DOE/EIS-0226
January 2010

Final Environmental Impact Statement for

Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center

The West Valley Site

A Summary and Guide for Stakeholders

NYSERDA

Availability of the
Final EIS for Decommissioning and/or
Long-Term Stewardship at the West Valley Demonstration Project
and Western New York Nuclear Service Center

For further information on this Final EIS, or to request a copy of the EIS or references, please contact:

Catherine Bohan, EIS Document Manager
West Valley Demonstration Project
U.S. Department of Energy
Ashford Office Complex
9030 Route 219
West Valley, NY 14171
Telephone: 716-942-4159
Fax: 716-942-4703
E-mail: catherine.m.bohan@wv.doe.gov
www.westvalleyeis.com

Printed with soy ink on recycled paper

COVER SHEET

Co-Lead Agencies: U.S. Department of Energy (DOE)
New York State Energy Research and Development Authority (NYSERDA)

Cooperating Agencies: U.S. Nuclear Regulatory Commission (NRC)
U.S. Environmental Protection Agency (EPA)
New York State Department of Environmental Conservation (NYSDEC)

Involved Agencies: New York State Department of Health (NYSDOH)
New York State Department of Environmental Conservation (NYSDEC)

Title: *Final Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center* (DOE/EIS-0226)

Location: Western New York Nuclear Service Center, 10282 Rock Springs Road, West Valley, New York 14171-0191 (Erie and Cattaraugus Counties)

For additional information on the Final Environmental Impact Statement (EIS) or for references, contact:

Catherine Bohan, EIS Document Manager
West Valley Demonstration Project
U.S. Department of Energy
Ashford Office Complex
9030 Route 219
West Valley, NY 14171
Telephone: 716-942-4159
Fax: 716-942-4703
E-mail: catherine.m.bohan@wv.doe.gov

For general information on the DOE National Environmental Policy Act (NEPA) process, contact:

Carol M. Borgstrom, Director
Office of NEPA Policy and Compliance
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0103
Telephone: 202-586-4600, or leave a message at 1-800-472-2756

For general questions and information about NYSERDA, contact:

Paul J. Bembia, Program Director
West Valley Site Management Program
New York State Energy Research and Development Authority
Ashford Office Complex
9030 Route 219
West Valley, NY 14171
Telephone: 716-942-9960 x4900
Fax: 716-942-9961
E-mail: pjb@nyserda.org

For general information on the State Environmental Quality Review Act (SEQR) process, contact:

David A. Munro, Deputy Counsel
New York State Energy Research and Development Authority
17 Columbia Circle
Albany, NY 12203
Telephone: 1-866-697-3732
Fax: 518-862-1091
E-mail: dam@nyserda.org

Abstract: The Western New York Nuclear Service Center (WNYNSC) is a 1,351-hectare (3,338-acre) site located 48 kilometers (30 miles) south of Buffalo, New York and owned by NYSERDA. In 1982, DOE assumed control but not ownership of the 68-hectare (167-acre) Project Premises portion of the site in order to conduct the West Valley Demonstration Project (WVDP), as required under the 1980 West Valley Demonstration Project Act. In 1990, DOE and NYSERDA entered into a supplemental agreement to prepare a joint EIS to address both the completion of WVDP and closure or long-term management of WNYNSC.

A Draft EIS was issued for public comment in 1996: the *Draft Environmental Impact Statement for Completion of the West Valley Demonstration Project and Closure or Long-Term Management of Facilities at the Western New York Nuclear Service Center*, also referred to as the 1996 *Cleanup and Closure Draft EIS* (DOE/EIS-0226D), January 1996. The 1996 Draft EIS did not identify a preferred alternative.

Based on decommissioning criteria for WVDP issued by NRC since the publication of the 1996 *Cleanup and Closure Draft EIS* and public comments on that EIS, DOE and NYSERDA issued the *Revised Draft Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center* (also referred to as the *Decommissioning and/or Long-Term Stewardship EIS*) in December 2008, revising the 1996 Draft EIS. The *Decommissioning and/or Long-Term Stewardship EIS* has been prepared in accordance with NEPA and the State Environmental Quality Review Act (SEQR) to examine the potential environmental impacts of the range of reasonable alternatives to decommission and/or maintain long-term stewardship at WNYNSC. The alternatives analyzed in the EIS include the Sitewide Removal Alternative, the Sitewide Close-In-Place Alternative, the Phased Decisionmaking Alternative (Preferred Alternative), and the No Action Alternative. The analysis and information contained in the EIS are intended to assist DOE and NYSERDA with the consideration of environmental impacts prior to making decommissioning or long-term management decisions.

Phased Decisionmaking Alternative (Preferred Alternative): Under the Preferred Alternative, decommissioning would be accomplished in two phases: Phase 1 would include removal of all Waste Management Area (WMA) 1 facilities, the source area of the North Plateau Groundwater Plume, and the lagoons in WMA 2. Phase 1 activities would also include additional characterization of site contamination and scientific studies to facilitate consensus decisionmaking for the remaining facilities or areas. Phase 2 actions would complete decommissioning or long-term management decisionmaking according to the approach determined most appropriate during the additional Phase 1 evaluations. In general, the Phased Decisionmaking Alternative involves near-term decommissioning and removal actions where there is agency consensus and undertakes characterization work and studies that could facilitate future decisionmaking for the remaining facilities or areas. Phase 1 activities are expected to take 8 to 10 years to complete. The Phase 2 decision would be made no later than 10 years after issuance of the initial DOE Record of Decision and NYSERDA Findings Statement, if the Phased Decisionmaking Alternative is selected. In response to public comments, the Preferred Alternative has been modified since the Revised Draft EIS was issued.

Public Comments: In preparing the Final EIS, DOE considered comments received during the scoping period (March 13 through April 28, 2003) and public comment period on the Revised Draft EIS (December 5, 2008 through September 8, 2009). Public hearings on the Revised Draft EIS were held in Albany, Irving, West Valley, and Buffalo, New York during the public comment period. In addition, a videoconference with the DOE Assistant Secretary for Environmental Management, the President of NYSERDA, and various stakeholders was held on September 4, 2009. Comments on the Revised Draft EIS were requested during the 9-month period following publication of the U.S. Environmental Protection Agency's (EPA's) Notice of Availability in the *Federal Register*. All comments, including late comments and those presented during the September 4, 2009 videoconference, were considered during preparation of the Final EIS.

The Final EIS contains revisions and new information based in part on comments received on the 2008 Revised Draft EIS. Vertical change bars in the margins indicate the locations of these revisions and new information. Volume 3 contains the comments received during the public comment period on the Revised Draft EIS including late comments, and DOE's and NYSERDA's responses to the comments. DOE will use the analysis presented in the Final EIS, as well as other information, in preparing its Record(s) of Decision (RODs) regarding actions to complete WVDP. DOE will issue ROD(s) no sooner than 30 days after EPA publishes a Notice of Availability of the Final EIS in the *Federal Register*. NYSERDA will use the analysis presented in the Final EIS, as well as other information, in preparing its Findings Statement, which will be published in the *New York State Environmental Notice Bulletin* no sooner than 10 days after the Final EIS is issued.

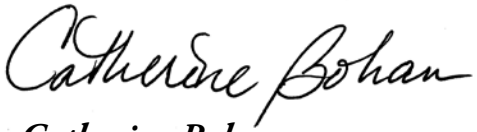
A Message to Stakeholders

The *Final Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center* (Final EIS) is an important step in the path forward for environmental cleanup at the Western New York Nuclear Service Center. It represents years of study and efforts by officials from the Federal Government and New York State, as well as site employees, elected officials, community members, and contractors. We want to extend our personal thanks to all personnel and stakeholders who contributed to this achievement.

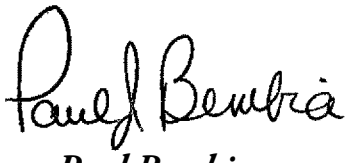
As we move ahead with cleanup and site closure activities, it will be equally important that we maintain this collaborative environment and complete the work at West Valley in a cost-effective manner that is protective of the public health. As you know, there are many complexities involved in a long-term project of this type. The *Revised Draft Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center* (Revised Draft EIS) analyzed those complexities and presented the results for public review and comment from December 2008 to September 2009. Many of you took advantage of the opportunity to provide comments on the Revised Draft EIS. All of those comments were taken into consideration in development of the Final EIS. Official responses to comments may be found in Volume 3, *Comment Response Document*, of the Final EIS.

This document, *A Summary and Guide for Stakeholders* provides an overview of the Final EIS. We hope it proves helpful to you in understanding the issues that concern you. It is also intended to help you quickly find the more detailed technical information you may want to review in the complete Final EIS.

Thank you for your participation in this process. We look forward to your continued involvement as we move toward a DOE Record of Decision and NYSERDA Findings Statement and implementation of cleanup and closure activities.



Catherine Bohan
EIS Document Manager
U.S. Department of Energy



Paul Bembia
Program Director
West Valley Site Management
New York State Energy Research
and Development Authority

Interested citizens attending a public hearing on the Revised Draft EIS, Ashford, New York, April 1, 2009

A Summary and Guide for Stakeholders

Table of Contents

List of Figures and Tables

Front-end Loader Moving Uncontaminated Soil and Debris

1. Introduction

This *Summary and Guide for Stakeholders (Summary)* is intended to facilitate review of the *Final Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center (Decommissioning and/or Long-Term Stewardship EIS).* This *Summary* is a brief compilation of the major findings presented in the *Decommissioning and/or Long-Term Stewardship EIS* and provides guidance for locating more detailed information on specific topics in the full document.

Informing the public and fostering public participation has been an important goal throughout this EIS process. Section 7 of this *Summary* is a discussion of the public review opportunities and includes a summary of the comments received from stakeholders during the public comment period. Stakeholders typically include members of the general public; representatives of environmental groups, industry, educational groups, unions, and other organizations; and representatives of Congress, Federal agencies, American Indian Tribes, state agencies, and local governments. For the *Decommissioning and/or Long-Term Stewardship EIS*, stakeholders are the people or organizations who have an interest in or may be affected by activities at the Western New York Nuclear Service Center (WNYNSC).

Readers interested primarily in the major issues and results presented in the *Decommissioning and/or Long-Term Stewardship EIS* should find their information needs met by this *Summary*. Key information is presented about the Proposed Action, the proposed alternatives, the Preferred Alternative, and the potential short- and long-term impacts of implementing each of the alternatives, uncertainties in the analyses, potential mitigation measures, and public participation. In Section 6 of this *Summary*, readers who would like more detail on these and other topics are directed to the pertinent sections of the *Decommissioning and/or Long-Term Stewardship EIS* or its appendices. Technical terms have been avoided where possible or have been defined in the glossary. A glossary and a list of acronyms and abbreviations have been included in Section 8 of this *Summary*.

Federal and State Responsibility for the *Decommissioning and/or Long-Term Stewardship EIS*

The objective of an EIS is to foster better decisions by providing high-quality environmental information to decisionmakers and the public. The National Environmental Policy Act of 1969 (NEPA) requires Federal agencies to integrate environmental values into their

Brief History of the Western New York Nuclear Service Center

- The 68-hectare (167-acre) West Valley Demonstration Project Premises and 6.1-hectare (15-acre) State-Licensed Disposal Area (SDA) are part of the 1,351-hectare (3,338-acre) Western New York Nuclear Service Center, which is owned by the New York State Energy Research and Development Authority (NYSERDA).
- Licensed by the Atomic Energy Commission in 1966, the site was the home of the only operational commercial nuclear fuel reprocessing facility in the United States.
- Approximately 640 metric tons (705 tons) of spent nuclear fuel were reprocessed at the facility between 1966 and 1972, generating 2.5 million liters (660,430 gallons) of high-level radioactive waste.
- The facility was closed for modifications in 1972 and never reopened, leaving tanks of liquid high-level radioactive waste, a storage pool containing spent nuclear fuel, and a contaminated reprocessing building.
- In 1980, Congress passed the West Valley Demonstration Project Act, directing the U.S. Department of Energy (DOE) to conduct a demonstration project for solidification of the high-level radioactive waste at the site.
- High-level radioactive waste vitrification (solidification in a glass matrix) was completed in 2002; 275 canisters of glass waste were produced and are stored at the site pending offsite disposal.
- The West Valley Demonstration Project Act also directed DOE to:
  - Transport the solidified high-level radioactive waste as soon as feasible to an appropriate Federal repository for disposal;
  - Dispose of low-level radioactive waste and transuranic waste that is produced in the process of solidifying high-level radioactive waste; and
  - Decontaminate and decommission the tanks, facilities, material and hardware used in the solidification of the high-level radioactive waste in connection with the project.
- NYSERDA has continued to manage the SDA along with other, non-project areas from the early 1980s to the present.

DOE and NYSERDA are now implementing some specific cleanup activities and jointly preparing this EIS.

What Is the Proposed Action?

The Proposed Action in the EIS is the completion of the West Valley Demonstration Project and the decommissioning and/or long-term management or stewardship of the Western New York Nuclear Service Center.

Purpose and Need

What Does DOE Need To Do?

DOE needs to determine what, if any, material or structures for which it is responsible would remain on site, and what, if any, institutional controls, engineered barriers, or stewardship provisions would be needed.

What Does NYSERDA Need To Do?

NYSERDA needs to determine what, if any, material or structures for which it is responsible would remain on site and what, if any, institutional controls, engineered barriers, or stewardship provisions would be needed.

decisionmaking processes by considering the environmental impacts of their proposed actions and reasonable alternatives for implementing those actions. To meet this requirement, Federal agencies perform analyses consistent with the scope and significance of the potential impacts of the Proposed Action, as required by NEPA. An EIS presents analyses of the potentially affected environment, which includes the natural physical environment (air, water, noise, soils, geography, geology, and plant and animal life) and the relationship between humans and the environment (health, safety, jobs, schools, housing, aesthetics, and environmental justice).

New York State has similar requirements for preparing EISs under the State Environmental Quality Review Act (SEQR). SEQR requires all state and local government agencies to consider environmental impacts equally with social and economic factors in their decisionmaking processes.

The *Decommissioning and/or Long-Term Stewardship EIS* was prepared by the U.S. Department of Energy (DOE) and the New York State Energy Research and Development Authority (NYSERDA) to identify and assess the impacts of the alternatives proposed to meet DOE's responsibilities under the West Valley Demonstration Project (WVDP) Act and NYSERDA's areas of management responsibility for WNYNSC. Three cooperating agencies have been involved in reviewing the alternatives analyzed in the EIS: the U.S. Nuclear Regulatory Commission (NRC), the U.S. Environmental Protection Agency (EPA), and the New York State Department of Environmental Conservation (NYSDEC). The New York State Department of Health and NYSDEC are involved agencies under SEQR.

As part of the WVDP Act, NRC was charged with developing decommissioning criteria. In the "Decommissioning Criteria for the WVDP at the West Valley Site; Final Policy Statement," (NRC Policy Statement), NRC prescribes the requirements for decommissioning WVDP. The decommissioning criteria define the conditions that would allow WVDP to be used with specified restrictions or without restrictions on future use. If those conditions cannot be met, the NRC Policy Statement also defines the circumstances under which portions of the site could remain under long-term management or stewardship.

What Does the Final EIS Address?

The EIS includes analyses of potential environmental impacts associated with the range of reasonable alternatives for decommissioning and/or long-term stewardship of WNYNSC, as well as a No Action Alternative.

The EIS includes:

- Descriptions of the affected environment and impacts on human health and safety from normal releases and accidents, waste management, transportation, radiological releases during

decommissioning, land use, visual resources, site infrastructure, geology, soils and seismology, water resources, noise, air quality, ecological resources, socioeconomics, and environmental justice.

- Results of impact analyses for each of the four alternatives
- Impacts of shipping waste
- Long-term impacts of continued onsite waste storage
- Uncertainties in the analyses due to incomplete or unavailable information
- The explanation and rationale for the DOE and NYSERDA Preferred Alternative

The scope of the Final EIS is detailed further in Section 2 of this *Summary*.

