



DPG 14-071

April 1, 2014

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Docket No. 50-312
Rancho Seco Nuclear Generating Station
License No. DPR-54

CHANGE IN RANCHO SECO DECOMMISSIONING SCHEDULE

Attention: John Hickman

In accordance with 10 CFR 50.82(a)(7), SMUD is informing the NRC of a schedule change from the SAFSTOR activities described in Amendment 4 of the Post Shutdown Decommissioning Activities Report (PSDAR).

Specifically, SMUD intends to ship the stored Class B and Class C low-level radioactive waste (LLRW) currently in storage at Rancho Seco for disposal in 2014. SMUD has made a determination that the low-level radioactive waste disposal facility near Andrews, Texas and operated by Waste Control Specialists, Inc. (WCS) is suitable for disposal of the LLRW materials currently in storage at Rancho Seco. After making that determination, SMUD has entered into contract with WCS for disposal of all of the material by the end of 2014.

The staff at Rancho Seco is finalizing contracts for providing qualified personnel to assist with the shipments and for rental of qualified shipping casks and transportation services appropriate for the material.

Following removal of the stored LLRW, SMUD will proceed with the appropriate license termination activities for the structure (Interim Onsite Storage Building) and associated land areas remaining under the Part 50 license in accordance with the approved License Termination Plan beginning in 2015. Following completion of the activities, including performance of Final Status Surveys, SMUD will submit a request for termination of the license along with the supporting documentation.

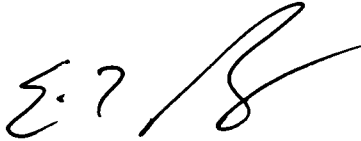
This is only a change in schedule. The cost for disposal of the LLRW, while significant, was expected and planned for in previous Decommissioning Cost Estimates.

FSME20
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The revised schedule of activities is reflected in PSDAR, Amendment 5, attached.
PSDAR Amendment 5 replaces PSDAR Amendment 4 in its entirety.

If you or members of your staff have questions or require additional information, please contact me by email at einar.ronningen@smud.org or by phone at (916) 732-4817.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. T. Ronningen', with a stylized flourish extending from the end.

Einar T. Ronningen
Superintendent, Rancho Seco Assets

Attachment: PSDAR, Amendment 5

CC with Attachment: NRC, Region IV
Radiological Health Branch of the California Department of
Health Services

Rancho Seco

Post Shutdown Decommissioning Activities Report

Amendment 5

RANCHO SECO POST-SHUTDOWN DECOMMISSIONING ACTIVITIES REPORT

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1.0 INTRODUCTION

In accordance with the results of a public referendum on June 6, 1989, the Sacramento Municipal Utility District (SMUD) decided to permanently shut down the Rancho Seco Nuclear Generating Station. Accordingly, on August 29, 1989, SMUD notified the U.S. Nuclear Regulatory Commission (NRC) of its intent to seek amendments to the Rancho Seco operating license to decommission the facility. The Commission acknowledged the notification on November 27, 1989 [Ref. 1].

On March 20, 1995, the NRC issued Rancho Seco's Decommissioning Order. The Order authorized SMUD to decommission Rancho Seco in accordance with the Decommissioning Plan, submitted to the NRC in May 1991 [Ref. 2]. The Decommissioning Plan described SMUD's intention to place Rancho Seco into safe-storage for the remainder of its originally licensed operating life, in 2008. After safe-storage, SMUD would begin decontamination and dismantlement activities, resulting in the termination of Rancho Seco's 10 CFR 50 license. Deferring decontamination and dismantlement activities until 2008, would allow SMUD additional time to accumulate funds sufficient to complete decommissioning.

In 1996, the NRC amended its regulations for decommissioning nuclear power reactors. The new regulations provide licensees with simplicity and flexibility in implementing the decommissioning process. A major change from past regulations was that the NRC no longer required licensees to have an approved decommissioning plan before performing major decommissioning activities. Licensees can now conduct major decommissioning activities under 10 CFR 50.59.

In March 1997, SMUD submitted its Post Shutdown Decommissioning Activities Report (PSDAR), in accordance with 10 CFR 50.82. The PSDAR superseded the original Decommissioning Plan, and provided the information required in 10 CFR 50.82.

