL is calculated per the *Seneca Army Depot Activity License Termination and License Release Plan*, ANL, January 2002, and MARSSIM equation 4-4.

[5/] Beta phoswich Static MDA calculated per NUREG-1507 and MARSSIM.

[6/] FIDLER detection efficiency is based on modeling results.

[7/] Static MDA for FIDLER calculated per NUREG-1507 and MARSSIM. This MDA is used for direct measurements of one-minute count times. FIDLER is coupled with the Bicron Analyst portable count-rate meter.

[8/] Static MDA for a count time of 10 minutes (applicable to in-situ gamma spectroscopy).

[9/] NA = not applicable due to the FIDLER being coupled with the in-situ gamma spectroscopy, and not used for scanning surveys.

[10/] Static MDA for a count time of 45 minutes (applicable to in-situ gamma spectroscopy).

[11/] Calculations of MDAs are presented in **Appendix E**.

Table 3-3
Instrument Check Sources
NRC License Termination Workplan
Seneca Army Depot Activity

Instument	Probe Model	Use	Check Source
Phoswich	Ludlum 43-1-1	Alpha/Beta Surveys	Th-230/Tc-99
FIDLER	Bicron G5	Gamma Surveys	Am-241/Depleted Uranium
Exposure Rate Meter	Bicron MicroRem	Health and Safety	Cs-137
3"x3" NaI	Ludlum	High-energy Gamma Surveys	Cs-137/Depleted Uranium
Floor Monitor	Ludlum 43-37	Large-area Alpha/Beta Surveys	Th-230/Tc-99
URSA Gamma Spectrometer	Alpha Spectra 012502C	Gamma Spectroscopy	Calibration Source A3-084 contains Cd-109, Co-57, Te-123m, Cr-51, Sn-113, Sr-85, Cs-137, & Co-60
GM Pancake Probe	Ludlum 44-9	Health and Safety	Cs-137/Tc-99

Table 3-4
Instrument Flag Values for Class II Direct and Scanning Measurements
NRC License Termination Workplan
Seneca Army Depot Activity

Instrument	Limiting Radionuclides	DCGL (dpm/100cm^2) [1,7]	Area (cm^2)	Efficiency [2]	Above Background Instrument Flag Value (cpm)	Background Average (cpm) [3]	Field Instrument Flag Value (cpm) [8]
Direct Measurements							
Alpha Floor Monitor	DU [4]	7060	425	0.15	4501	4	4505
Beta Floor Monitor	DU	7060	425	0.20	6001	775	6776
Alpha Phoswich	DU	7060	86	0.15	911	4	915
Beta Phoswich	DU	7060	86	0.20	1214	365	1579
FIDLER	DU	7060	126	0.15	1334	17000 [5]	18334
Scanning Measurements [6]							
Alpha-Beta Floor Monitor	DU	7060	425	0.15	4500	1400	5900
Alpha-Beta Phoswich	DU	7060	86	0.15	900	560	1460
FIDLER	DU	7060	126	0.15	1300	19000 [5]	20000

[1] dpm/100cm^2 = distintegrations per minute per 100 square centimeters. All DCGLs modeled for the NRC license termination survey areas are listed in Table 3-1.

[2] The values in this column are conservative estimates based on MARSSIM or modeling results.

[3] The background average is the mean of the direct or scanning background measurements from Building 722 for each instrument, except where noted.

[4] DU = depleted uranium. Gross DCGL for depleted uranium was calculated by assuming activity fractions of 0.13, 0.01, and 0.86, for U-234, U-235, and U-238, respectively.

[5] The FIDLER direct and scanning measurement flag values are equal to the 95% UTL (upper threshold limit) of the Building 722 background direct and scanning data, respectively.

[6] Flag values for scanning measurements are rounded to two significant figures.

[7] The gross DCGL is calculated per the *Seneca Army Depot Activity License Termination and License Release Plan*, ANL, January 2002, and MARSSIM equation 4-4.

[8] Calculations of field instrument flag values are presented in **Appendix E**.

Table 3-5
Class III Building/Igloo Field Instrument Flag Values
Based on Instrument-Specific Background 95% UTL
NRC License Termination Workplan
Seneca Army Depot Activity

Instrument	Building 722 Background [1/]			Igloo CO912 Background [2/]			Field Instrument Flag Value (cpm)
	Average Background (cpm) [3/]	Background 95% UTL (cpm) [4/]	Maximum Background (cpm)	Average Background (cpm)	Background 95% UTL (cpm)	Maximum Background (cpm)	
DIRECT MEASUREMENTS							
Alpha Floor Monitor	3.8	**8**	8	4.7	8	8	**8**
Beta Floor Monitor	775	**1435**	1435	707	757	757	**1435**
Alpha Phoswich	3.9	**9**	14	1.2	6	6	**9**
Beta Phoswich	365	**935**	1187	289	411	411	**935**
Gamma FIDLER	11265	**17000**	19762	7889	8219	8219	**17000**
SCANNING MEASUREMENTS [5/]							
Alpha/Beta Floor Monitor	1400	**1800**	1800	800	800	800	**1800**
Alpha/Beta Phoswich	560	**1100**	1100	440	460	460	**1100**
Gamma FIDLER	15500	**19000**	19000	9900	12000	12000	**19000**

[1/] Background measurements were collected from Building 722 during the SEAD-12 work, and are used here as preliminary estimates.

[2/] Additional background will be taken for Igloo CO912, and the Class III instrument flag values will be adjusted as necessary.

[3/] cpm = counts per minute.

[4/] Background 95% UTL = 95% upper threshold limit of the background data set.

[5/] Scanning measurements are rounded. Statistics were performed on the maximum scanning reading for each background sampling location.

Table 3-6
Summary of URSA Measurements and Material Sampling
NRC License Termination Workplan
Seneca Army Depot Activity

URSA Measurements	Number of Samples	Comments
Interior Surveys		
Class I	0	No Class I Surveys
Class II	16	Co-located with the 4 highest gamma measurements per survey unit (There are four Class II survey units)
Class III	4	Co-located with the 3 highest Class III gamma measurements from the igloos and the 1 highest gamma measurement from the Class III buildings
Total for Interior	*20*	
Exterior Surveys		
Class I	0	There are no exterior area surveys included in the current NRC work plan.
Class II	0	
Class III	0	
Total for Exterior	0	
TOTAL	**20**	

Material Samples	Number of Samples	Comments
Interior		
Class I	0	No Class I Surveys
Class II	8	Co-located with the 2 highest gamma measurements per survey unit X 4 Class II survey units. Analyzed for U-235, U-238, and Ra-226.
Class III	2	Co-located with the 2 highest Class III gamma measurements. Analyzed for U-235, U-238, and Ra-226
Total for Interior	*10*	
Exterior Surveys		
Class I	0	There are currently no exterior area surveys included in the current NRC work plan.
Class II	0	
Class III	0	
Total for Exterior	*0*	
TOTAL	**10**	

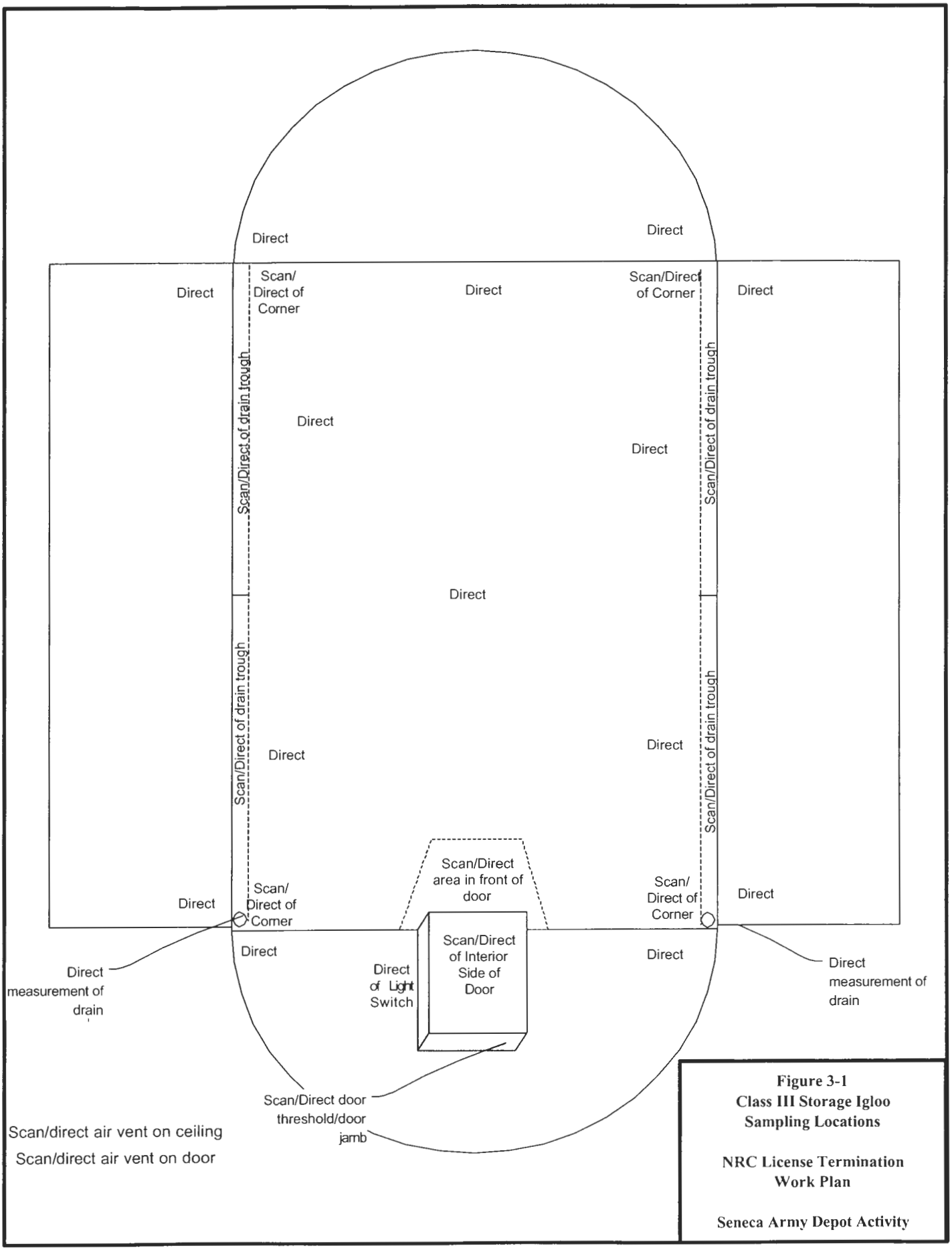

Figure 3-1
Class III Storage Igloo
Sampling Locations

NRC License Termination
Work Plan

Seneca Army Depot Activity

4 DATA REDUCTION, ASSESSMENT, AND INTERPRETATION

The data collected from the radiological screening surveys, direct measurement surveys, exposure rate surveys, removable radiation surveys, and the in-situ gamma surveys will be reduced, assessed and interpreted following the guidance in NUREG/CR-5849, NUREG 1505, and MARSSIM (NUREG-1575 Rev. 1, EPA 402-R-97-016 Rev. 1, August 2000). These data will be used to compare the data to background/reference data using the Wilcoxon Ranked Sum test and/or the Quantile Test following the guidance provided in NUREG 1505, MARSSIM (NUREG-1575 Rev. 1, EPA 402-R-97-016 Rev. 1, August 2000), and the EPA's Statistical Methods for Evaluating the Attainment of Cleanup Standards. These tests, as well as statistical graphs of the site and reference data (which may include histograms, quantile plots, power curves, etc.), and basic statistical quantities (such as the mean, standard deviation, median, maximum, and minimum values of the datasets) will be used to illustrate the conditions at each survey area as compared to one or more background / reference areas and to show that the survey complies with final status survey requirements.

5 DATA REPORTING

The data from the radiological surveys will be presented in a format that provides the calculated surface activity or radionuclide concentration value, the estimated confidence level for that value, and the estimated MDA for the measurement, as detailed in NUREG/CR-1507. All data shall be subject to verification and validation prior to use in the final report, including consideration of technical validity.

6 STAFFING

All field personnel working on site will have received a minimum of 1 hour of radiological safety and fundamental training, as well as a minimum of 24 hours of onsite orientation and technique training. This will include briefing on the risk associated with each of the ROCs. All radiation scanning work onsite will be overseen by a Health Physicist/Radiological Safety Officer (HP/RSO). All onsite workers will also be current on their 40-hour OSHA HAZWOPPER Certification.

7 SCHEDULING

The execution of this work plan will commence in May/June 2002. This allows for the warmer weather that is needed for the proper operation of many of the instruments. The work will take approximately 20 weeks to complete.

PARSONS

100 Summer Street • Boston, Massachusetts 02110 • (617) 457-7900 • Fax: (617) 457-7979 • www.parsons.com

May 29, 2003

Mr. Julio Vazquez
USEPA Region II
Superfund Federal Facilities Section
290 Broadway, 18th Floor
New York, NY 10007-1866

Mr. George Momberger
New York State Department of Environmental Conservation (NYSDEC)
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
625 Broadway, 11th Floor
Albany, NY 12233-7015

SUBJECT: **NRC License Termination Sites, Seneca Army Depot Activity, Romulus, New York**

Dear Mr. Vazquez/Mr. Momberger:

As you are aware, Parsons has completed the fieldwork for the Final Status Survey (FSS) at the Nuclear Regulatory Commission (NRC) License Termination Sites at Seneca Army Depot Activity (SEDA), Romulus, New York. The survey consisted of the radiological surveying of 120 storage igloos and four buildings (Buildings 5, 306, 2073, and S-2084).

Upon completion of the fieldwork, a letter report was prepared summarizing the final status survey data. This report has been included for your reference. Upon the acceptance of the FSS by the NRC, all radiological licenses at the SEDA will be terminated and the former storage areas for licensed commodities will be considered suitable for unrestricted use.

If you have any questions or concerns regarding this letter report, please do not hesitate to call me at (617) 457-7900.

Sincerely,

Katie Kadlubek for

Todd Heino, P.E.
Program Manager

cc: S. Absolom, SEDA
C. Bethany, NYSDOH
M. Greene, USACOE – Huntsville
T. Enroth, USACOE – NY District
K. Healy, USACOE – Huntsville
J. Cleary, SEDA

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File

NRC Survey

PARSONS

100 Summer Street • Boston, Massachusetts 02110 • (617) 457-7900 • Fax: (617) 457-7979 • www.parsons.com

July 2, 2003

U.S. Army Corps of Engineers
Engineering and Support Center, Huntsville
ATTN: Edna Sheridan
4820 University Square
Huntsville, AL 35816-1822

SUBJECT: **Contract DACA87-95-D-0031 – Budget for Delivery Order 31, Final Status Surveys of the Radiological Survey Sites at the Seneca Army Depot Activity (SEDA), Romulus, NY**

Dear Ms. Sheridan:

This letter notifies you of the budget surplus in Delivery Order 31 to Parsons Contract DACA87-95-0031.

On June 20, 2002 Parsons submitted a cost proposal for Modification A of Delivery Order 31, Rev. 3 (Annex AF). A summary of the tasks under Delivery Order 31 is as follows:

Task	Description	Proposed Cost	Status
Task 1	Site Visit	$ 37,590	Funded in DO 31
Task 2	FSS Workplan	$ 42,261	Funded in DO 31
Task 3	Fieldwork	$487,178	Funded in Mod A
Task 4	FSS Report	$121,046	Negotiated, Not Funded
Task 5	LTP Report	Postponed	Deleted
Task 6	Post FSS Support	Postponed	Deleted
Task 7	Project Management	$ 28,013	Funded in Mod A

Tasks 1 and 2 were awarded under Delivery Order 31. Upon award of Modification A of Delivery Order 31, the Army chose to fund only Task 3 (fieldwork), and Task 7 (project management). At that time, a cost estimate for Task 4 (Final Status Survey [FSS] Report), was also provided but was not awarded due to lack of available funding.

Currently, a surplus budget exists in Task 3 (fieldwork), which was funded for $487,178. Approximately $122,000 of the Task 3 (fieldwork) budget is available to fund additional work. The surplus is due primarily to an expedited field schedule. This schedule was expedited due to greater accessibility to the survey areas than anticipated and the use of an overtime schedule reducing the number of work shifts necessary. The shortened schedule resulted in a savings of other direct costs (ODCs) that would have been incurred over the remainder of the anticipated schedule. In addition, a newly developed database used in the field to record and manipulate data also resulted in cost savings greater than anticipated.

Parsons proposes using the surplus budget of $122,000 from Task 3 (fieldwork) to fund the FSS reports in Task 4. The proposed cost for Task 4, the FSS Report, is $121,046. This estimate is detailed in our cost proposal dated June 20, 2002.

It is our understanding that Steve Absolom, BRAC Coordinator at the Seneca Army Depot, would like to proceed with the execution of Task 4 as soon as possible.

Should you have any questions or comments regarding the budget for Delivery Order 31, please do not hesitate to call me at (617) 457-7905 to discuss them.

Sincerely,

Jacqueline Travers for

Todd Heino, P.E.
Program Manager

cc: Marshall Greene, USACOE
Tom Enroth, CENAN
Steve Absolom, SEDA

DEPARTMENT OF THE ARMY
SENECA ARMY DEPOT ACTIVITY
5786 STATE RTE 96, P.O. BOX 9
ROMULUS, NEW YORK 14541-0009

February 28, 2005

REPLY TO
ATTENTION OF
Caretaker Office

Mr. James Kottan
U.S. Nuclear Regulatory Commission
Region 1
Division of Nuclear Materials Safety
Nuclear Materials Safety Branch 2
475 Allendale Road
King of Prussia, PA 19406-1415

SUBJECT: Response to Request for Additional Information Concerning NRC License Termination Report for Seneca Army Depot Activity (Control Number 135163) - phone conversation from January 27, 2005

Dear Mr. Kottan,

The United States Army is pleased to submit the additional information requested regarding the License Termination Report for Seneca Army Depot Activity (SEDA) in Romulus, New York. The NRC, in a phone call on January 27, 2005 clarified their request for additional information pertaining to retrospective power curves.

In comments provided on August 9, 2004, the NRC made the request to: "Please discuss the statistical methods you used for determining compliance to the DCGLs relative to the null hypothesis recommended in MARSSIM and presented in Table 5-4 of your LTP. Also please provide the retrospective power curves." The Army responded to the comment in a letter dated September 2, 2004 explaining the statistical methods used; however, retrospective power curves were not provided at that time.

As requested, the retrospective power curves are being provided. The CD provided with this letter contains the following:

- The file *Summary Tables.pdf.* This file summarizes for each of the survey units included in the license termination the results of the WRS test, the Quantile test, the background median plus Lower Bound of the Grey Region (LBGR), and the Power test.
- A folder *Retrospective Power Curves.* This folder contains both the alpha and beta radiation retrospective power curves for each of the survey units included in the license termination.
- A folder *Supporting Information*, which contains the following folders:
    - *Kruskal-Wallis Test Data,* which contains the tables and calculations used to perform the Kruskal-Wallis (K-W) Tests on the survey units; and
    - *WRS_Quantile_Power Calculations*, which contains the tables and calculations used to perform each the WRS test, the Quantile test, and the Power test for the survey units. This information was used to create the retrospective power curves.

Also included with this letter is Attachment A, which provides a discussion of each of the tests used in the retrospective power curve development.

The goal of the License Termination Report for SEDA, which follows the *Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM; NRC, 2000) and other applicable guidance, is to demonstrate that the license termination requirements for NRC license SUC-1275 (NRC Docket No. 040-08526) have been met and to remove SEDA from Licenses SUC-1380, 45-16023-01NA, SUB-834, BML 12-00722-07, and STC-133.

We appreciate the opportunity to provide you with this additional information for a report that is of great importance to the United States Army. Should you have any questions regarding the document, please do not hesitate to contact me (607) 869-1235.

Sincerely,

Stephen M. Absolom
Installation Manager

Attachment A
Discussion of Retrospective Power Curves
NRC License Termination Report for Seneca Army Depot Activity
(Control Number 135163)

Retrospective power curves for the statistical analyses involving the alpha and beta radiation field measurements were generated for the *NRC License Termination Report for Seneca Army Depot Activity*. The following describes the methodology and the assumptions used, and a brief summary of each step in the process. Files used to perform the calculations that are provided in the attached CD have been referenced in italics.

1. **Kruskal-Wallis Test:** Per Section 13.3 of NUREG-1505 (NRC, 1998), the Kruskal-Wallis (K-W) test was performed on the reference area data using the different types of materials present or different measurement locations to determine if there was sufficient variability in background for the Scenario B null hypothesis. The K-W test was performed for the following background datasets:

- **Building 722** *(NRC Building 722 K-W Test.xls)*: Data from Building 722 were grouped by type of surface or material measured for each direct measurement. The phoswich data had nine types of surfaces, while the floor monitor data had three types. Two datasets (beta phoswich and beta floor monitor) showed significant variability at a Type I error (α) of 0.05. One dataset (alpha phoswich) showed significant variability at an α of 0.2. One dataset (alpha floor monitor) did not demonstrate significant variability (i.e., the calculated value of K was less than all critical values [K_C] listed in Table 13.1 of NUREG-1505). However, to maintain consistency for all survey unit datasets using this reference area, Scenario B was used for the alpha floor monitor measurements despite the K-W test result.

- **2002 Igloos** *(NRC Igloos 2002 K-W Test.xls)*: Since the measurement surfaces within each background igloo were the same (i.e., concrete), the data were grouped by individual background igloo (i.e., Igloo A1107, B0806, C0912, D0405, E0403). Both the alpha phoswich and beta phoswich datasets demonstrated significant variability at an α of 0.05.

- **Building 2078** *(NRC Building 2078 K-W Test.xls)*: Locations for background measurements taken from Building 2078 were not available; as a result, to group measurements for the K-W test, the data for both floor monitor and hand-held gas proportional measurements were visually inspected and were grouped on the basis of "high" or "low" measurements. For the floor monitor data, there was a break between beta measurements of 945 and 1065 counts per minute (cpm) when ranked in order of magnitude. As a result, locations with beta measurements of 945 cpm or lower were grouped as "low" and locations with beta measurements of 1065 cpm or higher were grouped as "high". For the hand-held data, there was a break between ranked beta measurements of 192 and 233 cpm, and the data were grouped accordingly. As a result of this data grouping,

the alpha hand-held, beta hand-held, and beta floor monitor data demonstrated significant variability at an α of 0.05. The alpha floor monitor data showed significant variability at an α of 0.2.

2. **Calculation of Lower Boundary of the Gray Region (LBGR):** The calculation for the LGBR (i.e., level that is distinguishable from background) for Scenario B was performed per Section 13.4 of NUREG-1505. The recommended default value ($3w$) was calculated and used for all background datasets, except for the Building 722 alpha floor monitor. Because the K-W test did not demonstrate significant variability for the Building 722 alpha floor monitor dataset, a value of zero was used as the LBGR for the background tests with that dataset. The LBGR calculation spreadsheets are included on the CD in the K-W spreadsheets noted above in bullet 1.

3. **Wilcoxon Rank Sum (WRS) Test Comparing Survey Unit Data and Background:** The WRS test was performed on the survey unit and reference area data using Scenario B, per Section 6 of NUREG-1505. The null hypothesis used for this test was that the difference between the survey unit median and the background median is less than the LBGR (i.e., the survey unit is indistinguishable from background). The critical value for the WRS test was calculated using the equation in Table A.4 of NUREG-1505. To determine the effect of tied ranks on the critical value, an example calculation for the critical value accounting for ties was performed for the 306 Room 10 alpha phoswich and alpha floor monitor datasets (*306R10 Power.xls*). For the phoswich, the difference between the initial critical value (1332.86) and the critical value accounting for ties (1332.74) was not significant. Likewise, the difference for the floor monitor was also not significant (514.13 initial, 514.06 with ties). It was concluded that ties would not significantly affect the critical value, and ties were not considered for the other tests.

Five alpha floor monitor datasets were found to exceed background based on the WRS test: Building 306 Room 10, Building 306 Room 11, Building 306 Room 13, Building 2073 Room 3, and Building 2084 Room 3. The WRS tests for each survey unit are included in the ****Power.xls* files (e.g., *306R10 Power.xls, 306R11 Power.xls,* etc.). The WRS test results are summarized in the *2002 Buildings, Building 612,* and *Igloos* spreadsheets in the *Summary Tables.pdf* file.

4. **Quantile Test:** The Quantile test was performed per Section 7 of NUREG-1505 to detect differences in only a fraction of the survey unit data versus the reference area data. Per NUREG-1505, it is required for the Scenario B null hypothesis that a survey unit passing the WRS test must also pass the Quantile test. Values of k, r, and α for the test were determined from Table A.7b from NUREG-1505. For numbers of survey or reference area measurements that did not exactly match those listed in Table A.7b, the closest values were used. If k of the r largest ranks were from the survey unit, the null hypothesis was rejected. Per EPA 230-R-94-004 (EPA, 1994), if the r-th largest measurement was among a group of tied (i.e., equal-in-value) measurements, r was increased to include the tied measurements. The value of k was increased by the same number of measurements. Two datasets (Building 306 Room 10 alpha floor monitor and Igloo C0401 alpha phoswich) failed the Quantile test with background. The Quantile tests for each survey unit are included in the ****Power.xls* files. The Quantile test results are summarized in the *2002 Buildings, Building 612,* and *Igloos* spreadsheets in the *Summary Tables.pdf* file.

5. **WRS and Quantile Tests Comparing Survey Unit Data and the $DCGL_W$:** This second WRS test was performed for datasets that failed either the initial WRS test or Quantile test with background. The null hypothesis for this test is that the difference between the survey unit median and the background median is less than the LBGR plus the $DCGL_W$ (i.e., the test is rerun after adding the $DCGL_W$ in cpm to the LBGR). The six datasets that failed either the initial WRS test or Quantile test all passed the WRS test with the $DCGL_W$, indicating that each met the release criterion. In addition, all six datasets passed the Quantile test. The detailed WRS and Quantile tests for each survey unit and the $DCGL_W$ are included in the ****Power.xls* files. The WRS and Quantile tests for each survey unit and the $DCGL_W$ are summarized in the *DCGL Comparison* spreadsheet in the *Summary Tables.pdf* file.

6. **Generation of Retrospective Power Curves:** Retrospective power curves were generated using the methods described in Section 10.5 of NUREG-1505. The larger of the standard deviations from the survey unit measurements and background measurements (shaded in yellow on the spreadsheets) was used in the calculation. The power (i.e., probability of survey unit failing) was determined at the survey unit median equal to the background median measurement plus the LBGR (i.e., the distinguishable level above background). For the datasets that underwent a comparison with the $DCGL_W$, additional power curves were generated and the power was determined at the survey unit median equal to the background median plus the LBGR plus the $DCGL_W$. The desired power for the statistical tests was 0.95. The power calculations for the comparison of survey unit data with background are presented in detail in the ****Power.xls* files and are summarized in the *2002 Buildings, Building 612,* and *Igloos* spreadsheets in the *Summary Tables.pdf* file. The power calculations for the comparison of the survey unit data with the $DCGL_W$ are also presented in detail in the ****Power.xls* files and are summarized in the *DCGL Comparison* spreadsheet in the *Summary Tables.pdf* file. The power calculation results are discussed in further detail below.

- **2002 Buildings:** Of the 33 alpha phoswich datasets, 5 datasets had a calculated power less than 0.95 (ranging from 0.74 to 0.93). Four of the 33 beta phoswich datasets also had a calculated power less than 0.95 (ranging from 0.87 to 0.93). Of the 24 alpha floor monitor datasets, 8 datasets had a calculated power less than 0.95 (ranging from 0.37 to 0.91). Three of the 24 beta floor monitor datasets had a calculated power less than 0.95 (ranging from 0.66 to 0.92).

  All but one of the 2002 Buildings datasets with a calculated power less than 0.95 were collected from Building 5. The alpha and beta phoswich datasets from Building 5 that resulted in a calculated power of less than 0.95 consisted of 5 to 8 measurements. The alpha floor monitor datasets from Building 5 that resulted in a calculated power of less than 0.95 consisted of 2 to 14 measurements. The alpha floor monitor datasets from Building 5 Room 2 and Building 306 Room 13 had standard deviations greater than the background standard deviation, which contributed to the reduced power. The beta floor monitor datasets from Building 5 that resulted in a calculated power of less than 0.95 consisted of 2 to 3 measurements.

- **Building 612:** Of the 28 alpha hand-held gas proportional datasets, 20 datasets had a calculated power less than 0.95 (ranging from 0.46 to 0.92). All 28 of the beta hand-held datasets had a calculated power of 1.0. Of the 23 alpha floor monitor datasets, 2 datasets had a calculated power less than 0.95 (ranging from 0.50 to 0.91). All 23 of the beta floor monitor datasets had a calculated power of 1.0.

  The alpha hand-held datasets from Building 612 with a calculated power of less than 0.95 consisted of 9 to 47 measurements. Based on that wide range of survey unit measurements, the fixed number of background measurements (32) may be more responsible for the reduced power. The two alpha floor monitor datasets from Building 612 that resulted in a calculated power of less than 0.95 consisted of 2 and 4 measurements.

- **Igloos**: All 120 of the alpha phoswich datasets had a calculated power less than 0.95 (ranging from 0.072 to 0.30). All 120 of the beta phoswich datasets had a calculated power of 1.0.

  Since each igloo had the same number of alpha measurements (30), the change in calculated power appears to be primarily based on the change in standard deviation of the survey unit data. As discussed in Section 3.3.3 of the *NRC License Termination Report for Seneca Army Depot Activity* , elevated alpha measurements were consistently taken at the vent screen on the upper rear wall of each igloo – these elevated measurements were observed in both the background and affected igloos, and were attributed to the presence of radon progeny. The effect of these vent measurements can be seen in the file *A0201 K-W Test and Power – rev bkgd.xls.* As an exercise, the measurement from the vent location was removed from each background igloo dataset, the K-W test was re-run, and the LBGR was re-calculated. As a result of removing these vent measurements, the LBGR was reduced from 13.3 to 10.7. More importantly, the standard deviation of the background data decreased from 12 cpm to 4.1 cpm. Correspondingly, the calculated power for that dataset increased, from 0.30 to 0.92.

- **DCGL Comparison:** Of the six datasets that were compared with the $DCGL_W$, two datasets (Building 306 Room 13 alpha floor monitor and Igloo C0401 alpha phoswich) had a calculated power at the background median plus LBGR plus $DCGL_W$ of less than 0.95 (0.86 and 0.16, respectively). The calculated power for these datasets in the $DCGL_W$ comparison is the same as the calculated power for these datasets in the background comparison.

The information presented above follows the methodology discussed via telephone conversation with NRC personnel on January 27, 2005. The procedures followed from NUREG-1505 were to demonstrate sufficient variability in background (i.e., the Kruskal-Wallis test), calculate the LBGR, perform the WRS and Quantile Tests for Scenario B, and generate retrospective power curves. Of the 462 alpha and beta datasets evaluated, 164 (i.e., 35 percent) had a calculated power of less than 0.95, while 298 (i.e., 65 percent) datasets had a calculated power of 0.95 or better. All survey units had at least one dataset with a calculated power of 0.95 or greater. While additional measurements at some survey units may have resulted in an increased statistical power, it is very unlikely that a different

outcome to the tests (i.e., the survey unit fails rather than passes) would have resulted based on those additional measurements.

Cited References:

EPA, 1994. *Statistical Methods for Evaluating the Attainment of Cleanup Standards; Volume 3: Reference-Based Standards for Soils and Solid Media*, EPA 230-R-94-004, U.S. Environmental Protection Agency, June.

NRC, 1998. *A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys*, NUREG-1505, U.S. Nuclear Regulatory Commission.

General References:

Abelquist, 2001. *Decommissioning Health Physics: A Handbook for MARSSIM Users*, Institute of Physics Publishing, Philadelphia, PA.

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

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

Tom 6
Jonathan Cleary
O.F.

August 12, 1999

To NRC General Licensees:

Enclosed are two notices of rulemaking which may affect you. The first is a final rule that requires Nuclear Regulatory Commission (NRC) general licensees respond to requests for information that we may make. This rule will be effective October 4, 1999. The second rule was published to solicit public comment before completing a final rule. This rule proposes requirements for a registration process and payment of fees that NRC plans to initiate for licensees who possess certain generally licenced devices. Presently, registration is planned for devices that contain certain types and quantities of radioactive materials.

You are being sent a copy of these rules because our records show that you received a device which is generally licensed under Title 10 of the Code of Federal Regulations. Thus, you may be considered to be an NRC general licensee. The devices containing radioactive material included under a general license are various types of measuring, gauging, and controlling devices, as well as devices for producing light or an ionized atmosphere. Among the most common devices are self-luminous exit signs, gas chromatographs, and other gauges used to measure product level, thickness, density, or chemical composition.

If you wish to comment on the proposed rule, please follow the instructions in the notice. The comment period closes on October 12, 1999.

Sincerely,

John W. N. Hickey, Chief
Materials Safety and Inspection Branch
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

Enclosures: As stated

Rules and Regulations

Federal Register
Vol. 64, No. 149
Wednesday, August 4, 1999

NUCLEAR REGULATORY COMMISSION

10 CFR Part 31

RIN 3150—AG06

Requirements for Those Who Possess Certain Industrial Devices Containing Byproduct Material to Provide Requested Information

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is amending its regulations to add an explicit requirement that general licensees, who possess certain measuring, gauging, or controlling devices that contain byproduct material, provide the NRC with information concerning these devices. The NRC intends to use this provision to request information concerning devices that present a comparatively higher risk of exposure to the public or property damage. The final rule is intended to help ensure that devices containing byproduct material are maintained and transferred properly and are not inadvertently discarded.

EFFECTIVE DATE: October 4, 1999.

FOR FURTHER INFORMATION CONTACT: Catherine R. Mattsen, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001, telephone (301) 415–6264, or e-mail at CRM@nrc.gov; or Jayne McCausland, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001, telephone (301) 415–6219, or e-mail at JMM2@nrc.gov.

SUPPLEMENTARY INFORMATION:

Background

On February 12, 1959 (24 FR 1089), the Atomic Energy Commission (AEC) amended its regulations to provide a general license for the use of byproduct material contained in certain measuring, gauging, or controlling devices (10 CFR 30.21(c)). Under current regulations in 10 CFR 31.5, certain persons may receive and use a device containing byproduct material under this general license if the device has been manufactured and distributed according to the specifications contained in a specific license issued by the NRC or by an Agreement State. A specific license authorizing distribution of generally licensed devices is issued if a regulatory authority determines that the safety features of the device and the instructions for safe operation of that device are adequate and meet regulatory requirements.

The person or firm who receives such a device is a general licensee. The general licensee is subject to requirements for maintaining labels, following instructions for use, storing or disposing of the device properly, and reporting transfers and failure of or damage to the device. For some devices, the general licensee must also comply with leak testing requirements. The general licensee is also subject to the terms and conditions in 10 CFR 31.2 concerning general license requirements, transfer of byproduct material, reporting and recordkeeping, and inspection. The general licensee must comply with the safety instructions contained in or referenced on the label of the device and must have the testing or servicing of the device performed by an individual who is authorized to manufacture, install, or service these devices.

A generally licensed device usually consists of radioactive material, contained in a sealed source, within a shielded device. The device is designed with inherent radiation safety features so that it can be used by persons with no radiation training or experience. Thus, the general license is meant to simplify the licensing process so that a case-by-case determination of the adequacy of the radiation training or experience of each user is not necessary.

There are about 45,000 general licensees under 10 CFR 31.5. These licensees possess about 600,000 devices that contain byproduct material. The NRC has not contacted general licensees on a regular basis because of the relatively small radiation exposure risk posed by these devices and the very large number of general licensees. However, general licensees are not always aware of applicable regulations and thus are not necessarily complying with all of the applicable requirements. The NRC is particularly concerned about occurrences where generally licensed devices containing radioactive material have not been properly handled or properly disposed of. In some cases, this has resulted in radiation exposure to the public and contamination of property. Although known exposures generally have not exceeded the public dose limit, there is a potential for significant exposures. When a source is accidentally melted in a steel mill, considerable contamination of the mill, the steel product, and the wastes from the process, the slag and the baghouse dust, can result.

The NRC conducted a 3-year sampling (1984 through 1986) of general licensees to assess the effectiveness of the general license program. The sampling revealed several areas of concern regarding the use of generally licensed devices. In particular, the NRC concluded that many general licensees are not aware of the appropriate regulations. Also, approximately 15 percent of all general licensees sampled could not account for all of their generally licensed devices. The NRC concluded that these problems could be remedied by more frequent and timely contact between the general licensee and the NRC.

On December 27, 1991 (56 FR 67011), the NRC published a notice of proposed rulemaking concerning the accountability of generally licensed devices. The proposed rule contained a number of provisions, including a requirement for general licensees under 10 CFR 31.5 to provide information to the NRC upon request, through which a device registry could be developed. The proposed rule also included requirements in 10 CFR 32.51a and 32.52 for the specific licensees who manufacture or initially transfer generally licensed devices. Although the public comments received were reviewed and a final rule developed, a final rule was not issued because the resources needed to implement the proposed rule properly were not available.

The NRC continued to consider the issues related to the loss of control of generally licensed, as well as

specifically licensed, sources of radioactivity. In July 1995, the NRC, with assistance from the Organization of Agreement States, formed a working group to evaluate these issues. A final report was completed in July 1996 and published in October 1996 as NUREG–1551, "Final Report of the NRC-Agreement State Working Group to Evaluate Control and Accountability of Licensed Devices."

In considering the recommendations of the working group, the NRC decided, among other things, to again initiate rulemaking to establish an annual registration program of devices generally licensed under 10 CFR 31.5 that would be similar to the program originally proposed in the December 27, 1991, proposed rule. However, the NRC decided to do so only for those devices that present a higher risk, compared to other generally licensed devices, of potential exposure to the public and property loss if control of the device were lost. The NRC found the working group process valuable in identifying criteria for categorizing devices that are more likely to present a significant risk by exposure of the public or through contamination of property.

On December 2, 1998 (63 FR 66492), the Commission again proposed the addition of an explicit requirement to provide information in response to requests made by the NRC. While the rule applies to all 10 CFR 31.5 general licensees, the NRC plans to contact only those general licensees identified by the working group for the purpose of the registration program. For the most part, general licensees using devices meeting these criteria have a limited number of devices that will require registration.

In that notice (at 63 FR 66493), the NRC also withdrew the December 27, 1991, proposed rule. The NRC has reviewed the other provisions contained in the December 27, 1991, proposed rule and the recommendations of the working group and developed additional requirements in a separate proposed rule published July 26, 1999 (64 FR 40295). The recommendations made in NUREG–1551 were considered in developing the separate, more comprehensive proposed rule issued July 26, 1999. That proposed rule addresses fees for registration, additional reporting, recordkeeping, and labeling requirements for 10 CFR 32.51 licensees, and compatibility of Agreement State regulations in this area.

On March 9, 1999 (64 FR 11508), the Commission established an interim enforcement policy for violations of 10 CFR 31.5 that are discovered and reported by licensees during the initial cycle of the registration program. The initial cycle is considered to be the issuance of one round of registration requests to all affected general licensees. This policy supplements the normal NRC Enforcement Policy in NUREG–1600, Rev. 1. It will remain in effect through one complete cycle of the registration program.

Under this interim enforcement policy, enforcement action normally will not be taken for violations of 10 CFR 31.5 that are identified by the general licensee, and reported to the NRC if reporting is required, provided that the general licensee—

Takes appropriate corrective action to address the specific violations and prevent recurrence of similar problems; and

Has undertaken good faith efforts to respond to NRC notices and provide requested information.

This change from the Commission's normal enforcement policy is intended to remove the potential for the threat of enforcement action to be a disincentive for the licensee to identify deficiencies.

Under the interim enforcement policy, enforcement action, including issuance of civil penalties and Orders, may be taken where there is —

(1) Failure to take appropriate corrective action to prevent recurrence of similar violations;

(2) Failure to respond and provide the information required by regulation;

(3) Willful failure to provide complete and accurate information to the NRC; or

(4) Other willful violations, such as willfully disposing of generally licensed material in an unauthorized manner.

As noted in the December 2, 1998, proposed rule, and discussed further in the separate, more comprehensive proposed rule of July 26, 1999, the Commission also plans to increase the civil penalty amounts specified in its Enforcement Policy in NUREG–1600, Rev. 1, for violations involving lost or improperly disposed of sources or devices. This increase will better relate the civil penalty amount to the costs avoided by the failure to properly dispose of the source or device. Due to the diversity of the types of sources and devices, the Commission is considering the establishment of three levels of base civil penalty for loss or improper disposal. The higher tiers would be for sources that are relatively costly to dispose of.

Discussion

The Atomic Energy Act of 1954 (AEA), as amended, authorizes the NRC to request appropriate information from its licensees concerning licensed activities. However, the Commission had not included such an explicit provision in the regulations governing 10 CFR 31.5 general licensees.

This final rule adds an explicit requirement to 10 CFR 31.5 that requires general licensees who possess certain measuring, gauging, and controlling devices to respond in a timely way to written requests from the NRC for information concerning products that they have received for use under a general license.

The final rule requires a response to requests within 30 days or such other time as specified in the request. For routine requests for information, 30 days should be adequate in most instances, and an extension can be obtained for good cause. If more complicated requests are made or circumstances recognized that may require a longer time, the Commission may provide a longer response time. In the unusual circumstance of a significant safety concern, the Commission could demand information in a shorter time. The NRC will provide a phone number in the request for information in case additional guidance is necessary.

The NRC intends to use this provision primarily to institute an annual registration program for devices using certain quantities of specific radionuclides. The registration program is primarily intended to ensure that general licensees are aware of and understand the requirements for the possession of devices containing byproduct material. The registration process will allow NRC to account for devices that have been distributed for use under the general license. The NRC believes that, if general licensees are aware of their responsibilities, they will comply with the requirements for proper handling and disposal of generally licensed devices. This should help reduce the potential for incidents that could result in unnecessary radiation exposure to the public as well as contamination of property.

The general licensees covered by the registration program will be asked to account for the devices in their possession and to verify, as well as certify, information concerning—

(1) The identification of devices, such as the manufacturer, model, and serial numbers;

(2) The persons knowledgeable of the device and the applicable regulations;

(3) The disposition of the devices; and

(4) The location of the devices.

An organization which uses generally licensed devices at numerous locations is usually considered a separate general licensee at each location (except in the case of different facilities at the same complex or campus). In the case of

portable devices that are routinely used at multiple sites, there is one general licensee for each primary place of storage, not for each place of use. Thus, an organization may be required to complete more than one registration, if it possess devices subject to registration at multiple locations.

While the final rule applies to all 10 CFR 31.5 general licensees (about 45,000), the NRC will contact only approximately 5100 general licensees, possessing about 20,000 devices, for registration purposes. This category of general licensees is based on the criteria recommended by the working group for determining which sources should have increased oversight. The proposed rule presented an estimate of 6000 general licensees, based on the estimates made in the working group report. However, this had not accounted for the fact that, in the interim, Massachusetts had become an Agreement State. Using the same criteria, and removing the previously NRC general licensees in Massachusetts, results in an estimate of 5100. Other States are expected to become Agreement States in the near future which will affect the number of general licensees under NRC jurisdiction, but not the overall number nationally. The separate, more comprehensive proposed rule published July 26, 1999, indicated that Agreement States will be required to achieve a compatible level of accountability over generally licensed devices. Thus, following State implementation of compatible programs in conjunction with that rule, further changes in the number of generally licensed devices within NRC jurisdiction should not adversely affect accountability.