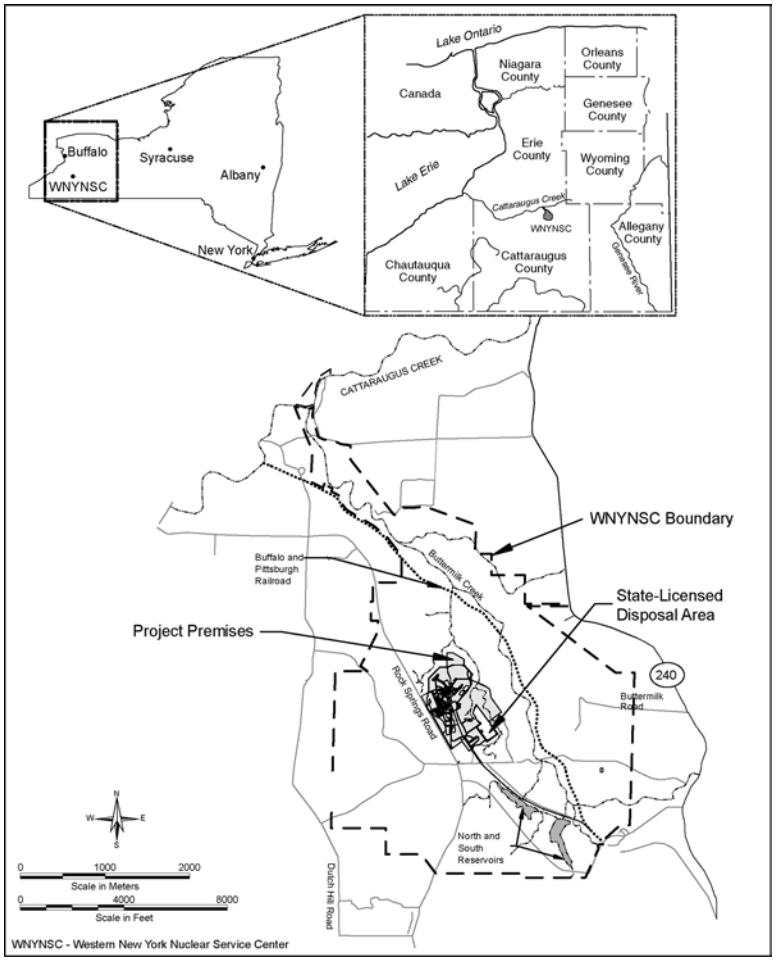
What Makes Up the Western New York Nuclear Service Center?

Figure 1 shows the location and boundaries of WNYNSC. *Figures 2 and 3* show the site divided into 12 Waste Management Areas (WMAs); (see Chapter 2, Section 2.3, of the *Decommissioning and/or Long-Term Stewardship EIS* for a more detailed description of the WMAs).

A WMA refers to a geographic unit on the site consisting of facilities and surrounding grounds, including soil, piping, tanks, stored or buried waste, other underlying materials, and associated soil or groundwater contamination within a geographic boundary. DOE manages WMAs 1 through 10, with the exception of WMA 8. NYSERDA manages WMAs 8, 11, and 12.

- WMA 1: Main Plant Process Building and Vitrification Facility Area
- WMA 2: Low-Level Waste Treatment Facility Area
- WMA 3: Waste Tank Farm Area
- WMA 4: Construction and Demolition Debris Landfill (a disposal system in which waste is buried between layers of earth)
- WMA 5: Waste Storage Area
- WMA 6: Central Project Premises
- WMA 7: NRC-Licensed Disposal Area (NDA) and Associated Facilities
- WMA 8: State-Licensed Disposal Area (SDA) and Associated Facilities
- WMA 9: Radwaste Treatment System Drum Cell Area

Figure 1. *The Western New York Nuclear Service Center*



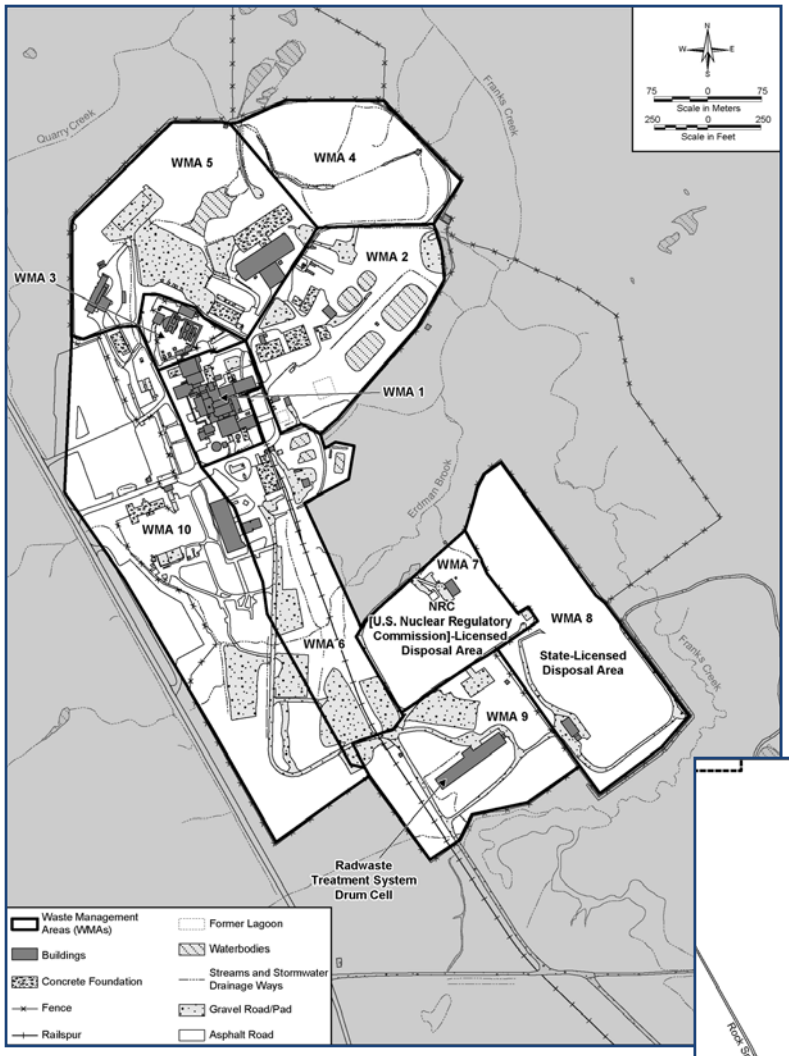


Figure 2. *Location of Waste Management Areas 1 through 10*

- WMA 10: Support and Services Area
- WMA 11: Bulk Storage Warehouse and Hydrofracture Test Well Area
- WMA 12: Balance of Site
- Other geographic units of interest include the Cesium Prong and the North Plateau Groundwater Plume.

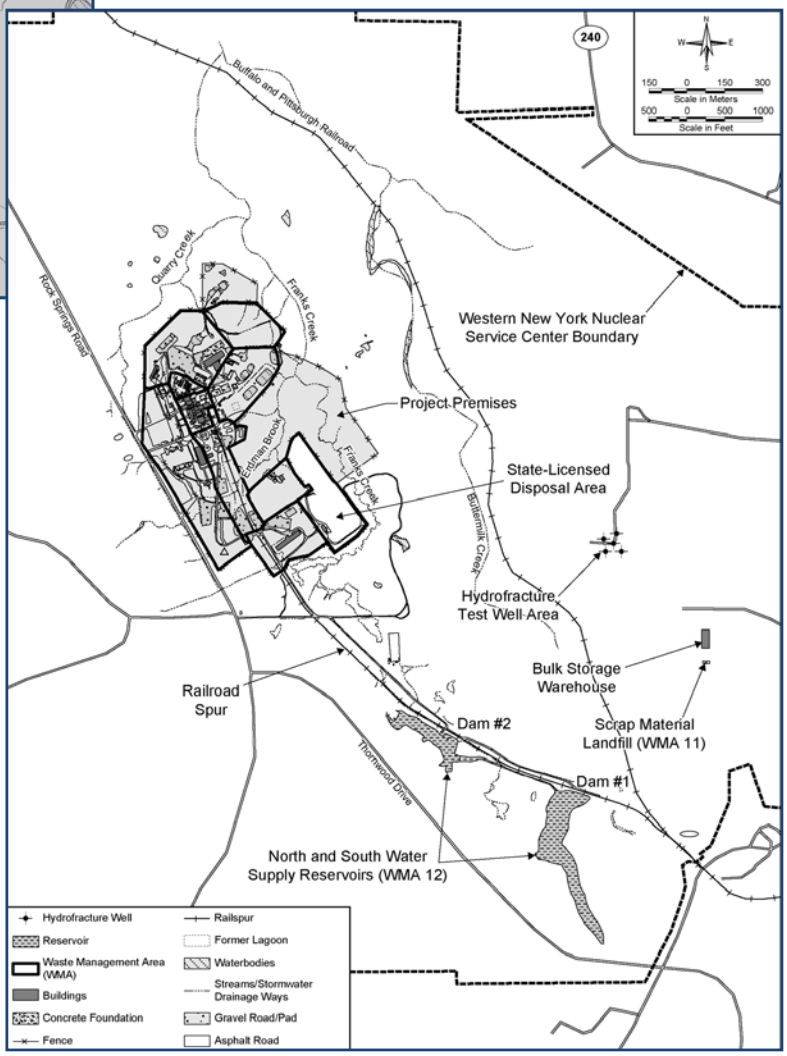


Figure 3. *Waste Management Areas 11 and 12 — Bulk Storage Warehouse and Hydrofracture Test Well Area and Balance of the Western New York Nuclear Service Center*

What Decisions Will Be Made?

The *Decommissioning and/or Long-Term Stewardship EIS* provides input to DOE and NYSERDA decisionmaking regarding actions to complete WVDP and to close or manage WNYNSC, including decommissioning the former spent nuclear fuel facility, the high-level radioactive waste storage tanks, the North Plateau Groundwater Plume, the Cesium Prong, and the NDA.

The EIS also provides analyses to support decisions regarding the decommissioning or continued management of the SDA.

The information and analyses in the EIS will help decisionmakers address questions such as:

- How and when would WNYNSC be decommissioned?
- What would be done with the waste; i.e., where would the waste be disposed?
- If the waste were stored on site pending disposal, how would it be managed?

The results of the analyses presented in the EIS will be considered by the decisionmakers along with mission, policy, cost, public input, regulatory requirements, and other relevant factors. DOE's decisions regarding its responsibilities at WNYNSC will be announced in a Record of Decision (ROD) to be issued after the Final EIS is published.

A ROD is a concise public document published in the *Federal Register* no sooner than 30 days after the publication of EPA's Notice of Availability of the Final EIS to present and explain agency decision(s) concerning the Proposed Action. The ROD identifies the alternatives considered in reaching the decision, the decision made, the environmentally preferable alternative(s), the factors balanced by the agency in making the decision, whether all practicable means to avoid or minimize environmental harm were adopted, and if not, why.

NYSERDA's decisions regarding its responsibilities at WNYNSC will be announced in the SEQR Findings Statement that will be published in the *New York State Environmental Notice Bulletin* no sooner than 10 days after issuance of the Final EIS. The Findings Statement is a written statement that considers the relevant environmental impacts presented in an EIS; weighs and balances them with social, economic, and other essential considerations; provides a rationale for the agency's decision; and certifies that SEQR requirements have been met.

What are the Changes from the Revised Draft EIS?

In preparing the Final EIS, DOE and NYSERDA made revisions to the Revised Draft EIS in response to comments received during the public comment period from Federal and state legislators, other Federal agencies, state and local government entities, American Indian Tribal governments, and the public. The descriptions of the proposed alternatives, in particular, the Phased Decisionmaking Alternative, have been revised to reflect the current preferred plan for their implementation. In addition, the EIS was revised to provide additional and updated environmental baseline information, to include the results of additional analyses, to correct editorial errors, and to clarify text. The EIS was also updated to reflect events that occurred, notifications that were made for other NEPA documents, and changes in applicable regulatory requirements or guidance since the Revised Draft EIS was issued for public comment in December 2008. The more important changes made to the EIS are summarized in the following paragraphs.

Incorporation of Updated Environmental and Site-Specific Information. The EIS was updated to include another year of environmental monitoring data for WNYNSC, primarily as provided in the *West Valley Demonstration Project Annual Site Environmental Report for Calendar Year 2007* and the Site Technical Reports. The near-field hydrologic analysis was revised to reflect the current understanding of the North Plateau slack-water sequence and Lavery till-sand unit and updated to incorporate design parameters for the as-installed NDA slurry wall and geomembrane cover.

Changes Made in Response to the NYSERDA View on the Revised Draft EIS. Changes were made in response to the NYSERDA View, which appears as the Foreword to both the Revised Draft and Final EISs. The View has been revised for the Final EIS, but additional analyses were performed by DOE between the Revised Draft EIS and the Final EIS to address issues raised in the initial View. In addition to revising the text in the EIS to incorporate new analyses and to clarify certain discussions, text boxes have been added to applicable sections of the EIS to indicate NYSERDA's view and DOE's response. Specifically, NYSERDA identified eight issues, five of which (Issue numbers 1, 2, 3, 4, and 8 in the View) related to the nature and use of the long-term performance assessment information. The remaining three presented NYSERDA's opinions that the connection between analyses in the Revised Draft EIS and the applicable regulatory framework needed to be strengthened (Issue 5), that the approach for exhumation of the SDA, NDA, and Waste Tank Farm described in the Revised Draft EIS may be overly conservative and based on extreme conditions (Issue 6), and that nonradiological fatalities from waste transportation rail accidents appeared to be overestimated (Issue 7). NYSERDA has revised the View for the Final EIS to reflect its current position based on the updated analyses and other relevant changes in the Final EIS.

Revised Description of Alternatives. The description of the Interim End State, the starting point for analyses in the EIS, has been updated to reflect new information about when activities to achieve the Interim End State are expected to be completed.

The descriptions of the proposed alternatives, in particular, the Phased Decisionmaking Alternative, have been revised to reflect the current plan for implementing each of these alternatives. For example, the discussion of monitoring and maintenance during decommissioning and for any post-decommissioning activities has been expanded for each of the alternatives.

The Phased Decisionmaking Alternative included in the November 2008 Revised Draft EIS allowed for a Phase 2 decision to be made anytime after the Phase 1 decision, but no later than 30 years from issuance of the initial DOE ROD and NYSERDA Findings Statement, if the Phased Decisionmaking Alternative is selected. In response to public comments that expressed concern over the length of time that could elapse between the Phase 1 and Phase 2 decisions, DOE and NYSERDA have reconsidered the timeframe for making a Phase 2 decision. As a result, the Phased Decisionmaking Alternative presented in the Final EIS specifies that a Phase 2 decision would be made no later than 10 years after issuance of the initial DOE ROD and NYSERDA Findings Statement, if the Phased Decisionmaking Alternative is selected. The overall effect of this change in the timeframe for making a Phase 2 decision is to eliminate the majority of monitoring and maintenance activities and avoid incurring their associated impacts. Specifically, monitoring and maintenance activities originally proposed for years 11 through 30 of Phase 1 would not occur, with the exception of monitoring and maintenance of the Interim

Storage Facility for high-level radioactive waste canister storage. Instead, Phase 2 actions would begin. The specific changes in the impacts are discussed qualitatively for each resource area in Chapter 2, Section 2.6, of the EIS, which summarizes and compares the impacts among the evaluated alternatives. The short-term impacts of the revised Phased Decisionmaking Alternative would generally be less than the impacts identified in Chapter 4 of the EIS, which are based on a decision 30 years after the initial DOE ROD and NYSERDA Findings Statement, if the Phased Decisionmaking Alternative is selected.

In addition, NYSERDA has clarified that for the SDA, alternatives that will be considered for Phase 2 actions will include at least: complete exhumation, close-in-place, or continued active management consistent with SDA permit and license requirements. The impact analysis in Chapter 4 includes discussions of the potential impact of continued active management.

Differences of Opinion

NYSERDA and DOE support the Phased Decisionmaking Alternative. The agencies agree that under the first phase of this alternative, important work would be conducted that the agencies believe is critical to keep the project moving toward completion. There is disagreement, however, regarding the level of additional analysis related to long-term performance assessment required to support the Phase 2 decision.

DOE View. DOE acknowledges the uncertainty inherent in long-term (i.e., 10,000 to 100,000 years) performance assessment modeling. Chapter 4, Section 4.3.5, of the EIS contains a comprehensive list of uncertainties that affect the results of the long-term performance assessment of the site. DOE's analyses account for these uncertainties using state-of-the-art models, generally accepted technical approaches, existing credible scientific methodology, and the best available data in such a way that the predictions of peak radiological and hazardous chemical risks are expected to be conservative (i.e., the results are more likely to overstate rather than understate the actual future consequences). DOE believes the analyses and disclosure of uncertainties in the EIS fully complies with the requirements and spirit of NEPA. Furthermore, DOE believes the information in the EIS is adequate to support agency decisionmaking for all the reasonable alternatives.

NYSERDA View. As explained in the Foreword to the EIS, NYSERDA believes that the EIS technical analyses of soil erosion, groundwater flow and contaminant transport, engineered barriers, and uncertainty are not technically defensible for use in long-term decisions regarding WNYNSC cleanup. NYSERDA does not agree that the analyses are adequate to demonstrate that the predictions of peak radiological and chemical risk are conservative, and NYSERDA believes that a comprehensive analysis of uncertainty is needed.

