



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

NRC INSPECTION MANUAL

IMOB/NMSS

TEMPORARY INSTRUCTION 2800/026

FOLLOWUP INSPECTION OF FORMERLY-LICENSED SITES IDENTIFIED AS POTENTIALLY CONTAMINATED

SALP FUNCTIONAL AREA: N/A

APPLICABILITY: 2600 and 2800

2800/026-01 OBJECTIVE

To verify the status of formerly-licensed sites for which there is inadequate documentation in the docket file to demonstrate that they were properly decommissioned.

2800/026-02 BACKGROUND

In 1976, the General Accounting Office (GAO) raised concerns about the decommissioning of sites formerly licensed by the Atomic Energy Commission's (AEC's) regulatory body, which is now the Nuclear Regulatory Commission (NRC). In its response, NRC agreed to reexamine the files of the terminated licenses. Between 1977 and 1982, Oak Ridge National Laboratory (ORNL) reviewed the docket files for all fuel cycle and materials licenses terminated before 1965 (approximately) to verify that all sites had been properly decommissioned. This was done under an interagency agreement with the NRC. The files of 16,230 former licensees were reviewed and a total of 12 contaminated sites were identified. All of the 12 sites had been licensed pursuant to 10 CFR Part 40 and none represented a significant risk to public health and safety. NRC took action to have former licensees decontaminate seven of the sites. The Department of Energy (DOE) accepted responsibility for the other five sites under its Formerly Utilized Site Remedial Action Program (FUSRAP).

In 1989, GAO issued a report on NRC decommissioning procedures and criteria. This report raised additional concerns about the decommissioning of formerly-licensed sites. On August 3, 1989, Chairman Carr testified to the House Subcommittee on Environment, Energy, and Natural Resources that NRC would review the records of all sites terminated since 1965. ORNL was contracted again to review all docket files retired between 1965 and 1985. This second study required the creation of a computerized inventory of the docket files in addition to screening the files to determine whether all licensed sites had been properly decommissioned. If documentation were inadequate to verify that a formerly-licensed site had been properly decommissioned, the status of the site was to be verified by inspection.

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Issue Date: 02/16/95

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Subsequently, NRC decided that it was necessary to review the files of all terminated licenses (Pre-1965 and Post-1985) using the same screening criteria and to document their status in one computer inventory. This would improve information retrieval and permit comparison of the review findings for all terminated license files. The staff intends to verify by inspection the status of additional sites for which there is inadequate decommissioning documentation also.

2800/026-03 INSPECTION REQUIREMENTS

- 03.01 When the docket file for a formerly-licensed site or a sealed source license is referred to the region for followup, review the concerns raised by ORNL and verify that there are no errors or misunderstandings in ORNL's findings. First priority shall be given to sites scoring >300, then sites scoring ≤ 300 , and then sealed source files. Check regional files and institutional memory regarding legitimate concerns raised by ORNL. If necessary, request the former licensee and/or the current site owner to review its files and institutional memory regarding concerns about the site. If any of the sites are located in Agreement States and there is reason to believe that State files may help, request the Agreement State to check its files and institutional memory, and forward any results to the region.
- 03.02 For each site in question, determine whether a site visit is required to resolve any of the concerns raised by the file review. If the site is located in an Agreement State, request the Agreement State to inspect the site, with NRC accompaniment if necessary. For sealed source licensees, a site visit would not be required normally; however, if the site will be inspected because of potential site contamination, an inquiry into the disposition of the sealed sources can be conducted as part of the site visit. Inform the Regional State Agreements Officer (RSAO) of any requests made to an Agreement State.
- 03.03 Coordinate all site visits with the appropriate radiological control program within the State, local authorities, the former licensee (if possible), and current site owner before the inspection. Explain the specific issues concerning the site status raised by the file review.
- 03.04 Determine if documentation missing from the docket file can be obtained from additional records that may still be available at the site. Check the institutional memory of site operations by interviewing key personnel from the former licensee, current site owner (if different), or other knowledgeable individuals. For sealed sources, these inquiries should be made by telephone or written correspondence if possible.
- 03.05 If necessary or desirable to verify the status of the site, survey the site for residual contamination or other radioactive material associated with previous AEC/NRC activities. Determine whether remedial actions are required to remove radioactive materials in excess of NRC limits for unrestricted use. Notify IMOB/NMSS promptly of any site found contaminated and obtain NMSS input on plans to proceed.

