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# **Status of the Decommissioning Program**

**2018 Annual Report**

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**Division of Decommissioning, Uranium Recovery, and Waste Programs  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001**

Enclosure 1

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## ABBREVIATIONS

ACL	Alternate concentration limit
ADAMS	Agencywide Documents Access and Management System
ALARA	As low as reasonably achievable
ANC	American Nuclear Corporation
BLEU	Blended low enriched uranium
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
DandD	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DoD	U.S. Department of Defense
DP	Decommissioning plan
DUWP	Division of Decommissioning, Uranium Recovery, and Waste Programs
EA	Environmental assessment
EIS	Environmental impact statement
EPA	U.S. Environmental Protection Agency
FCSE	Division of Fuel Cycle Safety, Safeguards, and Environmental Review
FSSR	Final status survey report
FTE	Full-time equivalents
FY	Fiscal year
GCAP	Ground water compliance action plan
GE	General Electric
GEIS	Generic environmental impact statement
GETR	General Electric-Hitachi Test Reactor
HLW	High-level waste
IAEA	International Atomic Energy Agency
IDIP	Integrated decommissioning improvement plan
ISFSI	Independent spent fuel storage installation
ISOE	Information System on Occupational Exposure
ISR	In-situ recovery
JPG	Jefferson Proving Ground
LCF	Lead Cascade Facility

LM	Office of Legacy Management
LTP	License termination plan
LTR	License Termination Rule
LTSP	Long-term surveillance plan
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MOU	Memorandum of understanding
N/A	Not applicable
NARM	Naturally occurring and accelerator-produced radioactive material
NEA	Nuclear Energy Agency
NFS	Nuclear Fuel Services
NMSS	Office of Nuclear Material Safety and Safeguards
NPS	National Park Service
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NSIR	Office of Nuclear Security and Incident Response
NYSERDA	New York State Energy and Research Development Authority
OCA	Office of Congressional Affairs
OGC	Office of the General Counsel
OPA	Office of Public Affairs
PSDAR	Post-shutdown decommissioning activities report
RAI	Request for additional information
RAMP	Radiation protection computer code, analysis, and maintenance program
RES	Office of Nuclear Regulatory Research
RESRAD	Residual Radioactivity
RP	Reclamation plan
SDMP	Site decommissioning management plan
SER	Safety evaluation report
SFC	Sequoyah Fuels Corporation
SNM	Special nuclear material
SRM	Staff requirements memorandum
TBD	To be determined
TRIGA	Training, Research, Isotopes General Atomics
UMTRCA	Uranium Mill Tailings Radiation Control Act

UNC	United Nuclear Corporation
USACE	U.S. Army Corps of Engineers
VESR	Vallecitos Experimental Superheat Reactor
WNI	Western Nuclear Incorporated
WPDD	Working Party on Decommissioning and Dismantling
WVDP	West Valley Demonstration Project

# 1. INTRODUCTION

This report provides a summary of decommissioning activities at nuclear facilities in the United States. Its purpose is to provide a reference document that summarizes the U.S Nuclear Regulatory Commission's (NRC's) decommissioning activities in fiscal year (FY) 2018, including the decommissioning of power reactors, research and test reactors, complex materials sites, uranium recovery facilities, and fuel cycle facilities. As such, this report discusses the current progress and accomplishments with respect to the NRC's Decommissioning Program, provides information supplied by Agreement States on the status of decommissioning activities at sites within their States, and identifies key Decommissioning Program activities that the NRC staff will undertake in the coming year. The information contained in this report is current as of September 30, 2018.

As noted in the NRC staff's FY 2017 report (SECY-17-0111, "Status of the Decommissioning Program - 2017 Annual Report"; Agencywide Documents Access and Management System (ADAMS) Accession No. ML17276B164), the Decommissioning Program has changed considerably as the inventory of complex materials sites in decommissioning status has been substantially reduced. In turn, new programmatic issues have arisen as the NRC has addressed facilities with different decommissioning challenges. Examples of such challenges are the regulation of military sites contaminated with depleted uranium from past testing of munitions and the regulation of military and non-military sites with radium contamination.

As of September 30, 2018, 21 nuclear power and early demonstration reactors, 3 research and test reactors, 12 complex materials facilities, 11 Title II<sup>1</sup> uranium recovery facilities, and parts of 1 fuel cycle facility are undergoing decommissioning or are in long-term safe storage (SAFSTOR) under NRC jurisdiction. In addition, 20 of the 22 Title I legacy uranium recovery sites are under general license with the U.S. Department of Energy (DOE).<sup>2</sup> Most power reactors undergoing decommissioning remain in SAFSTOR, with Zion Units 1 and 2, Humboldt Bay, La Crosse, and San Onofre Units 2 and 3 in active decommissioning. The inventory of decommissioning power reactor sites is expected to increase as the licensees for Three Mile Island Unit 1 and Pilgrim have expressed their intent to permanently cease power operations in 2019. Licensees for 10 additional reactors have expressed their intent to shut down by 2025: Indian Point Units 2 and 3, Duane Arnold, Davis Besse, Perry, Beaver Valley Units 1 and 2, Palisades, and Diablo Canyon Units 1 and 2. Staff within the Office of Nuclear Material Safety and Safeguards (NMSS), the regional offices, as well as the Office of Nuclear Reactor Regulation (NRR), the Office of Nuclear Security and Incident Response (NSIR), the Office of Congressional Affairs (OCA), and the Office of Public Affairs (OPA) will continue to coordinate extensively on activities that support the transition of operating reactors to plants in a decommissioning status.

In FY 2018, the NRC staff terminated the licenses for the Westinghouse Electric-Hematite site in Festus, Missouri, and the State University of New York at Buffalo research reactor in Buffalo,

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<sup>1</sup> Title I refers to facilities under the Uranium Mill Tailings Radiation Control Act of 1978, as amended, that were inactive, unregulated processing sites when the act was passed, while Title II facilities are those facilities licensed by the NRC or an Agreement State.

<sup>2</sup> Two of the 22 Title I sites are former processing sites and general licenses under 10 CFR 40.27 are not in effect at those sites.

New York, and amended the license at the Beltsville Agricultural Research Center site in Beltsville, Maryland, to approve the unrestricted release of a portion of the site that was used for on-site burial.

On September 25, 2018, the NRC entered into an agreement with the State of Wyoming. Under this agreement, the NRC discontinued its regulatory authority, and Wyoming assumed regulatory authority over certain radioactive materials (83 *Federal Register* 48905; September 28, 2018). Effective September 30, 2018, the State of Wyoming assumed regulatory authority for five Title II uranium recovery sites undergoing decommissioning. The NRC staff also entered into a memorandum of understanding (MOU) with the State of Wyoming to ensure a smooth transition of regulatory oversight of the Title II uranium recovery sites undergoing decommissioning.

## 2. DECOMMISSIONING SITES

The NRC regulates the decontamination and decommissioning of materials and fuel cycle facilities, power reactors, research and test reactors, and uranium recovery facilities. The purpose of the Decommissioning Program is to ensure that NRC-licensed sites, and sites under NRC authority, are decommissioned in a safe, timely, and effective manner so that they can be returned to beneficial use and to ensure that stakeholders are informed and involved in the decommissioning process, as appropriate. This report summarizes a broad spectrum of activities associated with the program's functions.

Each year, the NRC terminates approximately 100 materials licenses. Most of these license terminations are routine and the sites require little, if any, remediation to meet the NRC's unrestricted release criteria. This report focuses on the more challenging sites where the termination of the site's license is not a routine licensing action.

The NRC public Web site contains status summaries for the facilities managed in the Decommissioning Program (<http://www.nrc.gov/waste/decommissioning.html>). These summaries, which are updated annually or when significant changes in status occur, describe the status of each site and identify the major technical and regulatory issues affecting the completion of decommissioning. For those licensees or responsible parties that have submitted a decommissioning plan (DP) or license termination plan (LTP), the schedules for completion of decommissioning are based on an assessment of the complexity of the DP or LTP review. For those that have not submitted a DP or LTP, the schedules are based on other available site-specific information and on the anticipated decommissioning approach.

Through the Agreement State Program, 38 States have signed formal agreements with the NRC, by which those States have assumed regulatory responsibility over certain byproduct, source, and small quantities of special nuclear material (SNM), including the decommissioning of some complex materials sites and uranium recovery sites. Agreement States do not have regulatory authority over nuclear reactors, which are licensed under either 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," or 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," or over fuel cycle facilities. Section 7 of this report discusses the NRC's coordination with the Agreement States' decommissioning programs.



## **2.1 Nuclear Power Reactor Decommissioning**

The NRC's power reactor decommissioning activities include project management, technical review of licensee submittals in support of decommissioning, core inspections, support for the development of rulemaking and guidance, public outreach efforts, international assistance and cooperation, and participation in industry conferences and workshops. In addition, the NRC staff routinely processes license amendments and exemptions to support the progressive stages of decommissioning. The Decommissioning Program staff regularly coordinates with other offices on issues affecting decommissioning power reactors, and with the Division of Spent Fuel Management in NMSS regarding the independent spent fuel storage installations (ISFSIs) at reactor sites undergoing decommissioning.

As of September 30, 2018, the 21 nuclear power and early demonstration reactors identified in Table 2.1-a are undergoing decommissioning. Table 2.1-a provides an overview of the status of these nuclear power reactors. Plant status summaries for all decommissioning nuclear power reactors are available at <http://www.nrc.gov/info-finder/decommissioning/power-reactor/>. Table 2.1-b lists the decommissioned power reactors that have ISFSIs onsite.

### **2.1.1 Decommissioning Process**

The decommissioning process begins when a licensee decides to permanently cease operations. The major steps that make up the reactor decommissioning process are: certification to the NRC of permanent cessation of operations and removal of fuel; submittal and implementation of the post-shutdown decommissioning activities report (PSDAR); submittal of the LTP; implementation of the LTP; and completion of decommissioning.

#### **Notification**

When the licensee has decided to permanently cease operations, it is required to submit a written certification to the NRC. In addition, the licensee is required to provide certification to the NRC in writing once fuel has been permanently removed from the reactor vessel.

#### **Post-Shutdown Decommissioning Activities Report**

Before, or within 2 years after cessation of operations, the licensee must submit a PSDAR to the NRC and a copy to the affected State(s). The PSDAR must include:

- a description of and schedule for the planned decommissioning activities;
- an estimate of the expected costs; and
- a discussion of the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate, previously issued environmental impact statements (EISs).

The NRC will notice receipt of the PSDAR in the *Federal Register* and make the PSDAR available for public comment. In addition, the NRC will hold a public meeting in the vicinity of the licensee's facility to discuss the PSDAR. Although the NRC does not approve the PSDAR,

the licensee cannot perform any major decommissioning activities until 90 days after the NRC has received the PSDAR. After this period, the licensee can perform decommissioning activities as long as the activities do not have the following results:

- foreclose release of the site for unrestricted use;
- result in significant environmental impacts not previously reviewed; or
- jeopardize reasonable assurance that adequate funds will be available for decommissioning.

The regulations in 10 CFR 50.59, "Changes, Tests, and Experiments," allow a reactor licensee to make certain changes to its facility without a license amendment. In taking actions permitted under 10 CFR 50.59 after submittal of the PSDAR, the licensee must notify the NRC, in writing, before performing any decommissioning activity inconsistent with, or making any significant schedule change from, those actions and schedules in the PSDAR (10 CFR 50.82(a)(7)).

The NRC staff will periodically inspect operations at the site to ensure that decommissioning activities are being conducted in accordance with all applicable regulations and commitments.

#### License Termination Plan

Each power reactor licensee must submit an application for termination of its license. An LTP must be submitted at least 2 years before the license termination date. The NRC and licensee hold pre-submittal meetings to discuss the format and content of the LTP. These meetings are open to the public and intended to improve the efficiency of the LTP development and review process. The LTP must include the following:

- a site characterization;
- identification of remaining dismantlement activities;
- plans for site remediation;
- detailed plans for the final radiological survey;
- description of the end use of the site, if restricted;
- an updated site-specific estimate of remaining decommissioning costs;
- a supplement to the environmental report describing any new information or significant environmental change associated with the licensee's proposed termination activities; and
- identification of parts, if any, of the facility or site that were released for use before approval of the LTP.

In addition, the licensee should demonstrate that it will meet the applicable requirements of the License Termination Rule (LTR) in 10 CFR Part 20, "Standards for Protection Against Radiation," Subpart E, "Radiological Criteria for License Termination."

The NRC will notice receipt of the LTP and make the LTP available for public comment. In addition, the NRC will hold a public meeting in the vicinity of the licensee's facility to discuss the LTP and the LTP review process. The LTP technical review is guided by NUREG-1700, "Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans," Revision 2, issued April 2018 (ADAMS Accession No. ML18116A124); NUREG-1757, "Consolidated Decommissioning Guidance," Revision 1 of Volume 2, published September 2006 (ADAMS Accession No. ML063000243); and NUREG-0586, "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities—Supplement 1," published November 2002 (ADAMS Accession No. ML023470327). The LTP is approved by license amendment.