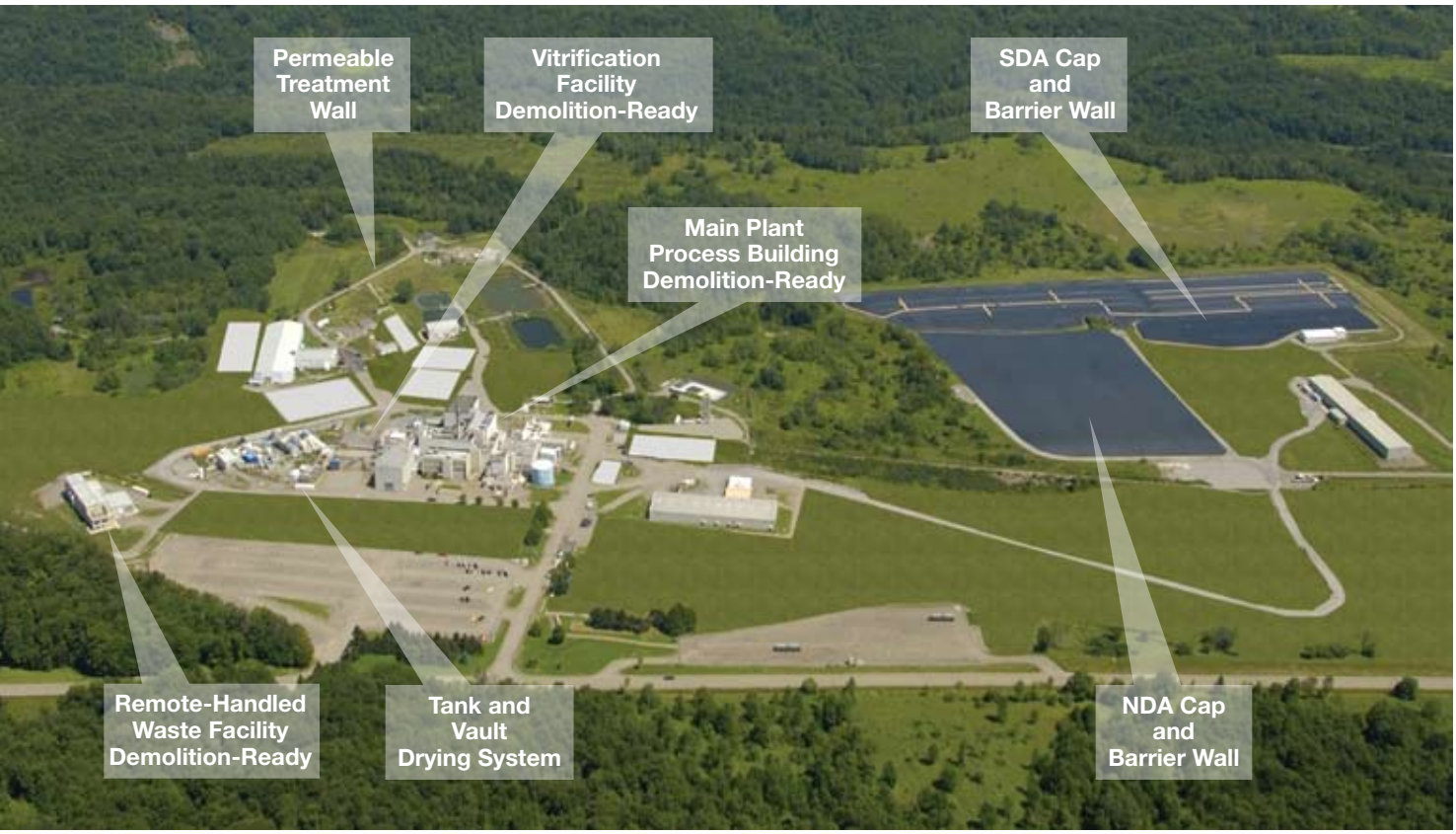

KOMA
WM

2. What Is the EIS Starting Point and What Are the Alternatives Analyzed?

The EIS Starting Point

While DOE and NYSERDA have been addressing the difficult challenges involved in planning for closure of WNYNSC, they have also continued to take action where possible to remove waste or facilities in order to achieve a site status referred to as the Interim End State, which is the starting point for analyses in this EIS. Activities to achieve the starting point are underway and will continue until completed. Major activities include:

- A number of minor, generally uncontaminated facilities will be closed, emptied of equipment, decontaminated as necessary, and demolished down to concrete foundations, floor slabs, or gravel pads.
- The Main Plant Process Building, with the exception of the area used for storing vitrified high-level radioactive waste canisters and the areas and systems that support high-level radioactive waste canister storage, will be decontaminated to a demolition-ready status. The 01-14 Building and the Vitrification Facility in WMA 1 and the Remote-Handled Waste Facility in WMA 5 will be decontaminated to a demolition-ready status.
- A tank and vault drying system will be installed at the WMA 3 Waste Tank Farm to dry the remaining heels in the waste storage tanks.
- A permeable treatment wall will be installed in WMA 2 to mitigate further North Plateau Groundwater Plume migration. The North Plateau Groundwater Plume and background soils were sampled for potential hazardous constituents. These samples were also analyzed for radionuclide content.
- Waste created by activities to achieve the EIS starting point eventually will be shipped off site for disposal, with the possible exception of potential non-defense transuranic waste.
- An upgradient barrier wall was installed, and a geomembrane cover was placed over the NDA in 2008 to help mitigate surface water infiltration.



The Project Premises and State-Licensed Disposal Area as Envisioned at the EIS Starting Point

Alternatives Analyzed in the EIS

Before any decisions can be made, DOE and NYSERDA must complete the EIS process, which includes the analysis of impacts on resource areas; comparison of impacts for each alternative considered, including the Preferred Alternative; and other data necessary to produce the Final EIS.

Four alternatives are analyzed in the EIS (see *Table 1* on page 14):

Sitewide Removal. Under this alternative, all site facilities as outlined in Chapter 2, Table 2–2, of the EIS would be removed; contaminated soil, sediment, and groundwater would be removed to meet criteria that would allow unrestricted release of WNYNSC; and all radioactive, hazardous, and mixed waste would be characterized, packaged as necessary, and eventually shipped off site for disposal. This alternative would generate waste for which there is currently no offsite disposal location (e.g., potential non-defense transuranic waste, commercial Class B and C low-level radioactive waste, Greater-Than-Class C waste). This orphan waste would be stored on site until an appropriate offsite facility is available. Completion of these activities would allow unrestricted use of the site (i.e., the site could be made available for any public or private use). The Sitewide Removal Alternative includes temporary onsite storage of vitrified high-level radioactive waste canisters until they can be shipped off site.

Sitewide Close-In-Place. Under this alternative, most facilities would be closed in place. In other words, major facilities and sources of contamination such as the Waste Tank Farm, NDA, and SDA would be managed at their current locations.

Residual radioactivity in facilities with larger inventories of long-lived radionuclides would be isolated by specially designed closure structures and engineered barriers. These structures would be designed to meet regulatory requirements both to retain hazardous and radioactive constituents and to ensure they would be resistant to long-term degradation. This approach would allow large areas of the site to be released for unrestricted use. The NRC license for remaining portions of WNYNSC could be terminated under restricted conditions, or could be converted to a long-term license. For the SDA, in-place closure would require, as applicable, a regulatory variance or a postclosure permit or order in accordance with 6 NYCRR Parts 373 and 380. Facilities that are closed in place, and any buffer areas around them, would require long-term stewardship.

Phased Decisionmaking (the Preferred Alternative). Under this alternative, decommissioning would be completed in two phases. This alternative involves substantial removal actions in the first phase. In addition, during this first phase, this alternative provides for additional site characterization and scientific studies to facilitate consensus decisionmaking for the remaining facilities or areas. Thoughout the EIS process, the lead, cooperating, and involved agencies have striven for consensus and will continue to do so.

Phase 1 would include removal of the Main Plant Process Building and the source of the North Plateau Groundwater Plume. In addition, the lagoons and all facilities in WMA 2 (except the permeable treatment wall) would be removed. The Vitrification Facility, the Remote Handled Waste Facility, and a number of facilities in WMAs 5, 6, 9, and 10 would also be removed. Foundations, slabs, or pads from these facilities, as well as previously demolished facilities would also be removed. During Phase 1, several facilities would continue under active management. These facilities include the Waste Tank Farm and its support facilities, the Construction and Demolition Debris Landfill, the non-source area of the North Plateau Groundwater Plume, the NDA, and the SDA.

Phase 1 activities are expected to take 8 to 10 years to complete. During this 8- to 10-year period, the agencies would conduct a number of activities to help determine the best technical approach to complete decommissioning of the remaining facilities. These activities would include further characterization of site contamination and additional scientific studies.

Phase 1 activities would make use of proven technologies and available waste disposal sites to reduce the potential short-term health and safety risks from residual radioactivity and hazardous contaminants at the site. In order to facilitate interagency consensus while Phase 1 cleanup activities are progressing, additional studies would be conducted to possibly reduce technical uncertainties related to the decision on final decommissioning and long-term management of the balance of WNYNSC. In particular, these studies may address uncertainties associated with the long-term performance models, the viability and cost of exhuming buried waste and tanks, the availability of waste disposal sites, and technologies for in-place containment.

While the Phase 1 activities are being conducted, DOE and NYSERDA would assess the results of site specific studies as they become available, along with other emerging information such as applicable technology development. In consultation with NYSERDA and cooperating and involved agencies on this EIS, DOE would determine whether new information would warrant preparation of a Supplemental EIS. NYSERDA also would assess the results of site-specific studies and other information during Phase 1.

NYSERDA expects to prepare and issue for public comment an EIS, or to supplement the existing EIS, to evaluate Phase 2 decisions for the SDA and the balance of WNYNSC for which NYSERDA has responsibility.

The **Phase 2** decision would be made within 10 years of the initial DOE ROD and NYSERDA Findings Statement, if the Phased Decisionmaking Alternative is selected. NYSERDA and DOE will strive to make a comprehensive Phase 2 decision for the entire site that is protective of public health and safety and the environment. For WVDP, Phase 2 actions would complete decommissioning or long-term management decisionmaking according to the approach determined most appropriate during the additional Phase 1 evaluations for each remaining facility. For the SDA, alternatives that will be considered for Phase 2 actions will include at least: complete exhumation, close-in-place, and continued active management consistent with SDA permit and license requirements.

No Action. Under the No Action Alternative, no actions toward decommissioning would be taken. The No Action Alternative would involve the continued management and oversight of all facilities located on WNYNSC property as of the starting point for this EIS. The No Action Alternative does not meet the purpose and need for agency action, but analysis of the No Action Alternative is required under NEPA and SEQR.

Which Alternatives Were Considered But Eliminated from Detailed Analysis?

Indefinite Storage of Decommissioning or Long-term Management Waste in Existing or New Aboveground Structures. DOE and NYSERDA do not consider the use of existing structures or construction of new aboveground facilities at WNYNSC for indefinite storage of decommissioning or long-term management waste to be a reasonable alternative for further consideration because the indefinite storage of waste in this manner is inconsistent with the NRC License Termination Rule and Final Policy Statement on WVDP Decommissioning. Under the ROD for the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE-EIS-0200-F), DOE decided that sites without appropriate disposal capacity such as WVDP would ship their low-level radioactive waste and mixed low-level radioactive waste to other DOE sites that have disposal capabilities for these wastes (65 FR 10061). This decision regarding using DOE sites does not preclude the use of commercial disposal sites.

Walk Away. The 1996 *Cleanup and Closure Draft EIS* analyzed an alternative that involved discontinuing all WNYNSC operations and essentially "walking away" from the site, its facilities, and the wastes stored there. The Walk Away Alternative, as defined in the *Cleanup and Closure Draft EIS,* is not a reasonable alternative for analysis in the EIS because it would not meet Federal and state legal requirements and would pose major health and safety issues to the public.

The Preferred Alternative identified and analyzed in an EIS is the alternative that an agency believes would best fulfill its mission and responsibilities after consideration of environmental, economic, technical, regulatory, and other factors.

Why Is Phased Decisionmaking the DOE and NYSERDA Preferred Alternative?

DOE and NYSERDA have identified the Phased Decisionmaking Alternative as the Preferred Alternative. The rationale for identifying the Phased Decisionmaking Alternative is as follows:

- Phase 1 of the Phased Decisionmaking Alternative would remove major facilities (such as the Main Plant Process Building and lagoons), thereby reducing or eliminating potential human health impacts associated with these facilities while introducing minimal potential for generation of new orphan waste (waste that cannot currently be disposed of in an established or a planned permanent disposal facility).
- Phase 1 would remove the source area for the North Plateau Groundwater Plume, thereby reducing the source of radionuclides that are a potentially significant contributor to human health impacts.
- Phase 1 would allow up to 10 years for collection and analysis of data and information on major facilities or areas (such as the Waste Tank Farm, NDA, and SDA), with the goal of reducing technical risks associated with implementation of the Sitewide Removal and Sitewide Close-In-Place Alternatives, because one of these alternatives, or a combination that could include continued active management of the SDA, could be selected for Phase 2.

Examples of the technical risks that could be reduced include how to address the Cesium Prong, reaching a determination regarding Waste Incidental to Reprocessing, and further evaluation of long-term impacts. Waste Incidental to Reprocessing refers to wastes resulting from reprocessing spent nuclear fuel that are not highly radioactive and do not need to be disposed of in a geologic repository in order to manage the risk that they pose. The Waste Incidental to Reprocessing would be managed under DOE regulatory authority in accordance with applicable laws and regulations.

The anticipated result of Phase 1 information gathering and analysis is to provide additional information to support decisionmaking for both the removal and in-place closure options for remaining facilities. It is also anticipated that, during Phase 1, progress would be made in identifying and developing disposal facilities for orphan wastes, thereby facilitating removal actions if they are selected as part of Phase 2 decisionmaking. Establishment of improved close-in-place designs or improved analytical methods for long-term performance assessment would facilitate close-in-place actions if they are selected as part of Phase 2 decisionmaking.

Table 1. Summary of Alternatives

	Sitewide Removal	Sitewide Close-In-Place	Phased Decisionmaking Phase 1 Activities (up to 10 years)	No Action
High-level Radioactive Waste Canisters	Storage in new Interim Storage Facility until shipped off site.	Storage in new Interim Storage Facility until shipped off site.	Storage in new Interim Storage Facility until shipped off site.	No decommissioning actions.
Main Plant Process Building	Decontamination, demolition and removal from site.	Decontamination. Rubble used to backfill underground portions of the Main Plant Process Building and Vitrification Facility, and to form the foundation of a cap.	Decontamination and removal from site.	No decommissioning actions.
High-level Radioactive Waste Tanks	Removal, including associated contaminated soil and groundwater in Waste Management Area 3.	Backfilled with controlled low-strength material. Strong grout placed between the tank tops and in the tank risers. Underground piping to remain in place and filled with grout. Closed in an integrated manner with the Main Plant Process Building, Vitrification Facility, and North Plateau Groundwater Plume source with a common circumferential hydraulic barrier and beneath a common robust multi-layer cap.	Remain in place, monitored and maintained with the Tank and Vault Drying system operating as necessary.	No decommissioning actions.
NRC-Licensed Disposal Area (NDA)	Removal.	Removal off site of liquid pretreatment system. Trenches and holes emptied of leachate and grouted. Buried leachate transfer line to remain in place. Existing NDA geomembrane cover replaced with a robust multi-layer cap.	Continued monitoring and maintenance.	No decommissioning actions.
State-Licensed Disposal Area (SDA)	Removal.	Leachate removed from disposal trenches and replaced with grout. Waste Storage Facility removed to grade. Existing SDA geomembrane cover replaced with robust multi-layer cap. Hydraulic barrier installed.	Active management.	No decommissioning actions.
North Plateau Groundwater Plume	Removal.	Plume source area closed in an integrated manner with the Main Plant Process Building, Vitrification Facility and Waste Tank Farm within a common circumferential barrier. Permeable treatment wall installed before decommissioning would remain in place. Non-source area allowed to decay in place.	Removal of source area. Permeable treatment wall installed before decommissioning would remain in place.	No decommissioning actions.
Cesium Prong	Removal.	Restrictions on use until sufficient decay has taken place.	Managed in place.	No decommissioning actions.

Lagoon 2. Storage Basin for Low-level Radioactive Wastewater Prior to Treatment.

Lagoon 3. Storage Basin for Treated Wastewater Awaiting Discharge to Erdman Brook through the State Pollutant Discharge Elimination System (SPDES) - Permitted Discharge.

Slurry Wall Being Constructed in NRC-Licensed Disposal Area

3. How Do the Alternatives Compare?

Each of the four alternatives considered in the EIS has the potential to produce short-term impacts on one or more resource areas. Alternatives that would leave residual radioactivity and/or contamination on site also have the potential for local long-term impacts on resource areas.

Comparisons of the proposed alternatives are based on both short- and long-term impacts. Five resource areas where meaningful impact differences could occur are used to compare short-term impacts: land use (land available for reuse), socioeconomics (employment), human health and safety, waste management, and transportation. For comparative analyses of long-term impacts, the projected radiation dose to future hypothetical individuals and populations is identified as a meaningful difference among the alternatives; that is, long-term risks are dominated by radiological rather than chemically hazardous constituents.