Requests for information will be sent to general licensees who are expected, based on current NRC records, to possess devices containing (as indicated on the label) at least—

370 MBq (10 mCi) of cesium-137;
3.7 MBq (0.1 mCi) of strontium-90;
37 MBq (1 mCi) of cobalt-60; or
37 MBq (1 mCi) of any transuranic (at this time, the only generally licensed devices meeting this criterion contain curium-244 and americium-241).

Most of the devices meeting these criteria are used in commercial and industrial applications measuring thickness, density, or chemical composition in petrochemical and steel manufacturing industries. The requests will include the information contained in NRC records concerning the possession of these devices. The licensees will be asked to verify, correct, and add to that information. The NRC records are based on information provided to the NRC by distributors under 10 CFR 32.52(a) and compatible Agreement State regulations and from general licensees as required by 10 CFR 31.5(c) (8) or (9) regarding transfer of generally licensed devices. If a general licensee no longer possesses devices meeting the criteria, it will be expected to provide information about the disposition of the devices previously possessed. Errors in current NRC records concerning these general licensees could be the result of—

(1) Errors made in the quarterly reports of manufacturers or initial distributors;

(2) General licensees not reporting transfers; or

(3) Errors made by NRC or its contractors in recording transfer information.

In addition to the 5100 general licensees identified for registration, the NRC may occasionally request information from other general licensees on a case-by-case basis as necessary or appropriate. For example, this might involve investigating the extent that other users have experienced a problem that has been identified with the design of a particular device model. However, significant modifications to the registration program to include a larger class of licensees would be done through rulemaking.

Although the amendment to the regulations imposes some additional costs on licensees, the NRC has estimated these costs to be minimal. This cost is the estimated administrative cost expended by general licensees to verify the information requested by the NRC regarding licensed devices. The NRC believes that the rule's intended effect of increased compliance by general licensees with regulatory requirements, and resulting NRC and public confidence in the general license program potentially afforded by these new requirements, outweigh this nominal administrative cost.

Public Comments on the Proposed Rule

The NRC reviewed the public comments received on the December 2, 1998, proposed rule. Seven comment letters were received from: the State of Illinois (an Agreement State), National Steel Pellet Company, Steel Manufacturers Association (SMA), the Commonwealth of Massachusetts (an Agreement State), the State of New Jersey (a non-Agreement State), American Iron and Steel Institute (AISI), and one private citizen.

All commenters supported the proposed rule. One commenter agreed with the NRC that the proposed change would increase accountability and control over generally licensed radioactive devices. Another commenter supported the proposed regulation as a step in the right direction, if not completely solving the regulatory problems of the NRC. The steel industry supported the proposed rule as a positive, although small, step toward minimizing the risk associated with improper disposal of spent sources in the scrap supply.

Agreement was expressed by two commenters that the administrative burden on general licensees to provide the minimal information requested by the NRC is reasonable, as is the 30-day period in which general licensees have to respond, with extensions granted for good cause.

Several commenters voiced agreement with the interim enforcement policy. One commenter, the State of New Jersey, believes that it is extremely important to remove any incentive for a general licensee to attempt to discard its source rather than comply with the reporting requirement. The commenter stated that when people get rid of their generally licensed devices in a hurry, the State has to go out and find them in mountains of trash or scrap metal.

Two other commenters, the SMA and AISI, stated that they would support any enforcement program that deters improper disposal of radioactive sources. They also endorse the provision allowing general licensees to report and correct violations without incurring penalties. These commenters believe that this provision would encourage licensees, who are not sure about sources they hold, to remedy the problem rather than improperly dispose of the sources in an attempt to avoid high penalties.

A. Current NRC General Licensing Process and Cost Shift

Comment: In general, the three representatives of the steel industry expressed similar concerns regarding the current NRC general licensing process. One commenter, the SMA, stated that the proposed rule did not address the fact that the current regulatory regime has shifted the costs of lax accountability and control onto steel makers, insurers, and the taxpayers. This commenter stated that general licensees do not pay for their licenses nor provide information directly to NRC about the sources they hold. Instead, the cost has fallen on steel producers to detect the sources, on steel producers and taxpayers to arrange for proper disposal, and on steel producers and their insurers to pay the cost when a source is inadvertently melted. This commenter believed that general

licensees should be required to shoulder their fair share.

Similarly, the AISI pointed out that current NRC regulations have inadvertently and improperly shifted the costs for accountability and control onto hot metal producers, insurers, and taxpayers and that steel producers are being forced to pay the cost of detecting orphaned sources, to arrange for proper disposal, and to pay for the cleanup when a source is inadvertently melted. This commenter also believed that general licensees should be required to pay their fair share of these costs and stated that improving licensee accountability would also reduce the risk of the illegal release of generally licensed material into the public scrap supply. In addition, the AISI noted that the inadvertent melting of orphaned sources by domestic steel producers has resulted in decontamination, disposal, and lost production costs ranging between $10 million and $24 million at electric furnace mills and that the cost of a similar incident occurring in a major integrated steel mill could easily exceed $100 million.

Response: The Commission recognizes the expense to the steel industry when generally licensed devices containing radioactive material are not properly disposed of or properly handled. The NRC believes that this rulemaking will reduce the probability of lost and improperly disposed of sources, and ultimately the number of incidents of inadvertent meltings. This would reduce the total expense to the steel industry, insurers, and taxpayers resulting from such incidents. A separate, more comprehensive rulemaking on this subject (proposed on July 26, 1999) is expected to further improve accountability for devices and reduce the impact of improperly disposed of sources to the steel industry. In addition, that rule would establish a registration fee to recover the cost of the NRC enhanced oversight program for those general licensees being required to register their devices.

B. Reporting Electronically and Data Verification

Comment: Two commenters recommended that the NRC provide a means for electronically reporting the information requested by the NRC in order to save time, mailing expenses, and paper. They also indicated that the NRC should ensure that its database has an adequate data quality verification system and can easily flag inconsistencies.

One commenter suggested that the electronic filing could be accomplished through a secure page on the NRC Internet Web Site and that the NRC could use the employer's tax identification number and a password to secure the information. This commenter also recommended that the NRC database include a data quality verification system to quickly identify and immediately notify licensees of any reporting inconsistencies and that employers could also be required to annually verify the accuracy of the inventory.

Response: The submission of electronic applications and reports is a generic issue that impacts more than the general license registration program. The NRC has evaluated the issue of permitting licensees to file applications and reports electronically and plans to publish an amendment to the regulations to allow such submissions. The NRC expects to publish the amendment next year. At that time, the NRC will evaluate how this change will impact implementation of the registration program and future enhancements to the design of the automated system. However, the NRC currently expects that the initial registration program would require submission of hard copies of the registration forms.

The NRC is in the process of upgrading its information technology systems to facilitate processing of annual registrations. The upgrades will include adequate data verification for distributor, general licensee, and registration information and will include automated readers for processing the large volume of registration forms. The automated readers will identify changes and inconsistencies with the database, convert changes to electronic form, and incorporate the new data.

C. Control and Accountability

Comment: One commenter believed that a great deal of improvement is needed in the regulations governing licensed radioactive devices concerning their location and whether they are being disposed of properly. This commenter felt that a license should not be given out to persons to own as many devices as they please; instead a license should be given out per device, thereby limiting the number of devices available and making known the number of devices in use. This commenter felt that radioactive material presents an extreme threat to health and safety even if disposed of properly.

Response: The Commission does not believe it is necessary, appropriate, or practical to limit the number of devices going out to general licensees to one per licensee. Tracking the number of devices in use and who has them is achievable without such a restriction. Generally licensed devices are designed to be inherently safe and do not present nearly as great a risk to health and safety as the commenter suggests. Given the nature of the general license, restrictions on numbers of devices that can be possessed would be difficult to enforce and would likely lead to difficulties in getting accurate information on devices possessed.

Comment: Another commenter recommended that the NRC not target businesses with specific licenses, pointing out that they are required to—

(1) Have a Radiation Safety Officer;

(2) Actively perform testing and inspections; and

(3) Maintain written documentation.

Therefore, specific licensees are almost always aware of the byproduct material regulations applicable to byproduct material managed under a general license as well and are more likely to adequately account for and handle devices containing byproduct material in accordance with the regulatory requirements. The commenter recommended that the NRC instead target general licensees that do not currently maintain byproduct material under a specific NRC license because these general licensees are more likely to be unaware of the appropriate regulations and are more likely to inappropriately account for and handle devices containing byproduct material.

Response: Specific licensees who also have generally licensed devices are subject to any regulations applicable to the general license. Therefore, these specific licensees will be subject to registration. Given the approach of this first rule, it would be possible for NRC to simply not make this request for information from those who also hold specific licenses. However, this would require additional effort to cross reference data on specific licensees with that on general licensees. Specific licensees, while generally more aware of applicable regulations, do have problems with incomplete accountability for devices. The potential improvement in accountability should justify the limited administrative effort of providing registration information even in the case of those holding specific licenses.

If the additional rulemaking concerning registration is made final, specific licensees holding generally licensed devices subject to registration may wish to avoid the additional fee. If so, they would have the option of amending their specific license, if necessary, to include the devices, and thereby remove the devices from the

general license status. In this case, labels may have to be changed to be consistent with the device's regulatory status.

Comment: The State of Illinois indicated that a group of general licensees in Illinois possesses devices containing curium-244 in quantities that would require registration under the proposed rule. This commenter recommended that the NRC contact licensees possessing not only americium-241 but also curium-244, and noted that the statement in the December 2, 1998, proposed rule (63 FR 66493) that americium-241 is the only transuranic radionuclide found in generally licensed devices in quantities exceeding 37 megabecquerels (1 millicurie), is in error.

Response: The Commission agrees. The omission in that statement, of curium-244 as a transuranic element used in generally licensed devices meeting the criteria for registration, was an oversight. Devices containing curium-244 with quantities meeting the criterion for transuranics will be included in the registration requirement.

Comment: Several commenters stated that the NRC should give serious consideration to the NRC-Agreement State Working Group recommendations as contained in NUREG–1551, "Final Report of the NRC-Agreement State Working Group to Evaluate Control and Accountability of Licensed Devices." Specifically, one commenter stated that there should be a Responsible Individual (RI) and a Backup Responsible Individual (BRI) for each general license. This commenter stated that, unlike a specific license where there are a Radiation Safety Officer and Authorized Users, there may be only one person (RI) who has a real understanding that his or her company possesses a generally licensed device that contains a radioactive source. When that RI dies, retires, resigns, or is laid off, there may be no one at the facility with any understanding or appreciation of the significance of the generally licensed device. The commenter stated that the addition of one extra name and phone number to the records should not be too burdensome on the licensee and may help avoid the burden of responding to a radiation incident involving the device.

Two other commenters recommended that the NRC consider the Working Group's recommended comprehensive measures, including requirements for the NRC to maintain inventory records, to compare and reconcile related discrepancies, and to mandate reporting the bankruptcy of a licensee to the NRC. The commenters also recommended State/NRC site inspections and inventories at regular intervals. These commenters felt that serious consideration should be given to each of these measures in order to prevent the continued loss of licensed sources into the scrap stream.

One of these commenters also urged the NRC to move forward with the planned additional regulations amending or establishing requirements for registration fees, labeling, and compatibility with Agreement State requirements. The commenter stated that the limited registration program would have minimal impact on the radioactive scrap problem if it is the only amendment the NRC proposes.

Response: The more comprehensive measures recommended by the NRC-Agreement State Working Group are being considered in the separate, more comprehensive rule proposed on July 26, 1999. Comments on these issues will be considered as part of that rulemaking process.

D. Registration Program

Comment: One commenter noted that the language of the proposal did not call for a periodic registration program requiring reporting at least annually. Rather, the proposed amendment would merely restate NRC's authority to collect information from licensees. The commenter pointed out that the NRC already has this authority under 42 U.S.C. 2095 and in its own regulations at 10 CFR 30.34. This commenter urged the NRC to explicitly call for a periodic registration program in the amended regulation stating that this would remind general licensees that they have licensed radioactive sources and that there are responsibilities attached to their licenses. It would also indicate that the Government has knowledge of their sources and the authority to enforce prohibitions on improper disposal.

Response: The NRC has proposed explicit provisions for an annual registration requirement in the separate, more comprehensive rule on this subject.

Comment: A commenter suggested that the NRC reconsider one of the provisions in a proposed rule published February 5, 1974 (39 FR 4583), that would have required registration of the generally licensed devices before customers are allowed to receive them. This commenter stated that this would ensure and document that general licensees have received copies of the regulations and that they are aware of their rights and responsibilities.

Response: The Commission does not believe preregistration is necessary to ensure and document that general licensees have received copies of the regulations and that they are aware of their rights and responsibilities. However, the Commission has proposed amendments to address the need for customers to receive additional information prior to purchases of generally licensed devices in the separate, more comprehensive rule.

Comment: Another commenter strongly encouraged the NRC to adopt a mandatory registration program for all sources, not merely those that pose the greatest risk to steel mills.

Response: The Commission has decided to use the criteria developed by the NRC/Agreement State Working Group to determine which sources should be subject to the registration program. These criteria were based on considerations of relative risk and were limited to radionuclides currently in use in devices considered to present a higher risk of potential exposure, as well as potential for contamination of property.

E. Fee-Based System

Comment: One commenter believed that a fee-based system for all general licensees would ensure that the NRC recovers the minimal cost to initiate and maintain the reporting program. The commenter stated that such a registration program would enable the NRC to account for all sources that have been distributed. The commenter further suggested that the program could be designed to allow steel companies and the general public to trace the origins of an improperly disposed of source. This would help steel companies in determining liability for the multimillion-dollar clean-up costs that the steel companies and their insurers incur when sources are inadvertently melted. It would also provide Federal and State nuclear regulators that handle orphan sources a means to obtain reimbursement resulting in an additional deterrent against improper source disposition.

Another commenter was concerned that, even though a fee-based system for all general licensees would permit the NRC to recover the anticipated cost of initiating and maintaining the reporting program, a fee schedule could slow or prevent implementation of the entire proposal. If this is correct, the commenter recommended that the NRC retain the proposal as published.

Response: The Commission is not addressing comments on its proposed fee-based system as part of this rulemaking process. The separate, more

comprehensive rule addresses fees for registration and the comments will be considered in connection with that rulemaking.

F. Registration Information Available on the Internet

Comment: One commenter was opposed to making the registration information available on the Internet because such posting would unnecessarily cause public concern over the presence and use of low level devices. The commenter believes that this information should be available only through the Freedom of Information Act request process.

Response: Some of the information submitted in distributor quarterly reports and entered into the general license tracking system that is to be used for handling registration information would be considered proprietary. This database will be designed with security features in order to protect proprietary information. It will not be available on the Internet. The NRC would post information on its website concerning lost or unaccounted for devices.

G. Civil Penalty Amounts

Comment: One commenter agreed with the NRC's intent to increase the civil penalty amounts for violations involving lost or improperly disposed of sources or devices. The commenter stated that the penalties must be significantly higher than the costs avoided by the failure to properly dispose of the source or device.

A second commenter supported fining general licensees who violate their general licenses by using a schedule that is proportionate to the damage actually caused by the lost source. The commenter used the example of the cost for cleaning a steel mill contaminated by melting such a source. This commenter believed that because the NRC's proposed penalty is not much higher than the current fine of $2500 per loss that has been assessed to licensees, it would not significantly deter illegal behavior. The commenter believes that increasing the current relatively minimal penalty levels to amounts that reflect the real world damage caused by loss of a licensed source will provide general licensees with a substantive economic incentive to dispose of their sources legally.

Response: As discussed in the July 26, 1999 (64 FR 40295) proposed rule, the Commission is considering raising civil penalties for violations involving lost or improperly disposed of sources or devices and may use a tiered approach with higher than usual civil penalties for sources that are relatively costly to dispose of. This is to ensure that such civil penalties better relate to the costs avoided by the failure to properly dispose of the source or device. The cost of cleaning a contaminated steel mill would not be an appropriate basis for setting fees.

No comments were made concerning the specific wording of the proposed amendment. No change to the rule has been made as a result of these comments.

Agreement State Compatibility

Under the "Policy Statement on Adequacy and Compatibility of Agreement State Programs" approved by the Commission on June 30, 1997 (62 FR 46517), this final rule is classified as Compatibility Category D. Category D means the provisions are not required for purposes of compatibility; however, if adopted by the State, the provisions should not create any conflicts, duplications, or gaps in the regulation of AEA material. Ultimately, an enhanced oversight program is expected to include provisions that will require a higher degree of compatibility. This is being considered in the separate, more comprehensive rulemaking that would add more explicit requirements for the registration program and additional provisions concerning accountability of generally licensed devices.

Voluntary Consensus Standards

The National Technology Transfer and Advancement Act of 1995, Pub. L. 104–113, requires that agencies use technical standards that are developed or adopted by voluntary consensus standards bodies unless the use of such a standard is inconsistent with applicable law or otherwise impractical. In this final rule, the NRC is amending its regulations to require that those who possess certain industrial devices containing byproduct material provide requested information. The amendments are administrative in nature and require certain types of specific entities to provide information concerning specific devices in their possession. Therefore, this action does not constitute the establishment of a standard that establishes generally applicable requirements.

Environmental Impact: Categorical Exclusion

The NRC has determined that this final rule is the type of action described in the categorical exclusion in 10 CFR 51.22(c)(3)(iii). Therefore, neither an environmental impact statement nor an environmental assessment has been prepared for this regulation.

Paperwork Reduction Act Statement

This final rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). The information collection requirements in this rule have been approved by the Office of Management and Budget, approval number 3150–0016.

The public reporting burden for this information collection is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments on any aspect of this information collection, including suggestion for reducing the burden, to the Records Management Branch (T–6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001, or by Internet electronic mail at BJS1@NRC.GOV; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB–10202, (3150–0016), Office of Management and Budget, Washington, DC 20503.

Public Protection Notification

If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

Regulatory Analysis

The NRC has prepared a regulatory analysis for this regulation. The analysis examines the cost and benefits of the alternatives considered by the NRC. The regulatory analysis is available for inspection in the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the analysis may be obtained by calling Jayne McCausland, U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, DC, 20555–0001; telephone (301) 415–6219; or e-mail at JMM2@nrc.gov.

Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act (5 U.S.C. 605(b)), the Commission certifies that this final rule does not have a significant economic impact on a substantial number of small entities. This rule requires general licensees who have received specific devices to respond to requests for information from NRC. The final rule applies to the approximately 45,000 persons using products under an NRC general license, many of whom may be classified as small entities. However, the

NRC intends to request registration information from only approximately 5100 of these general licensees. Registration information to be obtained will include identification of the devices, accountability for the devices, the persons knowledgeable of the device and the applicable regulations, and the disposition of the devices. The NRC believes that the economic impact that any general licensee incurs as a result of supplying this information constitutes a negligible increase in administrative burden. It is estimated that there are approximately 20,000 devices in the possession of the Commission's general licensees which will come under the registration requirement. The average cost to the general licensee per device per year is about $4.00. Therefore, the action will not have a significant economic impact on small entities. The final rule is intended to ensure that general licensees understand and comply with regulatory responsibilities regarding the generally licensed radioactive devices in their possession.

Backfit Analysis

The NRC has determined that the backfit rule, 10 CFR 50.109, does not apply to this rule, because these amendments do not involve any provisions that impose backfits as defined in 10 CFR 50.109(a)(1) and, therefore, a backfit analysis is not required.

Small Business Regulatory Enforcement Fairness Act

In accordance with the Small Business Regulatory Enforcement Fairness Act of 1996, the NRC has determined that this action is not a major rule and has verified this determination with the Office of Information and Regulatory Affairs, Office of Management and Budget.

List of Subjects in 10 CFR Part 31

Byproduct material, Criminal penalties, Labeling, Nuclear materials, Packaging and containers, Radiation protection, Reporting and recordkeeping requirements, Scientific equipment.

For the reasons set out above and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 552 and 553, the NRC is adopting the following amendments to 10 CFR Part 31.

PART 31—GENERAL DOMESTIC LICENSES FOR BYPRODUCT MATERIAL

1. The authority citation for Part 31 continues to read as follows:

Authority: Secs. 81, 161, 183, 68 Stat. 935, 948, 954, as amended (42 U.S.C. 2111, 2201, 2233); secs. 201, as amended, 202, 88 Stat. 1242, as amended, 1244 (42 U.S.C. 5841, 5842).

Section 31.6 also issued under sec. 274, 73 Stat. 688 (42 U.S.C. 2021).

2. Section 31.5 is amended by adding paragraph (c)(11) to read as follows:

§ 31.5 Certain measuring, gauging, or controlling devices.[2]

* * * * *

(c) * * *

(11) Shall respond to written requests from the Nuclear Regulatory Commission to provide information relating to the general license within 30 calendar days of the date of the request, or other time specified in the request. If the general licensee cannot provide the requested information within the allotted time, it shall, within that same time period, request a longer period to supply the information by submitting a letter to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001 and provide written justification as to why it cannot comply.

* * * * *

Dated at Rockville, Maryland, this 1st day of July, 1999.

For the Nuclear Regulatory Commission.

William D. Travers,

Executive Director for Operations.

[FR Doc. 99–19984 Filed 8–3–99; 8:45 am]

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Proposed Rules

Federal Register
Vol. 64, No. 142
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This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

NUCLEAR REGULATORY COMMISSION

10 CFR Parts 30, 31, 32, 170, and 171

RIN 3150–AG03

Requirements for Certain Generally Licensed Industrial Devices Containing Byproduct Material

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is proposing to amend its regulations governing the use of byproduct material in certain measuring, gauging, or controlling devices. The proposed amendments would include adding explicit requirements for a registration process that the NRC plans to initiate through a related rulemaking, would add a registration fee, and would clarify which provisions of the regulations apply to all general licenses for byproduct material. The proposed rule would also modify the reporting, recordkeeping, and labeling requirements for specific licensees who distribute these generally licensed devices. The proposed rule is intended to allow the NRC to better track certain general licensees and the devices they possess and to further ensure that general licensees are aware of and understand the requirements for the possession of devices containing byproduct material.

DATES: Submit comments by October 12, 1999. Comments received after this date will be considered if it is practical to do so, but the Commission is able to ensure consideration only for comments received on or before this date.

ADDRESSES: Send comments by mail to the Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001. Attention: Rulemakings and Adjudications Staff.

Hand deliver comments to: 11555 Rockville Pike, Rockville, Maryland, between 7:30 am and 4:15 pm on Federal workdays.

You may also provide comments via the NRC's interactive rulemaking web site through the NRC home page (http://www.nrc.gov). This site provides the availability to upload comments as files (any format), if your web browser supports that function. For information about the interactive rulemaking site, contact Ms. Carol Gallagher (301) 415–5905; e-mail CAG@nrc.gov.

Certain documents related to this rulemaking, including comments received and the regulatory analysis, may be examined at the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. These same documents also may be viewed and downloaded electronically via the interactive rulemaking website established by NRC for this rulemaking.

FOR FURTHER INFORMATION CONTACT: Catherine R. Mattsen, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001, telephone (301) 415–6264, or e-mail at CRM@nrc.gov.

SUPPLEMENTARY INFORMATION:

Background

On February 12, 1959 (24 FR 1089), the Atomic Energy Commission (AEC) amended its regulations to provide a general license (10 CFR 30.21(c)) for the use of byproduct material contained in certain measuring, gauging, or controlling devices. Under current regulations in 10 CFR 31.5, certain persons may receive and use a device containing byproduct material under this general license if the device has been manufactured and distributed according to a specific license issued by the NRC or by an Agreement State. A specific license authorizing distribution of generally licensed devices is issued if a regulatory authority determines that the safety features of the device and the instructions for its safe operation are adequate and meet regulatory requirements.

The person or firm who receives such a device is a general licensee. These general licensees are subject to requirements for maintaining labels, following instructions for safe use, storing or disposing of the device properly, and reporting transfers and failure of or damage to the device. For some devices, the general licensee must also comply with testing requirements for leakage and for proper operation of on-off mechanisms. General licensees are also subject to the terms and conditions in § 31.2 concerning general license requirements, transfer of byproduct material, reporting and recordkeeping, and inspection. General licensees must comply with the safety instructions contained in or referenced on the label of the device and must have the testing or servicing of the device performed by an individual who is authorized to manufacture, install, or service these devices except as indicated on the label.

A generally licensed device usually consists of radioactive material, contained in a sealed source, within a shielded housing. The device is designed with inherent radiation safety features so that it can be used by persons with no radiation training or experience. The general license simplifies the licensing process so that a case-by-case determination of the adequacy of the radiation training or experience of each user is not necessary.

There are about 45,000 general licensees authorized by § 31.5 to possess about 600,000 devices that contain byproduct material. The NRC has not contacted or inspected these general licensees on a regular basis because of the relatively small radiation risk posed by these devices.

Individuals who possess devices under this general license are not always aware of applicable requirements and thus are not necessarily complying with all of these requirements. The NRC is most concerned about occurrences where generally licensed devices have not been handled or disposed of properly. In some cases, this has resulted in radiation exposure to the public and contamination of property. Some generally licensed devices have been accidentally melted in steel mills causing considerable contamination of the mill, the steel product, and the wastes from the process, the slag and the baghouse dust. Although known exposures have generally not exceeded the public dose limits, there is a potential for significant exposures.

The NRC conducted a 3-year sampling (1984 through 1986) of general licensees to assess the effectiveness of the general license program. The sampling revealed several areas of concern regarding the

use of generally licensed devices. In particular, the NRC concluded that—

(1) Many general licensees are unaware of the regulations that apply to the possession of a generally licensed device; and

(2) Many general licensees are unable to account for their devices.

Approximately 15 percent of the general licensees sampled could not account for all of their generally licensed devices. The NRC concluded that these problems could be resolved by more frequent and timely contact between general licensees and the NRC.

On December 27, 1991 (56 FR 67011), the NRC published a notice of proposed rulemaking concerning the accountability of generally licensed devices. The proposed rule contained a number of provisions, including a requirement under § 31.5 for general licensees to provide information to the NRC upon request, through which a device registry could be developed. The proposed rule also included requirements in §§ 32.51a and 32.52 for specific licensees who manufacture or initially transfer generally licensed devices. Although the public comments received were reviewed and a final rule developed, a final rule was not issued because the resources to fully implement the rule were not available.

The NRC has continued to consider the issues related to the loss of control of generally licensed, as well as specifically licensed, devices. In July 1995, the NRC, with assistance from the Organization of Agreement States, formed a working group to evaluate these issues. The working group consisted of both NRC and Agreement State regulatory personnel and encouraged the involvement of all persons having a stake in the process and its final recommendations. All working group meetings were open to the public. A final report was published in October 1996 as NUREG–1551, "Final Report of the NRC-Agreement State Working Group to Evaluate Control and Accountability of Licensed Devices."

In considering the recommendations of this working group, the NRC decided, among other things, to again initiate rulemaking to establish an annual registration of devices generally licensed under § 31.5. This registration program would be similar to the program originally proposed in the 1991 proposed rule. However, it would apply only to those devices considered to present a higher risk of potential exposure of the public or property loss in the case of loss of control (compared to other generally licensed devices). Initially, the NRC has been using the criteria developed by the working group for determining which sources should be subject to the registration program. Using these criteria, it is now estimated that the registration requirement would apply to about 5100 general licensees possessing about 20,000 devices. These criteria were based on considerations of relative risk and are limited to radionuclides currently in use in these types of devices. If quantities of other radionuclides that would present a similar risk are used in these devices in the future, the criteria may be revised to include additional radionuclides. The Commission may also consider revising the criteria to include a larger number of devices in the registration requirement for other reasons in future rulemaking.

The Atomic Energy Act of 1954 (AEA), as amended, provides the NRC with the authority to request information from its licensees concerning licensed activities. However, the Commission had not included an explicit provision in its regulations that would require § 31.5 general licensees to provide information on request. On December 2, 1998 (63 FR 66492), the Commission published a proposed rule that would explicitly require general licensees who possess certain measuring, gauging, or controlling devices to provide the NRC with information about the devices. Assuming it becomes a final rule, the NRC intends to use that provision primarily to institute a registration and accounting system for the devices containing certain quantities of specific radionuclides that present a higher risk of exposure to the public or property damage if a device were lost. That rulemaking was not proposed as a matter of compatibility for Agreement States. That proposed rule presented an estimate of 6000 general licensees, based on the estimates made in the working group report. However, this had not accounted for the fact that, in the interim, Massachusetts had become an Agreement State. Using the same criteria, and removing the previously NRC general licensees in Massachusetts, results in an estimate of 5100 NRC general licensees that would be subject to the registration requirement.

This proposed rule would add specific requirements concerning the registration of devices and additional provisions of an enhanced regulatory oversight program for all general licensees to be registered. The proposed rule would also establish levels of compatibility for Agreement State regulations so that an increased level of oversight for general licensees in Agreement States would also be required. Some States have already instituted some form of enhanced oversight for these general licensees. In a few cases, States have instituted a registration program. A few States have a higher level of control on these devices through requiring specific licenses. Under the proposed level of compatibility for § 31.5, the essential objectives of the regulation should be adopted by the State to avoid conflicts, duplications, or gaps. However, the manner in which the essential objectives of the regulation are addressed need not be the same as NRC. Strict compatibility would only be required for revisions to the requirements applicable to distributors because of interjurisdictional distribution.

Discussion

The December 2, 1998, proposed rule would provide one of the key elements in improving the accountability and control over devices of particular concern through the institution of a registration process. However, current regulatory provisions are inadequate to allow for the NRC to track general licensees and the specific devices they possess. The NRC needs to track these general licensees in order that they can be contacted or inspected when appropriate. The NRC also needs to track individual generally licensed devices, so that the responsible party can be identified when a device is found in an inappropriate situation.

Tracking devices would also allow the NRC to contact the appropriate general licensees if a generic defect in a group of devices is identified. As noted, that proposed rule would not require Agreement State regulations to be compatible.

There are other means for reducing the likelihood of incidents of lost sources. The Commission has reconsidered the provisions in its 1991 proposed rule, evaluated the recommendations of the NRC-Agreement State Working Group, and identified additional issues concerning these devices in developing this proposed rule.

Summary and Discussion of Proposed Requirements

Revisions to the Requirements for General Licensees Under § 31.5

Registration

This proposed rule would add explicit provisions delineating an annual registration requirement, as well as a registration fee. The registration process would be initiated under § 31.5(c)(11), proposed on December 2,

1998, if that requirement is adopted in a final rule. Proposed § 31.5(c)(11) would require licensees to respond to requests for information from NRC within 30 days or as otherwise specified. The provisions proposed in this document (new § 31.5(c)(13)) are essentially consistent with the Commission's plans for the registration process discussed in the December 2, 1998, proposed rule. This proposed rule would specifically require that the information about devices be verified by the licensee through a physical inventory and by checking label information. The advantage of including more explicit requirements in the regulation is that information about the registration process will be more clearly defined and more available. When the distributor of a device supplies copies of § 31.5 to its customers (under § 32.51a(a)), the potential general licensees would be made aware of the registration requirement, the devices to which it applies, the nature of the registration information, and the registration fee.

An organization which uses generally licensed devices at numerous locations is considered a separate general licensee at each location. Different facilities at the same complex or campus are not, however, considered separate locations. In the case of portable devices that are routinely used at multiple field sites, there is one general licensee for each primary place of storage, not for each place of use. Thus, an organization would be required to complete more than one registration, if it possess devices subject to registration at multiple distinct locations.

The proposed rule would add a fee to § 170.31 to be assessed in conjunction with the annual registration process. This registration fee would be for each general licensee filing a registration under § 31.5(c)(13) regardless of the number of devices. As noted above, an organization is considered to be a separate general licensee at each separate address at which devices are used, and would be assessed a registration fee for each location of use.

The NRC is required by the Omnibus Budget Reconciliation Act of 1990, as amended (OBRA–90), to recover approximately 100 percent of its budget through fees. Since OBRA–90 was enacted, all costs of the general license program have been recovered through annual fees paid by specific licensees. The proposed registration fees would recover the cost of the general license program associated with this group of general licensees in an equitable way, as required by law. Those who are allowed to use devices under the general license would now bear the operational cost of the program instead of those who hold specific licenses. However, it should be noted that the initial program startup costs would be recovered from the annual fee paid by current holders of specific licenses.

The costs to be recovered through the registration fee include the costs for obtaining and maintaining information associated with the devices subject to the registration requirement, the costs of processing and reviewing the registrations, and the costs for inspections and follow-up efforts expected to be made as a result of the registration process identifying noncompliance with existing regulations. The fee would be based on the average cost of the program for each of the licensees registering devices. Some of the general licensees, such as non-profit educational institutions, will be exempt from the fee under § 170.11. Costs not recovered from this small segment of the general licensees registering devices would continue to be recovered from annual fees paid by current holders of specific licenses.

It is expected that the overall cost will decline after the initial years of implementation of the registration process, due to increased compliance leading to reduced inspection and follow-up. However, the number of generally licensed devices in NRC jurisdiction is reduced when a State becomes an Agreement State and takes over responsibility for the general licensees in that State. Although a large part of the cost of the program is proportional to the number of general licensees, a portion of the cost is fixed. Thus, the cost per general licensee could increase if the number of general licensees subject to registration decreases. The proposed registration fee is $420 based on the current estimated cost of the program and the current number of general licensees with devices that would be subject to registration. If additional States become Agreement States before this rule is made final, the fee could be somewhat higher in the final rule.

The Commission considered other approaches to the proposed fee structure, such as a fee per device or a sliding scale, i. e., fees set for a few ranges of numbers of devices. However, basing fees on the number of devices or a sliding scale would not necessarily meet the intent of the Independent Offices Appropriation Act of 1952 (IOAA), which is the authority under which 10 CFR part 170 fees are established. The IOAA provides that fees recover the agency's cost in providing the service. The agency's costs to register generally licensed devices at each location is projected to be nearly the same regardless of the number of sources/devices possessed by the licensee. Costs of follow-up and inspection do not go up substantially with increased numbers of devices. In addition, these alternative methods would complicate the determination of the proper fee and the fee recovery process, not only for NRC but for the registrants as well. With the uncertainty of the licensees' status from one year to the next, the additional administrative effort related to the reconciliation of the fee based on the number of devices possessed from year to year, would not be cost effective, considering the total amount projected to be recovered for the registration program. Additionally, under these alternative methods a large diversified firm that owns one device would pay a reduced fee, while a small entity whose business may depend solely on the use of the devices might pay a disproportionate fee because it has more than one device. The NRC believes that basing the fee on a per device basis or a sliding scale would not result in a fair and equitable allocation of its regulatory costs, and would not achieve the goal of the Regulatory Flexibility Act to reduce the impact of fees on small entities. The NRC believes that the proposed approach of assessing a fee for each licensee subject to registration—

(1) Better reflects the costs to administer the program,

(2) Is most consistent with existing NRC fee assessment practices,

(3) Would simplify fee collection,

(4) Would be fair and equitable, and

(5) Would minimize impacts to small entities.

The planned registration process will be somewhat different from that used in the Commission's other registration programs, in which blank forms are filled out by registrants. Instead, it is planned to send a registration request containing the information recorded in the Commission's database, which would ask the general licensee to verify, correct, and/or add to the information provided. This would be similar to the approach typically used by States for the renewal of automobile registrations. This is intended to be more efficient for the general licensees and the Commission.

The first registration that would be carried out under § 31.5(c)(11) would depend on the NRC's ability to contact general licensees because the NRC must request the information. This proposed rule also specifies that the general licensee would complete registration by verifying, correcting, and/or adding to the information in a request for

registration received from the Commission. It is silent on when or how general licensees should register if the Commission fails to contact the general licensee. Thus, it might be interpreted that, if the Commission fails to contact a general licensee, the registration requirement would not apply. The Commission seeks comment on whether the registration requirement should include a provision that would require the general licensee to complete registration by a certain time, such as 15 months after—

(1) The date of the previous registration certificate;

(2) The receipt of a device subject to registration; or

(3) The effective date of this rule for an unregistered device possessed at the time of the effective date of a final rule enacted in response to this proposed rule.

This would put the burden of registering on general licensees who have not been notified by the NRC of the requirement. The intent would be for general licensees who find out about the new requirements, for example, from a distributor, to contact the NRC to begin the registration process. If this approach were taken, the Commission would likely exercise enforcement discretion in cases where the Commission locates a general licensee who has not previously registered devices, if the general licensee was unaware of the requirement. It is recognized that some general licensees who have received devices in the past may never be located.

The time of year for registration would vary for licensees. However, requests for renewal of registration would be made approximately 1 year after the previous registration request for that licensee. Although registration would not be required before the receipt of a device, the Commission plans to send requests for registration to new general licensees subject to registration that are identified in distributors' quarterly transfer reports submitted under § 32.52 shortly after this information is received and recorded. If a general licensee has previously registered devices and receives additional devices requiring registration, the new devices would be registered when the annual reregistration is carried out. The Commission requests comment on whether the NRC should have earlier contact with previous registrants who receive additional devices, either by an acknowledgment by NRC to the user or by a required response from the general licensee that accounts for the additional device(s). The effective date of the registration fee will be set to apply after the initial registration requests have been sent for response under § 31.5(c)(11) so that the first round of annual registration will be complete prior to this effective date and the fee will be imposed with the first reregistration for all devices currently in use.

Other Revisions for § 31.5 General Licensees.

The proposed rule would establish additional requirements for all general licensees under § 31.5. These proposed requirements include—

(1) An explicit requirement for the general licensee to appoint an individual assigned responsibility for knowing what regulatory requirements are applicable and having authority to take required actions to comply with the applicable regulations and through whom the general licensee carries out its responsibilities to comply with the applicable regulations (new § 31.5(c)(12));

(2) A provision that limits the amount of time a general licensee can keep an unused device in storage and allows the deferment of testing during the period of storage (new § 31.5(c)(15));

(3) A provision to allow transfers to specific licensees authorized under part 30, or equivalent Agreement State regulations, as waste collectors, in addition to currently allowed transfers to part 32 (and Agreement State) licensees; to allow transfers to other specific licensees but only with prior written NRC approval; and to add the recipient's license number, the serial number of the device, and the date of transfer to the information required to be provided to NRC upon transfer of a device (revision of § 31.5(c)(8));

(4) A provision to notify NRC of address changes, including name changes (new § 31.5(c)(14));

(5) For device damage or failures that are likely to or are known to have resulted in contamination, the addition of a plan for ensuring that premises and environs are suitable for unrestricted access, to the information that must be sent to NRC in the case of a failure; a change to the addressee for reporting information concerning a failure; and a note that the criteria in § 20.1402, "Radiological criteria for unrestricted use," may be applied by the Commission in the case of contamination in spite of the exemption in § 31.5(c)(10) (revision to § 31.5(c)(5)); and

(6) A revision of the reporting requirement, in the case of a transfer to a general licensee taking over possession of a device at the same location, to provide the serial number of the device and the name and phone number for the person designated as the responsible individual, rather than simply a contact name (revision to § 31.5(c)(9)(i)).

The rationale for each of these proposed amendments is:

(1) New § 31.5(c)(12)—Responsible person. The "person" who holds a general license is usually a corporation, or public or private institution, rather than an individual. In practice, in order for the general licensee to comply with existing regulations, an individual in the corporation or institution must be aware of the requirements and be authorized to take the required actions. Appointing a specific individual to be responsible for knowing about and taking actions to comply with regulations is an appropriate operational practice, which, unfortunately, is not always followed. If a device is not subject to testing under § 31.5(c)(2), there are no routine actions required to be taken, because the requirements are generally restrictions on actions, such as not abandoning the device, or actions to be taken only in the case of particular, non-routine events, such as notification of NRC of the transfer or failure of the device. It is this type of situation, where knowledge of the nature of the device, the general license, and the associated regulations is unlikely to be maintained and passed on to individuals using the device. Requiring the assignment of the responsibility for knowing and having authority to take required actions for complying with regulations to a specific individual would improve the probability that the general licensees will do what they are already required to do. The impact of this should be minimal, somewhat limiting operational flexibility with regard to the assignment of duties. This individual does not have to work on site at the place of use of the device and does not have to conduct all required actions, but would be responsible to ensure that the general licensee is aware of required actions to be taken. This assignment does not relieve the general licensee of responsibility.

The NRC/Agreement State Working Group recommended that general licensees assign a backup responsible individual (BRI) as well. The proposed rule does not include this requirement, but the Commission solicits comment on this issue and will consider adding it to the final rule. A BRI would add some assurance that there is a continuation of knowledge of the requirements in the event of the person assigned to be the responsible individual leaves his assigned duties.

However, even without a BRI, the general licensee would have the responsibility under the proposed rule to replace the responsible individual to maintain compliance with proposed § 31.5(c)(12).

(2) New § 31.5(c)(15)—Timeliness of disposition and deferral of testing while in storage. When a device is not in use for a prolonged time, it is particularly susceptible to being forgotten and ultimately disposed of or transferred inappropriately. General licensees are unlikely to keep a device unused for more than 2 years and subsequently use it. If a device is being held in storage indefinitely, it is likely that it is being stored to avoid the costs of proper disposal. If a general licensee intends to use a device after a period of more than 2 years of nonuse, the device could be sent back to the supplier to be held under the distributor's specific license until later use, or the general licensee could request an exemption from § 31.5(c)(15) indicating the reason(s) why the licensee intends to use the device after 2 years and prefers to keep it on site in the interim.

If a period of storage exceeds the normal interval for testing, testing would not need to be done until the device is to be put back into use again. This would relieve the burden of unnecessary testing during the period of storage as well as eliminate any unnecessary exposure that could occur during testing for that period.

(3) Revision to § 31.5(c)(8)—Provisions for transfers to specific licensees. This proposed revision would provide some flexibility to the general licensee in transferring a device while ensuring that it is transferred appropriately. It would allow a general licensee to transfer a device directly to a waste collector for disposal, rather than going through a distributor. It would also allow the transfer of a device to other specific licensees, but would require NRC approval in these cases so that NRC can ensure that the recipient is authorized to receive the device.

The inclusion of a recipient's license number in the report of transfer would better ensure that the general licensee has verified that the recipient is a part 32 licensee, a part 30 waste collection licensee, or a specific licensee under equivalent Agreement State regulations authorized to receive it. It would also supply an additional means for NRC to identify the recipient, because company names and addresses sometimes change. The addition of the date of transfer will make the transfer easier to track and help to ensure that the general licensee makes the report in a timely manner (required within 30 days of transfer).

(4) New § 31.5(c)(14)—Change of address notification (including change in name of general licensee). The quarterly reports required of distributors under § 32.52(a) and (b) are intended to provide NRC and the Agreement State regulatory agencies with the identity of general licensees in their jurisdictions and addresses at which these general licensees can be contacted (proposed to now be specifically the mailing address for the location of use of the generally licensed device). These general licensees can then be contacted or inspected. If general licensees move their operations without notifying the NRC, or appropriate Agreement State agency, they may be difficult to locate. Even a change of name can cause mail to be returned. This proposed requirement to report address changes would only apply to previously supplied mailing addresses and, for portable devices, the mailing address for the primary place of storage, although the devices may be used at multiple field sites. For those registering devices, other changes in addresses, if different from the mailing address for the location of use, will be provided at the time of the next registration.

Note: Changes to the general licensee, other than a simple name change, such as in the case of a sale of a company, require reporting of additional information under § 31.5(c)(9)(i).

This simple change of address notification is intended to track moves into and within NRC jurisdiction and to maintain current mailing address information. The general license in § 31.5 only applies to persons within NRC jurisdiction. If a general licensee intends to move from one jurisdiction to another, it should contact the applicable regulatory authority, NRC or the particular Agreement State, before doing so to determine the applicable, current regulations in that jurisdiction. All jurisdictions do not have a comparable general license and specific provisions of the general license may vary among jurisdictions. If a general licensee has obtained a portable device in an Agreement State and wishes to use the device within NRC jurisdiction, it must do so under § 31.5, because there is no reciprocity provision applicable to general licenses. In this case, they would be subject to the provisions of § 31.5.