NOTE: If significant site contamination is identified, the inspector should contact regional management before leaving the site to discuss the need for barriers,

postings, and/or administrative controls to address any immediate health and safety concerns.

- 03.06 If the former licensee or current site owner will perform remedial actions that are expected to be completed within a few months, monitor the cleanup activities to ensure they meet the intent of 10 CFR Parts 19 and 20, and verify that the site is decontaminated to levels suitable for unrestricted use. Coordinate with IMOB/NMSS regarding the transfer of sites requiring long-term remediation to the Site Decommissioning Management Plan (SDMP) or another long-term program.
- 03.07 When all regional action on a license file is complete, return the file to the NRC File Center, unless otherwise instructed.

2800/026-04 GUIDANCE

- 04.01 If an Agreement State cannot support a request to review its files, the region should assist with the review of State files to the extent possible. If there are questions about whether NRC will be allowed to review State files, coordinate with the RSAO and IMNS/NMSS. Obtain copies of official documents for the docket file whenever possible. If official documents are not available, verbal confirmation may be used to close out specific concerns about contamination if a record of such conversations is placed in the docket file and neither of the following conditions apply. Verbal confirmation shall not be used as a basis for closing out a concern if --
- a. The concern raised by ORNL involved the sensitivity of the survey instruments originally used, or
 - b. The license authorized possession of a large quantity of unsealed material (>100 kilograms of uranium/thorium or >1 curie of long-lived byproduct material such as cobalt-60).
- 04.02 Copies of Agreement State inspection reports should be obtained for the docket files. The region should review Agreement State inspection findings and determine whether they resolve the concerns about the license file. If an Agreement State cannot support a request to inspect a site in its jurisdiction, the region should offer to provide assistance with inspecting the site. If there are questions about NRC performing an inspection in an Agreement State, coordinate with the RSAO and IMNS/NMSS. The license files involving unaccounted sealed sources are a lower priority and less amenable to resolution. For active sites, or even licensees active at another site, it may be possible to determine the disposition of the sources. Government licensees in particular may be able to determine the disposition of sources. For licensees no longer active, it may be very difficult to come to any conclusion. Recognizing the difficulties of tracing the disposition of sealed sources when neither documents nor institutional memory remain, the regions should try to resolve these without an undue expenditure of effort and should exercise their judgment as to whether particular sources are of concern.
- 04.03 The inspector should try to arrange mutually agreeable inspection times to ensure that knowledgeable individuals at the site will be available for interview. Non-Agreement States should be invited to accompany the inspector on any site visits.

04.04 Obtain copies of official documents for the docket file whenever possible. If official documents are not available, verbal confirmation may be used to close out specific concerns about contamination if a record of such conversations is placed in the docket file and neither of the conditions listed in 04.01 applies.

04.05 The initial survey should be a scoping survey to determine whether there is any indication that residual contamination or other radioactive material may be present. A sample scoping survey plan is provided in Appendix A, including criteria for determining when remediation is required. Guidance on release criteria is provided in Appendix B. Inspectors may also use guidance in Inspection Procedure (IP) 83890 and other routine inspection procedures, as appropriate. If radioactive material is found or if the site is too extensive to permit an inspector to reasonably eliminate the possibility of contamination, a detailed site survey should be performed. The former licensee or current site owner should be requested to conduct the detailed site survey whenever possible. If neither party is able or willing to perform a survey, funds are available under FIN A9093, "Radiological Evaluation Assistance for Formerly Licensed Sites," to have the Oak Ridge Institute for Science and Education (ORISE) perform scoping surveys, confirmatory surveys (during/after remediation), and sample analyses. ORISE may be requested to evaluate licensee surveys also. Regions should submit requests for technical assistance (RFTAs) in accordance with Manual Chapter (MC) 0312 to obtain services from ORISE. If the site has not been inspected already, regional management should consider the need for a site visit before an RFTA is submitted.