The analyses for the Phased Decisionmaking Alternative presented in Chapter 4 of the EIS are based on making a Phase 2 decision 30 years after the initial DOE ROD and NYSERDA Findings Statement, if the Phased Decisionmaking Alternative is selected. This is consistent with the longest timeframe allowed for making a Phase 2 decision for the Phased Decisionmaking Alternative evaluated in the Revised Draft EIS. Although the Phased Decisionmaking Alternative in the Final EIS specifies that a Phase 2 decision would be made no later than 10 years after issuance of the initial ROD and Findings Statement, the 30-year analytical timeframe has been retained in the Final EIS. The potential effect of making the Phase 2 decision at 10 years rather than 30 years is addressed qualitatively in this section of the *Summary* for the five resource areas identified as being potential discriminators among alternatives. The potential effect on other resource areas that are addressed in Chapter 4 from this change in the timing of the Phase 2 decision for the Phased Decisionmaking Alternative has also been qualitatively addressed. This assessment indicates that the duration of Phase 1 (10 years or 30 years) does not change the overall impact for any of these resource areas because there are no actions that would result in environmental consequences on these resource areas between the completion of Phase 1 decommissioning actions and the initiation of Phase 2 actions.

In addition, the potential impacts of the Phase 2 decision for the SDA of continued active management are also discussed in this section.

Short-term refers to the active project period under each alternative during which implementation (most of the construction, operation, and decommissioning activities) would take place.

Long-term is defined as the timeframe beyond implementation of each alternative.

Short-term Impacts

Short-term impacts for the resource areas identified as having meaningful differences among the alternatives are presented in *Table 2* on pages 26 and 27 of this *Summary*. The conclusions regarding the short-term impacts of the EIS alternatives are:

Land Use. The Sitewide Removal Alternative would result in the most land available for release for unrestricted use: the entire 1,351 hectares (3,338 acres) encompassing WNYNSC. With the exception of land needed to manage orphan waste that may remain on site until a disposition

path is available, the entire site would be cleaned up to the point where it could meet the NRC standard for license termination without restriction, which would allow WNYNSC to be used for other purposes.

The Sitewide Close-In-Place Alternative (after completion of decommissioning activities and decay of the Cesium Prong) would make 1,118 hectares (2,762 acres) available for unrestricted use. However, some land would need to be retained for access control, as a buffer area, and for maintenance and erosion control for the South Plateau burial grounds.

Following completion of Phase 1 of the Phased Decisionmaking Alternative, an estimated 693 hectares (1,712 acres) of land would be available for unrestricted release. The amount of land available for unrestricted release following implementation of Phase 2 would depend on the Phase 2 decision. If the Phase 2 decision is removal of all remaining waste and contamination, the remaining 658 hectares (1,626 acres) would become available, and the total land available for unrestricted release would be the same as that for the Sitewide Removal Alternative, 1,351 hectares (3,338 acres). If the Phase 2 decision is continued active management for the SDA and removal of the remaining waste and contamination for the rest of the site, the amount of land available for release would be reduced by approximately 6.1 hectares (15 acres), plus additional land for a buffer area. If the decision is in-place closure of the remaining waste and contamination, an additional 425 hectares (1,050 acres) would be available for release for unrestricted use, similar to that for the Sitewide Close-In-Place Alternative. There would be no change in the amount of land available for release if the Phase 2 decision for the SDA is continued active management. Making the Phase 2 decision at 10 years rather than 30 years would result in additional land becoming available for unrestricted release approximately 20 years sooner.

For the No Action Alternative, 693 hectares (1,712 acres) would be available for release for unrestricted use. This land would not be needed for continued management and oversight.

Socioeconomics (employment during project implementation). Implementation of the Sitewide Removal Alternative would have the greatest impact on employment because the duration of decommissioning activities would continue longer under this alternative than any of the other alternatives. The average annual employment level for Phase 1 of the Phased Decisionmaking Alternative would be similar to that for the Sitewide Removal Alternative. The average employment level for the Sitewide Close-In-Place Alternative would be about 28 percent higher than that for the Sitewide Removal Alternative. Decommissioning employment for the Sitewide Close-In-Place Alternative and Phase 1 of the Phased Decisionmaking Alternative, however, would not last as long as for the Sitewide Removal Alternative. No post-decommissioning employment for monitoring and maintenance activities would be required for the Sitewide Removal Alternative, unless there is a need for temporary orphan waste storage. The Sitewide Close-In-Place and the No Action Alternatives would require a reduced employment level for an indefinite period of time.

If the Phase 2 decision is removal of all remaining waste and contamination, the employment levels and related socioeconomic impacts for the entire Phased Decisionmaking Alternative would be similar to those for the Sitewide Removal Alternative. If the Phase 2 decision is continued active management for the SDA and removal of the remaining waste and contamination for the rest of the site, the overall labor required for both phases of the alternative would decrease by about 25 percent. If the Phase 2 decision is in-place closure,

employment levels and socioeconomic impacts for the entire Phased Decisionmaking Alternative would be similar to the Sitewide Close-In-Place Alternative. If the Phase 2 decision is continued active management for the SDA and in-place closure of the remaining waste and contamination for the rest of the site, employment would be decreased by about 15 percent. In either case, approximately 10 employees would be required for continued active management of the SDA.

Making the Phase 2 decision at 10 years rather than 30 years would eliminate the approximately 20-year period of reduced employment that would occur between completion of Phase 1 decommissioning activities and the beginning of Phase 2 actions. In addition to avoiding a reduction in employment levels, implementation of Phase 2 activities at 10 years would have the advantage of a mobilized and trained workforce available to immediately begin implementing Phase 2.

Based on the expected changes in employment levels for each of the alternatives, there would be no discernable impact on the economies of the local and regional areas surrounding WNYNSC.

Human Health and Safety (radiation doses to the public and site workers during implementation of the alternatives). Decommissioning actions would result in radiological releases to the atmosphere and to local surface waters. These releases would result in radiological exposure and the associated risk of latent cancer fatalities (LCFs) to offsite individuals and populations. Decommissioning actions would also result in occupational exposure to site workers.

Health Risk

Latent cancer fatality (LCF) is a term used to indicate the estimated number of cancer fatalities that may result from exposure to ionizing radiation. Dose conversion factors are used to convert radiological dose to LCFs.

Collective dose refers to the sum of the individual radiological doses received in a given period of time by a specified population from exposure to a specified source of radiation. Collective dose is expressed in units of person-rem.

Excluding the No Action Alternative, the collective radiological dose to the general population within an 80-kilometer (50-mile) radius of WNYNSC would range from about 40 person-rem for the Sitewide Close-In-Place Alternative to 120 person-rem for the Sitewide Removal Alternative. Less than 1 additional LCF would be expected in the population as a result of decommissioning actions under any of the alternatives. For the Phased Decisionmaking Alternative, the population dose for both phases would range from 82 person-rem for in-place closure to 120 person-rem for removal of remaining waste and contamination. These doses would be reduced if the Phase 2 decision for the SDA is continued active management. Because the dose to the general population is negligible during the monitoring and maintenance period after the Phase 1 decommissioning actions are complete, the general population would not be affected by the timing of the Phase 2 decision. The peak annual dose to the maximally exposed individual at the site boundary would be highest for Phase 1 of the Phased Decisionmaking Alternative because it has the highest annual radionuclide release.

As shown in *Table 2*, the total worker dose for decommissioning actions would range from about 120 person-rem for the Sitewide Close-In-Place Alternative to 990 person-rem for the Sitewide Removal Alternative. For the Phased Decisonmaking Alternative, the total worker dose for both phases would range from 240 person-rem if the Phase 2 decision is in-place closure to 990 person-rem if the Phase 2 decision is removal of remaining waste and contamination. Doses would be reduced if the Phase 2 decision for the SDA is continued active management. The higher dose would still be expected to result in less than 1 additional LCF

among the involved worker population. The average worker dose for decommissioning actions would range from about 54 to 83 millirem per year, which is well below the site administrative control limit of 500 millirem per year. The annual worker population dose during the monitoring and maintenance portion of Phase 1 of the Phased Decisionmaking Alternative would be about 1.7 person-rem, so making the Phase 2 decision at 10 years rather than 30 years would reduce the total estimated worker population dose by about 34 person-rem.

Waste Management. Decommissioning activities and construction and operation of decommissioning facilities under different alternatives would generate high-level radioactive waste, nonhazardous waste, hazardous waste, transuranic waste, low-level and mixed low-level radioactive wastes, and Greater-Than-Class C waste (see text box on page 21 of this *Summary* for definitions of these waste types).

General Disposal Options for Low-Level Radioactive Waste

DOE/Commercial Disposal Option - DOE low-level radioactive waste would be disposed of at DOE disposal facilities (e.g. Nevada Test Site). Commercial low-level radioactive waste would be disposed of at commercial disposal facilities.

Commercial Disposal Option - All low-level radioactive waste would be disposed of at commercial disposal facilities.

For both options, all wastes would be disposed of in accordance with applicable waste acceptance criteria and appropriate permits/licenses.

The Sitewide Removal Alternative would generate the largest volume of waste from decommissioning activities, but no waste from long-term stewardship. Wastes that may be generated include nonhazardous waste, hazardous waste, low-level and mixed low-level radioactive wastes (including low-specific-activity waste), transuranic waste, and Greater-Than-Class C waste.

Phase 1 of the Phased Decisionmaking Alternative would generate the second largest volume of waste from decommissioning activities. Wastes that may be generated include nonhazardous waste, hazardous waste, low-level and mixed low-level radioactive wastes (including low specific activity waste), and transuranic waste. Making the Phase 2 decision at 10 years rather than 30 years would result in waste from monitoring and maintenance activities being generated for only about 2 years. The total volume of Phase 1 waste would be reduced by less than 2 percent because the vast majority of the waste generated during Phase 1 would result from decommissioning activities.

If the Phase 2 decision is removal of all remaining waste and contamination, the total decommissioning waste volumes for the Phased Decisionmaking Alternative would be similar to those for the Sitewide Removal Alternative. If the Phase 2 decision is continued active management of the SDA and removal of the remaining waste and contamination for the rest of the site, there would be about 30 percent less low-level radioactive waste generated from decommissioning than for the Sitewide Removal Alternative, and almost no other radioactive waste generated. If the Phase 2 decision is in-place closure of remaining waste and contamination, the total volume of waste generated by the Phased Decisionmaking Alternative would include the Phase 1 waste plus about 30 percent of the waste volume generated under the Sitewide Close-In-Place Alternative. If the Phase 2 decision is continued active management of the SDA and in-place closure for the remainder of WNYNSC, the quantities of wastes from decommissioning would be slightly lower than these estimates.

The Sitewide Close-In-Place Alternative would generate the smallest volume of waste from decommissioning activities. Wastes that may be generated include nonhazardous waste, hazardous waste, low-level and mixed low-level radioactive wastes, and transuranic waste. Low-level radioactive waste would also be generated during long-term stewardship activities.

Waste Types

High-level Waste or High-level Radioactive Waste – The high-level radioactive waste that was produced by the reprocessing of spent nuclear fuel at the Western New York Nuclear Service Center. This waste includes liquid wastes, which are produced directly in reprocessing; dry solid material derived from such liquid wastes; and such other material the U.S. Nuclear Regulatory Commission (NRC) designates as high-level radioactive waste for the purposes of protecting the public health and safety (West Valley Demonstration Project Act, Public Law 96-368, 94 Stat. 1347). Also see the definition of high-level radioactive waste in the Nuclear Waste Policy Act of 1982, as amended (Public Law 97-425, 96 Stat. 2201), and as promulgated in 10 Code of Federal Regulations (CFR) 63.2.

Transuranic Waste – DOE radioactive waste not classified as high-level radioactive waste and containing more than 100 nanocuries per gram of alpha-emitting transuranic isotopes with half-lives greater than 20 years (40 CFR Part 191). Transuranic waste may be considered defense or non-defense waste depending on its origin.

Hazardous Waste – A category of waste regulated under the Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in 40 CFR 261.20-24 and 6 New York Code of Rules and Regulations (NYCRR) 371.1(d)(1) and 371.3—ignitability, corrosivity and reactivity, or toxicity—or be specifically listed by the U.S. Environmental Protection Agency in 40 CFR 261.3-33 or by the State of New York in 6 NYCRR 371.4. Toxicity is determined by the Toxicity Characteristic Leaching Procedure method, as given in 40 CFR 261.24 and 6 NYCRR 371.3(e).

Low-level Radioactive Waste – Waste that contains radioactivity and is not classified as high-level radioactive waste, transuranic waste, or spent nuclear fuel, or the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material (DOE Manual 435.1-1, 10 CFR 20.1003). In accordance with NRC regulations in 10 CFR 61.55, low-level radioactive waste is further classified into Class A, Class B, or Class C low-level radioactive waste. [Low-level radioactive waste may also be categorized as low-specific-activity waste for the purposes of transportation analyses. Low-specific-activity wastes have low specific activity, are nonfissile, and meet certain regulatory exceptions and limits. Low-specific-activity wastes may be transported in large bulk containers.]

Mixed Low-level Radioactive Waste – Low-level radioactive waste that also contains hazardous waste regulated under RCRA (42 United States Code [U.S.C.] 6901 et seq.).

Greater-Than-Class C Waste – Low-level radioactive waste that exceeds the concentration limits established for Class C low-level radioactive waste in 10 CFR 61.55. [Note: Greater-Than-Class C waste is generated by activities (e.g., by commercial entities) licensed by NRC or Agreement States. This waste classification does not apply to low-level radioactive waste generated or owned by DOE that is disposed of at a DOE disposal facility.]

Construction and Demolition Debris – Discarded nonhazardous material, including solid, semisolid, or contained gaseous material resulting from construction, demolition, industrial, commercial, mining, and agricultural operations and from community activities. This category does not include source, special nuclear, or byproduct material as defined by the Atomic Energy Act (42 U.S.C. 2011 et seq.).

The No Action Alternative would generate no waste from decommissioning activities but the largest annual volume of waste from monitoring and maintenance activities.

Transportation (radiation doses to the public along transportation routes and to transportation workers during transportation). Both radiological and nonradiological impacts could result from shipment of radioactive waste from WNYNSC to offsite disposal facilities. Uncertainty about the locations of facilities for disposal of low-level radioactive waste has been addressed by considering two general disposal options. In the DOE/Commercial Disposal Option, low-level radioactive waste would be transported to a combination of commercial and DOE disposal facilities; and in the Commercial Disposal Option, low-level radioactive waste would be transported only to commercial disposal facilities.

The impacts would be proportional to the distance traveled. DOE and NYSERDA could choose to use a combination of rail and truck shipments during implementation of any of the proposed alternatives. If that were the case, for the DOE/Commercial Disposal Option the dose to the population along the transportation route would be expected to range from the lowest projected dose of about 2.8 person-rem, which is associated with all-rail shipments under the Sitewide Close-In-Place Alternative, to the highest projected dose of about 370 person-rem, which is associated with all-truck shipments under the Sitewide Removal Alternative. Less than 1 additional LCF would be expected from such exposures to the general population.

For the Sitewide Removal Alternative, the highest collective dose to transportation workers would occur under the Commercial Disposal Option using all-truck shipments. For the Sitewide Close-in-Place Alternative, the highest collective dose to transportation workers would occur under the DOE/Commercial Option using all-truck shipments. For both the Sitewide Removal and Sitewide Close-in-Place Alternatives, the highest dose to the population along the transportation route would occur under the DOE/Commercial Disposal Option, also using all-truck shipments. For Phase 1 of the Phased Decisionmaking Alternative, the highest collective dose to transportation workers would be from all-truck shipments under the Commercial Disposal Option; the highest dose to the population along the transportation route would be from all-truck shipments under the DOE/Commercial Disposal Option. Making the Phase 2 decision at 10 years rather than 30 years would result in about a 2 percent reduction in the total number of waste shipments in Phase 1. This would result in about a 4 percent reduction in the collective dose to transportation workers and about a 5 percent reduction in the dose to the population along the transportation route.

If the Phase 2 decision is removal of all remaining waste and contamination, the total transportation worker and population dose and risk for this alternative (both Phase 1 and Phase 2) would be essentially equal to those for the Sitewide Removal Alternative. If the Phase 2 decision is continued active management for the SDA and removal of the remaining waste and contamination for the rest of the site, the total transportation dose and risk for both phases of the Phased Decisionmaking Alternative would be about 40 percent less than those for the Sitewide Removal Alternative. If the Phase 2 decision is in-place closure for all remaining waste and contamination, the total transportation worker and population dose and risk for both phases of this alternative would be about 5 percent higher than those for Phase 1 alone because the Phase 2 closure actions would cause only a small percent increase in the volume of low-level radioactive waste to be shipped. If the Phase 2 decision is continued active management for the SDA and in-place closure of the remaining waste and contamination for the rest of the site,

the total transportation dose and risk for both phases of this alternative would be essentially the same as for Phase 1 alone. This is because no closure activities would be undertaken for the SDA, so no radioactive waste would need to be transported offsite for disposal.