On January 9, 1997, the SMUD Board of Directors approved an "incremental decommissioning" project for Rancho Seco. Incremental decommissioning began in early-1997, and was expected to last through 1999. Incremental decommissioning involved performing some decommissioning activities earlier than 2008, as described in the originally approved Decommissioning Plan. In accordance with 10 CFR 50.82, SMUD provided written notification to the NRC [Ref. 3] regarding SMUD's intent to begin incremental decommissioning. SMUD used the decommissioning funds accumulated to-date to accomplish incremental decommissioning.

On July 1, 1999, the SMUD Board of Directors voted to continue the decommissioning process at Rancho Seco until termination of the 10 CFR 50 license. However, based upon the lack of suitable waste disposal options at that time, SMUD chose to store

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Class B and C radioactive waste in the Interim Onsite Storage Building until a suitable disposal option became available.

On August 21, 2002, Rancho Seco completed placing all 493 spent fuel assemblies in dry storage at the Independent Spent Fuel Storage Installation (ISFSI), licensed under 10 CFR Part 72. On August 22, 2006 a single canister containing Greater-Than-Class-C material was loaded into the 22nd Horizontal Storage Module. This completed the placement of materials at the ISFSI that will remain in storage until the Department of Energy removes the material from the facility.

In November, 2007 the NRC approved the Rancho Seco License Termination Plan.

In 2009, Phase I of Rancho Seco Nuclear Generating Station Decommissioning was completed. The physical work had been completed in 2008 and SMUD submitted a report with the remainder of the Phase I Final Status Survey results in July 2009 with a request to release the appropriate areas from the license. In September 2009 the NRC released all land formerly under the Part 50 license with the exception of the approximately 1-acre parcel that contains the Interim Onsite Storage Building where the Class B and Class C waste is stored. The ISFSI remains licensed separately under 10 CFR Part 72 and was not affected.

In 2012, the low-level radioactive waste disposal facility located near Andrews, TX and operated by Waste Control Specialists, LLC (WCS) became operational. SMUD has evaluated the disposal facility and has determined that it is a suitable facility for disposal of the stored Class B and C waste.

In 2013, SMUD entered into contract with WCS and will proceed with disposal of the waste beginning in the second quarter of 2014, with all waste shipments scheduled to be completed by the end of 2014.

With the radioactive waste disposed, SMUD will proceed with the appropriate license termination activities in and around the Interim Onsite Storage Building that will lead to termination of the Part 50 License. These activities will be conducted in accordance with the approved License Termination Plan.

SMUD maintains sufficient staff to meet NRC regulatory requirements. The current estimated cost to decommissioning Rancho Seco is \$518.2 million (2013 dollars).

2.0 SITE DESCRIPTION

The Rancho Seco nuclear facility is located in the southeast part of Sacramento County, California approximately 26 miles north-northeast of Stockton and 25 miles southeast of the city of Sacramento. The Rancho Seco nuclear facility is approximately 87 acres and sits within a 2480-acre plot of land that is owned and controlled by SMUD. The area around the site is almost exclusively agricultural.

Water for the fire protection system is supplied from the Folsom South Canal, which is a feature of the Central Valley Water Project. The canal was constructed by the Bureau of Reclamation. A pipeline and pumping station are located between the facility and the Folsom South Canal.

Groundwater movement in the area is to the southwest with a slope of about ten feet per mile.

The soils at the Rancho Seco site can be categorized as hard to very hard silts and silty clays with dense to very dense sands and gravels.

State Route 104 runs along the northern boundary of the site and connects with State Route 99 and Interstate Route 5 to the west and State Route 88 to the east. Rail access is available via a rail spur from an existing Union Pacific railroad line that runs roughly parallel to State Route 104 adjacent to the site. Figure 2-2 shows the routing of the rail spur.

The Rancho Seco Independent Spent Fuel Storage Installation (ISFSI) is located on District owned land approximately 600 feet west of the Rancho Seco Interim On-site Storage Building and within a security fence.

Figure 2-1 shows the general location of the Rancho Seco site. Figure 2-2 provides a more specific layout of the SMUD-owned land and a general layout of the site.