04.06 Inspectors should use guidance in IP 83890, "Closeout Inspection and Survey," and other routine inspection procedures as appropriate to monitor remediation activities. Each region shall notify IMOB/NMSS promptly of any site found contaminated and discuss transfer of sites requiring long-term remediation to the SDMP or another remediation program. The following criteria should be used to determine which sites should be transferred to SDMP for remediation (see NUREG-1444):

- a. The responsible organization is not financially viable (e.g., unable to pay for decommissioning).
- b. There are settling ponds, burial sites, or large amounts of contaminated soil that will be difficult to decommission.
- c. There are contaminated structures or other permanent facilities that will be difficult to decommission.
- d. There is contamination or potential contamination of the ground water from onsite wastes.

04.07 No guidance.

2800/026-05 REPORTING REQUIREMENTS

Each region shall document its findings regarding the specific concerns identified by ORNL for each site in quarterly status reports to IMOB/NMSS. Regions should provide the information shown in the example status report provided in Appendix C. IMOB will track each site referred to the region and

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verify that it is closed out. In addition, each region shall send the IMOB contact statistics on the number of sites referred to the region for followup, number of sites eliminated from concern, number of sites found contaminated, and number of sites pending a determination. These figures should be divided into licenses with scores above 300 and scores below 300. This information is required for the Monthly Information Status Report, however it will only be submitted quarterly. (See Appendix D for guidance.)

Inspections and confirmation surveys should be documented in an inspection report. All site visits, whether for inspection or for other purposes, should be documented including a description of the site and any controls in place. Status reports and inspection reports shall be forwarded to the contact listed in Section 08 of this temporary instruction (TI). Documents demonstrating that a site is suitable for unrestricted use shall be placed in the docket file for that site and sent to the IMOB contact.

2800/026-06 COMPLETION SCHEDULE

The completion schedule for followup inspections of formerly licensed sites will vary depending on the resources available and the number of sites requiring followup action. In general, the initial inspection of each site requiring a site visit should be completed within 9 months of receiving the docket file.

2800/026-07 EXPIRATION

This temporary instruction shall remain in effect until December 31, 1997.

2800/026-08 CONTACT

Questions regarding this temporary instruction should be addressed to Paul Goldberg, Project Manager for the Review of Terminated Licenses, at (301) 415-7842.

2800/026-09 STATISTICAL DATA REPORTING

Staff hour expenditures or administrative effort should be charged to Regulatory Information Tracking System (RITS) number 232BM - Review of Terminated Licenses. Direct inspection effort should be charged to the retired docket number, the item of major interest code (i.e., IMAT - Materials Inspections), and the inspection procedure element code (i.e., OA - Other Routine Activities, or OR - Other Reactive Activities). Include the temporary instruction number 2800/026X with the appropriate status codes P - Partially Complete, C - Complete, or R - Completed By Reference, so staff hour expenditures charged to the TI can be accounted for by site.

Note: The docket number should be listed in the Licensing Tracking System (LTS) with a retired status code 4 to ensure that fee statements are not generated and to allow RITS to recognize the retired docket as being valid for staff time expenditures. Staff should not create fictitious docket numbers for capturing staff hour data. Contact M. Moriarty at 301-415-7876, if assistance with LTS is required, or B. Jones at 301-415-7807, if assistance with RITS is required.

2800/026-10 ORIGINATING ORGANIZATION INFORMATION

- 10.01 Organizational Responsibility. The Operations Branch of the Division of Industrial and Medical Nuclear Safety (IMOB/NMSS) initiated this TI.
- 10.02 Resource Estimate. The estimated onsite inspection time necessary to interview personnel, check records, and perform an initial scoping survey is 8 hours per site. Actual inspections at a specific site may require substantially more or less time depending on the circumstances. With trip preparation, travel, and report preparation, the total time required is estimated to average 20 hours.

END

Appendix A - Sample Scoping Survey Plan
Appendix B - Guidance on Release Criteria
Appendix C - Example Site Status Report
Appendix D - Input for Monthly Information Status Report (MISR)

SAMPLE SCOPING SURVEY PLAN

Licensee: Name
 Address
 City, State, Zip Code

License No.: XXX-000 (Terminated)
Docket No.: OXO-00000 (Terminated)

Inspection Dates: Month Day, 19yr

Inspector(s): Name(s)

Purpose of Inspection: Describe (e.g., To perform a scoping survey to determine whether any radioactive contaminants exist onsite, and if necessary, determine the general extent of residual activity present on building surfaces and grounds, and adjacent offsite areas.)