#### Implementation of the License Termination Plan

After approval of the LTP, the licensee or responsible party must complete decommissioning in accordance with the approved LTP. The NRC staff will periodically inspect the decommissioning operations at the site to ensure compliance with the LTP. These inspections will normally include in-process and confirmatory radiological surveys.

Decommissioning must be completed within 60 years of permanent cessation of operations, unless otherwise approved by the Commission.

#### Completion of Decommissioning

At the conclusion of decommissioning activities, the licensee will submit a final status survey report (FSSR) that documents the final radiological conditions of the site, and request that the NRC either: (1) terminate the 10 CFR Part 50 license; or (2) if the licensee has an ISFSI, reduce the 10 CFR Part 50 license boundary to the footprint of the ISFSI. For decommissioning reactors with no ISFSI, or an ISFSI that is authorized via specific license under 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater than Class C Waste," completion of reactor decommissioning will result in the termination of the 10 CFR Part 50 license. The NRC will approve the FSSR and the licensee's request if it determines that the licensee has met both of the following conditions:

- The dismantlement has been performed in accordance with the approved LTP.
- The final radiation survey and associated documentation demonstrate that the facility and site are suitable for release in accordance with the LTR.

### 2.1.2 Summary of Fiscal Year 2018 Activities

- The NRC staff continued its evaluation of a request for an alternate decommissioning schedule for the reactors at the General Electric (GE) Vallecitos facility, which proposes to extend the schedule for decommissioning beyond the 60-year timeline required for power reactor licensees in 10 CFR 50.82(a)(3).
- In September 2018, the staff approved the LTP for Zion Units 1 and 2, as the site continues to work toward completion of decommissioning and license termination.
- In January 2018, the staff approved a partial site release of 30.4 acres of wetlands on the Humboldt Bay site in accordance with its approved LTP. In August 2018, Humboldt Bay completed the removal of all decommissioning-related radiological material from the site.
- In August 2018, the 10 CFR Part 50 general license for the Rancho Seco site was terminated for the Onsite Storage Building formerly used to store low level radioactive waste.
- In September 2018, Oyster Creek permanently ceased operations and transferred into a decommissioning status. The staff in NMSS, Region I, NRR, NSIR, and the Office of the General Counsel (OGC) coordinated licensing activities, transfer of inspection responsibilities, and public meetings. Project management responsibility for the plant's decommissioning activities is expected to be transferred from NRR to NMSS in FY 2019.
- In August 2018, Exelon and Holtec submitted an application to transfer the license for Oyster Creek to Holtec as part of their sales agreement to purchase the plant and spent fuel. The staff expects to receive a revised PSDAR for Oyster Creek with a new decommissioning schedule, contingent on the license transfer and sale.
- In April 2018, project management responsibility for Fort Calhoun was transferred from NRR to NMSS. Region IV inspection responsibility for the site was internally transferred from the Division of Reactor Projects to the Division of Nuclear Materials Safety in FY 2017.
- To ensure openness during the regulatory process, the NRC staff participated in several public meetings, including a meeting regarding the Oyster Creek PSDAR and decommissioning webinars for the media and public regarding the Oyster Creek shutdown. In addition, the NMSS staff supported Region I staff at annual assessment meetings for licensees that have announced their intent to shut down within the next 3 years, including Indian Point Units 2 and 3, Oyster Creek, and Pilgrim.
- The staff participated in a government-to-government meeting with the Town of Cortlandt Community Unity Indian Point Task Force, Congressional staff members, and other local government officials to discuss the decommissioning of Indian Point.

The staff also delivered a presentation regarding the Pilgrim shutdown at a Massachusetts Nuclear Decommissioning Citizens Advisory Panel meeting.

- The NRC staff completed oversight activities and inspections at reactor decommissioning facilities in accordance with Inspection Manual Chapter 2561 at Crystal River 3; Dresden 1; Fermi 1; Fort Calhoun; GE Vallecitos reactors; Humboldt Bay; Indian Point Unit 1; Kewaunee; La Crosse; Millstone Unit 1; Nuclear Ship Savannah; Peach Bottom Unit 1; San Onofre Units 2 and 3; Three Mile Island Unit 2; Vermont Yankee; and Zion Units 1 and 2.

### **2.1.3 Fiscal Year 2019 Trends and Areas of Focus**

The NRC staff will continue its extensive coordination with other offices while working to complete the transfer of recently shutdown reactors to the Decommissioning Program. Reactors that have ceased operation remain under NRR project management until formal transfer occurs shortly after the licensee's defueled technical specifications are approved. On October 12, 2018, the staff issued a first-of-a-kind Order approving the permanent transfer of the Vermont Yankee operating license from Entergy to NorthStar for the purposes of decommissioning. The staff will continue to stay apprised of developments related to future license transfer requests to facilitate decommissioning, such as the license transfer application submitted for Oyster Creek in August 2018. In addition, the licensees for Three Mile Island Unit 1 and Pilgrim have expressed their intent to permanently cease power operations in 2019. The staff will continue to coordinate with NRR, OCA, OPA, and the Regional offices, as necessary, to provide support with public outreach and ensure efficient reviews of all submittals. The staff will also continue to work toward the termination of licenses at sites where decommissioning is nearly complete, including Humboldt Bay, Zion Units 1 and 2, and La Crosse.

**Table 2.1-a. Power and Early Demonstration Reactors Undergoing Decommissioning**

Reactor	Location	Status	Date of Shutdown	Date PSDAR* Submitted	Date LTP Submitted	Date LTP Approved	Date of Decom Completion **	
1	Crystal River Unit 3	Crystal River, FL	SAFSTOR	2/13	12/13	TBD	TBD	2074
2	Dresden Unit 1	Morris, IL	SAFSTOR	10/78	6/98	TBD	TBD	2036
3	Fermi Unit 1	Newport, MI	SAFSTOR	9/72	4/98	2011***	TBD	2032
4	Fort Calhoun	Blair, NE	SAFSTOR	10/16	3/17	TBD	TBD	2065
5	GE-EVESR	Sunol, CA	SAFSTOR	2/67	N/A	TBD	TBD	2025
6	GE-Vallecitos Boiling Water Reactor	Sunol, CA	SAFSTOR	12/63	7/66	TBD	TBD	2025
7	Humboldt Bay	Eureka, CA	DECON	7/76	2/98	5/13	5/16	2019
8	Indian Point Unit 1	Buchanan, NY	SAFSTOR	10/74	1/96	TBD	TBD	2026
9	Kewaunee	Kewaunee, WI	SAFSTOR	5/13	5/13	TBD	TBD	2073
10	La Crosse	La Crosse, WI	DECON	4/87	5/91	7/16	TBD	2020
11	Millstone Unit 1	Waterford, CT	SAFSTOR	7/98	6/99	TBD	TBD	2056
12	Nuclear Ship Savannah	Baltimore, MD	SAFSTOR	11/70	12/08	TBD	TBD	2031
13	Oyster Creek	Forked River, NJ	SAFSTOR	9/18	6/18****	TBD	TBD	2078****
14	Peach Bottom Unit 1	Delta, PA	SAFSTOR	10/74	6/98	TBD	TBD	2034
15	San Onofre Unit 1	San Clemente, CA	SAFSTOR	11/92	12/98	TBD	TBD	2030
16	San Onofre Unit 2	San Clemente, CA	DECON	6/13	9/14	TBD	TBD	2031

**Table 2.1-a. Power and Early Demonstration Reactors Undergoing Decommissioning**

	<b>Reactor</b>	<b>Location</b>	<b>Status</b>	<b>Date of Shutdown</b>	<b>Date PSDAR* Submitted</b>	<b>Date LTP Submitted</b>	<b>Date LTP Approved</b>	<b>Date of Decom Completion **</b>
17	San Onofre Unit 3	San Clemente, CA	DECON	6/13	9/14	TBD	TBD	2031
18	Three Mile Island Unit 2	Harrisburg, PA	SAFSTOR	3/79	6/13	TBD	TBD	2036
19	Vermont Yankee	Vernon, VT	SAFSTOR	12/14	12/14****	TBD	TBD	2073****
20	Zion Unit 1	Zion, IL	DECON	2/97	2/00	12/14	09/18	2020
21	Zion Unit 2	Zion, IL	DECON	9/96	2/00	12/14	09/18	2020

GE General Electric  
TBD to be determined  
EVESR ESADA (Empire State Atomic Development Associates) Vallecitos Experimental Superheat Reactor

\* PSDAR or DP equivalent. Prior to August 28, 1996, the effective date of Final Rule “Decommissioning of Nuclear Power Reactors” (61 FR 39278; July 29, 1996), licensees submitted DPs (or equivalent).

\*\* Anticipated year of completion of decommissioning. For decommissioning reactors with no ISFSI or an ISFSI licensed under 10 CFR Part 72, completion of decommissioning will result in the termination of the 10 CFR Part 50 license. For reactors with an ISFSI licensed under the provisions of 10 CFR Part 50, completion of decommissioning will result in reducing the 10 CFR Part 50 license boundary to the footprint of the ISFSI.

\*\*\* Licensing action put on hold at licensee’s request.

\*\*\*\* The staff expects to receive a revised PSDAR with a new decommissioning schedule, contingent on a license transfer and sale of the site.

**Table 2.1-b. Decommissioned Power Reactors That Have Independent Spent Fuel Storage Installations**

	<b>Reactor</b>	<b>Onsite Fuel Status</b>	<b>Cask Vendor</b>	<b>Model</b>
1	Big Rock Point	10 CFR 50 ISFSI	Energy Solutions, Inc.	Fuel Solutions W74
2	Connecticut Yankee	10 CFR 50 ISFSI	NAC International, Inc.	NAC-MPC
3	Fort St. Vrain (DOE site)	10 CFR 72 ISFSI	Foster Wheeler Energy Applications, Inc.	Modular Vault Dry Store
4	Maine Yankee	10 CFR 50 ISFSI	NAC International, Inc.	NAC-UMS
5	Rancho Seco	10 CFR 72 ISFSI	Transnuclear, Inc.	NUHOMS-24P
6	Trojan	10 CFR 72 ISFSI	BNFL Transtor/Holtec International	HI-STORM 100
7	Yankee Rowe	10 CFR 50 ISFSI	NAC International, Inc.	NAC-MPC



## **2.2 Research and Test Reactor Decommissioning**

The NRC research and test reactor decommissioning activities include project management, technical review of licensee submittals in support of decommissioning, inspections, support for the development of rulemaking and guidance, public outreach, and participation in industry conferences and workshops. In addition, the NRC staff routinely processes license amendments and exemptions to support the progressive stages of decommissioning.

As of September 30, 2018, the three research and test reactors identified in Table 2.2 were undergoing decommissioning. Plant status summaries for all decommissioning research and test reactors are available at <http://www.nrc.gov/info-finder/decommissioning/research-test/>.

### **2.2.1 Decommissioning Process**

The decommissioning process begins when a licensee decides to permanently cease operations. The major steps of the decommissioning process are submittal of a DP, review and approval of the DP, implementation of the DP, and completion of decommissioning.

#### Application

Within 2 years following permanent cessation of operations, and in no case later than 1 year before license expiration, the licensee must submit a written application for license termination to the NRC. Each application for license termination must be accompanied or preceded by a DP submitted for NRC approval. The NRC and licensee hold pre-submittal meetings to discuss the format and content of the DP. These meetings are open to the public and are intended to improve the efficiency of the DP development and review process.

#### Decommissioning Plan

The DP must include the following:

- the choice of the alternative<sup>3</sup> for decommissioning with a description of the planned decommissioning activities;
- a description of the controls and limits on procedures and equipment to provide for occupational and public health and safety;
- a description of the planned final radiation survey;

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<sup>3</sup> An alternative is acceptable if it provides for completion of decommissioning without significant delay. Consideration will be given to alternatives involving a delay in decommissioning only when necessary to protect public health and safety, including cases where waste disposal capacity is unavailable or other site-specific conditions, such as the presence of co-located nuclear facilities, are a factor.

- an updated estimate of the expected costs for the alternative chosen, including the following:
  - a comparison with the estimated present funds set aside for decommissioning.
  - a plan for assuring the availability of adequate funds for completion of decommissioning.
- A description of technical specifications, quality assurance provisions, and physical security plan provisions in place during decommissioning.

In addition, the licensee should demonstrate that it will meet the applicable requirements of the LTR.

The NRC staff's technical review of the DP is guided by NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," issued February 1996 (ADAMS Accession No. ML042430055), and applicable portions of NUREG-1757. The DP is approved by license amendment, as a supplement to the safety evaluation report (SER), or equivalent.