The Sitewide Removal Alternative has the highest estimated nonradiological health risk to the public, ranging from about 9.7 to 15 traffic or rail accident fatalities for the various shipping options.[1] The other alternatives would result in less than 1 nonradiological accident fatality, except for Phase 1 of the Phased Decisionmaking Alternative, which would result in about 2 fatalities for the rail shipping options. If the Phase 2 decision is removal of all remaining waste and contamination, the total nonradiological health risk for this alternative (both Phase 1 and Phase 2) would be essentially the same as for the Sitewide Removal Alternative. If the Phase 2 decision is continued active management for the SDA, and removal of the remaining waste and contamination for the rest of the site, nonradiological transportation impacts would be about 30 percent less than for the Sitewide Removal Alternative. If the Phase 2 decision is in-place closure for all remaining waste and contamination, the total nonradiological health risk for both phases of this alternative would be about 5 percent higher than the Phase 1 risk. If the Phase 2 decision is continued active management for the SDA and in-place closure for the rest of the site, total nonradiological transportation impacts would be lower because there would be no deliveries of construction and erosion control materials for construction of an engineered cap for the SDA. Considering that the transportation activities would occur over a period of time of about 7 to 60 years and that the average number of annual traffic fatalities in the United States is about 40,000 per year, the traffic fatality risks under all alternatives would be very small.

Long-term Impacts

Long-term impacts would result from any alternative that would leave radioactive materials on site. For analysis purposes, "long-term" extends from the end of the decommissioning action implementation period out to at least 10,000 years, and perhaps longer if the predicted peak annual dose occurs later.

Table 3 on page 28 of this *Summary* provides an overview of the potential long-term human health radiological dose consequences for comparison among the alternatives.

The **Sitewide Removal Alternative** would result in minimal long-term impacts to the public in the vicinity of WNYNSC because this alternative would transfer the long-term waste management risk and the need for long-term institutional controls (stewardship) to other locations where the removed materials would be disposed. Contamination would be removed from WNYNSC such that an individual in direct contact with any residual contamination would receive an annual dose of less than 25 millirem per year, assuming conservative land reuse scenarios that include houses, gardens, and water wells located in areas with the highest residual contamination. Other site reuse scenarios would result in substantially lower doses, and the dose to offsite receptors would be many orders of magnitude lower (i.e., negligible).

The **Sitewide Close-In-Place Alternative** would include additional engineered barriers and also rely on institutional controls to limit offsite and onsite doses. For this alternative, the estimated peak annual dose to offsite individual receptors, if institutional controls are assumed to remain in place, is less than 1 millirem, similar to the dose for the No Action Alternative. The estimated dose to offsite individual receptors in the event of loss of institutional controls is

[1] *The nonradiological accident fatality estimates for rail transport are based on the conservative assumption of one waste railcar per train.*

Alternatives	Impacts from Decommissioning Actions (Short-term Impacts)
Sitewide Removal - All site facilities would be removed - All environmental media would be decontaminated - All radioactive, hazardous, and mixed waste would be shipped off site for disposal	• Entire site would be available for release for unrestricted use. • Requires highest overall level of employment because of long duration. • Incurs highest radiological population dose to the public, but less than 1 LCF. Average worker dose would remain below administrative control limits. • Generates the largest quantity of decommissioning waste for offsite disposal, about 60 times more than Sitewide Close-In-Place and 8 times more than Phase 1 of Phased Decisionmaking. Greatest volume of potential orphan waste. • Has the highest nonradiological health risk to the public from traffic accidents. • This alternative appears to meet NRC's decommissioning ALARA requirement.
Sitewide Close-In-Place - Major facilities would be closed in place - Residual radioactivity and/or contamination in facilities with larger inventories of long-lived radionuclides would be isolated by specially designed closure structures and engineered barriers - Buffer area and long-term stewardship required	• Portions of the site would be available for release for unrestricted use over a period of time. • Requires high level of employment but over a short duration. • Incurs lowest radiological population dose to the public of the decommissioning alternatives, and less than 1 LCF. Average worker dose would remain below administrative control limits. • Smallest volume of waste including potential orphan waste for offsite disposal. • Would result in less than 1 nonradiological traffic fatality from traffic accidents. • This alternative appears to meet NRC's decommissioning ALARA requirement.
Phased Decisionmaking [1](the Preferred Alternative) - Decommissioning would be completed in two phases - Phase 1 activities: removal of Main Plant Process Building, Vitrification Facility and 01-14 Building, source area for the North Plateau Groundwater Plume, lagoons in the Low-Level Waste Treatment Facility Area - The Waste Tank Farm and waste disposal areas would be actively managed in their current configuration during Phase 1 - Additional studies and evaluations would be conducted during Phase 1 to clarify and possibly reduce uncertainties related to the Phase 2 decision - Phase 2 would address Waste Tank Farm, Construction Demolition and Debris Landfill, non-source area of the plume, and waste disposal areas following the approach determined through Phase 1 evaluations, including for the SDA, possible continued active management.	• A portion of the site would be available for release for unrestricted use during Phase 1. Balance of the site would be available for unrestricted release if Phase 2 is removal of the remaining facilities/contamination; a smaller portion if Phase 2 is close-in-place for the remaining facilities/contamination. • Average level of employment for Phase 1 actions comparable to Sitewide Removal but for shorter period of time. Total employment (worker-years) would be similar to Sitewide Removal if Phase 2 is removal of remaining facilities/contamination; similar to Phase 1 plus Sitewide Close-In-Place if Phase 2 is close-in-place for the remaining facilities/contamination. • Phase 1 incurs radiological population dose to the public between the other decommissioning alternatives, and less than 1 latent cancer fatality. Average worker dose would remain below administrative control limits. • Generates more waste for offsite disposal than Sitewide Close-In-Place, but less than Sitewide Removal for Phase 1 actions. Total waste volumes would be similar to Sitewide Removal if Phase 2 is removal of remaining facilities/contamination, similar to Phase 1 plus 30 percent of Sitewide Close-In-Place volume if Phase 2 is close-in-place for the remaining facilities/contamination. • Phase 1 would result in less than 2 nonradiological traffic fatalities. • Impacts for both phases would generally be bounded by those for the Sitewide Removal and Sitewide Close-in-Place Alternatives, but would in some cases be bounded by the No Action Alternative if the Phase 2 decision for the SDA is continued active management. • This alternative appears to meet NRC's decommissioning ALARA requirement regardless of the Phase 2 decommissioning decision.
No Action - No actions taken toward decommissioning - Would require continued management and oversight of all facilities located on the WNYNSC property - Does not meet the purpose and need for agency action	• No decommissioning actions or impacts.

[1] *The short-term impact analyses in the EIS are based on Phase 1 comprising 8 years of decommissioning activities followed by 22 years of monitoring and maintenance.*

Mitigation Measures for Decommissioning Actions	Monitoring and Maintenance Impacts	Mitigation Measures for Long-term Monitoring and Maintenance	Implementation Schedule
• Runoff and sedimentation controls, spill prevention and control measures, waste water treatment systems, scheduling restrictions to protect water quality. • Dust suppression system, equipment exhaust, building off-gas systems to protect air quality. • Environmental enclosures, building off-gas systems, shield walls, remote operations, protective equipment to protect human health and safety.	• No long-term monitoring or maintenance (stewardship) requirement or impacts. • Negligible long-term radiological dose to the offsite public, very small dose to individuals who would reuse the site.	• None necessary.	• 60 years to implement decommissioning actions. • No monitoring or maintenance after removal is complete.
• Runoff and sedimentation controls, spill prevention and control measures, waste water treatment systems, scheduling restrictions to protect water quality. • Dust suppression system, equipment exhaust, building off-gas systems to protect air quality. • Building off-gas systems, shield walls, remote operations, and protective equipment to protect human health and safety.	• Requires a small number of workers in perpetuity. • Small radiological dose to the public and workers (less than No Action). • Small waste volumes (less than No Action). • Results in small to moderate radiological doses in the long-term to the public, assuming institutional controls are in place, moderate dose to an intruder if institutional controls fail.	• Engineered barriers (including erosion control measures), monitoring and maintenance activities to protect the environment and human health and safety.	• 7 years to implement decommissioning actions. • Monitoring and maintenance in perpetuity.
• Runoff and sedimentation controls, spill prevention and control measures, waste water treatment systems, scheduling restrictions to protect water quality. • Dust suppression system, equipment exhaust, building off-gas systems to protect air quality. • Building off-gas systems, shield walls, remote operations, and protective equipment to protect human health and safety.	• If Phase 2 is close-in-place, a small number of workers would be required in perpetuity; no workers would be required if Phase 2 is Sitewide Removal. • Long-term human health impacts are comparable to Sitewide Removal if Phase 2 is removal of remaining facilities/contamination. Long-term human health impacts are slightly less than Sitewide Close-In-Place if Phase 2 is close-in-place for the remaining facilities/contamination. • Long-term human health impacts in some cases are bounded by the No Action Alternative if the Phase 2 decision for the SDA is continued active management.	• Engineered barriers (including erosion control measures), monitoring and maintenance activities to protect the environment and human health and safety if Phase 2 is close-in-place management of portions of the site or if the Phase 2 decision for the SDA is continued active management. • None required if Phase 2 is removal.	• 8 years for Phase 1 removal actions • Up to 10 years (concurrent with Phase 1 removal actions) for additional studies and analyses to support Phase 2 decisionmaking. • Additional time to implement the Phase 2 decision. • Potential for monitoring and maintenance in perpetuity, depending on the Phase 2 decision.
	• Non-impacted portions of the site would be available for unrestricted release. • Requires workers in perpetuity. • Incurs annual radiological dose to the public and workers from monitoring and maintenance activities. • Generates waste from monitoring and maintenance activities in perpetuity. • Results in small to moderate radiological doses in the long-term to the public, potentially very high dose to an inadvertent intruder if institutional controls are lost.	• Existing wastewater treatment systems to protect water quality. • Existing, building off-gas systems to protect air quality. • Existing building off-gas systems, shield walls, and protective equipment to protect human health and safety.	• Monitoring and maintenance in perpetuity.

Table 2. Comparison of Alternatives by Resource Area for Short-term Impacts [a]

Resource Area	Sitewide Removal Alternative	Sitewide Close-In-Place Alternative	Phased Decisionmaking Alternative (Phase I only) [b, c]	No Action Alternative
Duration of Decommissioning Action	60 years	7 years	8 years	None
Duration of Post-decommissioning Monitoring and Maintenance or Stewardship	Necessary only while any orphan waste is being stored	In perpetuity	In perpetuity if Phase 2 involves in-place closure	No decommissioning Monitoring and Maintenance in perpetuity
Land Use [d] – land estimated to be available for unrestricted release upon completion of alternative	Entire 1,351 hectares (except for any land used for orphan waste storage)	1,118 hectares	693 hectares	693 hectares
Socioeconomics [e] – average employment	Decommissioning: 250 employees annually Monitoring and Maintenance: 20 employees (assuming orphan waste storage)	Decommissioning: 320 employees annually Monitoring and Maintenance: about 31 employees annually until Interim Storage Facility removed; then about 18, indefinitely	Decommissioning: 230 employees annually Monitoring and Maintenance: About 50 employees annually, up to 30 years	Monitoring and Maintenance: About 75 employees annually, indefinitely
Human Health and Safety (public)[f] – population dose (and risk) to the public	Decommissioning: 120 person-rem (0.027 LCF) Monitoring and Maintenance: negligible dose, even if orphan waste is stored onsite	Decommissioning: 40 person-rem (0.012 LCF) Monitoring and Maintenance: 0.0015 person-rem for periodic permeable treatment wall replacement, if necessary; and one-time Interim Storage Facility removal	Decommissioning: 42 person-rem (0.0056 LCF) Monitoring and Maintenance: 0.038 person-rem for one-time permeable treatment wall replacement, if necessary; one-time Interim Storage Facility removal; and ongoing WMA 3 operations	Monitoring and Maintenance: 0.083 person-rem per year
– peak annual MEI dose	1.3 millirem (2.0×10^{-7} LCF)	0.16 millirem (4.2×10^{-8} LCF)	2.2 millirem (3.5×10^{-7} LCF)	0.61 millirem (2.1×10^{-7} LCF)
Human Health and Safety (site workers) [g] – worker population dose (and risk)	Decommissioning: 990 person-rem (0.60 LCF) Monitoring and Maintenance following decommissioning actions: 0.15 person-rem (8.0×10^{-5} LCF) per year if orphan waste is stored on site	Decommissioning: 120 person-rem (0.0070 LCF) Monitoring and Maintenance following decommissioning actions: 0.80 person-rem (5.0×10^{-4} LCF) per year	Decommissioning: 160 person-rem (0.090 LCF) Monitoring and Maintenance following decommissioning actions: 1.7 person-rem (1.0×10^{-3} LCF) per year	Monitoring and Maintenance: 2.0 person-rem per year (0.0010 LCF)
– average worker dose from decommissioning actions	66 millirem (4.0×10^{-5} LCF) per year	54 millirem (3.0×10^{-5} LCF) per year	83 millirem (5.0×10^{-5} LCF) per year	No decommissioning occurs
Waste Management [h] – packaged decommissioning waste (cubic meters)	140,000 nonhazardous 15 hazardous 1,500,000 LLW [i] 4,200 GTCC [i] 1,000 TRU [i] 570 MLLW **1,600,000 Total**	15,000 nonhazardous 3 hazardous 9,900 LLW [i] 0 GTCC 35 TRU [i] 410 MLLW **26,000 Total**	33,000 nonhazardous 2 hazardous 180,000 LLW [i] 0 GTCC 710 TRU [i] 41 MLLW **210,000 Total**	None
Waste Management [h] – packaged monitoring and maintenance (M&M) or long-term stewardship (LTS) waste (cubic meters per year)	3.2 LLW [i] (assuming orphan waste storage)	0 nonhazardous 0 hazardous 110 LLW 0 GTCC 0 TRU 0 MLLW **110 Total** (LTS)	6 nonhazardous <1 hazardous 140 LLW 0 GTCC 0 TRU 0 MLLW **150 Total** (M&M)	32 nonhazardous 1 hazardous 450 LLW 0 GTCC 0 TRU <1 MLLW **480 Total** (M&M)

Resource Area	Sitewide Removal Alternative	Sitewide Close-In-Place Alternative	Phased Decisionmaking Alternative (Phase I only) [b,c]	No Action Alternative
Transportation [j,k] – dose and risk to the public along transportation routes during transportation (person-rem [LCFs])	DOE/Commercial Truck: 370 (0.22) Rail: 94 (0.057) Commercial Truck: 350 (0.21) Rail: 94 (0.57)	DOE/Commercial Truck: 11 (6.6×10^{-3}) Rail: 2.8 (1.7×10^{-3}) Commercial Truck: 9.9 (6.0×10^{-3}) Rail: 2.6 (1.6×10^{-3})	DOE/Commercial Truck: 72 (0.043) Rail: 16 (9.8×10^{-3}) Commercial Truck: 58 (0.035) Rail: 16 (9.7×10^{-3})	DOE/Commercial Truck: 12 (7.1×10^{-3}) Rail: 2.6 (1.6×10^{-3}) Commercial Truck: 9.8 (5.9×10^{-3}) Rail: 2.6 (1.6×10^{-3})
Transportation [j,k] – dose and risk to transportation workers during transportation (person-rem [LCFs]) [l]	DOE/Commercial Truck: 2,100 (1.2) Rail: 65 (0.039) Commercial Truck: 2,200 (1.3) Rail: 65 (0.039)	DOE/Commercial Truck: 49 (0.029) Rail: 1.9 (1.2×10^{-3}) Commercial Truck: 45 (0.027) Rail: 1.4 (8.5×10^{-4})	DOE/Commercial Truck: 270 (0.16) Rail: 11 (6.5×10^{-3}) Commercial Truck: 400 (0.24) Rail: 11 (6.5×10^{-3})	DOE/Commercial Truck: 38 (0.023) Rail: 1.7 (1.0×10^{-3}) Commercial Truck: 31 (0.019) Rail: 1.4 (8.2×10^{-4})
Transportation [j,k] – nonradiological accident risk (number of traffic fatalities)	DOE/Commercial Truck: 9.7 Rail: 15 Commercial Truck: 10 Rail: 15	DOE/Commercial Truck: 0.10 Rail: 0.17 Commercial Truck: 0.12 Rail: 0.17	DOE/Commercial Truck: 1.0 Rail: 1.8 Commercial Truck: 1.3 Rail: 1.8	DOE/Commercial Truck: 0.050 Rail: 0.090 Commercial Truck: 0.060 Rail: 0.090

GTCC = Greater-Than-Class C waste, LCF = latent cancer fatality, LLW = low-level radioactive waste, MEI = maximally exposed individual, MLLW = mixed low-level radioactive waste, TRU = transuranic waste.

[a] Totals may not add due to rounding. All values except for land use are rounded to no more than two significant figures.

[b] Magnitude of impacts for the Phased Decisionmaking Alternative depends on the Phase 2 activities implemented.

[c] The analyses for the Phased Decisionmaking Alternative presented in Chapter 4 of the EIS are based on making a Phase 2 decision 30 years after the initial ROD and Findings Statement, if the Phased Decisionmaking Alternative is selected, and the impacts identified in this table result from those analyses. The Phased Decisionmaking Alternative now specifies that Phase 2 decisions would be made no later than 10 years after issuance of such a ROD and Findings Statement. The potential impact of the change in decision point timing is qualitatively addressed in the text in this section of the Summary.