(5) Revision to § 31.5(c)(5)—Reports of device failures. General licensees are not subject to decommissioning requirements. A general license is granted by regulation and, under normal circumstances, does not involve any termination of license process. If a generally licensed device fails or is seriously damaged so as to cause significant contamination of the premises or environs, the NRC may need to respond to the notification of an incident made under § 31.5(c)(5) to ensure that a facility is properly decontaminated. Following such an incident, the NRC would determine what actions are necessary on a case-by-case basis and, if necessary, would apply the criteria set out in § 20.1402, "Radiological criteria for unrestricted use." The general licensee is exempt from this section of part 20 when in possession of an intact generally licensed device. However, when a device has been damaged, the material in the device may no longer be fully contained within the device, i.e., it may also be unsealed radioactive material. Action can be taken by the NRC under § 30.61, "Modification and revocation of licenses," which is applicable to general licensees. The provision proposed in this action would require that the general licensee propose to the Commission how it will be shown that the premises are or will be adequately cleaned up. Depending on the nature of the event, the remedial action taken (and reported under existing requirements) along with any confirmatory surveys may be sufficient to complete action on the event.

The addressee for submitting information under § 31.5(c)(5) would be changed from Regional Administrator to Director of Nuclear Material Safety and Safeguards so that all NRC addressees specified in § 31.5 for reports by these licensees are the same and to eliminate the need for the general licensee to refer to part 20 to determine the appropriate addressee. The addressee and address for registration will be specified in the registration request. Adding a note concerning the possible applicability of § 20.1402 is a clarification.

(6) Revision to § 31.5(c)(9)(i)—Reporting new general licensee's responsible individual. Consistent with the provision for appointing an individual through whom the general licensee will ensure compliance with the applicable regulations and requirements, and other reporting requirements being proposed, it is more effective for the general licensee to provide the name of the new responsible individual when another general licensee takes over the facility and responsibility for the device.

An additional proposed amendment to § 31.5 would clarify the status of a person who receives a device through an unauthorized transfer and would remove a restriction on devices. Paragraph (b) would be revised to (1)

limit the applicability of the general license to those who receive a device through an authorized transfer and (2) expand the applicability of the general license to devices authorized for distribution by an Agreement State that has no general license covering the use of such devices within that State.

Concerning the first of these issues, the NRC has generally, although not consistently, interpreted the general license to apply to any recipient within the group identified in § 31.5(a), i.e., "* * * commercial and industrial firms and research, educational and medical institutions, individuals in the conduct of their business, and Federal, State or local government agencies * * *", even if the device is received through an unauthorized transfer. The proposed language would clearly provide that the general license does not apply if the device is obtained through an unauthorized transfer. In the case of an unauthorized transfer, the recipient would possess the device without a license.

Section 31.5(b) currently restricts applicability of the general license in the case of devices from distributors in Agreement States, to those devices from Agreement States that authorize the devices to be used under a general license within their respective States. However, the NRC practice is to allow a device to be used under the general license in § 31.5, that is distributed in accordance with a license issued under equivalent regulations to § 32.51 by an Agreement State that does not authorize devices to be used under a general license within their State. This approach reserved for NRC the right to require distributors in this situation to obtain an NRC distribution license in order to transfer devices into NRC jurisdiction, but did not require them to do so as long as the State issued acceptably equivalent licenses. Through NRC's oversight of Agreement State programs, NRC ensures the safety of these devices. Given this fact and the experience to date with these few States, the Commission believes that this restriction is no longer necessary.

In addition to the proposed changes to § 31.5, other amendments are proposed that would clarify which sections of the regulations in part 30 apply to all of the general licensees under part 31. Section 31.1, "Purpose and scope," would be amended to clarify that only those paragraphs in part 30 specified in § 31.2 or the particular general license apply to part 31 general licensees. Section 31.2, "Terms and conditions," would be amended to reference the sections of part 30 that are applicable to all of the part 31 general licensees, including § 30.7, "Employee protection," § 30.9, "Completeness and accuracy of information," and § 30.10, "Deliberate misconduct." The proposed clarification would make it easier for general licensees to be aware of applicable regulations. In addition, future amendments to part 30 that would apply to part 31 general licensees would include a conforming amendment to part 31. Note, however, that while § 31.2 would specify sections of part 30 generally applicable to general licenses, it would not eliminate the applicability of other parts of the Commission's regulations that may apply.

The applicability of § 30.34(h) on bankruptcy notification to general licensees also needs to be clarified. Under the existing regulations, this requirement appears to apply to all licensees. However, its application to general licensees is not clear because it is not referenced in § 31.2 or § 31.5. This proposed rule would make the bankruptcy notification requirement applicable only to those general licensees subject to the registration requirement. These licensees possess devices for which the Commission believes a higher level of oversight is appropriate. Thus, notification that such a general licensee is filing for bankruptcy may be important to allow the Commission to intervene to ensure that the financial status of the licensee does not lead to the improper disposal or abandonment of a device.

Requirements for Manufacturers and Initial Distributors of Devices

The proposed rule would modify the quarterly transfer reporting, recordkeeping, and labeling requirements for specific licensees who distribute these generally licensed devices, and the requirement for providing information to users. The existing requirements in these areas are a matter of strict compatibility of Agreement State regulation, that is, the State regulations are essentially identical. The proposed amendments would also be a matter of strict compatibility so that revisions to Agreement State regulations would be necessary and distributors in Agreement States would be affected. The basis of this compatibility requirement is significant direct transboundary implications. This results from the fact that devices are distributed under various Agreement State and NRC authorities into other jurisdictions where different regulatory agencies regulate the possession and use of the devices. Currently, there are 28 NRC licensed distributors and approximately 61 licensed distributors in Agreement States.

Reporting

The following information would be added to the existing quarterly transfer reporting requirement: The serial number and model number of the device; the date of transfer; indication if the device is a replacement, and if so, the type, model number, and serial number of the one returned; name and license number of reporting company; and the specific reporting period. The model number of the device is already required in reports to Agreement States. The general licensee address would be specified as the mailing address for the location of use of the generally licensed device.

The name and phone number of the person identified by the general licensee as having knowledge of and authority to take required actions to ensure compliance with the appropriate regulations and requirements would replace the name and/or position of a simple contact between the Commission and the general licensee.

A form will be provided for use in making these reports. However, the use of the form would not be required as long as the report is clear and legible and includes all of the required information. Proposed amendments would be made to § 32.52(a) and (b).

The existing reporting requirement is intended to provide NRC and the Agreement State regulatory agencies with the identity of general licensees in their jurisdictions, addresses at which the general licensees can be contacted (which are usually the location of use of the devices), the particulars of the type of device possessed, and the name (or position) of an individual who constitutes a point of contact between the NRC or the Agreement State and the general licensee. These general licensees can then be contacted or inspected. Including the serial number would allow the NRC and Agreement States to track individual devices. The existing reporting requirement in § 31.5(c)(8) does not require the general licensee to report a transfer if it is for the purpose of obtaining a replacement. This is consistent with the original intent of this regulation in that the status of the general licensee is unchanged, only the specific device is changed. In order for individual devices to be tracked, the NRC or Agreement State needs to be informed of such a transfer. The proposed rule would require that the distributor provide this information either to NRC or the appropriate Agreement State. Under existing requirements, quarterly reports are

required to include specifics on any new device transferred but not on the devices returned. The NRC believes that the distributor could include this additional information in the quarterly reports without a significant burden and that the distributor is likely to be more reliable than the general licensee in providing this information. The name and license number of the reporting company and the specific reporting period are typically included in the reports in order to show compliance with the reporting requirement. However, this information is not always readily identifiable.

The individual who acts as contact with the NRC or the Agreement State concerning the general license should have knowledge of the device, the general license, and the regulations pertaining to the general license, or at least know who in the organization does. This is the intent of the existing requirement. However, in practice, the name given to the distributor and reported to the NRC (or the Agreement State) frequently is not an individual with this type of knowledge. The proposed rule would specify that the contact designated be the person (1) assigned responsibility for ensuring that the general licensee is aware of its regulatory responsibilities and (2) who has authority to take required actions for complying with the applicable regulations.

Recordkeeping

The proposed rule would add to the recordkeeping requirements information on final disposition of devices. The recordkeeping requirements concerning transfers would have the period of retention extended from 5 years from the date of the recorded event, to 3 years after the expected useful life of the device or the final disposition, if known. Proposed amendments would be made to § 32.52(c).

It is important that information about the general licensees and the specific devices in their possession be available until the device is disposed of permanently. Requiring the distributor to keep these records for an extended time provides a backup to the recordkeeping of NRC and State regulatory agencies. The records include information on final disposition that may not have been included in reports to NRC and the Agreement States. It is NRC's understanding that these distributors generally keep these records indefinitely. Thus, this regulatory requirement should have little, if any, impact.

In addition, distributors would be required to make available records of final disposition of devices to the various regulatory agencies in the case of bankruptcy or termination of license (new § 32.51a(d)). When a distributor goes out of business and terminates its license, the distributor can no longer be required to retain these records. This requirement would give NRC, as well as State regulatory agencies, the opportunity to obtain and retain records of this type previously kept by the distributor. These records could be helpful in verifying information used to keep track of devices relative to the final disposition of devices. This provision would not require distributors to automatically provide these records unless the NRC or the Agreement State in which the device was distributed makes a request for these records. In the case of bankruptcy, NRC or the Agreement State may want to secure these records early in the process, in case financial difficulties interfere with the licensee fulfilling its responsibilities.

Labeling

The proposed rule would amend the existing labeling requirements to require an additional label on any separable source housing and a permanent label on devices meeting the criteria for registration (new § 32.51(a)(4) and (5) and § 32.51a(c)). The NRC would consider a label "permanent," if, for example, it were embossed, etched, stamped, or engraved in metal. Under these requirements, new distributors would have labels approved as part of obtaining a license; distributors, including existing licensees, would have the new labeling requirements as conditions of license in § 32.51(a)(4) and (5). Approval of the new labels by NRC for existing distributors would not be required. However, distributors may voluntarily submit information for NRC review on how they plan to comply with the new labeling requirements. In any case, labeling is subject to inspection. To the extent necessary, the new labeling requirements would supercede anything contradictory in individual license conditions. The individual license conditions would be updated to include specifics related to the new requirements during the first license renewal or amendment following the effective date of those paragraphs of the rule.

The first change simply carries out the initial intent of the existing requirement for devices where the source may be separable in a housing that does not include the label. It is important that this housing, if separated from the remainder of the device, can also be identified. The impact of this requirement should be minimal. The permanent label for devices requiring registration would provide better assurance that even when a device has been exposed to other than normal use conditions, for example, when a building has been refurbished or demolished with the device in place, the label will be intact and the device may be identified and proper actions can be taken. This may result in a more significant change to the production of devices. Distributors would have 1 year after the effective date of the rule to implement these changes to minimize any impact to the manufacturing and distributing process.

Information To Be Provided to General Licensees

The proposed rule would amend the requirements pertaining to the information distributors must provide to the general licensee (§ 32.51a(a) and (b)). Distributors are now required to provide general licensees with a copy of § 31.5 when the device is transferred. The proposed rule would require that a copy of § 31.5 be provided before transfer. The distributor would also be required to provide copies of additional applicable sections of the regulations, a listing of the services that can only be performed by a specific licensee, and information regarding disposal options for the devices being transferred. The disposal options would include the estimated cost for disposal of the device at the end of its useful life to the extent that the cost information is available to the distributor at the time of the sale of the device. For transfers to general licensees in Agreement States, the distributor may furnish either the applicable NRC regulations or the comparable ones of the Agreement State. In addition, the distributor would furnish the name, address, and phone number of the contact at the Agreement State regulatory agency from which additional information may be obtained.

The general licensee should be aware of the specific requirements before purchasing a generally licensed device, rather than afterward. While the Commission does not want to get involved with details of licensees' business practices, it is the Commission's intent that "prior to transfer" would be before a final decision to purchase so that the information can be considered in making that decision. The Commission seeks comment on how best to achieve and enforce this intent. For example: What are the advantages/disadvantages of using the words, "prior to purchase" in the regulatory text?

While § 31.5 contains the primary requirements related to the general license, it does not reference the applicable sections of part 30. The general licensee should have copies of at least those regulations that may require an action on his part. The sections of the regulation that would be included in this requirement are believed to be the most important for the general licensee to be aware of. The inclusion of a listing of services that can only be performed by a specific licensee would clarify the services that can and cannot be performed by the general licensee. These services vary depending on the nature and design of the particular device and so are not specified in the regulations. Information on the estimated cost for disposal of the device at the end of its useful life may be a significant factor in a decision to purchase a device because of the high costs of disposing of radioactive materials. In some cases, the cost of disposal could exceed the purchase price of the device.

Additional clarifying amendments would be made in §§ 30.31, 30.34(h), and 31.5(c)(9)(ii). The wording of § 30.31 would provide a similar clarification as that in the Suggested State Regulations with respect to general licenses. The amendment to § 30.34(h) would be consistent with the previously discussed change concerning reporting bankruptcy.

The revision of § 31.5(c)(9)(ii) to include the term, "intermediate person," is intended to provide clarification about intermediate persons holding devices. Specifically, intermediate persons holding devices in their original shipping containers at their intended location of use are general licensees. Distributors licensed under § 32.51, or equivalent Agreement State regulations, must provide information about both intermediate persons and intended users in their quarterly reports submitted under § 32.52(a). Transfers from intermediate persons to intended users under § 31.5(c)(9)(ii) do not need to be reported to NRC because information about the intended user must be reported by the distributor under § 32.52(a).

Minor conforming amendments would also be made to §§ 170.2, 170.3, 171.5, and 171.16.

Public Comments on the Original Proposed Rule

The NRC reviewed the comments received on the December 27, 1991, proposed rule in developing both the proposed rule published on December 2, 1998 (63 FR 66492), and this proposed rule. There were 26 comment letters received from a variety of sources including private and publicly held corporations, private citizens, citizens groups, the Armed Forces, and State governments. These comments have been considered to the extent applicable to each rule. A detailed analysis of the comments received on the December 27, 1991, proposed rule, which was withdrawn by the notice of proposed rulemaking on December 2, 1998, is not presented in either of the subsequent proposed rules because many of the specific comments pertain to specific provisions that have been withdrawn, a great deal of time has passed since these comments were made, and additional opportunity for comment is being provided.

Early State and Public Input

These proposed amendments were provided to the Agreement States twice during its development via the use of the NRC Technical Conference Website and notification to the States of its availability. Input was received following the first posting through discussions at an All Agreement State meeting in October of 1998. The second posting was also available to the public. A notice of availability was published December 31, 1998 (63 FR 72216). The States and the distributors were notified of its availability directly, as well. Two comments were received. One from a State and one from industry. They were generally supportive and indicated points needing clarification.

Summary of Proposed Provisions by Paragraph

Section 30.31—Revision would reconcile the apparent conflict between the description of a general license and a registration requirement.

Section 30.34, paragraph (h)(1)—Revision would make the bankruptcy notification requirement applicable only to those general licensees subject to the registration requirement.

Section 31.1—Revision would clarify that only those paragraphs in part 30 specified in § 31.2 or the particular general license apply to part 31 general licensees.

Section 31.2—Revision would clarify references to the sections of part 30 that are applicable to all of the part 31 general licensees.

Section 31.5, paragraph (b)—Revision would clarify the status of a person who receives a device through an unauthorized transfer by limiting the applicability of the general license to those who receive a device through an authorized transfer; and would remove the restriction on devices distributed by Agreement State licensees in Agreement States without a general license.

Section 31.5, paragraph (c)(5)—Revision would add a plan for ensuring that premises and environs are suitable for unrestricted access, to the information that must be sent to NRC in the case of a failure, when device damage or failure is likely to or known to have resulted in contamination; would change the addressee for reporting information concerning a failure; and would clarify that the criteria in § 20.1402 may be applied in spite of the exemption in § 31.5(c)(10).

Section 31.5, paragraph (c)(8)—Revision would allow transfers to specific licensees authorized under part 30, or equivalent Agreement State regulations, as waste collectors, in addition to currently allowed transfers to part 32 (and Agreement State) licensees; would allow transfers to other specific licensees but only with prior written NRC approval; and would add the recipient's license number, the serial number of the device, and the date of transfer to the information required to be provided to NRC upon transfer of a device.

Section 31.5, paragraph (c)(9)(i)—Revision would add to the reporting requirement, in the case of a transfer to a general licensee taking over possession of a device at the same location, to provide the serial number of the device and the name and phone number of the person identified as having knowledge of and authority to take required actions to ensure compliance with the appropriate regulations and requirements, rather than simply a contact name.

Section 31.5, paragraph (c)(9)(ii)—Revision would add the term, "intermediate person," to clarify that a report of transfer is not required only when the information on both an intermediate person and an intended user was provided through the distributor in a quarterly material transfer report.

Section 31.5, paragraph (c)(12)—Would add an explicit requirement for the general licensee to appoint an individual assigned responsibility for knowing what regulatory requirements are applicable to the general licensee and having authority to take required actions to comply with the applicable regulations.

Section 31.5, paragraph (c)(13)—Would add an explicit requirement for the general licensee to register devices meeting certain criteria, which specifies the information to be provided and references the fee requirement in § 170.31.

Section 31.5, paragraph (c)(14)—Would add requirement for general licensees to notify NRC of address changes.

Section 31.5, paragraph (c)(15)—Would limit to 2 years the amount of time a general licensee can keep an unused device in storage and allow the deferment of testing during the period of storage.

Section 32.51, paragraphs (a)(4) and (5)—Would add requirement for an additional label on any separable source housing and a permanent label on devices meeting the criteria for registration.

Section 32.51a, paragraphs (a) and (b)—Revision would amend the requirements pertaining to the information distributors must provide to the general licensee. Distributors are now required to provide general licensees with a copy of § 31.5 when the device is transferred. The proposed rule would require that § 31.5 be provided before transfer. The distributor would also be required to provide copies of additional applicable sections of the regulations, a listing of the services that can only be performed by a specific licensee, and information regarding disposal options for the devices being transferred, including estimated costs of disposal. For transfers to general licensees in Agreement States, the distributor may furnish either the applicable NRC regulations or the comparable ones of the Agreement State. In addition, the distributor would furnish the name, address, and phone number of the contact at the Agreement State regulatory agency from which additional information may be obtained.

Section 32.51a, paragraph (c)—Would make labeling requirements a condition of license 1 year after effective date of rule.

Section 32.51a, paragraph (d)—Would add requirement for distributors to make available records of final disposition of devices to the various regulatory agencies in the case of bankruptcy or termination of the distributor's license.

Section 32.52, paragraphs (a) and (b)—Revision would add the following information to the existing quarterly transfer reporting requirement: the serial number and model number of the device; the date of transfer; indication if device is a replacement, and if so, the type, model number, and serial number of the one returned; name and license number of reporting company; and the specific reporting period. Also, the general licensee address would be specified as the mailing address for the location of use of the generally licensed device.

The name and phone number of the person identified by the general licensee as having knowledge of and authority to take required actions to ensure compliance with the appropriate regulations and requirements would replace the name and/or position of a simple contact between the Commission and the general licensee. Also, a form will be provided for use in making these reports. However, the use of the form would not be required as long as the report is clear and legible and includes all of the required information.

Section 32.52, paragraph (c)—Revision would add to the recordkeeping requirements information on final disposition of devices. The recordkeeping requirements concerning transfers would have the period of retention extended from 5 years from the date of the recorded event to 3 years after the expected useful life of the device or the final disposition, if known.

Section 170.2—Would conform the scope of part 170 to include a general licensee registrant.

Section 170.3—Would revise definition of "Materials License" to include part 31 and the words, "or granted" as general licenses are granted by regulation rather than individually issued to licensees.

Section 170.31—Revision would add $420 registration fee for general licensees subject to § 31.5(c)(13).

Section 171.5—Would revise definition of "Materials License" to include part 31 and the words, "or granted" as general licenses are granted by regulation rather than individually issued to licensees.

Section 171.16—Would add category for part 31 general license registration for consistency with the Table in § 170.31.

National Database

The Commission is in the process of developing a new computer database to handle information about general licensees and generally licensed devices. Among other improvements from the currently used system, it will be designed to handle the registration process efficiently with automated features. In doing so, the Commission has given some consideration to whether a national database should be established in which information on the identity of general licensees and device information for all jurisdictions would be maintained, making this information accessible to all Agreement States and the NRC. There are variations on the exact approach that might be taken particularly with respect to access and update authority. At this time, the Commission has not yet found it practical to resolve all the issues related to having broad access to the database.

The Commission would like to give further consideration to establishing such a database. It would not require rulemaking. However, if it were to be established, one option would be to change the material transfer reporting requirements so that distributors would report all transfers to the NRC rather than reporting to all jurisdictions into which transfers of devices are made.

A primary advantage of a national database would be the ease of tracing a "found" device back to the general licensee owner responsible for the device. A "found" generally licensed device would be considered an orphan source until such time as the responsible general licensee is identified and it is returned to the licensee. The Commission is in the process of modifying the Nuclear Materials Events Database (NMED) to accept and track information on orphan sources nationally (i.e. all States). Access to the NMED will be available to the NRC and all the States. The Commission will encourage the States to use NMED for this purpose so that this category of information will be shared nationally. However, NMED would rely on reporting of events for its data. In order for a device to be traced back to the responsible general licensee, each jurisdiction would need to search its own files. In addition, information in a national general license database would be immediately available, and would contain the most complete information about general licensees and generally licensed devices.

The primary disadvantage to a national database would be the difficulty of maintaining the security of the data, which is primarily made up of proprietary information. A national database would also present more risk to the integrity of the data, because there would be a higher potential for illicit corruption of data.

In considering whether or not to implement a national database and, if so, what the particular approach would be used, there are a number of aspects to be considered including—

(1) Who will maintain the database (the NRC, an independent third party, or each agency maintaining its own data)?

(2) How access to the data would be controlled.

(3) Potential changes to the reporting requirements for transfers.

(4) The ability for the NRC and the Agreement States to protect information of other agencies.

(5) Costs to implement and maintain the system or systems (including training).

The Commission seeks comment on the advantages and disadvantages of implementing a national database and on these related issues.

Specific Questions for Public Comment

The Commission welcomes comments on all aspects of this proposed rule, and is especially interested in receiving comments on the specific questions summarized here:

1. The Commission seeks comment on whether the registration requirement should include a provision that would require the general licensee to complete registration by a certain time, whether or not the NRC requests registration.

2. The Commission requests comment on whether it is appropriate for new devices obtained by registrants to be registered when the annual reregistration is carried out without the NRC having earlier contact after additional devices are received. Earlier contact could be made either by an acknowledgment by NRC to the user or by a required response from the general licensee to account for the additional device(s).

3. The Commission solicits comment on whether general licensees should be required to assign a backup responsible individual (BRI).

4. The Commission seeks comment on how best to achieve and enforce the intent that full disclosure of information required to be provided to general licensee customers by distributors be made early enough to be considered in a decision to purchase. For example: Would it be better to use the words, "prior to purchase" in the regulatory text?

5. The Commission seeks comment on the advantages and disadvantages of implementing a national database of general licensees and their devices.

Enforcement

On March 9, 1999 (64 FR 11508), the Commission established an interim enforcement policy for violations of § 31.5 that licensees discover and report during the initial cycle of the registration program. This policy supplements the normal NRC Enforcement Policy in NUREG–1600, Rev. 1. It will remain in effect through one complete cycle of the registration program.

Under this interim enforcement policy, enforcement action normally will not be taken for violations of § 31.5 that are identified by the general licensee, and reported to the NRC if reporting is required, provided that the general licensee takes appropriate corrective action to address the specific violations and prevent recurrence of similar problems and otherwise has undertaken good faith efforts to respond to NRC notices and provide requested information. This change from the Commission's normal enforcement policy is to remove the potential for the threat of enforcement action to be a disincentive for the licensee to identify deficiencies. This approach is warranted given the limited NRC inspections of general licensees. This approach is intended to encourage general licensees to determine if applicable requirements have been met, to search their facilities to ensure sources are located, and to develop appropriate corrective action when deficiencies are found. Under the interim enforcement policy, enforcement action, including issuance of civil penalties and Orders, may be taken where there is—

(a) Failure to take appropriate corrective action to prevent recurrence of similar violations;

(b) Failure to respond and provide the information required by regulation;

(c) Willful failure to provide complete and accurate information to the NRC; or

(d) Other willful violations, such as willfully disposing of generally licensed material in an unauthorized manner.

As noted in the December 2, 1998, proposed rule, the Commission also plans to increase the civil penalty amounts specified in its Enforcement Policy in NUREG–1600, Rev. 1, for violations involving lost or improperly disposed sources or devices. This increase will better relate the civil penalty amount to the costs avoided by the failure to properly dispose of the source or device. Due to the diversity of the types of sources and devices, the Commission is considering the establishment of three levels of base civil penalty for loss or improper disposal. The three levels of base civil penalty would be $5500, $15,000, and $45,000. The higher tiers would be for sources that are relatively costly to dispose of and would be based on approximately three times the average cost of proper transfer or disposal of the source or device.

Agreement State Compatibility

Under the "Policy Statement on Adequacy and Compatibility of Agreement State Programs" published on September 3, 1997 (62 FR 46517), the proposed rule would be a matter of compatibility between the NRC and the Agreement States, thereby providing consistency among Agreement State and NRC requirements. The revisions to part 32 would be classified as Category B and the revisions to § 31.5 would be classified as Category C. Through this action, existing provisions of § 31.5 would also be reclassified from Category D to Category C. Although changes are being made to §§ 30.31, 30.34(h)(1), 31.1, and 31.2, and parts 170 and 171 as part of this rulemaking, the existing compatibility designations for these regulations will not be affected.

Category B means the provisions affect a program element with significant direct transboundary implications. The State program element should be essentially identical to that of NRC. Category C means the provisions affect a program element, the essential objectives of which should be adopted by the State to avoid conflicts, duplications, or gaps in the national program. The manner in which the essential objectives are addressed need not be the same as NRC provided the essential objectives are met.

Specific information about the compatibility or health and safety components assigned to this rule may be found at Office of State Programs website, http://www.hsrd.ornl.gov/nrc/home.html.

As discussed above, revised § 32.52(a) and (b) would add the following information to the existing distributors' quarterly transfer reporting requirements: the serial number and model number of the device, the date of transfer, indication if the device is a replacement (and if so, the type, model number, and serial number of the device returned), the name and license number of the reporting company, and the specific reporting period. The proposed revisions would also require the name and phone number of a general licensee's "responsible individual" rather than simply a contact and would specify that the address of the general licensee be the mailing address for the location of use. According to NRC Management Directive (MD) 5.9, "Adequacy and Compatibility of Agreement State Programs," NRC regulations that should be adopted by an Agreement State for purposes of compatibility should be adopted in a time frame such that the effective date of the State requirement is no later than 3 years after the effective date of NRC's final rule. MD 5.9 also provides that some circumstances may warrant that the States adopt certain regulations in less than the recommended 3-year time frame or that the effective dates for both NRC licensees and Agreement State licensees be the same. The Commission believes it is important to the implementation of this program, and to Agreement State programs, to begin receiving the additional information in

the distributors' quarterly transfer reports as soon as possible. The Commission requests comments on whether NRC and the Agreement States should establish a single implementation date for this provision which would be earlier than is usually allowed for revision of Agreement State rules for compatibility. One approach would be to request Agreement States to require distributors to provide all the information consistent with this rule (proposed § 32.52(a) and (b)) either coincident with the effective date of the Commission's final action on this rulemaking or within 1 year of that effective date. Agreement States would have the flexibility to adopt this provision through rulemaking, license conditions, or other legally binding requirements.

Plain Language

The Presidential Memorandum dated June 1, 1998, entitled, "Plain Language in Government Writing," directed that the government's writing be in plain language. This memorandum was published June 10, 1998 (63 FR 31883). In complying with this directive, editorial changes have been made in the proposed revisions to improve the organization and readability of the existing language of paragraphs being revised. These types of changes are not discussed further in this notice. The NRC requests comments on this proposed rule specifically with respect to the clarity and effectiveness of the language used. Comments should be sent to the address listed under the heading: **ADDRESSES** above.

Environmental Impact: Categorical Exclusion

The NRC has determined that the revisions proposed in this rule are the types of actions described in the categorical exclusions in § 51.22(c)(1) through (3). Therefore, neither an environmental impact statement nor an environmental assessment has been prepared for this regulation.

Paperwork Reduction Act Statement

This proposed rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq). This rule has been submitted to the Office of Management and Budget for review and approval of the information collection requirements.

The public reporting burden for this information collection is estimated to average 2 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. The time involved is small because most of the proposals are minor revisions to existing information collection requirements. The U.S. Nuclear Regulatory Commission is seeking public comment on the potential impact of the information collections contained in the proposed rule and on the following issues:

1. Is the proposed information collection necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?
2. Is the estimate of burden accurate?
3. Is there a way to enhance the quality, utility, and clarity of the information to be collected?
4. How can the burden of the information collection be minimized, including the use of automated collection techniques?

Send comments on any aspect of this proposed information collection, including suggestions for reducing the burden, to the Records Management Branch (T-6F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail at BJS1@NRC.GOV; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0016), Office of Management and Budget, Washington, DC 20503.

Comments to OMB on the information collections or on the above issues should be submitted by August 25, 1999. Comments received after this date will be considered if it is practical to do so, but assurance of consideration cannot be given to comments received after this date.

Public Protection Notification

If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

Regulatory Analysis

The NRC has prepared a draft regulatory analysis for this proposed regulation. The analysis examines the cost and benefits of the alternatives considered by the NRC. The comments received on the draft regulatory analysis associated with the proposed rule of December 27, 1991, have been considered to the extent that they apply to this action. The regulatory analysis is available for inspection in the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the analysis may be obtained by calling Catherine R. Mattsen, U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, DC 20555-0001; telephone (301) 415-6264; or e-mail at CRM@nrc.gov.

Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act (5 U.S.C. 605(b)), the Commission has evaluated the impact of this rule on small entities. The NRC has established standards for determining which NRC licensees qualify as small entities (10 CFR 2.810). The Commission certifies that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities. The most significant cost of this proposed rule would be the proposed $420 fee to be assessed for each registration. Portions of the proposed rule would apply to the approximately 45,000 persons possessing products under an NRC general license, many of whom may be classified as small entities. However, the annual registration requirement and associated fee would apply to about 5100 of these general licensees. Based on input received previously from small entities who hold specific materials licenses, the NRC believes that the proposed $420 part 170 registration fee would not have a significant economic impact on a substantial number of small entities. The NRC believes that the economic impact of the other proposed requirements on any general licensee would be a negligible increase in administrative burden. The NRC is soliciting comment from the general licensees who meet the NRC's small entity size standards and would be required to register their devices pursuant to part 31 on whether the proposed part 170 fee for their annual registration would have a significant economic impact on their business.

The proposed rule would also revise requirements for specifically licensed distributors of certain generally licensed devices. Currently, there are 28 NRC licensed distributors and approximately 61 Agreement State licensed distributors. Many of these licensees are not small entities and the impact to any of these distributors is not expected to be significant in any case. Distributors who are small entities are also invited to comment on whether they believe the economic impact would be significant.

Those small entities that offer comments on the potential impact on small entities and how that might be minimized should specifically include information on the type and size of their business and how the proposed

regulations would result in a significant economic impact on them as compared to larger organizations in the same business community. To the extent possible, the commenter should provide relevant economic data, such as the licensee's gross annual receipts, as well as number of employees.

Backfit Analysis

The NRC has determined that the backfit rule, § 50.109, does not apply to this proposed rule and, therefore, a backfit analysis is not required because these amendments would not involve any provisions that would impose backfits as defined in § 50.109(a)(1).

List of Subjects

10 CFR Part 30

Byproduct material, Criminal penalties, Government contracts, Intergovernmental relations, Isotopes, Nuclear materials, Radiation protection, Reporting and recordkeeping requirements.

10 CFR Part 31

Byproduct material, Criminal penalties, Labeling, Nuclear materials, Packaging and containers, Radiation protection, Reporting and recordkeeping requirements, Scientific equipment.

10 CFR Part 32

Byproduct material, Criminal penalties, Labeling, Nuclear materials, Radiation protection, Reporting and recordkeeping requirements.

10 CFR Part 170

Byproduct material, Import and export licenses, Intergovernmental relations, Non-payment penalties, Nuclear materials, Nuclear power plants and reactors, Source material, Special nuclear material.

10 CFR Part 171

Annual charges, Byproduct material, Holders of certificates, registrations, approvals, Intergovernmental relations, Non-payment penalties, Nuclear materials, Nuclear power plants and reactors, Source material, Special nuclear material.

For the reasons set out above and under the authority of the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 553, the NRC is proposing to adopt the following amendments to 10 CFR parts 30, 31, 32, 170, and 171.

PART 30—RULES OF GENERAL APPLICABILITY TO DOMESTIC LICENSING OF BYPRODUCT MATERIAL

1. The authority citation for part 30 continues to read as follows:

Authority: Secs. 81, 82, 161, 182, 183, 186, 68 Stat. 935, 948, 953, 954, 955, as amended, sec. 234, 83, Stat. 444, as amended, (42 U.S.C. 2111, 2112, 2201, 2232, 2233, 2236, 2282); secs. 201 as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846).

Sec. 30.7 also issued under Pub. L. 95–601, sec. 10, 92 Stat. 2951 as amended by Pub. L. 102–486; sec. 2902, 106 Stat. 3123, (42 U.S.C. 5851). Section 30.34(b) also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 30.61 also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

2. Section 30.31 is revised to read as follows:

§ 30.31 Types of licenses.

Licenses for byproduct material are of two types: General and specific.

(a) The Commission issues a specific license to a named person who has filed an application for the license under the provisions of this part and parts 32–36, and 39 of this chapter.

(b) A general license is provided by regulation, grants authority to a person for certain activities involving byproduct material, and is effective without the filing of an application with the Commission or the issuance of a licensing document to a particular person. However, registration with the Commission may be required by the particular general license.

3. In § 30.34, paragraph (h)(1) is revised to read as follows:

§ 30.34 Terms and conditions of licenses.

* * * * *

(h)(1) Each general licensee that is required to register by § 31.5(c)(13) of this chapter and each specific licensee shall notify the appropriate NRC Regional Administrator, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of title 11 (Bankruptcy) of the United States Code by or against:

(i) The licensee;

(ii) An entity (as that term is defined in 11 U.S.C. 101(14)) controlling the licensee or listing the license or licensee as property of the estate; or

(iii) An affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee.

* * * * *

PART 31—GENERAL DOMESTIC LICENSES FOR BYPRODUCT MATERIAL

4. The authority citation for part 31 continues to read as follows:

Authority: Secs. 81, 161, 183, 68 Stat. 935, 948, 954, as amended (42 U.S.C. 2111, 2201, 2233); secs. 201, as amended, 202, 88 Stat. 1242, as amended, 1244 (42 U.S.C. 5841, 5842).

Section 31.6 also issued under sec. 274, 73 Stat. 688 (42 U.S.C. 2021).

5. Section 31.1 is revised to read as follows:

§ 31.1 Purpose and scope.

This part establishes general licenses for the possession and use of byproduct material and a general license for ownership of byproduct material. Specific provisions of 10 CFR part 30 are applicable to general licenses established by this part. These provisions are specified in § 31.2 or in the particular general license.

6. Section 31.2 is revised to read as follows:

§ 31.2 Terms and conditions.

The general licenses provided in this part are subject to the general provisions of Part 30 of this chapter (§§ 30.1 through 30.10), the provisions of §§ 30.14(d), 30.34(a) to (e), 30.41, 30.50 to 30.53, 30.61 to 30.63, and parts 19, 20, and 21, of this chapter [1] unless indicated otherwise in the specific provision of the general license.

7. In § 31.5, paragraphs (b), (c)(5), (c)(8), and (c)(9) are revised and paragraphs (c)(12), (13), (14), and (15) are added to read as follows:

§ 31.5 Certain measuring, gauging, or controlling devices.[2]

* * * * *

(b)(1) The general license in paragraph (a) of this section applies only to byproduct material contained in devices which have been manufactured or initially transferred and labeled in accordance with the specifications contained in—

(i) A specific license issued under § 32.51 of this chapter; or

(ii) An equivalent specific license issued by an Agreement State.

(2) The devices must have been received from one of the specific licensees described in paragraph (b)(1)

[1] Attention is directed particularly to the provisions of part 20 of this chapter concerning labeling of containers.

[2] Persons possessing byproduct material in devices under a general license in § 31.5 before January 15, 1975, may continue to possess, use, or transfer that material in accordance with the labeling requirements of § 31.5 in effect on January 14, 1975.

of this section or through a transfer made under paragraph (c)(9) of this section.

(c) * * *

* * * * *

(5) Shall immediately suspend operation of the device if there is a failure of, or damage to, or any indication of a possible failure of or damage to, the shielding of the radioactive material or the on-off mechanism or indicator, or upon the detection of 0.005 microcurie or more removable radioactive material. The device may not be operated until it has been repaired by the manufacturer or other person holding a specific license to repair such devices that was issued under parts 30 and 32 of this chapter or by an Agreement State. The device may be disposed of by transfer to a person authorized by a specific license to receive the byproduct material contained in the device. A report containing a brief description of the event and the remedial action taken; and, in the case of detection of 0.005 microcurie or more removable radioactive material or failure of or damage to a source likely to result in contamination of the premises or the environs, a plan for ensuring that the premises and environs are acceptable for unrestricted use, must be furnished to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001 within 30 days. Under these circumstances, the criteria set out in § 20.1402, "Radiological criteria for unrestricted use." may be applicable, as determined by the Commission on a case-by-case basis;

* * * * *

(8)(i) Shall transfer or dispose of the device containing byproduct material only by transfer to another general licensee as authorized in paragraph (c)(9) of this section or to a person authorized to receive the device by a specific license issued under parts 30 and 32 of this chapter, part 30 of this chapter that authorizes waste collection, or equivalent regulations of an Agreement State, or as approved under paragraph (c)(8)(iii) of this section.

(ii) Shall furnish a report to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001 within 30 days after the transfer of a device to a specific licensee. A report is not required if the device is transferred to the specific licensee in order to obtain a replacement device from the same specific licensee. The report must contain—

(A) The identification of the device by manufacturer's name, model number, and serial number;

(B) The name, address, and license number of the person receiving the device; and

(C) The date of the transfer.

(iii) Shall obtain written NRC approval before transferring the device to any other specific licensee.

(9) Shall transfer the device to another general licensee only if—

(i) The device remains in use at a particular location. In this case, the transferor shall give the transferee a copy of this section and any safety documents identified in the label of the device. Within 30 days of the transfer, the transferor shall report the manufacturer's name and the model number and the serial number of the device transferred, the name and address of the transferee, and the name and phone number of the responsible individual identified by the transferee in accordance with paragraph (c)(12) of this section to have knowledge of and authority to take actions to ensure compliance with the appropriate regulations and requirements to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001; or

(ii) The device is held in storage by an intermediate person in the original shipping container at its intended location of use prior to initial use by a general licensee.

* * * * *

(12) Shall appoint an individual responsible for having knowledge of the appropriate regulations and requirements and the authority for taking required actions to comply with appropriate regulations and requirements. The general licensee, through this individual, shall ensure the day-to-day compliance with appropriate regulations and requirements. This appointment does not relieve the general licensee of responsibility in this regard.

(13)(i) Shall register, in accordance with paragraphs (c)(13)(ii) and (iii) of this section, devices containing at least 370 MBq (10 mCi) of cesium-137, 3.7 MBq (0.1 mCi) of strontium-90, 37 MBq (1 mCi) of cobalt-60, or 37 MBq (1 mCi) of americium-241 or any other transuranic, i.e., element with atomic number greater than uranium (92), based on the activity indicated on the label.

(ii) If in possession of a device meeting the criteria of paragraph (c)(13)(i) of this section, shall register these devices annually with the Commission and shall pay the fee required by § 170.31 of this chapter. Registration must be done by verifying, correcting, and/or adding to the information provided in a request for registration received from the Commission. The registration information must be submitted to the NRC within 30 days of the date of the request for registration or as otherwise indicated in the request. In addition, a general licensee holding devices meeting the criteria of paragraph (c)(13)(i) of this section is subject to the bankruptcy notification requirement in § 30.34(h) of this chapter.

(iii) In registering devices, the general licensee shall furnish the following information and any other information specifically requested by the Commission—

(A) Name and mailing address of the general licensee.

(B) Information about each device: The manufacturer, model number, serial number, the radioisotope and activity (as indicated on the label).

(C) Name and telephone number of the responsible person designated as a representative of the general licensee under paragraph (c)(12) of this section.

(D) Address at which the device(s) are used and/or stored. For portable devices, the address of the primary place of storage.

(E) Certification by the responsible representative of the general licensee that the information concerning the device(s) has been verified through a physical inventory and checking of label information.

(F) Certification by the responsible representative of the general licensee that they are aware of the requirements of the general license.

(14) Shall report changes of address (including change in name of general licensee) to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001 within 30 days of the effective date of the change. If it is a portable device, a report of address change is only required for a change in the device's primary place of storage.

(15) May not hold devices that are not in use for longer than 2 years. If devices with shutters are not being used, the shutter must be locked in the closed position. The testing required by paragraph (c)(2) of this section need not be performed during the period of storage only. However, when devices are put back into service or transferred to another person, and have not been tested within the required test interval, they must be tested for leakage before

use or transfer and the shutter tested before use.

* * * * *

PART 32—SPECIFIC DOMESTIC LICENSES TO MANUFACTURE OR TRANSFER CERTAIN ITEMS CONTAINING BYPRODUCT MATERIAL

8. The authority citation for part 32 continues to read as follows:

Authority: Secs. 81, 161, 182, 183, 68 Stat. 935, 948, 953, 954, as amended (42 U.S.C. 2111, 2201, 2232, 2233); sec. 201, 88 Stat. 1242, as amended (42 U.S.C. 5841).

9. In § 32.51, paragraphs (a)(4) and (5) are added to read as follows:

§ 32.51 Byproduct material contained in devices for use under § 31.5; requirements for license to manufacture, or initially transfer.

(a) * * *

(4) Each device having a separable source housing that provides the primary shielding for the source also bears, on the source housing, a durable label containing the device model number and serial number, the isotope and quantity, the words, "Caution—Radioactive Material," the radiation symbol described in § 20.1901 of this chapter, and the name of the manufacturer or initial distributor.

(5) Each device meeting the criteria of § 31.5(c)(13)(i) of this chapter, bears a permanent (e.g., embossed, etched, stamped, or engraved) label affixed to the source housing if separable, or the device if the source housing is not separable, that includes the words, "Caution—Radioactive Material," and, if practicable, the radiation symbol described in § 20.1901 of this chapter.

* * * * *

10. Section 32.51a is revised to read as follows:

§ 32.51a Same: Conditions of licenses.

(a) If a device containing byproduct material is to be transferred for use under the general license contained in § 31.5 of this chapter, each person that is licensed under § 32.51 shall provide the information specified in this paragraph to each person to whom a device is to be transferred. This information must be provided before the device may be transferred. In the case of a transfer through an intermediate person, the information must also be provided to the intended user prior to initial transfer to the intermediate person. The required information includes—

(1) A copy of the general license contained in § 31.5 of this chapter;

(2) A copy of §§ 31.2, 30.51, 20.2201, and 20.2202 of this chapter;

(3) A list of the services that can only be performed by a specific licensee; and

(4) Information on acceptable disposal options including estimated costs of disposal.