#### Implementation of the Decommissioning Plan

For DPs in which the major dismantlement activities are delayed by first placing the facility in storage, planning for these delayed activities may be less detailed. Updated detailed plans must be submitted and approved before the start of any dismantlement activities.

For DPs that involve delayed completion of decommissioning by including a period of storage or surveillance, the licensee shall meet the following conditions:

- Funds needed to complete the decommissioning process will be placed into an account segregated from the licensee's assets and outside the licensee's administrative control during the storage or surveillance period, or a surety method or fund statement of intent will be maintained in accordance with the criteria of 10 CFR 50.75(e).
- Means will be included for adjusting cost estimates and associated funding levels over the storage or surveillance period.

After approval of the DP, the licensee or responsible party must complete decommissioning in accordance with the approved DP. The NRC staff will periodically inspect the decommissioning operations at the site to ensure compliance with the DP. These inspections will normally include in-process and confirmatory radiological surveys.

#### Completion of Decommissioning

At the conclusion of decommissioning activities, the licensee will submit an FSSR, which identifies the final radiological conditions of the site. The NRC will terminate the license if it determines that the licensee has met the following conditions:

- The decommissioning process has been performed in accordance with the approved DP.
- The final radiation survey and associated documentation demonstrate that the facility and site are suitable for release in accordance with the LTR.

### **2.2.2 Summary of Fiscal Year 2018 Activities**

- In August 2018, the NRC staff terminated Facility Operating License No. R-77 for the State University of New York at Buffalo research reactor in Buffalo, New York.
- Decommissioning work at the two General Atomics research reactors in San Diego, California, is nearing completion. General Atomics plans to repurpose the facility and is evaluating removal of the remaining activated concrete to ensure its removal will not compromise the structural integrity of the building.

### **2.2.3 Fiscal Year 2019 Trends and Areas of Focus**

In FY 2019, the NRC staff expects to work toward the termination of licenses for the General Atomics research reactors.

**Table 2.2. Research and Test Reactors Undergoing Decommissioning**

<b>Reactor</b>		<b>Location</b>	<b>Date of Shutdown</b>	<b>Status</b>	<b>Date of Decommissioning Completion</b>
1	General Atomics TRIGA Mark F	San Diego, CA	9/94	DP Approved	2019
2	General Atomics TRIGA Mark I	San Diego, CA	12/96	DP Approved	2019
3	General Electric-Hitachi GETR	Sunol, CA	1/85	Possession-Only	2025
GETR TRIGA		General Electric Test Reactor Training, Research, Isotopes General Atomics			

## **2.3 Complex Materials Facility Decommissioning**

Decommissioning activities associated with materials facilities include maintaining regulatory oversight of complex decommissioning sites, undertaking financial assurance reviews, examining issues and funding options to facilitate remediation of sites in Non-Agreement States and sites in Agreement States that have exclusive Federal jurisdiction, interacting with the U.S. Environmental Protection Agency (EPA), interacting with the U.S. Army Corps of Engineers (USACE), inspecting complex decommissioning sites, conducting public outreach, participating in international decommissioning activities, conducting program evaluations, and participating in industry conferences and workshops. In addition, the NRC staff routinely reviews decommissioning financial assurance submittals for operating materials and fuel cycle facilities and maintains a financial instrument security program.

As of September 30, 2018, 12 complex materials sites are undergoing decommissioning (see Table 2.3). Complex materials sites are defined as sites where the complexity of the decommissioning process will require more than minimal technical and administrative support from the headquarters program office. It is expected that for these sites, it will take more than a year to complete the decommissioning process. Examples of complex materials sites include: sites with groundwater contamination, sites containing significant soil contamination, sites in which the owners are in bankruptcy, any site where a decommissioning plan is required, all fuel cycle facilities undergoing decommissioning, and sites where there is significant public and/or Congressional interest.

Status summaries for the complex materials sites undergoing decommissioning are provided at <http://www.nrc.gov/info-finder/decommissioning/complex/>.

### **2.3.1 Decommissioning Process**

Any one of the following events can initiate the decommissioning process:

- The license expires.
- The licensee has decided to permanently cease operations at the entire site (or in any separate building or outdoor area that contains residual radioactivity, such that the building or outdoor area is unsuitable for release in accordance with the NRC requirements. In these cases, the decommissioning process does not lead to license termination).
- No principal activities have been conducted at the site for a period of 24 months.
- No principal activities have been conducted for a period of 24 months in any separate building or outdoor area that contains residual radioactivity, such that the building or outdoor area is unsuitable for release in accordance with the NRC requirements. In these cases, the decommissioning process does not lead to license termination.

Major steps in the decommissioning process are notification of cessation of operations; submittal, review and approval of the DP; implementation of the DP; and completion of decommissioning.

### Notification

Within 60 days of the occurrence of any of the triggering conditions described above, the licensee or responsible party must notify the NRC of such occurrence and either begin decommissioning or, if required, submit a DP within 12 months of notification and begin decommissioning activities upon approval of the DP. The regulations allow alternative schedules, if approved by the NRC.

### Decommissioning Plan

A DP must be submitted if required by license condition or if the NRC has not previously approved the procedures and activities necessary to conduct site decommissioning and the procedures could increase potential health and safety impacts on workers or the public, such as in any of the following cases:

- Procedures would involve techniques not applied routinely during cleanup or maintenance operations.
- Workers would be entering areas not normally occupied where surface contamination and radiation levels are significantly higher than routinely encountered during operation.
- Procedures could result in significantly greater airborne concentrations than are present during operations.
- Procedures could result in significantly greater releases of radioactive material to the environment than those associated with operations.

Generally, before submitting a DP, the licensee or responsible party meets with the NRC to discuss the form and content of the DP. This pre-submittal meeting is intended to make the DP review process more efficient by reducing the potential need for requests for additional information (RAIs). It is important for the NRC and the licensee or responsible party to work effectively in a cooperative manner to resolve the issues that make a complex decommissioning site challenging.

The DP is approved by license amendment, as a supplement to the SER, or equivalent, and may include specific license conditions based on the findings from the NRC staff's review of the DP.

### Implementation of the Decommissioning Plan

After approval of the DP, the licensee or responsible party must complete decommissioning within 24 months in accordance with the approved DP, or apply for an alternate schedule, which must also be approved. The NRC staff will periodically inspect the decommissioning operations

at the site to ensure compliance with the DP and the license. These inspections will normally include in-process and confirmatory radiological surveys.

### Completion of Decommissioning

As the final step in the decommissioning process, the licensee or responsible party is required to do the following:

- Certify the disposition of all regulated material, including accumulated wastes, by submitting a completed NRC Form 314, "Certificate of Disposition of Materials," or providing equivalent information.
- Conduct a radiation survey of the premises where licensed activities were conducted (in accordance with the procedures in the approved DP, if a DP is required) and submit a report of the results of the final status survey, unless the licensee or responsible party demonstrates in some other manner that the premises are suitable for release in accordance with the LTR.

A license is terminated or the site is released by written notice to the licensee when the NRC determines that the licensee has met the following conditions:

- Regulated material has been disposed of properly.
- Reasonable effort has been made to eliminate residual radioactive contamination, if present.
- The radiation survey has been performed or other information submitted by the licensee or responsible party demonstrates that the premises are suitable for release in accordance with the LTR.

### **2.3.2 Summary of Fiscal Year 2018 Activities**

- In September 2018, the NRC staff terminated SNM License No. SNM-33 for the Westinghouse Hematite Decommissioning Project in Festus, Missouri, and released the site for unrestricted use. The licensee requested license termination in December 2017 and submitted its final serial FSSR in March 2018. Significant regulatory and licensee interaction occurred during the decommissioning process to resolve issues that arose during the decommissioning and surveying processes, and regular inspections and independent confirmatory surveys were performed to ensure that activities were conducted in accordance with the approved DP.
- In November 2017, the NRC staff completed action on the U.S. Department of Agriculture's Beltsville Agricultural Research Center site in Beltsville, Maryland, by amending the license to approve the unrestricted release of a portion of the site that was used for on-site burial. The license remains active for other locations of use.

- The EPA conducted a removal action of legacy laboratory chemicals at the FMRI, Inc., site in Muskogee, Oklahoma during July and August 2018. While in bankruptcy, Fansteel has continued to fund FMRI. The licensee continues to maintain public health and safety at the site after the issuance and subsequent relaxation of Order EA-17-102 in July 2017, although little progress on site decommissioning has occurred since Fansteel filed for bankruptcy in September 2016. Some funds (\$700,000) were added into the decommissioning trust in 2017 and 2018, primarily due to negotiations in the bankruptcy court, but the total is insufficient to make significant progress towards decommissioning the site. The NRC, the U.S. Department of Justice, and the Oklahoma Department of Environmental Quality continue to be involved in the Fansteel bankruptcy proceedings and are monitoring the situation as it develops. The Federal and State regulatory agencies are continuing to work toward a settlement agreement to ensure minimum payments are provided for site operations and are also planning for contingencies should a less than optimal situation result from Fansteel's bankruptcy.
- The staff continues its review of the U.S. Army license amendment request to amend the Jefferson Proving Ground (JPG) site license in Madison, Indiana to possession only, and its associated exemption to the decommissioning timeliness rule under 10 CFR 40.42, submitted in December 2016. The staff plans to further inform the Commission of its conclusion of this issue in a Commission paper. The staff plans to complete the SER and related environmental review activities in FY 2019. The NRC also expects to publish a notice in the *Federal Register* in FY 2019.
- The NRC staff is coordinating with the USACE Pittsburgh office to discuss the decommissioning schedule and planning for the Shallow Land Disposal Area site in Vandergrift, Pennsylvania. The USACE is in the process of obtaining a decommissioning contractor and anticipates that it can begin developing new work plans sometime in FY 2019.
- In January 2018, Centrus, LLC, submitted a revised DP for its Lead Cascade Facility (LCF) in Piketon, Ohio. The FSSR for the facility was submitted in April 2018. Independent confirmatory surveys were conducted in May 2018. The staff approved the DP in August 2018. A request to terminate the LCF license was submitted in August following approval of the DP and is currently under review by the staff.
- In addition, the NRC staff completed inspections or site visits at Cimarron, FMRI, Sequoyah, United Nuclear Corporation (UNC) Naval, West Valley Demonstration Project, and Westinghouse Electric-Hematite.

Other significant activities are described below.

#### Activities Associated with Military Sites Contaminated with Radium

The NRC staff continued implementing the “stay-informed” approach approved by the Commission in Staff Requirements Memorandum (SRM) – SECY-08-0077 (ADAMS Accession No. ML081780111) in June 2008 for the U.S. Navy’s remediation of the Hunters Point Shipyard



site in San Francisco, California. This approach includes reliance on the U.S. Navy's ongoing remediation of this Superfund site conducted under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) process with EPA oversight. The primary purpose of the NRC's approach is to stay informed about the ongoing U.S. Navy remediation activities and confirm that remediation of the site meets dose limits in either 10 CFR 20.1402, "Radiological Criteria for Unrestricted Use," or 10 CFR 20.1403, "Criteria for License Termination Under Restricted Conditions."

In June 2017, Greenaction for Health and Environmental Justice submitted a petition to the NRC pursuant to 10 CFR 2.206 requesting that NRC revoke Tetra Tech's service provider license due to falsification of records. The petitioner filed three supplements to the petition in January, February, and July 2018. In October 2018, the petitioner addressed the petition review board with the licensee present. The petition review board is currently determining whether the petition, as supplemented, meets the criteria for acceptance into the 10 CFR 2.206 review process. By way of background, as part of its oversight of service providers, the NRC performed an investigation into whether Tetra Tech EC, Inc., deliberately falsified soil samples at Hunters Point Shipyard. The NRC subsequently issued a notice of violation to Tetra Tech EC, Inc., for the deliberate falsification of soil samples in July 2016 and Confirmatory Order Enforcement Action-15-230 in October 2016.

The NRC staff also utilized the "stay-informed" approach approved by the Commission for the McClellan former Air Force Base, a Superfund site in Sacramento, California, and the U.S. Navy's Alameda Naval Air Station in Alameda, California. The NRC staff held discussions with the U.S. Navy and U.S. Air Force as well as EPA Region 9 and State of California agencies in 2018. These discussions with the principal stakeholders involved in the ongoing remediation process continue to be an effective way to understand the remediation progress, issues that are being addressed, and the oversight activities of EPA and the State agencies. Based on these interactions, the NRC staff plans to continue its reliance on the CERCLA process and EPA oversight at these sites.