2.1 Topography

The plant site's rolling terrain is not directly intersected by any streams; however, drainage from higher levels is well defined and intercepts with run-off streams at lower levels. The plant's grade level of approximately 165 feet above sea level allows excellent drainage without danger of flooding. The elevation of the site acreage varies from 130 feet to 280 feet above sea level and drainage along natural gullies varies from 2 to 6 percent.

2.2 Hydrology

The site is bounded on the north by the Hadselville Creek, which intercepts all drainage from the site and empties into Laguna Creek to the west. Laguna Creek conveys this flow westerly to the Cosumnes River and then into the Mokelumne River. The Mokelumne River is a tributary of the southerly flowing Sacramento River and enters the Sacramento River approximately 20 miles south of the city of Sacramento.

Storm water runoff is controlled primarily by surface ditches. The drainage system was designed to accommodate the 25-year recurrence storm with a minimum of six inches freeboard and the 100-year recurrence storm with zero freeboard. Within recent historical times, no flooding or inundation from storms or runoff has occurred within the site boundaries. It is unlikely that the site can be inundated or flooded, even with abnormal rainfall intensities.

Groundwater under site is approximately 150 feet below the original ground surface. The water is of good quality and is readily extracted by wells.

2.3 Climatology

Rancho Seco climate is typical of the Great Central Valley of California. Rainy winter, but fair summer, spring, and fall are characteristic. Midwinter is noted for heavy fog that may last for several days. Severe weather at Rancho Seco occurs primarily as thunderstorms.

2.4 Plant Description

The Rancho Seco Nuclear Generating Station was a single generating unit designed and constructed by Bechtel Power Corporation, with a pressurized water reactor (PWR) supplied by Babcock and Wilcox Company (B&W). The Nuclear Steam Supply System (NSSS) was capable of a thermal output of 2,772 megawatts. The unit had a net electrical power output of 913 megawatts.

The NSSS consisted of two independent primary coolant loops (each of which contained two reactor coolant pumps and a steam generator), an electrically heated pressurizer, and connecting piping housed within the Reactor Building.

Major structures included: Reactor Building, Fuel Storage Building, Auxiliary Building, radioactive waste Interim Onsite Storage Building, tank farm, two spray ponds, two retention basins, switchyard, and assorted general support buildings.

The station is located in a low lying portion of the site, 1/2 mile from the site boundaries and adjacent public roadways. The site layout is shown in Figure 2-2. Following completion of Phase I of Decommissioning, the Interim Onsite Storage Building is the

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only structure remaining relevant to decommissioning:

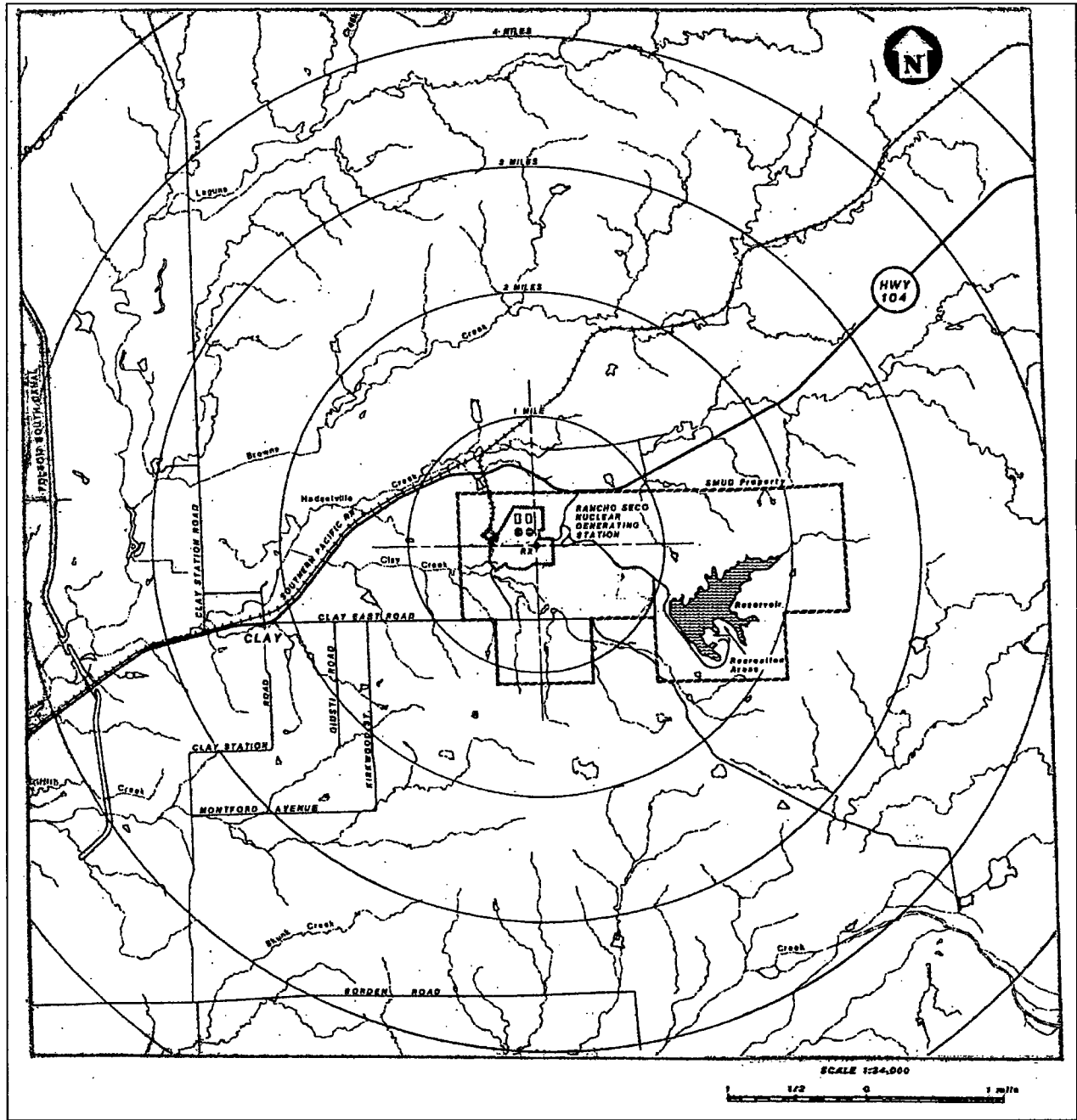
- **Interim On Site Storage Building** - a concrete, two-story building located west of the cooling towers that provides on-site storage of dry contaminated waste.

The other major infrastructure at the facility is the ISFSI:

- **Independent Spent Fuel Storage Installation** - Provides interim dry storage of 100% of Rancho Seco's spent fuel assemblies and Greater-Than-Class-C waste in a NUHOMS transportable storage system. The ISFSI is located west of the current Industrial Area.