(b) If byproduct material is to be transferred in a device for use under an equivalent general license of an Agreement State, each person that is licensed under § 32.51 shall provide the information specified in this paragraph to each person to whom a device is to be transferred. This information must be provided before the device may be transferred. In the case of a transfer through an intermediate person, the information must also be provided to the intended user prior to initial transfer to the intermediate person. The required information includes —

(1) A copy of the Agreement State's regulations equivalent to §§ 31.5, 31.2, 30.51, 20.2201, and 20.2202 of this chapter or a copy of §§ 31.5, 31.2, 30.51, 20.2201, and 20.2202 of this chapter. If a copy of the NRC regulations is provided to a prospective general licensee, it shall be accompanied by a note explaining that use of the device is regulated by the Agreement State;

(2) A list of the services that can only be performed by a specific licensee;

(3) Information on acceptable disposal options including estimated costs of disposal; and (4) The name, address, and phone number of the contact at the Agreement State regulatory agency from which additional information may be obtained.

(c) Each device that is transferred after (insert date 1 year after the effective date of this rule) must meet the labeling requirements in § 32.51(a)(3) through (5).

(d) If a notification of bankruptcy has been made under § 30.34(h) or the license is to be terminated, each person licensed under § 32.51 shall provide, upon request, to the NRC and to any appropriate Agreement State, records of final disposition required under § 32.52(c).

11. Section 32.52 is revised to read as follows:

§ 32.52 Same: Material transfer reports and records.

Each person licensed under § 32.51 to initially transfer devices to generally licensed persons shall comply with the requirements of this section.

(a) The person shall report all transfers of devices to persons for use under the general license in § 31.5 of this chapter to the Director of the Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001. The report must be submitted on a quarterly basis on Form 653—"Transfers of Industrial Devices Report" or in a clear and legible report containing all of the data required by the form.

(1) The required information includes—

(i) The identity of each general licensee by name and mailing address for the location of use;

(ii) The name and phone number of the person identified by the general licensee as having knowledge of and authority to take required actions to ensure compliance with the appropriate regulations and requirements;

(iii) The date of transfer;

(iv) The type, model number, and serial number of the device transferred; and

(v) The quantity and type of byproduct material contained in the device.

(2) If one or more intermediate persons will temporarily possess the device at the intended place of use before its possession by the user, the report must include the same information for both the intended user and each intermediate person, and clearly designate the intermediate person(s).

(3) If a device transferred replaced another returned by the general licensee, the report must also include the type, model number, and serial number of the one returned.

(4) The report must cover each calendar quarter, must be filed within 30 days of the end of the calendar quarter, and must clearly indicate the period covered by the report.

(5) The report must clearly identify the specific licensee submitting the report and include the license number of the specific licensee.

(6) If no transfers have been made to persons generally licensed under § 31.5 of this chapter during the reporting period, the report must so indicate.

(b) The person shall report all transfers of devices to persons for use under a general license in an Agreement State's regulations that are equivalent to § 31.5 of this chapter to the responsible Agreement State agency. The report must be submitted on Form 653—"Transfers of Industrial Devices Report" or in a clear and legible report containing all of the data required by the form.

(1) The required information includes—

(i) The identity of each general licensee by name and mailing address for the location of use;

(ii) The name and phone number of the person identified by the general licensee as having knowledge of and

authority to take required actions to ensure compliance with the appropriate regulations and requirements;

(iii) The date of transfer;

(iv) The type, model number, and serial number of the device transferred; and

(v) The quantity and type of byproduct material contained in the device.

(2) If one or more intermediate persons will temporarily possess the device at the intended place of use before its possession by the user, the report must include the same information for both the intended user and each intermediate person, and clearly designate the intermediate person(s).

(3) If a device transferred replaced another returned by the general licensee, the report must also include the type, model number, and serial number of the one returned.

(4) The report must be submitted within 30 days after the end of each calendar quarter in which such a device is transferred to the generally licensed person and clearly indicate the period covered by the report.

(5) The report must clearly identify the specific licensee submitting the report and must include the license number of the specific licensee.

(6) If no transfers have been made to a particular Agreement State during the reporting period, this information shall be reported to the responsible Agreement State agency upon request of the agency.

(c) The person shall keep records of all transfers of devices for each general licensee including all the information in the reports required by this section and records of final disposition. Records required by this paragraph must be maintained for a period of 3 years following the estimated useful life of the device or the date of final disposition, if known.

PART 170—FEES FOR FACILITIES, MATERIALS, IMPORT AND EXPORT LICENSES, AND OTHER REGULATORY SERVICES UNDER THE ATOMIC ENERGY ACT OF 1954, AS AMENDED

12. The authority citation for part 170 continues to read as follows:

Authority: 31 U.S.C. 9701; sec. 301, Pub. L. 92—314, 86 Stat. 222 (42 U.S.C. 2201w); sec. 201, 88 Stat. 1242, as amended (42 U.S.C. 5841); sec. 205, Pub. L. 101–576, 104 Stat. 2842, (31 U.S.C. 9012).

13. Section 170.2 is amended by adding a paragraph (r) to read as follows:

§ 170.2 Scope.

* * * * *

(r) A holder of a general license granted by 10 CFR part 31 who is required to register a device(s).

14. In § 170.3, the definition of *Materials License* is revised to read as follows:

§ 170.3 Definitions.

* * * * *

Materials License means a license, certificate, approval, registration, or other form of permission issued or granted by the NRC pursuant to the regulations in 10 CFR parts 30, 31 through 36, 39, 40, 61, 70, 71 and 72.

* * * * *

15. Section 170.31 is amended by adding a fee category, 3. Q. to the schedule of materials fees and amending footnote 1 to add a paragraph (f).

§ 170.31 Schedule of fees for materials licenses and other regulatory services, including inspections, and import and export licenses.

* * * * *

SCHEDULE OF MATERIALS FEES

[See footnotes at end of table]

Category of materials licenses and type of fees [1]	Fee [2,3]
* * * * *	
3. * * *	
Q. Registration of a device(s) generally licensed pursuant to Part 31	$420
* * * * *	

[1] Types of fees.

* * *

(f) Generally licensed device registrations under 10 CFR 31.5. Submittals of registration information must be accompanied by the prescribed fee.

* * * * *

PART 171—ANNUAL FEES FOR REACTOR OPERATING LICENSES, AND FUEL CYCLE LICENSES AND MATERIALS LICENSES, INCLUDING HOLDERS OF CERTIFICATES OF COMPLIANCE, REGISTRATIONS, AND QUALITY ASSURANCE PROGRAM APPROVALS AND GOVERNMENT AGENCIES LICENSED BY THE NRC

16. The authority citation for part 171 continues to read as follows:

Authority: Sec. 7601, Pub. L. 99–272, 100 Stat. 146, as amended by sec. 5601, Pub. L. 100–203, 101 Stat. 1330, as amended by sec. 3201, Pub. L. 101–239, 103 Stat. 2106 as amended by sec. 6101, Pub. L. 101–508, 104 Stat. 1388 (42 U.S.C. 2213); sec. 301, Pub. L. 92–314, 86 Stat. 222 (42 U.S.C. 2201(w)); sec. 201, 88 Stat. 1242 as amended (42 U.S.C. 5841; sec. 2903, Pub. L. 102–486, 106 Stat. 3125 (42 U.S.C. 2214 note).

17. In § 171.5, the definition of Materials License is revised to read as follows:

§ 171.5 Definitions.

* * * * *

Materials License means a license, certificate, approval, registration, or other form of permission issued or granted by the NRC pursuant to the regulations in 10 CFR parts 30, 31 through 36, 39, 40, 61, 70, 71, and 72.

* * * * *

18. In § 171.16, paragraph (d) is amended by adding a fee category, 3. Q. to the schedule of annual fees.

§ 171.16 Annual fees: Material Licensees, Holders of Certificates of Compliance, Holders of Sealed Source and Device Registrations, Holders of Quality Assurance Program Approvals and Government Agencies Licensed by the NRC.

* * * * *

(d) * * *

SCHEDULE OF MATERIALS ANNUAL FEES AND FEES FOR GOVERNMENT AGENCIES LICENSED BY NRC

[See footnotes at end of table]

Category of materials license	Annual fees [1,2,3]
* * * * *	
3. * * *	
Q. Registration of devices generally licensed pursuant to part 31	[11]N/A
* * * * *	

[11] No annual fee is charged for this category since the cost of the general license registration program will be recovered through 10 CFR part 170 fees.

Dated at Rockville, MD., this 19th day of July, 1999.

For the Nuclear Regulatory Commission.

J. Samuel Walker,

Acting Secretary of the Commission.

[FR Doc. 99–18981 Filed 7–23–99; 8:45 am]

BILLING CODE 7590–01–P

DEPARTMENT OF THE ARMY
SENECA ARMY DEPOT ACTIVITY
Authority for Possession and Use of Radioactive Materials

In reliance on statement and representation made by the applicant, authority is hereby granted to receive, possess, use, and store the material(s) designated in item 5. This authority is subject to conditions specified below:

---

1. COMPANY GRANTED AUTHORITY
Maxim Technologies, Inc.

2. 2415 Triphammer Road
Suite 3
Ithaca, NY 14850

3. AUTHORITY/PERMIT #
99-001

4. EXPIRATION DATE:
18 September 1999

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5. MATERIAL	CHEMICAL or PHYSICAL FORM	QUANTITY LIMITATION
a. Cesium 137	a. Sealed sources	a. See condition 6.
b. Americium241: Beryllium	b. Sealed sources	b. See condition 6.

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6. AUTHORIZED USE:

a. Maxim Technologies, Inc., and its employees, agree to comply with all of the conditions in current New York State Radioactive Materials License number 2500-3613 (attachment #1) while using the sealed sources or associated portable moisture / density gauges on Seneca Army Depot Activity (SEDA).
b. Maxim Technologies, Inc. will notify the Installation Radiation Protection Officer, John F. Cleary, at (607) 869-1235, when licensed materials will be brought on to Seneca Army Depot property.
c. Licensed materials shall be used by, or under the supervision of Thomas A. Hamilton (Radiation Safety Officer for Maxim Technologies, Inc.) by licensed personnel, trained and certified by the device manufacturer. A list of licensed operators and their certification expiration date will be provided to the Installation Radiation Protection Officer.

d. To satisfy Condition 10 of aforementioned NY state license number 2500-3613, a safe and secure structure may be provided by SEDA to Maxim Technologies, Inc. to safely store the radioactive materials while being used on SEDA.
e. Maxim Technologies, Inc. acknowledges the rights of the Army as landowner to periodically inspect the job site for proper use and storage of licensed materials.
f. In the case of radiological contamination as a result of authorized operations or an accident, Maxim Technologies, Inc. agrees to notify the Installation Radiation Protection Officer or the Commander, Seneca Army Depot Activity, immediately. Any decontamination required will be the responsibility of Maxim Technologies, Inc.

DATE: 6 Apr 99

APPROVED:

Donald C. Olson
LTC, U.S. Army
Commanding Officer

MAXIM
TECHNOLOGIES INC

Empire Soils Investigations, Inc., Division
2415 N. Triphammer Rd., Suite 3
Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-6409

April 5, 1999

To Whom It May Concern:

Maxim Technologies of NY, Inc. has been hired as a sub-contractor by URS/Griner to perform construction testing for NYSOGS at the Seneca Army Depot in Romulas, NY.

Our Engineering Technicians are trained and certified to use nuclear density gauges in performance of soil compaction testing in accordance with manufactures and NY State Department of Labor procedures.

Sincerely,

Maxim Technologies of NY, Inc.

Thomas Hamilton

Thomas A. Hamilton
Office Manager

TAH:lw

STATE OF NEW YORK
DEPARTMENT OF LABOR
DIVISION OF SAFETY AND HEALTH
Radiological Health Unit
Building #12, Room 457
State Office Building Campus
Albany, NY 12240

April 4, 1997

Thomas Hamilton
Radiation Safety Officer
Maxim Technologies
2415 N. Triphammer Rd. Suite 3
Ithaca, NY 14850

License # 2500-3613
Reference 3
Amendment -
DL # 97-039

Dear Mr. Hamilton:

Enclosed is the renewal of your New York State Department of Labor Radioactive Materials License number 2500-3613, authorizing the possession of radioactive materials in the types and amounts specified for the uses indicated. All activities conducted under this license shall be governed by the provisions of Industrial Code Rule 38 (12 NYCRR 38) and by the specific conditions of the license. You should read these documents carefully to familiarize yourself with all applicable requirements including any statements, representations and procedures contained in documents specified in License Condition 22, to which you have committed as part of the licensing review process. These requirements should also be included in the initial and annual refresher training provided to all employees who use licensed material.

Your program will be evaluated periodically by inspectors from the Radiological Health Unit. A copy of this license (including amendments) must be maintained at the address indicated in License Condition 2, along with other required records, for their review.

If you have any questions please do not hesitate to contact this office.

Sincerely,

Desmond C. Gordon
Assoc. Radiophysicist

encl: License

FAX: 518-457-5545

STATE OF NEW YORK - DEPARTMENT OF LABOR
DIVISION OF SAFETY AND HEALTH

RADIOACTIVE MATERIALS LICENSE

DL 97-039

PURSUANT TO THE LABOR LAW AND INDUSTRIAL CODE RULE 38, AND IN RELIANCE ON STATEMENTS AND REPRESENTATIONS HERETOFORE MADE BY THE LICENSEE DESIGNATED BELOW, A LICENSE IS HEREBY ISSUED AUTHORIZING SUCH LICENSEE TO RECEIVE, POSSESS, USE AND TRANSFER RADIOACTIVE MATERIAL(S) DESIGNATED BELOW; AND TO USE SUCH RADIOACTIVE MATERIAL(S) FOR THE PURPOSE(S) AND AT THE PLACE(S) DESIGNATED BELOW. THIS LICENSE IS SUBJECT TO ALL APPLICABLE RULES, REGULATIONS, AND ORDERS NOW OR HEREAFTER IN EFFECT OF ALL APPROPRIATE REGULATORY AGENCIES AND TO ANY CONDITIONS SPECIFIED BELOW.

1. NAME OF LICENSEE	3. LICENSE NUMBER
Maxim Technologies, Inc FEIN:13-6108582 PHONE:(607)266-0147	2500-3613
2. ADDRESS OF LICENSEE	4. EXPIRATION DATE
2415 North Triphammer Rd. Suite 3 Ithaca, NY 14850	March 31, 2000
	5a. REFERENCE No. b. AMENDMENT No 3 ---

6. RADIOACTIVE MATERIALS (element in mass number)	7. CHEMICAL AND/OR PHYSICAL FORM	8. MAXIMUM QUANTITY LICENSEE MAY POSSESS AT ANY ONE TIME
A. Cesium 137	A. Sealed Sources	A. See Condition 9.
B. Americium 241: Beryllium	B. Sealed Sources	B. See Condition 9.

9. Authorized use:
Conditions 6.A. and 6.B.

1. The licensee is authorized to use any sealed source, or associated portable moisture/density gauge which has been manufactured and distributed in accordance with a specific license issued by an Agreement State or the United States Nuclear Regulatory Commission. Combinations of sources and devices must be compatible for use as stated in a Sealed Source and Device Registration Certificate (i.e. stated in the registration certificate for the source or device).

2. No single source may exceed the maximum activity specified for that nuclide in the Sealed Source and Device Registration Certificate for any device in which the source is to be used.

3. License Number 2500-3613 5a. Ref. No. -3- b. Amend. No. ----

10. A. Licensed material shall be stored at 2415 N. Triphammer Rd. Suite 3, Ithaca, NY 14850, and may be used at temporary job sites of the licensee anywhere within the State of New York, where the Department of Labor exercises jurisdiction.

B. Overnight storage at other locations shall be in accordance with statements referenced in Condition 22 herein, providing that such storage may not be in a residence, or in an attached garage except within a vehicle. Any vehicle used for storage shall be driven only for purposes associated with use or transport of the contained radioactive material, by a person qualified to use the material, and no passengers shall be carried unless they are also involved in work under this license. Vehicular storage shall only be allowed if no other storage is possible and shall not exceed five (5) consecutive nights unless authorization to exceed this limit is obtained from the Department.

C. Under no circumstances shall radioactive material authorized by this license be transferred to the custody of any person or firm other than the licensee, or be used or stored by another person or firm or its employees; unless that person or firm possesses a valid license to possess and use such radioactive material.

11. Licensed material shall be used by, or under the supervision of **Thomas A. Hamilton** (Radiation Safety Officer), by licensee personnel trained and certified by the device manufacturer. The licensee shall maintain a complete and accurate record of the qualifications of each person permitted to use radiation sources under this license.

12. Sealed Sources containing radioactive materials shall not be opened or removed from the licensed gauge by the licensee.

13. A. The licensee is not authorized to dismantle, repair or effect any changes in the source holders/gauges.

B. The licensee shall not alter labels attached to gauges, and shall maintain labels in legible condition at all times.

14. The licensee shall instruct persons who engage in work under the license, in accordance with section 38.27(c) of Code Rule 38. Such instruction shall include the licensee's operating and emergency procedures, and other information contained in documents incorporated in Condition 22.

3. License Number 2500-3613- 5a. Ref. No. -3- b. Amend. No. ----

15. The licensee shall conduct a physical inventory every six (6) months to account for all Gauges received and possessed under the License. The records of the inventories shall be maintained for three (3) years from the date of the inventory for inspection by the Department, and shall include the quantities and kinds of licensed material, Manufacturer's Name and Model No., location of the gauges, the date of the inventory and the name of the person who performed it.

16. A. The licensee shall maintain a utilization log containing the identification of sources used, dates removed and returned to storage, the location of use, and the identity of user.

B. The log shall be kept at the location of storage and shall contain sufficient detail to enable the licensee to inform the Department at any time, of the exact location of each source.

17. Current copies of the following documents shall be maintained at temporary job sites for Department inspection:

i) The manufacturer's instruction manual and the licensee's operating and emergency procedures.

ii) A copy of the results of the latest test for leakage and/or contamination performed on the sealed sources.

18. In the event that a theft, loss or other serious incident does occur, the Department shall be notified immediately by telephone and subsequent information acquired by the licensee shall be reported as it is received. All gauge users must carry the NYSDOL's current telephone number in their emergency procedures.

19. The licensee shall ensure that all persons authorized to use portable gauges comply with safe use and maintenance procedures and that they do not leave a gauge unattended or unsecured at any time, even for a few minutes.

20. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in Section 38.7 of 12 NYCRR 38 for establishing decommissioning financial assurance.

STATE OF NEW YORK - DEPARTMENT OF LABOR
DIVISION OF SAFETY AND HEALTH

RADIOACTIVE MATERIALS LICENSE

3. License Number 2500-3613 5a. Ref. No. -3- b. Amend. No. ----

21. Within fifteen (15) days of the purchase of any device containing sealed sources of licensed radioactive material, the licensee shall submit to the Department written assurance from the manufacturer of the device that the manufacturer will accept the return of the radioactive sources for disposal.

22. Except as specifically provided otherwise in this License, the licensee shall conduct its program in accordance with the statements, representation and procedures contained in the documents, including any enclosures, listed below. The Department's Regulations shall govern, unless the statements, representation and procedures in the licensee's application and correspondence are more restrictive than the Regulations.

A. License Renewal Request dated January 1, 1997, signed by John Berry, PE, President, with attachments.

B License Renewal Application dated February 1997, signed by John Berry, PE, President, with attachments.

John E. Sweeney
COMMISSIONER OF LABOR

DATE: 4/4/97
DCD:wp

by: Clayton J. Bradt
Associate Radiophysicist

Q/C RESOURCE

Training Course Certification

This is to certify that

Michel Nabogis

has successfully completed the user's course as required by the U.S. Nuclear Regulatory Commission and the Agreement States, in the Fundamentals of Safety and Gage operation, for the use of nuclear moisture/density equipment. The course covered:

Atomic Physics	*Transportation*	*Operation*
Radiation Safety	*RIsk*	*Field Applications*
Dose/Shielding Calculations	*ALARA*	*Calibration*
Accidents/Storage	*Measurement Theory*	*Maintenance*

April 27, 1998
Date of Training

1881
Certificate Number

Philip C. Palilla
Instructor - Philip C. Palilla
Manufacturer's Rep

MICHAEL NABOGLS

has successfully completed initial training for Driver Qualifications as required under 49 CFR 172 Subpart H

Michael Nabogis

Employee Signature

100-40-2116

Social Security Number

I hereby certify that the above named employee has been provided with training on general awareness, familiarization, function - specific, safety and driver training for handling and transporting hazardous materials on 4/27/98

Training was both written and oral.

Exp.Date 4/27/2001

Philip C. Palilla

Q/C Resource Instructor

DEPARTMENT OF THE ARMY
SENECA ARMY DEPOT ACTIVITY
5786 STATE RTE 96, P.O. BOX 9
ROMULUS, NEW YORK 14541-0009

April 3, 2003

REPLY TO
ATTENTION OF
BRAC Field Office

Ms. Elizabeth Ullrich
United States Nuclear Regulatory Commission
Region 1
Division of Nuclear Materials Safety
Nuclear Materials Safety Branch 2
475 Allendale Road
King of Prussia, PA 19406-1415

Mail Control No. 132746

Dear Ms. Ullrich,

Thank you for the NRC's quick response to our request for concurrence to our license termination plan for NRC license SUC-1275. In response to your questions in your March 13, 2003 letter the following clarification is provided:

1. The comment concerning Section 2.2.1 referring to "present day standards", refers to the prevailing dose criterion, either the NRC's 25 mrem/yr standard, or New York State's 10 mrem.yr standard. Since none of the license termination areas were former release sites, the question of what standard would apply never arose.

2. The comment concerning Section 5.4.2 refers to the survey unit sizes for building 612. Based on a review of the raw data collected we now propose reclassifying building 612 from Class 1 to Class 2. All references in the Plan will be changed to reflect this reclassification.

3. In regards to your comment on storage bunkers, it is our intent that each storage bunker be surveyed as a separate Class 3 survey unit.

4. This comment addresses text in Sec 5.4.2 of the Plan that states that contamination, if present, is expected to be confined to floors for all buildings, and further states that walls and ceilings in all buildings will receive only biased scanning surveys. The comment correctly points out that for rooms classified as Class 1 and Class 2 require direct samples to be collected from all surfaces including walls and perhaps ceilings. Affected buildings include 612 (previous Class 1), and buildings 5, 306, 2073, and S-2084, portions of which include a total of 21 Class 2 survey units. However, while the Plan did not explicitly call for such samples, systematic direct measurements on walls and ceilings were taken in the actual surveys conducted of these survey units. This sampling will be reviewed for sufficiency for supporting the pre-designated survey unit classification. If

insufficient sampling was conducted, additional sampling will be done in the affected surfaces. The Plan will be revised to reflect the requirement for the collection of such measurements in Class 1 and 2 survey units.

5. The comment asks that Sec 5.4 address the classification of soil survey areas outside of buildings. Sec 5.5.1.2 indicates that all storage bunkers "and surrounding grounds" will be surveyed as Class 3 areas. Sec 5.4 currently does not address outdoor survey units or their classification. During the surveys that were conducted of the storage bunkers and other buildings, no evidence of contamination was apparent. On this basis, it was concluded that contamination of surrounding grounds was highly unlikely. Therefore, no soil areas were surveyed or direct measurements taken. It is proposed that outdoor areas be classified as un-impacted under MARSSIM. Sec 5.4 will be revised to reflect this classification of outdoor areas.

6.a. The comment indicates that some survey parameters might change, e.g., the required number of direct measurements in a survey unit, if final DCGLs are different from those in the Plan. It appears that such changes are unlikely, as the Plan over-specified by about 50% the number of samples required as compared to what MARSSIM calculations indicated. Further, the revised DCGLs are, for the most part, somewhat higher than the original values and would require fewer samples than indicated in the Plan. In any case, the sufficiency of sampling will be reviewed upon final approval of DCGLs.

6.b. This comment, in reference to Table 5-4, raises the issue of data quality assessment (DQA). DQA requires reviewing the sufficiency of the data collected after the fact when the actual coefficient of variance (CV) of measurements is known. The Plan assumed an initial CV of 30% as suggested in MARSSIM. While the sample numbers specified are expected to prove to be sufficient, data quality assessment will be performed to verify the CV assumption and the sufficiency of sample numbers using the results of the collected data.

The plan will be revised to incorporate these changes and any additional changes on the proposed DCGLs, when they become available. We look forward to working with the NRC on this issue of great importance to the United States Army.

Sincerely,

Stephen M. Absolom
Commander's Representative

DEPARTMENT OF THE ARMY
SENECA ARMY DEPOT ACTIVITY
5786 STATE RTE 96, P.O. BOX 9
ROMULUS, NEW YORK 14541-0009

February 11, 2003

REPLY TO
ATTENTION OF

Caretaker Office

Ms. Elizabeth Ullrich
United States Nuclear Regulatory Commission
Region I
Division of Nuclear Materials Safety
Nuclear Materials Safety Branch 2
475 Allendale Road
King of Prussia, PA 19406-1415

Dear Ms. Ullrich:

This letter is a request from the license holder of NRC license SUC-1275 for approval of the enclosed License Termination and License Release Plan dated January 2003. Enclosed also is a CD containing the document on Microsoft Word format, as well as the relevant back-up material for the RESRAD modeling that was performed in developing this plan.

We appreciate your efforts and those of others on the NRC staff in assisting us in getting this document to this point. We look forward to gaining your approval of this plan and the timely termination of this license.

Feel free to contact Mr. John F. Cleary, Installation Radiation Safety Officer, with any questions concerning this submission, at (607) 869-1235/1309.

Enclosure

STEPHEN M. ABSOLOM
Commander's Representative

File - Scope of Work NRC License Close out

APPENDIX A

ANNEX ?

RAD SURVEYS:

PERFORMANCE OF FINAL STATUS SURVEYS

AT THE RADIOLOGICAL SURVEY SITES,

SENECA ARMY DEPOT ACTIVITY, ROMULUS, NEW YORK

1.0 GENERAL STATEMENT OF SERVICES

1.1 Background.

1.1.1 General. As part of its continuing program of evaluating its hazardous waste management practices, the Army is performing remedial activities at Seneca Army Depot Activity (SEDA). A Final Status Survey and License Termination Report is required at several sites prior to closure and termination of SEDA's Nuclear Regular Commission (NRC) license. The U.S. Army Corps of Engineers, Huntsville Division, is contracting for the required work.

1.1.2 Site Description. NRC license-related activities occurred in 6 buildings and 121 ammunition storage igloos as listed in Table 1.

1.2 Location. SEDA is a US Army facility located in Seneca County, New York. SEDA occupies approximately 10,600 acres. It is bounded on the west by State Route 96A and on the east by State Route 96. The cities of Geneva and Rochester are located to the northwest (14 and 50 miles, respectively); Syracuse is 53 miles to the northeast and Ithaca is 31 miles to the south. The surrounding area is generally used for farming.

1.3 Regulatory Status. SEDA was included on the Federal Facilities National Priorities List on 13 July 1989. Consequently, all work to be performed under this contract shall be performed according to CERCLA guidance and the Federal Facilities Agreement in effect for Seneca Army Depot (Reference 12.2). Additionally, all work shall be performed in conformance with Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) requirements.

1.4 Basis of this Investigation. The RI/FS Work Plan prepared by Parsons Engineering Science, Inc., for the Radiological Waste Sites RI (References 12.3 and 12.4), the License Termination Plan prepared by Argonne National Labs, the Work Plan prepared and approved as part of this Task Order and MARSSIM guidance will be the basis under which the survey activities under this Statement of Work (SOW) will be carried out.

TABLE 1

LIST OF BUILDINGS/STRUCTURES WHERE NRC LICENSE-RELATED ACTIVITIES OCCURRED

BUILDINGS	BLD 612	BLD 5	BLD 306	BLD S-2084	BLD 2073	WAREHOUSE 356			
IGLOOS	A0201	B0109	C0203	D0104	E0103				
	A0316	B0411	C0303	D0105	E0105				
	A0317	B0501	C0307	D0107	E0112				
	A0508	B0602	C0308	D0108	E0211				
	A0701 (b)	B0603	C0401	D0110	E0301				
	A0706	B0609	C0403	D0113	E0302				
	A0707	B0610	C0405	D0206	E0303				
	A0710	B0701	C0406	D0207	E0312				
	A0711	B0705	C0407	D0305	E0402				
	A0901	B0707	C0408	D0306	E0410				
	A0905	B0708	C0501	D0312	E0411				
	A1108	B0709	C0503	D0401	E0413				
	A1109	B0711	C0504	D0406	E0504				
		B0801	C0505	D0407	E0506				
		B0802	C0508	D0413	E0508				
		B0804	C0510	D0601	E0510				
		B0809	C0511	D0604	E0512				
		B0810	C0513	D0607	E0602				
		B0811	C0603	D0704	E0604				
		B0909	C0604	D0705	E0609				
			C0605	D0711	E0610				
			C0606	D0712	E0702				
			C0608	D0801	E0706				
			C0701	D0805	E0711				
			C0706		E0801				
			C0707		E0802				
			C0708		E0801				
			C0801		E0802				
			C0803						
			C0807						
			C0809						
			C0901						
			C0902						
			C0906						
			C0907						
			C0908						
			C0909						
			C0912 ©						

(a) Except as otherwise indicated, bunkers were used for storage of packaged DU ammunition under SUC-1275.

(b) A0701 was used for storage of light anti tank rockets containing promethium-147 under BML 12-00722-07

(c) Bunker C0912 is a control bunker to establish radiological background levels.

2.0 OBJECTIVE

The objective of this Statement of Work is to plan and perform a Final Status Survey at the facilities listed in Table 1 as defined by MARSSIM guidance. Additionally, a License Termination Report shall be prepared to support license termination efforts.

3.0 DETAILED DESCRIPTION OF SERVICES

3.1 General Requirements. All work performed by the A-E shall be designed and implemented in a manner which complements earlier investigations and shall conform to this SOW, the approved Work Plans and the requirements of EPA, NYSDEC and SEDA. In the event that any conflicts arise, it will be the Huntsville Division Project Manager's responsibility to assure resolution. All work shall be performed under the general supervision of a Professional Engineer registered in the State of New York.

3.2 (Task 1) Site Visit and Historical Records Review. The A-E shall visit the affected sites for the purpose of gaining familiarity with the physical characteristics of each. Additionally, the A-E shall review pertinent records and prior investigations as provided to determine the extent of previous work and plan the additional work required to close out this site according to MARSSIM. Most importantly, the A-E shall use the initial Work Plan prepared by Argonne National Labs as a basis for the work to be performed under this Task Order.

3.3 (Task 2) Preparation of a Final Status Survey Work Plan. The A-E shall prepare a Work Plan (Draft, Draft-Final and Final) which completely lays out the sampling and analysis required to perform the Final Status Survey at the subject sites. The Work Plan shall include historical data and analysis thereof so as to provide the complete rationale for the sampling proposed. Drawing on the classification work performed so far by Argonne National Labs, the A-E shall lay out the process and steps required to achieve complete closure of the site according to MARSSIM so that the regulators can see the process envisioned and provide input.

3.4 (Task 3) Final Status Survey Field Investigations. "To Be Determined" following completion of the Draft-Final version of the Work Plan prepared under Task 2.

3.5 (Task 4) Final Status Survey Report. "To Be Determined" following completion of the Draft-Final version of the Work Plan prepared under Task 2.

3.6 (Task 5) Preparation of License Termination Report. The A-E shall

prepare a License Termination Report which presents a complete summation of the background of the sites, the classification and sampling efforts performed and the results and conclusions of the overall effort.

3.7 (Task 6) Project Management. The A-E shall, during the life of this Delivery Order (DO), manage the DO in accordance with Appendix A of the basic contract SOW. The A-E shall perform all project management associated with this DO as a part of this task including, but not limited to, preparing and submitting a master network schedule, cost and manpower plan, monthly progress reports, monthly individual performance report and cost/schedule variance report, work task proposals and a program plan in accordance with Section 4.5 of Appendix A to the basic contract SOW.

4.0 SUBMITTALS AND PRESENTATIONS

4.1 Format and Content. All reports shall present data, analyses, and recommendations and shall be prepared in accordance with the suggested Format as presented in the RI/FS Guidance Manual. All drawings shall be of engineering quality in drafted form with sufficient details to show interrelations of major features on the installation site map. When drawings are required, data may be combined to reduce the number of drawings. The report shall consist of 8-½ x 11" pages with drawings folded, if necessary, to this size. A decimal paragraphing system shall be used, with each section and paragraph of the reports having a unique decimal designation. The report covers shall consist of vinyl 3-ring binders and shall hold pages firmly while allowing easy removal, addition, or replacement of pages. A report title page shall identify the A-E, the Corps of Engineers, Huntsville Division, and the data. The A-E identification shall not dominate the title page. Each page of draft and draft-final reports shall be stamped "DRAFT" and "DRAFT-FINAL", respectively. Each report shall identify the members and title of the A-E's staff which had significant, specific input into the report's preparation or review. Submittals shall include incorporation of all previous review comments accepted by the A-E as well as a section describing the disposition of each comment. Disposition of comments submitted with the final report shall be separate from the report document. All final submittals shall be sealed by the registered Professional Engineer-In-Charge.

4.2 Presentations. The A-E shall make presentations of work performed according to the schedule in paragraph 4.6. Each presentation shall consist of a summary of the work accomplished and anticipated followed by an open

discussion among those present. The A-E shall provide a minimum of two persons at the meetings which are expected to last one day each.

4.3 Conference Minutes. The A-E shall be responsible for taking notes and preparing the minutes of all conferences, presentations, and review meetings. Conference notes shall be prepared in typed form and the original furnished to the Contracting Officer (within five (5) working days after date of conference) for concurrence and inclusion in the next monthly report. This report shall include the following items as a minimum:

a. The date and place the conference was held with a list of attendees. The roster of attendees shall include name, organization, and telephone number;

b. Written comments presented by attendees shall be attached to each report with the conference action noted. Conference action as determined by the Government's Project Manager shall be "A" for an approved comment, "D" for a disapproved comment, "W" for a comment that has been withdrawn, and "E" for a comment that has an exception noted;

c. Comments made during the conference and decisions affecting criteria changes must be recorded in the basic conference notes. Any augmentation of written comments should be documented by the conference notes.

4.4 Confirmation Notices. The A-E shall be required to provide a record of all discussions, verbal directions, telephone conversations, etc., participated in by the A-E and/or representatives on matters relative to this contract and the work. These records, entitled "Confirmation Notices", shall be numbered sequentially and shall fully identify participating personnel, subject discussed, and any conclusions reached. The A-E shall forward to the Contracting Officer as soon as possible (not more than five (5) work days), a reproducible copy of said confirmation notices. Distribution of said confirmation notices shall be made by the Government.

4.5 Progress Reports and Charts. The A-E shall submit progress reports to the Contracting Officer with each request for payment. The progress reports shall indicate work performed and problems incurred during the payment period. Upon award of this delivery order, the A-E shall, within 15 days, prepare a progress chart to show the proposed schedule for completion of the project. The progress chart shall be prepared in reproducible form and submitted to the Contracting Officer for approval. The actual progress shall be updated and submitted by the 15th of each month and may be included with the request for payment.

4.6 Proposed Schedule. The proposed schedule for the Final Status Survey is given below. All work and services under Appendix A, Annex ?, shall be completed by 31 December 2002.

Milestone	Date
Assumed Notice To Proceed	11 May 01
Draft FSS Work Plan	29 Jun 01
Comments to A-E	20 Jul 01
Draft-Final FFS Work Plan	10 Aug 01
Comments to A-E	24 Aug 01
Final FSS Work Plan	21 Sep 01
Initiation of Field Work	TBD
Completion of Field Work	TBD
Draft FSS Report	TBD
Comments to A-E	TBD
Draft-Final FSS Report	TBD
Comments to A-E	TBD
Final FSS (Assumes No Disputes)	TBD
Public Comment Period	TBD
Meetings/Presentations	TBD

4.7 Submittals.

4.7.1 General Submittal Requirements.

4.7.1.1 Distribution. The A-E is responsible for reproduction and distribution of all documents. The A-E shall furnish copies of submittals to each addressee listed in paragraph 4.7.2 in the quantities listed in the document submittal list. Submittals are due at each of the addresses not later than the close of business on the dates shown in paragraph 4.6.

4.7.1.2 Partial Submittals. Partial submittals will not be accepted unless prior approval is given.

4.7.1.3 Cover Letters. A cover letter shall accompany each document and indicate the project, project phase, the date comments are due, to whom comments are submitted, the date and location of the review conference, etc., as appropriate. (Note that, depending on the recipient, not all letters shall contain the same information.) The contents of the cover letters should be coordinated with CEHND-PM prior to the submittal date. The cover letter shall not be bound into the document.

4.7.1.4 Supporting Data and Calculations. The tabulation of criteria,

data, circulations, etc., which are performed but not included in detail in the report shall be assembled as appendices. Criteria information provided by CEHND need not be reiterated, although it should be referenced as appropriate. Persons performing and checking calculations are required to place their full names on the first sheet of all supporting calculations, etc., and initial the following sheets. These may not be the same individual. Each sheet should be dated. A copy of this statement of work shall be included as Appendix A in the Draft RI/FS report only.

4.7.1.5 Reproducibles. One camera-ready, unbound copy of each submittal shall be provided to the Contracting Officer in addition to the submittals required in the document and submittal list.

4.7.2 Addresses.

Commander
U.S. Army Corps of Engineers,
Huntsville Division
ATTN: CEHND-PM (Maj. Sheets)
4820 University Square
Huntsville, AL 35816

Commander's Representative
Seneca ADA
ATTN: SMASE-CO (Bld.123, Mr. Absolom)
5786 State Route 96
Romulus, New York, 14541-5001

Commander
USACHPPM (PROV)
ATTN: MCHB-ME-R (Mr. Hoddinott)
Building E1677
Aberdeen Proving Ground, MD
21010-5422

Commander
US Army Engineer District, New York
Seneca Office for Project Management
ATTN: Mr. Tom Enroth, Bld.125
5786 State Route 96
Romulus, New York, 14541-5001

Commander
U.S. Army Environmental Center,
ATTN: Mr. Clayton Kim
Aberdeen Proving Ground, MD
21010-5422

Commander
US Army Engineer District, New England
ATTN: Ms. Michelle Brock
696 Virginia Road
Concord, Mass, 01742

4.7.3 Document and Submittal List

Work Plans and Final Report

	Draft	Draft-Final	Final
CEHND-PM	2	2	2
SMASE-CO	2	8	8
AEC	1	1	1

CENAN	2	3	3
USACHPPM	2	2	2
TOTAL	9	9	9

5.0 SAFETY REQUIREMENTS

5.1 Site activities in conjunction with this project may pose unique safety, chemical, and/or radiological exposure hazards which require specialized expertise to effectively address and eliminate. The A-E shall conduct the RI/FS activities according to the requirements presented in the Workplan.

5.2 Prior to commencement of RI/FS field activities, the A-E shall submit for review an amendment to the Workplan SHERP which is to contain the following:

5.2.1 A discussion of the A-E's organization structure, to include lines of authority of the A-E and all subcontractors, shall be provided along with an organization chart showing the lines of authority for safety and health from site level to corporate management. Each person assigned specific safety and health responsibilities shall be identified and pertinent qualifications and experience shall be described.

5.2.2 Documentation of compliance with training and medical surveillance requirements for affected employees shall be provided. A format for such documentation is provided in the Workplan SHERP.

6.0 QUALITY ASSURANCE PROJECT PLAN REQUIREMENTS

The A-E shall perform all sampling and analysis activities according to the requirements presented in the Work Plan.

7.0 SOIL BORING AND MONITORING WELL REQUIREMENTS

All drilling, installation and sampling activities shall be performed according to the requirements presented in the Work Plan.

8.0 SURVEY REQUIREMENTS

All surveying shall be completed according to the requirements presented in the Work Plan.

9.0 REFERENCES

GENERAL

12.1 Interim Final, "Guidance for or Conducting Remedial Investigations/Feasibility studies Under CERCLA", U.S. EPA, Office of Solid Waste and Emergency Response, October 1988.

12.2 "Federal Facility Agreement under CERCLA Section 120 in the matter of Seneca Army Depot, Romulus, New York", Docket No. II-CERCLA-FFA-00202, USEPA, U.S. Department of the Army, and the New York State Department of Environmental Conservation, November 1990.

12.3 Preliminary-Draft, " Generic Work Plan for RI/FS" , Engineering Science, Inc., January 1995.

SPECIFIC

12.4 Preliminary-Draft, " Project Scoping Plan for Performing a CERCLA Remedial Investigation/Feasibility Study (RI/FS) at the Pitchblende Storage Igloos, Seneca Army Depot Activity.", Engineering Science, Inc., August, 1995.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Following the evaluation process for determining if the SEDA facility is compliant with the release criteria as outlined in **Section 2**, and illustrated in **Figure 2-1**, each radiological area within SEDA has been investigated. Areas where activities were conducted under the NRC licenses listed in **Section 1** were divided into sites, and further divided into survey units. To determine if the release criterion of 10 mrem/yr has been met at each site, a contributing radiological dose at each survey unit was calculated and the doses within a site were added together. The results from these calculations are presented in **Sections 3** through **6** of this report, respective to the area associated with the licensed radiological activity. It was determined and reported in the corresponding tables that, although there were sites with datasets or measurements above background, there were no sites with a calculated dose that exceeded the release criteria of 10 mrem/yr. The doses calculated for each site where a licensed commodity was used is listed in **Table 8-1**.

In conclusion, there are no radiological sites where licensed commodities were used that exceed the release criteria. Sites impacted by activities involving non-licensed commodities and that exceeded the release criteria (i.e. area EM-5 within SEAD-12 and certain areas within SEAD-48) are being investigated and managed under the CERCLA program in conjunction with USEPA and NYSDEC. It is SEDA's position that these isolated areas should not impact the license termination since 1) site impacts do not appear to be connected to the use of licensed commodities and 2) management of these sites is being regulated under the CERCLA program. In meeting the USEPA/NYSDEC requirements, the areas at SEDA will also meet the NRC decommissioning requirements because these areas will be remediated and/or demonstrated to meet the same standard of release of 10 mrem/yr for unrestricted use as the sites where licensed activities occurred. Consequently, it is recommended that SEDA be released from all NRC licenses and sites where licensed commodities were stored or used be released for unrestricted use. Specifically, this includes:

- 120 storage igloos (see Table 3-1);
- Building 5;
- Building 306;
- Building 612;
- Building 2073;
- Building S-2084; and
- Warehouse 356.

The following is a list of the NRC licenses to terminate or to remove SEDA from, with the supporting conclusions for the license termination or release:

License SUC-1275: The main license being terminated involved activities related to the commodity DU at the 120 storage igloos, Building 5, Building 306, Building 2073, Building S-2084, Building 612, and Warehouse 356; these areas are presented in **Sections 3, 4, 5**, and **6**. It was determined that each of the sites that comprises each of the areas was below the release criteria of 10 mrem/yr (**Table**

8-1). Consequently, it is recommended that License SUC-1275 be terminated and the associated areas be released for unrestricted use.

License SUC-1380: This license is currently held by the US Army Field Support Command, Rock Island, IL, and is for the possession and storage of DU commodities. SEDA is currently listed on License SUC-1380 as a bulk quantity storage facility. Activities under this license were the same as for SUC-1275 and were conducted in the same locations listed under SUC-1275, (120 storage igloos, Building 5, Building 306, Building 2073, Building S-2084, Building 612, and Warehouse 356). As indicated above, there were no calculated doses for the associated igloos and buildings that exceed the release criteria of 10 mrem/yr (**Table 8-1**). Consequently, it is recommended that SEDA be removed from License SUC-1380 and the associated areas be released for unrestricted use.

License 45-16023-01NA: The U.S. Navy holds this license for storage of DU commodities. Since all areas used for the storage of licensed DU commodities have been shown to meet the release criteria of 10 mrem/yr, SEDA would like to confirm that the SEDA facility is no longer listed on this license, as available records indicate.