As part of the approaches discussed in SECY-14-0082, "Jurisdiction for Military Radium and U.S. Nuclear Regulatory Commission Oversight of U.S. Department of Defense Remediation of Radioactive Material," (ADAMS Accession No. ML14097A005) and in the NRC-Department of Defense (DoD) MOU, which was finalized in 2016, the NRC staff has also initiated monitoring activities for the ongoing cleanups at Dugway Proving Grounds in Dugway, Utah; Fort Gillem in Forest Park, Georgia; Long Beach Naval Shipyard in Long Beach, California; Mare Island Naval Shipyard in Vallejo, California; and Treasure Island Naval Station in San Francisco, California. The NRC's monitoring has included coordination calls with the U.S. Air Force, U.S. Army, and U.S. Navy to determine upcoming activities and schedules at a programmatic and site-specific level.

The NRC coordinates extensively with the States and DoD at each of the sites that the NRC staff monitors. Due to the regular communications between the DoD and the NRC staff, implementation of the MOU is going well.

## Non-Military Radium Sites

The Energy Policy Act of 2005 gave the NRC authority over radium and some other materials in a category known as NARM. The NRC's first step in implementing that new authority was to put in place regulations. These regulations, known as the NARM rule, became effective in November 2007. While the NRC was developing its program for military radium sites, the NRC staff became aware of radium cleanup efforts at the former Waterbury Clock Factory in Waterbury, Connecticut, and the Great Kills Park site in Staten Island, New York. As the staff learned more about these projects, it began a systematic effort to identify sites around the country where radium was historically used to ensure those sites no longer posed a risk. The staff identified and prioritized a list of non-military sites with potential radium contamination due to historical manufacturing of consumer products. The staff originally identified 29 historic sites for follow-up, as described in SECY-16-0020, "Near-Term Actions to Address Non-Military Sites with Potential Radium Contamination," (ADAMS Accession No ML17130A774). A site can have multiple property owners, and as such, from these 29 historical sites, there are 47 unique site owners. Subsequently, State of Michigan officials informed the staff of seven additional sites that may be contaminated with radium. Additionally, during preparations for the site visit to the Seth Thomas Clock Company in Connecticut, the staff identified two additional sites with potential radium contamination.

The NRC staff has also initiated near-term follow-up actions for the identified sites. These actions include contacting the site owners and requesting access to perform surveys in an initial site visit, and in limited instances, conducting a follow-up scoping survey. The staff has dispositioned 45 of the original 47 and five of the nine additional unique site owners identified to date. As of September 30, 2018, initial site visits have been performed at 36 of the original 47 and one of the nine additional unique site owner properties. Additionally, the staff has determined that initial site visits are unnecessary at 9 of the original 47 and four of the nine additional unique site owner properties (e.g., some of these site owners possessed intact radium gauges and are already general licensees per 10 CFR 31.12, while others were incorrectly identified).

Contamination has been identified at 14 of the original 47 and two of the additional nine unique site owner properties. Contamination that required access controls to ensure public dose limits were not exceeded was identified at four sites. Only one site had contamination that could result in the public dose limit being exceeded in areas accessed by people. In accordance with NRC's Temporary Instruction 2800/043, "Inspection of Facilities Potentially Contaminated with Discrete Radium-226 Sources," (ADAMS Accession No. ML16330A678), the staff recommended, and the site owners implemented, controls in contaminated areas until remediation can be completed. These controls include limiting access to the contaminated areas and limiting the amount of time occupants spend in areas with radium contamination.

At the few sites where cleanup may be necessary, and consistent with the direction in SRM-SECY-17-0026, "Policy Considerations and Recommendations for Remediation of Non-Military, Unlicensed Historic Radium Sites in Non-Agreement States," (ADAMS Accession No. ML17250A841), the staff has begun issuing letters of forbearance to cooperative site owners that will document each owner's understanding and agreement to interim controls on access and use until completion of remediation. In March and June 2018, the NRC staff issued two letters of forbearance to cooperative site owners. Further, in August 2018, the NRC staff

informed the EPA that the staff would be taking a monitoring role at the portion of the Waterbury Clock Company site currently under the EPA's Brownfields program. In addition, the staff provided pertinent information about contamination at another site to EPA Region 1's Superfund Emergency Planning and Response Branch for removal action consideration. EPA informed the staff that it is currently working to perform a removal action for the contaminated soil at this site. At two sites where the staff identified aircraft instruments with radium paint, the staff sent letters in May and June 2018 informing the site owners that they are general licensees and requesting information regarding the owners' plans to disposition the products.

The NRC staff continues to communicate with State and local government officials regarding the surveys and results of the initial site visits. The staff has continued outreach to the Agreement and non-Agreement States through presentations at the Conference of Radiation Control Program Directors meeting in May 2018, the annual Health Physics Society meeting in July 2018, and the Organization of Agreement States meeting in August 2018. The Agreement States continue their efforts to develop or implement plans to address potential non-military radium contamination. Most Agreement States have conducted a prioritized review of the sites within their jurisdictions, focusing on the most risk-significant sites. Feedback from the Agreement States continues to indicate that their investigations have resolved the question of potential radium contamination at a significant number of the listed sites. At this time, 16 Agreement States have completed their investigation activities, have eliminated all sites from their lists, and plan no further actions.

Great Kills Park was the site of a previous landfill in Staten Island, New York. Radium contamination has been identified at the site and is currently undergoing CERCLA investigation and remediation. In January 2018, the NRC staff and the National Park Service (NPS) finalized an MOU for coordination of response actions at Great Kills Park. The NRC will take an approach at Great Kills Park similar to the approach the NRC has taken with respect to military sites to address an overlap between CERCLA and the Atomic Energy Act of 1954, as amended. After the MOU was finalized, NPS notified the NRC that radium contamination was found at Spring Creek Park in Queens, New York. The NRC staff and NPS worked together to revise the Great Kills Park MOU to include response actions at Spring Creek Park. The revised MOU was finalized in August 2018.

#### Depleted Uranium at U.S. Army Installations

The NRC staff completed the licensing of U.S. Army Management Command installations which possessed depleted uranium from the Davy Crockett weapons system. A license for the Schofield Barracks and Pohakuloa Training Area sites in Hawaii was issued in October 2013. In June 2015, the NRC received an application from the licensee to amend its license to add 15 other installations, which are located throughout the United States. The staff completed its review and issued Amendment 1 to Source Material License SUC-1593 to incorporate the additional sites in March 2016. In June 2016, the NRC received submittals addressing License Condition 17 (submit site-specific environmental radiation monitoring plans for the installations) and License Condition 18 (submit dose assessment evaluations to show that the all-pathway dose for each radiation controlled area was bounded). The staff found the submittals acceptable and amended the license (Amendment 2) in March 2017 to incorporate the site-specific environmental radiation monitoring plans and associated quality assurance plan. In March 2017, a petitioner filed a petition pursuant to 10 CFR 2.206 requesting that the NRC

reconsider the issuance of Amendment 2 to the license, for the U.S. Army Installation Management Command's (licensee's) Pohakuloa Training Area. As the basis for the request, the petitioner asserted that the environmental radiation monitoring program is inadequate to detect depleted uranium leaving the radiation control areas at the Pohakuloa Training Area. In May 2018, the director of NMSS determined that there is no basis for granting the petitioner's request to modify, suspend, or take other action with respect to the license under 10 CFR 2.206.

### West Valley Demonstration Project

DOE's preferred alternative to decommissioning the West Valley Demonstration Project site near Buffalo, New York, employs a two-phased approach. Phase 1 involves the decommissioning of most site facilities, including demolition of the main plant process building and vitrification facility and studies to reduce uncertainties associated with decommissioning the remaining facilities (referred to as Phase 1 studies). Phase 2 involves the completion of the decommissioning process and long-term management decisionmaking for the site.

Phase 1 of the decommissioning approach is being conducted in accordance with DOE's NRC-approved DP and is estimated to take 10 years to complete. This work includes relocating the 275 high-level waste (HLW) canisters and 3 non-conforming HLW canisters to long-term interim storage on-site with the demolition of on-site structures (remote handled waste facility, vitrification facility, process plant), continuing to ship low-level waste, and managing the NRC-licensed disposal area. In July 2018, DOE completed a major milestone, processing, shipping, and disposing of all legacy waste on site. The remaining legacy waste shipments were completed in the fall of 2018. DOE completed the deactivation of the vitrification facility and started its demolition in October 2017 and anticipates that it will complete this work in FY 2019. In November 2018, DOE completed the deactivation of the main process plant. DOE has also completed deactivation of 22 of the 47 balance of site facilities slated for demolition. In FY 2018, the NRC staff conducted several monitoring visits covering the vitrification facility demolition and reviewed the first revision of the demolition work plan for the main process plant.

During 2018, DOE and the New York State Energy Research and Development Authority (NYSERDA) completed Phase 1 studies which included erosion, exhumation, and engineered barriers. The results of these studies will be used to assist decision-making and to inform the Phase 2 Supplemental EIS. In early FY 2018, the NRC confirmed its intent to act as a cooperating agency for the DOE/NYSERDA Supplemental EIS. The NRC staff attended scoping meetings on the Supplemental EIS that were held by DOE and NYSERDA in April 2018. Preliminary work for conducting a probabilistic performance assessment is currently underway. DOE requested that NRC review the preliminary probabilistic performance assessment draft documents and several models beginning in FY 2019.

### **2.3.3 Fiscal Year 2019 Trends and Areas of Focus**

The NRC staff intends to make deliberate progress in exercising its regulatory authority to further complex sites' decommissioning activities. This will include completing the U.S. Army's license amendment request for a possession only license of JPG. The staff has initiated review activities associated with the revised Cimarron DP, which was submitted in November 2018.

The NRC staff intends to implement the MOU with the DoD for military radium beyond the initial “pilot” effort by prioritizing its activities based on available resources. Factors for consideration in prioritizing annual monitoring activities include: (1) involvement of other regulatory agencies; (2) use of engineered controls and/or land use controls as remedies; (3) contamination in buildings for reuse; (4) amount or type of material and how transportable it is; and (5) previous monitoring activities.

The staff plans to continue its efforts on non-military radium by completing initial site visits and follow-on scoping surveys as necessary. Additionally, the staff will focus on working with site owners on risk-informed approaches for site cleanup.

**Table 2.3. Complex Decommissioning Sites**

	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Compliance Criteria</b>	<b>Projected Date of Completion</b>
1	Alameda Naval Air Station*	Alameda, CA	N/A	N/A	MOU**	N/A
2	Cimarron (Kerr-McGee)	Cimarron, OK	4/95 revised 11/18	8/99	Action-UNRES***	2032
3	Department of the Army, U.S. Armament Research, Development, and Engineering Center	Picatinny, NJ	11/13	04/17	LTR-UNRES	TBD
4	FMRI (Fansteel), Inc.	Muskogee, OK	8/99, revised 5/03	12/03	LTR-UNRES	TBD
5	Hunter's Point Naval Shipyard* (former Naval shipyard)	San Francisco, CA	N/A	N/A	MOU**	N/A
6	Jefferson Proving Ground	Madison, IN	8/99 revised 6/02	10/02 retracted 11/15	N/A	N/A
7	Lead Cascade Facility (Centrus)	Piketon, OH	1/18	8/18	LTR-UNRES	2019
8	McClellan* (former Air Force base)	Sacramento, CA	N/A	N/A	MOU**	N/A
9	Shallow Land Disposal Area (BWX Technologies, Inc.)****	Vandergrift, PA	N/A	N/A	LTR-UNRES	TBD
10	Sigma-Aldrich	Maryland Heights, MO	10/08, revision pending	5/09, revised TBD	LTR-UNRES	2019

**Table 2.3. Complex Decommissioning Sites**

	Name	Location	Date DP Submitted	Date DP Approved	Compliance Criteria	Projected Date of Completion
11	UNC Naval Products	New Haven, CT	8/98, revised 2004,12/06	4/99, revised 10/07	LTR-UNRES	TBD
12	West Valley Demonstration Project	West Valley, NY	Phase 1 3/09	Phase 1 2/10	LTR-UNRES†	TBD
<p>* The Hunter’s Point Shipyard and Alameda Naval Air Station sites are being remediated by the U.S. Navy, and the McClellan site is being remediated by the U.S. Air Force, under the CERCLA process and EPA oversight. It is assumed that some licensable material might be present at both sites; however, the NRC has not licensed these sites. Instead, the Commission has approved a “limited involvement approach to stay informed” and the NRC staff will rely on the ongoing CERCLA process and EPA oversight. More information is available on this approach in SECY-08-0077, “Options for U.S. Nuclear Regulatory Commission Involvement with the U.S. Navy’s Remediation of the Hunters Point Naval Shipyard Site in California,” (ADAMS Accession No. ML080800110).</p> <p>** “Memorandum of Understanding Between the U.S. Nuclear Regulatory Commission and the U.S. Department of Defense for Coordination on CERCLA Response Actions at DoD Sites with Radioactive Materials,” dated April 2016 (ADAMS Accession No. ML16092A294).</p>						

- \*\*\* Under the provisions of 10 CFR 20.1401(b), any licensee or responsible party that submitted its DP before August 20, 1998, and received NRC approval of that DP before August 20, 1999, may use the SDMP action plan criteria for site remediation.
- \*\*\*\* USACE's remediation approach for the Shallow Land Disposal Area site is to follow the CERCLA process and adhere to the MOU between the NRC and USACE for coordination, remediation, and decommissioning of Formerly Utilized Sites Remedial Action Program sites with NRC-licensed facilities, "Memorandum of Understanding Between the U.S. Nuclear Regulatory Commission and The U.S. Army Corps of Engineers for Coordination of Cleanup & Decommissioning of the [FUSRAP] Sites with NRC-Licensed Facilities," 66 FR 36606. A Supplemental MOU between USACE, DOE, and the NRC was signed in June 2014, and complements the existing MOU by incorporating the relevant requirements of 10 CFR Parts 70, 73, and 74, and stipulates the specific roles of each Federal entity throughout the remainder of the remediation process.
- † The West Valley Phase I DP includes plans to release a large portion of the site for unrestricted use, while the remainder of the site may have a perpetual license or be released with restrictions.