I. Determine radionuclide(s) used at the facility:
 List isotopes.

A. Review file to determine use areas:
 Describe areas of use.

B. Interview previous or current employees:
 Discuss as applicable.

II. Identify affected and unaffected areas:
 Discuss generally.

A. Affected Areas (Areas that have the potential for contamination):
 Define (e.g., labs, machine shops, storage areas, manufacturing areas, locker rooms, emission stacks, offsite areas adjacent to release points where material may have been deposited)

B. Potential Areas (Areas immediately adjacent to affected areas):
 Define (e.g., loading docks, storage areas, hallways, roofs)

C. Unaffected Areas (All remaining areas not identified as affected or potentially affected):
 Define (e.g., offices, lobbies, bathrooms, parking lots)

III. Determine survey instruments and efficiency (see NUREG/CR-5845, "Manual for Conducting Surveys in Support of License Termination"):

- A. If only a few nuclides used, determine efficiency for all nuclides:
See *Sample Instrumentation Worksheet*.
- B. If numerous nuclides used --
 - 1. Determine efficiency of predominately used radionuclides or
 - 2. Determine efficiency based on nuclide present in analyzed samples.
See *Sample Instrumentation Worksheet*.
- C. List instruments to be used:
Complete before inspection.

IV. Burial Sites

- A. Determine if facility had onsite burials:
Discuss (e.g., Based on a review of the docket file and discussions with the former licensee, it was determined that there was no onsite burial.)
- B. If the possibility of subsurface contamination or burials exist, what additional sampling and surveying will be conducted?
Describe (e.g., Because it has been determined that onsite burial did exist, ORISE has been contacted to perform surveys of this site.)
- C. Do groundwater monitoring wells exist?
Discuss (e.g., Because it has been determined that some onsite burial took place, and onsite groundwater sampling wells exist, water samples will be collected from these wells. In addition, the results of the analysis of previous samples from these wells will be obtained.)

V. Other

- A. Photograph site and adjacent areas:
Discuss (e.g., Photos will NOT be taken.)

VI. Survey

- A. Areas to be surveyed:
Describe (e.g., Survey will include floors, drains, pipes, ducts, cracks, lower 2 meters of walls, ventilation system to extent practicable, areas adjacent to release points, and outside areas adjacent to buildings.)

Guidelines:
Affected areas - 100 percent walkover using 2-meter wide lanes.
Potential areas - 50 percent walkover using 2-meter wide lanes.
Unaffected areas - 25 percent walkover using 2-meter wide lanes.

B. Locations for collection of wipes:

Describe (e.g., Wipes will be collected at each location of elevated measurements or randomly, if no elevated measurements are found.)

C. Collection of residue samples:

Describe (e.g., Samples will be collected of all residues found with elevated readings, including surfaces under paint. If samples are potentially contaminated with hazardous biological or chemical materials, the regional office will be contacted for any special instructions on sampling and shipping before collecting the sample.)

D. Collection of soil/sediment samples:

Describe (e.g., Soil/sediment samples will be collected from outside areas where unsealed licensed material was stored, from areas that were formerly settling ponds, at storm and/or sanitary drain outfalls, and in or at the edge of streams or lakes.)

E. Documentation:

See Survey Plan by Location.

Describe (e.g., All survey results and locations of elevated readings will be documented with enough detail to be able to relocate any point. Reference will be made to predominant landmarks.)

VII. Identification of Contamination:

A. Provide sufficient information for laboratory personnel to identify/track samples and wipes that were collected:

Describe (e.g., Each sample and wipe will be uniquely identified.)

B. Conduct laboratory analysis:

1. Determine the radiological characteristics of the contamination:

Discuss (e.g., Samples will be evaluated to determine exposure rate, and whether they are an alpha, beta, or gamma emitter.)

2. Determine whether contamination is removable or fixed:

Discuss (e.g., Wipes will be counted to determine whether contamination is fixed or removable.)

3. Determine levels of contamination in samples:

Discuss (e.g., Samples will be counted and results reported to the inspector for evaluation.)

VIII. Evaluate survey and laboratory results:

1. Identify survey data and laboratory sample analysis that exceed the maximum guideline criteria:

Discuss. If activity is identified that exceeds the maximum release guidelines, remediation is required.

See Sample Instrumentation Worksheet.

2. Identify samples that exceed the average (over one square meter), but are less than the maximum guideline criteria:
Discuss. If activity is identified that exceeds the average release guideline, but is less than the maximum release guideline, the NUREG/CR-5849 area weighted formula will be used to determine the contamination level averaged over one square meter. If the area weighted average exceeds the average release guideline, remediation is required.