License SUB-834: The U.S. Army Aberdeen Test Center, Aberdeen Proving Ground, MD holds this license for the possession of natural uranium, natural thorium, and DU, for the purposes of evaluating and testing munitions and projectiles. Although it is believed that SEDA at one time was authorized to, did not actually store commodities under this license on the facility and has since been removed from the license. The locations known to have stored DU commodities under the other NRC licenses meet the release criteria. Consequently, it is recommended that SEDA be removed from this license, if still currently listed.

License BML 12-00722-07: The U.S. Army Field Support Command, Rock Island, IL currently holds this license for the possession of Pm-147 to be used with military rocket sighting systems. Army records indicate that only one igloo at SEDA, Igloo A0701, stored material controlled by this license. As indicated in **Table 3-5**, survey measurements from Igloo A0701 were below background. Consequently, it is recommended that Igloo A0701 be released for unrestricted use, and if not already done, SEDA be removed from the list of approved storage facilities for License BML 12-00722-07.

License STC-133: The DLA, Fort Belvoir, VA currently holds this license for the possession of uranium and thorium ores, including columbium and tantalum minerals, for use with the National Defense Stockpile. According to Army records, activities at SEDA under this license occurred at Warehouse 356, Section D. SEDA was removed from this license in 1994, following Army, NYSDEC/NYSDOH, and NRC confirmatory surveys (**Section 6**). The supporting documentation for the removal of SEDA as a storage facility under STC-133 is presented in **Appendix 1.F**. Review of the various surveys indicates that that contributing dose at Warehouse 356 would have not been greater than 1.62 mrem/yr. Consequently, Warehouse 356 meets the current release criterion of 10 mrem/yr, and no further investigation is necessary at this site.

In conclusion, the SEDA facility has performed the appropriate investigations for termination or release from the NRC licenses listed above and has demonstrated that any radiological doses above background are below the conservative 10 mrem/yr release criteria accepted by the NRC and based on the TAGM-4003 of 10 mrem/yr. It is the recommended that the SEDA be removed from all related licenses and be released for unrestricted use.

7.0 SURVEYS OF NON-LICENSED AREAS

As discussed in **Section 2.4**, there are two additional areas at SEDA (SEAD-12 and SEAD-48) where radiological activities were performed that are included in this report. SEAD-12 is the former Weapons Storage Area (WSA; also known as the "Q" area), located at the northern end of SEDA (**Figure 1-2**). SEAD-48 is a row of 11 storage igloos at the southern end of SEDA that were used to temporarily store uranium pitchblende ore. Both SEAD-12 and SEAD-48 are being investigated under the CERCLA program at SEDA, with work being reviewed by the USEPA, NYSDEC, and NYSDOH. To avoid the possibility of dual regulation, these two areas remain under the enforcement action of the USEPA, not the NRC. The consistency between the USEPA and the NRC requirements and methodologies for cleanup and decommissioning allows for the evaluation of these areas with the 10 mrem/yr release criterion, the same as the evaluation presented for the licensed areas in this report. Although the activities performed in these areas do not involve commodities licensed by the NRC, the areas have been included in the License Termination Report because radiological investigations have been performed at both locations. The two areas are summarized briefly in this section in order to determine their contribution to a site dose.

7.1 SEAD-12

As noted above, SEAD-12 is the former WSA, consisting of 20 buildings and approximately 400 acres of surrounding grounds, as shown in **Figure 7-1**. Each building performed a specific function in the process of receiving, storing, maintaining, or shipping special weapons at the site (Parsons, 2003). MARSSIM protocols were implemented in the design and execution of the surveys at SEAD-12. Survey units were classified according to known activities within the buildings or grounds that were surveyed. **Table 7-1** summarizes the historical uses and MARSSIM classification of the SEAD-12 buildings.

Parsons conducted radiological surveys of both the interior and the exterior surfaces at SEAD-12. Exterior surveys and sampling at SEAD-12 were performed in 1997 and 1998 (Parsons, 2002). The interior surveys were conducted in two phases (**Table 7-1**). Phase I of the interior surveys, which consisted of Class 1 survey units, was performed between October 1999 and January 2000. Phase II of the interior surveys, which consisted of Class 2 and 3 survey units, was performed between June and August 2001 (Parsons, 2003).

Site-specific DCGLs for soils and building surfaces were developed in 1999 to correspond to the New York State 10 mrem/yr dose limit and were approved by USEPA, NYSDEC, and NYSDOH (Parsons, 2000). The DCGLs that were developed for SEAD-12 were more conservative than those developed in the LTP (ANL, 2003) for the same radionuclide (**Table 7-2**). Although the values of the DCGLs are different, both the SEAD-12 and LTP DCGLs are based on the release criterion of 10 mrem/yr.

As a result of the exterior surveys, none of the exterior areas at SEAD-12 were found to contribute to an above-background dose. One exterior area, EM-5, has been identified as having potentially-

elevated concentrations of Pb-210 (Parsons, 2002). This is believed to be the result of naturally-occurring radiation and/or potential laboratory error, and the Army is currently pursuing additional investigation of this site with NYSDEC and USEPA. No military activities have been reported at the EM-5 area (named after a subsurface anomaly designation) and no evidence of military debris was found during the RI investigation. Subsurface anomalies identified during the RI were identified as the foundation and remains of a 19th century farmstead. The location of EM-5 is shown on **Figure 7-1**.

The interior surveys performed at SEAD-12 identified potentially-elevated areas at two locations - a hotspot on a large overhead hoist/crane in Building 819, and a hotspot on a shelf in Building 803 (Parsons, 2003). Both hotspots are believed to be the result of radium paint contamination. The shelf was disposed of as low-level radioactive waste, and remediation and confirmation sampling of the spot on the crane is pending. These areas are being addressed in coordination with NYSDEC and USEPA. All interior areas at SEAD-12 meet the 10 mrem/yr release criterion based on comparison with the 1999 SEAD-12 DCGLs.

As noted in **Sections 1** and **2**, portions of SEAD-12 that were not associated with the storage of special weapons were transferred to the KidsPeace organization in 2001. Additional property within the SEAD-12 boundary was transferred in 2003.

7.2 SEAD-48

SEAD-48, which is located in the southern area of SEDA (**Figure 1-2**), consists of eleven ammunition storage igloos, Igloos E0801 though E0811 (**Figure 7-2**). The SEAD-48 igloos are located within the secured area along Igloo Road No. 39 (E0800 Row). The following provides a brief history of events at SEAD-48:

- During the 1940s, 1,823 barrels of pitchblende ore were stored in the Igloos E0804 through E0811 for approximately three months (ANL, 2001). Igloos E0801 through E0803 were not used for pitchblende ore storage.

- After removal of the pitchblende ore, Igloos E0804 through E0811 were used for storage of non-radioactive army munitions until the late 1970's (U.S. Army Belvoir Research Group, 1985). Igloo E0803 was also used for this purpose.

- Licensed DU commodities were stored in Igloos E0801 and E0802 under licenses SUC-1275 and SUC-1380 until the late 1970's (U.S. AMC, 1998; ANL, 2003). These igloos were included in the DU Storage Igloo surveys conducted in 2002 (**Section 3**).

- Expanded site investigations at SEAD-48 in 1976, 1980, and 1985 indicated that levels of Ra-226, U-234, U-235, and U-238 in the soil potentially presented risks to human health and to

the environment (U.S Army Belvoir Research Group, 1985; Ford, Bacon, and Davis, Utah [FB&DU], 1981; U.S. Army Ballistic Research Laboratory, 1986).

- In July 1985, decontamination/remediation activities were performed by the Army inside and around the entrance pads to the SEAD-48 igloos (U.S. Army Belvoir R&D Center, 1985).

- The NRC conducted a follow-up post-remediation inspection in October 1987 and subsequently released the site for unrestricted use in a May 2, 1988 letter (**Appendix 7.A**; ANL, 2001).

- Subsequent investigations conducted in 1993 by NYSDOH indicated that some areas within SEAD-48 potentially contained elevated levels of radioactive contamination (NYSDOH, 1993), particularly inside and around Igloo E0804 and Igloo E0808. This prompted the Army to plan further investigation of the area.

- USEPA and NYSDEC approved the SEAD-48 Work Plan submitted by the Army in March, 2003 (Parsons, 2003).

In order to demonstrate compliance with the current State of New York release criterion, Parsons conducted interior and exterior surveys of SEAD-48 in the summer of 2003 (Parsons, 2004). MARSSIM protocols were used in the design and execution of the SEAD-48 surveys. The DCGLs from the LTP (ANL, 2003) were used to determine a gross activity DCGL for pitchblende ore using expected activity fractions for naturally-occurring constituents (NCRP, 1987). The primary ROCs for SEAD-48 were Ra-226, Th-232, U-234, U-235, and U-238. Selected decay progeny of the ROCs (Th-230, Ra-228, Th-228, Pb-210, Pa-231, and Ac-227) are also included in the gross activity DCGL.

Interior surveys identified areas of residual contamination within Igloos E0804 and E0806. In-situ gamma spectroscopy and material sampling confirmed the contamination to be the result of elevated levels of uranium ore. Although these interior survey units meet the wide-area release criterion of 10 mrem/yr, these contaminated areas will likely be remediated prior to the site release to comply with ALARA requirements. All other interior surveys met the release criterion and had no hotspots (Parsons, 2004)

Four exterior survey units (Igloos E0804, E0805, E0806, and E0811) did not meet the wide-area release criterion of 10 mrem/yr. Each of these survey units had at least one identifiable area of residual contamination. In addition, Igloo E0810 met the wide-area release criterion, but had one hotspot. In order to meet the release criterion and/or ALARA, these areas will be remediated and the survey units resurveyed. All other exterior survey units met the release criterion of 10 mrem/yr and had no hotspots (Parsons, 2004).

The Draft SEAD-48 report is currently in the review cycle with USEPA, NYSDEC, and NYSDOH. Additional remediation and investigation activities will proceed pending the review of those agencies.

7.3 REMAINING AREAS

Other than at the areas listed above, additional non-licensed radiological activities did not take place at SEDA. Therefore, it is concluded that the remainder of SEDA is unaffected and levels of radioactivity are at natural background levels.

Main Identity

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Sent: Wednesday, May 26, 2004 9:21 AM
Subject: NRC Call today at 1pm

KATHLEEN KADLUBAK has invited you to a MeetingPlace e-Conference (Mtg ID
2558) on May 26, 2004 at 01:00 PM America/New_York. If provided, use the following password:

Meeting Description: <None>

To attend from your PC:

1) Launch the "Click to Attend" Web Link:
http://gc1gw1.meetingplace.net/attend/FeEkfPmBpDgKjoCbfcNjJlIbNmEhkD
JnDaLdIpcpDndHdNkEooieDaIgAjIkkKahpiHdNoEdAfLpldoFlooenfedmaa

2) Or browse to http://gc1gw1.meetingplace.net & enter Mtg ID 2558.
A MeetingPlace web page appears.

3) Click Join Voice & enter your phone number

To attend from your phone:

Call 800-320-4844 or 650-260-9110. Enter Mtg ID 2558 when prompted.

For more info about this MeetingPlace e-Conference, contact: KATHLEEN KADLUBAK, 781-401-2449

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File NRC Licence Term Plan.

MEMORANDUM OF UNDERSTANDING BETWEEN
THE ENVIRONMENTAL PROTECTION AGENCY AND
THE NUCLEAR REGULATORY COMMISSION

CONSULTATION AND FINALITY ON DECOMMISSIONING AND DECONTAMINATION OF CONTAMINATED SITES

I. Introduction

The Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC), in recognition of their mutual commitment to protect the public health and safety and the environment, are entering into this Memorandum of Understanding (MOU) in order to establish a basic framework for the relationship of the agencies in the radiological decommissioning and decontamination of NRC-licensed sites. Each Agency is entering into this MOU in order to facilitate decision-making. It does not establish any new requirements or rights on parties not subject to this agreement.

II. Purpose

The purpose of this MOU is to identify the interactions of the two agencies for the decommissioning and decontamination of NRC-licensed sites and to indicate the way in which those interactions will take place. Except for Section VI, addressing corrective action under the Resource Conservation and Recovery Act (RCRA), this MOU is limited to the coordination between EPA, when acting under its Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) authority, and NRC, when a facility licensed by the NRC is undergoing decommissioning, or when a facility has completed decommissioning, and the NRC has terminated its license. It continues a basic policy of EPA deferral to NRC decision-making in the decommissioning of NRC-licensed sites except in certain circumstances, and establishes the procedures to govern the relationship between the agencies in connection with the decommissioning of sites at which those circumstances arise.

III. Background

An August 3, 1999, report (106-286) from the House Committee on Appropriations to accompany the bill covering EPA's FY1999 Appropriations/FY 2000 budget request states:

> Once again the Committee notes that the Nuclear Regulatory Commission (NRC) has and will continue to remediate sites under its jurisdiction to a level that fully protects public health and safety, and believes that any reversal of the long-standing policy of the Agency to defer to the NRC for cleanup of NRC's licensed sites is not a good use of public or private funds. The interaction of the EPA with the NRC, NRC licensees, and others, with regard to sites being remediated under NRC regulatory requirements--when not specifically requested by the NRC--has created stakeholder concerns regarding the authority and finality of NRC licensing decisions, the duration and costs of site cleanup, and the potential future liability of parties associated with affected sites. However, the Committee recognizes that there may be circumstances at specific NRC licensed sites where the Agency's expertise may be of critical use to the NRC. In

the interest of ensuring that sites do not face dual regulation, the Committee strongly encourages both agencies to enter into an MOU which clarifies the circumstances for EPA's involvement at NRC sites when requested by the NRC. The EPA and NRC are directed to report to the Committee on Appropriations no later than May 1, 2000, on the status of the development of such an MOU.

Since September 8, 1983, EPA has generally deferred listing on the CERCLA National Priorities List (NPL) those sites that are subject to NRC's licensing authority, in recognition that NRC's actions are believed to be consistent with the CERCLA requirement to protect human health and the environment. However, as EPA indicated in the Federal Register notice announcing the policy of CERCLA deferral to NRC, if EPA "determines that sites which it has not listed as a matter of policy are not being properly responded to, the Agency will consider listing those sites on the NPL" (see 48 FR 40658).

EPA reaffirms its previous 1983 deferral policy. EPA expects that any need for EPA CERCLA involvement in the decommissioning of NRC licensed sites should continue to occur very infrequently because EPA expects that the vast majority of facilities decommissioned under NRC authority will be decommissioned in a manner that is fully protective of human health and the environment. By this MOU, EPA agrees to a deferral policy regarding NRC decision-making without the need for consultation except in certain limited circumstances as specified in paragraphs V.C.2 and V.C.3.

One set of circumstances in which continued consultation should occur, pursuant to the procedures defined herein, relates to sites at which the NRC determines during the license termination process that there is radioactive ground-water contamination above certain limits. Pursuant to its License Termination rule, NRC applies a dose criterion that encompasses all pathways, including ground water. In its cleanup of sites pursuant to CERCLA, by contrast, EPA customarily establishes a separate ground-water cleanup standard in which it applies certain Maximum Contaminant Levels (MCLs, found at 40 CFR 141) promulgated for radionuclides and other substances pursuant to the Safe Drinking Water Act. NRC has agreed in this MOU to consult with EPA on the appropriate approach in responding to the circumstances at particular sites with ground-water contamination at the time of license termination in excess of EPA's MCLs or those sites for which NRC contemplates either restricted release or the use of alternate criteria for license termination, or radioactive contamination at the time of license termination exceeds the corresponding levels in Table 1 as provided in Section V.C.2.

IV. Principles

In carrying out their respective responsibilities, the EPA and the NRC will strive to:

1. Establish a stable and predictable regulatory environment with respect to EPA's CERCLA authority in and NRC's decommissioning of contaminated sites.
2. Ensure, to the extent practicable, that the responsibilities of the NRC under the AEA and the responsibilities of EPA under CERCLA are implemented in a coordinated and consistent manner.

V. Implementation

A. Scope

This MOU is intended to address issues related to the EPA involvement under CERCLA in the cleanup of radiologically contaminated sites under the jurisdiction of the NRC. EPA will continue its CERCLA policy of September 8, 1983, which explains how EPA implements deferral decisions regarding listing on the NPL of any sites that are subject to NRC's licensing authority. The NRC's review of sites under NRC jurisdiction indicates that few of these sites have radioactive ground-water contamination in excess of the EPA's MCLs. At those sites at which NRC determines during the license termination process that there is radioactive ground-water contamination above the relevant EPA MCLs, NRC will consult with EPA and, if necessary, discuss with EPA the use of flexibility under EPA's phased approach to addressing ground-water contamination. NRC has agreed in this MOU to consult with EPA on the appropriate approach in responding to the circumstances at particular sites where ground-water contamination will exceed EPA's MCLs, NRC contemplates either restricted release or the use of alternate criteria for license termination, or radioactive contamination at the time of license termination exceeds the corresponding levels in Table 1 as provided in Section V.C.2.

B. General

Each agency will keep the other agency generally informed of its relevant plans and schedules, will respond to the other agency's requests for information to the extent reasonable and practicable, and will strive to recognize and ameliorate to the extent practicable any problems arising from implementation of this MOU.

C. NRC Responsibilities

1. NRC will continue to ensure remediation of sites under its jurisdiction to a level that fully protects public health and safety.

2. For NRC-licensed sites at which NRC determines during the license termination process that there is radioactive ground-water contamination in excess of EPA's MCLs, or for which NRC contemplates either restricted release (10 CFR 20.1403) or the use of alternate criteria for license termination (10 CFR 20.1404), NRC will seek EPA's expertise to assist in NRC's review of a decommissioning or license termination plan. In addition, NRC will consult with EPA if either the planned level of residual radioactive soil concentrations in the proposed action or the actual residual level of radioactive soil concentrations found in the final site survey exceed the radioactive soil concentration in Table 1. With respect to all such sites, the NRC will consult with EPA on the application of the NRC decommissioning requirements and will take such action as the NRC determines to be appropriate based on its consultation with EPA. For example, if NRC determines during the license termination process that there will be radioactive ground-water contamination in excess of EPA's MCLs at the time of license termination, then NRC will discuss with EPA the use of flexibility under EPA's phased approach for addressing ground-water contamination. If NRC does not adopt recommendations provided by the EPA, NRC will inform EPA of the basis for its decision not to do so.

3. NRC will defer to EPA regarding matters involving hazardous materials not under NRC's jurisdiction.

D. EPA Responsibilities

1. If the NRC requests EPA's consultation on a decommissioning plan or license termination plan, EPA will provide, within 90 days of NRC's notice to EPA, written notification of its views on the matter.

2. Consistent with this MOU, EPA agrees to a policy of deferral to NRC decision making on decommissioning without the need for consultation on sites other than those presenting the circumstances described in Sections V.C.2 and V.C.3. The agencies will consult with each other pursuant to the provisions of this MOU with respect to those sites presenting the circumstances described in Sections V.C.2 and V.C.3. EPA does not expect to undertake CERCLA actions related to radioactive contamination at a site that has been decommissioned in compliance with the NRC's standards, including a site addressed under Section V.C.2, despite the agencies decision to engage in consultation on such sites. EPA's deferral policy, and its expectation of not taking CERCLA action, continues to apply to sites that are covered under Section V.C.2.

3. For NRC-licensed sites presenting the circumstances described in Section V.C.2 and for which NRC has not adopted the EPA recommendation, EPA will consult with NRC on any CERCLA actions EPA expects to take if EPA does not agree with the NRC's decision.

4. EPA will resolve any CERCLA concerns involving hazardous substances outside of NRC's jurisdiction at NRC licensed sites, including concerns involving hazardous constituents that are not under the authority of NRC. As provided in Section V.D.2, EPA under CERCLA will defer or consult with NRC as appropriate regarding matters involving AEA materials under NRC's jurisdiction.

E. Other Provisions

1. Nothing in this MOU shall be deemed to establish any right nor provide a basis for any action, either legal or equitable by any person, or class of persons challenging a government action or failure to act.

2. Each agency will appoint a designated contact for implementation of this MOU. The designated individuals will meet at least annually or at the request of either agency to review NRC-licensed sites that meet the criteria for consultation pursuant to Section V.C.2. The NRC designated contact is the Director, Office of Nuclear Materials Safety and Safeguards, and the EPA designated contact is the Director Office of Emergency and Remedial Response, or as each designee delegates.

3. This MOU will remain in effect until terminated by the written notice of either party submitted six months in advance of termination.

4. Within six months of the execution of this MOU, each party will revise its guidance to its Headquarters and Regional Offices to reflect the terms of this MOU.

5. If differences arise that cannot be resolved by senior EPA and NRC management within 90 days, then either senior EPA or NRC management may raise the issue to their respective agency head.

Section VI. Corrective Action under RCRA

Some NRC sites undergoing decommissioning may be subject to cleanup under RCRA corrective action authority. This authority, administered either by EPA or authorized states, requires cleanup of releases of hazardous waste or constituents at hazardous waste treatment, storage or disposal facilities. NRC sites subject to RCRA corrective action will be expected to meet RCRA cleanup standards for chemical contamination within EPA's jurisdiction. EPA Office of Solid Waste's policy is to encourage regional and State program implementers to coordinate RCRA cleanups with decommissioning, as appropriate, at those NRC sites subject to EPA's corrective action authority.[1]

EPA will continue to support coordination of cleanups under the RCRA corrective action program with decommissioning at NRC sites consistent with its March 5, 1997 policy. In addition, under RCRA the majority of States are authorized to implement the corrective action requirements. States are not signatories to this MOU; however, EPA will encourage States to act in accordance with this policy where they have responsibility for RCRA corrective action at NRC sites undergoing decommissioning.

Items 1 and 3 of the "Other Provisions" of Section V.E. apply to this section.

SEP 30 2002

Christine T. Whitman — Date
Administrator
US Environmental Protection Agency

October 9, 2002

Richard A. Meserve — Date
Chairman
US Nuclear Regulatory Commission

[1]See letter from Elizabeth Cotsworth, Acting Director, Office of Solid Waste to James R. Roewer, USWAG, dated March 5, 1997.

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Christine T. Whitman Administrator US Environmental Protection Agency	Date	Richard A. Meserve Chairman US Nuclear Regulatory Commission	Date

[1]See letter from Elizabeth Cotsworth, Acting Director, Office of Solid Waste to James R. Roewer, USWAG, dated March 5, 1997.

MOU Table 1: Consultation Triggers for Residential and Commercial/Industrial Soil Contamination

Except for radium-226, thorium-232, or total uranium, concentrations should be aggregated using a sum of the fraction approach to determine site specific consultation trigger concentrations. This table is based on single contaminant concentrations for residential and commercial/industrial land use when using generally accepted exposure parameters. Table users should select the appropriate column based on the site's reasonably anticipated land use.

Radionuclide	Residential Soil Concentration	Industrial/Commercial Soil Concentration
H-3	228 pCi/g	423 pCi/g
C-14	46 pCi/g	123,000 pCi/g
Na-22	9 pCi/g	14 pCi/g
S-35	19,600 pCi/g	32,200,000 pCi/g
Cl-36	6 pCi/g	10,700 pCi/g
Ca-45	13,500 pCi/g	3,740,000 pCi/g
Sc-46	105 pCi/g	169 pCi/g
Mn-54	69 pCi/g	112 pCi/g
Fe-55	269,000 pCi/g	2,210,000 pCi/g
Co-57	873 pCi/g	1,420 pCi/g
Co-60	4 pCi/g	6 pCi/g
Ni-59	20,800 pCi/g	1,230,000 pCi/g
Ni-63	9,480 pCi/g	555,000 pCi/g
Sr-90+D	23 pCi/g	1,070 pCi/g
Nb-94	2 pCi/g	3 pCi/g
Tc-99	25 pCi/g	89,400 pCi/g
I-129	60 pCi/g	1,080 pCi/g
Cs-134	16 pCi/g	26 pCi/g
Cs-137+D	6 pCi/g	11 pCi/g
Eu-152	4 pCi/g	7 pCi/g
Eu-154	5 pCi/g	8 pCi/g

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Radionuclide	Residential Soil Concentration	Industrial/Commercial Soil Concentration
Ir-192	336 pCi/g	544 pCi/g
Pb-210+D	15 pCi/g	123 pCi/g
Ra-226	5 pCi/g	5 pCi/g
Ac-227+D	10 pCi/g	21 pCi/g
Th-228+D	15 pCi/g	25 pCi/g
Th-232	5 pCi/g	5 pCi/g
U-234	401 pCi/g	3,310 pCi/g
U-235+D	20 pCi/g	39 pCi/g
U-238+D	74 pCi/g	179 pCi/g
total uranium	47 mg/kg	1230 mg/kg
Pu-238	297 pCi/g	1,640 pCi/g
Pu-239	259 pCi/g	1,430 pCi/g
Pu-241	40,600 pCi/g	172,000 pCi/g
Am-241	187 pCi/g	568 pCi/g
Cm-242	32,200 pCi/g	344,000 pCi/g
Cm-243	35 pCi/g	67 pCi/g

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LIST OF ACRONYMS

Ac	Actinium
AEC	Atomic Energy Commission
AEHA	Army Environmental Hygiene Agency
ALARA	As Low As Reasonably Achievable
AMC	U. S. Army Material Command
ANL	Argonne National Laboratory
ANSI	American National Standards Institute, Inc.
ASTM	American Society for Testing and Materials
Bi	Bismuth
BRAC	Base Realignment and Closure
BRDC	U. S. Army Belvoir Research & Development Center
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
Ci	Curie
cm	Centimeters
cm/sec	Centimeters per second
cpm	counts per minute
DCGL	Derived Concentration Guideline Level
$DCGL_W$	Derived Concentration Guideline Level- wide area
$DCGL_{EMC}$	Derived Concentration Guideline Level- elevated measurement comparison
DOA	Department of the Army
DOD	Department of Defense
DOE	Department of Energy
dpm	Disintegrations Per Minute
DQO	Data Quality Objective
ELAP	Environmental Laboratory Approval Program
EMC	Elevated Measurement Comparison
EPA	U. S. Environmental Protection Agency
ESI	Expanded Site Inspections
FIDLER	Field Instrument for the Detection of Low Energy Radiation
FB&DU	Ford Bacon & Davis Utah
FSS	Final Status Survey
ft	Feet
ft/sec	Feet per second
g	Gram

GEL	General Engineering Laboratories, Inc.
HASP	Health and Safety Plan
HAZWOPPER	Hazardous Waste Operations and Emergency Response
HP	Health Physicist
HSA	Historic Site Assessment
IAG	Interagency Agreement
keV	kiloelectron volt
L	Liter
LCS	Laboratory Controlled Sample
LTP	License Termination Plan
m	Meter
MARSSIM	Multi-Agency Radiological Survey and Site Investigation Manual
MCA	Multi Channel Analyzer
MDA	Minimum Detection Amount
MDC	Minimum Detectable Concentration
mg/l	Milligram per liter
mg/kg	Milligrams per kilogram
mL	Milliliter
mrem	milli-Roentgen equivalent man
mR	Milli-Roentgen
MSL	Mean Sea level
MW	Monitoring Well
NA	Not analyzed or not available
NaI	Sodium Iodide
No.	Number
NIST	National Institute of Standards and Technology
NCRP	National Council on Radiation Protection and Measurements
NPL	National Priority List
NRC	Nuclear Regulatory Commission
NUREG/CR	Stands for a series of NRC formal reports
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOL	New York State Department of Labor
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
Pa	Protactinium
Pb	Lead

PCi	pico Curies
PPE	Personal Protective Equipment
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/ Quality Control
R&D	Research and Development
Ra	Radium
RADCON	Radiation Control
Rn	Radon
ROC	Radionuclide of Concern
RSA	Radiation Safety Associates, Inc.
RSO	Radiation Safety Officer
SEDA	Seneca Army Depot Activity
SEAD	Seneca Army Depot Activity
SOP	Standard Operating Procedure
TAGM	New York State Technical and Administrative Guidance Memorandum
TEDE	Total Effective Dose Equivalent
Th	Thorium
TLD	Thermoluminescent Dosimeter
U	Uranium
uR	Micro Roentgen
uRem	micro- Roentgen Equivalent Man
URSA	Universal Radiation Spectrum Analyzer
USACOE	United States Army Core of Engineers
USAMC	United States Army Material Command
USEPA	United States Environmental Protection Agency
WRS	Wilcoxon Rank Sum

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

Parsons is pleased to submit this License Termination Report in support of terminating Nuclear Regulatory Commission (NRC) licenses and permits held by the Seneca Army Depot Activity (SEDA) in Romulus, New York. This work was performed in accordance with the Scope of Work (SOW) for Delivery Order 31 to the Parsons contract DACA87-95-D-0031.

The work completed for this License Termination Report has been performed following the requirements set forth in the *Seneca Army Depot Activity License Termination and License Release Plan* (LTP; Argonne National Laboratory [ANL], 2003; reprinted as **Appendix 1.A**), which was approved by the NRC in a letter dated June 11, 2003 (**Appendix 1.B**).

Final status surveys were performed in accordance with the *Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM; NRC, 2000) and other applicable guidance to meet the license termination requirements for NRC license SUC-1275 (NRC Docket No. 040-08526; documentation in **Appendix 1.B**) and to remove SEDA from the following licenses:

a) License SUC-1380;

b) License 45-16023-01NA;

c) License SUB-834;

d) License BML 12-00722-07; and

e) License STC-133.

Descriptions of these licenses are provided in **Section 1.4** of this report.

1.2 REPORT ORGANIZATION

A description and history of SEDA and a summary of the history of NRC licensed activities are presented in the remainder of **Section 1.0** of this report. **Section 2.0** presents the release criteria and a description of the process used to determine compliance with the release criteria. **Sections 3.0** through **6.0** present the discussions of each of the areas under the NRC licenses listed above. **Section 7.0** presents the discussion of areas where radiological activities unrelated to licensed commodities were performed at SEDA. The conclusions of this report and the recommendation for the license termination are presented in **Section 8.0**.

1.3 SITE DESCRIPTION

SEDA is located about 40 miles south of Lake Ontario, near Romulus, Seneca County, New York (**Figure 1-1**). Seneca County is located in the center of the state, in the Finger Lakes Region. The facility is located in an uplands area, at an elevation of approximately 600 feet above mean sea level (MSL) that forms a divide separating two of the Finger Lakes, with Cayuga Lake on the east and Seneca Lake on the west. New York State Highways 96 and 96A adjoin SEDA on the east and west boundaries, respectively. The surrounding area is sparsely-populated farmland.

The 10,587-acre SEDA facility was constructed in 1941 and has been owned by the U.S. government and operated by the Department of the Army (DOA) since that date. From its inception in 1941 until 1995, SEDA's primary mission was the receipt, storage, maintenance, and supply of military items, including munitions and equipment. The Depot's mission changed in 1995 when the Department of Defense (DOD) recommended closure of the SEDA under the Base Realignment and Closure (BRAC) process.

SEDA is currently in the process of completing the process to close the base and transfer the property. In accordance with the requirements of the BRAC process, the Seneca County Board of Supervisors established the Seneca Army Depot Local Redevelopment Authority (LRA) in October 1995. The primary responsibility assigned to the LRA was to plan and oversee the redevelopment of the Depot. The Reuse Plan and Implementation Strategy for Seneca Army Depot was adopted by the LRA and approved by the Seneca County Board of Supervisors on October 22, 1996. Under this plan and subsequent amendment, areas within the Depot were classified as to their most likely future use. These areas included: housing, institutional, industrial, an area for the existing navigational LORAN transmitter, recreational/conservation and an area designated for a prison. The future land use plan and the location of areas discussed in this license termination plan are presented in **Figure 1-2**. In ~~November~~ Sept 2003, 7325 acres of land were transferred to the Seneca County Industrial Development Agency for use as conservation/recreation areas. There are plans to transfer an additional 1000 acres of land within the Planned Industrial/Warehouse Area by the end of 2004.

1.4 HISTORY OF LICENSED ACTIVITIES

As indicated in **Section 1.1**, there are a total of six NRC licenses or permits held by or listing SEDA that are included in this license termination effort. Below is a description of each.

License SUC-1275: SUC-1275 is held by SEDA (NRC Docket No. 040-08526) for the possession and storage of depleted uranium (DU) commodities. According to Army records, the facilities at SEDA that conducted activities under this license included 120 storage igloos, Building 5, Building 306, Building 2073, Building S-2084, and Building 612. After NRC approval of the LTP (ANL, 2003), license SUC-1275 was amended to allow for decommissioning activities only. Available documentation for SUC-1275 is reprinted in **Appendix 1.B**.

The 120 storage igloos were used for the storage of packaged DU ammunition. During storage operations at these igloos, radiation surveys were periodically conducted. There were no elevated

levels of radioactivity detected in these surveys. In September 1999, the last of the DU ammunition stored in these bunkers was shipped offsite. Parsons conducted surveys of these igloos in 2002 as described in **Section 3**.

Buildings 5, 306, 2074,and S-2083 were used as staging points to prepare DU ammunition for shipment. Parsons conducted radiological surveys of these buildings in 2002 as described in **Section 4**. These buildings are located within the secured ammunition area at SEDA and are not currently in use.

DU ammunition was unpackaged, inspected, and repackaged at Building 612. Under license SUC-1275, demilitarization of munitions was permitted, including the mechanical separation of the munitions; however, this operation was never performed at SEDA. In 1999, clearance surveys were conducted by Army personnel (refer to **Section 5),** and the land surrounding Building 612 was subsequently transferred to the State for use as a State Prison. However, Building 612 has remained been locked and unoccupied, pending its release for unrestricted use by the NRC.

License SUC-1380: SUC-1380, which is currently held by the US Army Field Support Command, Rock Island, IL (NRC Docket No. 040-08767), is for the possession and storage of DU commodities. SEDA is currently listed on license SUC-1380 as a bulk quantity storage facility. Available records indicate that DU commodities such as 25 millimeter (mm), 105 mm, and 120 mm cartridge penetrators were stored at SEDA under this license. Activities under this license were the same as for SUC-1275 and were conducted in the same locations that are listed above. The most recent available version SUC-1380 (October, 2003; **Appendix 1.C**) lists SEDA as an authorized storage facility. The intention is to amend this license so that SEDA is no longer listed. As indicated under License SUC-1275, all DU commodities stored at SEDA were shipped off site by September 1999.

License 45-16023-01NA: 45-16023-01NA is a U.S. Navy license that controlled DU commodities (20 and 25 mm cartridges) that were stored at SEDA, as described in Supplement 1 to the January and October1992 license renewal applications for SUC-1275 (**Appendix 1.B**). A current version of this license is not available. It is not known if SEDA is listed on this license as an approved storage facility, but if so, the intention is to amend this license so that SEDA is no longer listed since all DU commodities have been off site since September 1999.

License SUB-834: SUB-834 is currently held by the U.S. Army Aberdeen Test Center, Aberdeen Proving Ground, MD (NRC Docket No. 040-07354), for the possession of natural uranium, natural thorium, and DU, for the purposes of evaluating and testing munitions and projectiles. Supplement 1 to the January 1992 license renewal application for SUC-1275 indicates that 7.62 mm and 50 caliber cartridges controlled by license SUB-834 would be among the commodities stored at SEDA. However, the October 1992 license renewal application for SUC-1275 does not list these commodities or SUB-834, so it is unlikely that they were actually stored at SEDA. The most recent available copy of SUB-834 (June, 2000; **Appendix 1.D**) lists Aberdeen Proving Ground as the only authorized location for the use of licensed materials. It is not known if SEDA was listed on earlier

versions of SUB-834. The discussion of SUB-834 is intended to verify that materials controlled by this license are no longer present at SEDA, and to confirm that SEDA is no longer an authorized storage facility for commodities covered by the license.

License BML 12-00722-07: BML 12-00722-07 is currently held by the U.S. Army Field Support Command, Rock Island, IL (NRC Docket No. 030-14796), for the possession of Pm-147 to be used with military rocket sighting systems. Army records indicate that only one igloo at SEDA, Igloo A0701, stored material controlled by this license. According to the 1997 license application for BML 12-00722-07 (**Appendix 1.E**), the Pm-147 was contained in ceramic microspheres, mixed with luminous paint, and laminated between plastic sheet to provide illumination of the 100- and 150- yard markings in the rocket sights. Unless the rocket site was crushed, melted, or otherwise broken (all unlikely scenarios), the Pm-147 would not be able to escape. The 1997 license application also includes documentation from 1995 that lists SEDA as a potential storage facility. However, the same application has an inventory of Pm-147 commodities that dated from 1997, and SEDA is not listed. The most recent available copy of BML 12-00722-07 (January, 2004; **Appendix 1.E**) does not specifically list SEDA on the license. The discussion of BML 12-00722-07 is intended to verify that materials controlled by this license are no longer present at SEDA, and to confirm that SEDA is no longer an authorized storage facility for Pm-147 commodities.

License STC-133: STC-133, which is currently held by the Defense Logistics Agency (DLA), Fort Belvoir, VA (NRC Docket No. 040-00341), is for the possession of uranium and thorium ores, including columbium and tantalum minerals, for use with the National Defense Stockpile. According to Army records, activities at SEDA under this license occurred at Warehouse 356, Section D. In 1992, a portion of the ore was sold and shipped to Cabot Performance Materials Company. The remaining material was transferred to another DLA facility in Binghamton, New York, in May, 1993. SEDA was removed from this license in 1994, following Army, NYSDEC/NYSDOH, and NRC confirmatory surveys (refer to **Section 6**). The supporting documentation for the removal of SEDA as a storage facility under STC-133 is presented in **Appendix 1.F**. The discussion of STC-133 in this report is intended to confirm that the current license termination criteria are met at the locations that were included under the license.

2.0 LICENSE TERMINATION PLAN

The Seneca Army Depot Activity License Termination and License Release Plan (LTP; ANL, 2003; **Appendix 1.A**) was approved by the NRC in 2003 (**Appendix 1.B**). Outlined in the LTP are the release criteria for the site, along with the documentation of how the release criteria were derived. This section provides a summary of the selection and development of release criteria at SEDA and an overview of the process used to determine compliance with those criteria.

2.1 APPROPRIATE RELEASE CRITERIA

As stated in the LTP (ANL, 2003), the total effective dose equivalent (TEDE) selected for development of Derived Concentration Guideline Levels (DCGLs) at SEDA was the New York State Department of Environmental Conservation (NYSDEC) TAGM-4003 of 10 millirem per year (mrem/yr). DCGLs are defined in MARSSIM as residual levels of radioactive material that correspond to allowable radiation dose standards (NRC, 2000). Although the U.S. Environmental Protection Agency (USEPA) allows a TEDE of 15 mrem/yr and the NRC allows a TEDE of 25 mrem/yr, the NYSDEC TAGM-4003 TEDE was selected since it is the most conservative. Compliance with the DCGLs is used to determine if and where the release criteria are met. This report will demonstrate that the areas under the NRC license meet the NRC release criterion of 25 mrem/yr, as well as the more conservative release criterion set in the LTP (ANL, 2003) of 10 mrem/yr.

Two types of DCGLs were used in the license termination evaluation:

1. The $DCGL_W$ (derived concentration guideline level, wide area) is defined as the concentration of residual radioactivity distinguishable from background that, if uniformly distributed throughout a survey unit, would result in a defined TEDE to an average member of a critical group.

2. The $DCGL_{EMC}$ (derived concentration guideline level, elevated measurement comparison) is the concentration of residual radioactivity limited to a small, localized area that is equivalent to the TEDE.

The Environmental Assessment Division at ANL derived the radionuclide-specific DCGLs used in this license termination in Section 6 of the LTP (ANL, 2003).

In addition to the use of DCGLs as guideline values, the concept of As Low As Reasonably Achievable (ALARA) was also employed. Residual radioactivity being ALARA is supported in MARSSIM and 10 CFR 20. In terms of implementation, the objective of being ALARA is to maintain all exposures as far below the applicable dose limits as is reasonably achievable. In the license termination process, although a survey unit may pass the site-wide release criteria (i.e., the $DCGL_W$), it may still have measurements that exceed the localized release criteria (i.e., the

$DCGL_{EMC}$) or that are indicative of residual contamination. In evaluating survey results, it is necessary to consider if all levels of residual radioactivity are ALARA.

2.2 CONCEPTUAL DOSE MODEL/EXPOSURE PATHWAY

In the development of the DCGLs by ANL, as presented in the LTP (ANL, 2003), two dose model scenarios were assumed:

1) The resident farmer for the exterior soil DCGLs; and

2) The building occupancy scenario for the interior surface DCGLs.

For the modeling of the resident farmer scenario, the RESRAD (Version 6.21) computer code was used. This scenario assumes that a hypothetical farmer, who lives on the site after the site is released for unrestricted use, is the average member of the critical group. The hypothetical farmer drinks water from a well that is located downgradient from the study area, ingests plant food that was grown in a garden located in the study area, ingests fish from a pond that is downgradient to the study area, and ingests meat and milk from livestock raised in the study area.

For the modeling of the building occupancy scenario, the RESRAD-BUILD (Version 3.21) computer code was used. This scenario assumes that a hypothetical person who lives in an onsite building is the average member of the critical group. The hypothetical resident spends 16.3 hours a day in the building and is exposed to external radiation (from the source, the floor, and airborne dust) and internal radiation (from inhalation and ingestion).

These scenarios were chosen because they were the most conservative of all potentially reasonable scenarios. It is recognized, however, that the resident farmer and the building resident scenarios may be too conservative based on the future land use plans. Currently, the buildings and igloos associated with this license termination are located in the area designated for conservation/recreation, the planned industrial development area, or the warehouse area, as designated by the future use plans for SEDA, not for residential use; refer to **Figure 1-2** to see the location of each area included in this license termination. If either of the scenarios were changed to an industrial or commercial activity scenario, occupancy and exposure pathways would be greatly reduced. Regardless, per the approved LTP, the DCGLs based on the conservative scenarios are used to demonstrate compliance with the release criteria. The input parameters for the DCGL derivation using the dose modeling from the RESRAD and RESRAD-BUILD computer code are presented in Section 6 of the LTP (ANL, 2003)

2.3 DCGL DEVELOPMENT

As described in **Section 2.2**, $DCGL_W$ values and $DCGL_{EMC}$ values developed in the LTP (ANL, 2003) were used to determine compliance with the release criterion of 10 mrem/yr. Selection of the applicable DCGLs for a site from those that were calculated is based on the radionuclides of concern (ROCs) at the site. At SEDA, three groups of DCGLs were used:

a) Depleted Uranium (DU) Gross Activity DCGL;
b) Individual Radionuclide Surface or Soil DCGLs; and
c) Pitchblende Ore Gross Activity DCGL.

The DU DCGLs were used to demonstrate compliance with the sites under NRC license SUC-1275 where the primary ROC was DU with components U-234, U-235, and U-238. These sites are discussed in **Sections 3**, **4**, and **5**. The individual surface or soil DCGLs were used to evaluate the radionuclide-specific analytical results from the material and soil samples that were collected . The pitchblende ore DCGL was calculated for use at SEAD-48, where residual uranium ore was the ROC, (SEAD-48 is discussed in **Section 7**).

The final DCGLs developed by ANL (LTP, 2003) are listed in **Table 2-1**. To allow for use with survey data, the surface DCGLs in decays per minute per 100 square centimeters (dpm/100cm^2) were converted to an instrument-specific number in units of counts per minute (cpm) using the instrument probe area and efficiency.

2.4 SIGNIFICANCE OF AREAS WHERE LICENSED AND NON-LICENSED COMMODITIES WERE USED

The intent of the LTP is primarily to terminate license SUC-1275, thereby releasing any area where materials under this license were used. However, the NRC stated in a letter dated July 26, 2000 (**Appendix 2.A**):

> "...because you plan to terminate the license and release the entire facility for unrestricted use, confirm that you will evaluate the entire site (including Building 612, [the 120 storage igloos], and any other facilities remaining at your site that were previously released for unrestricted use) to determine if the site meets the Radiological Criteria for License Termination specified in 10 CFR 20.1402, that any residual radioactivity from all facilities at your site does not result in a total effective dose equivalent (TEDE) greater than 25 millirem per year to an average member of a critical group".