Figure 2-1

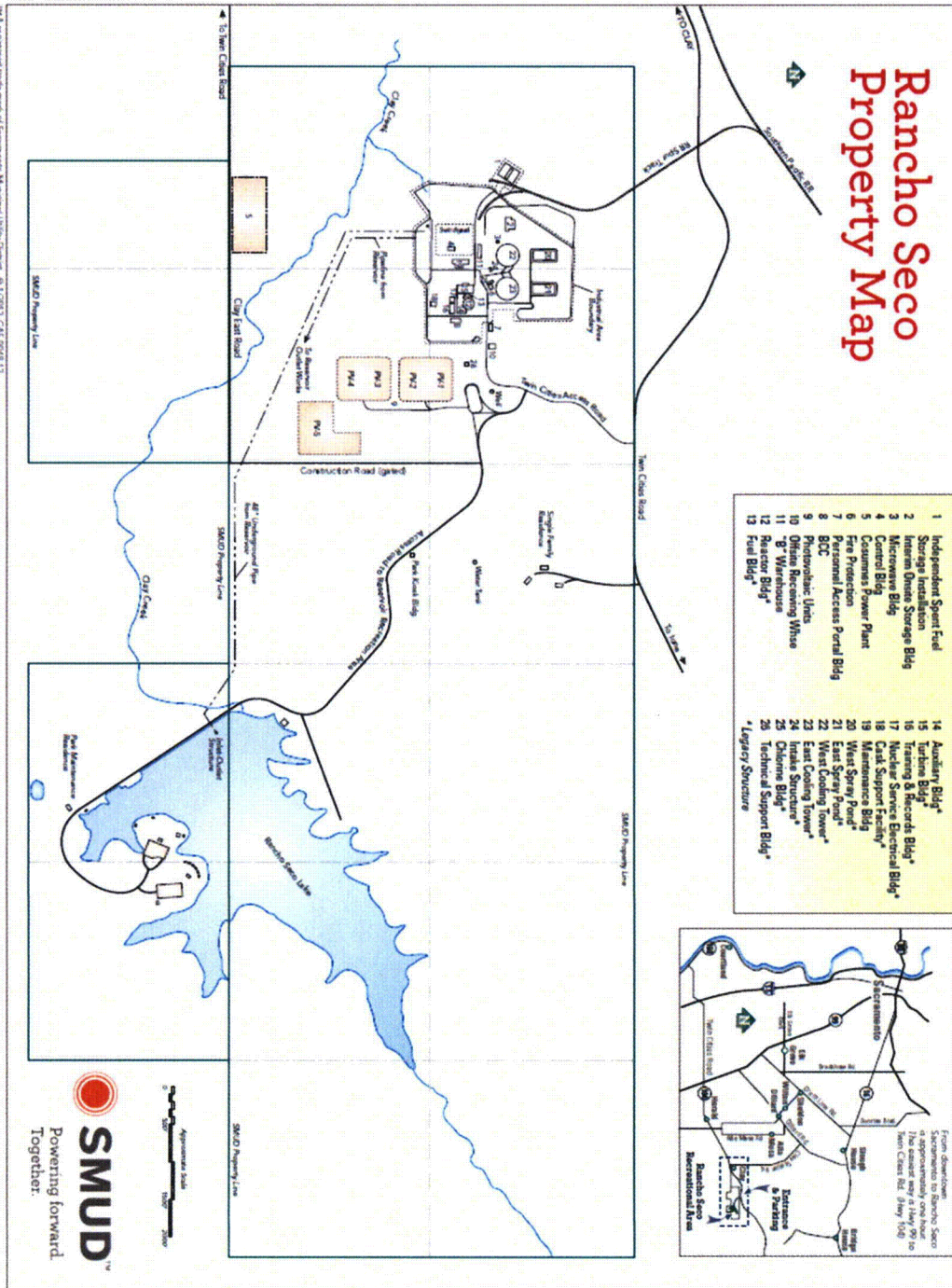
General Area Map



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Figure 2-2

SMUD Property and Rancho Seco Layout



3.0 OVERVIEW OF DECOMMISSIONING ACTIVITIES

3.1 *Initial Decommissioning Alternative*

In the original decommissioning plan, SMUD proposed to decommission Rancho Seco using SAFSTOR until 2008, which would be followed by Deferred-DECON being completed by 2011.

Maintaining Rancho Seco in SAFSTOR until 2008 would allow additional time to accumulate sufficient funds to complete decommissioning. Since submitting the original Decommissioning Plan in May 1991, the cost to decommission Rancho Seco continued to escalate due primarily to the rising low-level waste disposal cost projections for the Southwest Compact, and increasing facility maintenance and staff costs. In response, SMUD continued to review options for decommissioning Rancho Seco.

When alternative waste disposal options became available, SMUD determined that a reduction in the risk and costs associated with maintaining radioactive systems could be realized by implementing some decommissioning activities starting in 1997, instead of waiting until 2008. Initial decommissioning activities included dismantling and disposing of the least contaminated portions of the plant, in what SMUD called "incremental decommissioning".

Due to the success of incremental decommissioning, on July 1, 1999, the SMUD Board of Directors decided to continue decommissioning until the NRC terminates Rancho Seco's 10 CFR 50 license and releases the site for unrestricted use. However, based upon the lack of suitable waste disposal options at that time, the decision was made to store Class B and C radioactive waste in the Interim Onsite Storage Building (IOSB) until a suitable disposal facility became available.

3.2 *Current Decommissioning Activities*

3.2.1 Dry Fuel Storage

In August 2002, SMUD completed the transfer of Rancho Seco's spent nuclear fuel into dry storage at the onsite ISFSI. In August of 2006, SMUD placed a canister of Greater-Than-Class-C (GTCC) material into storage at the ISFSI. SMUD will maintain Rancho Seco's spent fuel and GTCC in dry storage, in a NUHOMS transportable storage system¹, until it is transferred to a DOE facility.