Notes:

- The compliance criteria identified in this table reflect the information in the most recent NRC-approved DP or approach. The compliance criteria may change if the NRC approves alternate compliance criteria requested by the licensee.
- Abbreviations used in this table include: "Action" for SDMP action plan criteria, "ADAMS" for Agencywide Documents Access and Management System, "CERCLA" for Comprehensive Environmental Response, Compensation, and Liability Act, "CFR" for *Code of Federal Regulations*, "DP" for decommissioning plan, "DOE" for U.S. Department of Energy, "EPA" for U.S. Environmental Protection Agency, "FY" for fiscal year, "FR" for *Federal Register*, "LTR" for LTR criteria, "MOU" for memorandum of understanding, "N/A" for not applicable, "NRC" for U.S. Nuclear Regulatory Commission, "RES" for restricted use, "TBD" for to be determined, "UNRES" for unrestricted use, and "USACE" for U.S. Army Corps of Engineers.
- Reasons for multiple DP submittals range from changes in the favored decommissioning approach, to the phased implementation of decommissioning, to poor quality submittals.



## **2.4 Uranium Recovery Facility Decommissioning**

In enacting the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), as amended, Congress had two general goals. The first was to provide a remedial action program to stabilize and control the residual radioactive material at various identified inactive mill sites. The second was to ensure the adequate regulation of uranium production activities and cleanup of mill tailings at mill sites that were active and licensed by the NRC (or Agreement States). At the time, the NRC did not have direct regulatory control over uranium mill tailings. The tailings themselves did not fall into any category of NRC-licensable material. Before 1978, the NRC was regulating tailings at active mills indirectly through its licensing of source material milling operations under the Atomic Energy Act of 1954, as supplemented by authority provided by the National Environmental Policy Act of 1969.

Through the provisions of Title I of UMTRCA, Congress addressed the problem of inactive, unregulated tailings piles. Title I of UMTRCA specified the inactive processing sites for remediation and required that DOE remediate these sites. Except at the Atlas Moab site, surface reclamation activities have been completed by DOE and approved by the NRC for all Title I sites. However, groundwater cleanup is still ongoing at many of these Title I sites. When groundwater cleanup is completed, DOE will submit a revised long-term surveillance plan (LTSP) for NRC concurrence. Table 2.4-a identifies the 22 Title I sites: 20 that are under general license with the DOE and 2 former mill sites at Riverton, Wyoming and Monument Valley, Utah that have been designated as Title I sites by Congress. The regulation at 10 CFR 40.27, "General License for Custody and Long-Term Care of Residual Radioactive Material Disposal Sites," governs the long-term care of Title I sites under a general license held by either DOE or the State in which the site is located, after decommissioning is complete.

Title II of UMTRCA addresses mill tailings produced at active sites licensed by the NRC or an Agreement State as of the date UMTRCA was passed. UMTRCA amended the definition of byproduct material to include mill tailings and added specific authority for the NRC to regulate this new category of byproduct material at licensed sites. Title II uranium recovery decommissioning activities include review of site characterization plans and data; review and approval of reclamation plans (RPs); preparation of environmental assessments (EAs) and EISs; inspection of decommissioning activities, including confirmatory surveys; decommissioning cost estimate reviews, including annual surety updates; and oversight of license termination. Regulations governing uranium recovery facility decommissioning are at 10 CFR Part 40, "Domestic Licensing of Source Material," and in Appendix A to that Part, "Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings of Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content." Licensed operations include conventional uranium mill facilities and in situ recovery (ISR) facilities, as both types of facilities conduct "uranium milling" (as defined in 10 CFR 40.4). Table 2.4-b identifies the Title II sites that are no longer operating and in decommissioning status. As of September 30, 2018, 11 Title II uranium recovery facilities are undergoing decommissioning<sup>4</sup>. The regulation at 10 CFR 40.28, "General License for Custody and Long-Term Care of Uranium or Thorium Byproduct Materials Disposal Sites,"

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<sup>4</sup> On September 25, 2018, the NRC entered into an agreement with the State of Wyoming, transferring regulatory authority to the State over certain radioactive materials. On September 30, 2018, Wyoming assumed authority for 5 Title II uranium recovery sites undergoing decommissioning. The NRC will retain jurisdiction for the American Nuclear Corporation site.

governs the long-term care of Title II conventional uranium mill sites under a general license held by either DOE or the State in which the site is located, after decommissioning is complete. The six Title II sites that have been transferred for long-term care are identified in Table 2.4-c. Status summaries for the Title II sites undergoing decommissioning are provided at <http://www.nrc.gov/info-finder/decommissioning/uranium/>.

#### **2.4.1 Decommissioning Process for Uranium Mills**

These facilities are not subject to the license termination criteria set forth in Subpart E, “Radiological Criteria for License Termination,” to 10 CFR Part 20, “Standards for Protection Against Radiation.” Instead, they are subject to similar requirements in 10 CFR Part 40, Appendix A, as summarized below.

Any one of the following events may initiate the decommissioning process for uranium recovery facilities:

- The license expires or the license is revoked.
- The licensee has decided to permanently cease principal activities at the entire site or in any separate building or outdoor area.
- No principal activities have been conducted for a period of 24 months (except for impoundments and in disposal areas).
- No principal activities have been conducted for a period of 24 months in any separate building or outdoor area (except for impoundments and disposal areas).

The uranium recovery facility decommissioning process includes several major steps, depending on the type of facility. These steps include notification of intent to decommission; submittal, review, and approval of the DP or RP;<sup>5</sup> implementation of the DP or RP; completion of decommissioning or reclamation; submittal and review of a completion report; submittal and review of a well-field restoration report (for ISR facilities); submittal and review of an LTSP (for sites with tailings piles); termination of the license; and transfer of the property to the long-term care custodian, for sites with tailings piles, under a general license held by either DOE or a State.

##### Notification

Within 60 days of the occurrence of any of the triggering conditions described above, the licensee must notify the NRC of such occurrence and either begin decommissioning or, if required, submit a DP or RP within 12 months of notification and begin decommissioning upon approval of the DP or RP. Under 10 CFR 40.42(f), licensees may delay facility decommissioning if the NRC determines that such a delay is not detrimental to public health and safety and is otherwise in the public interest.

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<sup>5</sup> For uranium recovery sites, DPs typically deal with the remediation of structures, while RPs typically deal with tailings impoundments, groundwater cleanup, and other remediation efforts.

### Decommissioning Plan/Reclamation Plan

All uranium recovery facilities currently licensed by the NRC have NRC-approved DPs or RPs. For new ISR or conventional facilities, the licensee submits groundwater restoration, surface reclamation, and facility DPs with the initial license application. The NRC reviews and approves these plans before issuing a license. Therefore, for existing uranium facilities, the NRC staff would review only amendments to the existing DPs or RPs. Amendments would be necessary under any of the following circumstances:

- Environmental contamination exists or other new conditions arise that were not considered in the existing DP/RP.
- The licensee requests a change in reclamation design or procedures.
- The licensee requests a change in the timing of restoration.

Depending on the complexity of the revision, a public meeting between the licensee and the NRC staff may be warranted.

### Implementation of the Decommissioning Plan/Reclamation Plan

As the licensee prepares to enter decommissioning, it submits a revised DP or RP. After approval of the revised DP or RP, the licensee must complete decommissioning within 24 months or apply for an alternate schedule. For conventional facilities with groundwater contamination, or for ISR facilities where well-field restoration is involved, 24 months to complete decommissioning activities is usually insufficient, because remediation of groundwater contamination is more time-consuming than remediation of surface contamination. As such, an alternate schedule may be appropriate.

The NRC staff will inspect the licensee's activities during decommissioning or reclamation to ensure compliance with the DP or RP, associated license conditions, and NRC and other applicable regulations (e.g., U.S. Department of Transportation regulations). The staff will also ensure that there is no degradation in groundwater quality after the completion of groundwater restoration by requiring monitoring of the groundwater for a period of time.

Decommissioning at uranium recovery sites involves two main activities: surface reclamation (i.e., soil contamination cleanup, 11e.(2) byproduct material reclamation and disposal, equipment removal, and structure decommissioning), and groundwater restoration. Groundwater restoration is considered complete when concentrations on- and off-site (depending on the extent of contaminant migration) meet previously established groundwater protection standards in accordance with Appendix A of 10 CFR Part 40. For the groundwater constituents being monitored at a given site, three types of standards are potentially applicable in accordance with Criterion 5B(5) in Appendix A:

- NRC-approved background concentrations;
- maximum contaminant levels established by the EPA (in Table 5C of 10 CFR Part 40, Appendix A); and
- NRC-approved alternate concentration limits (ACLs).

If the licensee demonstrates that concentrations of monitored constituents cannot be restored to either background or Appendix A, Table 5C values (whichever value is higher), the NRC staff may approve ACLs, after considering all the factors required in Appendix A, Criterion 5B(6). To obtain approval of ACLs, the licensee submits a license amendment request and a detailed environmental report that addresses all the Criterion 5B(6) factors. If the NRC staff determines that the ACLs are protective of public health and the environment, the staff would approve the ACLs.

After surface decommissioning or reclamation has been completed, the licensee submits a completion report for NRC staff review and approval. As part of this review, the staff performs an inspection to confirm that surface reclamation was performed according to the DP or RP, license conditions, and the NRC regulations. Inspections also include surveys of tailings disposal areas to ensure that radon emissions comply with 10 CFR Part 40, Appendix A, Criterion 6.

#### License Termination - Conventional Mills

After all reclamation activities have been completed and approved, the licensee, the NRC staff, and the long-term custodian will start license termination procedures. Before a conventional mill license is terminated, the custodial agency (i.e., State agency, DOE, or other Federal agency) will submit an LTSP for NRC staff review and acceptance. The LTSP documents the custodian's responsibilities for long-term care, including security, inspections, groundwater and surface water monitoring, and remedial actions. Concurrent with the staff's acceptance of an LTSP, the existing license is terminated and titles to any mill tailings disposal sites are transferred to the custodian under 10 CFR 40.28, "General License for Custody and Long-Term Care of Uranium or Thorium Byproduct Materials Disposal Sites."

#### License Termination - In Situ Uranium Recovery Facilities

License termination at an ISR uranium recovery facility occurs when all groundwater contamination has been cleaned up to acceptable levels and surface decommissioning or reclamation has been completed and approved by the NRC. Surface decommissioning completion typically would include an NRC inspection. Because 10 CFR Part 40, Appendix A, Criterion 2 generally prohibits ISR uranium extraction facility owners from disposing of 11e.(2) byproduct material at their sites, long-term care of ISR facilities by a governmental custodian under a general license is not required. However, licensees of ISR facilities are still required to find a licensed 11e.(2) disposal site for facility waste, though some licensees are allowed to dispose of liquid wastes in deep disposal wells. Thus, all groundwater restoration and surface reclamation is performed so that the site can qualify for unrestricted release.

## 2.4.2 Summary of Fiscal Year 2018 Activities

### UMTRCA Title I Sites

- DOE submitted a revised LTSP for the site in Naturita, Colorado, in FY 2018. The NRC staff accepted the revised LTSP for full review.
- The NRC staff conducted observational site visits at the Grand Junction, Mexican Hat, Naturita, Salt Lake City, and Tuba City sites that are generally licensed pursuant to 10 CFR 40.27.
- In addition, the NRC staff continued its participation with other Federal agencies and the Navajo Nation in implementing the five-year plan to address uranium contamination on the Navajo Nation. The staff is working with the Federal agencies and the Navajo Nation to develop the next plan. The staff is also working with the Navajo Nation and involved Federal agencies to develop training for the Navajo on uranium and its health and environmental impacts. In addition, the staff continued participation in Navajo Nation/Hopi/DOE quarterly meetings and community outreach.