In response to the request from the NRC to evaluate the entire facility, discussion of all radiological areas at SEDA have been included in this license termination report. The areas included in this report, as discussed in **Section 1.4**, consist of the following:

- 120 DU Storage Igloos
- Building 5;
- Building 306;
- Building 612;
- Building 2073;
- Building S-2084;
- Warehouse 356; and
- Non-licensed areas (including SEAD-12 and SEAD-48).

Each of these areas has been investigated because of past known or suspected activities using licensed or non-licensed, radiological activities. A non-licensed area is defined in this context as a location

where radionuclides may have be present but were not licensed commodities. In order to comply with the release criteria, all radiological areas are addressed in this report. **Table 2-2** outlines each area, and, if applicable, the associated licenses and additional investigation being performed at the area. Both SEAD-12 and SEAD-48 (presented in **Section 7**) are being investigated under the CERCLA process in coordination with the USEPA, and NYSDEC, and as such, the primary reporting for the work at SEAD-12 and SEAD-48 has been with those agencies. In this report, the survey results for SEAD-12 and SEAD-48 are summarized with the information necessary to determine the contribution of survey units within those areas to a site dose. Integration into the license termination of each of the radiological sites at SEDA is intended to support and demonstrate a facility-wide compliance with the site-specific release criterion of 10 mrem/yr and the Radiological Criteria for License Termination specified in 10 CFR 20.1402.

2.5 BACKGROUND REFERENCE AREAS

To represent background radiological conditions at the site and to provide reference areas for conducting statistical comparisons of study areas, measurements were made in areas that were not affected by site radiological operations. The selection of background areas was based upon documentation that the area was not used in the handling or storage of radioactive commodities and that the area is of similar construction to the site survey unit to which it is compared. Various background datasets have been collected on an assortment of building materials so that the variability in measurements due to material type could be taken into account. Summary statistics of the background datasets collected at the areas listed below are presented in **Table 2-3**, comprehensive background data sets are provided in **Appendix 2.B**.

For the DU Storage Igloo surveys (presented in **Section 3**), several unaffected igloos were used as background areas. One unaffected igloo from each geographical "block" was selected. Measurements from Igloos A1107, B0806, C0912, D0405, and E0403 were combined into a large background dataset. According to Army records, these igloos were not used for any radiological activities. As with the affected igloos, the background igloos are constructed of reinforced concrete and are ~~partially buried under~~ covered with soil mounds. Background measurements at Igloos A1107, B0806, C0912, D0405, and E0403 were collected in 2002.

Individually, Igloo C0912 was used as the background reference area for the SEAD-48 surveys and for Building 803 of the SEAD-12 surveys (presented in **Section 7**). Igloo C0912 is located in the approximate center of the ammunition area at SEDA, near the east end of Igloo Road 23. Background data were collected at Igloo C0912 in 2000 and 2003.

Background datasets were collected from Building 722 in 1999 and were used for comparison with the DU Storage Buildings (Buildings 5, 306, 2073, S-2084, and 612) and the buildings included in the SEAD-12 radiological surveys (presented in **Sections 4**, **5**, and **7**, respectively). Building 722 was located in the administrative area north-northwest of SEAD-12. This building was chosen as a background reference area because of its construction of reinforced concrete, cinder block, and

mortar. In addition, Building 722 had similar wall and floor coverings to those found in the DU Storage and SEAD-12 buildings (including painted concrete block, wallboard, paneling, and porcelain). The property where Building 722 was located was transferred in 2000 to the KidsPeace organization; subsequently, the Building 722 has been demolished.

Data from Building 2078 were used for background data for the survey of Building 612 that was conducted by Army personnel in 1999 (presented in **Section 5**). Alpha and beta measurements were collected at various locations using a hand-held gas proportional detector and a gas proportional floor monitor. Background gamma measurements from Building 2078 were not available. ? why not

2.6 COMPLIANCE APPROACH

To demonstrate the facility-wide compliance with the Radiological Criteria for License Termination specified in 10 CFR 20.1402A and the site-specific release criterion of 10 mrem/yr, a MARSSIM-based approach was developed. The approach was designed to evaluate the collected survey data to determine if residual radioactivity is present at the affected sites at SEDA, and if so, to calculate the corresponding dose to the hypothetical receptor. This process is discussed below and is summarized in **Figure 2-1**.

2.6.1 Grouping of Survey Units

The initial step in the process is the grouping of survey units. For the calculation of dose to the receptor, survey units were grouped into larger sites; a *site* is defined in this context as a logical grouping of survey units, such as those within a building or an igloo. It is assumed that each site is independent of other sites, and the potential dose contributions between each site are not additive (i.e., the receptor is exposed to only one site at a time). Survey data from each survey unit within a site are evaluated separately and the resultant dose contribution is added together for all survey units for that site. The sites and grouping of survey units at SEDA are listed in **Table 2-4**.

> ***Example:***
> *For example, consider a hypothetical building, Building 1234, which has three rooms, labeled X, Y, and Z. Building 1234 would be considered the site and would be evaluated with the 10 mrem/yr release criterion. Survey data from each room (X, Y, and Z) would be evaluated separately, but any dose contribution from those survey units would be added to determine a total dose for the site (Building 1234). Because the assumption is that each site is independent, the dose for Building 1234 would not be added to the dose from any other buildings.*

2.6.2 Background Area Selection

The next step in the process is the selection of an appropriate background area. As discussed in **Section 2.5**, background areas used during this evaluation include the group of five background igloos (Igloos A1107, B0806, C0912, D0405, and E0403), Building 722, and Building 2078. The selection of background is based on similarities in building construction and expected ambient radiation levels.

> ***Example:***
> *Continuing the example from* ***Section 2.6.1****, Building 722 is selected as the appropriate background area for hypothetical Building 1234, based on similar room size and construction materials, such as tile and concrete block.*

2.6.3 Comparison with Background

In order to determine if residual radioactivity is present within a survey unit, it is necessary to conduct a statistical comparison between survey unit and background data. Per MARSSIM, the Wilcoxon Rank Sum (WRS) statistical test is used to compare each dataset from a survey unit with the appropriate background dataset. The WRS analysis is performed using the Statistica (StatSoft, 2001) software package. The rank-sum analysis performed by Statistica is also known as the Mann-Whitney U test, and there are three primary outputs:

1) The U-statistic (the result of the comparison of the two datasets);

2) The Z-statistic (an approximation of the deviation of one dataset from another); and

3) A p-value corresponding to the U- and Z-statistics.

If the p-value is less than 0.05 (corresponding to a Type I error [α] of 0.05), the null hypothesis that states that the two datasets (i.e., survey unit data and background data) are similar is rejected. A p-value of 0.05 or greater indicates that the null hypothesis is correct, and that the datasets are similar.

If the survey unit dataset fails the initial WRS test (i.e., the p-value is less than 0.05), then the average rank of each dataset and box-and-whisker plots visually depicting the survey unit data and background data are generated and compared.

If the WRS test indicates that a survey unit dataset is equivalent to or below background, it is concluded that the survey unit does not contribute to the total dose for the site (although individual measurement locations may contribute to dose, as described in **Section 2.6.5**).

If the WRS test indicated that a survey unit dataset is greater than background, it is concluded that the survey unit will contribute to the total dose for the site. The dose that the survey unit will contribute is calculated, as explained in **Section 2.6.6**.

Example:
In the example case, the WRS test is used to compared direct alpha floor monitor (FM), direct beta FM, and direct gamma FIDLER measurements from Rooms X, Y, and Z in hypothetical Building 1234 with background measurements taken with the same types of instruments from Building 722. For the purposes of the example, the WRS test results indicate that only the Room X alpha FM, Room Y beta FM, and Room Z gamma measurements are different than background; all other datasets are at background levels and do not contribute to the site dose. A comparison of the average ranks and of the box-and-whisker plots for Room Y and Building 722 beta FM measurements indicate that the Room Y beta FM data is below background; therefore it is assumed that there is no contribution to site dose from beta radiation in Room Y. Box-and-whisker plots for Room X alpha FM and Room Z gamma data and background indicate that the survey unit data is elevated above background. The dose contribution as a result of the Room X alpha FM and Room Z gamma measurements is calculated per ***Section 2.6.5****.*

2.6.4 Comparison with $DCGL_W$

After the above-background datasets are determined for each survey unit, it is necessary to compare the data to the DCGLs. As discussed in **Section 2.3**, the appropriate $DCGL_W$ is identified for the survey units that are determined to be above background based on the ROCs for the site. For direct measurement data, the $DCGL_W$ is converted to units of cpm and added to each measurement in the background dataset (referred to as the *$DCGL_W$-adjusted background* dataset).

The WRS test is used to compare each above-background survey unit dataset to the appropriate $DCGL_W$-adjusted background dataset. If the survey unit dataset fails the WRS comparison with the $DCGL_W$-adjusted background dataset (i.e., the null hypothesis that states that the survey and $DCGL_W$-adjusted background datasets are the same is rejected), then the average rank of each dataset and the box-and-whisker plots of survey and $DCGL_W$-adjusted background data are generated and compared. A survey unit is said to **not** meet the release criterion of 10 mrem/yr when it is determined to be elevated above the $DCGL_W$-adjusted background. If the survey unit fails the DCGLw adjusted-background comparison, the cause for the failure is investigated.

Example:
From the example, the above-background datasets are Room X alpha FM and Room Z gamma. Hypothetical Building 1234 was used for temporary storage of DU ammunition under SUC-1275, so the only expected contaminant is DU. Using ***Table 2-1****, the DU gross activity $DCGL_W$ of 31,800 dpm/100cm^2 for surface contamination is applicable. In order to create the $DCGL_W$-adjusted background, the value of 31,800 dpm/100cm^2 is converted to cpm for the alpha FM (using a probe area of 425 cm^2 and observed efficiency of 20%) and the FIDLER (using a probe area of 126 cm^2 and observed efficiency of 15%). The instrument equivalent $DCGL_W$ values that are calculated (27,030 and 6,020 cpm for alpha FM and FIDLER, respectively) are added to each background measurement for those instruments, and the survey unit datasets and the $DCGL_W$-adjusted background are compared using the WRS test. Results from the WRS test indicate that neither datasets exceed the $DCGL_W$-adjusted background; consequently, both survey units with above-background datasets (Room X and Room Z) meet the release criterion of 10 mrem/yr.*

2.6.5 Elevated Measurement Comparison

Per MARSSIM, it is necessary to evaluate survey data to determine the presence of hotspots, or areas of localized contamination. Each individual measurement (i.e., direct and scanning) within a survey unit is compared to the $DCGL_{EMC}$ value if the survey unit has been classified as Class 1, and to the $DCGL_W$ if the survey unit has been classified as Class 2 or 3 (survey unit classification at SEDA is specified in the LTP [ANL, 2003]). The $DCGL_{EMC}$ is calculated using area factors from the LTP (ANL, 2003) for the appropriate survey grid size, and converted to an instrument-specific value in units of cpm using the methodology described above. If the measurement exceeds the $DCGL_{EMC}$ or $DCGL_W$, the measurement location is potentially a hotspot and should be evaluated further to determine if the location is ALARA.

Example:
Continuing the example, all scanning and direct measurements from hypothetical Building 1234 Rooms X and Y (Class 2 survey units) are compared with the instrument equivalent $DCGL_W$. All scanning and direct measurements from Room Z (Class 1 survey unit) are compared with the instrument-specific $DCGL_{EMC}$, which is calculated using the U-235 area factor (AF = 11.9) for a 4 m^2 sampling grid size. One gamma FIDLER scanning measurement at a floor location from Room Z (75,000 cpm) is above the FIDLER $DCGL_{EMC}$ (71,638 cpm). The location is marked and will be evaluated to determine if remediation is necessary. All measurements from Rooms X and Y are below the $DCGL_W$.

2.6.6 Dose Contribution

The final step in the process is to calculate the dose contribution from both the above-background datasets within a survey unit and any hotspot locations within a survey unit. The calculated doses for each survey unit are added to determine a total above-background dose contribution for the site. It is assumed that survey units that are at background levels do not contribute to an above-background dose.

For datasets that failed the background comparison (as described in **Section 2.6.3**), the maximum measurement for the survey unit is used to calculate the resultant dose, per the following equation:

$$\frac{Instrument\ Equivalent - DCGL_W\ (cpm)}{10\,mrem/yr} = \frac{Maximum\ Direct\ Measurement\ (cpm)}{Survey\ Unit\ Dose\ (mrem/yr)} \quad \text{(Equation 2-1)}$$

If a measurement exceeds the $DCGL_{EMC}$ or $DCGL_W$ (depending on survey unit classification) as a result of the elevated measurement comparison (**Section 2.6.5**), that measurement is used to calculate the dose to a receptor at that location, per the following equation:

$$\frac{Instrument\ Equivalent - DCGL_{EMC}\ (or\ DCGL_W)\ (cpm)}{10\,mrem/yr} = \frac{Individual\ Measurement\ (cpm)}{Location\ Dose\ (mrem/yr)} \quad \text{(Equation 2-2)}$$

For each site, the dose contributions as a result of above-background datasets and hotspots from each survey unit are added to determine a total dose. The total dose from each site is compared with the 10 mrem/yr release criterion, and one of the following conclusions is made:

Conclusion A: The site does not contain residual radioactivity above background; consequently, *the release criterion is met.* This conclusion is made because each survey unit within a site is at or below background levels and all individual measurements are below the appropriate $DCGL_{EMC}$ or $DCGL_W$.

Conclusion B: The site does not contain residual radioactivity above the release criterion of 10 mrem/yr; consequently, *the release criterion is met.* This conclusion is made because the total dose from the above-background datasets within a site and/or hotspots that are identified within a site is less than 10 mrem/yr.

Conclusion C: The site contains residual radioactivity above the release criterion of 10 mrem/yr; consequently, *the release criterion is <u>not</u> met.* This conclusion is made because the total dose from the above-background datasets within a site and/or hotspots that are identified within a site is greater than 10 mrem/yr.

Finishing the example, as a result of the WRS comparison the Room X alpha FM and the Room Z gamma were determined to be above background. The hypothetical maximum direct measurements within these datasets were 100 cpm (Room X alpha FM) and 5,000 cpm (Room Z gamma), which correspond to 0.04 and 8.3 mrem/yr, respectively, using Equation 2-1. The remainder of the datasets were at background levels and do not contribute to an above-background dose. The hotspot gamma measurement from Room Z (75,000 cpm) corresponds to a dose of 10.5 mrem/yr, using Equation 2-2. The total dose to a receptor in hypothetical Building 1234 as a result of residual radioactivity would be equal to 0.04 + 8.3 + 10.5 mrem/yr, or 18.84 mrem/yr. Since this dose exceeds the release criterion of 10 mrem/yr, hypothetical Building 1234 would not be suitable to release for unrestricted use. However, if the Room Z hotspot was remediated, or it was shown to be the result of something other than contamination (e.g., naturally-occurring background, instrument fluctuation or malfunction, etc.), the dose contribution from that location could be removed from the Building 1234

total dose. The resulting dose (0.04 + 8.3, or 8.34 mrem/yr) would then be below the 10 mrem/yr release criterion, and hypothetical Building 1234 would be suitable to release for unrestricted use.

3.0 SURVEYS OF DEPLETED URANIUM STORAGE IGLOOS

As discussed in **Section 1**, Parsons conducted radiological surveys between May and August of 2002 at 120 storage igloos located within the secured ammunition storage area at SEDA.

3.1 SITE DESCRIPTION

Army records identified 120 igloos that were used for the storage of depleted uranium ammunition under NRC licenses SUC-1275 and SUC-1380 (**Table 3-1**). One of the 120 igloos (Igloo A0701) was also identified as having stored weaponry containing Pm-147 sights (under BML 12-00722-07). Four of the 120 igloos (Igloos A0201, A0316, A0317, and A0508) were identified as potentially having stored special weapons. Five unaffected igloos (A1107, B0806, C0912, D0405, and E0403) were selected as background reference areas (**Section 2.5**). The locations of the affected and background igloos are shown in **Figure 3-1**.

The storage igloos are ~~partially buried and have~~ Earth Covered concrete construction. They range in length from 20 to 25 meters (m), with a typical height at the center of approximately 4 m (**Figure 3-2**). In addition to the primary door, each igloo has two approximately 1" deep drainage troughs along each wall leading to outlets at the front of the igloo, and an air vent leading to the top of the igloo located along the upper back wall (**Figure 3-3**).

Based on historical evidence and the sealed, packaged, and nondispersible nature of the stored commodities, the interior of each igloo was determined to be a separate Class 3 survey unit. Exterior grounds surrounding the storage igloos were considered to be unaffected and were not surveyed. A gross activity $DCGL_W$ for depleted uranium was calculated using the DCGLs from the LTP (ANL, 2003) and expected activity fractions for U-234, U-235, and U-238 in typical DU (**Table 3-2**).

3.2 RADIOLOGICAL SURVEY

3.2.1 Survey Instrumentation

Surveys for alpha, beta, and gamma radiation were performed using the instruments listed in **Table 3-3**. Flag values based on background and the gross $DCGL_W$ were calculated and used to identify any areas of potentially elevated activity in the field. Minimum detectable activities (MDAs) that are listed in **Table 3-3** were calculated per MARSSIM.

Additional measurements were collected to further characterize the site or provide health and safety data. These additional measurements consisted of in-situ gamma spectroscopy, smear and material samples, radon measurements, exposure rate measurements, and personnel dosimetry.

All field instrumentation was calibrated prior to the field effort by an approved laboratory using NIST-traceable sources. Instrument function checks were performed using appropriate and dedicated check sources a minimum frequency of twice per day each instrument was used. The procedure for

instrument function checks typically consisted of a source measurement and a background measurement collected in the morning, at midday, and at the end of the workday. Instrument function check data and a list of the check sources used are presented as **Appendix 3.A**.

3.2.2 Number and Locations of Measurements

For the evaluation of the DU igloos, each igloo was considered to be a site that consisted of one interior survey unit. Since each igloo/survey unit was classified as Class 3, 30 direct measurements and a limited number of scanning measurements were collected from each survey unit, per MARSSIM and the LTP (ANL, 2003). One-minute direct measurements for alpha, beta, and low-energy gamma radiation were taken at both random and biased locations (**Figure 3-4**). In addition, alpha/beta and low-energy gamma scanning measurements were collected at areas where accumulation of residual radioactivity would be most likely, such as along the drainage troughs, in the corners, and along the air vents. Measurement locations were kept consistent for each igloo. A post-survey evaluation indicated that an appropriate number of measurements were collected (**Table 3-4**).

Thirty direct alpha/beta/gamma radiation measurements were collected at each background igloo at the locations indicated in **Figure 3-4**. Alpha/beta/gamma radiation scanning measurements were collected at the same locations at each background igloo in the same manner as with the affected igloos. Data from the five background igloos were combined to create a background dataset of 150 measurements for each data type.

3.3 SURVEY RESULTS AND ANALYSIS

3.3.1 Survey Data Evaluation

The evaluation of survey data collected at the DU storage igloos was performed in the following manner:

- Direct measurement datasets were compared with the background and $DCGL_W$-adjusted background datasets to determine if the survey unit met the release criteria.
- Individual direct and scanning measurements were compared with the $DCGL_W$ to determine if elevated areas of radioactivity were present in the survey units.
- In-situ gamma spectroscopy measurements were used to identify the presence of and the relative radioactivity levels at potentially elevated scanning locations.
- Gross alpha/beta/gamma dry smear samples were used to determine if removable contamination was present within the survey units.
- Analytical results from the material samples were used to determine approximate activity concentrations of ROCs.

- Radon testing was used to determine potential radon production from residual contamination and to assess potential worker exposure.

3.3.2 Direct Measurement Evaluation

Per MARSSIM, the comparison of survey direct measurement data to background data was performed using the WRS nonparametric two-sample test. Direct measurements from each survey unit were first compared to an instrument-specific background dataset using the WRS test. If the survey unit dataset failed the initial WRS test (i.e., the null hypothesis that states that the survey and background datasets are the same was rejected), then box-and-whisker plots visually depicting the survey unit data and background data were compared. If it was determined that the survey unit dataset was elevated above background, the WRS test was repeated comparing the survey unit dataset to the $DCGL_W$-adjusted background dataset. If the survey unit dataset failed the WRS comparison using the $DCGL_W$-adjusted background dataset, (i.e., the null hypothesis that states that the survey and $DCGL_W$-adjusted background datasets are the same was rejected), then box-and-whisker plots of survey and $DCGL_W$-adjusted background data were inspected to determine which dataset was elevated. A survey unit dataset was said to not meet the site-wide release criterion when it was determined to be elevated above the $DCGL_W$-adjusted background. This evaluation process if explained in full detail in **Section 2.6**. Data collected during the DU storage igloo surveys are tabulated in **Appendix 3.B**.

The alpha, beta, and gamma direct measurements from each igloo were compared to the alpha, beta, and gamma background datasets using the WRS test, per MARSSIM. Datasets found to exceed background were compared to a $DCGL_W$-adjusted background dataset with the WRS test. Summary statistics of the direct measurements and results of the WRS tests with background are presented in **Table 3-5** through **Table 3-9**. Box-and-whisker plots of selected site and background data are presented in **Appendix 3.C**. Forty-one datasets from 38 igloos (out a total of 360 datasets) were above background and were compared to the $DCGL_W$-adjusted background. None of those datasets were elevated above the $DCGL_W$-adjusted background (**Table 3-10**). The remaining datasets were at or below background levels.

3.3.3 Elevated Measurement Comparison

Per MARSSIM for Class 3 survey units, all direct and scanning measurements from each igloo were compared directly with the $DCGL_W$ for DU. All of the alpha, beta, and gamma direct measurements were below the $DCGL_W$. In addition, all of the maximum scanning results listed in **Table 3-11** were below the $DCGL_W$. The rear air vent consistently had direct alpha (and to some extent, beta) measurements that were above background, but not above the $DCGL_W$. From in-situ gamma spectroscopy and smear sampling results, it was determined that the measurements were due to the deposition of naturally-occurring radon decay progeny on the mesh screen of the vent. It was concluded that there were no localized areas of elevated contamination within the DU storage igloos.

3.3.4 In-Situ Gamma Spectroscopy

In-situ gamma spectroscopy measurements were collected at two floor locations (B0909-21 and C0909-21) and five air vent locations (C0303-29, C0603-29, C0906-29, E0602-29, and E0609-29). Identified and quantified radionuclides detected at these locations are listed in **Table 3-12**. None of the DU ROCs were identified at levels above the $DCGL_W$.

3.3.5 Smear and Material Sampling

Dry smear samples were collected over a 100-cm^2 area at each direct measurement location and analyzed for gross alpha, beta, and gamma radiation. A summary of the results for each igloo is presented in **Table 3-13**. The maximum detected gross alpha, beta, and gamma results for the affected igloos were 22, 130, and 77 dpm/100cm^2, respectively. These results are below both the $DCGL_W$ and the limits for surface contamination from 10 CFR 835, Appendix D (listed in the footnote to **Table 3-13**).

Wet smear samples were collected at the four igloos potentially used to store special weapons (Igloos A0201, A0316, A0317, and A0508) and analyzed for beta emissions from tritium. Results from this analysis are presented in **Table 3-13**. The maximum result was 10 dpm/100cm^2, which is below the $DCGL_W$ and surface contamination limit for tritium from 10 CFR 835, Appendix D.

Material samples were collected from a floor location at Igloo B0909 (B0909-21) and an air vent location at Igloo E0602 (E0602-29). Isotope-specific analyses were performed to detect U-234, U-235, U-238, Th-230, Th-232, Ra-226, and Cs-137. Results from the material sample analysis are presented in **Table 3-14**. None of the isotopic results were above the individual volumetric $DCGL_W$'s (**Table 2-1**).

3.3.6 Radon Measurements

Radon measurements were collected using E-perm electrets (Rad-Elec, Inc.) that were placed in the center of 12 affected igloos (at 1.5-2 feet in height). Measurements were also taken in the five background igloos. Duplicate E-perms were deployed in four affected igloos and one background igloo. Measured radon concentrations in the affected igloos and the background igloos were similar - an average of 4.7 picocuries per liter (pCi/L) and maximum of 8.5 pCi/L for the affected igloos, and an average of 4.4 pCi/L and maximum of 9.3 pCi/L for the background igloos. The upper estimate worker dose resulting from radon exposure over the course of the DU storage igloo surveys was calculated to be 2.3 mrem/yr.

3.3.7 Personnel Dosimetry

All site personnel were issued thermoluminescent dosimeters (TLDs) from Landauer, Inc., that were worn at all times onsite. The TLDs measured whole body exposure to gamma and beta radiation. The exposure limit for members of the general public (the applicable standard to the workers on this

project) was 100 mrem/yr. All of the results from the dosimeters worn over the course of the project were below the minimum dose equivalent reported (1 mrem). In addition, exposure rate measurements were taken at all direct measurement locations. The stop work limit of 500 uRem/hr was not exceeded at any location.

3.4 CONCLUSIONS

No datasets from the DU storage igloo surveys exceeded the $DCGL_W$ for DU. The doses from the DU storage igloo datasets that were determined to be above background were calculated as described in **Section 2**. Although the 10 mrem/yr dose limit was applied to each igloo survey unit individually, the igloos are grouped by geographic "block" (i.e., A-Block through E-Block) in the discussion below.

- Nine of the datasets collected from the 13 A-Block igloos exceeded background, as indicated by the WRS test (**Table 3-5**). The highest calculated above-background dose occurred at Igloos A0508 (based on gamma measurements) and A0706 (based on alpha and gamma measurements) and is approximately 6.5 mrem/yr, which is below the 10 mrem/yr release criterion.

- Three of the datasets collected from the 20 B-Block igloos exceeded background, as indicated by the WRS test (**Table 3-6**). The highest calculated above-background dose occurred at Igloo B0909 (based on gamma measurements) and is approximately 6.7 mrem/yr, which is below the 10 mrem/yr release criterion.

- Seven of the datasets collected from the 37 C-Block igloos exceeded background, as indicated by the WRS test (**Table 3-7**). The highest calculated above-background dose occurred at Igloo C0901 (based on gamma measurements) and is approximately 6.3 mrem/yr, which is below the 10 mrem/yr release criterion.

- Twelve of the datasets collected from the 24 D-Block igloos exceeded background, as indicated by the WRS test (**Table 3-8**). The highest calculated above-background dose occurred at Igloo D0604 (based on beta and gamma measurements) and is approximately 7.7 mrem/yr, which is below the 10 mrem/yr release criterion.

- Nine of the datasets collected from the 26 E-Block igloos exceeded background, as indicated by the WRS test (**Table 3-9**). The highest calculated above-background dose occurred at Igloo E0103 (based on gamma measurements) and is approximately 6.4 mrem/yr, which is below the 10 mrem/yr release criterion.

Calculated doses from the above-background igloos are summarized in **Table 3-16**. Based on these calculations, it is concluded that the 120 DU storage igloos meet the release criterion for unrestricted use.

4 SURVEYS OF DEPLETED URANIUM STORAGE BUILDINGS

As discussed in **Section 1**, Parsons conducted radiological surveys in between May and August of 2002 at four buildings (Buildings 5, 306, 2073, and S-2084) that were used to receive and store packaged DU ammunition.

4.1 SITE DESCRIPTION

Army records identified five buildings (Buildings 5, 306, 2073, S-2084, and 612) that were used for the receipt and storage of DU ammunition under NRC licenses SUC-1275 and SUC-1380 (**Figure 3-1**). Army personnel surveyed Building 612 in 1999 (presented in **Section 5**). Floor plans of the four remaining buildings that were surveyed by Parsons are shown in **Figure 4-2** through **Figure 4-5**.

Based on the potential presence of contamination and known activities within the buildings, each interior room within each building was classified as either a Class 2 or Class 3 survey unit (**Table 4-1**). Exterior grounds surrounding the buildings were considered to be unaffected and were not surveyed. A gross activity $DCGL_W$ for depleted uranium was calculated using the DCGLs from the LTP (ANL, 2003) and expected activity fractions for U-234, U-235, and U-238 in typical DU (**Table 4-2**). No other radionuclides of concern were considered for the building survey.

4.2 RADIOLOGICAL SURVEY

4.2.1 Survey Instrumentation

Surveys for alpha, beta, and gamma radiation were performed using the instruments listed in **Table 4-3**. Flag values based on background and the gross $DCGL_W$ were calculated and used to identify any areas of potentially elevated activity in the field. MDAs that are listed in **Table 4-3** were calculated per MARSSIM.

Additional measurements were collected to further characterize the site or provide health and safety data. These additional measurements consisted of in-situ gamma spectroscopy, smear and material samples, exposure rate measurements, and personnel dosimetry.

All field instrumentation was calibrated prior to the field effort by an approved laboratory using NIST-traceable sources. Instrument function checks were performed using appropriate and dedicated check sources a minimum frequency of twice per day each instrument was used. The procedure for instrument function checks typically consisted of a source measurement and a background measurement collected in the morning, at midday, and at the end of the workday. Instrument function check data for the DU building surveys and a list of the check sources used are presented as **Appendix 4.A**.

4.2.2 Number and Locations of Measurements

Within each Class 2 survey unit, a 2 m by 2 m sampling grid was established on the floors and on walls below 2 m in height. A 1 m by 1 m sampling grid was established on the walls above 2 m in height and on the ceiling. Per MARSSIM, 50% of the grids below 2 meters and 10% of the grids above 2 m were included in the surveys of Class 2 survey units. At each Class 2 sampling grid, one-minute direct measurements and scanning measurements for alpha, beta, and low-energy gamma radiation were performed. In addition, smear samples and exposure rate measurements were also collected. A minimum of 10 measurements per survey unit were collected. A post-survey evaluation of all DU building data indicated that an appropriate number of measurements were collected within the Class 2 survey units (**Table 4-4**). Smear samples and exposure rate measurements were also collected at each direct measurement location. Measurement locations for each Class 2 survey unit are provided in **Appendix 4.B**.

For the Class 3 survey units, 30 direct measurements and a limited number of scanning measurements were collected from each survey unit, per MARSSIM and the LTP (ANL, 2003). One-minute direct measurements for alpha, beta, and low-energy gamma radiation were taken at both random and biased locations. Alpha/beta and low-energy gamma scanning measurements were collected around the entrances and exits to the Class 3 rooms. A post-survey evaluation indicated that an appropriate number of measurements were collected within the Class 3 survey units (**Table 4-4**). Smear samples and exposure rate measurements were also collected at each direct measurement location. Measurement locations for each Class 3 survey unit are provided in **Appendix 4.B**.

For the DU building surveys, Building 722 was selected as a representative background area. Background measurements for all instruments used in the DU building surveys were collected in 1999 on a variety of building materials. Refer to **Section 2.5** for a discussion of the background areas at SEDA.

4.3 SURVEY RESULTS AND ANALYSIS

4.3.1 Survey Data Evaluation

The evaluation of survey data collected at the DU buildings was performed in the following manner:

- Direct measurement datasets were compared with the background and $DCGL_W$-adjusted background datasets to determine if the survey unit met the release criteria.
- Individual direct and scanning measurements were compared with the $DCGL_W$ to determine if elevated areas of radioactivity were present in the survey units.
- In-situ gamma spectroscopy measurements were used to identify the presence of and the relative radioactivity levels at potentially elevated scanning locations.

- Smear samples were used to determine if removable contamination was present within the survey units.

- Analytical results from the material samples were used to determine approximate activity concentrations of ROCs.

4.3.2 Direct Measurement Evaluation

Per MARSSIM, the comparison of survey direct measurement data to background data was performed using the Wilcoxon Rank Sum (WRS) nonparametric two-sample test. Direct measurements from each survey unit were first compared to an instrument-specific background dataset using the WRS test. If the survey unit dataset failed the initial WRS test (i.e., the null hypothesis that states that the survey and background datasets are the same was rejected), then box-and-whisker plots visually depicting the survey unit data and background data were compared. If it was determined that the survey unit dataset was elevated above background, the WRS test was repeated comparing the survey unit dataset to the $DCGL_W$-adjusted background dataset. If the survey unit dataset failed the WRS comparison using the $DCGL_W$-adjusted background dataset, (i.e., the null hypothesis that states that the survey and $DCGL_W$-adjusted background datasets are the same was rejected), then box-and-whisker plots of survey and $DCGL_W$-adjusted background data were inspected to determine which dataset was elevated. A survey unit dataset was said to not meet the site-wide release criterion when it was determined to be elevated above the $DCGL_W$-adjusted background. Data collected during the DU building surveys are tabulated in **Appendix 4.C**.

The alpha, beta, and gamma direct measurements from each igloo were compared to the alpha, beta, and gamma background datasets using the WRS test, per MARSSIM. Datasets found to exceed background were compared to a $DCGL_W$-adjusted background dataset with the WRS test. Summary statistics of the direct measurements from each building and results of the WRS tests with background are presented in **Table 4-5** through **Table 4-8**. Box-and-whisker plots of selected site and background data are presented in **Appendix 4.D**. A total of five datasets from the four buildings (out of a total of 148 datasets) were above background and were compared to the $DCGL_W$-adjusted background. None of the above-background datasets were elevated above the $DCGL_W$-adjusted background (**Table 4-9**). The remaining datasets were at or below background levels.

4.3.3 Elevated Measurement Comparison

Per MARSSIM for Class 2 and 3 survey units, all direct and scanning measurements from each building were compared directly with the $DCGL_W$ for DU. All of the alpha, beta, and gamma direct measurements were below the $DCGL_W$. In addition, all of the maximum scanning results listed in **Table 4-10** were below the $DCGL_W$. It was concluded that there were no localized areas of elevated contamination within the DU buildings.

4.3.4 In-Situ Gamma Spectroscopy

In-situ gamma spectroscopy measurements were collected at four locations from each building included in the survey. The measurement locations were based on the highest field measurements. Identified and quantified radionuclides detected at these locations are listed in **Table 4-11**. None of the DU radionuclides of concern were identified at levels above the $DCGL_W$.

4.3.5 Smear and Material Sampling

Dry smear samples were collected over a 100 cm^2 area at each direct measurement location and analyzed for gross alpha, beta, and gamma radiation. A summary of the results for each igloo is presented in **Table 4-12**. The maximum detected gross alpha, beta, and gamma results for the surveyed buildings were 15, 28, and 179 dpm/100cm^2, respectively. These results are below both the $DCGL_W$ and the limits for surface contamination from 10 CFR 835, Appendix D (listed in the footnote to **Table 4-12**).

Material samples were collected from two locations with each building. The sampling locations were based on the highest field measurements. Isotope-specific analyses were performed to detect U-234, U-235, U-238, Th-230, Th-232, Ra-226, and Cs-137. Results from the material sample analysis are presented in **Table 4-13**. None of the isotopic results were above the individual volumetric $DCGL_W$'s (**Table 2-1**).

4.3.6 Personnel Dosimetry

All site personnel were issued TLDs from Landauer, Inc., that were worn at all times onsite. The TLDs measured whole body exposure to gamma and beta radiation. The exposure limit for members of the general public (the applicable standard to the workers on this project) was 100 mrem/yr. All of the results from the dosimeters worn over the course of the project were below the minimum dose equivalent reported (1 mrem). In addition, exposure rate measurements were taken at all direct measurement locations. The stop work limit of 500 uRem/hr was not exceeded at any location.

4.4 CONCLUSIONS

No datasets from the DU building surveys exceeded the $DCGL_W$ for DU. The doses from the DU building datasets that were determined to be above background were calculated as described in **Section 2**. Although each building consists of several survey units, each building in its entirety was evaluated with the 10 mrem/yr dose limit (i.e., the hypothetical receptor would likely be exposed to residual radioactivity in all of rooms rather than only one). The following is a discussion of the release criteria evaluation by building:

- Building 5 contains eleven Class 2 survey units and five Class 3 survey units. No datasets were determined to be above background using the WRS test (**Table 4-5**). Therefore, there is no residual contamination present at Building 5 that would contribute to an above-background dose to a receptor.

- Building 306 contains four Class 2 survey units and eight Class 3 survey units. Three datasets (306 Room 10 - alpha FM; 306 Room 11- alpha FM; and 306 Room 13 - alpha FM) were determined to be above background using the WRS test (**Table 4-6**). None of the datasets exceeded the DCGL for DU. The calculated above-background dose to a receptor is approximately 0.06 mrem/year, which is below the 10 mrem/year release criterion.

- Building 2073 contains three Class 2 survey units. One dataset (2073 Room 3 - alpha FM) was determined to be above background using the WRS test (**Table 4-7**). That dataset did not exceed the DCGL for DU. The calculated above-background dose from Building 2073 Room 3 to a receptor is approximately 0.02 mrem/year, which is below the 10 mrem/year release criterion.

- Building S-2084 contains three Class 2 survey units. One dataset (S-2084 Room 3 - alpha FM) was determined to be above background using the WRS test (**Table 4-8**). That dataset did not exceed the DCGL for DU. The calculated above-background dose from residual alpha radiation in Building S-2084 Room 3 to a receptor is approximately 0.02 mrem/year, which is below the 10 mrem/year release criterion.

Calculated doses from the above-background igloos are summarized in **Table 4-14**. Based on these calculations, it is concluded that Buildings 5, 306, 2073, and S-2084 meet the release criterion for unrestricted use.

5.0 SURVEY OF BUILDING 612

As discussed in **Section 1**, Army personnel conducted radiological surveys between March and May of 1999 at Building 612, which was used to receive and store packaged DU ammunition under SUC-1275 and SUC-1380. Building 612 survey data were obtained from the Army and evaluated by Parsons for this report.

5.1 SITE DESCRIPTION

Army records identified Building 612 as one of the five buildings that were used for the receipt and storage of DU ammunition under NRC licenses SUC-1275 and SUC-1380 at SEDA (**Figure 1-2**). A floor plan of the Building 612 is shown in **Figure 5-1**.

Army personnel conducted a radiological survey of Building 612 in 1999 (see **Section 5.2**). The purpose of the radiological survey was to demonstrate compliance with the release criteria so that the building and the surrounding grounds could be released for unrestricted use so that the property could be transferred to the State of New York Department of Corrections. The Army concluded from the survey that there was no residual radiological contamination and recommended that the building be released for unrestricted use. A characterization survey and analysis report was submitted on behalf of the Army to serve as the basis of releasing Building 612 for unrestricted use prior to the termination of the License SUC-1275 (Parsons 2000). The NRC did not find the DCGL value for depleted uranium used in the March 2000 report acceptable; consequently, Building 612 was not released for unrestricted use (refer to letter from NRC dated July 26, 2000 in **Appendix 1.B**). However, the property around Building 612 was transferred in 2001 and Building 612 remains locked and unoccupied on the property. Based on the statement made by the NRC in the July 26, 2000 letter (**Appendix 1.B**) that "even if Building 612 is release prior to the termination of the license, Building 612 and the surrounding grounds that are transferred to the State of New York must be included in the evaluation to determine if the entire site meets the Radiological Criteria for License Termination," Building 612 has been included in this evaluation.

Based on the potential presence of contamination and known activities within the buildings, each of the 28 interior rooms within Building 612 was classified as a Class 1 survey unit (ANL, 2003; **Table 5-1**). Exterior grounds surrounding the buildings were considered to be unaffected and were not surveyed. A gross activity $DCGL_W$ for DU was calculated using the DCGLs from the LTP (ANL, 2003) and expected activity fractions for U-234, U-235, and U-238 in typical depleted uranium (**Table 5-2**). A $DCGL_{EMC}$ based on the area factor for the survey grid size ($4m^2$) and the worst-case component of DU (U-235) was calculated and is also listed in **Table 5-2**. No other radionuclides of concern were considered for the Building 612 survey.

5.2 RADIOLOGICAL SURVEY

5.2.1 Survey Instrumentation

Surveys for alpha, beta, and gamma radiation were performed using the instruments listed in **Table 5-3**. Alpha and beta flag values based on background were calculated on a daily basis and used to identify any areas of potentially elevated activity in the field. Minimum detectable activities (MDAs) that are listed in **Table 5-3** were calculated per MARSSIM.

All field instrumentation was calibrated prior to the field effort by an approved laboratory using NIST-traceable sources. Instrument function checks were performed using appropriate and dedicated check sources a minimum frequency of twice per day each instrument was used. The procedure for instrument function checks typically consisted of a source measurement and a background measurement collected in the morning, and additional source measurements at midday and at the end of the workday. Available instrument function check data for the Building 612 survey and a list of the check sources used are presented as **Appendix 5.A**.

5.2.2 Number and Locations of Measurements

Within each Building 612 survey unit, a 2 m by 2 m sampling grid was established on the floors and on walls below 2 m in height. A 1 m by 1 m sampling grid was established on the walls above 2 m in height and the ceiling. Per MARSSIM, 100% of the grids below 2 meters and 10% of the grids above 2 m were included in the surveys of Building 612. At each Class 1 sampling grid, one-minute direct measurements and scanning measurements for alpha, beta, and low-energy gamma radiation were performed. In addition, smear samples were also collected and analyzed for gross alpha, beta, and gamma radiation. A post-survey evaluation of all DU building data indicated that an appropriate number of alpha and beta measurements were collected within the Class 1 survey units (**Table 5-4**). Smear samples were also collected at each direct measurement location. Measurement locations for each survey unit in Building 612 are provided in **Appendix 5.B**.

For the Building 612 surveys, Building 2078 was selected as a representative background area. According to Army records, Building 2078 did not have any radiological activities. Only alpha and beta floor monitor and hand-held gas proportional data are available from Building 2078. Because background FIDLER data are not available for Building 2078, the gamma field measurements collected with the FIDLER from each survey unit within Building 612 were qualitatively compared with all other available background datasets, including background measurements from Igloo C0912 (collected with both closed and open energy window settings), Building 722, and the daily instrument function checks from the Building 612 survey.

5.3 SURVEY RESULTS AND ANALYSIS

5.3.1 Survey Data Evaluation

The evaluation of survey data collected at Building 612 was performed in the following manner:

- Direct alpha and beta measurement datasets were compared with the background and $DCGL_W$-adjusted background datasets to determine if the survey unit met the release criteria.

- Direct gamma measurement datasets were compared with all available background datasets to determine if the survey unit met the release criteria.

- Individual direct measurements were compared with the $DCGL_{EMC}$ to determine if elevated areas of radioactivity were present in the survey units.

- Smear samples were used to determine if removable contamination was present within the survey units.

5.3.2 Direct Measurement Evaluation

Per MARSSIM, the comparison of survey direct measurement data to background data was performed using the WRS nonparametric two-sample test. Direct measurements from each survey unit were first compared to an instrument-specific background dataset using the WRS test. If the survey unit dataset failed the initial WRS test (i.e., the null hypothesis that states that the survey and background datasets are the same was rejected), then box-and-whisker plots visually depicting the survey unit data and background data were compared. If it was determined that the survey unit dataset was elevated above background, the WRS test was repeated comparing the survey unit dataset to the $DCGL_W$-adjusted background dataset. If the survey unit dataset failed the WRS comparison using the $DCGL_W$-adjusted background dataset, (i.e., the null hypothesis that states that the survey and $DCGL_W$-adjusted background datasets are the same was rejected), then box-and-whisker plots of survey and $DCGL_W$-adjusted background data were inspected to determine which dataset was elevated. A survey unit dataset was said to not meet the site-wide release criterion when it was determined to be elevated above the $DCGL_W$-adjusted background. Available data collected during the Building 612 surveys are tabulated in **Appendix 5.C**.