3.2.2 Decommissioning

The goal of decommissioning is to reduce the radioactive material at the site to

¹ A system licensed both for dry storage under 10 CFR Part 72, and for transportation under 10 CFR Part 71.

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acceptable levels such that the NRC can terminate Rancho Seco's 10 CFR 50 license. The Interim Onsite Storage Building is the only structure remaining to be decommissioned. After removal of the stored low-level radioactive waste, the structure will undergo characterization surveys and other equipment will be removed. Non-contaminated material is free-released for asset recovery, recycling or disposal at an offsite landfill. Contaminated material is prepared for onsite or offsite decontamination, if required, and subsequently recycled or shipped to a disposal site, as appropriate. LLW will be packaged for transport in accordance with applicable NRC and Department of Transportation (DOT) regulatory requirements.

The following is typical of how SMUD conducts decommissioning:

1. Identify the systems, equipment, and components for removal and disposal.
2. Develop work packages to implement in accordance with established plant procedures.
3. Determine appropriate radiological precautions.
4. Determine component removal sequences and/or structural decontamination methods based on accessibility, safety, material handling restrictions, and ALARA considerations.
5. Isolate systems to be dismantled as required.
6. Install required temporary services (e.g., electrical).
7. Solicit bids for all necessary outside equipment and services to perform the work activities, including structure decontamination, radwaste disposal containers, transportation services, and disposal/burial services.
8. Decontaminate removed materials, systems and components and/or package for shipment for disposal.
9. Ship radwaste for disposal.
10. Conduct Final Status Surveys in accordance with the NRC-approved license termination plan.
11. Submit results of the Final Status Surveys to NRC along with a request for termination of the license.

3.3 Forecast Decommissioning Schedule

The forecast schedule dates for major decommissioning activities include:

<u>Description</u>	<u>Forecast Schedule Dates</u>
Ship LLRW from IOSB	Q2 – Q4 2014
Decommissioning Activities in the IOSB	Q4 2014 through 2016
License termination survey and NRC license termination	2016 - 2017
Final spent fuel removal from site by DOE ⁵	2028

3.4 Final Site Survey Plan

SMUD will continue to follow the approved License Termination Plan when conducting decommissioning activities including the Final Status Surveys. When the surveys are complete, SMUD will submit the results in a final report to the NRC demonstrating that the remaining licensed areas meet acceptable release criteria. SMUD will also submit a request for termination of the license at that time.

⁵ DOE fuel acceptance estimates to be updated when better information is available.

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3.5 Decommissioning Cost Estimate

Based on the 2013 decommissioning cost study [Ref. 5], the estimated cost to decommission Rancho Seco and terminate the license is \$518.2 million (2013 dollars). The following is a summary of the estimated remaining costs to complete the decommissioning of Rancho Seco:

<u>Activity</u>	<u>Cost Estimate (\$1,000s)</u>
Transportation	\$652
Waste Burial	\$20,479
Staffing	\$3,025
Other	\$1,175
Contingency	\$687
Total	\$26,198

3.6 Amount of Available Funds

SMUD maintains an external trust fund agreement with Wells Fargo Bank Corporate Trust Services in San Francisco, California. The Trust is fully funded for the remainder of the decommissioning costs, but in accordance with regulatory requirements SMUD conducts reviews of the expended costs and remaining funds. Adjustments to the amount of funding in the Trust will be adjusted as necessary to maintain sufficient funding to complete the decommissioning of Rancho Seco.

3.7 Programs

3.7.1 Quality Assurance

The Rancho Seco Quality Assurance Program for decommissioning is defined in the NRC-approved Rancho Seco Quality Manual (RSQM). SMUD maintains the RSQM in accordance with 10 CFR 50.54(a) ensuring that decommissioning will be accomplished in accordance with the license, applicable codes and standards, and regulatory requirements. In addition to administrative controls, the RSQM provides an audit program to determine compliance with specified requirements and a corrective action program to address deficiencies.