### UMTRCA Title II Sites

- In January 2017, the NRC staff revised the confirmatory order to focus the remaining decommissioning funds on stabilizing those areas of the American Nuclear Corporation (ANC) Gas Hills, Wyoming, site that have deteriorated and improve the tailings pile cover in order to prevent additional contamination impacting the groundwater and to mitigate erosion. In spring and summer 2018, the Wyoming Department of Environmental Quality contractor completed the majority of the stabilization activities and will complete the remaining activities by the end of calendar year 2018. In addition, the NRC staff is developing options for Commission consideration for securing funding to support permanent closure of the ANC Gas Hills site.
- On September 25, 2018, the NRC entered into an agreement with the State of Wyoming. Under this agreement, the NRC discontinued its regulatory authority, and Wyoming assumed regulatory authority over certain radioactive materials. Effective September 30, 2018, the State of Wyoming assumed regulatory authority for five Title II uranium recovery sites undergoing decommissioning. The staff has entered into an MOU with the State to ensure a smooth transition of regulatory oversight. In FY 2018, the staff activities on the Title II sites that were transferred to Wyoming included: review of the draft LTSP and long-term care fee for the Bear Creek site in Converse County, Wyoming, and working with DOE and the licensee to resolve any remaining issues related to license termination; continuing the review of ExxonMobil Highland's ACL and long-term care boundary revisions in response to previous NRC requests for additional information about the site, which is located in Converse County, Wyoming; and continuing to interact with Western Nuclear Incorporated (WNI) to address the groundwater modeling for the WNI Split Rock site in Jeffrey City, Wyoming.

- The NRC staff continued inspection and review of licensee actions as required by the confirmatory order issued in March 2017 at the Homestake site in Grants, New Mexico. The staff enhanced communications between the EPA and the State of New Mexico through monthly teleconferences to discuss coordination and alignment between the agencies. The staff also participated in monthly teleconferences with interested members of the community to provide an update on all activities at the Homestake site. In September 2018, the licensee submitted its self-assessment associated with the confirmatory order.
- In March 2018, Sequoyah Fuels Corporation (SFC) began shipping its bagged raffinate sludge from its site in Gore, Oklahoma, to the White Mesa Uranium Mill. White Mesa received its renewed license from the State of Utah in January 2018. The renewed license includes a condition that allows the mill to receive SFC's bagged raffinate sludge, process it to recover uranium, and dispose of the waste as tailings. As of August 2018, 5,389 bags of material have been shipped to the mill. 7,244 bags remain to be dispositioned. A hearing was held in District Court in March 2018 regarding the motion to extend the injunction against on-site disposal of the bagged material beyond February 1, 2018 that was filed by the State of Oklahoma and the Cherokee Nation. The District Court extended the injunction until such time as approximately 75 percent of the bagged material (~9,000 bags) has been shipped to White Mesa. The District Court also stated that it will allow any remaining bagged material to be disposed on-site if the material cannot be shipped to the mill within SFC's \$3.5 million commitment, and the State and/or Cherokee Nation cannot provide additional funding. Currently, SFC's spending on offsite disposal is expected to reach its \$3.5 million commitment prior to 75 percent of the bagged material being shipped offsite.
- The NRC staff conducted site inspections at the ExxonMobil Highlands, Homestake, Pathfinder–Shirley Basin, Umetco, WNI Split Rock, Pathfinder–Lucky Mc, Bear Creek, Rio Algom–Ambrosia Lake, and UNC Church Rock sites. The NRC staff also conducted a site visit at the ANC Gas Hills site.

#### UMTRCA Title II Sites Transferred to DOE for Long-Term Care

- The NRC staff continued to discuss options with DOE to resolve two technical concerns associated with the Bluewater site in Grants, New Mexico, that involve: (1) subsidence of approximately 40 acres of the cover used to control both radon emissions and erosion, and (2) expansion of a groundwater plume within a regional drinking water aquifer. The staff participated in a joint agency public meeting with the State of New Mexico, the DOE, and the EPA to provide an update on site status and next steps to the public. DOE is working to submit a report by the end of 2018 that will outline its previous efforts to characterize the extent of the groundwater plume at the site. Additionally, with the assistance of the State of New Mexico Environment Department, DOE has offered to sample public groundwater wells at an owner's request.
- In addition, the NRC staff conducted observational site visits at the Bluewater site that has been transferred to DOE and is generally licensed pursuant to 10 CFR 40.28.

### **2.4.3 Fiscal Year 2019 Trends and Areas of Focus**

In FY 2019, the NRC staff will work with the State of Wyoming in accordance with the MOU for ensuring an orderly transition of regulatory oversight of Title II sites that are being transferred to the State after September 30, 2018. The staff also plans to provide an analysis to the Commission regarding funding options for the ANC site during FY 2019. The staff will continue to make progress on the Homestake, Bluewater, and Rio Algom–Ambrosia Lake sites. Lastly, the staff will continue its participation in the activities associated with the Navajo Nation five-year plan, DOE/Navajo Nation/Hopi quarterly meetings, and reviewing DOE reports and plans for the reclamation and management of these sites.

**Table 2.4-a. Decommissioning Title I Uranium Recovery Sites**

	<b>Name</b>	<b>Location</b>	<b>Status</b>
1	Ambrosia Lake	Grants, NM	Monitoring
2	Burrell	Blairsville, PA	Monitoring
3	Canonsburg	Canonsburg, PA	Monitoring
4	Durango	Durango, CO	Monitoring
5	Falls City	Falls City, TX	Monitoring
6	Grand Junction	Grand Junction, CO	Monitoring
7	Green River	Green River, UT	Monitoring
8	Gunnison	Gunnison, CO	Monitoring
9	Lakeview	Lakeview, OR	Monitoring
10	Lowman	Lowman, ID	Monitoring
11	Maybell	Maybell, CO	Monitoring
12	Mexican Hat	Mexican Hat, UT	Monitoring
13	Monument Valley	Monument Valley, AZ	Monitoring
14	Moab Mill	Moab, UT	Active – surface and groundwater remediation
15	Naturita	Naturita, CO	Monitoring
16	Rifle	Rifle, CO	Monitoring
17	Riverton	Riverton, WY	Monitoring
18	Salt Lake City	Salt Lake City, UT	Monitoring
19	Shiprock	Shiprock, NM	Active – groundwater remediation
20	Slick Rock	Slick Rock, CO	Monitoring
21	Spook	Converse Co., WY	Monitoring
22	Tuba City	Tuba City, AZ	Active – groundwater remediation (currently suspended*)

\* DOE has suspended active groundwater remediation and is evaluating the effectiveness of the remediation approach.

Note: Active denotes that a site is still undergoing surface reclamation or is resolving groundwater issues. Monitoring denotes that the site is being monitored under its LTSP or a groundwater compliance action plan.



**Table 2.4-b. Decommissioning Title II Uranium Recovery Sites**

	<b>Name</b>	<b>Location</b>	<b>Date DP/RP Approved</b>	<b>Date of Decomm. Completion</b>
1	American Nuclear Corporation	Gas Hills, WY	10/88, Revision 2006	TBD
2	Bear Creek*	Converse County, WY	5/89	TBD
3	ExxonMobil Highlands*	Converse County, WY	1990	TBD
4	Homestake Mining Company	Grants, NM	Revised plan—3/95 Revision pending	TBD
5	Pathfinder—Lucky Mc*	Gas Hills, WY	Revised plan—7/98	TBD
6	Pathfinder—Shirley Basin**	Shirley Basin, WY	Revised plan—12/97	TBD
7	Rio Algom—Ambrosia Lake	Grants, NM	2003 (mill); 2004 (soil)	2021
8	Sequoyah Fuels Corporation	Gore, OK	2008	2020
9	Umetco Minerals Corporation*	East Gas Hills, WY	Revised soil plan—4/01	TBD
10	United Nuclear Corporation	Church Rock, NM	3/91, Revision 2005	TBD
11	Western Nuclear Incorporated Split Rock*	Jeffrey City, WY	1997	TBD

TBD to be determined

\* Effective September 30, 2018, the State of Wyoming assumed responsibility for oversight pursuant to an agreement with the NRC (83 FR 48905; September 28, 2018).

\*\* The Pathfinder—Shirley Basin site is no longer in operation, and is not actively decommissioning, but is accepting 11e2 material from other licensees for disposal. In addition, effective September 30, 2018, the State of Wyoming assumed responsibility for oversight pursuant to the agreement with the NRC.

**Table 2.4-c. Title II Uranium Recovery Sites – DOE Licensed Under 10 CFR 40.28**

	<b>Name</b>	<b>Location</b>	<b>Date Transferred to DOE</b>
1	Bluewater (Arco)	Grants, NM	1997
2	Edgemont	Edgemont, SD	1996
3	L-Bar	Seboyeta, NM	2005
4	Maybell West	Maybell, CO	2010
5	Sherwood	Wellpinit, WA	2001
6	Shirley Basin South	Shirley Basin, WY	2005

## **2.5 Fuel Cycle Facility Decommissioning**

Currently, there is one fuel cycle demonstration facility, the Centrus, LLC, LCF, that has been completely dismantled and decontaminated with all of its equipment and materials appropriately dispositioned offsite, and is currently under NRC review for license termination. The LCF lies completely within the footprint of Centrus LLC's larger, but yet to be completed, American Centrifuge Plant licensed by the NRC and located in Piketon, Ohio. Information regarding the LCF decommissioning is available in Section 2.3.2 of this report. There is also one fuel cycle facility undergoing partial decommissioning: the Nuclear Fuel Services (NFS) site in Erwin, Tennessee, in accordance with applicable provisions under 10 CFR 70.38. The NRC's public Web site at <http://www.nrc.gov/info-finder/decommissioning/fuel-cycle/> summarizes additional information about the status of the facility.

### **2.5.1 Fuel Cycle Facility Decommissioning Process**

The decommissioning processes for fuel cycle facilities and for complex materials sites are similar (see Section 2.3.1). Decommissioning activities at fuel cycle facilities can be conducted during operations (partial decommissioning) or after the licensee has ceased all operational activities.

Project management responsibility for fuel cycle facilities resides within NMSS and the Division of Fuel Cycle Safety, Safeguards, and Environmental Review (FCSE) during licensee operations and partial site decommissioning with technical support from the Decommissioning Program. In cases where the entire site is being decommissioned in support of license termination, the project management responsibility resides within the Decommissioning Program. Project management responsibility for fuel cycle facilities is transferred from FCSE when the licensee has ceased all operational activities and a critical mass of material no longer remains at the site.

### **2.5.2 Summary of Fiscal Year 2018 Activities**

- NFS has continued to work toward releasing different areas within its site located in Erwin, Tennessee. NFS is remediating the Building 234 site (former plutonium building). The building has been dismantled and removed from the site. The current phase of decommissioning involves excavation of the contaminated soil that was located under the building. NFS has demolished and removed the Blended Low Enriched Uranium (BLEU) Complex that was operated as a joint venture between NFS and AREVA and was located outside the protected area at the Erwin site. NFS submitted an FSSR for the BLEU Complex in FY 2018. The NRC staff completed its review of the FSSR in November 2018 and confirmed that the facility was suitable for unrestricted release. NFS has completed remediation of the North Site area, which includes former radiological burial areas and ponds that received effluents. NFS submitted a surface soil FSSR for this area in FY 2018, and the NRC staff expects to complete its review in December 2018.

### **2.5.3 Fiscal Year 2019 Activities and Areas of Focus**

In FY 2019, the NRC staff expects to complete its review of the final FSSR for the NFS North Site area.

### 3. GUIDANCE AND RULEMAKING ACTIVITIES

In FY 2018, the NRC staff worked to increase the effectiveness of the Decommissioning Program through a rulemaking effort for reactor decommissioning and updates to decommissioning guidance. The Decommissioning Program has also been performing a self-evaluation of dose modeling to help it become more effective in the decommissioning of sites.

#### Decommissioning Rulemaking

With the permanent shutdown of seven power reactors since 2012, and the announcement of 12 additional reactors to shut down by 2025, the Commission requested the NRC staff to consider rulemaking to increase the efficiency of the transition from operations to decommissioning, clarify existing requirements, and incorporate lessons learned. In SRM-SECY-14-0118, "Request by Duke Energy Florida, Inc., for Exemptions from Certain Emergency Planning Requirements," (ADAMS Accession No. ML14364A111) the Commission directed the staff to proceed with rulemaking on reactor decommissioning and set an objective of early 2019 for its completion. The Commission also stated that this rulemaking should address the following:

- issues discussed in SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," such as the graded approach to emergency preparedness;
- lessons learned from the plants that have already gone (or are currently going) through the decommissioning process;
- the advisability of requiring a licensee's PSDAR to be approved by the NRC;
- the appropriateness of maintaining the three existing options (DECON, SAFSTOR, and ENTOMB) for decommissioning and the timeframes associated with those options;
- the appropriate role of State and local governments and nongovernmental stakeholders in the decommissioning process; and
- any other issues deemed relevant by the NRC staff.