[d] Source: Chapter 4, Table 4–1, of the EIS, "Summary of Land and Visual Resources Impacts."

[e] Source: Chapter 4, Table 4–11, of the EIS, "Summary of Socioeconomic Impacts."

[f] Source: Chapter 4, Table 4–12, of the EIS, "Summary of Health and Safety Impacts." The peak annual dose to the MEI is the highest of the following locations: receptor at nearest site boundary, on Cattaraugus Creek near the site, or on the lower reaches of Cattaraugus Creek.

[g] Source: Chapter 4, Table 4–18, of the EIS, "Projected Worker Dose and Risk During and After Decommissioning."

[h] Source: Chapter 4, Table 4–46, of the EIS, "Summary of Waste Management Impacts." For all decommissioning alternatives, up to approximately 3.2 cubic meters (110 cubic feet) per year of additional low-level radioactive waste could be generated due to management of orphan waste.

[i] Pre-West Valley Demonstration Project Class B and C low-level radioactive waste, Greater-Than-Class C low-level radioactive waste, and non-defense transuranic waste do not have a clear disposal path and may need to be stored on site until a disposal location is identified. DOE plans to select a location for a disposal facility for Greater-Than-Class C waste and potential non-defense transuranic waste following completion of the Disposal of Greater-Than-Class C Low-Level Radioactive Waste Environmental Impact Statement (GTCC EIS) (DOE/EIS-0375).

[j] Source: Chapter 4, Table 4–53, of this EIS, "Risks of Transporting Radioactive Waste Under Each Alternative."

[k] For the purpose of comparison with other alternatives, transportation impacts for the No Action Alternative are provided for monitoring and maintenance activities over a 20-year period, which would continue to recur in 20-year cycles. Under the DOE/Commercial Disposal Option, low-level radioactive wastes are assumed to go to the Nevada Test Site or a western U.S. commercial disposal site. Under the Commercial Disposal Option, only commercial facilities would be used. However, for purposes of analysis only, it was assumed that transuranic waste and Greater-Than-Class C waste would be transported to the Waste Isolation Pilot Plant and the Nevada Test Site, respectively.

[l] The dose to transportation workers presented in this table does not reflect administrative controls applied to the workers. In practice, workers who are not trained radiation workers would be limited to a dose of 100 millirem per year, and trained radiation workers would be limited to an Administrative Control Limit of 2 rem per year, which would represent an annual risk of 0.0012 LCF for a trained radiation worker. Enforcement of the administrative limit would most likely be necessary under the Sitewide Removal Alternative.

Note: To convert hectares to acres, multiply by 2.471. To convert cubic meters to cubic feet, multiply by 35.314.

Table 3. Comparison of Long-term Human Health Radiological Consequences

Peak Annual Dose	Sitewide Removal Alternative	Sitewide Close-In-Place Alternative	Phased Decisionmaking Alternative	No Action Alternative
Peak Annual Dose to Postulated Offsite Populations	Essentially negligible.	About 95 person-rem with or without institutional controls. About 240 person-rem assuming unmitigated erosion.	If Phase 2 is removal for the remaining Waste Management Areas, long-term impacts would be comparable to the Sitewide Removal Alternative. If Phase 2 is close-in-place for the remaining Waste Management Areas, long-term impacts would be slightly less than those for the Sitewide Close-In-Place Alternative. If the Phase 2 decision for the SDA is continued active management, long-term impacts for some exposure scenarios and receptors would be bounded by the No Action Alternative.	Abut 95 person-rem with institutional controls and 340 person-rem without. About 1,500 person-rem assuming unmitigated erosion.
Peak Annual Dose to Postulated Offsite Individual Receptors	Essentially negligible.	Less than 0.2 millirem with or without institutional controls. Up to 4 millirem assuming unmitigated erosion.		About 0.7 millirem with institutional controls and up to 3 millirem without. Up to 34 millirem assuming unmitigated erosion.
Peak Annual Dose to Postulated Onsite Receptors (Intruders) Assuming Loss of Institutional Controls	Less than 25 millirem for intruders with houses, gardens, and water wells in areas with soil contaminated at unrestricted release levels.	Less than 1 millirem to about 160 millirem to intruders with gardens in contaminated soil or wells in contaminated water.		Less than 1 millirem to 400 rem to intruders with gardens in contaminated soil or wells in contaminated water.

less than 1 millirem per year if only groundwater release mechanisms are involved (less than the No Action Alternative) and up to 4 millirem per year if there is extended (many hundreds of years) loss of institutional control such that unmitigated erosion occurs.[2] If institutional controls are lost and there are intruders into the industrialized area, there could be annual doses of less than 1 millirem to 160 millirem to intruders who consume produce from gardens in areas containing contaminated soil from large excavation activities or who use water from contaminated wells. The intruder doses would be less than those for the No Action Alternative because engineered barriers would reduce the likelihood of direct intrusion and slow the migration of contaminants. The highest doses for the Sitewide Close-In-Place Alternative are for an intruder with a well in the North Plateau Groundwater Plume, or near the Main Plant Process Building or the Waste Tank Farm.

Long-term human health impacts for the **Phased Decisionmaking Alternative** would depend on the Phase 2 decision. If the Phase 2 decision is removal of remaining waste and contamination, the long-term impacts at WNYNSC and in the region would be the same as those projected for the Sitewide Removal Alternative. If the Phase 2 decision is in-place closure of remaining waste and contamination, long-term impacts would be slightly less than those for the Sitewide Close-In-Place Alternative because the Main Plant Process Building, the Vitrification Facility, the source area of the North Plateau Groundwater Plume, and the Low-

[2] *If institutional controls remain in place, any release to the accessible environment could be monitored and time- and location-specific corrective actions taken.*

Level Waste Treatment Facility Area lagoons would have been removed during Phase 1. If the Phase 2 decision for the SDA is continued active management, the long-term impacts for some exposure scenarios and receptors would be bounded by those for the No Action Alternative. Neither the magnitude nor timing of the peak annual dose from units that would be closed in place is considered to be sensitive to whether the Phase 2 decision is made 10 or 30 years after the initial DOE ROD and NYSERDA Findings Statement, if the Phased Decisionmaking Alternative is selected.

Under the **No Action Alternative**, material would not be removed and engineered barriers would not be added to isolate waste. Existing barriers and institutional controls would be relied on to limit offsite and onsite doses. The estimated peak annual dose to offsite individual receptors, if institutional controls are assumed to remain in place, would be less than 1 millirem. The estimated peak annual dose to offsite individual receptors in the event of loss of institutional controls is up to 3 millirem per year if only groundwater release mechanisms are involved, and up to 34 millirem per year if there is extended (many hundreds of years) loss of institutional controls such that unmitigated erosion occurs. If institutional controls are lost and there are intruders into the industrialized area, there could be annual doses of up to 400 rem to intruders who consume produce from gardens in areas containing contaminated soil from large excavation activities or use water from contaminated wells. The higher doses could occur near any of the industrial facilities on the Project Premises or the SDA. The No Action Alternative is the baseline for evaluating and comparing the long-term impacts under the decommissioning alternatives.

Cost-Benefit Analysis

Insight into the cost-effectiveness of the alternatives is provided by comparing the ratio of the incremental cost for an alternative (the cost for an alternative less the cost of the No Action Alternative) and the net 1,000-year population dose reduction (the avoided population dose due to removal or increased isolation less the worker and public population dose required to achieve the new end state).

As shown in *Table 4*, the Sitewide Close-In-Place Alternative has the lowest range of incremental cost-effectiveness, although portions of the ranges of incremental cost-effectiveness overlap for all action alternatives. The range for the Phased Decisionmaking Alternative is the broadest and is influenced, in order of importance, by the following factors: real discount rate, the nature of the Phase 2 decision (removal or in-place closure), timing of the Phase 2 decision, and the cost of Greater-Than-Class C waste disposal (if the Phase 2 decision is removal). The cost effectiveness range for the Phased Decisionmaking Alternative in *Table 4* includes the cost per avoided person-rem for making the Phase 2 decision at both 10 years and 30 years from the initial ROD and Findings Statement, if the Phased Decisionmaking Alternative is selected. All other factors being equal, the cost per avoided person-rem would be higher if the Phase 2 decision is made at 10 years rather than 30 years. This can be primarily attributed to the effect of the discount rate over time.

Table 4. Cost-Benefit Comparative Assessment [a]

Sitewide Removal Alternative	Sitewide Close-In-Place Alternative	Phased Decisionmaking Alternative [b]	No Action Alternative
The Sitewide Removal Alternative would transfer essentially the entire site radionuclide inventory to other disposal sites. The incremental cost-effectiveness is estimated to range from about $430,000 to $1,300,000 per avoided person-rem.	The Sitewide Close-In-Place Alternative would keep most of the site radionuclide inventory out of the site's accessible environment. The incremental cost-effectiveness is estimated to range from about $210,000 to $950,000 per avoided person-rem.	The cost-effectiveness of this alternative would depend primarily on the Phase 2 decision. If the Phase 2 decision is timely removal of the remaining waste and contamination, the incremental cost-effectiveness is estimated to range from about $230,000 to $1,300,000 per avoided person-rem. If the Phase 2 decision is timely in-place closure for the remaining waste and contamination, the incremental cost-effectiveness is estimated to range from about $450,000 to $760,000 per avoided person-rem.	The No Action Alternative serves as a baseline for assessing the incremental cost-effectiveness of the decommissioning alternatives.

[a] The analysis was performed for all alternatives assuming real discount rates ranging from 1 to 5 percent, and unit Greater-Than-Class C waste disposal costs ranging from $2,300 to $21,000 per cubic foot. The values in this table are based on calculations that assume continued institutional controls.

[b] The analysis for the Phased Decisionmaking Alternative assumes the Phase 2 decision is either all removal or all in-place closure of the Waste Tank Farm, NRC-Licensed Disposal Area, and State-Licensed Disposal Area.

Conclusions by Alternative

The following conclusions are based on a comparative analysis of impacts of the proposed alternatives. This discussion is focused on impacts considered to be potential discriminators among the alternatives.

- The ***Sitewide Removal Alternative*** would result in the most land available for release for unrestricted use (the entire WNYNSC), and would not require long-term stewardship, although institutional controls could be needed during possible temporary management of orphan waste. This alternative would result in the highest decommissioning impacts at the site, on site workers, and on the public in the vicinity of WNYNSC and along the transportation routes over a period of about 60 years. This alternative would incur the highest short-term collective radiological dose to the public and workers from both onsite and transportation activities. Transporting the waste off site for disposal is estimated to result in as many as 10 to 15 fatalities from truck and rail accidents, respectively. Possible long-term dose to the general population in the vicinity of WNYNSC would be negligible. This alternative appears to meet NRC's decommissioning as low as is reasonably achievable (ALARA) requirement.

- The ***Sitewide Close-in-Place Alternative*** would result in fewer decommissioning impacts at the site, require the least amount of time to accomplish, and generate the least amount of waste (other than the No Action Alternative) that would need to be disposed of elsewhere. This alternative would result in less land available for release for unrestricted use than the Sitewide Removal Alternative. Transporting the waste off site for disposal is estimated to result in 1 fatality from transportation accidents. However, implementing this alternative would require long-term stewardship at WNYNSC, including institutional controls. The reasonably foreseeable long-term peak annual dose to Lake Erie water users assuming unmitigated erosion (worst case) would be about 0.4 millirem, which would be indistinguishable from the dose associated with background radiation. This alternative appears to meet NRC's decommissioning ALARA requirement.

- The ***Phased Decisionmaking Alternative*** (Phase 1) would not result in more land available for release than the No Action Alternative, but would have positive impacts because contaminated facilities would be removed and the source area for the North Plateau Groundwater Plume would be removed during decommissioning activities. Transporting waste off site is estimated to result in 1 to 2 fatalities from transportation accidents.

  If the Phase 2 decision is removal of remaining waste and contamination, total impacts from the Phased Decisionmaking Alternative would be similar to those for the Sitewide Removal Alternative. If the Phase 2 decision is in-place closure of the remaining waste and contamination, total waste generation and transportation impacts (including nonradiological fatalities from traffic accidents) would be only slightly more than those for Phase 1, but the total worker exposure would be about 50 percent higher than that for Phase 1. Long-term impacts would be less than those for the Sitewide Closure Alternative: because of removal actions during Phase 1, the time-integrated (cumulative) population dose over 1,000 years would be about 85 percent of the dose projected for the Sitewide Close-in-Place Alternative. However, because of the long-lived radionuclides that would remain in the waste disposal areas, the time-integrated population dose over 10,000 years would be about 97 percent of the dose projected for the Sitewide Close-in-Place Alternative. If the Phase 2 decision for the SDA is continued active management, short-term Phase 2 impacts for some resource areas are expected to be bounded by those for the No Action Alternative. There would be less transportation, so the associated impacts, including nonradiological fatalities from traffic accidents, would be lower. The long-term human health impacts for continued active management of the SDA would be the same as those identified for the SDA under the No Action Alternative. The Phased Decisionmaking Alternative appears to meet NRC's decommissioning ALARA requirement regardless of the Phase 2 decommissioning decision.

  Making the Phase 2 decision at 10 years instead of 30 years would result in a small reduction in the total impact of decommissioning because most of the Phase 1 impacts are the result of the removal actions that occur in the first 8 years of Phase 1. The most important change in impacts associated with the shorter duration of Phase 1 would be the reduced socioeconomic impact. A shorter Phase 1 would eliminate the approximately 20-year period of reduced site employment following completion of the Phase 1 decommissioning actions followed by an increase in site employment when Phase 2 implementation begins.

- The ***No Action Alternative*** would not involve decommissioning. Waste and contamination would remain in their current locations, and there would be no change in site operations. Long-term impacts would be higher than those for the Sitewide Close-in-Place Alternative because there would be fewer engineered barriers to retard the migration of radionuclides from their original locations and to act as intrusion barriers in the event of loss of institutional controls. The long-term peak annual dose to Lake Erie water users assuming unmitigated erosion (worst case) would be about 3 millirem. This alternative and its impacts serve as the baseline for evaluating decommissioning alternatives.

A Low-level Radioactive Waste Shipment Leaving the WNYNSC

4. What are the Uncertainties In the Environmental Impact Estimates?

There are analytical uncertainties in the estimates of environmental impacts. The analytical uncertainties were accommodated either by making conservative assumptions in the environmental impact analyses or by providing multiple analyses with different assumptions in order to provide bounding estimates of the impacts. The following paragraphs provide examples of these uncertainties and how they have been addressed.

Human health impacts. For occupational exposure, information that is incomplete or unavailable includes: (1) more detailed information on the radionuclides in the waste, particularly the gamma emitters, (2) the design details for the facilities that would be used for waste handling and processing, and (3) more detailed information on how workers would be used in decommissioning actions. This uncertainty has been addressed primarily by the use of conservative assumptions related to category-specific exposure rates and by not accounting for radioactive decay of the radionuclides considered to be the major contributors to dose.

For public exposure, information that is incomplete or unavailable includes: (1) more detailed information on the radionuclides in the waste; (2) the location and actions of future nearby critical receptors; and (3) changes in the total population and population distribution during the time period associated with decommissioning actions. The uncertainty related to this lack of information is addressed through the use of conservative assumptions for: the normal and accident scenario release source terms; total population and its distribution; average breathing rate, water, and fish consumption; and the location of critical receptors.

Transportation impacts. Information that is unavailable at this time includes (1) detailed data on the distribution of radionuclides, particularly gamma emitters, in packaged waste; (2) the radiation dose from the waste packages; (3) the specific transportation route (because of uncertainty about where the waste would be disposed); and (4) information on how the waste would be shipped (truck, rail, or a combination of both). Uncertainty about the radionuclide distribution has been addressed by using conservative assumptions related to the waste package inventory and surface dose rate. Uncertainty about the locations of facilities to dispose of low-level and mixed low-level radioactive waste has been addressed by considering two general disposal options. In the *DOE/Commercial Disposal Option*, wastes would be transported to a combination of commercial and DOE disposal facilities; in the *Commercial Disposal Option*, waste would be transported only to commercial disposal facilities. The uncertainty about the transportation mode (truck or rail) has been addressed by evaluating both modes.

Waste management impacts. The waste management analysis has two areas of uncertainty due to the lack of complete information, including (1) the volumes and characteristics of waste that would be generated under each alternative, and (2) the availability of disposal sites for some of the waste, particularly commercial Class B and C low-level radioactive waste, Greater-Than-Class C waste, potential non-defense transuranic waste, and any high-level radioactive waste. The uncertainty related to waste volumes and characteristics is limited by the availability of site contamination characterization data. This uncertainty has been addressed by using moderately conservative estimates of waste volume and waste classification. The uncertainty about the availability of disposal sites for commercial Class B and C low-level radioactive waste,

Greater-Than-Class C waste, and potential non-defense transuranic waste has been addressed by estimating the annual impacts of on-site storage of these potentially orphan wastes.