See Sample Instrumentation Worksheet.

APPROVED BY:

Branch Chief

Date

SURVEY PLAN BY LOCATION

LOCATION 1

Area: *Affected/Potential/Unaffected*

Size: *????? m²*

Use: *Describe (e.g., U-235 and natural uranium. Uranium tetrafluoride-magnesium blend was pressed into briquettes using a 3,000 ton Farquhar press.)*

Potential for Contamination: *Discuss. Modify Items 1-4 as necessary.*

1. 50 percent surface scan of floor (If items stored in the building cover more than 50 percent of the floor surface, than all available floor surface area will be scanned.)
2. 100 percent surface scan of cracks in floor, support beams (up to 2m high), and drains
3. 50 percent inlets/openings to ventilation system ducts
4. collect samples of positive areas 2 to 3 times background

OTHER LOCATIONS ONSITE

Repeat above (Location 1) as necessary.

SAMPLE INSTRUMENTATION WORKSHEET

Inspector: _____
Date: _____

Inspection Location: _____
Inspection Date: _____

Isotopes of Interest: _____

Instrument - Type: _____
Serial #: _____
NRC #: _____
Calibration Date: _____

Probe: _____
Serial #: _____
NRC #: _____
Size (S): _____ cm²

Check Source: Isotope: _____ Serial No.: _____
NRC Tag No.: _____

Half Life ($T_{1/2}$): _____ years x 365 = _____ days

Date: _____ Activity (A_0): _____ μCi x 2.2×10^6 = _____ dpm

Current Date minus Source Date (t): _____ years or days

Current Check Source Activity: $A = A_0 \times \exp[-0.693t/T_{1/2}]$

= _____ x $\exp[-0.693 \times \text{_____} / \text{_____}]$ = _____ μCi or dpm

Meter Reading with check Source (M): _____ μCi (x 2.2×10^6 = cpm)
_____ cpm

Efficiency (E): $M/A = \text{_____} / \text{_____} = \text{_____}$ (x 100 = _____ %)

Background (B): _____ μCi (x 2.2×10^6 = cpm)
_____ cpm Date: _____
Location: _____

Background (B): _____ μCi (x 2.2×10^6 = cpm)
_____ cpm Date: _____
Location: _____

Background (B): _____ μCi (x 2.2×10^6 = cpm)
_____ cpm Date: _____
Location: _____

SAMPLE INSTRUMENTATION WORKSHEET, continued

Inspector: _____
Date: _____

Maximum Release Criteria for Isotope of Interest (X): _____ dpm/100 cm²
(See Appendix B and the guidance in NUREG/CR-5849.)

Instrument Reading That Equals Maximum Release Criteria: $\{(X/100) \times S \times E\} + B$
= $\{((\text{____}/100) \times \text{____} \times \text{____})\} + \text{____} = \text{____} \text{ cpm}$

Average Release Criteria for Isotope of Interest (X): _____ dpm/100 cm²

Instrument Reading That Equals Average Release Criteria: $\{(X/100) \times S \times E\} + B$
= $\{((\text{____}/100) \times \text{____} \times \text{____})\} + \text{____} = \text{____} \text{ cpm}$

Meter Source Checks

Check Source: _____ Isotope: _____ Serial No.: _____
NRC Tag No.: _____

<u>Date</u>	<u>Time</u>	<u>Meter Reading</u>	<u>Location</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

APPENDIX B

Guidance on Release Criteria

As stated in the SDMP Action Plan (57 FR 13389, April 16, 1992) and NUREG-1444, the guidance for determining whether sites are suitable for unrestricted use consists of the following documents:

1. Options 1 and 2 of the Branch Technical Position, "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations" (46 FR 52061, October 23, 1981).
2. "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," Policy and Guidance Directive FC 83-23, Division of Industrial and Medical Nuclear Safety, November 4, 1983. (Editorial revision issued August 1987)
3. "Termination of Operating Licenses for Nuclear Reactors," Regulatory Guide 1.86, June 1974, Table 1, for surface contamination of reactor facility structures. Also Cobalt-60, Cesium-137, and Europium-152 that may exist in concrete, components, structures, and soil should be removed such that the exposure rate is less than 5 micro-roentgen per hour above natural background at 1 meter, with an overall dose objective of 10 millirem per year (cf. Letter to Stanford University from James R. Miller, Chief, Standardization and Special Projects Branch, Division of Licensing, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, April 21, 1982, Docket No. 50-141).
4. The Environmental Protection Agency's (EPA's) "Interim Primary Drinking Water Standards," 40 CFR Part 141. In accordance with FC 83-23, the maximum contaminant levels for radionuclides in public drinking water, as established by EPA, should be used as reference standards for protection of groundwater and surface water resources.
5. EPA's "Radiation Dose Guidelines for Protection Against Transuranium Elements Present in the Environment as a Result of Unplanned Contamination," (42 FR 60956, November 30, 1977). This document provides guidelines for acceptable levels of transuranium elements in soil.

NRC uses the guidelines listed in the following tables as acceptable levels to release sites for unrestricted use. Acceptable levels for other radionuclides will be determined on a case-by-case basis.

Table 1. Acceptable Soil Contamination Levels

Radionuclide ^a	Maximum Soil Concentration (pCi/gm)
Hydrogen-3 ^b	(no limit, see Table 2)
Cobalt-60 ^b	8
Strontium-90 ^b	5
Cesium-137 ^b	15
Plutonium-238/239 ^b	-- ^e
Americium-241 ^b	-- ^e
Radium-226 ^c	5
Radium-228 ^c	5
Natural Thorium ^d	10
Natural Uranium ^d	10
Depleted Uranium ^d	35
Enriched Uranium ^d	30

Table 2. Acceptable Groundwater Contamination Levels^b

Radionuclide ^a	Maximum Groundwater Concentration (pCi/liter)
Hydrogen-3	20,000
Cobalt-60	100
Strontium-90	8
Cesium-137	200
Gross alpha incl. Ra-226	15
Ra-226/228	5

^a If only one radionuclide is present, then the maximum concentration is the value listed in the table. However, if more than one radionuclide is present, determine for each radionuclide the ratio between the measured concentration (in soil or groundwater) and the concentration listed in the table. The sum of the ratios may not exceed one (i.e., unity).

^b Order Establishing Criteria and Schedule for Decommissioning the Bloomsburg, PA Site (Safety Light Corporation), 57 FR 6136, February 20, 1992.

^c U.S. Environmental Protection Agency, Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, 40 CFR Part 192, Subparts B and E, July 1, 1991.

^d Branch Technical Position, Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations, 46 FR 52061, October 23, 1981.

^e The values for Pu-238/239 and Am-241 provided in the Order are substantially higher than the values currently being proposed in NUREG-1500, Working Draft Regulatory Guide on Release Criteria. Consult INOB/NRCS and LLDP/NRCS if values are required.

Table 3. Acceptable Surface Contamination Levels

Nuclides ^f	Average ^{g h k}	Maximum ^{g i k}	Removable ^{g j k}
J-nat, U-235, U-238, and associated decay products	5000 dpm alpha/100 cm ²	15,000 dpm alpha/100 cm ²	1000 dpm alpha/100 cm ²
Transuranics, Ra-226, Ra-228, Th-228, Th-230, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm ²	300 dpm/100 cm ²	20 dpm/100 cm ²
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm ²	3000 dpm/100 cm ²	200 dpm/100 cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above	5000 dpm beta-gamma/ 100 cm ²	15,000 dpm beta-gamma/ 100 cm ²	1000 dpm beta-gamma/ 100 cm ²

^f Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

^g As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

^h Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each object.

ⁱ The maximum concentration level applies to an area not more than 100 square centimeters.

^j The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface area should be wiped.

^k The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

APPENDIX C

Example Site Status Report

Docket no. _____

License no. _____

Licensee Name: _____

Site Name: _____

Site Address: _____

City: _____ State: _____ Zip: _____

Regional Contact: _____ Phone: _____

Status Summary:

APPENDIX E

INPUT FOR MONTHLY INFORMATION STATUS REPORT (MISR)

STATUS OF SITES IDENTIFIED BY ORNL

	Total	Sites Eliminated	Sites Pending	Sites Contaminated
> 300				
5-300				
Total				

STATUS OF LICENSES WITH SEALED SOURCES NOT ACCOUNTED FOR

	Total	Eliminated	Pending
> 300			
5-300			
Total			