The NRC's goals in amending these regulations would be to provide a more efficient decommissioning process, reduce the need for exemptions from existing regulations, and support the principles of good regulation, including openness, clarity, and reliability. This rulemaking effort remains on schedule, and NRR, NMSS, and NSIR continued the process throughout FY 2018.

The NRC published an advance notice of proposed rulemaking for public comment in November 2015; this document was issued to obtain preliminary stakeholder feedback regarding the scope of the rulemaking. Subsequently, the staff issued a draft regulatory basis for 90-day public comment period in early 2017, which identified various options that the staff considered for each of the topical areas included in the proposed rulemaking. In May 2017, the staff published the

regulatory analysis for the draft regulatory basis for public comment. This document provided the costs and benefits associated with each of the topics that the staff considered in the draft regulatory basis. In November 2017, the staff issued the final regulatory basis, and the regulatory analysis associated with the final regulatory basis was issued in January 2018. Most recently, the staff submitted the draft proposed rule package to the Commission for vote in May 2018. If the Commission approves the proposed rule, then any Commission-directed changes will be incorporated, and the proposed rule package, including the draft guidance documents intended to help implement the new rule, will be published for a public comment period. The staff will consider any comments received during this period in developing the draft final rule package, which should be provided to the Commission in late 2019.

### Decommissioning Generic Environmental Impact Statement

The NRC staff is planning to revise NUREG-1757, Supplement 1, “Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Regarding the Decommissioning of Nuclear Power Reactors” (referred to as the Decommissioning Generic Environmental Impact Statement [GEIS]), which was last updated in 2002. The Decommissioning GEIS evaluates the potential environmental impacts from decommissioning nuclear power reactors licensed by the NRC.

In connection with the Decommissioning Rulemaking effort, the staff identified the need to update the decommissioning GEIS since the GEIS was last updated in 2002. Planned revisions include: (1) adding experience from recent decommissioning facilities, (2) incorporating the conclusions of NUREG-2157, Volumes 1 and 2, “Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel,” issued September 2014 (ADAMS Accession No. ML14198A440), which is also known as the Continued Storage GEIS, (3) revisiting the Decommissioning GEIS findings based on updated information, including comments received on the rulemaking, and (4) revising as necessary to reflect the outcome of the current rulemaking activities. In addition, the staff would incorporate best practices and lessons learned from environmental reviews conducted for other NRC applications. The staff would also evaluate the process for implementing the decommissioning GEIS and make any necessary enhancements to the document. The staff would revise the Decommissioning GEIS on a separate schedule from the decommissioning rulemaking because of the additional public interactions and engagement with other Federal agencies that occur during a National Environmental Policy Act review.

### Decommissioning Guidance

Revision 1 of NUREG-1757, Volume 2, “Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria,” (ADAMS Accession No. ML063000252) was published in September 2006. An effort to update the volume was initiated in early 2014. This update will amend the guidance to address longstanding technical issues and lessons learned which would improve the quality of licensee DPs and LTPs and improve the efficiency of the NRC staff review of these documents. Revisions include development of additional dose modeling review guidance on topics such as model abstraction and simplification, consideration of uncertainty, use of distribution coefficients, and consideration of elevated areas or “hot spots.” Revisions also include updated guidance on conducting “as low as reasonably achievable (ALARA)” reviews, as well as a new appendix providing guidance on

composite sampling. An update to uranium recovery licensing guidance is also being prepared as Volume 4 of NUREG-1757. This volume will incorporate those provisions and aspects of the existing uranium recovery guidance, which are specifically relevant to the reclamation, restoration, and decommissioning of uranium recovery facilities. In April 2018, the staff published Revision 2 to NUREG-1700, "Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans," (ADAMS Accession No. ML18116A124), which provides updated guidance to the NRC staff for conducting safety reviews of LTPs. A revision to the associated Regulatory Guide 1.179, "Standard Format and Content of License Termination Plans for Nuclear Power Reactors," was developed and will be published in FY 2019.

During FY 2018, the staff also updated Regulatory Guide 1.191, "Fire Protection Program for Nuclear Power Plants During Decommissioning and Permanent Shutdown," (ADAMS Accession No. ML011500010) and the revision will be published in FY 2019.

In FY 2019, the staff also plans to initiate revisions to NUREG-1569, "Standard Review Plan for In Situ Leach Uranium Extraction License Applications" (ADAMS Accession No. ML032250177). The planned revisions include guidance for alternate concentration limits at in situ recovery facilities and other updates based on experiences with licensing and oversight at uranium recovery facilities and feedback from the public. Once drafted, the staff plans to share with the public for comment.

#### Self-Evaluation of Dose Modeling

The staff continued to evaluate of the uses and applicability of computer codes employed in carrying out licensing activities, particularly those codes used for the demonstration of compliance with the decommissioning dose criteria. This evaluation is intended for NRC's use when assessing ways to enhance the efficiency of the use of codes and models and to establish consistency and relevance in the selection of these computer codes and models. This activity is expected to continue into FY 2019.

## 4. RESEARCH ACTIVITIES

The Office of Nuclear Regulatory Research (RES) and NMSS continue to coordinate activities focusing on key decommissioning issues, including updating computer codes, development of an MOU with the DOE on the roles, responsibilities, and processes related to implementation of radiation protection computer code, analysis, and maintenance program (RAMP), supporting international activities related to decommissioning, and studying the effects of engineered covers.

In FY 2018, the RES and NMSS staff continued activities with DOE national laboratories for the development or modification of computer codes useful for decommissioning analyses, including the upgrade of several codes identified as part of a FY 2015 and FY 2018 User's Need request from NMSS staff. This includes the following activities:

- working on the Residual Radioactivity (RESRAD) family of computer codes that includes RESRAD-ONSITE, RESRAD-OFFSITE and RESRAD-BUILD to enhance the realism of the modeling by updating default parameters and modifying RESRAD-OFFSITE V3.1 to include solubility and diffusion limited leaching source terms;
- updating, benchmarking, and distributing the user manual and quality assurance documents for the MILDOS-AREA computer code, which is used by uranium recovery licensees to estimate radon effluents;
- adding new features to Visual Sampling Plan based on the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) final survey protocols;
- distributing and maintaining the Decommissioning and Decontamination (DandD) computer code, which is used by licensees to develop derived concentration guideline levels for cleanup; and
- supporting the development of the VARSKIN computer code, used in the analysis of hot particle doses at decommissioning nuclear power plants.

Additionally, RES developed an MOU with DOE that describes the roles, responsibilities, and processes related to the implementation of RAMP. RAMP provides the nuclear energy and radiation protection community with access to the distribution, development, and use of radiation protection computer codes, including MILDOS-AREA and DandD, while ensuring sustainability of code development. This MOU is specific to the portion of RAMP in which NRC and DOE jointly conduct cooperative research and DOE provides programmatic support to DOE National Laboratories to manage the RESRAD family of computer codes.

RES supports international activities including the Information System on Occupational Exposure (ISOE). The staff participates in the ISOE management board that oversees the Working Group on Radiological Aspects of Decommissioning Activities in Nuclear Power Plants. This working group's objective is to provide a forum for experts to develop a process to better share operational radiation protection data and experience for nuclear power plants in some stage of decommissioning, or in preparation for decommissioning. The staff also participated in



the Modeling Data for Radioactive Impact Assessment, which is an International Atomic Energy Agency (IAEA)-sponsored technical meeting that brings together modelers of computer codes to assess and benchmark them.

The RES staff continues working on a research program that was created to study the effects of changes in properties of in-service engineered earthen covers over uranium mill tailings as these covers age. The purpose of this study is to evaluate the effects of soil structure formation by abiotic and biotic processes on the hydraulic conductivity and gaseous diffusivity of radon barriers, how structural development varies with depth and thickness of the radon barrier, and how structure influences transmission of radon and seepage carrying groundwater contaminants. This research is a collaboration effort between the DOE Office of Legacy Management (LM) and the NRC, with investigators at the University of Wisconsin, University of Virginia, University of California, Berkeley, and Navarro Engineering (the DOE contractor). Four mill tailing sites were visited by the research team: Falls City in Texas, Bluewater in New Mexico, Shirley Basin South in Wyoming, and Lakeview in Oregon. A workshop was held in July 2018 at NRC Headquarters where the research team members presented their observations. A Conference Proceedings (NUREG-CP) is being prepared to document this workshop. The team also made four presentations at the DOE/LM 2018 Long-Term Stewardship Conference in August 2018. Currently, data are being prepared and interpreted from these sites and a NUREG/CR is being written. A White Paper is also being prepared that will outline key finding of the research and present topics and approaches for follow-on research. The RES staff also continued to provide direct assistance to NMSS efforts through participating in the MARSSIM Interagency Working Group which is revising the MARSSIM guidance document.

The RES and NMSS staff participated effectively in the Federal Remediation Technologies Roundtable workshops and coordinated a session on use of nanotechnology in remediation of radionuclides contaminated soil and water.

## 5. INTERNATIONAL ACTIVITIES

The NRC participates in multiple international activities to fulfill U.S. commitments to international conventions, treaties, and bilateral/multilateral agreements. The NRC staff is also actively engaged in reviewing, developing, and updating international radiation safety standards, and technical support documents through interaction with international organizations, including the IAEA and the Organisation for Economic Co-operation and Development's Nuclear Energy Agency (NEA), as well as foreign governments. The NRC participates in bilateral and trilateral exchanges with other countries in coordination with the U.S. Department of State and other Federal and State agencies. This is accomplished by hosting foreign assignees and participating in reciprocal assignments, developing and providing workshops to requesting countries, and providing technical support as needed. The NRC is generally recognized in the international nuclear community as an experienced leader in the regulation and safety of decommissioning, spent fuel management and storage, radioactive waste management and disposal, site remediation, and environmental protection. Interaction with international organizations and governments allows the NRC to share insights about lessons learned and successful, safe, and effective decommissioning approaches. This interaction also allows the NRC staff to provide input for various international guidance documents and standards that benefit the U.S. and other countries in establishing and implementing safe decommissioning strategies. In addition, the staff gains insight into approaches and methodologies, lessons learned, and new technologies used in the international community, and considers these approaches as it continues to risk-inform the NRC Decommissioning Program and gain further insights into the decommissioning process. The most significant of these FY 2018 activities are summarized below.

- The staff participated in the review and development of IAEA Safety Standards; participated in IAEA projects, conferences, peer reviews, and workshops related to decommissioning and waste disposal; and advised on the development of other countries' regulatory programs. For example, the staff: (1) conducted reviews and updates of IAEA standards related to decommissioning and low-level waste during the Waste Safety Standards Committee (WASSC) 44<sup>th</sup> and 45<sup>th</sup> review cycles; (2) participated in the NEA Working Party on Decommissioning and Dismantling (WPDD) 18<sup>th</sup> annual meeting and delivered presentations on stakeholder involvement representing U.S. views; (3) participated in a technical meeting and consultancy working group on the completion of decommissioning; (4) participated in a consultancy working group on the decommissioning of small facilities; (5) attended a technical meeting on institutional controls and the release of sites from regulatory control; and (6) developed modules and instructor notes for an IAEA training course for decommissioning regulators.
- The staff participated in technical meetings of the International Forum on Regulatory Supervision of Legacy Sites, related to the remediation of legacy nuclear facilities.
- The staff continued its participation in the IAEA Project on the Decommissioning and Remediation of Damaged Nuclear Facilities.

- The staff presented the NRC’s perspectives on entombment as a decommissioning option at an IAEA/DOE-sponsored international technical exchange on International Best Practices for In-situ Decommissioning.
- The staff participated in the 2018 Waste Management Symposia international conference.
- The staff participated in the organizational and extraordinary meetings of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management in Vienna.
- The staff provided a presentation at the Workshop on Regulation of Decommissioning at the NEA in Paris, France, which focused on the NRC's experience with stakeholder involvement in the decommissioning process.
- The staff participated in a bilateral cooperation meeting with the Republic of Korea on decommissioning and spent fuel management, which included presentations on the U.S. Reactor Decommissioning Program, reactor transition lessons learned, radiological characterization lessons learned, and decommissioning ALARA.
- The Reactor Decommissioning Branch hosted an assignee from the Korean Institute of Nuclear Safety for one year, and sponsored delegations from the Korean Institute of Nuclear Safety, Korean Nuclear Safety and Security Commission, and Taiwan Atomic Energy Council on inspection accompaniments at San Onofre.
- The staff attended the Conference on Nuclear Safety Cooperation in Seoul, Korea, and delivered a presentation on U.S. experience in decommissioning with a focus on nuclear safety.
- The staff met with Japanese regulators and government officials to discuss reactor decommissioning regulatory programs.
- The staff prepared and presented a reactor decommissioning workshop in Taipei, Taiwan, for members of the Taiwan Atomic Energy Council, which included modules on the U.S. experience with reactor transitions to decommissioning and a technical discussion on dose modeling and radiological surveys.
- The staff participated in a bilateral meeting and provided presentations on reactor decommissioning and waste management to the French Nuclear Safety Authority, and visited decommissioning sites in France.
- The staff participated in the IAEA’s mission of “Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation” program in review of Italy’s program for dismantlement and decommissioning of nuclear power plants.