Long-term human health impacts. The major elements of currently unavailable information include (1) characterization of the nature and distribution of the contaminants, (2) the performance of engineered barriers, (3) site hydrology and groundwater chemistry, (4) contaminant release rates, (5) unmitigated erosion rates, (6) contaminant chemistry at the point of release into surface waters and the resulting adsorption and deposition, (7) bioaccumulation in plants and animals, and (8) knowledge of the timing and nature of future human activity, including the reliability of institutional controls. To address the uncertainty associated with this unavailable information, assumptions considered to be reasonably conservative have been used in the analyses. The major conservative assumptions are discussed in Appendix H, Section H.2.2.1, of the EIS.

The uncertainty about the reliability of institutional controls that would limit access to the site, maintain facilities or engineered barriers, and monitor the performance of waste isolation systems has been addressed by conducting the long-term analyses under two different sets of assumptions. The first set assumes that institutional controls are effective for the foreseeable future and that (1) intruders are kept off the site, and (2) facilities or engineered barriers are maintained. The second set assumes that institutional controls fail after 100 years so that intruders can enter areas containing waste. There is a special case in the second set that analyzes the unmitigated erosion scenario. In this scenario, institutional controls are assumed to remain in a failed mode for many hundreds of years so there is no mitigation of erosion as gullies advance toward areas containing waste.

Franks Creek – A short distance downstream of its confluence with Erdman Brook and just upstream of the WVDP boundary.

5. Potential Mitigation Measures

Mitigation includes avoiding an impact by not taking a certain action; minimizing an impact by limiting the action's magnitude; rectifying an impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating an impact over time by preservation and maintenance operations; or compensating for an impact by replacing or providing substitute resources or environments.

DOE and NYSERDA developed a series of potential mitigation measures to address the anticipated impacts of the proposed alternatives. *Table 5* presents the potential mitigation measures, resource areas, and proposed alternatives and identifies which resource areas and alternatives would benefit from selected measures. The first part of the table identifies potential mitigation measures that could be applied during design, construction, and demolition activities. The second part identifies potential mitigation measures that could be applied during decommissioning activities when facilities would be operating. The third part of *Table 5* identifies mitigation measures (e.g., engineered barriers, access and erosion controls, environmental monitoring) that would reduce potential long-term impacts from implementation of the EIS alternatives.

Soil Characterization Activities

Table 5. Potential Mitigation Measures

Mitigation Measure	Resource Area											EIS Alternative [a]			
	Land Use and Visual Resources	Geology and Soils	Water Resources	Air Quality and Noise	Ecological Resources	Cultural Resources	Socioeconomics	Human Health and Safety	Waste Management	Transportation	Environmental Justice [b]	Sitewide Removal	Sitewide Close-In-Place	Phased Decisionmaking	No Action
Potential Mitigation Measures During Design, Construction, or Demolition[c]															
Visual screens, lower-profile buildings	●											●	●	●	
Erosion and sediment controls		●	●		●	●						●	●	●	
Buffer zones			●		●							●	●	●	
Wetlands and floodplain protection measures			●		●							●	●	●	
Spill control measures			●		●							●	●	●	
Dust suppression measures				●								●	●	●	
Selective location of laydown areas				●								●	●	●	
Use of low sulfur fuels in construction equipment				●								●	●	●	
Scheduling of construction activities			●	●	●		●			●		●	●	●	
Scheduling of transportation				●						●		●	●	●	
Personal protective equipment								●				●	●	●	
Road improvement, traffic controls				●				●		●		●	●	●	
Waste minimization									●	●		●	●	●	
Wastewater treatment systems			●					●	●			●		●	
Preventing contamination spread		●	●									●	●	●	
Potential Mitigation Measures During Facility Operations															
Road improvement, traffic controls				●						●		●		●	
Spill control measures			●		●							●	●	●	●
Personal protective equipment								●				●	●	●	●
Best available control technologies				●								●	●	●	

Mitigation Measure	Resource Area											EIS Alternative[a]			
	Land Use and Visual Resources	Geology and Soils	Water Resources	Air Quality and Noise	Ecological Resources	Cultural Resources	Socioeconomics	Human Health and Safety	Waste Management	Transportation	Environmental Justice[b]	Sitewide Removal	Sitewide Close-In-Place	Phased Decisionmaking	No Action
Confinement systems with ventilation controls and filters				●	●			●				●[d]	●	●[e]	
Wastewater treatment systems			●									●[f]	●[f]	●	●
Scheduling							●			●		●	●	●	●
Job placement and retraining services							●					●	●	●	
Emergency response personnel training								●		●		●	●	●	
Incorporate ALARA measures, including shielding								●				●	●	●	
Selection of transportation routes that limit impacts										●		●	●	●	
Potential Long-Term Mitigation Measures															
Engineered barriers			●[g]		●			●					●[h]	●	●
Access controls								●				●[i]	●	●	●
Erosion controls		●[j]	●[j]									●[j]	●[j]	●[j]	●[j]
Environmental monitoring		●	●		●			●				●	●	●	●
Future site development	●											●	●	●	●

ALARA = as low as is reasonably achivevable.

[a] A complete description of the alternatives is found in Chapter 2 of the EIS.

[b] No Environmental Justice mitigation measures have been identified because no disproportionately high and adverse impacts on minority or low-income populations have been identified.

[c] Some of these mitigation measures that are initially implemented for the construction of facilities that aid decommissioning (e.g., the Container Management Facility) would remain during the operating phase of the facility.

[d] e.g., (1) Waste Tank Farm Waste Processing Facility, (2) Container Management Facility, (3) various enclosures to support exhumation efforts.

[e] Enclosures to support exhumation effort.

[f] e.g., Leachate Treatment Facility.

[g] Circumferential hydrologic barriers utilized as a long-term mitigation measure for protection of water resources (i.e., groundwater quality).

[h] e.g., (1) WMA 1 through WMA 3 hydraulic barrier walls and multi-layer cap, (2) WMA 2 lagoons engineered multi-layer cover, (3) NDA engineered multi-layer cover, (4) SDA engineered multi-layer cover, (5) erosion control structures.

[i] Under the Sitewide Removal Alternative, the Container Management Facility would operate indefinitely until final disposition of decommissioning waste is realized. Access controls would be needed.

[j] Erosion controls as a long-term mitigation measure are more permanent measures when compared to "erosion and sediment controls" for design, construction, or demolition that are more temporary in nature (e.g., mitigation measures usually employed during construction).

High-Level Waste Transfer Trench and Vitrification Facility

6. Where Can I Find Out More?

The Foreword to the EIS presents NYSERDA's view regarding analysis and results presented in the document.

Chapter 1 of the EIS provides a historical overview of activities at WNYNSC, including a brief history of the events leading to development of the document. Topics include the purpose and need for agency action; the scope of the EIS and decisions to be made; the relationship of the EIS to other NEPA documentation, the process used to obtain public input for the EIS, including the process for soliciting comments on the Revised Draft EIS and a summary of comments received; and a discussion of important changes from the Revised Draft EIS to the Final EIS.

Chapter 2 describes the actions proposed by DOE and NYSERDA for decommissioning and long-term stewardship of WNYNSC. It includes descriptions of the three decommissioning alternatives, the No Action Alternative, and a discussion of the alternatives considered and subsequently eliminated from detailed evaluation. The chapter concludes with a comparison of impacts of the alternatives, a discussion of uncertainties, and identification of the Preferred Alternative.

Chapter 3 describes the existing conditions at WNYNSC and the surrounding area and the environmental consequences of the historical activities conducted there on the various resource areas.

Chapter 4 describes the environmental consequences of the alternatives. Topics include detailed discussions of the potential impacts of the alternatives, cost-benefit considerations, intentional destructive acts, cumulative impacts, resource commitments, unavoidable adverse environmental impacts, the relationship between short-term use of the environment and long-term productivity, and irreversible and irretrievable commitments of resources.

Chapter 5 identifies the Federal, State, and local laws, regulations, agency orders, and requirements that are relevant to the EIS.

Chapter 6 summarizes the potential mitigation measures that DOE and NYSERDA could use to avoid or reduce the potential environmental impacts that may result from implementation of the alternatives.

Chapters 7 through 10 contain references, a glossary, index, list of EIS preparers; and a list of agencies, organizations, and individuals who were sent copies of the EIS.

Appendix A provides a summary of the comments received on the 1996 *Cleanup and Closure Draft EIS.*

Appendix B includes the *Federal Register* Notices and New York State Environmental Notice Bulletins pertaining to the EIS.

Appendix C describes the facilities and waste disposal areas associated with the 12 WMAs at WNYNSC. Additional topics include proposed decommissioning and construction activities for each decommissioning alternative.

Appendix D provides an overview of the performance assessment approach.

Appendix E discusses geohydrological modeling, including local three-dimensional groundwater modeling, analysis of near-field flow for different EIS alternatives, and independent modeling calibration results.

Appendix F describes the erosion studies conducted as part of the EIS analyses, including erosional processes at WNYNSC and erosion modeling.

Appendix G discusses the long-term performance assessment models used for the EIS analyses.

Appendix H describes the long-term performance assessment results of the EIS analyses.

Appendix I provides a general discussion of radiation and its health effects. It addresses the methodologies and assumptions used to estimate potential impacts on and risks to individuals and the general public from exposure to radioactive and hazardous chemical material releases during normal operations and hypothetical accidents.

Appendix J provides an overview of the approach used to assess the human health risks that could result from transportation of radioactive materials.

Appendix K presents the methodology used to estimate nonradiological air quality concentrations for each alternative evaluated in the EIS.

Appendix L discusses regulatory compliance issues related to implementation of the decommissioning alternatives.

Appendix M is the Floodplain and Wetland Assessment required by 10 CFR Part 1022.

Appendix N is the analysis of Intentional Destructive Acts. Intentional Destructive Acts include intentional malevolent acts, intentional malicious acts, and acts of terrorism.

Appendix O provides letters documenting the consultations with Federal and State agencies and Tribal Governments.

Appendix P provides a Quantitative Risk Assessment for the SDA, authored by NYSERDA, which evaluates the risk to the public from continued management of the SDA for the next 30 years with its current physical and administrative controls.

Appendix Q provides copies of the concurrence letters on the EIS.

Appendix R provides the Contractor Disclosure Statements.

Finding Answers to Your Questions

For More Information About…	See:
Air Quality	Chapter 3, Section 3.7.2 Chapter 4, Section 4.1.5 Appendix K
Affected Environment	Chapter 3
Alternatives Considered But Eliminated from Detailed Analysis	Chapter 2, Section 2.5
Alternatives Evaluated in this Final EIS	Chapter 2, Section 2.4
Applicable Laws and Regulations	Chapter 5
Cesium Prong	Chapter 2, Section 2.3.2.14 Appendix C, Section C.2.14
Comparison of Impacts	Chapter 2, Section 2.6
Construction of New Facilities and Structures	Chapter 2, Sections 2.4.1.3, 2.4.2.3, and 2.4.3.5 Appendix C, Section C.4
Cost of Alternatives	Chapter 4, Section 4.2.1
Cultural Resources	Chapter 3, Section 3.9 Chapter 4, Section 4.1.7
Cumulative Impacts of Alternatives	Chapter 4, Section 4.5
Decisions to be Supported by this EIS	Chapter 1, Section 1.5
Ecological Resources	Chapter 3, Section 3.8 Chapter 4, Section 4.1.6
EIS Starting Point	Chapter 2, Section 2.3.1
Environmental Justice	Chapter 3, Section 3.12 Chapter 4, Section 4.1.13
Erosion	Chapter 3, Section 3.4 Appendix F

For More Information About…	See:
Floodplains	Chapter 4, Section 4.1.4 Appendix M
Geology and Soils	Chapter 3, Section 3.3 Chapter 4, Section 4.1.3
Groundwater	Chapter 3, Section 3.6.2 Chapter 4, Section 4.1.4 Appendix E
Human Health Effects	Chapter 3, Section 3.11 Chapter 4, Sections 4.1.9, 4.1.10, and 4.5.13 Appendix I
Land Use	Chapter 3, Section 3.1.1 Chapter 4, Section 4.1.1
Long-term Impacts of Alternatives	Chapter 2, Section 2.6.2 Chapter 4, Section 4.1.10 Appendix H
Mitigation Measures	Chapter 6
North Plateau Groundwater Plume	Chapter 2, Section 2.3.2.13 Appendix C, Section C.2.13
No Action Alternative	Chapter 2, Section 2.4.4
NRC-licensed Disposal Area	Chapter 2, Section 2.3.2.7 Appendix C, Section C.2.7
Performance Assessment	Appendix D Appendix G Appendix H
Phased Decisionmaking Alternative	Chapter 2, Section 2.4.3 Appendix C, Section 3.3
Preferred Alternative	Chapter 2, Section 2.7
Proposed Action	Chapter 2, Section 2.2
Public Participation and Comment Process	Chapter 1, Section 1.7 CRD Section 1

For More Information About…	See:
Purpose and Need for Agency Action	Chapter 1, Section 1.3
Scope of this EIS	Chapter 1, Section 1.4
Seismology	Chapter 3, Section 3.5
Short-term Impacts	Chapter 2, Section 2.6.1
Site Infrastructure	Chapter 2, Section 2.3 Chapter 3, Section 3.2 Chapter 4, Section 4.1.2 Appendix C, Section C.2
Sitewide Close-In-Place Alternative	Chapter 2, Section 2.4.2 Appendix C, Section C.3.2
Sitewide Removal Alternative	Chapter 2, Section 2.4.1 Appendix C, Section C.3.1
Socioeconomics	Chapter 3, Section 3.10 Chapter 4, Section 4.1.8
State-Licensed Disposal Area	Chapter 2, Section 2.3.2.8 Appendix C, Section C.2.8
Surface Water	Chapter 3, Section 3.6.1 Chapter 4, Section 4.1.4 Appendix E, Section E.2.3
Transportation	Chapter 4, Section 4.1.12 Appendix J
Uncertainties	Chapter 2, Section 2.8 Chapter 4, Section 4.3
Visual Resources	Chapter 3, Section 3.1 Chapter 4, Section 4.1.1
Waste Management	Chapter 3, Section 3.13 Chapter 4, Section 4.1.11
Waste Management Areas	Chapter 2, Section 2.3.2 Appendix C, Section C.2

For More Information About…	See:
Western New York Nuclear Service Center – Overview	Chapter 2, Section 2.3
West Valley Demonstration Project	Chapter 1, Section 1.1
Wetlands	Chapter 3, Section 3.8.2 Chapter 4, Section 4.1.6 and 4.5.10 Appendix M

7. Public Participation

DOE and NYSERDA have been committed to open, two-way, formal and informal communication with the public throughout the development of this EIS. DOE and NYSERDA have involved the public through public hearings and other comment opportunities, website communications, mailings, working groups, and the Citizen Task Force. Figure 4 identifies the steps in developing an EIS under NEPA and SEQR and the formal opportunities for public involvement. When the steps are different or have different names from the NEPA process steps, the SEQR step is indicated parenthetically.

DOE and NYSERDA solicited comments on the Revised Draft EIS during a 9-month public comment period, which began on December 5, 2008, when the Notice of Availability appeared in the *Federal Register* (73 FR 74170). A Notice of Completion of the Revised Draft EIS and Public Hearing Notice was also published on December 10, 2008, in the *New York State Environmental Notice Bulletin* in accordance with SEQR requirements. The Notice of Availability and Notice of Completion announced a 6-month public comment period, through June 8, 2009, and three public hearings to be held to solicit comments. In response to stakeholder requests, another meeting was added in Albany and the Buffalo meeting was moved from the original Blasdell location to a more central downtown Buffalo location. At a later date, again in

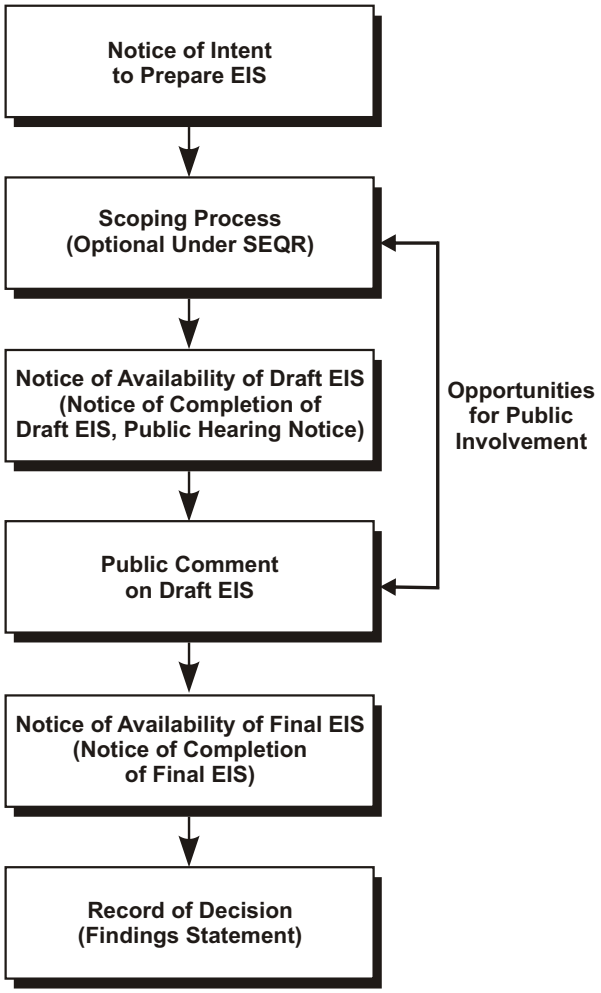


Figure 4. *National Environmental Policy Act and State Environmental Quality Review Act Process*

response to stakeholder requests, the public comment period was extended another 90 days, until September 8, 2009.