3.7.2 Decommissioning Fire Protection Plan

SMUD maintains a fire protection plan in accordance with plant administrative procedures. SMUD assesses the fire protection program on a regular basis, and will revise it, as appropriate, as decommissioning progresses.

3.7.3 Radiation Protection Program

SMUD maintains a radiation protection program to control radiation hazards, maintain worker doses as low as reasonably achievable (ALARA), and ensure compliance with applicable regulations.

3.7.4 Process Control Program

SMUD implements the Process Control Program to ensure compliance with applicable regulations and disposal site rules.

3.7.5 Radiological Environmental Monitoring Program

SMUD implements the Radiological Environmental Monitoring Program (REMP) to monitor the site and environs for impacts due to site operations to ensure compliance with applicable regulations.

3.7.6 Offsite Dose Calculation Manual

The Offsite Dose Calculation Manual (ODCM) is used to calculate offsite doses due to gaseous and liquid effluents. In the current condition, there are no release processes in place and no planned releases of radioactivity in effluents.

4.0 ENVIRONMENTAL REVIEW

NUREG-0586 "Final Generic Environmental Impact Statement on decommissioning of nuclear facilities" (GEIS) [Ref. 6], provides a generic environmental assessment of decommissioning a reference nuclear facility. Based on the findings in NUREG-0586, the NRC reached a generic finding of "no significant (environmental) impact." Further, the NRC concluded that licensees need not prepare an additional environmental impact statement, in connection with the decommissioning of a particular nuclear site, unless the impacts of their plant have site-specific considerations significantly different from those studied generically.

Section 4.0 of NUREG-0586 provides a description of a generic PWR of a size and rating larger than Rancho Seco. Specifically, the reference facility is a 1175-MWe Westinghouse PWR⁶ that had operated over its 40-year design life. Rancho Seco is a 913-MWe PWR, designed by Babcock and Wilcox. Although Rancho Seco operated for about 14 years, it accumulated only approximately six full power effective years of reactor operation.

While the design of the facilities and their Nuclear Steam Supply Systems (NSSS) are slightly different, the B&W design includes the same types of major components, buildings, and structures as the reference PWR. Consequently, decommissioning Rancho Seco involves the same types of decommissioning tasks and considerations, and has similar environmental impacts, as the reference facility evaluated in NUREG-0586.

In October 1991, SMUD submitted the "Supplement to Rancho Seco Environmental Report - Post Operating License Stage," [Ref. 7] in support of the proposed Rancho Seco Decommissioning Plan. The supplemental report compares Rancho Seco's decommissioning attributes with those of the reference plant in NUREG-0586. The report concludes that all of the decommissioning attributes identified for Rancho Seco are within the envelope of NUREG-0586, except for the decommissioning cost estimate which is not directly comparable.

In addition, SMUD staff conducted an environmental evaluation under the California Environmental Quality Act (CEQA), and determined that decommissioning Rancho Seco will not have a significant effect on the environment. Consistent with the applicable provisions of CEQA, SMUD issued a Negative Declaration for the project.

For environmental attributes including estimated radwaste volumes, occupational

⁶ The reference facility is based on the reference facility described in NUREG/CR-0130 "Technology, Safety, and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station. The actual reference facility is the Trojan Nuclear Plant, owned by Portland General Electric.

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exposure, and public exposure, the estimated values for the reference plant bound the estimated values for Rancho Seco.

5.0 REFERENCES

1. Letter from Thomas E. Murley to David Boggs, "Closure of Rancho Seco Nuclear Generating Station," November 27, 1989.
2. Rancho Seco Nuclear Generating Station Proposed Decommissioning Plan, May 20, 1991.
3. Letter from Steve Redeker to Seymour Weiss, "Rancho Seco Decommissioning Schedule Change," January 29, 1997.
4. Regulatory Guide 1.86 "Termination of Operating Licenses for Nuclear Reactors," June 1974.
5. Rancho Seco Decommissioning Cost Estimate, December 2013
6. NUREG-0586 "Final Generic Environmental Impact Statement on decommissioning of nuclear facilities," August 1988.
7. "Supplement to Rancho Seco Environmental Report - Post Operating License Stage," October 1991.
8. Rancho Seco License Termination Plan, Rev. 1, May 2008.