## **6. PROGRAM INTEGRATION AND IMPROVEMENT**

Given the scope of the decommissioning functional area, the Decommissioning Program has undertaken many initiatives to improve its efficiency and effectiveness.

### Power Reactor Program Improvements

The Decommissioning Program has historically sought opportunities to improve its processes in order to accomplish decommissioning activities more effectively. In response to an anticipated increase in workload due to early reactor shutdowns, the NMSS staff conducted a program evaluation of its power reactor decommissioning regulatory function. The Power Reactor Decommissioning Program evaluation was an outgrowth of the NRC staff's Integrated Decommissioning Improvement Plan (IDIP) efforts and part of its initiative to foster continuous improvement. The evaluation resulted in a set of recommendations to update guidance and policy documents within the Power Reactor Decommissioning Program to capture program improvements and lessons learned. In March 2018, the staff published a revision of Inspection Manual Chapter 2561, "Decommissioning Power Reactor Inspection Program," (ADAMS Accession No. ML17348A400), which reflects updates to the overall decommissioning reactor inspection program and changes to the core and discretionary inspection procedures.

### Comprehensive Decommissioning Program

The NRC staff has continued the implementation of an enhanced Comprehensive Decommissioning Program, which allows the staff to compile, in a centralized location, information on the status of decommissioning and decontamination of complex sites and uranium recovery sites in the United States. In FY 2018, State contacts provided responses to letter STC-18-012, "Information Request: Status of Current Complex Decommissioning and Uranium Recovery Sites," (ADAMS Accession No. ML17318A694). This information was compiled and placed into a database, which can be found on NRC's public web site. Summaries of information on sites undergoing decommissioning that are regulated by the Agreement States are currently available to the public to ensure openness and promote communication, and thus enhance public confidence by providing a national perspective on decommissioning.

### Knowledge Management

Progress continued on knowledge management activities identified as part of the IDIP. In December 2017, experts from RES, NMSS, and NRR provided a training class on the Decommissioning Planning Rule for staff and inspectors to discuss groundwater monitoring requirements for operating and decommissioning nuclear power plants. The training course was recorded for future use.

In November 2017, the staff chaired a session at the Division of Spent Fuel Management Regulatory Conference, an annual forum to discuss NRC regulatory and technical issues with interested staff and NRC stakeholders. The session included discussions on reactor decommissioning issues, inspection experience during transition from operations to decommissioning, an update on the rulemaking for reactor decommissioning, and an overview of NRC financial qualifications and decommissioning funding requirements. In March 2018, the

staff also chaired a session at the NRC's Regulatory Information Conference regarding current topics in reactor decommissioning, which focused on current and emerging challenges in the area of reactor decommissioning. Presentations included an overview of the NRC's Decommissioning Program, an update on IAEA Safety Standards for Decommissioning, an update on Fukushima Daiichi decommissioning efforts by the Japanese Nuclear Damage Compensation and Decommissioning Facilitation Corporation, and a discussion on Nuclear Energy Institute perspectives on efficient decommissioning.

#### Uranium Recovery Decommissioning Program Enhancements

Throughout FY 2018, the NRC staff continued interactions with DOE regarding those sites that are generally licensed under 10 CFR 40.27 and 40.28. The staff is working with DOE to develop a site transfer protocol and has continued to hold quarterly telephone conference calls with DOE to discuss overarching policy and technical issues associated with managing the generally licensed sites. In addition, the staff continued discussions with DOE on developing long-term care fees and to align on post-license termination groundwater monitoring expectations. The staff also continued its participation in DOE meetings with the Navajo Nation and Hopi Tribe pertaining to the sites on the Navajo Reservation.

#### Evaluation of Materials and Waste Business Lines

During FY 2017, a working group consisting of subject matter experts was formed to evaluate the Nuclear Materials and Waste Safety Program Business Lines with a goal of identifying alternative approaches that could result in fairer and more equitable fees. The working group evaluated workloads and programs/processes to identify opportunities to improve efficiency and effectiveness and to re-scope levels of effort. The working group considered a range of potential program/process changes including licensing process efficiencies, periodicity of certain licensing reviews, inspection scope and frequency, and changing the level of effort allocated for program infrastructure and other non-fee recoverable activities. The results of this evaluation were provided to the Office of the Executive Director for Operations in October 2017 and to the Commission in February of 2018.

During FY 2018, the NRC staff completed several recommendations from the evaluation of the Materials and Waste Business Lines to improve effectiveness of licensing and oversight in FY 2018. Examples of these improvements include adjustments to the uranium recovery inspection program through the extension of inspection intervals, revisions to inspection procedures for decommissioning power reactors, and changes to the internal process of completing financial surety reviews for uranium recovery licenses.

## 7. AGREEMENT STATE ACTIVITIES

In addition to the sites undergoing decommissioning that are regulated by the NRC, many complex materials sites are being decommissioned under the regulatory oversight of Agreement States. Thirty-eight States have signed formal agreements with the NRC and assumed regulatory responsibility over certain byproduct, source, and small quantities of SNM, including the decommissioning of some complex materials sites. After a State becomes an Agreement State, the NRC continues to have formal and informal interactions with the State.

Formal interactions with Agreement States in FY 2018 included the following:

- The staff worked with the Agreement States to incorporate more detailed information about complex materials decommissioning sites and uranium recovery facilities undergoing decommissioning that are under the regulatory purview of the Agreement States on the NRC's public Web site. These summaries are available at <http://www.nrc.gov/info-finder/decommissioning/complex/> and <http://www.nrc.gov/info-finder/decommissioning/uranium/> for complex materials sites and uranium recovery sites, respectively.
- Integrated Materials Performance Evaluation Program reviews that included an assessment of the decommissioning functional area were conducted in several Agreement States: Arkansas, Colorado, Illinois, Kansas, Massachusetts, New York, North Carolina, Oklahoma, Texas, Utah, and Washington.

On September 25, 2018, the NRC entered into an agreement with the State of Wyoming, transferring regulatory authority to the State over certain radioactive materials (83 FR 48905; September 28, 2018). On September 30, 2018, the State of Wyoming assumed regulatory authority for five Title II uranium recovery sites undergoing decommissioning: Bear Creek, ExxonMobil Highlands, Pathfinder–Lucky Mc, Umetco Minerals Corporation, and WNI Split Rock. In addition, the State assumed regulatory authority for the Pathfinder–Shirley Basin site. The NRC staff has worked to ensure a smooth transition of these sites to the State. For more information regarding NRC's activities at these sites during FY 2018, please refer to Section 2.4 of this report.

Table 7.1 identifies the decommissioning and uranium recovery sites in the Agreement States.

**Table 7.1. Agreement State Decommissioning Sites**

<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>
CA	Eberline Services	Richmond, CA	TBD	TBD
CO	Colorado Legacy Land – Schwartzwald Mine	Jefferson County, CO	11/16	6/17
CO	Cotter Uranium Mill	Canon City, CO	9/03	1/05
CO	Hecla Mining Company – Durita	Naturita, CO	10/91	3/92
CO	Umetco Uravan	Uravan, CO	6/93	6/93
FL	Iluka Resources	Green Cove Springs, FL	TBD	TBD
IL	Weston Solutions (formerly Kerr-McGee)	West Chicago, IL	9/93	2/94
MA	Norton/St. Gobain	Worcester, MA	TBD	TBD
MA	Starmet Corp. (formerly Nuclear Metals)	Concord, MA	10/06	TBD
MA	Texas Instruments	Attleboro, MA	TBD	TBD
MA	Wyman-Gordon Co.	North Grafton, MA	TBD	TBD
NJ	Shieldalloy Metallurgical Corp.	Newfield, NJ	12/16	1/17
OH	Advanced Medical Systems, Inc.	Cleveland, OH	6/04	5/05
OH	Ineos USA (formerly BP Chemical)	Lima, OH	4/92	6/98
OR	PCC Structurals, Inc.	Portland, OR	6/06	9/06
OR	TDY Industries d/b/a Wah Chang	Albany, OR	6/03	3/06
PA	Global Tungsten & Powders Corp.	Towanda, PA	6/13	9/13

**Table 7.1. Agreement State Decommissioning Sites**

<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>
PA	Karnish Instruments	Lock Haven, PA	TBD	TBD
PA	Keystone Metals Reduction	Cheswick, PA	TBD	TBD
PA	Remacor	West Pittsburg, PA	TBD	TBD
PA	Safety Light Corporation	Bloomsburg, PA	TBD	TBD
PA	Superbolt (formerly Superior Steel)	Carnegie, PA	TBD	TBD
PA	Westinghouse Electric (Waltz Mill)	Madison, PA	4/97	1/00
PA	Whittaker Corporation	Greenville, PA	12/00, revised 8/03, 10/06	5/07
SC	Starmet CMI	Barnwell, SC	TBD	TBD
TN	CB&I Federal Services, LLC	Knoxville, TN	6/14	7/14
TX	Ascend Performance Materials	Alvin, TX	11/03	3/04
TX	ConocoPhillips (Conquista Project)	Falls City, TX	11/87	9/89
TX	ExxonMobil (Ray Point Mill)	Three Rivers, TX	4/85	9/86
TX	Intercontinental Energy Corp.	Three Rivers, TX	3/03	TBD
TX	Pearland-Manvel Landfill	Pearland, TX	2/02	TBD
TX	Rio Grande Resources	Hobson, TX	4/93, revised 5/97	5/97



**Table 7.1. Agreement State Decommissioning Sites**

<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>
TX	Solvay USA, Inc.	Freeport, TX	7/15	9/15
UT	Rio Algom Uranium Mill	Lisbon Valley, UT	9/02	7/04
WA	Dawn Mining Company	Ford, WA	6/94	1/95
N/A not applicable				
TBD to be determined				

## **8. FISCAL YEAR 2019 PLANNED PROGRAMMATIC ACTIVITIES**

The Power Reactor Decommissioning Program evaluation resulted in a set of recommendations, including the recommendation to review all guidance and policy documents within the program to identify guidance documents in need of updating as well as other potential improvements. Subsequently, NMSS management reviewed the tasks identified as part of this program evaluation to promote programmatic enhancement and set task priorities. Throughout FY 2019, the staff will continue to work on these programmatic enhancement tasks.

In FY 2019, the staff will continue working on the decommissioning rulemaking effort and planned revisions to the Decommissioning GEIS. The staff will also continue its multi-year effort to update decommissioning guidance documents including Volumes 2 and 4 of the Consolidated Decommissioning Guidance, NUREG-1757.

The staff will continue to stay apprised of developments related to plant shutdowns and future license transfer requests to facilitate decommissioning, and will coordinate with NRR, OCA, OPA, and the Regional offices, as necessary, to provide support with public outreach and ensure efficient reviews of all submittals. The staff will evaluate the impact on resources of a possible increase in the number of license transfer requests and, as a result, an increase of the number of plants moving into active decommissioning.

In response to the issue of historic, non-military sites with radium contamination (e.g., Great Kills Park, Waterbury Clock Factory), the staff plans to focus its efforts with respect to non-military radium on transitioning from performing initial site visits to oversight of any necessary cleanup. For sites that do not meet the NRC's unrestricted use criteria, the staff will work with site owners on risk-informed approaches for site cleanup that are consistent with the Commission direction in SRM-SECY-17-0026, "Policy Considerations and Recommendations for Remediation of Non-Military, Unlicensed Historic Radium Sites in Non-Agreement States" (ADAMS Accession No. ML17250A841). The staff will also provide oversight appropriate to the scope and complexity of the cleanup at each site (e.g., issuing letters of forbearance to cooperative site owners), and the level of staff effort will be commensurate with the significance of the contamination. The staff will also continue in FY 2019 its monitoring role at additional military sites as part of the 2016 NRC-DoD MOU, as discussed in SECY-14-0082, "Jurisdiction for Military Radium and the U.S. Nuclear Regulatory Commission Oversight of U.S. Department of Defense Remediation of Radioactive Material," (ADAMS Accession No. ML14097A005).

During FY 2019, the staff will continue to ensure newly proposed work activities are justified with respect to their safety-significance, value added, and overall contribution to agency goals. The staff will continue to implement the recommendations from the 2017 Evaluation of Materials and Waste Business Lines and the self-assessment of the uranium recovery licensing program.