The alpha and beta direct measurements from each survey unit within Building 612 were compared to the alpha and beta background datasets using the WRS test, per MARSSIM. Datasets found to exceed background were compared to a $DCGL_W$-adjusted background dataset with the WRS test. Summary statistics of the alpha and beta direct measurements from each survey unit, and results of the WRS tests with background, are presented in **Table 5-5**. Box-and-whisker plots of selected site and background data are presented in **Appendix 5.D**. One dataset, 612-B beta hand-held, from the 28 survey units (out of a total of 102 alpha or beta datasets) was above background and were compared to the $DCGL_W$-adjusted background. The 612-B beta hand-held dataset was not elevated above the $DCGL_W$-adjusted background (**Table 5-6**). The remaining alpha and beta datasets were at or below background levels.

As discussed in **Section 5.2.2,** the gamma field measurements collected from each survey unit within Building 612 were qualitatively compared to the combined FIDLER background dataset. Summary statistics for the gamma measurements from the Building 612 survey units are presented in **Table 5-7**. Box-and-whisker plots were generated for each survey unit from Building 612 and each available background dataset (**Figure 5-2**). Based on comparison of the Building 612 box-and-whisker plots with the available background, it was concluded that none of the gamma measurements are above

background.

5.3.3 Elevated Measurement Comparison

Per MARSSIM for Class 1 survey units, all direct and scanning measurements from each building were compared directly with the $DCGL_{EMC}$ for DU. All alpha and beta direct measurements were below the $DCGL_{EMC}$. Scanning measurements from Building 612 were not available to perform the $DCGL_{EMC}$ comparison. Six survey units in Building 612 had at least one gamma measurement greater than the $DCGL_{EMC}$ (**Table 5-8**). However, given the small difference between the measurements and the $DCGL_{EMC}$ (less than 500 cpm for all) and the fact that there were no elevated alpha or beta measurements at these locations, ~~it is unlikely that~~ these gamma measurements are not ~~truly~~ indicative of contamination. It was concluded that there were no localized areas of elevated contamination within the DU buildings.

5.3.4 Smear Sampling

Dry smear samples were collected over a 100 cm^2 area at each direct measurement location and analyzed for gross alpha, beta, and gamma radiation. A summary of the results for each igloo is presented in **Table 5-9**. The maximum detected gross alpha, beta, and gamma results for the survey units in Building 612 were 1.8, 4.7, and 75 dpm/100cm^2, respectively. These results are below both the $DCGL_W$ and the limits for surface contamination from 10 CFR 835, Appendix D (listed in the footnote to **Table 5-9**).

5.4 CONCLUSIONS

No datasets from the Building 612 survey exceeded the $DCGL_W$ for DU. The dose from the one Building 612 dataset that was determined to be above background was calculated as described in **Section 2**. As shown in **Table 5-10**, the above-background dose from the 612-B beta handheld dataset was determined to be approximately 0.6 mrem/yr. Based on this calculation, it is concluded that Building 612 meets the release criterion for unrestricted use.

6 SURVEY OF WAREHOUSE 356

As discussed in **Section 1**, Army personnel conducted radiological surveys of Warehouse 356 in June and July of 1993. Under License STC-133, Warehouse 356 was used to receive and store columbite and tantalum ore containing elevated amounts of naturally-occurring thorium and uranium. The original survey report from the Army is presented as **Appendix 6.A**. NYSDEC and NYSDOH personnel conducted a confirmatory survey of Warehouse 356 in June 1993 (**Appendix 6.B**). NRC personnel conducted a Closeout Inspection Survey of Warehouse 356 in November 1994 (**Appendix 6.C**). As a result, in December 1994, SEDA was removed from NRC License STC-133

6.1 SITE DESCRIPTION

Warehouse 356 is located in the southeast corner of SEDA (**Figure 1-2**). The warehouse is divided into five 200-foot by 200-foot sections labeled Sections A through E, as illustrated in **Figure 6-1.** Section D of the warehouse was the only section used to store the columbite and tantalum ore. Some of the ore was sold and shipped to Cabot Performance Materials Company in 1992. The remaining material was transferred in May 1993 to another Defense Logistics Agency (DLA) facility in Binghamton, New York,. All material was removed from Warehouse 356 prior to the radiological survey conducted by the Army in 1993.

Because the surveys were conducted prior to the implementation of the MARSSIM guidance, a MARSSIM-based classification was not assigned to individual survey units within Section D. The other sections within, and the exterior grounds surrounding, Warehouse 356 were considered to be unaffected and were not surveyed since the licensed material was received and stored in Section D only. The original survey report prepared by the Army identified Th-232, U-238, and associated decay progeny as the radionuclides of concern (**Appendix 6.A**). Contamination limits for the survey were based on "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of License for Byproduct, Source, or Special Nuclear Material" (Guidelines; NRC 1987). The contamination limits from that document are presented along with the DCGLs for Th-232 and U-238 from the License Termination Plan (ANL, 2003) in **Table 6-1**. No other radionuclides of concern were considered for the building survey.

6.2 ARMY RADIOLOGICAL SURVEY

6.2.1 Survey Instrumentation

The Army performed gamma radiation surveys using a Ludlum Model 19 MicroR meter, as listed in **Table 6-2**. Measurements were collected at a height of 1 m. Per the original survey report (**Appendix 6.A**), the MicroR meter was appropriately calibrated and checked before survey measurements were collected.

Two sets of 100 cm^2 smear samples were collected. One set was collected and sent offsite for gross alpha and beta analysis at the Army analytical laboratory at Fort Belvoir, Virginia. The second set of smear samples were collected and analyzed onsite for gross alpha and beta radiation using two Nuclear Measurement PC-5 gas proportional counters (**Table 6-2**). The original survey report indicates that the onsite smear analysis results should be interpreted qualitatively due to a U-238 standard that had lost its calibration (**Appendix 6.A**).

6.2.2 Number and Locations of Measurements

The floor of Section D of Warehouse 356 was divided into 25-foot by 25-foot sections. One exposure rate (i.e., gamma) measurement was collected at each 25 foot by 25-foot section at a height of one meter. For the smear samples, these sections were divided further into 5 foot by 5-foot subsections. For the smear samples sent offsite to Fort Belvoir, a smear was collected in one randomly selected 5-foot by 5-foot subsection per 25-foot by 25-foot section. For the smear samples analyzed onsite, a smear was collected in five randomly selected subsections per 25-foot by 25-foot section. In addition, one smear sample was collected along the wall adjoining each floor section, at approximately 3 feet in height. Figures showing the sampling locations are presented in **Appendix 6.A**.

Five background exposure rate measurements were collected at Warehouse 357, Section C. This area is of the same construction as Warehouse 356 and was not used for radiological activities.

6.2.3 Survey Results and Analysis

The exposure rate measurements that were collected during the Warehouse 356 survey are listed in **Table 6-3**. The maximum measurement collected during the survey (24 µR/hr) was collected at a background location in Warehouse 357. The average and maximum measurements within Warehouse 356 were 16 and 22 µR/hr, respectively. The average and maximum measurements for the unaffected area within Warehouse 357 were 16 and 24 µR/hr, respectively.

Results from the smear samples that were analyzed offsite at Fort Belvoir are listed in **Table 6-4**. The maximum reported alpha and beta net count rates were 0.2 and 0.7 dpm/100cm^2, respectively. Results from the smears counted onsite are listed in **Table 6-5**. The maximum gross alpha plus beta result was 8.7 dpm/100cm^2. All of the smear results are below the limit of 200 dpm/100cm^2 for natural thorium from the Guidelines (NRC, 1987) and 10 CFR 835.

Based on the survey results it was concluded that Warehouse 356 had no residual contamination after the removal of the columbite and tantalum ores and that it could be released for unrestricted use.

6.3 NYSDEC/NYSDOH CONFIRMATORY SURVEY

The letter report recommending Warehouse 356 be considered a No Action SWMU is presented in **Appendix 6.B**. Three smear samples were collected by NYSDEC/NYSDOH personnel and analyzed for gross alpha and beta radiation. Neither the specific locations of the smear samples nor the

instrument used to count the smears were identified. Results for all three samples were reported as "< 20" dpm for both gross alpha and gross beta. It is assumed that field measurements were also taken during this survey, but no instruments or results were reported.

6.4 NRC CLOSEOUT INSPECTION SURVEY

6.4.1 Survey Instrumentation

NRC personnel performed three types of measurements during the Closeout Inspection Survey. An Eberline 2" x 2" NaI was used to measure gamma radiation from floor and wall surfaces. Exposure rate measurements were collected with a Ludlum Model 19 MicroR meter. Direct radiation measurements were collected at both a height of 1 m and on contact with floor and wall surfaces.

6.4.2 Number and Locations of Measurements

Per the Closeout Inspection Report (**Appendix 6.C**), NRC personnel surveyed approximately 50% of the floor surfaces and 10% of the wall surfaces at Warehouse 356, Section D. For the closeout inspection, the NRC collected both scanning and direct measurements. However, the final number of measurements collected was not reported.

The NRC collected smear samples at 42 locations. The selection of these locations was based on areas where radioactive material was stored, where contamination was suspected, and where survey instruments indicated elevated readings.

6.4.3 Survey Results and Analysis

Individual gamma and exposure rate measurements were not reported in the Closeout Inspection Report. A range of 0 dpm/100cm^2 to 500 dpm/100cm^2 above background was reported for radiation levels on the floor and wall surfaces that were surveyed. Based on the field measurements, the Closeout Inspection Report concluded that surface contamination levels were below the limits for natural thorium from the Guidelines (NRC, 1987; **Table 6-1**).

Results from the smear samples collected during the NRC Closeout Inspection Survey are listed in **Table 6-6**. The smear samples were analyzed for gross alpha radiation only. The maximum reported measurement was 3.9 dpm/100cm^2. It was concluded in the Closeout Inspection Report that the levels of removable contamination met the criteria for natural thorium in the Guidelines (NRC, 1987; **Table 6-1**).

6.4 CONCLUSIONS

Surveys conducted by the Army, the State of New York, and the NRC each concluded that Warehouse 356 met the requirements for release for unrestricted use. The criteria used in 1993-1994 to remove SEDA from license STC-133 were more stringent than the current DCGL values for Th-232 and U-238 that correspond to the 10 mrem/yr dose limit (**Table 6-1**).. If the maximum reported survey measurement is used with the Th-232 $DCGL_W$ to calculate the above-background dose to a receptor, an above-background dose of

$$\frac{500\ dpm/100cm^2}{3090\ dpm/100cm^2} \times 10\ mrem/yr = 1.62\ mrem/yr$$

is calculated. Based on the available survey results, it is concluded that Warehouse 356 meets the current 10 mrem/yr release criterion and is suitable for unrestricted use.

7.0 SURVEYS OF NON-LICENSED AREAS

As discussed in **Section 2.4**, there are two additional areas at SEDA (SEAD-12 and SEAD-48) where radiological activities were performed that are included in this report. SEAD-12 is the former Weapons Storage Area (WSA; also known as the "Q" area), located at the northern end of SEDA (**Figure 1-2**). SEAD-48 is a row of 11 storage igloos at the southern end of SEDA that were used to temporarily store uranium pitchblende ore. Both SEAD-12 and SEAD-48 are being investigated under the CERCLA program at SEDA, with work being reviewed by the USEPA, NYSDEC, and NYSDOH. Although the activities performed in these areas do not involve commodities licensed by the NRC, the areas have been included in the License Termination Report because radiological investigations have been preformed at both locations. The two areas are summarized briefly in this section in order to determine their contribution to a site dose.

7.1 SEAD-12

As noted above, SEAD-12 is the former WSA, consisting of 20 buildings and approximately 400 acres of surrounding grounds, as shown in **Figure 7-1**. Each building performed a specific function in the process of receiving, storing, maintaining, or shipping special weapons at the site (Parsons, 2003). MARSSIM protocols were implemented in the design and execution of the surveys at SEAD-12. Survey units were classified according to known activities within the buildings or grounds that were surveyed. **Table 7-1** summarizes the historical uses and MARSSIM classification of the SEAD-12 buildings.

Parsons conducted radiological surveys of both the interior and the exterior surfaces at SEAD-12. Exterior surveys and sampling at SEAD-12 were performed in 1997 and 1998 (Parsons, 2002). The interior surveys were conducted in two phases (**Table 7-1**). Phase I of the interior surveys, which consisted of Class 1 survey units, was performed between October 1999 and January 2000. Phase II of the interior surveys, which consisted of Class 2 and 3 survey units, was performed between June and August 2001 (Parsons, 2003).

Site-specific DCGLs for soils and building surfaces were developed in 1999 to correspond to the New York State 10 mrem/yr dose limit and were approved by USEPA, NYSDEC, and NYSDOH (Parsons, 2000). The DCGLs that were developed for SEAD-12 were more conservative than those developed in the LTP (ANL, 2003) for the same radionuclide (**Table 7-2**). Although the values of the DCGLs are different, both the SEAD-12 and LTP DCGLs are based on the release criterion of 10 mrem/yr.

As a result of the exterior surveys, none of the exterior areas at SEAD-12 were found to contribute to an above-background dose. One exterior area, EM-5, has been identified as having potentially-elevated concentrations of Pb-210 (Parsons, 2002). This is believed to be the result of naturally-occurring radiation and/or potential laboratory error, and the Army is currently pursuing additional investigation of this site with NYSDEC and USEPA. No military activities have been reported at the EM-5 area (named after a subsurface anomaly designation) and no evidence of military debris was

found during the RI investigation. Subsurface anomalies identified during the RI were identified as the foundation and remains of a 19th century farmstead. The location of EM-5 is shown on Figure 7-1.

The interior surveys performed at SEAD-12 identified potentially-elevated areas at two locations - a hotspot on a large overhead hoist/crane in Building 819, and a hotspot on a shelf in Building 803 (Parsons, 2003). Both hotspots are believed to be the result of radium paint contamination. The shelf was disposed of as low-level radioactive waste, and remediation and confirmation sampling of the spot on the crane is pending. These areas are being addressed in coordination with NYSDEC and USEPA. All interior areas at SEAD-12 meet the 10 mrem/yr release criterion based on comparison with the 1999 SEAD-12 DCGLs.

As noted in **Sections 1** and **2**, portions of SEAD-12 were transferred to the KidsPeace organization in 2001. Additional property within the SEAD-12 boundary was transferred in 2003.

7.2 SEAD-48

SEAD-48, which is located in the southern area of SEDA (**Figure 1-2**), consists of eleven ammunition storage igloos, Igloos E0801 though E0811 (**Figure 7-2**). The SEAD-48 igloos are located within the secured area along Igloo Road No. 39 (E0800 Row). The following provides a brief history of events at SEAD-48:

- During the 1940s, 1,823 barrels of pitchblende ore were stored in the Igloos E0804 through E0811 for approximately three months (ANL, 2001). Igloos E0801 through E0803 were not used for pitchblende ore storage.

- After removal of the pitchblende ore, Igloos E0804 through E0811 were used for storage of non-radioactive army munitions until the late 1970's (U.S. Army Belvoir Research Group, 1985). Igloo E0803 was also used for this purpose.

- Licensed DU commodities were stored in Igloos E0801 and E0802 under licenses SUC-1275 and SUC-1380 until the late 1970's (U.S. AMC, 1998; ANL, 2003). These igloos were included in the DU Storage Igloo surveys conducted in 2002 (**Section 3**).

- Expanded site investigations at SEAD-48 in 1976, 1980, and 1985 indicated that levels of Ra-226, U-234, U-235, and U-238 in the soil potentially presented risks to human health and to the environment (U.S Army Belvoir Research Group, 1985; Ford, Bacon, and Davis, Utah [FB&DU], 1981; U.S. Army Ballistic Research Laboratory, 1986).

- In July 1985, decontamination/remediation activities were performed by the Army inside and around the entrance pads to the SEAD-48 igloos (U.S. Army Belvoir R&D Center, 1985).

- The NRC conducted a follow-up post-remediation inspection in October, 1987 and subsequently released the site for unrestricted use in a May 2, 1988 letter (**Appendix 7.A**; ANL, 2001).

- Subsequent investigations conducted in 1993 by NYSDOH indicated that some areas within SEAD-48 potentially contained elevated levels of radioactive contamination (NYSDOH, 1993), particularly inside and around Igloo E0804 and Igloo E0808. This prompted the Army to plan further investigation of the area.

- USEPA and NYSDEC approved the SEAD-48 Work Plan submitted by the Army in March, 2003 (Parsons, 2003).

In order to demonstrate compliance with the current State of New York release criterion, Parsons conducted interior and exterior surveys of SEAD-48 in the summer of 2003 (Parsons, 2004). MARSSIM protocols were used in the design and execution of the SEAD-48 surveys. The DCGLs from the LTP (ANL, 2003) were used to determine a gross activity DCGL for pitchblende ore using expected activity fractions for naturally-occurring constituents (NCRP, 1987). The primary ROCs for SEAD-48 were Ra-226, Th-232, U-234, U-235, and U-238. Selected decay progeny of the ROCs (Th-230, Ra-228, Th-228, Pb-210, Pa-231, and Ac-227) are also included in the gross activity DCGL.

Interior surveys identified areas of residual contamination within Igloos E0804 and E0806. In-situ gamma spectroscopy and material sampling confirmed the contamination to be the result of elevated levels of uranium ore. Although these interior survey units meet the wide-area release criterion of 10 mrem/yr, these contaminated areas will likely be remediated prior to the site release to comply with ALARA requirements. All other interior surveys met the release criterion and had no hotspots (Parsons, 2004)

Four exterior survey units (Igloos E0804, E0805, E0806, and E0811) did not meet the wide-area release criterion of 10 mrem/yr. Each of these survey units had at least one identifiable area of residual contamination. In addition, Igloo E0810 met the wide-area release criterion, but had one hotspot. In order to meet the release criterion and/or ALARA, these areas will be remediated and the survey units resurveyed. All other exterior survey units met the release criterion of 10 mrem/yr and had no hotspots (Parsons, 2004).

The Draft SEAD-48 report is currently in the review cycle with USEPA, NYSDEC, and NYSDOH. Additional remediation and investigation activities will proceed pending the review of those agencies.

7.3 REMAINING AREAS

Other than at the areas listed above, additional non-licensed radiological activities did not take place at SEDA. Therefore, it is concluded that the remainder of SEDA is unaffected and levels of radioactivity are at natural background levels.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Following the evaluation process for determining if the SEDA facility is compliant with the release criteria as outlined in **Section 2**, and illustrated in **Figure 2-1**, each radiological area within SEDA has been investigated. Areas where activities were conducted under the NRC licenses listed in **Section 1** were divided into sites, and further divided into survey units. To determine if the release criterion of 10 mrem/yr has been met at each site, a contributing radiological dose at each survey unit was calculated and the doses within a site were added together. The results from these calculations are presented in **Sections 3** through **6** of this report, respective to the area associated with the licensed radiological activity. It was determined and reported in the corresponding tables that, although there were sites with datasets or measurements above background, there were no sites with a calculated dose that exceeded the release criteria of 10 mrem/yr. The doses calculated for each site where a licensed commodity was used is listed in **Table 8-1**.

In conclusion, there are no radiological sites where licensed commodities were used that exceed the release criteria. Sites impacted by activities involving non-licensed commodities and that exceeded the release criteria (i.e. area EM-5 within SEAD-12 and certain areas within SEAD-48) are being investigated and managed under the CERCLA program in conjunction with USEPA and NYSDEC. It is SEDA's position that these isolated areas should not impact the license termination since 1) site impacts do not appear to be connected to the use of licensed commodities and 2) management of these sites is being regulated under the CERCLA program. These areas will be remediated to achieve the same standard of release of 10 mrem/yr for unrestricted use as the sites where licensed activities occurred. Consequently, it is recommended that SEDA be released from all NRC licenses and sites where licensed commodities were stored or used be released for unrestricted use. Specifically, this includes:

- 120 storage igloos (see Table 3-1);
- Building 5;
- Building 306;
- Building 612;
- Building 2073;
- Building S-2084; and
- Warehouse 356.

The following is a list of the NRC licenses to terminate or to remove SEDA from, with the supporting conclusions for the license termination or release:

License SUC-1275: The main license being terminated involved activities related to the commodity DU at the 120 storage igloos, Building 5, Building 306, Building 2073, Building S-2084, Building 612, and Warehouse 356; these areas are presented in **Sections 3**, **4**, **5**, and **6**. It was determined that each of the sites that comprises each of the areas was below the release criteria of 10 mrem/yr (**Table 8-1**). Consequently, it is recommended that License SUC-1275 be terminated and the associated areas be released for unrestricted use.

License SUC-1380: This license is currently held by the US Army Field Support Command, Rock Island, IL, and is for the possession and storage of DU commodities. SEDA is currently listed on License SUC-1380 as a bulk quantity storage facility. Activities under this license were the same as for SUC-1275 and were conducted in the same locations listed under SUC-1275, (120 storage igloos, Building 5, Building 306, Building 2073, Building S-2084, Building 612, and Warehouse 356). As indicated above, there were no calculated doses for the associated igloos and buildings that exceed the release criteria of 10 mrem/yr (**Table 8-1**). Consequently, it is recommended that SEDA be removed from License SUC-1380 and the associated areas be released for unrestricted use.

License 45-16023-01NA: The U.S. Navy holds this license for storage of DU commodities. Since all areas used for the storage of licensed DU commodities have been shown to meet the release criteria of 10 mrem/yr, SEDA would like to confirm that the SEDA facility is no longer listed on this license, as available records indicate.

License SUB-834: The U.S. Army Aberdeen Test Center, Aberdeen Proving Ground, MD holds this license for the possession of natural uranium, natural thorium, and DU, for the purposes of evaluating and testing munitions and projectiles. Although it is believed that SEDA at one time was authorized to, did not actually store commodities under this license on the facility and has since been removed from the license. The locations known to have stored DU commodities under the other NRC licenses meet the release criteria. Consequently, it is recommended that SEDA be removed from this license, if still currently listed.

License BML 12-00722-07: The U.S. Army Field Support Command, Rock Island, IL currently holds this license for the possession of Pm-147 to be used with military rocket sighting systems. Army records indicate that only one igloo at SEDA, Igloo A0701, stored material controlled by this license. As indicated in **Table 3-5**, survey measurements from Igloo A0701 were below background. Consequently, it is recommended that Igloo A0701 be released for unrestricted use, and if not already done, SEDA be removed from the list of approved storage facilities for License BML 12-00722-07.

License STC-133: The DLA, Fort Belvoir, VA currently holds this license for the possession of uranium and thorium ores, including columbium and tantalum minerals, for use with the National Defense Stockpile. According to Army records, activities at SEDA under this license occurred at Warehouse 356, Section D. SEDA was removed from this license in 1994, following Army, NYSDEC/NYSDOH, and NRC confirmatory surveys (**Section 6**). The supporting documentation for the removal of SEDA as a storage facility under STC-133 is presented in **Appendix 1.F**. Review of the various surveys indicates that that contributing dose at Warehouse 356 would have not been greater than 1.62 mrem/yr. Consequently, Warehouse 356 meets the current release criterion of 10 mrem/yr, and no further investigation is necessary at this site.

In conclusion, the SEDA facility has performed the appropriate investigations for termination or release from the NRC licenses listed above and has demonstrated that any radiological doses above background are below the conservative 10 mrem/yr release criteria accepted by the NRC and based

on the TAGM-4003 of 10 mrem/yr. It is the recommended that the SEDA be removed from all related licenses and be released for unrestricted use.

DEPARTMENT OF THE ARMY
SENECA ARMY DEPOT ACTIVITY
5786 STATE RTE 96, P.O. BOX 9
ROMULUS, NEW YORK 14541-0009

September 2, 2004

REPLY TO
ATTENTION OF

Caretaker Office

Mr. James Kottan
U.S. Nuclear Regulatory Commission
Region 1
Division of Nuclear Materials Safety
Nuclear Materials Safety Branch 2
475 Allendale Road
King of Prussia, PA 19406-1415

SUBJECT: Response to Request for Additional Information Concerning NRC License Termination Report for Seneca Army Depot Activity (Control Number 135163)- letter from NRC dated August 9, 2004

Dear Mr. Kottan,

The United States Army is pleased to submit the additional information requested regarding the License Termination Report for Seneca Army Depot Activity (SEDA) in Romulus, New York. The NRC, in a letter dated August 9, 2004, made the request for additional information.

The goal of the License Termination Report for SEDA, which follows the *Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM; NRC, 2000) and other applicable guidance, is to demonstrate that the license termination requirements for NRC license SUC-1275 (NRC Docket No. 040-08526) have been met and to remove SEDA from Licenses SUC-1380, 45-16023-01NA, SUB-834, BML 12-00722-07, and STC-133.

Attached with this letter are revised Tables 3-11, 3-13, 4-10, 4-12, and 5-9 from the License Termination Report for SEDA. Please replace the tables submitted in the June 2004 Report with the revised tables.

We appreciate the opportunity to provide you with this additional information for a report that is of great importance to the United States Army. Should you have any questions regarding the document, please do not hesitate to contact me (607) 869-1235.

Sincerely,

Stephen M. Absolom
Installation Manager

Response to Comments from the Nuclear Regulatory Commission

Subject: NRC License Termination Report
Seneca Army Depot Activity
Romulus, New York

Comments Dated: August 9, 2004

Date of Comment Response: September 2, 2004

General Comments:

Comment 1: This is in reference to your letter dated June 15, 2004 requesting to amend Nuclear Regulatory Commission License No. SUC-1275. In order to continue our review, we need the following additional information.

Response 1: Acknowledged.

Comment 2: In accordance with 10 CFR 2.390, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC website at http://www.nrc.gov/reading-rm.html.

We will continue our review upon receipt of this information. Please reply to my attention at the Region I Office and refer mail to Mail Control No. 135163. If you have any technical questions regarding this deficiency letter, please call me at (610) 337-5214.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we shall assume that you do not wish to pursue your application.

Response 2: Acknowledged.

Specific Comments:

Comment 1: Your compliance approach does not appear to follow that recommended in MARSSIM. The null hypothesis recommended for use in MARSSIM is: "the residual radioactivity in the survey unit exceeds the release criteria." This statement directly addresses the issue of compliance with the DCGL, and requires significant evidence that the residual radioactivity in the survey unit is less than the DCGL to reject the null hypothesis and pass the survey unit. Distinguishability from background is not addressed under this hypothesis. Additionally, Appendix 1A of your submittal, License Termination and License Release Plan (LTP), Table 5-4, footnote 6, states that the alpha value in Table 5-4 is the acceptable level of Type I decision error, when the null hypothesis is that survey unit exceeds the clean-up standard. This statement is consistent with the recommended null hypothesis in

above information, the standard deviations provided (see response to Specific Comment 4 below), and the abundance of sample measurements collected, it is believed that sufficient statistical power to support our conclusions has been provided. However, if after reviewing these responses, NRC still wishes to request retrospective power curves to further support that there was adequate statistical power to support our conclusions, they can be provided.

Comment 2: MARSSIM recommends that when gross activity DCGLs are used, an appropriate weighted total efficiency should be used for the radiological surveys. ***[A]*** Please provide the calculations for determining the weighted total efficiencies used for the radiological surveys. If weighted total efficiencies were not used, please provide the basis for not using weighted total efficiencies. ***[B]*** In addition, MARSSIM states that the total efficiency for survey instruments may be considered to represent the product of two factors, the instrument efficiency and the source efficiency. Please provide the instrument efficiencies and source efficiencies used in the determination of the total efficiencies for the radiation survey instruments used to perform the radiological surveys. If the total efficiencies [sic], please provide the basis for not using these efficiencies for determining the total efficiency.

Response 2: **[A]** Given the primary constituents of concern (i.e., depleted uranium) at the site, it is believed that weighted efficiencies would not be necessary. The U-238, U-235, and U-234 present in depleted uranium have similar decay characteristics (e.g., alpha emissions between 4.2 and 4.7 MeV, low-energy gamma emissions). The instrument efficiencies were calculated using the daily instrument response checks to similar energy and radiation type (Th-230 with alpha emission at 4.6-4.7 MeV and Am-241 gamma emissions at 13, 26.4, and 59.5 keV) and similar measurement geometry (approximately 1 cm [0.39 inches] for alpha/beta instruments and 1 inch [2.54 cm] for gamma instruments).

[B] Both the instrument and source efficiency were considered in the calculation of the MDA, as shown in Response 3 below. The source efficiency was assumed to be 0.54 for all radiation types, based on the example calculation for scanning on concrete surfaces in Section 6 of NUREG-1507 (NRC, 1997). Only the instrument efficiency was used in the conversion of DCGL from units of dpm/100cm^2 to cpm, per the example data evaluation described in MARSSIM Appendix A.

Comment 3: Please provide examples of the calculations for the MDAs presented in Tables 3-3, 4-3, 5-3, and 6-2.

Response 3: MDAs for direct and scanning measurements were calculated in an Excel spreadsheet (see attached Table B) for each instrument using the following equations from MARSSIM:

$$MDCR = d' \sqrt{b_i} \times (60/i)$$

$$MDA = \frac{MDCR}{\sqrt{p\varepsilon_i\varepsilon_s}\,\frac{probe\ area}{100\ cm^2}}$$

where:

$MDCR$ = minimum detectable count rate (cpm)

d' = index of sensitivity; for a correct detection rate of 95% and a false positive rate of 60%, d' is equal to 1.38.

b_i = background counts during observation interval i, using the average measurement from the background dataset appropriate to the site (e.g., igloos or buildings).

i = scanning observation interval, equal to 1 second for beta and gamma scanning and 2 seconds for alpha scanning (since alpha and beta scanning was performed simultaneously, the 2-second observation interval was used).

p = surveyor efficiency, equal to 0.5 for scanning and 1.0 for direct measurements.

ε_i = instrument-specific efficiency

ε_s = surface efficiency, equal to 0.54.

The direct measurement MDAs for all instruments were calculated using the above equations, but modified to reflect a 1-minute, rather than a 1- or 5-second, observation interval, and a surveyor efficiency of 100% rather than 50%. Both the scanning and direct measurement MDAs were calculated with a d' of 1.38, corresponding to a measurement true positive rate of 95% and a false positive rate of 60%, per MARSSIM (Section 6.7.2).

Comment 4: Please provide the method used to determine the mean cpm in Tables 3-11 and 4-10. Also please provide the standard deviation for these mean values.

Response 4: Upon review, the averages originally presented in Tables 3-11 and 4-10 were found to be incorrect because they did not report weighted averages. In the revised tables provided, for each survey grid that was scanned, a mean scanning measurement was determined by taking the average of the minimum and maximum scanning results. To determine a mean scanning measurement for the survey unit, the average of the individual survey grid averages was then calculated. The standard deviations of each mean survey unit scanning measurement were also calculated. Updated versions of Tables 3-11 and 4-10 have been attached to this letter.

Comment 5: ***[A]*** MARSSIM states that sample results should be reported along with their associated uncertainties. For smear sample results in Tables 3-13, 4-12, 5-9, and 6-5, please provide the uncertainties for the results and the standard deviation for the average results. ***[B]*** Also, for the sample results in Table 3-14 and 4-13, please define the reported uncertainties. For example, do they represent the counting uncertainty (at some confidence interval) or the total propagated uncertainty (at some confidence interval).

Response 5: [A] Smear samples for the DU Igloos (Table 3-13), the DU Buildings (Table 4-12), and Building 612 (Table 5-9) were analyzed by an offsite laboratory and the measurement uncertainties for the smear results were not reported. The standard deviations for the calculated survey unit averages have been added to their respective tables (the revised tables are attached). Standard deviations for the smears collected at Warehouse 356 (Table 6-5), which were analyzed on-site using a NMC gas-proportional counter, were not reported because the results were primarily all below the lower limit of detection (LLD). It should be noted that per MARSSIM (Section 8.5.3), smears were used as a diagnostic tool to determine if further investigation is necessary, not as a means of determining compliance with the release criteria.

[B] The uncertainties for the results listed in Table 3-14 and 4-13 are considered to be the total propagated uncertainty at a 95% confidence level.

Comment 6: [A] Section 5.3.3 of the report on page 5-3 states: "Per MARSSIM for Class 1 survey units all direct and scanning measurements from each building were compared directly with the $DCGL_{EMC}$ for DU". A following sentence in Section 5.3.3 states: "Scanning measurements from Building 612 were not available to perform the $DCGL_{EMC}$ comparison". Table 5-3 indicates that the instrumentation used for the survey of Building 612 included a floor monitor. However, no scanning measurements are included in the data tables for Section 5 of the report. Were scanning measurements made during the survey of Building 612? If so, please provide these measurements. [B] Table 5-3 also reports an efficiency of 0.75% for the FIDLER, resulting in a scanning MDA of 167,867 dpm/100cm2 which is above the DCGLW for DU. The FIDLER efficiencies presented in Table 3-3 and 4-3 are 15%. Please explain the difference in the FIDLER efficiencies.

Response 6: [A] The surveys for Building 612 were completed in 1999 by the Army Radiological Assistance Team and the data collected has been evaluated using the MARSSIM guidance. Although data logger printouts exist indicating possible alpha/beta scanning with the floor monitor and hand-held gas proportional instruments, the manner in which the scanning was performed cannot be verified, and it was determined that the data should not be used. Records indicate that gamma scanning was performed using the FIDLER; however, that data cannot be located. Based on the analysis for DU, no datasets from Building 612 exceeded the $DCGL_W$, and only one dataset was determined to be above background, contributing a dose of 0.6 mrem/yr. Without the FIDLER scanning data to evaluate, it is still believed that there is sufficient information to conclude that Building 612 meets the release criterion for unrestricted use.

[B] Both efficiencies cited in the comment were determined by the daily FIDLER response checks using an Am-241 source. The earlier surveys conducted in 1999 by the Army at Building 612 were performed by taking measurements at a distance of 1 foot (0.30 meters) from the surface. Consequently, the instrument checks during the Building 612 surveys were performed using a 1-foot

(0.30 meters) jig. For the subsequent surveys in 2002 at the DU Storage Igloos and DU Storage Buildings, measurements were taken at a distance of approximately 1 inch (2.54 cm) from the surface. The response check jig used during the 2002 surveys had a distance from the source of 1 inch (2.54 cm).

REFERENCES:

Abelquist, 2001. *Decommissioning Health Physics: A Handbook for MARSSIM Users*, Institute of Physics Publishing, Philadelphia, PA.

NRC, 1997. *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*, NUREG-1507, U.S. Nuclear Regulatory Commission, December.

NRC, 1998. *A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys*, NUREG-1505, U.S. Nuclear Regulatory Commission.

Table A
Kruskal-Wallis Test (per NUREG-1505)
(see Specific Comment-Response 1 from Response to Comments from the NRC Letter dated August 9, 2004)
License Termination Report
Seneca Army Depot Activity

Background Dataset	Reference Area	Average Measurement (cpm)	St Dev (cpm)	Sum of Ranks	Number of Measurements	K	k-1	Kc	K > Kc?
2002 Igloo Alpha	A1107	13.3	19	3800	30	75.1	4	9.5	Yes
	B0806	6.7	15	2841.5	30				
	C0912	1.8	2	1379.5	30				
	D0405	2.1	1	1771.5	30				
	E0403	2.8	6	1532.5	30				
2002 Igloo Beta	A1107	242.8	78.1	2682.5	30	12.5	4	9.5	Yes
	B0806	211.6	53.7	1935.5	30				
	C0912	204.7	39.1	1748.5	30				
	D0405	237.2	48.9	2669	30				
	E0403	215.1	42.1	2289.5	30				
2002 Igloo Gamma	A1107	6695.8	897.8	2150	30	73.9	4	9.5	Yes
	B0806	7002.2	843.2	2868.5	30				
	C0912	4616.1	518.3	620	30				
	D0405	7168.0	870.4	3309	30				
	E0403	6741.1	1009.9	2377.5	30				

K calculated using equation 13-3 from NUREG-1505
k-1 is based on k=5 datasets
Kc is from Table 13.1, NUREG-1505 for k-1=4 and an α of 0.05.
If K > Kc, the null hypothesis that there is no difference between the populations is rejected (i.e., variability exists between the datasets).

Table B
MDA Calculations
(see Specific Comment-Response 3 from Response to Comments from the NRC Letter dated August 92004)
License Termination Report
Seneca Army Depot Activity

Calculation for MDA per MARSSIM Section 6.7.2 for Alpha Phoswich

Value of d-prime 1.38
This is from Table 6.5 per MARSSIM example on page 6-41.
Therefore the true positive proportion is 95% and false positive percent is 60%.

	First Stage	Second Stage	Static 1 min	Static 10 min
Value of b sub I	0.17	0.42	5.00	50.00
Background Count Rate	5	5	5	5
Count time (sec)	60	60	60	60
Observ. Interval (sec)	2	5	60	600
Value of s sub I	0.56	0.89	3.09	9.76
MDCR (cpm)	17	11	3	1
MDCR Surveyor (cpm)	24	15	3	1
Instrument Efficiency	15%	15%	15%	15%
Surface Efficiency	0.54	0.54	0.54	0.54
Surveyor Efficiency	0.5	0.5	1	1
Probe Area (cm2)	75	75	75	75
MDCR Surveyor (dpm)	291	184	38	12
MDA (dpm/100cm2)	388	246	50	16

Calculation for MDA per MARSSIM Section 6.7.2 for Beta Phoswich

Value of d-prime 1.38
This is from Table 6.5 per MARSSIM example on page 6-41.
Therefore the true positive proportion is 95% and false positive percent is 60%.

	First Stage	Second Stage	Static 1 min	Static 10 min
Value of b sub I	3.70	18.50	222.00	2220.00
Background Count Rate	222	222	222	222
Count time (sec)	60	60	60	60
Observ. Interval (sec)	1	5	60	600
Value of s sub I	2.65	5.94	20.56	65.02
MDCR (cpm)	159	71	21	7
MDCR Surveyor (cpm)	225	101	21	7
Instrument Efficiency	11%	11%	11%	11%
Surface Efficiency	0.54	0.54	0.54	0.54
Surveyor Efficiency	0.5	0.5	1	1
Probe Area (cm2)	75	75	75	75
MDCR Surveyor (dpm)	3792	1696	346	109
MDA (dpm/100cm2)	5056	2261	462	146

Calculation for MDA per MARSSIM Section 6.7.2 for FIDLER

Value of d-prime 1.38
This is from Table 6.5 per MARSSIM example on page 6-41.
Therefore the true positive proportion is 95% and false positive percent is 60%.