Public hearings on the Revised Draft EIS were held in Albany, Irving (on the Seneca Nation of Indians Reservation), Ashford, and Buffalo, New York on March 30 and 31, and April 1 and 2, 2009 respectively. A court reporter recorded the oral comments made at each hearing and prepared a transcript for each that is included in the Comment Response Document (CRD) found in Volume 3, *Comment Response Document*, of the Final EIS.

In response to public concern about some of the alternatives in the Revised Draft EIS, especially after the August 9 and 10, 2009 heavy rainfall events, the DOE Assistant Secretary for Environmental Management and the President of NYSERDA participated in a videoconference with various stakeholders on September 4, 2009 to address those concerns. This meeting was transcribed by a court reporter and the comments and responses were included in the comment response process.

In addition, Federal agencies, state and local government agencies, American Indian Tribal Governments, and the general public were encouraged to submit comments at the public hearings and through U.S. mail, e-mail, a toll-free fax line, and through the DOE EIS website (http://www.westvalleyeis.com). Overall, approximately 420 submittals containing approximately 1,900 comments addressing a wide range of issues were received. DOE and NYSERDA considered all comments, including those received after the comment period ended, in evaluating the accuracy and adequacy of the Revised Draft EIS and to determine whether corrections, clarifications, or other revisions were required.

Individual comments and DOE's and NYSERDA's responses have been compiled in a side-by-side format in Section 3 of the CRD, with each delineated comment receiving a separate response. Topics of broad public interest or concern or that required a more detailed response were characterized as major issues and addressed separately in Section 2 of the CRD.

Summary of Major Issues

The following Major Issues are addressed in Section 2 of the CRD:

Modified Phased Decisionmaking Alternative. A variety of comments revealed a need to clarify the nature of the Phase 2 actions and associated impacts. A specific comment requested clarification that Phase 2 of the Phased Decisionmaking Alternative would involve only removal or in-place closure for those facilities remaining after completion of the Phase 1 decommissioning actions. Several commentors also expressed concerns about the delay in the timing of the Phase 2 decisionmaking. Some expressed a concern that the Phase 2 decision would not be made. Others pointed out the loss in technical expertise and socioeconomic impact that would occur if many years passed between the completion of the Phase 1 decommissioning actions and the initiation of the Phase 2 decommissioning actions.

Support for Sitewide Removal of All Radioactive and Hazardous Wastes. Many of the commentors stated their preference for sitewide removal of all radioactive and hazardous wastes from WNYNSC as soon as possible. In many cases, these commentors expressed specific support for the Sitewide Removal Alternative over other alternatives and cited reasons for their preference.

Concerns about Potential Contamination of Water. Commentors expressed concerns that, because streams near WNYNSC eventually discharge into Lake Erie, contaminated liquid effluents from WNYNSC could enter the streams and adversely affect regional water users in Western New York and the Great Lakes region. Concerns were also expressed about the use of water from nearby streams. In addition, some commentors were specifically concerned about the potential effects of erosion at WNYNSC on water quality.

Questions about Long-term Erosion Modeling. Some commentors, referring to statements in the NYSERDA Foreword to the 2008 Revised Draft EIS, expressed their opinion that the long-term erosion analysis presented in the EIS is not scientifically defensible. Others questioned some of the assumptions used to calibrate the erosion model and expressed concerns about gully projections. Several commentors pointed out the erosion that occurred in the region following the heavy rainfall events of August 9 and 10, 2009, as an illustration of the potential for sudden and dramatic topography changes in the region.

Questions about Cost-Benefit Analysis. Several commentors stated that the cost information presented in Chapter 4, Section 4.2, of the Revised Draft EIS does not accurately represent the total costs of the alternatives or that the cost-benefit information (also presented in Section 4.2) is misleading. Some commentors expressed their opinion that there could be large releases of hazardous constituents that would require expensive mitigation actions if wastes were to remain on site. Some commentors were also critical of the assumptions in the cost-benefit methodology, stating that discounting is not appropriate when evaluating long-term costs.

Conclusions of the *Synapse Report*. Several commentors specifically cited or alluded to the conclusions of a report titled, The *Real Costs of Cleaning Up Nuclear Waste: A Full Cost Accounting of Cleanup Options for the West Valley Nuclear Waste Site (Synapse Report)*. These commentors expressed a preference for the Sitewide Removal Alternative, stating that it is the most cost-effective alternative or represents the least risk and lowest cost, based on the *Synapse Report*. In addition, some commentors stated that the *Synapse Report* analysis is supported by NYSERDA. This latter assertion is inaccurate, according to NYSERDA's comments on the report.

Next Steps

A *Summary and Guide for Stakeholders* and the complete Final EIS have been sent to those who requested it in compact disc or print formats. It is also available for downloading on the Internet (www.westvalleyeis.com) and in the following public reading rooms:

Concord Public Library
18 Chapel Street
Springville, NY 14141
716-592-7742

WVDP Public Reading Room
U.S. Department of Energy
Ashford Office Complex
9030 Route 219
West Valley, NY 14171
716-942-4555

U.S. Department of Energy
FOIA Reading Room
Room 1E-190, Forrestal Bldg.
1000 Independence Ave. SW
Washington, DC 20585
202-586-3142

Based on the Final EIS and other considerations, DOE will announce its decision regarding future actions at WNYNSC in a ROD to be published in the *Federal Register* no sooner than 30 days after publication of the EPA Notice of Availability for the Final EIS. The ROD will describe the alternative selected for implementation and explain how environmental impacts will be avoided, minimized, or mitigated, or, if not, why not. NYSERDA will publish its decisions regarding actions at WNYNSC in a Findings Statement in the *New York State Environmental Notice Bulletin* no sooner than 10 days after issuance of the Final EIS.

8. Helpful Information

Glossary

cask – Heavily shielded container used to store or ship radioactive materials.

cesium – A rare, highly reactive, silver-white element of the alkali metals group.

Cesium Prong – The area of surface soil contaminated by cesium-137 from abnormal releases to the atmosphere caused by reprocessing plant ventilation system failures.

collective dose – The sum of individual doses received in a given period of time by a specified population from exposure to a specified source of radiation. Collective dose is expressed in units of person-rem or person-sievert.

decontamination – Actions taken to reduce or remove chemical or radioactive substances from environmental media (i.e., soil, water, and air), structures (e.g., buildings), equipment, or personnel. Radioactive decontamination may be accomplished by washing, chemical action, mechanical cleaning, or other techniques.

defense waste – Nuclear waste deriving from the manufacture of nuclear weapons and the operation of naval reactors. Associated activities, such as the research carried on in weapons laboratories, also produce defense waste.

dose (radiological) – The radioactive energy that is absorbed by one gram of material that has been irradiated.

ecological resources – Resources such as broadly defined fish and wildlife populations and habitats, as well as their relationships to each other and the environment/ecosystem.

environmental justice – Executive Order 12898 directs Federal agencies to make achieving environmental justice part of their missions by identifying and addressing disproportionately high and adverse effects of agency programs, policies, and activities on minority and low-income populations.

exposure – The amount of radiation or pollutant present in a given environment that represents a potential health threat to living organisms.

floodplain – The portion of a river valley adjacent to the river channel that is built of sediments during the present regimen of the stream and is covered with water when the river overflows its banks at flood stages.

geology – The science that studies the materials, processes, environments, and history of the Earth, including rocks and their formation and structure.

geomembrane – Any impermeable membrane used with soils, rock, earth, or other geotechnical material to block the migration of fluids.

groundwater – Water below the ground surface in a zone of saturation. *Related definition:* Subsurface water is all water that exists in the voids found in soil, rocks, and sediment below the land surface, including soil moisture, capillary fringe water, and groundwater. The part of subsurface water in voids completely saturated with water is called groundwater. Subsurface water above the groundwater table is called vadose water.

infrastructure – The basic facilities, services, and utilities needed for the functioning of an industrial facility. Transportation and electrical systems are part of the infrastructure.

latent cancer fatality (LCF) – A statistically based estimate of deaths from cancer resulting from, and occurring some time after, exposure to ionizing radiation or other carcinogens (see *radiation*).

legacy waste – Waste resulting from past activities.

long-term stewardship – Activities necessary to ensure protection of human health and the environment following closure of a site. Long-term stewardship includes engineered and institutional controls designed to contain or to prevent exposure to residual contamination and waste such as monitoring and maintenance activities, record-keeping activities, inspections, groundwater monitoring and treatment, access control, posting signs, and periodic performance reviews.

maximally exposed individual (MEI) – A hypothetical individual whose location and habits are deliberately chosen to result in the highest total radiological or chemical exposure (and thus dose) from a particular source for all exposure routes (e.g., inhalation, ingestion, direct exposure).

media – Materials capable of absorbing or removing contaminants from other materials. Also, the aspects of the environment that may become contaminated (air, water, and soil are environmental media).

millirem – One-thousandth of a rem (see *rem*).

orphan waste – Waste that cannot currently be disposed of in an established or a planned permanent disposal facility because the path forward for treatment and disposal has not yet been defined. Non-defense transuranic waste, Greater-Than-Class C waste, and commercial Class B and C wastes are current examples of Western New York Nuclear Service Center orphan waste.

permeability – The rate at which liquids and gases pass through materials in a specified direction. In hydrology, the term is used to describe the capacity of a rock, sediment, or soil for transmitting groundwater. Permeability depends on the size and shape of the pores between soil particles and how they are interconnected.

person-rem – A unit of collective radiation dose applied to populations or groups of individuals; that is, a unit for expressing the dose when summed across all persons in a specified population or group.

radiation (ionizing) – Radioactivity resulting from the decay of a radioactive element or produced by radiation-generating equipment.

radioactivity – *As a process:* The spontaneous transformation of unstable atomic nuclei, usually accompanied by the emission of ionizing radiation. *As a property:* The property of unstable nuclei in certain atoms to spontaneously emit ionizing radiation during nuclear transformations.

radwaste – Radioactive waste.

rem – A unit of radiation dose that reflects the ability of different types of radiation to damage human tissues and the susceptibility of different tissues to the damage.

risk – The probability of a detrimental effect to life, health, property, and/or the environment from exposure to a hazard. Risk is often expressed quantitatively as the probability of an adverse event occurring multiplied by the consequences of that event (i.e., the product of these two factors). However, separate presentation of probability and consequence is often more informative.

sediment – Soil, sand, and minerals washed from land into water and deposited on the bottom of a water body.

slurry – A watery mixture of materials that will not dissolve.

source term – The amount of a specific pollutant (e.g., chemical, radionuclide) emitted or discharged to a particular environmental medium (e.g., air, water) from a source or group of sources. It is usually expressed as a rate (i.e., amount per unit time).

upgradient – Upwards against the direction of flow or slope.

uranium – A radioactive, metallic element with the atomic number 92; one of the heaviest naturally occurring elements. Uranium has 14 known isotopes. Uranium-235 is commonly used as a fuel for nuclear fission.

vadose – The zone between the land surface and the water table (saturated zone).

Waste Incidental to Reprocessing – Waste resulting from reprocessing spent nuclear fuel that is not highly radioactive and does not need to be disposed of in a geologic repository in order to manage the risk that it poses.

wetland – An area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in those conditions, including swamps, marshes, bogs, and similar areas.

Acronyms and Abbreviations

ALARA – as low as is reasonably achievable

CFR – *Code of Federal Regulations*

CRD – Comment Response Document

DOE – U.S. Department of Energy

EIS – Environmental Impact Statement

EPA – U.S. Environmental Protection Agency

LCF – latent cancer fatality

NDA – NRC-Licensed Disposal Area

NEPA – National Environmental Policy Act of 1969

NRC – U.S. Nuclear Regulatory Commission

NYCRR – New York Code of Rules and Regulations

NYSDEC – New York State Department of Environmental Conservation

NYSERDA – New York State Energy Research and Development Authority

RCRA – Resource Conservation and Recovery Act

ROD – Record of Decision

SDA – State-Licensed Disposal Area

SEQR – State Environmental Quality Review Act

U.S.C. – United States Code

WMA – Waste Management Area

WNYNSC – Western New York Nuclear Service Center

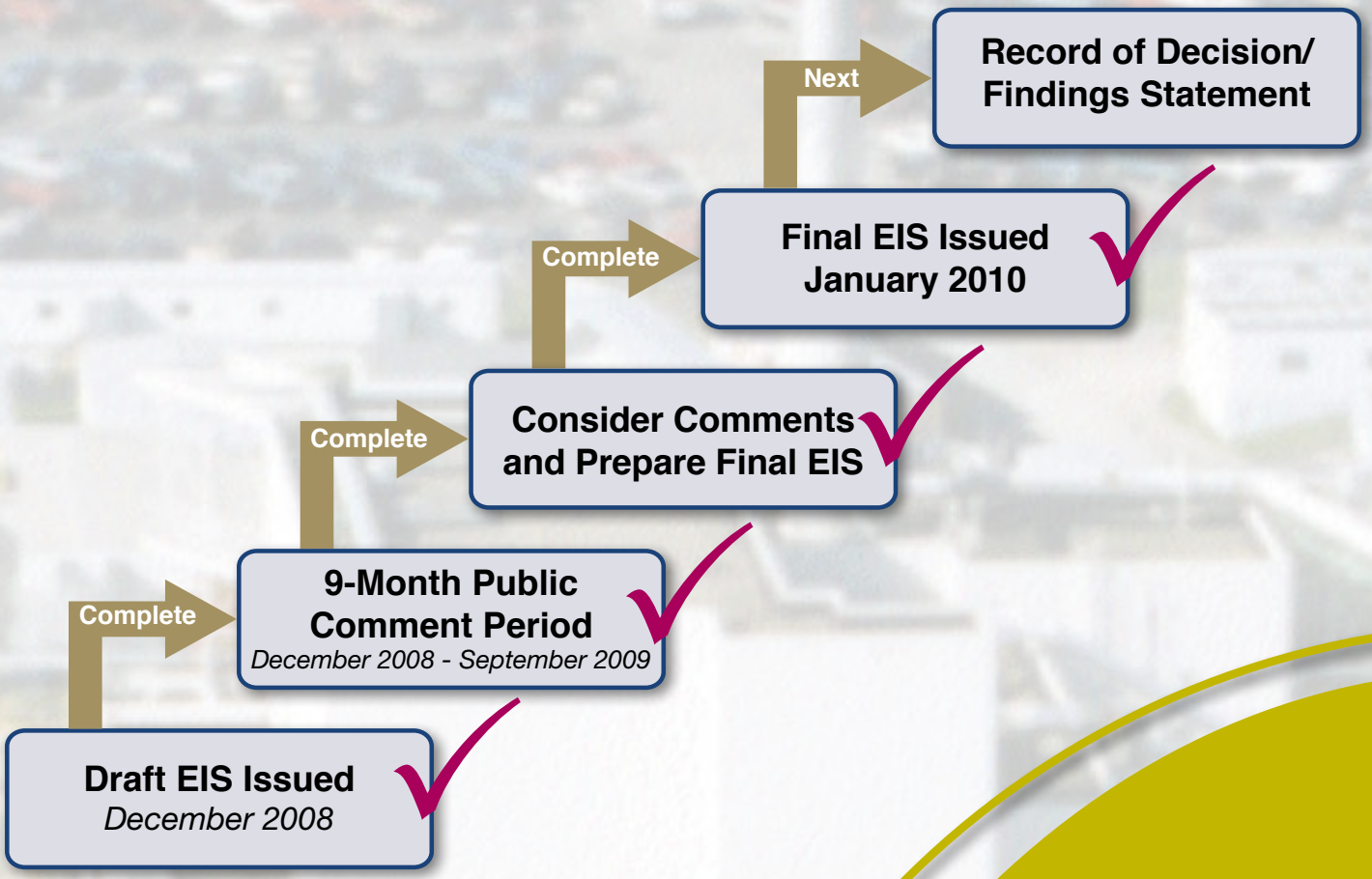
WVDP – West Valley Demonstration Project

Conversions

To convert hectares to acres, multiply by 2.471.

To convert cubic feet to cubic meters, multiply by 0.02832.

Next Steps:



For more information:

Catherine Bohan, EIS Document Manager
West Valley Demonstration Project
U.S. Department of Energy
Ashford Office Complex
9030 Route 219
West Valley, New York 14171

Telephone: 716-942-4159
Fax: 716-942-4703
email: catherine.m.bohan@wv.doe.gov
www. westvalleyeis.com

DOE/EIS-0226