	First Stage	Second Stage	Static 1 min	Static 10 min
Value of b sub I	108	542	6500	390000
Background Count Rate	6500	6500	6500	6500
Count time (sec)	60	60	60	60
Observ. Interval (sec)	1	5	60	3600
Value of s sub I	14.36	32.12	111.26	861.81
MDCR (cpm)	862	385	111	14
MDCR Surveyor (cpm)	1219	545	111	14
Instrument Efficiency	15%	15%	15%	15%
Surface Efficiency	0.54	0.54	0.54	0.54
Surveyor Efficiency	0.5	0.5	1	1
Probe Area (cm2)	126	126	126	126
MDCR Surveyor (dpm)	15047	6729	1374	177
MDA (dpm/100cm2)	11942	5341	1090	141

Table 3-11 (revised September 2004)
Summary of Igloo Scanning Results
DU Storage Igloos
License Termination Report
Seneca Army Depot Activity

Igloo	Number of Measurements	Alpha/Beta Scanning Minimum (cpm) [1,2]	Alpha/Beta Scanning Maximum (cpm)	Average of Alpha/Beta Scanning Mean (cpm)	Standard Deviation of Alpha/Beta Scanning Mean (cpm)	Is Maximum Reading Greater than Alpha/Beta Flag? [3]	Gamma Scanning Minimum (cpm)	Gamma Scanning Maximum (cpm)	Gamma Scanning Mean (cpm)	Standard Deviation of Gamma Scanning Mean	Is Maximum Reading Greater than Alpha/Beta Flag? [3]
A0201	30	100	340	236	48	No	1500	7000	4423	1077	No
A0316	30	80	340	208	38	No	1000	7000	4308	1251	No
A0317	30	80	340	210	41	No	2000	10000	6962	1677	No
A0508	30	60	400	201	46	No	2000	11000	7115	1816	No
A0701	30	60	380	201	42	No	1000	7000	4154	774	No
A0706	30	100	700	240	84	No	3000	10000	6962	1198	No
A0707	30	60	460	226	59	No	3000	11000	7346	987	No
A0710	30	100	460	242	49	No	2000	6000	4462	803	No
A0711	30	100	500	233	57	No	3000	10000	7038	1127	No
A0901	30	100	500	243	55	No	1800	6000	4223	850	No
A0905	30	100	480	249	63	No	1000	7000	4231	665	No
A1107	30	100	900	261	93	No	2000	8000	6423	1205	No
A1108	30	60	400	193	47	No	3000	8000	6500	1080	No
A1109	30	100	400	222	45	No	1000	7000	4231	927	No
B0109	30	80	360	192	42	No	3000	8000	6615	893	No
B0411	30	100	360	218	33	No	2000	7000	4077	732	No
B0501	30	60	300	178	34	No	1000	10000	6538	1738	No
B0602	30	80	360	190	35	No	3000	10000	6885	1044	No
B0603	30	80	360	195	41	No	3000	10000	7077	976	No
B0609	30	100	400	219	32	No	3000	10000	7231	1285	No
B0610	30	80	340	195	36	No	3000	10000	7038	1163	No
B0701	30	80	460	213	47	No	3000	11000	7154	1281	No
B0705	30	80	380	210	51	No	3000	10000	7000	1118	No
B0707	30	80	380	208	46	No	3000	10000	6654	774	No
B0708	30	80	300	178	29	No	2000	10000	6808	1164	No
B0709	30	40	360	202	47	No	2000	10000	6500	1258	No
B0711	30	80	340	202	29	No	3000	10000	7000	1080	No
B0801	30	100	280	188	18	No	1000	7000	4269	696	No
B0802	30	60	360	198	38	No	2000	7000	4154	516	No
B0804	30	100	380	202	33	No	1000	6000	4038	721	No
B0806	30	80	600	218	61	No	3000	10000	7115	870	No
B0809	30	80	600	230	89	No	3000	10000	6731	881	No
B0810	30	100	440	231	57	No	3000	10000	6923	1115	No
B0811	30	60	380	195	39	No	3000	10000	7269	1092	No
B0909	30	80	500	212	69	No	3000	11000	7308	1200	No
C0203	30	80	380	200	42	No	3000	10000	6769	1013	No
C0303	30	60	600	210	94	No	3000	9000	6385	1024	No
C0307	30	80	600	219	74	No	3000	9000	6462	1050	No
C0308	30	120	600	232	84	No	3000	10000	6769	971	No
C0401	30	80	600	204	95	No	3000	10000	7115	982	No
C0403	30	60	500	193	53	No	3000	11000	6962	1050	No
C0405	30	40	500	201	58	No	3000	9000	6615	939	No
C0406	30	100	500	218	63	No	3000	10000	6962	1163	No
C0407	30	80	440	195	47	No	3000	10000	6923	1058	No
C0408	30	40	300	182	26	No	3000	9000	6577	1115	No
C0501	30	80	300	174	21	No	3000	10000	6769	927	No
C0503	30	100	500	200	47	No	3000	10000	6962	877	No
C0504	30	100	300	186	29	No	3000	10000	6846	1028	No
C0505	30	100	500	198	52	No	3000	10000	6923	1058	No
C0508	30	80	500	191	55	No	3000	11000	6962	946	No

Table 3-11 (revised September 2004)
Summary of Igloo Scanning Results
DU Storage Igloos
License Termination Report
Seneca Army Depot Activity

Igloo	Number of Measurements	Alpha/Beta Scanning Minimum (cpm) [1,2]	Alpha/Beta Scanning Maximum (cpm)	Average of Alpha/Beta Scanning Mean (cpm)	Standard Deviation of Alpha/Beta Scanning Mean (cpm)	Is Maximum Reading Greater than Alpha/Beta Flag? [3]	Gamma Scanning Minimum (cpm)	Gamma Scanning Maximum (cpm)	Gamma Scanning Mean (cpm)	Standard Deviation of Gamma Scanning Mean	Is Maximum Reading Greater than Alpha/Beta Flag? [3]
C0510	30	80	600	202	65	No	3000	10000	6808	947	No
C0511	30	100	300	183	26	No	3000	9000	6038	967	No
C0513	30	40	300	172	33	No	3000	10000	6615	820	No
C0603	30	60	600	183	73	No	3000	10000	6577	838	No
C0604	30	80	600	186	68	No	2000	9000	6346	966	No
C0605	30	80	400	209	51	No	2000	9000	6500	1021	No
C0606	30	60	300	184	32	No	3000	9000	6346	899	No
C0608	30	60	420	193	44	No	2000	7000	5000	1137	No
C0701	30	80	600	193	71	No	3000	9000	6577	1058	No
C0706	30	80	600	194	65	No	3000	9000	6500	1000	No
C0707	30	80	320	204	36	No	3000	10000	6692	902	No
C0708	30	80	360	192	34	No	3000	10000	6846	1008	No
C0801	30	80	320	171	29	No	3000	10000	7154	1049	No
C0803	30	80	280	172	21	No	3000	9000	6538	989	No
C0807	30	80	320	188	29	No	3000	9000	6500	979	No
C0809	30	60	420	192	47	No	3000	9000	6654	1068	No
C0901	30	60	450	177	55	No	3000	9000	6962	1181	No
C0902	30	100	420	209	58	No	3000	10000	7038	1089	No
C0906	30	80	400	197	56	No	3000	11000	7192	1217	No
C0907	30	80	340	184	28	No	3000	9000	6654	1049	No
C0908	30	100	460	205	46	No	3000	10000	7077	1134	No
C0909	30	100	480	194	38	No	2000	7000	4423	813	No
C0912	30	40	420	201	41	No	2000	6000	4327	800	No
D0104	30	80	500	236	58	No	2000	7000	4038	721	No
D0105	30	100	420	216	39	No	2000	6000	3962	477	No
D0107	30	120	450	258	43	No	1000	10000	4577	1239	No
D0108	30	80	600	192	87	No	3000	9000	6577	1017	No
D0110	30	80	360	188	36	No	2000	6000	3808	522	No
D0113	30	40	400	199	41	No	3000	9000	6615	893	No
D0206	30	80	360	198	45	No	2000	6000	3962	431	No
D0207	30	80	440	218	59	No	2000	6000	4000	577	No
D0305	30	100	340	217	48	No	3000	10000	6923	932	No
D0306	30	80	400	188	46	No	3000	11000	7192	1128	No
D0312	30	80	340	198	35	No	2000	10000	6692	1234	No
D0401	30	80	400	197	43	No	2000	6000	3923	572	No
D0405	30	100	400	215	59	No	2000	11000	7115	1244	No
D0406	30	100	400	208	46	No	2000	11000	7385	1402	No
D0407	30	60	440	202	45	No	3000	10000	6731	949	No
D0413	30	100	400	208	61	No	3000	11000	7231	1268	No
D0601	30	100	400	207	46	No	3000	10000	7038	1145	No
D0604	30	100	400	235	35	No	3000	10000	6808	723	No
D0607	30	80	360	193	39	No	2000	6000	3885	506	No
D0704	30	100	440	191	43	No	3000	10000	7115	961	No
D0705	30	100	300	204	25	No	3000	10000	7115	1044	No
D0711	30	60	420	214	51	No	2000	6000	3808	522	No
D0712	30	60	420	206	49	No	1000	7000	4346	658	No
D0801	30	100	280	183	17	No	1000	6000	4115	768	No
D0805	30	100	420	229	35	No	2000	10000	6769	1317	No
E0103	30	80	600	212	51	No	2000	10000	7115	1227	No
E0105	30	100	600	234	89	No	2000	11000	7269	1467	No

Table 3-11 (revised September 2004)
Summary of Igloo Scanning Results
DU Storage Igloos
License Termination Report
Seneca Army Depot Activity

Igloo	Number of Measurements	Alpha/Beta Scanning Minimum (cpm) (1,2)	Alpha/Beta Scanning Maximum (cpm)	Average of Alpha/Beta Scanning Mean (cpm)	Standard Deviation of Alpha/Beta Scanning Mean (cpm)	Is Maximum Reading Greater than Alpha/Beta Flag? (3)	Gamma Scanning Minimum (cpm)	Gamma Scanning Maximum (cpm)	Gamma Scanning Mean (cpm)	Standard Deviation of Gamma Scanning Mean	Is Maximum Reading Greater than Alpha/Beta Flag? (2)
E0112	30	80	400	210	53	No	3000	10000	7000	1275	No
E0211	30	80	500	194	51	No	3000	11000	7077	1239	No
E0301	30	80	340	203	29	No	1000	7000	4231	665	No
E0302	30	60	400	212	46	No	3000	8000	6538	1145	No
E0303	30	100	420	191	57	No	2000	11000	7077	1397	No
E0312	30	60	380	179	43	No	2000	10000	6692	1109	No
E0402	30	80	340	185	27	No	3000	8000	6538	1145	No
E0403	30	80	440	212	44	No	2000	11000	7077	1718	No
E0410	30	80	400	196	43	No	2000	11000	7038	1520	No
E0411	30	80	300	185	30	No	1000	7000	4192	805	No
E0413	30	100	320	213	34	No	3000	9000	6731	1129	No
E0504	30	100	360	233	26	No	3000	10000	7000	1275	No
E0506	30	100	400	218	41	No	2000	11000	7038	1361	No
E0508	30	80	380	215	37	No	3000	10000	7154	1197	No
E0510	30	100	400	222	36	No	2000	12000	7423	1441	No
E0512	30	60	300	173	36	No	1000	7000	4231	971	No
E0602	30	100	1000	255	195	No	1000	6000	4192	663	No
E0604	30	100	600	232	84	No	1000	7000	4269	665	No
E0609	30	100	1200	278	222	No	1000	7000	4308	723	No
E0610	30	100	400	212	44	No	1000	7000	4423	838	No
E0702	30	80	460	214	50	No	1000	8000	4346	922	No
E0706	30	80	500	212	46	No	3000	8000	6462	1145	No
E0711	30	60	300	182	34	No	2000	8000	6269	1301	No
E0801	30	80	400	220	29	No	1000	7000	4346	689	No
E0802	30	100	380	227	44	No	1000	6000	4038	776	No

Notes:
(1) All Alpha/Beta measurements collected in the igloos were collected with a phoswich detector.
(2) cpm = counts per minute
(3) The scanning flag values for measurements in the Class 3 survey units are based on the gross activity DCGL for DU.
Average background is included in the flag value. The alpha/beta flag value, which is 6428 cpm for the phoswich detector, is the sum of the individual alpha and beta DU DCGLw's. The Gamma FIDLER flag value is 12465 cpm.

Table 3-13 (revised September 2004)
Summary of Smear Sampling Results [1, 2, 3]
DU Storage Igloos
NRC License Termination Report
Seneca Army Depot Activity

Igloo	Number of Smears	Alpha (dpm) [4]				Beta (dpm)				Gamma (dpm)				Tritium Beta (dpm)			
		Min	Average	St Dev	Max	Min	Average	St Dev	Max	Min	Average	St Dev	Max	Min	Average	St Dev	Max
A0201	30	0.0	0.2	0.5	1.4	0.0	0.9	1.8	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A0316	30	0.0	0.1	0.3	1.4	0.0	1.4	2.2	6.3	0.0	0.0	0.0	0.0	0.0	0.3	1.9	10.5
A0317	30	0.0	0.2	0.5	1.6	0.0	0.7	1.7	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A0508	30	0.0	0.2	0.4	1.2	0.0	0.7	1.5	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A0701	30	0.0	0.2	0.5	2.0	0.0	1.2	2.2	7.5	0.0	0.0	0.0	0.0	-- [5]	--	--	--
A0706	30	0.0	0.8	1.9	10.0	0.0	5.5	9.5	53.9	0.0	0.0	0.0	0.0	--	--	--	--
A0707	30	0.0	0.2	0.7	3.7	0.0	2.5	3.6	15.7	0.0	0.0	0.0	0.0	--	--	--	--
A0710	30	0.0	0.1	0.3	1.2	0.0	3.0	4.6	16.8	0.0	0.0	0.0	0.0	--	--	--	--
A0711	30	0.0	0.3	0.8	3.8	0.0	2.9	4.4	15.5	0.0	0.0	0.0	0.0	--	--	--	--
A0901	30	0.0	0.8	3.0	16.6	0.0	2.8	10.0	55.0	0.0	2.4	13.0	71.0	--	--	--	--
A0905	30	0.0	0.5	1.8	9.8	0.0	4.6	12.3	68.2	0.0	1.6	8.6	47.2	--	--	--	--
A1108	30	0.0	0.3	1.1	5.8	0.0	1.0	3.4	16.4	0.0	0.0	0.0	0.0	--	--	--	--
A1109	30	0.0	0.0	0.0	0.0	0.0	0.6	1.6	5.6	0.0	0.0	0.0	0.0	--	--	--	--
B0109	30	0.0	0.1	0.4	1.4	0.0	2.5	5.0	21.5	0.0	0.0	0.0	0.0	--	--	--	--
B0411	30	0.0	0.0	0.0	0.0	0.0	3.1	3.8	13.1	0.0	0.0	0.0	0.0	--	--	--	--
B0501	30	0.0	0.0	0.0	0.0	0.0	2.1	3.4	15.3	0.0	0.0	0.0	0.0	--	--	--	--
B0602	30	0.0	0.0	0.0	0.0	0.0	1.9	2.7	8.1	0.0	0.0	0.0	0.0	--	--	--	--
B0603	30	0.0	0.1	0.3	1.8	0.0	1.0	2.2	6.3	0.0	0.0	0.0	0.0	--	--	--	--
B0609	30	0.0	0.4	0.7	2.2	0.0	5.8	4.7	16.2	0.0	0.0	0.0	0.0	--	--	--	--
B0610	30	0.0	0.1	0.4	1.4	0.0	1.4	2.1	6.3	0.0	0.0	0.0	0.0	--	--	--	--
B0701	30	0.0	0.1	0.6	2.8	0.0	3.4	3.7	11.3	0.0	12.5	23.2	61.8	--	--	--	--
B0705	30	0.0	0.2	0.5	1.8	0.0	2.7	3.0	8.2	0.0	0.0	0.0	0.0	--	--	--	--
B0707	30	0.0	0.1	0.4	1.9	0.0	2.3	2.9	9.9	0.0	0.0	0.0	0.0	--	--	--	--
B0708	30	0.0	0.0	0.0	0.0	0.0	0.3	1.0	3.6	0.0	9.1	20.7	60.7	--	--	--	--
B0709	30	0.0	0.0	0.2	1.1	0.0	2.5	2.3	6.0	0.0	0.0	0.0	0.0	--	--	--	--
B0711	30	0.0	0.2	0.5	1.9	0.0	2.6	2.3	6.9	0.0	3.6	13.8	57.8	--	--	--	--
B0801	30	0.0	0.3	0.6	2.2	0.0	1.4	2.3	6.8	0.0	0.0	0.0	0.0	--	--	--	--
B0802	30	0.0	0.0	0.0	0.0	0.0	0.3	1.1	5.2	0.0	1.6	8.5	46.8	--	--	--	--
B0804	30	0.0	0.1	0.3	1.6	0.0	0.3	1.0	3.3	0.0	10.5	21.8	68.5	--	--	--	--
B0809	30	0.0	0.1	0.3	1.0	0.0	1.0	1.9	6.1	0.0	0.0	0.0	0.0	--	--	--	--
B0810	30	0.0	0.1	0.3	1.1	0.0	1.1	2.1	6.8	0.0	0.0	0.0	0.0	--	--	--	--
B0811	30	0.0	0.2	1.1	5.9	0.0	1.1	3.1	15.7	0.0	1.5	8.3	45.5	--	--	--	--
B0909	30	0.0	0.3	0.7	2.5	0.0	2.6	3.4	11.7	0.0	0.0	0.0	0.0	--	--	--	--
C0203	30	0.0	0.0	0.0	0.0	0.0	0.1	0.7	4.1	0.0	1.6	8.6	47.1	--	--	--	--
C0303	30	0.0	0.2	1.0	5.7	0.0	0.6	2.6	14.1	0.0	0.0	0.0	0.0	--	--	--	--
C0307	30	0.0	0.1	0.6	3.1	0.0	1.0	3.4	15.4	0.0	0.0	0.0	0.0	--	--	--	--

Table 3-13 (revised September 2004)
Summary of Smear Sampling Results [1, 2, 3]
DU Storage Igloos
NRC License Termination Report
Seneca Army Depot Activity

Igloo	Number of Smears	Alpha (dpm) [4]				Beta (dpm)				Gamma (dpm)				Tritium Beta (dpm)			
		Min	Average	St Dev	Max	Min	Average	St Dev	Max	Min	Average	St Dev	Max	Min	Average	St Dev	Max
C0308	30	0.0	0.2	0.6	2.3	0.0	1.7	3.1	14.6	0.0	1.5	8.1	44.1	--	--	--	--
C0401	30	0.0	0.0	0.0	0.0	0.0	0.4	1.1	3.8	0.0	0.0	0.0	0.0	--	--	--	--
C0403	30	0.0	0.2	0.8	4.3	0.0	0.9	2.6	12.2	0.0	3.4	13.0	55.0	--	--	--	--
C0405	30	0.0	0.1	0.5	2.6	0.0	0.3	1.0	4.0	0.0	0.0	0.0	0.0	--	--	--	--
C0406	30	0.0	0.0	0.0	0.0	0.0	0.3	1.0	4.3	0.0	0.0	0.0	0.0	--	--	--	--
C0407	30	0.0	0.2	0.8	4.1	0.0	1.0	3.5	18.1	0.0	0.0	0.0	0.0	--	--	--	--
C0408	30	0.0	0.0	0.0	0.0	0.0	0.3	1.1	4.8	0.0	5.0	15.3	57.1	--	--	--	--
C0501	30	0.0	0.2	0.7	3.1	0.0	1.0	2.1	7.8	0.0	1.5	8.2	45.0	--	--	--	--
C0503	30	0.0	0.5	2.0	10.3	0.0	1.2	4.9	26.2	0.0	3.4	13.0	51.6	--	--	--	--
C0504	30	0.0	0.1	0.5	2.5	0.0	0.2	1.1	6.1	0.0	0.0	0.0	0.0	--	--	--	--
C0505	30	0.0	0.0	0.0	0.0	0.0	0.4	2.4	13.1	0.0	11.1	20.5	57.2	--	--	--	--
C0508	30	0.0	0.0	0.0	0.0	0.0	0.2	0.8	4.6	0.0	3.5	13.1	54.5	--	--	--	--
C0510	30	0.0	0.1	0.7	3.9	0.0	1.1	4.2	22.3	0.0	1.5	8.3	45.6	--	--	--	--
C0511	30	0.0	0.0	0.2	1.3	0.0	0.3	1.2	5.6	0.0	2.2	11.8	64.8	--	--	--	--
C0513	30	0.0	0.0	0.0	0.0	0.0	0.3	1.2	5.6	0.0	3.8	14.5	65.4	--	--	--	--
C0603	30	0.0	0.1	0.3	1.9	0.0	0.1	0.6	3.5	0.0	0.0	0.0	0.0	--	--	--	--
C0604	30	0.0	0.3	1.3	7.2	0.0	2.6	6.2	32.3	0.0	0.0	0.0	0.0	--	--	--	--
C0605	30	0.0	0.1	0.6	3.4	0.0	4.9	7.6	27.4	0.0	0.0	0.0	0.0	--	--	--	--
C0606	30	0.0	0.6	1.7	9.0	0.0	2.6	3.4	11.0	0.0	3.5	13.3	57.9	--	--	--	--
C0608	30	0.0	0.2	0.6	2.9	0.0	3.2	4.6	21.8	0.0	3.2	12.3	50.2	--	--	--	--
C0701	30	0.0	0.2	0.5	1.7	0.0	0.8	1.5	4.4	0.0	2.1	11.7	63.9	--	--	--	--
C0706	30	0.0	0.0	0.2	1.1	0.0	0.9	1.7	4.7	0.0	0.0	0.0	0.0	--	--	--	--
C0707	30	0.0	0.1	0.4	1.5	0.0	1.7	2.0	4.7	0.0	0.0	0.0	0.0	--	--	--	--
C0708	30	0.0	0.1	0.4	1.5	0.0	0.9	1.7	4.7	0.0	0.0	0.0	0.0	--	--	--	--
C0801	30	0.0	0.4	0.7	2.5	0.0	1.9	2.2	5.9	0.0	1.7	9.3	50.8	--	--	--	--
C0803	30	0.0	0.4	0.7	2.9	0.0	2.8	2.4	7.4	0.0	6.4	16.6	54.6	--	--	--	--
C0807	30	0.0	0.4	0.9	4.0	0.0	2.8	2.9	11.8	0.0	1.9	10.2	55.7	--	--	--	--
C0809	30	0.0	0.2	0.5	2.1	0.0	1.5	2.3	7.8	0.0	0.0	0.0	0.0	--	--	--	--
C0901	30	0.0	0.3	0.6	1.7	0.0	2.1	4.0	19.5	0.0	0.0	0.0	0.0	--	--	--	--
C0902	30	0.0	0.4	0.9	3.2	0.0	3.9	2.9	9.4	0.0	0.0	0.0	0.0	--	--	--	--
C0906	30	0.0	0.1	0.4	1.3	0.0	1.1	2.0	6.8	0.0	1.8	9.6	52.8	--	--	--	--
C0907	30	0.0	0.1	0.4	1.7	0.0	0.9	1.7	5.0	0.0	0.0	0.0	0.0	--	--	--	--
C0908	30	0.0	0.2	0.7	2.9	0.0	2.3	4.3	21.1	0.0	0.0	0.0	0.0	--	--	--	--
C0909	30	0.0	0.6	0.7	2.1	0.0	2.7	5.3	26.8	0.0	0.0	0.0	0.0	--	--	--	--
D0104	30	0.0	0.1	0.7	3.7	0.0	0.6	1.7	6.7	0.0	0.0	0.0	0.0	--	--	--	--
D0105	30	0.0	0.0	0.0	0.0	0.0	0.3	1.1	5.3	0.0	0.0	0.0	0.0	--	--	--	--
D0107	30	0.0	0.4	1.6	8.9	0.0	1.3	5.4	29.3	0.0	1.6	8.6	47.2	--	--	--	--

Table 3-13 (revised September 2004)
Summary of Smear Sampling Results [1, 2, 3]
DU Storage Igloos
NRC License Termination Report
Seneca Army Depot Activity

Igloo	Number of Smears	Alpha (dpm) [4]				Beta (dpm)				Gamma (dpm)				Tritium Beta (dpm)			
		Min	Average	St Dev	Max	Min	Average	St Dev	Max	Min	Average	St Dev	Max	Min	Average	St Dev	Max
D0108	30	0.0	0.0	0.0	0.0	0.0	0.4	1.1	3.9	0.0	0.0	0.0	0.0	--	--	--	--
D0110	30	0.0	0.4	1.3	6.4	0.0	4.4	5.4	24.8	0.0	4.9	15.0	52.3	--	--	--	--
D0113	30	0.0	0.1	0.5	2.2	0.0	1.5	3.5	17.8	0.0	0.0	0.0	0.0	--	--	--	--
D0206	30	0.0	0.2	0.6	2.2	0.0	2.3	3.2	9.9	0.0	0.0	0.0	0.0	--	--	--	--
D0207	30	0.0	0.6	1.9	10.3	0.0	4.4	12.2	66.0	0.0	0.0	0.0	0.0	--	--	--	--
D0305	30	0.0	0.0	0.0	0.0	0.0	0.7	1.6	5.4	0.0	8.7	19.9	62.7	--	--	--	--
D0306	30	0.0	0.2	0.6	2.2	0.0	0.6	1.7	5.5	0.0	1.6	8.5	46.5	--	--	--	--
D0312	30	0.0	0.0	0.0	0.0	0.0	0.6	1.4	4.8	0.0	3.3	12.7	55.3	--	--	--	--
D0401	30	0.0	0.1	0.8	4.2	0.0	1.8	4.1	21.5	0.0	1.7	9.3	50.7	--	--	--	--
D0405	30	0.0	0.0	0.0	0.0	0.0	3.2	3.8	16.8	0.0	5.1	15.7	56.3	--	--	--	--
D0406	30	0.0	0.1	0.5	1.8	0.0	2.7	3.4	10.2	0.0	3.5	13.4	61.0	--	--	--	--
D0407	30	0.0	0.1	0.8	4.2	0.0	2.8	3.6	14.6	0.0	0.0	0.0	0.0	--	--	--	--
D0413	30	0.0	0.0	0.3	1.4	0.0	0.9	1.7	6.1	0.0	3.2	12.2	48.0	--	--	--	--
D0601	30	0.0	0.1	0.4	2.2	0.0	0.9	1.9	5.8	0.0	0.0	0.0	0.0	--	--	--	--
D0604	30	0.0	0.2	0.5	1.8	0.0	1.0	1.8	5.1	0.0	3.2	12.2	50.5	--	--	--	--
D0607	30	0.0	0.0	0.0	0.0	0.0	2.5	2.9	9.0	0.0	0.0	0.0	0.0	--	--	--	--
D0704	30	0.0	0.8	2.9	15.8	0.0	2.8	8.9	48.7	0.0	0.0	0.0	0.0	--	--	--	--
D0705	30	0.0	0.1	0.4	1.4	0.0	2.6	3.3	9.3	0.0	0.0	0.0	0.0	--	--	--	--
D0711	30	0.0	0.4	1.4	7.4	0.0	1.8	3.4	13.2	0.0	6.2	19.1	71.5	--	--	--	--
D0712	30	0.0	0.2	0.5	2.1	0.0	2.7	3.5	17.2	0.0	0.0	0.0	0.0	--	--	--	--
D0801	30	0.0	0.0	0.0	0.0	0.0	1.7	2.6	9.6	0.0	1.7	9.2	50.2	--	--	--	--
D0805	30	0.0	0.2	0.4	1.4	0.0	4.4	4.0	13.5	0.0	0.0	0.0	0.0	--	--	--	--
E0103	30	0.0	0.4	1.3	5.2	0.0	3.1	4.8	21.2	0.0	0.0	0.0	0.0	--	--	--	--
E0105	30	0.0	0.4	1.4	7.4	0.0	3.9	4.2	17.9	0.0	5.0	15.1	51.9	--	--	--	--
E0112	30	0.0	0.4	0.6	1.7	0.0	4.3	5.9	29.8	0.0	4.9	15.0	51.5	--	--	--	--
E0211	30	0.0	0.4	1.3	6.9	0.0	2.6	7.0	37.6	0.0	0.0	0.0	0.0	--	--	--	--
E0301	30	0.0	0.5	2.1	11.7	0.0	2.3	6.0	31.6	0.0	3.8	14.4	61.3	--	--	--	--
E0302	30	0.0	0.5	0.7	2.2	0.0	2.8	3.7	10.5	0.0	3.1	11.9	47.1	--	--	--	--
E0303	30	0.0	0.3	0.6	1.8	0.0	3.7	3.4	10.5	0.0	0.0	0.0	0.0	--	--	--	--
E0312	30	0.0	0.6	2.1	11.4	0.0	4.9	13.3	73.8	0.0	1.9	10.3	56.2	--	--	--	--
E0402	30	0.0	0.2	0.6	2.4	0.0	2.7	5.7	28.0	0.0	0.0	0.0	0.0	--	--	--	--
E0410	30	0.0	0.3	0.6	2.4	0.0	4.7	5.8	20.3	0.0	0.0	0.0	0.0	--	--	--	--
E0411	30	0.0	0.3	0.9	4.4	0.0	3.1	4.9	21.8	0.0	0.0	0.0	0.0	--	--	--	--
E0413	30	0.0	0.2	0.4	1.7	0.0	2.5	3.2	10.7	0.0	1.8	9.9	54.2	--	--	--	--
E0504	30	0.0	0.2	0.8	3.9	0.0	3.6	3.9	14.8	0.0	0.0	0.0	0.0	--	--	--	--
E0506	30	0.0	0.2	0.4	1.0	0.0	2.3	4.0	16.7	0.0	0.0	0.0	0.0	--	--	--	--
E0508	30	0.0	0.5	1.1	5.2	0.0	3.7	5.1	22.8	0.0	0.0	0.0	0.0	--	--	--	--

Table 3-13 (revised September 2004)
Summary of Smear Sampling Results [1, 2, 3]
DU Storage Igloos
NRC License Termination Report
Seneca Army Depot Activity

Igloo	Number of Smears	Alpha (dpm) [4]				Beta (dpm)				Gamma (dpm)				Tritium Beta (dpm)			
		Min	Average	St Dev	Max	Min	Average	St Dev	Max	Min	Average	St Dev	Max	Min	Average	St Dev	Max
E0510	30	0.0	0.9	3.4	18.4	0.0	6.7	23.6	130.1	0.0	7.0	18.4	65.1	--	--	--	--
E0512	30	0.0	0.4	0.8	3.2	0.0	2.9	3.0	9.2	0.0	3.8	14.5	64.6	--	--	--	--
E0602	30	0.0	1.2	3.4	16.5	0.0	5.5	9.1	37.7	0.0	4.4	17.0	77.0	--	--	--	--
E0604	30	0.0	0.1	0.3	1.7	0.0	1.2	2.0	5.9	0.0	1.8	9.7	53.2	--	--	--	--
E0609	30	0.0	0.9	4.1	22.4	0.0	4.0	12.3	67.0	0.0	0.0	0.0	0.0	--	--	--	--
E0610	30	0.0	0.5	1.7	9.1	0.0	6.7	7.5	35.5	0.0	1.9	10.2	55.9	--	--	--	--
E0702	30	0.0	0.1	0.4	2.3	0.0	2.1	3.6	15.0	0.0	1.8	9.9	54.3	--	--	--	--
E0706	30	0.0	0.2	0.6	2.7	0.0	2.7	4.7	22.2	0.0	0.0	0.0	0.0	--	--	--	--
E0711	30	0.0	0.3	0.5	1.9	0.0	1.0	1.9	5.8	0.0	0.0	0.0	0.0	--	--	--	--
E0801	30	0.0	0.3	0.6	1.9	0.0	0.6	1.7	5.8	0.0	0.0	0.0	0.0	--	--	--	--
E0802	30	0.0	0.3	0.5	1.6	0.0	1.4	2.5	8.0	0.0	0.0	0.0	0.0	--	--	--	--

Notes:

(1) 10 CFR 835, Appendix D, removable contamination limits: natural U, U-235, U-238, and assoc. decay products - 1,000 dpm/100cm^2; Tritium - 10,000 beta-gamma/100cm^2.

(2) Smear samples collected over a 100 cm^2 area.

(3) The reported detection limits ranged from 2-6 dpm for alpha measurements, 6-8 dpm for beta measurements, 85-93 dpm for gamma measurements, and 21.2 dpm for tritium measurements.

(4) dpm = disintegrations per minute.

(5) "--" = Tritium smears were not collected at this survey unit.

Table 4-10 (revised September 2004)
Summary of Building Scanning Results
DU Buildings
License Termination Report
Seneca Army Depot Activity

Survey Unit (Bldg/Room)	Measurement Type	Number of Grids Scanned	Scanning Minimum (cpm)	Scanning Maximum (cpm)	Average of Scanning Mean (cpm)	Standard Deviation of Scanning Mean (cpm)	Flag Value (cpm)	Maximum Reading Greater than Flag?
ALPHA/BETA FLOOR MONITOR								
5	1 Alpha/Beta	53	300	1200	609	113	32339	No
5	2 Alpha/Beta	14	200	1300	654	117	32339	No
5	3 Alpha/Beta	11	300	900	627	61	32339	No
5	4 Alpha/Beta	11	400	900	659	58	32339	No
5	5 Alpha/Beta	30	400	900	657	64	32339	No
5	6 Alpha/Beta	30	300	1000	645	79	32339	No
5	7 Alpha/Beta	7	600	1100	814	48	32339	No
5	8 Alpha/Beta	13	400	1300	785	149	32339	No
5	9 Alpha/Beta	27	300	1000	685	88	32339	No
5	10 Alpha/Beta	16	400	1200	744	83	32339	No
5	16 Alpha/Beta	8	400	1200	744	105	32339	No
306	10 Alpha/Beta	23	300	1400	643	125	32339	No
306	11 Alpha/Beta	18	300	1200	603	117	32339	No
306	12 Alpha/Beta	42	300	1200	589	89	32339	No
306	13 Alpha/Beta	21	400	1200	660	103	32339	No
2073	1 Alpha/Beta	56	200	900	563	83	32339	No
2073	3 Alpha/Beta	32	200	800	500	97	32339	No
2084	2 Alpha/Beta	20	200	800	615	110	32339	No
2084	3 Alpha/Beta	74	200	1000	572	116	32339	No
2084	6 Alpha/Beta	15	200	800	473	112	32339	No
ALPHA/BETA PHOSWICH								
5	1 Alpha/Beta	32	80	400	176	33	6571	No
5	2 Alpha/Beta	6	80	300	182	32	6571	No
5	3 Alpha/Beta	6	100	380	193	32	6571	No
5	4 Alpha/Beta	6	100	400	222	43	6571	No
5	5 Alpha/Beta	59	40	300	151	23	6571	No
5	6 Alpha/Beta	18	80	280	165	19	6571	No
5	7 Alpha/Beta	17	80	460	247	64	6571	No
5	8 Alpha/Beta	8	100	420	258	50	6571	No
5	9 Alpha/Beta	32	80	320	173	20	6571	No
5	10 Alpha/Beta	9	100	480	220	61	6571	No
5	11 Alpha/Beta	2	100	240	170	28	6571	No
5	12 Alpha/Beta	2	120	380	240	42	6571	No
5	13 Alpha/Beta	4	100	300	193	19	6571	No
5	14 Alpha/Beta	2	80	380	195	78	6571	No
5	15 Alpha/Beta	2	140	380	245	35	6571	No
5	16 Alpha/Beta	5	120	460	238	55	6571	No
306	1 Alpha/Beta	5	60	240	148	16	6571	No
306	2 Alpha/Beta	4	60	300	160	37	6571	No
306	3 Alpha/Beta	1	100	320	210	156	6571	No
306	4 Alpha/Beta	1	180	320	250	99	6571	No
306	5 Alpha/Beta	2	140	400	240	42	6571	No
306	6 Alpha/Beta	3	120	380	247	6	6571	No
306	7 Alpha/Beta	6	100	300	202	19	6571	No
306	8 Alpha/Beta	3	100	360	200	30	6571	No
306	10 Alpha/Beta	18	60	480	184	53	6571	No
306	11 Alpha/Beta	28	60	300	161	19	6571	No
306	12 Alpha/Beta	47	60	300	154	17	6571	No
306	13 Alpha/Beta	21	60	800	195	119	6571	No
2073	1 Alpha/Beta	67	80	300	166	22	6571	No
2073	2 Alpha/Beta	25	60	340	195	29	6571	No
2073	3 Alpha/Beta	31	40	260	157	17	6571	No
2084	2 Alpha/Beta	14	60	220	137	18	6571	No
2084	3 Alpha/Beta	99	40	280	134	20	6571	No
GAMMA FIDLER								
5	1 Gamma	85	2000	14000	5253	1654	17285	No
5	2 Gamma	20	2000	15000	6738	2203	17285	No
5	3 Gamma	17	2000	7000	4368	531	17285	No
5	4 Gamma	17	2000	10000	4824	814	17285	No
5	5 Gamma	89	2000	10000	4480	715	17285	No
5	6 Gamma	48	2000	10000	5182	1345	17285	No
5	7 Gamma	24	2000	16000	8344	2511	17285	No
5	8 Gamma	21	4000	15000	9024	2159	17285	No
5	9 Gamma	59	2000	10000	5140	1507	17285	No
5	10 Gamma	25	3200	13000	6554	1809	17285	No
5	11 Gamma	2	5000	11000	8500	2121	17285	No

Table 4-10 (revised September 2004)
Summary of Building Scanning Results
DU Buildings
License Termination Report
Seneca Army Depot Activity

Survey Unit (Bldg/Room)	Measurement Type	Number of Grids Scanned	Scanning Minimum (cpm)	Scanning Maximum (cpm)	Average of Scanning Mean (cpm)	Standard Deviation of Scanning Mean (cpm)	Flag Value (cpm)	Maximum Reading Greater than Flag?
GAMMA FIDLER (Continued)								
5	12 Gamma	2	8000	13000	10500	0 (3)	17285	No
5	13 Gamma	4	4000	9000	6000	408	17285	No
5	14 Gamma	2	3000	7000	5000	0 (3)	17285	No
5	15 Gamma	2	5000	12000	8750	1768	17285	No
5	16 Gamma	13	3000	13000	7769	1666	17285	No
306	1 Gamma	5	6000	12000	9200	758	17285	No
306	2 Gamma	4	5000	11000	8000	913	17285	No
306	3 Gamma	1	7000	12000	9500	3536	17285	No
306	4 Gamma	1	8000	12000	10000	2828	17285	No
306	5 Gamma	2	5000	10000	7500	0 (3)	17285	No
306	6 Gamma	3	6000	10000	8333	289	17285	No
306	7 Gamma	6	4000	11000	6667	1033	17285	No
306	8 Gamma	3	4000	9000	6333	289	17285	No
306	10 Gamma	41	3000	13000	6510	1613	17285	No
306	11 Gamma	46	3000	10000	6239	861	17285	No
306	12 Gamma	89	2000	12000	5242	1429	17285	No
306	13 Gamma	42	2000	9000	4764	1113	17285	No
2073	1 Gamma	123	1000	8000	3809	816	17285	No
2073	2 Gamma	25	2000	8000	5040	776	17285	No
2073	3 Gamma	63	3000	8000	5083	447	17285	No
2084	2 Gamma	34	2000	8000	5250	448	17285	No
2084	3 Gamma	173	1000	8000	3893	788	17285	No
2084	6 Gamma	15	3000	7000	4933	458	17285	No

Notes:
(1) cpm = counts per minute.
(2) The scanning flag values for measurements in the Class 2 and 3 survey units are based on the gross activity DCGL for DU. Average background is included in the flag value. The alpha/beta flag values are the sum of the individual alpha and beta DU DCGLw's for that instrument (**Table 4-4**).
(3) Two survey grids were scanned with this instrument and each had the same range and average measurement; therefore, the standard deviation for the average scanning measurment for this survey unit is zero.

Table 4-12 (revised September 2004)
Summary of Smear Sampling Results [1,2,3]
DU Buildings
NRC License Termination Report
Seneca Army Depot Activity

Survey Unit (Bldg/Room)		Number of Smears	Alpha (dpm) [4]				Beta (dpm)				Gamma (dpm)			
			Min	Average	St Dev	Max	Min	Average	St Dev	Max	Min	Average	St Dev	Max
5	1	85	0.0	0.1	0.3	1.9	0.0	0.1	0.6	4.8	0.0	7.1	17.9	67.6
5	2	20	0.0	0.0	0.2	0.9	0.0	0.6	1.1	3.0	0.0	0.0	0.0	0.0
5	3	17	0.0	0.0	0.0	0.0	0.0	0.4	1.0	3.3	0.0	3.1	12.7	52.5
5	4	17	0.0	0.1	0.2	0.9	0.0	0.2	0.8	3.3	0.0	0.0	0.0	0.0
5	5	89	0.0	0.0	0.0	0.0	0.0	0.3	1.0	5.1	0.0	0.0	0.0	0.0
5	6	48	0.0	0.0	0.0	0.0	0.0	0.1	0.5	3.8	0.0	2.1	10.0	52.5
5	7	24	0.0	0.0	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	8	21	0.0	0.0	0.0	0.0	0.0	0.5	1.3	4.0	0.0	0.0	0.0	0.0
5	9	63	0.0	0.2	0.5	2.0	0.0	0.4	1.3	5.4	0.0	8.9	19.7	64.1
5	10	25	0.0	0.5	0.7	2.0	0.0	0.4	1.2	3.7	0.0	0.0	0.0	0.0
5	11	28	0.0	0.0	0.0	0.0	0.0	0.4	1.2	4.1	0.0	1.7	9.1	48.3
5	12	32	0.0	0.1	0.3	1.6	0.0	0.2	0.8	3.2	0.0	4.2	13.3	45.5
5	13	30	0.0	0.0	0.0	0.0	0.0	0.2	0.9	3.7	0.0	6.3	16.2	50.7
5	14	30	0.0	0.1	0.3	1.6	0.0	0.1	0.7	4.1	0.0	1.5	8.1	44.4
5	15	30	0.0	0.1	0.3	0.9	0.0	0.1	0.7	3.7	0.0	0.0	0.0	0.0
5	16	13	0.0	0.2	0.5	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
306	1	30	0.0	0.0	0.2	1.1	0.0	1.1	1.6	4.9	0.0	0.0	0.0	0.0
306	2	30	0.0	0.2	0.5	1.8	0.0	0.1	0.6	3.3	0.0	0.0	0.0	0.0
306	3	30	0.0	0.0	0.2	1.1	0.0	0.4	1.2	4.3	0.0	0.0	0.0	0.0
306	4	30	0.0	0.1	0.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
306	5	30	0.0	0.3	0.6	1.8	0.0	0.2	0.9	3.6	0.0	5.2	15.8	55.2
306	6	30	0.0	0.1	0.3	1.1	0.0	0.8	1.5	4.6	0.0	0.0	0.0	0.0
306	7	30	0.0	0.1	0.3	1.4	0.0	0.1	0.7	4.1	0.0	0.0	0.0	0.0
306	8	30	0.0	0.1	0.3	1.5	0.0	1.0	1.8	5.7	0.0	0.0	0.0	0.0
306	10	41	0.0	0.1	0.3	1.5	0.0	1.0	1.6	4.3	0.0	0.0	0.0	0.0
306	11	46	0.0	0.0	0.1	1.0	0.0	0.2	0.9	4.3	0.0	0.0	0.0	0.0
306	12	89	0.0	0.1	0.3	1.5	0.0	0.9	1.7	5.2	0.0	0.5	4.6	43.0

Table 4-12 (revised September 2004)
Summary of Smear Sampling Results [1,2,3]
DU Buildings
NRC License Termination Report
Seneca Army Depot Activity

Survey Unit (Bldg/Room)		Number of Smears	Alpha (dpm) [4]				Beta (dpm)				Gamma (dpm)			
			Min	Average	St Dev	Max	Min	Average	St Dev	Max	Min	Average	St Dev	Max
306	13	42	0.0	0.2	0.5	2.7	0.0	0.5	1.3	4.8	0.0	0.0	0.0	0.0
2073	1	123	0.0	0.0	0.2	1.7	0.0	0.1	0.7	4.8	0.0	0.6	6.1	67.8
2073	2	25	0.0	0.3	0.5	1.7	0.0	0.4	1.2	3.8	0.0	0.0	0.0	0.0
2073	3	63	0.0	0.1	0.4	1.4	0.0	0.6	1.5	4.8	0.0	2.5	11.3	55.9
2084	2	34	0.0	0.3	0.5	1.7	0.0	0.4	1.1	3.8	0.0	0.0	0.0	0.0
2084	3	173	0.0	0.2	1.2	15.0	0.0	0.9	2.7	27.7	0.0	3.9	18.1	178.7
2084	6	15	0.0	0.12	0.5	1.8	0.0	1.2	2.5	6.5	0.0	0.0	0.0	0.0

Notes:

(1) 10 CFR 835, Appendix D, removable contamination limits: natural U, U-235, U-238, and assoc. decay products - 1,000 dpm/100cm^2; Tritium - 10,000 beta-gamma/100cm^2.

(2) Smear samples collected over a 100 cm^2 area.

(3) The reported detection limits ranged from 2-6 dpm for alpha measurements, 6-8 dpm for beta measurements, and 85-93 dpm for gamma measurements.

(4) dpm = disintegrations per minute.

Table 5-9 (revised September 2004)
Summary of Smear Sampling Results [1,2]
Building 612
Final Status Survey Report
Seneca Army Depot Activity

Survey Unit (Bldg/Room)		Number of Smears	Alpha (dpm)[3]				Beta (dpm)				Gamma (dpm)			
			Min	Average	St. Dev	Max	Min	Average	St. Dev	Max	Min	Average	St. Dev	Max
612	A	59	0.0	0.0	0.2	1.1	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
612	AA	142	0.0	0.0	0.1	0.8	0.0	0.0	0.3	3.6	0.0	0.0	0.0	0.0
612	B	22	0.0	0.0	0.0	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
612	BB	37	0.0	0.0	0.1	0.7	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
612	C	13	0.0	0.2	0.6	1.8	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
612	D	18	0.0	0.2	0.4	1.3	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
612	E	22	0.0	0.1	0.2	0.6	0.0	0.1	0.5	2.5	0.0	0.0	0.0	0.0
612	F	45	0.0	0.1	0.3	0.9	0.0	0.5	1.2	3.8	0.0	0.0	0.0	0.0
612	G	9	0.0	0.2	0.5	1.3	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
612	H	9	0.0	0.0	0.0	0	0.0	0.0	0.0	0	0.0	6.4	19.1	57.2
612	I	16	0.0	0.0	0.0	0	0.0	0.0	0.0	0	0.0	4.7	18.7	74.7
612	J	17	0.0	0.1	0.2	0.9	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
612	K	32	0.0	0.1	0.3	1.5	0.0	0.1	0.8	4.6	0.0	3.7	14.5	62.0
612	L	29	0.0	0.1	0.3	1.5	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
612	M	232	0.0	0.0	0.2	1.1	0.0	0.1	0.4	4.5	0.0	0.5	5.6	63.0
612	N	37	0.0	0.1	0.3	1.4	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
612	O	36	0.0	0.1	0.3	1	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
612	P	41	0.0	0.0	0.2	1.1	0.0	0.1	0.4	2.5	0.0	1.3	8.1	51.9
612	Q	41	0.0	0.1	0.3	1.5	0.0	0.4	1.0	3.8	0.0	0.0	0.0	0.0
612	R	37	0.0	0.1	0.2	1.2	0.0	0.2	0.8	4	0.0	0.0	0.0	0.0
612	S	35	0.0	0.1	0.3	1.5	0.0	0.3	0.8	2.9	0.0	0.0	0.0	0.0
612	T	36	0.0	0.1	0.4	1.2	0.0	0.3	0.9	3.5	0.0	0.0	0.0	0.0
612	U	95	0.0	0.1	0.3	1.4	0.0	0.2	0.7	3.7	0.0	0.0	0.0	0.0
612	V	118	0.0	0.0	0.2	1	0.0	0.1	0.5	4.1	0.0	0.0	0.0	0.0
612	W	103	0.0	0.0	0.2	1.1	0.0	0.2	0.7	3.3	0.0	0.0	0.0	0.0
612	X	107	0.0	0.1	0.3	1.1	0.0	0.0	0.3	3.2	0.0	0.7	6.9	71.5
612	Y	146	0.0	0.0	0.2	1	0.0	0.1	0.6	4.7	0.0	0.0	0.0	0.0
612	Z	93	0.0	0.1	0.3	1.3	0.0	0.0	0.4	4.1	0.0	0.0	0.0	0.0

Notes:

(1) 10 CFR 835, Appendix D, removable contamination limits: natural U, U-235, U-238, and assoc. decay products - 1,000 dpm/100cm^2; Tritium - 10,000 beta-gamma/100cm^2.

(2) Smear samples collected over a 100 cm^2 area.

(3) dpm = decays per minute.

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